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Subj: MV-22B TRAINING AND READINESS MANUAL

Ref: (a) NAVMC 3500.14D

Encl: (1) MV-22B T&R Manual

1. Purpose. In accordance with reference (a), enclosure (1) contains revised standards and regulations regarding training for MV-22B aircrew.

2. Cancellation. NAVMC 3500.11D.

3. Scope. Highlights of major training and readiness (T&R) planning considerations included in this MV-22B T&R Manual are as follows:

a. Updated all chapters to comply with reference (a).

b. Readiness metrics have been revised to align more closely with an update to the Marine Corps Readiness Reporting Order, Marine Corps Order 3000.13A.

c. Equipment standards for readiness have been changed from 70 percent full mission capable to 70 percent mission capable.

d. Replaced the core mission essential tasks of air delivery and air evacuation with aviation logistics support.

e. Placed greater emphasis on the execution of the skill of reduced visibility landings.

4. Information. Recommended changes to this Manual should be submitted via the syllabus sponsor and the appropriate chain of command to: Commanding General (CG), Training and Education

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Command (TECOM), Marine Air-Ground Task Force Training and Education Standards Division (MTESD) (C 466), Aviation Standards Branch using standard Naval correspondence or the Automated Message Handling System plain language address: CG TECOM MTESD.

5. Command. This Manual is applicable to the Marine Corps Total Force.

6. Certification. Reviewed and approved this date.



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By direction

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CHAPTER 1

MV-22B

	PARAGRAPH	PAGE
TRAINING AND READINESS REQUIREMENTS.....	1.0	1-3
MISSION.....	1.1	1-3
TABLE OF ORGANIZATION (T/O).....	1.2	1-3
MISSION ESSENTIAL TASK LIST (METL)	1.3	1-4
MISSION ESSENTIAL TASK (MET) TO SIX FUNCTIONS OF MARINE AVIATION	1.4	1-4
MET TO CORE/MISSION/CORE PLUS SKILL MATRIX	1.5	1-5
MISSION ESSENTIAL TASK (MET) OUTPUT STANDARDS.....	1.6	1-5
CORE MODEL MINIMUM REQUIREMENTS (CMMR) TRAINING STANDARDS FOR READINESS REPORTING (DRRS-MC)	1.7	1-6
CORE MODEL TRAINING STANDARD (CMTS)	1.8	1-6
INSTRUCTOR DESIGNATIONS	1.9	1-8
REQUIREMENTS, CERTIFICATIONS, QUALIFICATIONS, AND DESIGNATIONS (RCQD)	1.10	1-8
APPENDIX A MET WORKSHEETS		A-1
APPENDIX B REFERENCE SOURCES		B-1

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CHAPTER 1

MV-22B

1.0 TRAINING AND READINESS REQUIREMENTS. The goal of Marine Aviation is to attain and maintain combat readiness to support Expeditionary Maneuver Warfare while conserving resources. The standards established in this program are validated by subject matter experts to maximize combat capabilities for assigned METs. These standards describe and define unit capabilities and requirements necessary to maintain proficiency in mission skills and combat leadership. Training Events are based on specific requirements and performance standards to ensure a common base of training and depth of combat capability.

1.1 MISSION

1.1.1 Tactical and Reserve Squadron. Support the MAGTF Commander by providing assault support transport of combat troops, supplies, and equipment, day or night, under all weather conditions during expeditionary, joint or combined operations.

1.1.2 Fleet Replacement Squadron. Conduct Core Introduction tiltrotor training for aircrew in the MV-22B and provide technical training for aviation maintenance personnel.

1.2 TABLE OF ORGANIZATION (T/O). Refer to Table of Organization managed by Total Force Structure, MCCDC, for current authorized organizational structure and personnel strength for MV-22B units. As of this publication date, VMM/VMM FRS units are authorized:

1.2.1 Tactical and Reserve Squadrons

VMM				
TABLE OF ORGANIZATION T/O				
CREW POSITION	SQUADRON 12 Aircraft	SQUADRON(-) 8 Aircraft	DETACHMENT(+) 6 Aircraft	DETACHMENT 4 Aircraft
Pilots	28	18	14	9
Crew Chiefs	20	14	10	6
Aerial Observer /Gunner	12	8	6	4

1. 2.2 Tactical and Reserve Squadron's Critical Military Occupational Specialty* (MOS)

MV-22B TACTICAL AND RESERVE SQUADRON CRITICAL MOSs			
MOS Description	PRIMARY MOS	Billet and/or MOS Description	SECONDARY MOS
Pilot	7532	Maintenance Control (Safe-for-flight)	6012
Crew Chief	6176	Collateral Duty Inspector (CDI)	6016
Aircraft Maintenance Chief	6019	Collateral Duty QAR (CDQAR)	6017
Avionics Tech	6326	Quality Assurance Representative (QAR)	6018
Airframe Mechanic	6156	WTI Pilot	7577
Ordnance Technician	6531	WTI Crew Chief	6177
Flight Equipment Technician	6048	NSI	7547
Tiltrotor Mechanic	6116		
*Critical MOS - Those specialties that directly affect the unit's ability to undertake its mission. Definition per MCO 3000.13A. MOS list provided by APP-81 (Readiness).			
MOS shortages shall be reported by the squadron (12 Aircraft) only via DRRS-MC (See MET Worksheets Appendix A).			
Note: Critical MOSs for Section Leader, Division Leader, Flight Leader, and Air Mission Commander are reported in DRRS-MC via the CMMR paragraph under Combat Leadership (Para 1.7).			

1.2.3 VMMT-204 Fleet Replacement Squadron

VMMT-204	
TABLE OF ORGANIZATION T/O	
CREW POSITION	SQUADRON 20 Aircraft
Pilots	Reference FY+2 PPF Manpower Requirements
Crew Chiefs	Reference FY+2 PPF Manpower Requirements
Note: WebPPF (Production Planning Factors) is the Dept of the Navy program of record to determine the required inputs for projected RAC production. RAC production is variable based on demand from fleet Marine Corps units, USAF, USN, and FMS (foreign military sales) training requirements. Current manpower decisions should be based on FY+2 production planning factors to ensure the FRS is equipped to meet the forecasted demand.	

1.3 MISSION ESSENTIAL TASK LIST (METL). The METL is comprised of specified capabilities-based Mission Essential Tasks (METs) which a unit is designed to execute. METs are drawn from the Marine Corps Task List (MCTL), are standardized by type unit, and defined as Core or Core Plus METs. Core METs are those tasks that a unit is expected to execute at all times, and are the only METs used in reporting the Training Level (T-Level) for the Core Mission (C-Level) in the Defense Readiness Reporting System–Marine Corps (DRRS-MC). Core Plus METs identify additional capabilities to support missions or plans which are limited in scope, theater specific, or have a lower probability of execution. Core Plus METs may be included in Readiness Reporting when contained within an Assigned Mission METL. An Assigned Mission METL consists of only selected METs (drawn from Core and Core Plus METs) necessary to conduct the assigned mission. MCO 3000.13 provides additional information on readiness reporting.

VMM		
MISSION ESSENTIAL TASK LIST (METL)		
CORE		
MET	ABBREVIATION	MCT DESCRIPTION
MCT 4.3.8	ALS	Conduct Air Logistics Support
MCT 1.3.3.3.2	EXP	Conduct Aviation Operations From Expeditionary Shore-Based Sites
MCT 1.3.3.3.1	SEA	Conduct Aviation Operations From Expeditionary Sea-Based Sites
MCT 6.2.1.1	TRAP	Conduct Aviation Support of Tactical Recovery of Aircraft and Personnel
MCT 1.3.4.1	CAT	Conduct Combat Assault Transport
CORE PLUS		
MET	ABBREVIATION	MCT DESCRIPTION
MCT 1.3.4.1.1	RI/E	Conduct Airborne Rapid Insertion/Extraction
MCT 1.3.4.2.1	ADGR	Provide Aviation-Delivered Ground Refueling
MCT 1.3.4.3	BI	Provide Aviation-Delivered Battlefield Illumination
MCT 4.3.4	AD	Conduct Air Delivery
MCT 5.3.2.7.4	AC2	Provide an Airborne Command and Control Platform for Command Elements

1.4 MISSION ESSENTIAL TASK (MET) TO SIX FUNCTIONS OF MARINE AVIATION. As Aviation Ground units provide universal impact across all six functions of Marine Aviation, this table is optional for the Aviation Ground community.

VMM							
MISSION ESSENTIAL TASK (MET) TO SIX FUNCTIONS OF MARINE AVIATION							
MET	ABBREVIATION	SIX FUNCTIONS OF MARINE AVIATION					
		OAS	ASPT	AAW	EW	CoA&M	AerRec
MCT 4.3.8	ALS		X				
MCT 1.3.3.3.2	EXP		X				
MCT 1.3.3.3.1	SEA		X				
MCT 6.2.1.1	TRAP		X				
MCT 1.3.4.1	CAT		X				
CORE PLUS							
MCT 1.3.4.1.1	RI/E		X				
MCT 1.3.4.2.1	ADGR		X				
MCT 1.3.4.3	BI		X				
MCT 4.3.4	AD		X				
MCT 5.3.2.7.4	AC2					X	

1.5 MET TO CORE/MISSION/CORE PLUS SKILL MATRIX. Depicts the relationship between a MET and each Core/Mission/Core Plus/Mission Plus skill associated with the MET for readiness reporting and resource allocation purposes. There shall be a one-to-one relationship between the MET and a corresponding Mission Skill.

VMM																															
MET TO CORE/MISSION/CORE PLUS/SKILL MATRIX																															
MET	CORE SKILLS (2000 PHASE)												MISSION SKILLS (3000 PHASE)					CORE PLUS (4000 PHASE)													
																		CORE PLUS SKILLS (4000-4499 PHASE)								MISSION PLUS SKILLS (4500-4999)					
	FAM	FORM	CAL	RVL	NS HLL	NS LLL	AAR	TG	LAT	MAT	DIV	GTR	CQ	ALS	EXP	SEA	TRAP	CAT	AD	A/E	MAT	DWS	DCM	CBRN	CQ	HTT	RI/E	ADGR	BI	AD	AC2
ALS	X	X	X	X	X	X	X					X	X						X	X											
EXP	X	X	X	X	X	X	X	X	X	X	X		X						X	X	X	X	X	X		X					
SEA	X	X	X	X	X	X	X	X	X	X	X	X				X			X	X	X	X	X	X	X	X					
TRAP	X	X	X	X	X	X	X	X	X	X	X	X					X		X	X	X	X	X	X	X	X					
CAT	X	X	X	X	X	X		X	X	X	X	X						X	X	X	X	X	X	X		X					
CORE PLUS																															
RI/E	X	X	X	X	X	X		X	X	X	X	X							X	X	X						X				
ADGR	X	X	X	X	X	X		X	X	X	X	X								X								X			
BI	X	X			X	X			X																				X		
AD	X	X	X	X	X	X		X	X	X	X	X							X											X	
AC2	X	X			X	X																									X

1.6 MISSION ESSENTIAL TASK (MET) OUTPUT STANDARDS. The following MET output standards are the required level of performance a MV-22B squadron/detachment must be capable of sustaining during contingency operations by MET to be considered MET-ready.

1.6.1 Output standards will be demonstrated through the incorporation of unit training Events.

1.6.2 A core capable MV-22B squadron/detachment is able to sustain the number of sorties listed below on a daily basis during contingency/combat operations. The sortie rates are based on 1.5 hour average sortie duration. It assumes >70% Mission Capable aircraft with the associated aircraft survivability equipment, mission systems and mission sets required to conduct the MET and >90% T/O aircrew on hand. If unit MC aircraft is <70% or T/O aircrew <90%, core capability will be degraded by a like percentage.

VMM													
MISSION ESSENTIAL TASK (MET) OUTPUT STANDARDS													
CORE													
MET	SKILL	OUTPUT STANDARDS (BY NUMBER OF AIRCRAFT)											
		MAXIMUM SORTIES BY MET				MAXIMUM DAILY SORTIES ¹							
		12 A/C	8 A/C	6 A/C	4 A/C	12 A/C	8 A/C	6 A/C	4 A/C				
MCT 4.3.8	ALS	16	10	8	5	16	10	8	5				
MCT 1.3.3.3.2	EXP	16	10	8	5								
MCT 1.3.3.3.1	SEA	16	10	8	5								
MCT 6.2.1.1	TRAP	16	10	8	5								
MCT 1.3.4.1	CAT	16	10	8	5								
CORE PLUS													
MET	SKILL	12 A/C	8 A/C	6 A/C	4 A/C								
MCT 1.3.4.1.1	RI/E	4	4	2	2								
MCT 1.3.4.2.1	ADGR	4 ²	4 ²	2 ²	2 ²								
MCT 1.3.4.3	BI	4	4	2	2								
MCT 4.3.4	AD	4	4	2	2								
MCT 5.3.2.7.4	AC2	4	4	2	2								
Note ¹ A Unit is able to execute maximum daily sorties 16 total overall sorties on a sustained daily basis during contingency/combat operations. Based on historical flight hour data, average sortie duration is 1.5 hours for the Unit.													
Note ² The number reflects refueling points vice sorties.													

1.7 CORE MODEL MINIMUM REQUIREMENT (CMMR) TRAINING STANDARDS FOR READINESS REPORTING (DRRS-MC). The paragraphs and tables below delineate the minimum crew proficiency, qualifications and designations required to execute the MET training standards and MET observed standards of para 1.6. MCO 3000.13 Readiness Reporting provides additional guidance and a detailed description of readiness reporting using DRRS-MC.

1.7.1 The CMMR Readiness Reporting Matrix depicts the minimum crew composition (defined as a combination of qualifications and designations) reflecting the number of crews required per MET and minimum Combat Leadership requirements for readiness reporting purposes. The number of crews formed using the below minimum standards per crew capture the readiness capability of a squadron to perform the MET sortie.

VMM									
CORE MODEL MINIMUM REQUIREMENT (CMMR) FOR READINESS REPORTING									
CORE									
MET	SKILL	CREW POSITION				FORMED CREWS (CREW CMMR)			
		PILOT	CO-PILOT	CC	CC/AO	12 A/C	8 A/C	6 A/C	4 A/C
MCT 4.3.8	ALS	MSP,TAC	MSP	MSP	NSQ (LLL), TGQ	8	5	4	3
MCT 1.3.3.3.2	EXP	MSP,TAC	MSP	MSP	NSQ (LLL), TGQ	8	5	4	3
MCT 1.3.3.3.1	SEA	MSP,TAC	MSP	MSP	NSQ (LLL), TGQ, CQ	8	5	4	3
MCT 6.2.1.1	TRAP	MSP,TAC	MSP	MSP	NSQ (LLL), GTR	8	5	4	3
MCT 1.3.4.1	CAT	MSP,TAC	MSP	MSP	NSQ (LLL), GTR	8	5	4	3
CORE PLUS									
MET	SKILL	CREW POSITION				FORMED CREWS (CREW CMMR)			
		PILOT	CO-PILOT	CC	CC/AO	12 A/C	8 A/C	6 A/C	4 A/C
MCT 1.3.4.1.1	RI/E	MSP,TAC	MSP	MSP	NSQ (LLL), TGQ	4	3	2	2
MCT 1.3.4.2.1	ADGR	MSP,TAC	MSP	MSP	NSQ (LLL), TGQ	4	3	2	2
MCT 1.3.4.3	BI	MSP,TAC	MSP	MSP	NSQ (LLL), TGQ	4	3	2	2
MCT 4.3.4	AD	MSP,TAC	MSP	MSP	NSQ (LLL), TGQ	4	3	2	2
MCT 5.3.2.7.4	AC2	MSP,TAC	MSP	MSP	NSQ (LLL), TGQ	4	3	2	2
A standard MV-22B crew consists of two pilots, one crew chief, and one AG/O.									
COMBAT LEADERSHIP									
DESIGNATION		12 A/C		8 A/C		6 A/C		4 A/C	
TAC		12		8		6		4	
SEC LDR		8		5		4		3	
DIV LDR		6		4		3		2	
FLT LDR		3		2		1		1	
AIR MSN CMDR		2		1		1		1	

1.8 CORE MODEL TRAINING STANDARD (CMTS). The CMTS is the optimum training standard reflecting the number of crews or aircrews trained to CSP/MSP, per crew position to execute each Stage of instruction or flight as detailed below. The CMTS Matrix depicts the training goal and optimum depth of training desired for each unit or squadron as they develop their unit or squadron training plan. It is not utilized for readiness reporting (DRRS-MC) purposes. At a minimum, the CMTS shall enable a unit or squadron to form CMMR crews for Mission Skills (and Mission Plus Skills when required).

1.8.1 VMM Tactical and Reserve Squadron

VMM												
CORE MODEL TRAINING STANDARD (CMTS)												
CORE PHASE (2000 Phase)												
CORE SKILLS	PILOT				CREW CHIEFS				AERIAL OBSERVER/GUNNER			
	12 A/C	8 A/C	6 A/C	4 A/C	12 A/C	8 A/C	6 A/C	4 A/C	12 A/C	8 A/C	6 A/C	4 A/C
FAM	24	16	12	8	12	8	6	4	-	-	-	-
FORM	24	16	12	8	12	8	6	4	-	-	-	-
CAL	24	16	12	8	12	8	6	4	-	-	-	-
RVL	24	16	12	8	12	8	6	4	12	8	6	4
NS HLL	24	16	12	8	12	8	6	4	12	8	6	4
NS LLL	24	16	12	8	12	8	6	4	12	8	6	4
AAR	24	16	12	8	-	-	-	-	-	-	-	-
TG	24	16	12	8	12	8	6	4	12	8	6	4
LAT	24	16	12	8	12	8	6	4	12	8	6	4
MAT	24	16	12	8	-	-	-	-	-	-	-	-
DIV	24	16	12	8	12	8	6	4	12	8	6	4
GTR	24	16	12	8	12	8	6	4	12	8	6	4
CQ	24	16	12	8	12	8	6	4	12	8	6	4
MISSION PHASE (3000 Phase)												
MISSION SKILLS	PILOT				CREW CHIEFS				AERIAL OBSERVER/GUNNER			
	12 A/C	8 A/C	6 A/C	4 A/C	12 A/C	8 A/C	6 A/C	4 A/C	12 A/C	8 A/C	6 A/C	4 A/C
ALS	24	16	12	8	12	8	6	4	12	8	6	4
EXP	24	16	12	8	12	8	6	4	12	8	6	4
SEA	24	16	12	8	12	8	6	4	12	8	6	4
TRAP	24	16	12	8	12	8	6	4	12	8	6	4
CAT	24	16	12	8	12	8	6	4	12	8	6	4
CORE PLUS (4000 Phase)												
CORE PLUS SKILL	PILOT ¹				CREW CHIEFS ¹				AERIAL OBSERVER/GUNNER ¹			
	12 A/C	8 A/C	6 A/C	4 A/C	12 A/C	8 A/C	6 A/C	4 A/C	12 A/C	8 A/C	6 A/C	4 A/C
AD	4 8	2 5	2 5	2 3	2 4	2 3	2 2	2 2	2 4	2 3	2 2	2 2
AIE	4 8	2 5	2 5	2 3	2 4	2 3	2 2	2 2	2 4	2 3	2 2	2 2
MAT	4 8	2 5	2 5	2 3	2 4	2 3	2 2	2 2	2 4	2 3	2 2	2 2
DWS	4 8	2 5	2 5	2 3	2 4	2 3	2 2	2 2	2 4	2 3	2 2	2 2
DCM	4 8	2 5	2 5	2 3	2 4	2 3	2 2	2 2	2 4	2 3	2 2	2 2
CBRN	4 8	2 5	2 5	2 3	2 4	2 3	2 2	2 2	2 4	2 3	2 2	2 2
CQ	4 8	2 5	2 5	2 3	2 4	2 3	2 2	2 2	2 4	2 3	2 2	2 2
HTT	4 8	2 5	2 5	2 3	-	-	-	-	-	-	-	-
MISSION PLUS SKILLS												
MISSION PLUS SKILL	PILOT ¹				CREW CHIEFS ¹				AERIAL OBSERVER/GUNNER ¹			
	12 A/C	8 A/C	6 A/C	4 A/C	12 A/C	8 A/C	6 A/C	4 A/C	12 A/C	8 A/C	6 A/C	4 A/C
RI/E	4 8	2 5	2 5	2 3	2 4	2 3	2 2	2 2	2 4	2 3	2 2	2 2
ADGR	4 8	2 5	2 5	2 3	2 4	2 3	2 2	2 2	2 4	2 3	2 2	2 2
BI	4 8	2 5	2 5	2 3	2 4	2 3	2 2	2 2	2 4	2 3	2 2	2 2
AD	4 8	2 5	2 5	2 3	2 4	2 3	2 2	2 2	2 4	2 3	2 2	2 2
AC2	4 8	2 5	2 5	2 3	2 4	2 3	2 2	2 2	2 4	2 3	2 2	2 2

Note¹: For Core Plus Missions and Skills, the first number (highlighted in gray) represents the number of individuals the squadron is expected to train at all times in order to retain a cadre of capability within the squadron. The second number represents the number of MET capable individuals the squadron should train if that MET becomes an Assigned/Directed Mission Set. For Core Plus Skills the commanding officer determines the number of aircrew to train. The CMTS is based upon the community's collective recommendation.

1.9 INSTRUCTOR DESIGNATIONS

1.9.1 VMM Tactical and Reserve Squadron

VMM								
INSTRUCTOR DESIGNATIONS (5000 PHASE)								
DESIGNATION	PILOTS				CREW CHIEF			
	12 A/C	8 A/C	6 A/C	4 A/C	12 A/C	8 A/C	6 A/C	4 A/C
BIP	12	8	6	4	-	-	-	-
BICC	-	-	-	-	8	5	4	3
NI	1	1	0	0	1	1	0	0
ANI	4	2	2	1	4	2	2	1
INST EVAL	5	3	3	2	-	-	-	-
LATI	6	4	3	2	6	4	3	2
AARI	4	3	2	1	-	-	-	-
DCMI	2	2	1	1	2	1	1	1
RVLI	6	4	3	2	-	-	-	-
NSI	6	4	3	2	6	4	3	2
WTI	2	2	1	1	2	2	1	1
TGI	-	-	-	-	4	2	2	1
FLSE	2	1	1	1	-	-	-	-
DWSI	-	-	-	-	2	2	1	1
CRMF	5	3	2	1	5	3	2	1
CRMI	1	1	0	0	1	1	0	0

1.9.2 VMMT-204 Fleet Replacement Squadron

VMMT-204		
INSTRUCTOR DESIGNATIONS (5000 PHASE)		
DESIGNATION	FRS PILOTS	FRS CREW CHIEFS
FRSI	20	15
NSI	3	3
NSFI	6	6
STANI	5	5
RVLI	6	-
NI	1	1
ANI	2	2
INST EVAL	4	-
WTI	-	-
CRMF	4	4
CRMI	1	1

1.10 REQUIREMENTS, CERTIFICATIONS, QUALIFICATIONS, AND DESIGNATIONS (RCQD)

1.10.1 VMM Tactical and Reserve Squadron

VMM								
REQUIREMENTS, CERTIFICATIONS, QUALIFICATIONS, AND DESIGNATIONS (RCQD) (6000 PHASE)								
DESIGNATIONS								
DESIGNATION	PILOT				CREW CHIEF			
	12 A/C	8 A/C	6 A/C	4 A/C	12 A/C	8 A/C	6 A/C	4 A/C
FCP	8	6	4	2	-	-	-	-

1.10.2 VMMT-204 Fleet Replacement Squadron

REQUIREMENTS, CERTIFICATIONS, QUALIFICATIONS, AND DESIGNATIONS (RCQD) (6000 PHASE)	
DESIGNATION	PILOTS
TAC	Reference FY+2 PPF Manpower Requirements
SECTION LEADER	Reference FY+2 PPF Manpower Requirements
DIVISION LEADER	-
FLIGHT LEADER	-
AIR MSN CMDR	-
FCP	1/3 of Assigned Pilots

Appendix A

VMM (MV-22B)
Marine Corps Task (MCT) / Mission Essential Task (MET)
Task List and MET Worksheets

CORE METL	
MET	DESCRIPTION
MCT 4.3.8	Conduct Air Logistics Support
MCT 1.3.3.3.2	Conduct Aviation Operations From Expeditionary Shore-Based Sites
MCT 1.3.3.3.1	Conduct Aviation Operations From Expeditionary Sea-Based Sites
MCT 6.2.1.1	Conduct Aviation Support of Tactical Recovery of Aircraft and Personnel
MCT 1.3.4.1	Conduct Combat Assault Transport
CORE PLUS METL	
MET	MCT DESCRIPTION
MCT 1.3.4.1.1	Conduct Airborne Rapid Insertion/Extraction
MCT 1.3.4.2.1	Provide Aviation-Delivered Ground Refueling
MCT 1.3.4.3	Provide Aviation-Delivered Battlefield Illumination
MCT 4.3.4	Conduct Air Delivery
MCT 5.3.2.7.4	Provide an Airborne Command and Control Platform for Command Elements

CORE

MCT 4.3.8 **Conduct Air Logistics Support**

Conditions:

C 1.3.2.1 Light

Light available to illuminate objects from natural or manmade sources.

Descriptors: Bright (sunny day); Day (overcast day); low (dusk, dawn, moonlit, streetlight lit); Negligible (overcast night)

C 1.3.1.3.1 Air Temperature

Atmospheric temperature at ground level (degrees Fahrenheit).

Descriptors: Hot (> 85 F); Temperate (40 to 85 F); Cold (10 to 39 F); Very cold (< 10 F).

C 2.1.4.5 Intratheater Distance

Mileage between two locations (e.g., airfield to the FEBA).

Descriptors: Very short (< 10 NM); Short (10 to 50 NM); Moderate (50 to 150 NM); Long (150 to 500 NM); Very long (> 500 NM).

Standards: (Squadron[12]/Squadron-[8]/ Detachment+[6]/ Detachment[4]):

Personnel:

12/8/6/4 aircrews formed

90% of squadron T/O personnel MOS qualified and deployable

90% critical MOS fill: 7532, 6176, 6019, 6326, 6156, 6531, 6048, 6116, 6012, 6016, 6017, 6018, 7577, 6177, 7547, and Level 2 (L2) Required Maintainer Competency (RMC) IAW ASL-1 basis for measurement.

Equipment:

70% Mission Capable aircraft with the associated aircraft survivability equipment, mission systems and mission sets required to conduct the MET. (8/6/5/3 aircraft)

Operational support equipment fully supports MCT

Training:

8/5/4/3 aircrews MET capable IAW T&R requirements

Output Standards:

16/10/8/5 sorties daily sustained during contingency/combat

MCT 1.3.3.3.1

Conduct Aviation Operations From Expeditionary Sea-Based Sites

Conditions:

C 1.3.2.1 Light

Light available to illuminate objects from natural or manmade sources.

Descriptors: Bright (sunny day); Day (overcast day); low (dusk, dawn, moonlit, streetlight lit); Negligible (overcast night)

C 1.3.1.3.1 Air Temperature

Atmospheric temperature at ground level (degrees Fahrenheit).

Descriptors: Hot (> 85 F); Temperate (40 to 85 F); Cold (10 to 39 F); Very cold (< 10 F).

C 2.1.4.5 Intratheater Distance

Mileage between two locations (e.g., airfield to the FEBA).

Descriptors: Very short (< 10 NM); Short (10 to 50 NM); Moderate (50 to 150 NM); Long (150 to 500 NM); Very long (> 500 NM).

Standards: (Squadron[12]/Squadron-[8]/ Detachment+[6]/ Detachment[4]):

Personnel:

12/8/6/4 aircrews formed

90% of squadron T/O personnel MOS qualified and deployable

90% critical MOS fill: 7532, 6176, 6019, 6326, 6156, 6531, 6048, 6116, 6012, 6016, 6017, 6018, 7577, 6177, 7547, and Level 2 (L2) Required Maintainer Competency (RMC) IAW ASL-1 basis for measurement.

Equipment:

70% Mission Capable aircraft with the associated aircraft survivability equipment, mission systems and mission sets required to conduct the MET. (8/6/5/3 aircraft)

Operational support equipment fully supports MCT

Training:

8/5/4/3 aircrews MET capable IAW T&R requirements

Output Standards:

16/10/8/5 sorties daily sustained during contingency/combat

MCT 1.3.3.3.2

Conduct Aviation Operations From Expeditionary Shore-Based Sites

Conditions:

C 1.1.1.2 Terrain Elevation

Height of immediate terrain in reference to sea level.

Descriptors: High (6,000 to 10,000 ft); Moderately high (3,000 to 6,000 ft); Moderately low (1,000 to 3,000 ft); Low (500 to 1,000 ft); Very low (< 500 ft).

C 1.3.2.1 Light

Light available to illuminate objects from natural or manmade sources.

Descriptors: Bright (sunny day); Day (overcast day); low (dusk, dawn, moonlit, streetlight lit); Negligible (overcast night)

C 1.3.1.3.1 Air Temperature

Atmospheric temperature at ground level (degrees Fahrenheit).

Descriptors: Hot (> 85 F); Temperate (40 to 85 F); Cold (10 to 39 F); Very cold (< 10 F).

C 2.1.4.5 Intratheater Distance

Mileage between two locations (e.g., airfield to the FEBA).

Descriptors: Very short (< 10 NM); Short (10 to 50 NM); Moderate (50 to 150 NM); Long (150 to 500 NM); Very long (> 500 NM).

C 2.7.2 Air Superiority

The extent to which operations in the air, over sea and/or, over land can be conducted with acceptable losses due to hostile air forces and air defense systems action. Descriptors: Full (Air Supremacy); General; Local.

Standards: (Squadron[12]/Squadron-[8]/ Detachment+[6]/ Detachment[4]):

Personnel:

12/8/6/4 aircrews formed

90% of squadron T/O personnel MOS qualified and deployable

90% critical MOS fill: 7532, 6176, 6019, 6326, 6156, 6531, 6048, 6116, 6012, 6016, 6017, 6018, 7577, 6177, 7547, and Level 2 (L2) Required Maintainer Competency (RMC) IAW ASL-1 basis for measurement.

Equipment:

70% Mission Capable aircraft with the associated aircraft survivability equipment, mission systems and mission sets required to conduct the MET. (8/6/5/3 aircraft)

Operational support equipment fully supports MCT

Training:

8/5/4/3 aircrews MET capable IAW T&R requirements

Output Standards:

16/10/8/5 sorties daily sustained during contingency/combat

MCT 1.3.4.1

Conduct Combat Assault Transport

Conditions:

C 1.3.2.1 Light

Light available to illuminate objects from natural or manmade sources.

Descriptors: Bright (sunny day); Day (overcast day); low (dusk, dawn, moonlit, streetlight lit); Negligible (overcast night)

C.1.3.2.3 Aviation Meteorological Conditions

Current weather/flight conditions affecting flight rules next 24 hours.

Descriptors: VMC (Conditions that permit flight using external cues and a distinguishable horizon.)

C 1.1.1.2 Terrain Elevation

Height of immediate terrain in reference to sea level.

Descriptors: High (6,000 to 10,000 ft); Moderately high (3,000 to 6,000 ft); Moderately low (1,000 to 3,000 ft); Low (500 to 1,000 ft); Very low (< 500 ft).

C 2.7.2 Air Superiority

The extent to which operations in the air, over sea and/or, over land can be conducted with acceptable losses due to hostile air forces and air defense systems action. Descriptors: Full (Air Supremacy); General; Local.

Standards: (Squadron[12]/Squadron-[8]/ Detachment+[6]/ Detachment[4]):

Personnel:

12/8/6/4 aircrews formed

90% of squadron T/O personnel MOS qualified and deployable

90% critical MOS fill: 7532, 6176, 6019, 6326, 6156, 6531, 6048, 6116, 6012, 6016, 6017, 6018, 7577, 6177, 7547, and Level 2 (L2) Required Maintainer Competency (RMC) IAW ASL-1 basis for measurement.

Equipment:

70% Mission Capable aircraft with the associated aircraft survivability equipment, mission systems and mission sets required to conduct the MET. (8/6/5/3 aircraft)

Operational support equipment fully supports MCT

Training:

8/5/4/3 aircrews MET capable IAW T&R requirements

Output Standards:

16/10/8/5 sorties daily sustained during contingency/combat

MCT 6.2.1.1

Conduct Aviation Support of Tactical Recovery of Aircraft and Personnel (TRAP)

Conditions:

C 1.3.2.1 Light

Light available to illuminate objects from natural or manmade sources.

Descriptors: Bright (sunny day); Day (overcast day); low (dusk, dawn, moonlit, streetlight lit); Negligible (overcast night)

C.1.3.2.3 Aviation Meteorological Conditions

Current weather/flight conditions affecting flight rules next 24 hours.

Descriptors: VMC (Conditions that permit flight using external cues and a distinguishable horizon.)

C 1.1.1.2 Terrain Elevation

Height of immediate terrain in reference to sea level.

Descriptors: Very high (> 10,000 ft); High (6,000 to 10,000 ft); Moderately high (3,000 to 6,000 ft); Moderately low (1,000 to 3,000 ft); Low (500 to 1,000 ft); Very low (< 500 ft).

C 2.7.2 Air Superiority

The extent to which operations in the air, over sea and/or, over land can be conducted with acceptable losses due to hostile air forces and air defense systems action. Descriptors: Full (Air Supremacy); General; Local.

Standards: (Squadron[12]/Squadron-[8]/ Detachment+[6]/ Detachment[4]):

Personnel:

12/8/6/4 aircrews formed

90% of squadron T/O personnel MOS qualified and deployable

90% critical MOS fill: 7532, 6176, 6019, 6326, 6156, 6531, 6048, 6116, 6012, 6016, 6017, 6018, 7577, 6177, 7547, and Level 2 (L2) Required Maintainer Competency (RMC) IAW ASL-1 basis for measurement.

Equipment:

70% Mission Capable aircraft with the associated aircraft survivability equipment, mission systems and mission sets required to conduct the MET. (8/6/5/3 aircraft)

Operational support equipment fully supports MCT

Training:

8/5/4/3 aircrews MET capable IAW T&R requirements

Output Standards:

16/10/8/5 sorties daily sustained during contingency/combat

Core Plus

MCT 1.3.4.1.1

Conduct Airborne Rapid Insertion/Extraction Operations Conditions

Conditions:

C 1.3.2.1 Light

Light available to illuminate objects from natural or manmade sources.

Descriptors: Bright (sunny day); Day (overcast day); low (dusk, dawn, moonlit, streetlight lit); Negligible (overcast night)

C.1.3.2.3 Aviation Meteorological Conditions

Current weather/flight conditions affecting flight rules next 24 hours.

Descriptors: VMC (Conditions that permit flight using external cues and a distinguishable horizon.)

C 1.1.1.2 Terrain Elevation

Height of immediate terrain in reference to sea level.

Descriptors: High (6,000 to 10,000 ft); Moderately high (3,000 to 6,000 ft); Moderately low (1,000 to 3,000 ft); Low (500 to 1,000 ft); Very low (< 500 ft).

C 2.7.2 Air Superiority

The extent to which operations in the air, over sea and/or, over land can be conducted with acceptable losses due to hostile air forces and air defense systems action. Descriptors: Full (Air Supremacy); General; Local.

Standards: (Squadron[12]/Squadron-[8]/ Detachment+[6]/ Detachment[4]):

Personnel:

12/8/6/4 aircrews formed

90% of squadron T/O personnel MOS qualified and deployable

90% critical MOS fill: 7532, 6176, 6019, 6326, 6156, 6531, 6048, 6116, 6012, 6016, 6017, 6018, 7577, 6177, 7547, and Level 2 (L2) Required Maintainer Competency (RMC) IAW ASL-1 basis for measurement.

Equipment:

70% Mission Capable aircraft with the associated aircraft survivability equipment, mission systems and mission sets required to conduct the MET. (8/6/5/3 aircraft)

Operational support equipment fully supports MCT

Training:

4/3/2/2 aircrews MET capable IAW T&R requirements

Output Standards:

4/4/2/2/ sorties daily sustained during contingency/combat

MCT 1.3.4.2

Conduct Air-to-Air Refueling

Conditions:

C 1.3.2.1 Light

Light available to illuminate objects from natural or manmade sources.

Descriptors: Bright (sunny day); Day (overcast day); low (dusk, dawn, moonlit, streetlight lit); Negligible (overcast night)

C 2.1.4.5 Intratheater Distance

Mileage between two locations (e.g., airfield to the FEBA).

Descriptors: Very short (< 10 NM); Short (10 to 50 NM); Moderate (50 to 150 NM); Long (150 to 500 NM); Very long (> 500 NM).

C 2.7.2 Air Superiority

The extent to which operations in the air, over sea and/or, over land can be conducted with acceptable losses due to hostile air forces and air defense systems action. Descriptors: Full (Air Supremacy); General; Local.

Standards: (Squadron[12]/Squadron-[8]/ Detachment+[6]/ Detachment[4]):

Personnel:

12/8/6/4 aircrews formed

90% of squadron T/O personnel MOS qualified and deployable

90% critical MOS fill: 7532, 6176, 6019, 6326, 6156, 6531, 6048, 6116, 6012, 6016, 6017, 6018, 7577, 6177, 7547, and Level 2 (L2) Required Maintainer Competency (RMC) IAW ASL-1 basis for measurement.

Equipment:

70% Mission Capable aircraft with the associated aircraft survivability equipment, mission systems and mission sets required to conduct the MET. (8/6/5/3 aircraft)

Operational support equipment fully supports MCT

Training:

4/3/2/2 aircrews MET capable IAW T&R requirements

Output Standards:

4/4/2/2 sorties daily sustained during contingency/combat

MCT 1.3.4.2.1

Provide Aviation-Delivered Ground Refueling

Conditions:

C 1.3.2.1 Light

Light available to illuminate objects from natural or manmade sources.

Descriptors: Bright (sunny day); Day (overcast day); Low (dusk, dawn, moonlit, streetlight lit); Negligible (overcast night)

C 2.7.2 Air Superiority

The extent to which operations in the air, over sea and/or, over land can be conducted with acceptable losses due to hostile air forces and air defense systems action. Descriptors: Full (Air Supremacy); General; Local.

Standards: (Squadron[12]/Squadron-[8]/ Detachment+[6]/ Detachment[4]):

Personnel:

12/8/6/4 aircrews formed

90% of squadron T/O personnel MOS qualified and deployable

90% critical MOS fill: 7532, 6176, 6019, 6326, 6156, 6531, 6048, 6116, 6012, 6016, 6017, 6018, 7577, 6177, 7547, and Level 2 (L2) Required Maintainer Competency (RMC) IAW ASL-1 basis for measurement.

Equipment

70% Mission Capable aircraft with the associated aircraft survivability equipment, mission systems and mission sets required to conduct the MET. (8/6/5/3 aircraft)

Operational support equipment fully supports MCT

Training:

4/3/2/2 aircrews MET capable IAW T&R requirements

Output Standards:

Provide (4/4/2/2) refueling points capable of transferring 25gpm

MCT 1.3.4.3

Provide Aviation Delivered Battlefield Illumination

Conditions:

C 2.7.2 Air Superiority

The extent to which operations in the air, over sea and/or, over land can be conducted with acceptable losses due to hostile air forces and air defense systems action. Descriptors: Full (Air Supremacy); General; Local.

Standards: (Squadron[12]/Squadron-[8]/ Detachment+[6]/ Detachment[4]):

Personnel:

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90% of squadron T/O personnel MOS qualified and deployable

90% critical MOS fill: 7532, 6176, 6019, 6326, 6156, 6531, 6048, 6116, 6012, 6016, 6017, 6018, 7577, 6177, 7547, and Level 2 (L2) Required Maintainer Competency (RMC) IAW ASL-1 basis for measurement.

Equipment:

70% Mission Capable aircraft with the associated aircraft survivability equipment, mission systems and mission sets required to conduct the MET. (8/6/5/3 aircraft)

Operational support equipment fully supports MCT

Training:

4/3/2/2 aircrews MET capable IAW T&R requirements

Output Standards:

4/4/2/2 sorties daily sustained during contingency/combat

MCT 4.3.4

Conduct Air Delivery

Conditions:

C 1.3.2.1 Light

Light available to illuminate objects from natural or manmade sources.

Descriptors: Bright (sunny day); Day (overcast day); low (dusk, dawn, moonlit, streetlight lit); Negligible (overcast night)

C.1.3.2.3 Aviation Meteorological Conditions

Current weather/flight conditions affecting flight rules next 24 hours.

Descriptors: VMC (Conditions that permit flight using external cues and a distinguishable horizon.)

C 1.1.1.2 Terrain Elevation

Height of immediate terrain in reference to sea level.

Descriptors: High (6,000 to 10,000 ft); Moderately high (3,000 to 6,000 ft); Moderately low (1,000 to 3,000 ft); Low (500 to 1,000 ft); Very low (< 500 ft).

C 2.7.2 Air Superiority

The extent to which operations in the air, over sea and/or, over land can be conducted with acceptable losses due to hostile air forces and air defense systems action. Descriptors: Full (Air Supremacy); General; Local.

Standards: (Squadron[12]/Squadron-[8]/ Detachment+[6]/ Detachment[4]):

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Equipment:

70% Mission Capable aircraft with the associated aircraft survivability equipment, mission systems and mission sets required to conduct the MET. (8/6/5/3 aircraft)

Operational support equipment fully supports MCT

Training:

4/3/2/2 aircrews MET capable IAW T&R requirements

Output Standards:

4/4/2/2 sorties daily sustained during contingency/combat

MCT 5.3.2.7.4

Provide an Airborne Command and Control Platform for Command Elements

Conditions:

C.1.3.2.3 Aviation Meteorological Conditions

Current weather/flight conditions affecting flight rules next 24 hours.

Descriptors: VMC (Conditions that permit flight using external cues and a distinguishable horizon.)

C.1.3.1.3.11 Ceiling

Height of lowest cloud cover above sea level.

Descriptors: Low (100 to 3,000 feet); Medium (3,000 to 10,000 feet); High (>10,000 feet)

C 1.3.2 Visibility

Maximum distance to see an object given the moisture and particulate matter (dust, salt, ash) suspended in the atmosphere.

Descriptors: Moderate (1 to 3 NM); Good (3 to 10 NM); High (10 to 20 NM); Unlimited (>20 NM)

C 1.3.2.1 Light

Light available to illuminate objects from natural or manmade sources.

Descriptors: Bright (sunny day); Day (overcast day); low (dusk, dawn, moonlit, streetlight lit); Negligible (overcast night)

C 2.7.2 Air Superiority

The extent to which operations in the air, over sea and/or, over land can be conducted with acceptable losses due to hostile air forces and air defense systems action. Descriptors: Full (Air Supremacy); General; Local.

Standards: (Squadron[12]/Squadron-[8]/ Detachment+[6]/ Detachment[4]):

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Equipment:

70% Mission Capable aircraft with the associated aircraft survivability equipment, mission systems and mission sets required to conduct the MET. (8/6/5/3 aircraft)

Operational support equipment fully supports MCT

Training:

4/3/2/2 aircrews MET capable IAW T&R requirements

Output Standards:

4/4/2/2 sorties daily sustained during contingency/combat

Appendix B Reference Sources

ABBREVIATIONS

MV-22B ABBREVIATIONS	
CORE SKILLS (2000 Phase)	
FAM	Familiarization / Instrument
CAL	Confined Area Landing
FORM	Formation
LAT	Low Altitude Tactics
RVL	Reduced Visibility Landing
NS HLL	Night Systems High Light Level
NS LLL	Night Systems Low Light Level
AAR	Air-to-Air Refueling
TG	Tail Gunnery
MAT	Mountain Area Training
GTR	Ground Threat Reaction
CQ	Carrier Qualification
MISSION SKILLS (3000 Phase)	
ALS	Air Logistic Support
EXP	Expeditionary Shore-Based
SEA	Expeditionary Sea-Based
TRAP	Tactical Recovery of Aircraft and Personnel
CAT	Combat Assault Transport
CORE PLUS (4000 Phase)	
CORE PLUS SKILLS	
AD	Air Delivery
AC2	Airborne Command and Control
DWS	Defensive Weapons System
CBRN	Chemical Biological Radiological Nuclear
CQ	Carrier Qualification
DCM	Defensive Combat Maneuvers
HTT	High Threat Tactics
MISSION PLUS SKILLS	
RI/E	Rapid Insertion / Extraction
AD	Air Delivery
ADGR	Aviation-Delivered Ground Refueling
BI	Aviation-Delivered Battlefield Illumination
AC2	Airborne Command and Control
INSTRUCTOR TRAINING (5000 Phase)	
BIP	Basic Instructor Pilot
BICC	Basic Instructor Crew Chief
NI	NATOPS Instructor/Evaluator
ANI	Assistant NATOPS Instructor/Evaluator
INST EVAL	Instrument Evaluator
LATI	Low Altitude Tactics Instructor
AARI	Air-to-Air Refueling Instructor
DCMI	Defensive Combat Measures Instructor
FLSE	Flight Leadership Standardization Evaluator
TGI	Tail Gun Instructor
DWSI	Defensive Weapon System Instructor
RVLI	Reduced Visibility Landing Instructor
CRMF	Crew Resource Management Facilitator
CRMI	Crew Resource Management Instructor
NSI	Night Systems Instructor
NSFI	Night Systems Familiarization Instructor
FRSI	Fleet Replacement Squadron Instructor
STANI	Standardization Instructor
WTI	Weapons and Tactics Instructor
COMBAT LEADERSHIP (6000 Phase)	
SEC LDR	Section Leader
DIV LDR	Division Leader
FL LDR	Flight leader
AIR MSN CMDR	Air Mission Commander
REQUIREMENTS, QUALIFICATIONS, CERTIFICATIONS, AND DESIGNATIONS (RCQD) (6000 Phase)	
FCP	Functional Check Pilot

MV-22B EXTERNAL RESOURCE REQUIREMENTS

The following matrix summarizes training resource requirements for MV-22B squadron training as outlined in Chapters 2-4 of this Manual.

MV-22B EXTERNAL TRAINING RESOURCE REQUIREMENTS										
PHASE	STAGE	SIM	LZ/DZ	LAT AREA	AG / LASER RANGE	ORD	HST	HRST / JUMP/CAST MASTER	FCLP PAD& SHIP	FW BOGEY
CORE INTRO	FAM	X								
	NAV	X								
	INST	X								
	CAL	X	X							
	FORM	X	X							
	NS	X	X							
	CARGO	X								
	REV	X	X							
CORE	FAM	X								
	CAL	X	X							
	FORM	X								
	RVL	X	X							
	HLL NS	X	X							
	LLL NS	X	X							
	AAR	X								
	TG	X			X	X				
	LAT	X	X	X						
	MAT	X								
	GTR	X		X	X	X				
MISSION	CQ	X							X	
	ALS	X	X							
	SEA	X	X	X	X	X			X	
	SHORE	X	X	X	X	X				
	TRAP	X	X	X	X	X				
	CAT	X	X	X	X	X				
CORE PLUS	DCM	X		X	X	X				X
	DWS				X	X				
	CBRN	X								
	A/E		X							
	HTT	X						X		
	CQ	X							X	
	MAT		X							
	ADGR		X							
	AD	X	X	X			X	X		
	RI/E		X					X		
INSTRUCTOR TRAINING	BIP	X	X							
	AARI	X								
	LATI	X	X	X						
	RVLI	X	X							
	NSI	X	X	X					X	
	DCMI	X		X	X	X				X
RCQD	SL	X	X							
	DL	X	X							
	FL		X							
	AMC									
	FCP	X								

CHAPTER 2
MV-22 PILOT/7532

	PARAGRAPH	PAGE
CREWMEMBER SYLLABUS T&R REQUIREMENTS.....	2.0	2-3
TRAINING PROGRESSION MODEL	2.1	2-3
PROGRAMS OF INSTRUCTION.....	2.2	2-3
PROFICIENCY & CURRENCY	2.3	2-5
REQUIREMENTS, CERTIFICATIONS, QUALIFICATIONS, AND DESIGNATION (RCQD) TABLES	2.4	2-6
SYLLABUS NOTES	2.5	2-7
CORE INTRODUCTION PHASE (1000).....	2.6	2-11
CORE INTRODUCTION STAGES - GROUND.....	2.7	2-11
CORE INTRODUCTION STAGES - FLIGHT	2.8	2-20
CORE SKILL PHASE (2000)	2.9	2-87
MISSION SKILL PHASE (3000).....	2.10	2-134
CORE PLUS SKILL PHASE (4000)	2.11	2-144
INSTRUCTOR TRAINING PHASE (5000).....	2.12	2-167
REQUIREMENTS, CERTIFICATIONS, QUALIFICATIONS, DESIGNATIONS (RCQD) (6000) PHASE.....	2.13	2-179
MISSION ESSENTIAL TASK (MET) PHASE (7000)	2.14	2-204
AVIATION CAREER PROGRESSION MODEL (ACPM) (8000)	2.15	2-208
MV-22B PILOT T&R SYLLABUS MATRX (2000-8000 PHASE).....	2.16	2-212
MV-22B PILOT RANGE AND ORDNANCE MATRIX	2.17	2-223
MV-22B PILOT FRS MATRIX (1000, 5000, 6000 PHASE).....	2.18	2-227

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CHAPTER 2 MV-22 PILOT/7532

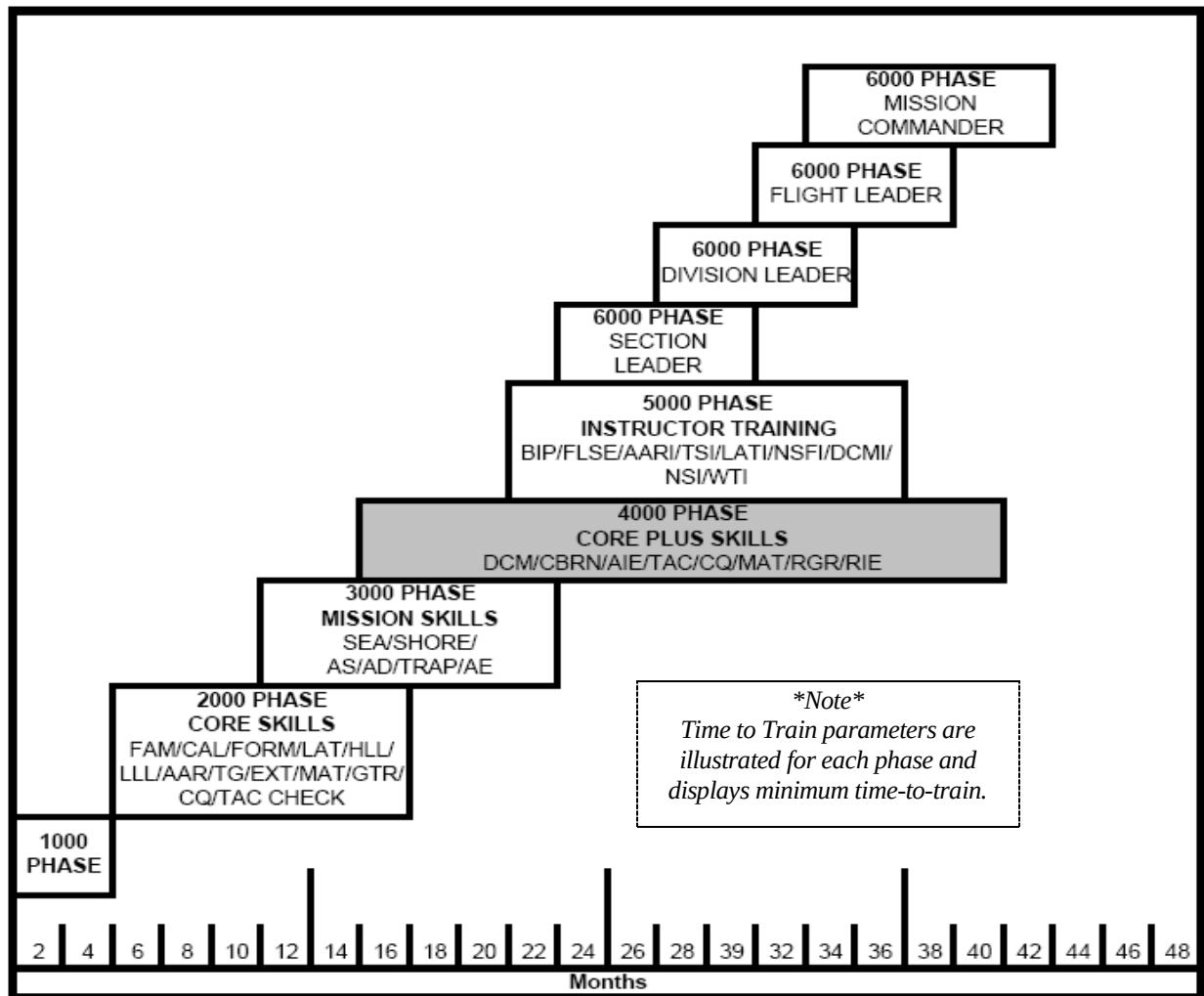
INDIVIDUAL TRAINING AND READINESS REQUIREMENTS

2.0 CREWMEMBER SYLLABUS T&R REQUIREMENTS

This T&R Syllabus is based on specific goals and performance standards designed to ensure individual proficiency in Core and Mission Skills. The goal of this chapter is to develop individual and unit warfighting capabilities.

2.1 TRAINING PROGRESSION MODEL

This model represents the recommended training progression for the average MV-22B pilot. Units should use the model as a point of departure to generate individual training plans. It represents minimum-to maximum time to train.



2.2 PROGRAMS OF INSTRUCTION

A Program of Instruction (POI) is a training track assigned to a Marine based on their proficiency in a skill. All Marines undergoing training are assigned to at least one POI. The following POI's represent the average POI time-to-train. All Marines undergoing training are assigned to at least one POI.

Table 2-1: Program of Instruction Matrix of Applicable Codes

Program of Instruction (POI)	Symbol	Aviation Flying
BASIC	B	INITIAL MOS/SKILL TRAINING
TRANSITION	T	MOVING FROM ONE TYPE TO ANOTHER (ROTARY-WING TO FIXED-WING)
REFRESHER	R	DIFDEN TO DIFOPS IN SAME T/M/S
MAINTAIN	M	ALL INDIVIDUALS WHO HAVE ATTAINED CSP/MSP/CPP BY INITIAL POI ASSIGNMENT ARE RE-ASSIGNED TO THE M POI TO MAINTAIN PROFICIENCY.
MODIFIED REFRESHER	MR	FRS ONLY – SEE CHAPTER 4 FOR SPECIFIC ASSIGNMENT
AIR FORCE	AF	AIR FORCE STUDENT MV-22B
AIR FORCE INSTRUCTOR	CV	AIR FORCE CV-22 INSTRUCTOR TO MV-22B INSTRUCTOR
FRS INSTRUCTOR	FRSI	FLEET REPLACEMENT SQUADRON INSTRUCTOR
CONTRACT INSTRUCTOR	CI	CONTRACT INSTRUCTOR

The following POIs can be assigned:

2.2.1 Basic (B)

Basic pilots shall be placed in the Basic POI and shall complete all events with the exception of CAL-1333, which is an Air Force POI event as referenced in Table 2-.

Table 2-2: POI Schedule for Basic Pilot

WEEKS	COURSE	PERFORMING ACTIVITY
1-3	GROUND SCHOOL	TRAINING SQUADRON
4-18	CORE SKILL INTRODUCTION	TRAINING SQUADRON
19-70	CORE SKILL	TACTICAL SQUADRON
71-83	MISSION SKILL	TACTICAL SQUADRON

2.2.2 Transition (T)

Pilots transitioning to the MV-22 shall be placed in the Basic POI.

2.2.3 Refresher (R)

Previously designated MV-22 pilots who have been out of the MV-22 cockpit for more than 730 days shall be placed in the Refresher POI and complete the FRS Refresher syllabus designated by an ‘R’ in the 1000 phase. Upon completion of FRS Refresher training, pilots are assigned to the Refresher syllabus at the tactical squadron. Refresher training at the tactical squadron is predicated on the experience of the pilot. A Refresher pilot need not fly every event within a stage of training to regain proficiency in that stage. The unit commanding officer may tailor the Refresher syllabus to fit the experience of the Refresher pilot per the T&R Program Manual. Any modification to the Refresher syllabus by the unit commanding officer shall be documented in Section 3 of the pilot’s APR prior to commencement of training. When all R-coded events in a stage are successfully completed, all remaining events in that stage that are proficient or delinquent are updated. NBA and Incomplete events are not updated and must be completed in addition to R-coded events. If the Refresher pilot has no previous proficiency in a stage or particular event, then the Refresher should fly the entire stage or all events not previously flown.

Table 2-3: POI Schedule for Refresher Pilot

WEEKS	COURSE	PERFORMING ACTIVITY
1-3	GROUND SCHOOL	TRAINING SQUADRON
4-13	CORE SKILL INTRODUCTION	TRAINING SQUADRON
14-39	CORE SKILL	TACTICAL SQUADRON
40-52	MISSION SKILL	TACTICAL SQUADRON

2.2.4 Modified Refresher (MR)

Previously designated MV-22 pilots who have been out of the MV-22 cockpit from 486 to 730 days shall be placed in the Modified Refresher POI and complete the FRS Mod Refresher syllabus designated by an ‘MR’ in the 1000 phase. The modified POI schedule is listed in Table Table 2-4. A Mod Refresher may fly ‘doubled up’ events in any stage as long as all the learning objectives are met and a minimum of 1 hour per scheduled event is flown. If the Mod Refresher pilot has no previous proficiency in a stage or particular event, then the Refresher should fly the entire stage or all events not previously flown. Upon completion of Modified Refresher training, pilots are assigned to the Refresher syllabus at the tactical squadron, as described above.

Table 2-4: POI Schedule for Modified Refresher Pilot

WEEKS	COURSE	PERFORMING ACTIVITY
1-3	GROUND SCHOOL	TRAINING SQUADRON
4-10	CORE SKILL INTRODUCTION	TRAINING SQUADRON
AFFECTS FRS ONLY		

2.2.5 Air Force (AF)

Air Force CV-22 pilots that are being trained in the 1000 phase shall be placed in the Air Force syllabus and shall complete all events designated by an 'AF'. Table 2-5 lists the appropriate Course and Phase.

Table 2-5: POI Schedule for Air Force Pilots

WEEKS	COURSE/PHASE	ACTIVITY
1-3	GROUND SCHOOL	TRAINING SQUADRON
4-13	CORE SKILL INTRODUCTION	TRAINING SQUADRON
AFFECTS FRS ONLY		

2.2.6 CV-22 to MV-22 FRS IP

The CV-22 to MV-22 FRS IP syllabus is located in both the Core Skill Introduction FRS Academic phase and 5100 stage of training. This syllabus is designed for Air Force CV-22 pilots assigned as instructors at the FRS. The syllabus includes CV-22 to MV-22 differences training as well as those sorties required to teach specific FRS events. Air Force instructors assigned to this syllabus shall complete all events designated by a 'CV'. Table 2-6 lists the appropriate Course and Phase.

Table 2-6: POI Schedule for CV-22 to MV-22

WEEKS	COURSE/PHASE	ACTIVITY
1-4	GROUND SCHOOL	TRAINING SQUADRON
5-6	CORE SKILL INTRODUCTION	TRAINING SQUADRON
AFFECTS FRS ONLY		

2.2.7 Fleet Replacement Squadron IP (FRSI)

The FRS IP syllabus is a subset of the CV-22 to MV-22 FRS IP syllabus located in the 5100 stage of training. Marine pilots assigned to the FRS shall be placed in the FRS IP POI and complete all events designated by an 'F'. Table 2-7 lists the appropriate Course and Phase.

Table 2-7: POI for FRS Instructor Pilot

WEEKS	COURSE/PHASE	ACTIVITY
1	GROUND SCHOOL	TRAINING SQUADRON
2-3	CORE SKILL INTRODUCTION	TRAINING SQUADRON
AFFECTS FRS ONLY		

2.2.8 Contract Instructor

The Contract Instructors syllabus includes the entire Core Skill Introduction FRS Academic Phase, the Core Skill Introduction phase, and the 5100 FRS IP stage of training. Contract Instructors assigned to instruct FRS simulator events shall be placed in the Contract Instructor POI and complete all events designated by a 'CI'. Table 8 lists the appropriate Course and Phase.

Table 2-8: POI Schedule for Contract Instructor Pilot

WEEKS	COURSE/PHASE	ACTIVITY
1-2	GROUND SCHOOL	TRAINING SQUADRON
3-16	CORE SKILL INTRODUCTION	TRAINING SQUADRON
AFFECTS FRS ONLY		

2.3 PROFICIENCY AND CURRENCY

The following rules apply when updating/developing the Attain and Maintain columns in the T&R matrix tables at the end of the chapter.

2.3.1 Event Proficiency

Event proficiency is defined as successful completion of the performance standard as determined by the instructor or evaluator. Event completion is predicated upon demonstrated proficiency. Once completed, it is logged in M-SHARP by entering the appropriate event code. M-SHARP automatically updates the event proficiency date to reflect the completion date.

2.3.2 Skill Proficiency

Proficiency is a measure of achievement of a specific skill. To attain Individual Skill proficiency, an individual must be simultaneously proficient in all events for that Skill. Individuals may be attaining proficiency in some skills while maintaining proficiency in others.

2.3.3 Maintaining Skill Proficiency

Once attained, skill proficiency is maintained by executing those events which have a Proficiency Period (Maintain events). Proficiency Periods establish the maximum time between Event demonstration. Should proficiency be lost in any maintain event, for a specific skill, that skill proficiency is temporarily lost. Skill proficiency can be re-attained by again demonstrating proficiency in the Event(s) that are not proficient. For flying communities, an individual shall complete delinquent events with a proficient instructor, crewman/flight lead as delineated by the T/M/S Syllabus Sponsor (see Chapter 3 of the Program Manual on specific instructor requirements for Low Altitude Flight, Night Systems, ACM, DM, DACM, DCM, FAC (A)).

2.3.3.1 Loss of Individual Skill Proficiency.

Should an individual lose proficiency in all maintain events in a skill, the individual will be assigned to the Refresher POI for the skill. To regain skill proficiency, the individual must demonstrate proficiency in all R-coded events for the skill.

2.3.3.2 Loss of Unit Skill Proficiency.

If an entire unit loses proficiency in an Event, unit instructors shall regain proficiency by completing the Event with an instructor from a like unit. If not feasible, the instructor shall regain proficiency by completing the Event with another instructor. For flying communities, if a unit has only one instructor and cannot complete the Event with an instructor from another unit, the instructor shall regain proficiency with another aircraft commander or as designated by the commanding officer.

2.3.3.3 Proficiency Status.

Proficiency is a “Yes/No” status by skill assigned to an individual. When an individual attains and maintains Core Skill Proficiency (CSP), Mission Skill Proficiency (MSP), Core Plus Skill Proficiency (CPSP), or Mission Plus Skill Proficiency (MPSP), the individual may count towards CMMR or CMTS.

2.3.3.4 Skill Currency.

Currency is a control measure used to provide an additional margin of safety based on exposure frequency to a particular skill and applies to all MOS's that must comply with NATOPS and CNAF requirements. It is a measure of time since the last event demanding that specific skill. For example, currency determines minimum altitudes in rules of conduct based upon the most recent low altitude fly date. Specific currency requirements for aircrew individual type mission profiles can be found in Chapter 3 of the Program Manual.

Management of individual CSP/MSP/CPSP/CPMP serves as the foundation for developing proficiency requirements in DRRS.

2.4 REQUIREMENTS, CERTIFICATIONS, QUALIFICATIONS, AND DESIGNATION TABLES

Commanders may issue certification, qualification or designation letters when individual personnel complete applicable training requirements. A copy of these letters shall be included in section 4 of Aircrew Performance Records per Chapter 2 of the Program Manual. Only after successfully completing certification, qualification or designation requirements and being issued a letter signed by the commanding officer will an individual be considered certified, qualified or designated. Do not confuse certifications with qualifications or designations as defined below.

Table 2-9 below delineate T&R events required to be completed to achieve initial qualifications and designations. In addition to event requirements, all required stage lectures, briefs, squadron training, prerequisites, and other criteria shall be completed prior to completing final events. Qualification and designation letters signed by the commanding officer shall be placed in individual Aircrew Performance Records (APR). Regaining a qualification requires completing all R-coded syllabus events associated with that qualification.

Table 2-9: Requirements Matrix

INDIVIDUAL QUALIFICATION REQUIREMENTS	
QUALIFICATION	Requirement Events and Prerequisites
NATOPS	6010, 6011, 6012, 6030
INSTRUMENT	6040, 6041, 6042, 6060
DAY LATQ	2620, 2630, 2631, 2632, 2640, 2641
NS LATQ	DAY LATQ, 2642, 2643
NSQ HLL	2330, 2331, 2340, 2341
NSQ	HLL NSQ, 2370, 2371, 2380, 2381, 2382, 2383
CQ	2930, 2931, 2940, 2941, 2942, 2943
DCMQ	4320, 4330, 4340
INDIVIDUAL DESIGNATION REQUIREMENTS	
DESIGNATION	REQUIREMENT EVENTS AND PREREQUISITES
T2P	SUCCESSFUL COMPLETION OF THE CORE SKILL INTRODUCTION PHASE. REV-1840 SERVES AS THE INITIAL NATOPS EVALUATION.
TAC	T2P, 6130, 6131, 6132
FCP	TAC, 6630, 6631
SECTION LEAD	TAC, 6220, 6221, 6222, 6223, 6224, 6225, 6230, 6231, 6232, 6233, 6234
DIVISION LEAD	SECTION LEAD, 6330, 6331, 6332, 6333
FLIGHT LEAD	DIVISION LEAD, 6430
AMC	FLIGHT LEAD, 6530
BIP	TAC, 5020, 5030, 5031
AF FRSI	5130, 5131, 5132, 5133, 5134, 5135, 5136, 5140, 5141, 5142, 5143, 5144, 5145, 5146
FRSI	SECTION LEAD, 5140, 5141, 5142, 5143, 5144, 5145, 5146
NSFI	FRSI, 5150, 5151, 5152
AARI	BIP, 5330, 5340
LATI	SECTION LEAD, BIP, 5620, 5630, 5640, 5641
RVLI	BIP, 5730, 5731, 5740
NSI	DIVISION LEAD, LATI, RVLI, 5930, 5931, 5940, 5941, 5942, 5943
DCMI	SECTION LEAD, 5830, 5840, 5841
WTI	SUCCESSFUL COMPLETION OF MAWTS-1 WEAPONS AND TACTICS INSTRUCTOR COURSE, 5950
FLSE	FLIGHT LEAD, 5210
ANI	6031
NI	6032
CRMF	6090, 6091
CRMI	6092
INST EVALUATOR	6061
NOTE: ALL QUALIFICATION AND DESIGNATIONS REQUIRE COMPLETION OF ALL ACADEMIC EVENTS IN STAGE. RE-QUALIFICATIONS REQUIRE COMPLETION OF ALL R-CODED EVENTS IN STAGE.	

2.5 SYLLABUS NOTES

2.5.1 Event Environmental Conditions

Refer to Table 2-10 for required event conditions.

Table 2-10: Event Environmental Conditions Matrix

Code	Description (Environmental Condition)
D	SHALL BE CONDUCTED DURING DAY
N	SHALL BE CONDUCTED AT NIGHT, AIDED OR UNAIDED, AT LEAST 30 MINUTES AFTER OFFICIAL SUNSET.
(N)	MAY BE CONDUCTED DAY OR NIGHT. IF AT NIGHT, AIDED OR UNAIDED.
NS	SHALL BE CONDUCTED AT NIGHT AIDED UNDER HIGH LIGHT LEVEL OR LOW LIGHT LEVEL AT LEAST 30 MINUTES AFTER OFFICIAL SUNSET.
HLL	SHALL BE CONDUCTED AT NIGHT AIDED UNDER HIGH LIGHT LEVEL CONDITIONS.
LLL	SHALL BE CONDUCTED AT NIGHT AIDED UNDER LOW LIGHT LEVEL CONDITIONS.
(NS)	MAY BE CONDUCTED DAY OR NIGHT. IF AT NIGHT, SHALL BE AIDED UNDER HIGH LIGHT LEVEL OR LOW LIGHT LEVEL AT LEAST 30 MINUTES AFTER OFFICIAL SUNSET.
(HLL)	MAY BE CONDUCTED DAY OR NIGHT. IF AT NIGHT, SHALL BE AIDED AND UNDER HIGH LIGHT LEVEL CONDITIONS.
(LLL)	MAY BE CONDUCTED DAY OR NIGHT. IF AT NIGHT, SHALL BE AIDED AND UNDER LOW LIGHT LEVEL CONDITIONS.
N*	SHALL BE CONDUCTED AT NIGHT UNAIDED, AT LEAST 30 MINUTES AFTER OFFICIAL SUNSET
(N*)	MAY BE CONDUCTED DAY OR NIGHT. IF AT NIGHT, SHALL BE UNAIDED.
D/N*	SHALL BE CONDUCTED IN THE SIMULATOR DURING DAY AND NIGHT AIDED.

2.5.2 Device Matrix

The following nomenclature in the Table 2-11 below is used to differentiate aircraft, simulator, cockpit trainer, cockpit management system part task trainer, computer based trainer, and classroom events. The aircraft is used for those events

designated with an A, the flight simulator is used for those events designated with an S, the cockpit trainer is used for those events designated with a C, the cockpit management system part task trainer is used for those events designated with a CMS, and the computer based trainer is used for those events designated with a G. To provide commanding officers the maximum amount of flexibility for training, some events allow for the optional use of simulators or aircraft and cockpit trainer or simulator. Those types of events will use the designator A/S for aircraft preferred, simulator optional and S/A for simulator preferred, aircraft optional and C/S for cockpit trainer preferred, simulator optional.

Refer to NAVMC 3500.14 for guidance concerning deviations from the device requirement.

Table 2-11: Device Matrix

Symbol	Meaning
A	CONDUCTED IN AIRCRAFT
A/S	AIRCRAFT PREFERRED/SIMULATOR OPTIONAL
S	CONDUCTED IN SIMULATOR
S/A	SIMULATOR PREFERRED/AIRCRAFT OPTIONAL
G	GROUND/ACADEMIC TRAINING. MAY INCLUDE ADVANCED DISTRIBUTED LEARNING, LECTURES, SELF PACED.
NOTE – IF THE EVENT IS TO BE FLOWN IN THE SIMULATOR THE SIMULATOR INSTRUCTOR SHALL SET THE DESIRED ENVIRONMENTAL CONDITIONS FOR THE EVENT.	

2.5.3 **Computer Based Training (G)**

G lessons comprise the majority of MV-22 Ground School training. All aircrew (Replacement Aircrew (RAC), Refreshers, etc.) shall complete the MV-22 Ground School as prescribed by the FRS Commanding Officer. Completion of G lessons shall be documented in the Aircrew Performance Record (APR). Courseware shall be reviewed on an annual basis to ensure proper content, concurrency with the aircraft, procedures, and tactics.

2.5.4 **Event Terms**

2.5.4.1 **Discuss**

The IP shall discuss a system, procedure, or maneuver during the brief, in flight, or debrief.

The PUI shall demonstrate an understanding of all discussed items listed in the event description.

Demonstrate/Introduce flight events shall be discussed during the brief.

Emergencies listed in the event description are treated as discussion items during the brief and may be simulated during the flight at the option of the IP and in accordance with unit SOP. EPs for Simulator events will be treated as Demonstrate/Introduce items on the event in which they are listed and are subject to review during any subsequent event.

2.5.4.2 **Demonstrate**

IP performs the maneuver with accompanying description. At IP discretion, the PUI may fly the maneuver, but is not graded. Playback of recorded demonstrations may be used during simulator events.

The PUI observes the maneuver and is responsible for knowledge of the procedures during the brief.

2.5.4.3 **Introduce**

The IP may perform the maneuver with an accompanying description followed by the PUI flying the maneuver, or the IP may coach the PUI through the maneuver without demonstration.

The PUI shall perform the maneuver with coaching as necessary and is responsible for knowledge of the procedures prior to the flight. In general, the expectation is that the PUI will not consistently recognize errors and will frequently be outside performance standards.

Safe but limited proficiency. Requires frequent input from the instructor.

2.5.4.4 **Practice**

The PUI shall perform, with occasional coaching, a maneuver or procedure that has been previously introduced. The purpose is to continue to work towards attaining a specified level of performance.

Correct. Recognizes and corrects errors. Requires occasional input from the instructor.

2.5.4.5 **Review**

The IP observes and grades the maneuver with only minimal coaching.

The PUI is expected to perform the maneuver with minimal coaching and with only minor procedural errors. In general, the expectation is that the PUI will consistently recognize errors; however occasionally, corrections will not be timely with some excursions outside performance standards.

Correct, efficient, skillful and without hesitation. Requires minimal input from the instructor.

2.5.4.6 Evaluate

The IP observes and grades the maneuver without coaching the PUI. An airborne critique of the PUIs performance is at the option of the instructor.

The PUI is expected to perform the maneuver without coaching, with minor or no procedural errors, and at a level acceptable to warrant progress in the syllabus. The expectation is that the PUI will consistently apply timely corrections with very few and quickly corrected excursions outside performance standards.

Unusually high degree of ability. Requires no input from instructor.

2.5.4.7 Expose

The IP shall expose the PUI to the procedure or consideration during the brief, in flight or debrief. The PUI is not responsible for the knowledge of the procedure or consideration prior to the flight.

2.5.5 Training Event Performance Requirements

Purpose. To familiarize the PUI with general syllabus expectations, definitions, and the observation scale found on the Aircrew Training Forms (ATF).

General. All flights shall terminate with a comprehensive debrief with emphasis on aircrew performance and procedures or systems discussed. Instructors should use all available debriefing techniques. The culmination of the debrief shall be an ATF for initial events or those events listed with an X at the discretion of the Commanding Officer.

2.5.6 Levels of Learning

Table 2-122 describes how the MAWTS grading scale correlates to the numerical observations for graded events. The MAWTS scale comments are designed to evaluate a student's performance.

Table 2-12: MAWTS Grading Scale Correlation

Observation	Level of Learning	General	MAWTS Scale
5	CORRELATION (EVALUATE)	PROACTIVE. AHEAD OF THE SITUATION. REACTS CORRECTLY WITH CHANGING CONDITIONS. AND/OR CHANGING MISSION.	UNUSUALLY HIGH DEGREE OF ABILITY. REQUIRES NO INPUT FROM INSTRUCTOR.
4	APPLICATION (REVIEW)	SELF / CREW RECOGNITION OF ERRORS. CORRECT APPLICATION OF RESOURCES.	CORRECT, EFFICIENT, SKILLFUL, AND WITHOUT HESITATION. REQUIRES MINIMAL INPUTS FROM THE INSTRUCTOR.
3	UNDERSTANDING (PRACTICE)	MINOR ERRORS NOT DETECTED. CREW REDUNDANCY DIMINISHED.	CORRECT. RECOGNIZES AND CORRECTS ERRORS. REQUIRES OCCASIONAL INPUT FROM THE INSTRUCTOR.
2	ROTE (INTRODUCE)	TASK ACCOMPLISHED MECHANICALLY AND/OR WITH LIMITED SITUATIONAL AWARENESS. CREW REDUNDANCY LOST. RISK INCREASED.	SAFE BUT LIMITED PROFICIENCY. REQUIRES FREQUENT INPUT FROM THE INSTRUCTOR.
1	UNFAMILIAR	UNABLE	UNSAT – UNSAFE OR COMPLETE LACK OF ABILITY AND/OR KNOWLEDGE. REQUIRES SUBSTANTIAL INPUT FROM INSTRUCTOR FOR SAFE EXECUTION AND /OR MISSION ACCOMPLISHMENT.

2.5.6.1 Aircrew Training Forms (ATF)

Also known as syllabus evaluation forms, EATFs are required for every event completed by a pilot in one of the formal POIs, or as recommended by the Squadron Standardization Board, to include ACAD and LAB events. Events that were converted from a previous version of the T&R do not require a new ATF however, events that did not previously exist will require an ATF.

If the commanding officer has waived a syllabus event, the squadron training officer shall place a waiver letter in section 3 of the APR.

2.5.6.2 Aircrew Evaluation Flights

All pilots shall have an appropriate NATOPS evaluation form completed annually upon completion of the following:
NATOPS Check (RQD-6030). A designated NATOPS Instructor/Assistant NATOPS Instructor shall evaluate RQD-6030.
Instrument Check (RQD-6060). A designated Instrument Evaluator who is a member of the Instrument Flight Board shall evaluate RQD-6060.

2.5.6.3 Instructor Requirements

For all simulator and flight events the instructor requirement is noted at the right margin of each event. If the event header does not contain an instructor requirement then the minimum requirement is an aircraft commander who is complete with the Basic Instructor Pilot syllabus, proficient in the given event, fulfilling the role of aircraft commander.

For Core Skill Introduction simulator events, designated contract instructors may fulfill the role of instructor. Additionally, when designated by the FRS Commanding Officer, a CI may instruct LAT and Night Systems simulator events. Certification as a CI may be withdrawn by the FRS Commanding Officer.

Basic networked events require a tactical network operator. During events designated as TEN (Tactical Environment Network) or TEN+ (Tactical Environment Network with additional networked simulator), the simulator(s) shall be configured (fuel, internal load, ordnance, etc.) in accordance with the flight brief and the mission scenario.

2.5.6.4 Crew Requirements/Position Designations

Crew requirements are listed for each stage of training. This Manual requires the use of an aerial observer for all external flights, NVD flights, Ground Threat Reaction (GTR), and all DCM flights. However, the squadron commanding officer may, at his or her discretion, employ an aerial observer on any flight event. The requirement for an aerial observer is intended to provide a second crewmember in the aircraft cabin section. A designated aerial observer or crew chief may fill this requirement. On NVD training flights a Crew Chief or Aerial Observer Under Instruction (CCUI/AOUI) may fill this requirement when flying with a Crew Chief Night Systems Instructor (CCNSI).

2.5.6.5 Event Completion

Event completion is predicated upon demonstrated proficiency. When an individual successfully accomplishes the requirements of an event per the performance standards, the individual should log completion of the event (enter the appropriate T&R code) in M-SHARP. When the event is entered into M-SHARP, the individual's proficiency date for that event is automatically updated to reflect the date the event was completed. When supervising individual events, unit instructors/leaders shall ensure that trainees demonstrate proficiency per T&R standards prior to logging successful event completion. Evaluating individual proficiency in an event normally requires both objective and subjective assessment. If, in the instructor's opinion, the PUI does not adequately perform a required event, then all or parts of the sortie shall be repeated until adequate performance is demonstrated. If an individual fails to accomplish the requirements of an event per the performance standards, the individual should not log that event and the proficiency status for that event remains unchanged. Times indicated for each event are for planning purposes only.

2.5.6.6 Weight & Balance Form F and Load Computation

Unless otherwise annotated, the Joint Mission Planning System (JMPS) will be the primary method used to complete the preflight forms, with the Naval WT and Balance software program and the NATOPS (paper products) as the alternates in accordance with certification and flight clearance.

2.5.6.7 Joint Mission Planning System (JMPS)

All tactical and non-tactical applications of the JMPS will be discussed in detail for each event.

2.5.6.8 Crew Resource Management (CRM)

Aircrews shall brief techniques of CRM for all flights and/or events.

2.5.6.9 Operational Risk Management (ORM)

Aircrews shall brief those factors that affect risk mitigation decisions for every flight or mission.

2.6 CORE INTRODUCTION PHASE (1000-1999)

General. The purpose of this phase is to instruct the copilot in MV-22 fundamentals and introduce mission elements. At the completion of this phase the PUI will be a NATOPS qualified T2P and rate the 7532 MOS.

Admin Notes. ROC will be per the T&R Program Manual.

Phase Overview

Table 2-13: MV-22B Core Introduction Phase

STAGE
GROUND SCHOOL (GS)
FAMILIARIZATION (FAM)
NAVIGATION (NAV)
INSTRUMENT (INST)
CONFINED AREA LANDING (CAL)
FORMATION (FORM)
DAY FIELD CARRIER LANDING PRACTICE (FCLP)
NIGHT SYSTEMS (NS)
REVIEW (REV)

2.7 CORE INTRODUCTION STAGES - GROUND

2.7.1 Ground School

2.7.1.1 Purpose.

Prepare the student for the flight portion of the Core Introduction phase. Emphasis is placed on major aircraft systems, Cockpit Management System (CMS), and pre-flight requirements such as Checklists, Course rules, and Load Computation.

2.7.1.2 General.

Ground school is set up in two parts:

The first is ADLs followed by an ACAD class on the major aircraft systems. Major aircraft systems follow the Demo (ADL), Intro (ACAD), Review (Sim), and Evaluate (Aircraft) method of learning from ground school through the FAM stage.

The second part focuses on the Cockpit Management System and pre-flight requirements such as Checklists, Course rules, and Load Computation.

2.7.1.3 Administrative Notes

The Commanding Officer of VMMT-204 has the responsibility to define the required content, conduct reviews, forward required changes and approve the content for all Ground School events. The Commanding Officer of VMMT-204 has waiver authority over any event within Ground School. The syllabus is graphically depicted below.

Ground School (GS) Overview

Table 2-14: Ground School Overview Matrix

EVENT	TIME	REFLY	POI	DEVICE	DESCRIPTION
ADL-0001	1.5	*	B,R,MR,AF,CI,CV	G	COURSEWARE INTRODUCTION-G
ADL-0002	2.5	*	B,R,MR,AF,CI	G	BASIC AIRFRAME-G
ADL-0003	2.5	*	B,R,MR,AF,CI	G	INTRO COCKPIT MANAGEMENT SYSTEM (CMS)-G
ADL-0004	3.0	*	B,R,MR,AF,CI	G	ELECTRICAL SYSTEM-G
ADL-0005	2.0	*	B,R,MR,AF,CI	G	HYDRAULIC SYSTEM-G
ADL-0006	3.5	*	B,R,MR,AF,CI	G	FLIGHT CONTROL SYSTEM (FCS)-G
ADL-0007	2.5	*	B,R,MR,AF,CI	G	DRIVE SYSTEM-G
ADL-0008	2.5	*	B,R,MR,AF,CI	G	POWERPLANT SYSTEMS-G
ADL-0009	2.0	*	B,R,MR,AF,CI	G	FUEL SYSTEM-G
ADL-0010	2.0	*	B,R,MR,AF,CI	G	ENVIRONMENTAL CONTROL SYSTEM (ECS)-G
ADL-0011	2.5	*	B,R,MR,AF,CI	G	INTRODUCTION TO COMM/NAV/FD-G
ADL-0012	2.0	*	B,R,MR,AF,CI,CV	G	PROCEDURES CHECKLISTS-G
ADL-0013	1.5	*	B,R,MR,AF,CI	G	AIRCREW MAINTENANCE SYSTEMS-G
ADL-0014	1.0	*	B,R,MR,AF,CI,CV	G	LOCAL COURSE RULES-G
ADL-0015	2.0	*	B,R,MR,AF,CI	G	V-22 PERFORMANCE-G
ACAD-0100	1.0	*	B,R,MR,AF,CI,CV	G	GROUND SCHOOL INTRO IN-BRIEF-CLS

EVENT	TIME	REFLY	POI	DEVICE	DESCRIPTION
ACAD- 0101	2.0	*	B,R,MR,AF,CI	G	ELECTRICAL SYSTEM-CLS
ACAD- 0102	4.0	*	B,R,MR,AF,CI	G	HYDRAULIC SYSTEM-CLS
ACAD- 0103	3.0	*	B,R,MR,AF,CI	G	FLIGHT CONTROL SYSTEM (FCS)-CLS
ACAD- 0104	3.0	*	B,R,MR,AF,CI	G	DRIVE SYSTEM-CLS
ACAD- 0105	3.0	*	B,R,MR,AF,CI	G	POWERPLANT SYSTEMS-CLS
ACAD- 0106	2.0	*	B,R,MR,AF,CI	G	FUEL SYSTEM-CLS
ACAD- 0107	2.0	*	B,R,MR,AF,CI	G	ENVIRONMENTAL CONTROL SYSTEM (ECS)-CLS
ACAD- 0108	3.0	*	B,R,MR,AF,CI	G	COURSE RULES-CLS
ACAD- 0109	3.0	*	B,R,MR,AF,CI	G	V-22 PERFORMANCE AND WEIGHT & BALANCE-CLS
ACAD- 0110	5.0	*	B,R,MR,AF,CI	G	FLIGHT AERODYNAMICS REVIEW-CLS
ACAD- 0111	5.0	*	B,R,MR,AF,CI	G	V-22 AERODYNAMICS-CLS
ACAD- 0112	2.5	*	B,R,MR,AF,CI	G	CREW RESOURCE MANAGEMENT (CRM) INITIAL-CLS
ACAD-0113	2.0	*	B,R,MR,AF,CI	G	MV-22B CRM
LAB 0200	2.0	*	B,R,MR,AF,CI, CV	G	OVERVIEW AND BASIC CMS FUNCTIONS-CMS
LAB 0201	2.0	*	B,R,MR,AF,CI	G	COMM (CDU), NAV, LOAD BRICK-CMS

ADL-0001 1.5 * B,R,MR,AF,CI,CV G

Courseware Introduction

Goal. The PUI has completed all courseware introduction modules with a basic understanding of the G course and references.

Requirements. The completion of all ADL-0001 modules.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. None.

ADL-0002 2.5 * B,R,MR,AF,CI G

Basic Airframe

Goal. The PUI has completed all Basic Airframe modules with a basic understanding of the V-22 airframe, landing gear, aircraft lighting and emergency exits.

Requirements. The completion of all ADL-0002 modules.

. Satisfactory completion of all modules.

Prerequisite. ADL-0001.

ADL-0003 2.5 * B,R,MR,AF,CI G

Introduction to Cockpit Management System (CMS)

Goal. The PUI has completed all Intro to CMS modules with a basic understanding of the cockpit, flight displays, and the basic elements of CMS.

Requirements. The completion of all ADL-0003 modules.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. ADL-0001.

ADL-0004 3.0 * B,R,MR,AF,CI G

Electrical System

Goal. The PUI has completed all Electrical System modules with a basic understanding of the V-22 electrical system.

Requirements. The completion of all ADL-0004 modules.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. ADL-0001.

ADL-0005	2.0	*	B,R,MR,AF,CI	G
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Hydraulic System

Goal. The PUI has completed all Hydraulic System modules with a basic understanding of the V-22 hydraulic system.

Requirements. The completion of all ADL-0005 modules.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. ADL-0001.

ADL-0006	3.5	*	B,R,MR,AF,CI	G
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Flight Control System (FCS)

Goal. The PUI has completed all FCS modules with a basic understanding of the V-22 FCS.

Requirements. The completion of all ADL-0006 modules.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. ADL-0001.

ADL-0007	2.5	*	B,R,MR,AF,CI	G
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Drive System

Goal. The PUI has completed the G with a basic understanding of the V-22 drive system.

Requirements. The completion of all ADL-0007 modules.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. ADL-0001.

ADL-0008	2.5	*	B,R,MR,AF,CI	G
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Power plant Systems

Goal. The PUI has completed the G with a basic understanding of the V-22 power plant system(s) to include the Engines, the Engine Control System and the APU.

Requirements. The completion of all ADL-0008 modules.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. ADL-0001.

ADL-0009	2.0	*	B,R,MR,AF,CI	G
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Fuel System

Goal. The PUI has completed the G with a basic understanding of the V-22 fuel system.

Requirements. The completion of all ADL-0009 modules.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. ADL-0001.

ADL-0010	2.0	*	B,R,MR,AF,CI	G
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Environmental Control System (ECS)

Goal. The PUI has completed the G with a basic understanding of the V-22 ECS, including OBOGS and OBIGGS.

Requirements. The completion of all ADL-0010 modules.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. ADL-0001.

ADL-0011	2.5	*	B,R,MR,AF,CI	G
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Introduction to COMM/NAV/FD

Goal. The PUI has completed the G with a basic understanding of the V-22 communication, navigation and flight director systems.

Requirements. The completion of all ADL-0011 modules.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. ADL-0001.

ADL-0012	2.0	*	B,R,MR,AF,CI,CV	G
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Normal/Emergency Procedures Checklists

Goal. The PUI has completed the G with a basic understanding of the V-22 Normal Procedures checklists.

Requirements. The completion of all ADL-0012 modules.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. ADL-0001. Required reading - NATOPS Ch 7 checklists from Cockpit Pre-Entry through Post Flight.

ADL-0013	1.5	*	B,R,MR,AF,CI	G
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Aircrew Maintenance Systems

Goal. The PUI has completed the G with a basic understanding of the aircraft V-22 maintenance systems and their integration with maintenance ground systems.

Requirements. The completion of all ADL-0013 modules.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. ADL-0001.

ADL-0014	1.0	*	B,R,MR,AF,CI,CV	G
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Local Course Rules

Goal. The PUI has completed the G with a basic understanding of the local area course rules.

Requirement. The completion of all ADL-0014 modules.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. ADL-0001.

ADL-0015	2.0	*	B,R,MR,AF,CI	G
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V-22 Performance

Goal. The PUI has completed the G with a basic understanding of the V-22 performance charts, load computation and Form F.

Requirements. The completion of all ADL-0015 modules.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. ADL-0001.

ACAD-0100	1.0	*	B,R,MR,AF,CI,CV	G
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Ground School Intro In-Brief

Goal. The PUI understands the expectations during Ground School and has the requisite knowledge of the course and where all the necessary references can be accessed to complete the Core Skill Introduction Phase.

Requirement

Discuss

Overall Course Design for Ground School and the Core Skill Introduction Phase.

Student Guide material: Class Schedule, Systems reference material, ACAD handouts, and Simulator and Flight Events Student Guides.

List, Location, and access to all appropriate references that will be required through the Core Skill Introduction Phase.

Expectations of PUI during Ground School to include work schedule, ACAD preparation, and event prerequisites.

Squadron and MATSS processes, particularly scheduling.

Demonstrate

Computer based training access. All students will log-on to the network and access the first ADL.

Basic operation of the ADL software.

Performance Standards. None.

Prerequisite. Squadron Operations Department check-in.

ACAD-0101	2.0	*	B,R,MR,AF,CI	G
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Electrical System

Goal. The PUI has an introductory knowledge of the V-22 electrical system, aircrew interaction and related EPs.

Requirements

Discuss

Basic architecture and major components

Recognition of a component failure

MFD view of the contactor and crosstie status

Impact of any Generator Failure with the help of the PCL

Impact of any Regulated Converter Failure with the help of the CMS

Impact of any AC Bus failure with the help of the CMS

Impact of any DC Bus Failure with the help of the CMS

Correct response to any component failure with the help of the PCL

Prerequisites. ADL-0004, Required Reading - Electrical System Student Guide chapter

ACAD-0102	4.0	*	B,R,MR,AF,CI	G
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Hydraulic System

Goal. The PUI has an introductory knowledge of the V-22 hydraulic system, aircrew interaction, and related EPs.

Requirements

Discuss

Basic architecture and major components

Normal operations of the hydraulic system

Hydraulic system status and indications on CMS displays

Functions available to the pilot via CMS displays

Warnings/Cautions/Advisories on the CDU/EICAS

Functions of the hydraulic system leak logic

Correct response to any component failure with the help of the PCL

Prerequisites. ADL-0005. Required Reading - Hydraulic System Student Guide chapter.

ACAD-0103	3.0	*	B,R,MR,AF,CI	G
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Flight Control System

Goal. The PUI has an introductory knowledge of the V-22 FCS to include Air Data System, Flight Control Computers, Flight Controls, and Control Laws.

Requirements

Discuss

Basic architecture and major components

Recognition of a component failure of the FCS
MFD view the status of the FCS on the MFD
Difference between a CCDL failure and a Dual FCC failure, on the MFD or CDU
Flight parameter that control the conversion corridor
Impact of AFCS Disengage with the help of the CMS
Impact of TCRS Disengage with the help of the CMS
Single engine failure effects on TCL input
Describe Interim Power and why it is used
Correct response to any component failure

Prerequisite. ADL-0006. Required Reading - FCS Student Guide chapter.

ACAD-0104	3.0	*	B,R,MR,AF,CI	G
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Drive System

Goal. The PUI has an introductory knowledge of the V-22 drive system.

Requirements

Discuss

Basic architecture and major components
Describe the proprotors and proprotor hub assembly including the elastomeric bearings
Describe which accessory systems are mounted on L/R TAGB, and MWGB
Distinguish Drive system Warnings/Cautions/Advisories on the CDU/EICAS
Describe the impact of R TAGB pressure lost on the #2 GEN
Describe Emergency Lubrication System functions, and limitations
Describe PRGB status and indications on CMS displays
Describe TAGB status and indications on CMS displays
Describe the correct response for a PRGB failure

Prerequisite. ADL-0007. Required Reading - Drive System Student Guide chapter.

ACAD-0105	3.0	*	B,R,MR,AF,CI	G
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Power plant Systems

Goal. The PUI has an introductory knowledge of the V-22 Engine System and APU, major components, aircrew interaction, and engine system EPs.

Requirements

Discuss

AE 1107 Engine Basic architecture and major components
Describe the components and functions of the following sub-systems: EAPS, FADECs, Fuel System, Oil System, Engine Anti-Ice System and TCRS
Describe the engine Inner Loop and Outer Loop control system
Understand the pilot displays and inputs available for control of the engine and various sub-assemblies
Understand the levels of malfunctions and their indications within the WCA hierarchy
Describe the correct response to engine malfunctions with help of the NATOPS PCL
Understand engine malfunctions as they relate to components of the engine
Explain the purpose of the APU
Explain where the APU gets its fuel
Describe the difference between RUN ENGAGE and EMER RUN ENGAGE
Identify the components that the APU drives through the MWGB

Prerequisite. ADL-0008. Required Reading - Engine and APU Student Guide chapter(s).

ACAD-0106 2.0 * B,R,MR,AF,CI G

Fuel System

Goal. The PUI has an introductory knowledge of the V-22 fuel system architecture, major components, aircrew interaction, and fuel system EPs.

Requirements

Discuss

Basic architecture and major components
Operation of the fuel system
Describe why the fuel system is a suction type
Describe the major components of the fuel system
Describe the Mission Auxiliary Tank System (MATS) (Self-Deploy and ADGR capabilities)
Describe how the pilot interfaces with the fuel system
Describe the impact of an FMU failure on the fuel system
Describe the considerations with fuel dumping

Prerequisite. ADL-0009. Required Reading - Fuel system Student Guide chapter.

ACAD-0107 2.0 * B,R,MR,AF,CI G

ECS including OBOGS and OBIGGS / Ice Protection System (IPS)

Goal. The PUI has an introductory knowledge of the V-22 ECS architecture, major components, aircrew interaction, and ECS & OBOGS EPs.

Requirements

Discuss

Basic architecture and major components of the ECS
Air Conditioning/Heating
OBOGS
OBIGGS
Avionics Cooling
Operation of the ECS.
Identify malfunctions associated with the ECS.
Identify the proper response of ECS malfunctions.
Describe the relationship between the ECS and the IPS.
Components of the IPS.
Operation of the IPS.
Identify the malfunctions associated with the IPS.
Identify the proper response of IPS malfunctions.

Performance Standards. None.

Prerequisite. ADL-0010. Required Reading - ECS Student Guide chapter.

ACAD-0108 3.0 * B,R,MR,AF,CI G

Course Rules

Goal. The PUI has an introductory knowledge of the local course rules and satisfactorily completes the course rules exam.

Requirements

Discuss

Identify significant features aboard MCAS
Describe Taxi and Takeoff procedures for MCAS
Identify local VFR Patterns
Identify VFR Entry/Exit Points
Identify Special VFR Entry/Exit Points

Identify Out Lying Fields (OLFs), Entry/Exit Points and Procedures
Describe MV-22 Operations aboard MCB Complex
Describe NVG Operations aboard MCAS

Evaluate. Course Rules exam

Performance Standards. Satisfactory completion of the course rules exam.

Prerequisite. ADL-0014, Required Reading - Local Base Operations SOP for course rules.

ACAD-0109	3.0	*	B,R,MR,AF,CI	G
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V-22 Performance and Weight & Balance

Goal. The PUI will have a basic understanding of V-22 performance and be able to use the NATOPS performance charts in mission planning. The PUI will produce a Load Computation and Weight & Balance Form F in preparation for CFAM-1030.

Requirements

Discuss

V-22 performance in different modes of flight and how it is affected by altitude and temperature
Use of V-22 NATOPS performance charts
Completion of a V-22 Load Computation form
Be familiar with the V-22 Wt & Bal Form F (Requirement for use and JMPS certification)

Prerequisite. ADL-0015. Required Reading - NATOPS Performance Charts.

ACAD-0110	5.0	*	B,R,MR,AF,CI	G
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Flight Aerodynamics Review

Goal. The PUI has a solid foundation of knowledge in flight aerodynamics.

Requirements

Discuss

Fixed Wing basic aerodynamics
Rotary Wing basic aerodynamics
Stability and Control
Performance

Prerequisite. ADL-0015.

ACAD-0111	5.0	*	B,R,MR,AF,CI	G
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MV-22 Aerodynamics

Goal. The PUI has an introductory knowledge of tiltrotor aerodynamics and how that is applied to the V-22.

Requirements

Discuss

Tiltrotor basic aerodynamics.
VMS and its application to V-22 Stability and Control.
V-22 Lessons learned:
Vortex Ring State (VRS)
, Pitch Up with Side Slip (PU/SS),
Flight envelope limitations:
Critical Azimuth testing
Over rotation during lateral quickstop
Vne limits
Angle of Bank and Pitch limits,
Slow flight and Tailwind Phenomenon:
Tailwinds in a hover

Rapid forward nacelle with a tailwind
High speed sideward flight
 Autorotation testing
 Roll On Deck (ROD)
 Dynamic Interface (shipboard envelopes, AFCS saturation)
 The “why” behind some Emergency Procedures.
Prerequisite. ACAD-0110. Required Reading - NATOPS Ch 11.

ACAD-0112	2.5	*	B,MR,R,AF,CI	G
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Crew Resource Management (CRM) Initial

Goal. The PUI understands the Risk and Resource Management (RRM) model and how the icons, processes, and seven principles apply to Crew Resource Management.

Requirements

Discuss

Seven principles
RRM model: ABCD process, Available resources, Decision model

Instructor. CRM-F

Prerequisite. 0100.

ACAD-0113	2.0	*	B,R,MR,AF,CI	G
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MV-22B CRM

Goal. The PUI will have an introductory knowledge of CRM concepts and procedures with emphasis on MV-22 cockpit and aircrew integration.

Requirements

Discuss

CRM
ORM
Lookout doctrine
PF responsibilities and procedures
PNF responsibilities and procedures
Crew chief responsibilities and procedures
FD and automation CRM procedures and techniques

Instructor. CRM-F.

Prerequisite. ACAD-0112.

LAB-0200	2.0	*	B,R,MR,AF,CI,CV	CMS
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Overview and Basic CMS functions

Goal. The PUI has a basic understanding of the V-22 CMS, is able to navigate the layers in the different sections (Top keys), understands the color and key coding, and knows how to input data to the CMS.

Requirements

Demonstrate

General design, architecture, and components
MFD Controls
MFD Top Bezel Keys (T1- T5): Flight Displays, NAV control layer and HSD, FLIR, STA and SYST
CDU Controls
CDU Layers

NAVMC 3500.11E
16 Apr 18

EICAS Display
CDU Keyboards: General data entry rules and dedicated system keys

Performance Standards. Satisfactory completion of all modules.

Instructor. CI.

Prerequisite. ADL-0011.

LAB-0201 2.0 * B,R,MR,AF,CI CMS

Comm (CDU), NAV, load brick

Goal. The PUI understands and gains familiarity with the V-22 CMS and is capable of pre-taxi CMS setup.

Requirements

Demonstrate

Comm functions
NAV sub-layers and functions
Mission Data Loader (MDL) (Loading missions, and map data)
Maint pages

System STA WRA pages
BFWS

Introduce

Pre-Start Checklist
Pre-taxi CMS setup

Instructor. CI.

Prerequisite. ADL-0012 and LAB-0200.

2.8 CORE INTRODUCTION STAGES - FLIGHT

General. The purpose of this phase is to instruct the copilot in MV-22 fundamentals and introduce mission elements. At the completion of this phase the PUI will be a NATOPS qualified T2P and rate the 7532 MOS as specified in RQD-6030. All cockpit trainer, simulator, and flight events require an Aviation Training Form (ATF).

Admin Notes. ROC will be per the T&R Program Manual.

Stages. The following stages are included in the Core Introduction Phase of training.

Table 2-15: Core Introduction Phase

Stage Name
FAMILIARIZATION (FAM)
NAVIGATION (NAV)
INSTRUMENT (INST)
CONFINED AREA LANDING (CAL)
FORMATION (FORM)
DAY FIELD CARRIER LANDING PRACTICE (FCLP)
NIGHT SYSTEMS (NS)NIGHT SYSTEMS (NS)
REVIEW (REV)

2.8.1 Familiarization (FAM)

2.8.1.1 Purpose.

To teach the PUI basic V-22 aircraft control, normal procedures, normal checklists and Pilot Flying (PF) actions during Emergency Procedures (EPs). Focus of Effort (FOE): Basic aircraft control, tiltrotor aerodynamics, tiltrotor flying qualities, major aircraft systems, cue level of automation, and NATOPS Chapters: 2, 4, 7, 11, & 12. The FAM stage also introduces the PUI to the application of CRM as it pertains to the MV-22 and associated aircrew.

2.8.1.2 General

CFAMs are events conducted to familiarize the pilot with the cockpit, CMS, start-up, and shutdown procedures prior to the first flight in the simulator. CFAMs may be conducted in an FFS, FTD, CFTD, Interactive Cockpit Learning Environment (ICLE) or other equivalent device. For CFAM events, a maximum of 2 PUI shall be scheduled per instructor.

EPs will be consistent with discuss items and with the flight profile of the event.

A standard DTM will be provided by the instructor for all events in the FAM stage. Starting with SFAM-1030, the PUI will fill out a load computation form by hand using NATOPS charts based on the conditions stated in the Student Guide.

Emphasis will be placed on NATOPS chapters 2, 4, 7, 11, and 12. PUI is responsible for reading all applicable NATOPS sections of the above chapters for each Simulator and Flight event.

If FAM-1080 is not flown within 7 days of SFAM-1072, SFAM-1072 shall be re-flown.

Crew Requirements. P/P for simulators, P/P/CC if flown in aircraft.

2.8.1.3 Familiarization Overview

Table 2-16: Familiarization Stage Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ADL-1001	1.0	*	B,R,MR,AF,CI		G		FLIR-G
ACAD-1010	1.0	*	B,R,MR,AF,CI		G		FAM STAGE INBRIEF-CLS
ACAD-1011	2.0	*	B,AF,CI		G		FLIR THEORY-CLS
ACAD-1012	0.5	*	B,AF,CI		G		MV-22B DAY HUD-CLS
ACAD-1013	2.0	*	B,R,MR,AF,CI		G		AERO-CLS
LAB-1020	2.0	*	B,R,MR,AF,CI,CV		S		FFS/FTD
LAB-1021	2.5	*	B,R,MR,AF,CI,CV		A	1	A/C PREFL EGRESS, SQDN PROC / A/C SYS HARDWARE FAM
CFAM-1030	2.0	*	B,R,AF,CI	D	S	1	ICLE/FFS
CFAM-1031	2.0	*	B,AF,CI	D	S	1	ICLE/FFS
CFAM-1032	2.0	*	B,R,AF,CI	D	S	1	ICLE/FFS/FTD
SFAM-1033	2.0	*	B,AF,CI	D	S	1	FFS/FTD
SFAM-1034	2.0	*	B,R,AF,CI	D	S	1	FFS/FTD
SFAM-1035	2.0	*	B,AF,CI	D	S		FFS/FTD
SFAM-1036	2.0	*	B,AF,CI	D	S	1	FFS/FTD
SFAM-1037	2.0	*	B,R,MR,AF,CI	D	S	1	FFS/FTD
SFAM-1038	2.0	*	B,AF,CI	D	S	1	FFS/FTD
SFAM-1039	2.0	*	B,R,MR,AF,CI	D	S	1	FFS/FTD
SFAM-1070	2.0	*	B,R,MR,AF,CI	D	S	1	FFS/FTD
SFAM-1071	2.0	*	B,R,MR,AF,CI	D	S	1	FFS/FTD
SFAM-1072	2.0	*	B,AF,CI	D	S	1	FFS/FTD
SFAM-1073	2.0	*	B,R,MR,AF,CI	N*	S	1	FFS/FTD
SFAM-1074	2.0	*	AF	D	S	1	FFS/FTD
SFAM-1075	2.0	*	AF	D	S	1	FFS/FTD
SFAM-1076	2.0	*	AF	D	S	1	FFS/FTD
SFAM-1077	2.0	*	AF	D	S	1	FFS/FTD
SFAM-1078	2.0	*	AF	D	S	1	FFS/FTD
FAM-1080	1.5	*	B,RAF, CI	D	A	1	MV-22
FAM-1081	1.5	*	B,R,MR,AF, CI	D	A	1	MV-22
FAM-1082	1.5	*	B,R, AF	D	A	1	MV-22
FAM-1083	1.5	*	B,AF, CI	D	A	1	MV-22
FAM-1084	1.5	*	B,R,MR,AF	D	A	1	MV-22
FAM-1085	1.5	*	B,AF	D	A	1	MV-22
FAM-1086	1.5	*	B,R,MR,AF	D	A	1	MV-22

ADL-1001 1.0 * B,R,MR,AF,CI G

FLIR

Goal. The PUI has completed the G with a basic understanding of the FLIR.

Requirements. The completion of all ADL-1001 modules.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. ADL-0001.

ACAD-1010	1.0	*	B,R,MR,AF,CI	G
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FAM Stage In-Brief

Goal. The PUI should have an introductory knowledge of the training syllabus for the familiarization stage and gain familiarity with the expectations and performance standards. Each PUI will be entered in and able to access the required web-based processes to include M-SHARP and the MATSS website for information and scheduling. Each PUI will also be checked out in the Simulator and Cockpit Trainer so that they may conduct training events or practice on their own.

Requirements

Introduce

Purpose/FOE of the syllabus.
Syllabus outline and flow.
Applicable publications.
PUI performance expectations.
M-SHARP
Access/log-in.
Tutorial.
Filing of NAVFLIRS.

Instructor. FRSI.

Prerequisites. ACAD-0100.

ACAD-1011	2.0	*	B,AF,CI	G
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FLIR Theory and Introduction Lecture

Goal. The PUI will have an introductory knowledge of the FLIR.

Required Reading. NVD Manual Chapter 2, 4.

Instructor. NSI/NFSI

Prerequisite. ACAD-1010.

ACAD-1012	0.5	*	B,AF,CI	G
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MV-22B Day HUD

Goal. The PUI will have an introductory knowledge of the MV-22B Day HUD.

Required Reading. ANTP Ch. 3, NTRP Ch. 3.

Instructor. FRSI

Prerequisite. ACAD-1014

ACAD-1013	2.0	*	B,R,MR,AF,CI	G
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MV-22 Slow Airspeed and Wind Limitations

Goal. The PUI has an introductory knowledge of aerodynamic phenomena associated with slow airspeed and tailwinds/crosswinds.

Requirements

Discuss

Low Airspeed and Wind Limitations
AFCS Saturation

Linear and Non-Linear Control

MV-22 Lessons learned: Vortex Ring State (VRS), Pitch Up with Side Slip, Pitch Down with Tailwind, Rapid forward nacelle at low airspeed, Lateral airspeed risks

Case Study

Instructor: CI

Prerequisite. SFAM-1036

LAB-1020 2.0 * B,R,MR,AF,CI,CV S 1 FFS/FTD

Goal. Familiarize PUI with operation of the simulator and scheduling procedures. Gain familiarization with the cockpit layout with emphasis on the overhead panel, center console and flight controls.

Requirements

Discuss

Scheduling procedures
Simulator operation
Cockpit layout
ARC-210 RCH operation

Introduce:

COMM/ICS
Side Panels
RFIS
ARC-210 RCH Operation
Overhead Panel
Switches vs Indicators
Lighting
Center console
SFD, SFI, FD Panel
LGCU, Track handle, Flaps, Parking brake, NAC CNTRL disable switches
Flight Controls
TCL
Cyclic
Pedals

Performance Standards:

Able to input a manual frequency in the RCH

Instructor. CI

Prerequisite. ACAD-0100

LAB-1021 2.5 * B,R,MR,AF,CI,CV A 1 MV-22

Goal. Familiarize PUI with squadron procedures for flight. Be able to correlate components learned in ADLs and ACADs on the aircraft and execute the standard walk-around/pre-flight inspection. Complete required V-22 egress training.

Requirements

Discuss

Scheduling procedures, Read and Initial File, Items required for brief, NATOPS brief, aircraft checkout, Flight equipment checkout, MAF generation, and pre-flight inspection.

Introduce

V-22 egress procedures, Hotseat procedures, Standard walk-around, Cabin door use, Ramp and cargo door use, and aircrew duties, and pre-flight inspection.

Performance Standards:

Be able to conduct the standard walk-around/pre-flight inspection with minimal coaching.

Be able to execute the V-22 egress procedures without reference or coaching.

Instructor. FRSI

Prerequisite. 1040

External Syllabus Support. Static Aircraft

CFAM-1030 2.0 * B,R,AF,CI D S 1 ICLE/FFS/FTD

Goal. Gain familiarization with the overall cockpit and in particular the hardware communication interface(s). Conduct the PRE-ENTRY through POST ENGINE START checklists by integrating the basic CMS learned in LAB-0201 with the switches and displays in the cockpit trainer.

Requirements

Discuss

Communication

Comm/ICS side panels

Remote Control Head (RCH)

Ground operations and limitations

Battery

External Power

APU

Flight Controls

Functions on TCL

Functions on Cyclic

Checklist flow / cockpit layout

Aircraft response to NORM FLT OPS selection

CRM

Demonstrate

Engine Start

Post Engine Start

Introduce

CRM

Cockpit Pre-Entry (min 2)

Cockpit Pre-Start (min 2)

Battery

External Power

Review.

CMS functions within PRE-START checklist

Performance Standards:

Understands the function of the NORM FLT OPS configuration.

Demonstrates familiarity with the operation of the CMS.

Properly identifies all switches and MFD/CDU layers to execute PRE-ENTRY and PRE-START checklists utilizing CRM.

Able to input a manual frequency in the RCH.

Instructor. CI.

Prerequisites. ACAD-1010.

CFAM-1031 2.0 * B,AF,CI D S 1 ICLE/FFS/FTD

Goal. Introduce and practice checklists. PUI should gain a familiarity with the location and function of cockpit switches and displays.

Requirements

Practice

Cockpit Pre-Entry (Min 2)

Cockpit Pre-Start (Min 2)
External Power
Battery
All Start

Performance Standards

Demonstrates familiarity with the operation of the CMS utilizing appropriate CRM.
Properly identifies all switches and MFD/CDU layers to execute all prescribed checklists.
Able to properly execute all items from COCKPIT PRE-ENTRY to ENGINE START in less than 30 minutes.

Instructor. CI

Prerequisites. CFAM-1030.

CFAM-1032 2.0 * B,R,AF,CI D S 1 ICLE/FFS/FTD

Goal. Be able to properly execute all listed Normal Procedures checklists in a timely manner. Recognize and perform the proper steps for all Ground Emergencies.

Requirements

Discuss

Load Computation
Weight and Balance Form F
Blade Fold/Wing Stow (BFWs) system: Full Stow and Flight Ready and Maintenance modes
Uncommanded engine acceleration

Introduce.

CRM
Ground Emergencies

BLADE FOLD/WING STOW
FLIGHT READY TO FULL STOW
FULL STOW TO FLIGHT READY

Practice

COCKPIT PRE-ENTRY
COCKPIT PRE-START
BATTERY
ALL START
ENGINE START
POST ENGINE START

Emergencies

Abnormal starts
Emergency shutdown
Engine fire, nacelle fire, or wing fire on ground

Performance Standards

Demonstrates familiarity with the operation of the CMS.
Properly identifies all switches and MFD/CDU layers to execute all prescribed checklists in a timely manner.
Able to properly execute all items from COCKPIT PRE-ENTRY through POST ENGINE START in less than 30 minutes.
Recognize indications, execute memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.

Instructor. CI.

Prerequisite. CFAM-1031.

SFAM-1033 2.0 * B,AF,CI D S 1 FFS/FTD

Goal. Timely execution of checklists and to introduce hover and nacelle drills. Develop PUI skill in using nacelle angle to control nose attitude and longitudinal aircraft control.

Requirements

Discuss

CRM

Electrical system

Constant Frequency Generators (CFG)
Variable Frequency Generators (VFG)
Regulated Converters
(AC and DC Busses
FCC Power sources

Pitch up with sideslip

Nacelle trim switch

Introduce

CRM

Pilot Flying (PF) callouts

Checklists

PRE-TAXI/BREAKDOWN
PRE-TAKEOFF
AFTER TAKEOFF
LANDING CHECKS

Ground Taxi

Power steering on and off
Hover Page
Rearward Taxi
Vertical Takeoff (Power and systems check)
Normal Hover and Hover Turns
Hover Nacelle Drills
Air Taxi Nacelle Drills
Square Pattern
Vertical landing

Practice

Load Comp/Weight and Balance
Checklists
From ALL START #19 "Personnel Equipment" through POST ENGINE START
AFTER LANDING
SHUTDOWN

Emergencies

Electrical system failures

CFG Failure
VFG Failure
AC Bus Failure
DC Bus Failure

Directional control problems

Performance Standards

Understands all checklist items, knows where the required cockpit switches are, ability to access required CMS functions, and demonstrates proper crew coordination during the startup and shutdown with some coaching.

Conduct all maneuvers IAW MV-22 NATOPS.

Recognize indications, execute memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.

Instructor. CI.

Prerequisite. CFAM-1032

SFAM-1034 2.0 * B,R,AF,CI D S 1 FFS/FTD

Goal. Introduce approaches to landings (hover, no-hover, Run-on landing). Practice low work and introduce forward flight in CONV. Further enforce the PUI understanding and skill in using nacelles for longitudinal control.

Requirements

Discuss

CRM
Hydraulic system
Pitch coupling
H-V diagram

Introduce

Transition from Hover
CONV Pattern
Landing to a WYPT (trend dots, course line)
Normal Approach to a Hover Landing
Normal Approach to a No-Hover Landing
Pilot Not Flying (PNF) duties and callouts
Calculate Hover/Cruise Performance (HIGE, HOGE, MAX RNG, MAX ENDUR)

Practice

Checklists
 PRE-TAXI/BREAKDOWN
 PRE-TAKEOFF
 AFTER TAKEOFF
 LANDING CHECKS
Vertical Takeoff and Landing
Hover Nacelle Drills
Air Taxi Nacelle Drills
Hover Page Utilization

Emergencies.

Hydraulic System Failures (Hydraulic X failure)

Performance Standards

Understands all checklist items, know where the required cockpit switches are, be able to access required CMS functions, and demonstrate proper crew coordination with minimal coaching.
Conduct all maneuvers IAW MV-22 NATOPS.
Land within .03 nm of intended point of landing.
Properly recognize normal approach glideslope.
Recognize indications, execute memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.

Instructor. CI.

Prerequisite. SFAM-1033.

SFAM-1035 2.0 * B,AF,CI D S 1 FFS/FTD

Goal. Introduce conversions and transitions and practice CONV pattern and approaches. Develop the fundamental skills necessary for the APLN Pattern.

Requirements

Discuss

CRM

VMS basic architecture/overview

Primary Flight Control System (PFCS)

FCCs

Electro-hydraulic controls

Flight Control Laws

Conversion protection system "Conversion Corridor"

Structural Load Limiting

PFCS Fail/Reset

Automatic Flight Control System (AFCS)

Full time and selectable modes of operation

Cyclic grip and TCL switches (AFCS unique)

AFCS/PFCS Reset

Vortex Ring State

Introduce

Transition to APLN

Transition straight and level

Transition constant rate climb

Conversion to CONV

Conversion straight and level

Conversion constant rate turn

Level Speed Changes

CONV

APLN

Practice

CONV Pattern

Landing to a WYPT

Normal Approach to a Hover Landing

Normal Approach to a No-Hover Landing

Pilot Not Flying (PNF) duties and callouts

Emergencies

VMS Failures (AFCS failed [CONV and APLN])

SINK (Vortex Ring State)

Performance Standards

Conduct all maneuvers IAW MV-22 NATOPS and MDG.

Land within .03 nm of intended point of landing.

Recognize indications, execute memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.

Instructor. CI.

Prerequisite. SFAM-1034, ACAD-1012.

SFAM-1036 2.0 * B,AF,CI D S 1 FFS/FTD

Goal. Introduce short takeoffs (STO) and rolling takeoff (RTO), APLN pattern, and steep approaches. Practice CONV pattern.

Requirements

Discuss

CRM
Day HUD
Run-On Landing
Drive systems
 Proprotor systems
 Gearboxes and Nacelle Blower
 Interconnecting Driveshaft System (ICDS)
 Drive System Interface Unit (DSIU)
Feathering/Flapping/Rotor Load (FFR) Indicator
Structural Load Limiting (SLL)

Demonstrate.

Use of FD panel, FD cues, FD commands

Introduce

CRM
Day HUD operations
HUD precision approach
STO
APLN pattern
Steep approach to a Hover Landing
Steep Approach to a No-Hover Landing
Nose Low Steep Approach
Run-On landing
PF and PNF duties and callouts

Practice

CONV pattern
Normal Approach to a Hover Landing
Normal Approach to a No-Hover Landing
Level Speed Changes

Emergencies

Drive system malfunction(s)
 PRGB/TAGB Oil Pressure Low/High
 PRGB/TAGB/MWGB Oil Press/Temp Invalid PRGB/TAGB/MWGB Chips
Gearbox Failure (Warning)
ICDS Failure (Warning)
Feathering/Flapping High Hot
Nacelle Interface Unit (NIU) failure
Wing Interface Unit (WIU) failure

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS
Properly recognize steep approach glideslope
Land within .03 nm of intended point of landing.
Recognize indications, execute memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.

Instructor. CI

Prerequisite. ACAD-1012, SFAM-1035

SFAM-1037 2.0 * B,R,MR,AF,CI D S 1 FFS/FTD

Goal. Introduce max gross weight operations.

Requirements

Discuss

CRM

Power plant systems

Engines

Engine control (FADEC, PDS)

APU

Interim power: Single Engine Flight

OEI performance envelopes APLN/CONV/VTOL

OEI flight characteristics

TOLD (Takeoff and Landing Data Calculations)

OEI Perf Calc

Introduce

CRM

TOLD (Takeoff and Landing Data calculations)

MGW Transition from Hover

MGW landing

Attitude capture takeoff

Practice

STO

APLN pattern

Steep Approach to a Hover Landing

Steep Approach to a No-Hover

Review.

CONV pattern

Emergencies

Single engine failure

In VTOL mode

In CONV mode

In APLN mode

Single Engine landing

Engine restart in-flight

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.

Recognize indications, execute memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures

Instructor. CI.

Prerequisite. SFAM-1036

SFAM-1038 2.0 * B,AF,CI D S 1 FFS/FTD

Goal. Practice APLN pattern. Introduce slow flight APLN maneuvers and high AOB turns. Begin to develop the understanding of energy management in APLN mode for an MV-22.

Requirements

Discuss

CRM

Fuel system
Slow flight characteristics in airplane mode
Angle of bank/load factor vs. stall speed

Introduce

CRM
Slow flight (APLN Mode)
High AOB (APLN Mode)
Overhead Break Entry
Touch and Go

Practice

STO
APLN pattern
No-Hover landing
Run-on Landing
MGW transition from Hover
MGW Landing

Emergencies

Single Engine Failure in Hover (HIGE, HOGE)
Single engine failure in-flight
 Single engine failure on takeoff to an abort
 Single engine failure on takeoff to a flyaway
Single Engine wave-off
Fuel system cautions

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.
Recognize indications, execute memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.

Instructor. CI

Prerequisite. SFAM-1037

SFAM-1039 2.0 * B,R,MR,AF,CI D S 1 FFS/FTD

Goal. Practice APLN flight. Introduce power on/off stalls and dual engine failures.

Requirements

Discuss

CRM
ECS
OBIGGS/OBOGS
Stall characteristics

Introduce

CRM
Slow flight (APLN Mode)
Stall Checklist
Practice power on/off stalls
Converting and Turning stall

Practice

High AOB (APLN Mode)
Overhead Break Entry
Steep approach

NAVMC 3500.11E
16 Apr 18

PF and PNF duties and callouts
APLN pattern
No-Hover landing
Touch and Go

Emergencies

SDC Failure
Nacelle Blower Failure
Dual engine failure NAC > 60

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.
Land within .03 nm of intended point of landing.
Recognize indications, execute memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.

Instructor. CI

Prerequisite. SFAM-1038

SFAM-1070	2.0	*	B,R,MR,AF,CI	D	S	1	FFS/FTD
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Goal. Introduce Emergency Landing Pattern (ELP), Fire emergency procedures, and landing gear malfunctions. Review previously introduced aircraft system WCAs.

Requirements

Discuss

CRM
Fire protection systems
Smoke and fume elimination
Landing gear systems
FADEC B Override Switch
Use of briefing guide

Introduce

CRM
PF and PNF duties and callouts during in-flight emergencies
ELP

Practice.

Power on stalls
Power off stalls

Emergencies

Dual Engine Failure Nac < 60
In-flight fires: Engine fire, Wing fire, Cockpit or cabin fire
Single engine failure with an ICDS failure
Engine FADEC cautions: Dual FADEC failure, FADEC auto transfer failure
Landing gear failures: Landing gear fails to extend, and Landing with hung gear

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.
Land within .03 nm of intended point of landing.
Recognize indications, execute memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.

Instructor. CI

Prerequisite. SFAM-1039

SFAM-1071 2.0 * B,R,MR,AF,CI D S 1 FFS/FTD

Goal. Introduce flight control emergencies and degraded handling qualities.

Requirements

Discuss.

CRM

VMS response to flight control and hydraulic failures

Practice.

CRM utilization during emergency procedures

Emergency Landing Profile (ELP)

Emergencies

Critical Swashplate Fault (Caution)
Single or Multiple Swashplate Fault (AADV)
Pilot Nacelle Controller Failure (Caution)
Elevator Failure (Warning)
Critical Elevator Fault (Caution)
Flaperon Failure (Caution)
ADS Failures (Caution)
FCC 1/2 Fail (Caution)
FCC X/3 Fail (Caution)
Hydraulic 1/2 failure (Caution)
Hydraulic X/3 failure (Caution)
Fixed Nacelle Landing

Performance Standards.

Land within .03 nm of intended point of landing.

Recognize indications, execute required memory items, exercise proper CRM and maintain control of the aircraft during simulated Emergency Procedures.

Instructor. CI

Prerequisite. SFAM-1070

SFAM-1072 2.0 * B,AF,CI D S 1 FFS/FTD

Goal. Stage review.

Requirements

Discuss:

CRM

Any previously briefed EP

Any previously briefed system

Aircraft limitations

Introduce:

Full flight gear and cockpit considerations (Helmet, vest, and gloves)

Review

Checklists: From ALL START #19 "Personnel Equipment" through POST ENGINE STAR ENGINE STAR POST ENGINE STAR AFTER LANDING, SHUTDOWN

Load Comp/Weight and Balance

STO

NAVMC 3500.11E
16 Apr 18

CONV pattern
APLN pattern
Hover landing
No-hover Landing
Run-on Landing
Steep Approach
MGW Transition from Hover
MGW Landing
Slow flight (APLN Mode)
High AOB (APLN Mode)
Practice power on/off stalls
Overhead Break Entry
PF and PNF duties and callouts

Performance Standards.

Land within .03 nm of intended point of landing.

Conduct all FAM maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.

Instructor. CI

Prerequisite. SFAM-1071

SFAM-1073	2.0	*	B,R,MR,AF,CI	N*	S	1	FFS/FTD
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Goal. Introduce the FLIR in the night environment and execute night unaided FAM maneuvers.

Requirements

Discuss

CRM

Lighting systems

Interior lighting

Exterior lighting

Searchlight

Night adaptation/visual effects

Night scanning techniques

Fixation tendencies

Radar altimeter low setting

Introduce

Night ground operations

Use of FLIR

Environmental impacts on the FLIR

FLIR calibration

Track Handle and TCL

FPV Mode

LACE

FWD Mode

MAN Mode

PT Mode

SCAN Mode

Gain/Level settings

Use of Hover page

Practice

Vertical takeoff

Hover Nacelle drills

Air Taxi Nacelle drills

STOs

CONV pattern
APLN pattern
Hover Landing
No-Hover Landing
Run-on Landing
Steep Approach
MGW Transition from Hover
MGW Landing
PF and PNF duties and callouts

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.
Be able to state indications, execute/recite memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.
Basic understanding of FLIR use and manipulation.
Land within .03 nm of intended point of landing.

Instructor. CI

Prerequisite. ACAD-1013, LAB-1021, SFAM-1072

SFAM-1074 2.0 * AF S 1 FFS/FTD

Goal. Provide POI students without previous helicopter training additional simulator training with FOE on hover and low work skills.
Event not required for students with prior helicopter experience.

Requirements

Practice

Ground Taxi
Power steering on and off
Rearward Taxi
Vertical Takeoff (Power and systems check)
Normal Hover and Hover Turns
Hover Nacelle Drills
Air Taxi Nacelle Drills
Square Pattern
Vertical landing

Performance Standards

Practice items introduced during SFAM 1033.

Instructor. N/A

Prerequisite. SFAM-1033

SFAM-1075 2.0 * AF S 1 FFS/FTD

Goal. Provide POI students without previous helicopter training additional simulator training with FOE on hover and low work skills.
Event not required for students with prior helicopter experience.

Requirements

Practice

Ground Taxi
Power steering on and off
Rearward Taxi
Vertical Takeoff (Power and systems check)
Normal Hover and Hover Turns
Hover Nacelle Drills
Air Taxi Nacelle Drills

NAVMC 3500.11E
16 Apr 18

Square Pattern
Vertical landing

Performance Standards

Practice items introduced during SFAM 1033.

Instructor. N/A

Prerequisite. SFAM-1033

SFAM-1076	2.0	*	AF	S	1	FFS/FTD
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Goal. Provide POI students without previous helicopter training additional simulator training with FOE on hover and low work skills.
Event not required for students with prior helicopter experience.

Requirements

Practice

Ground Taxi
Power steering on and off
Rearward Taxi
Vertical Takeoff (Power and systems check)
Normal Hover and Hover Turns
Hover Nacelle Drills
Air Taxi Nacelle Drills
Square Pattern
Vertical landing

Performance Standards

Practice items introduced during SFAM 1033.

Instructor. N/A

Prerequisite. SFAM-1033

SFAM-1077	2.0	*	AF	S	1	FFS/FTD
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Goal. Provide POI students without previous helicopter training additional simulator training with FOE on hover and low work skills.
Event not required for students with prior helicopter experience.

Requirements

Practice

Ground Taxi
Power steering on and off
Rearward Taxi
Vertical Takeoff (Power and systems check)
Normal Hover and Hover Turns
Hover Nacelle Drills
Air Taxi Nacelle Drills
Square Pattern
Vertical landing

Performance Standards

Practice items introduced during SFAM 1033.

Instructor. N/A

Prerequisite. SFAM-1033

SFAM-1078 2.0 * AF S 1 FFS/FTD

Goal. Provide POI students without previous helicopter training additional simulator training with FOE on hover and low work skills. Event not required for students with prior helicopter experience.

Requirements

Practice

Ground Taxi
Power steering on and off
Rearward Taxi
Vertical Takeoff (Power and systems check)
Normal Hover and Hover Turns
Hover Nacelle Drills
Air Taxi Nacelle Drills
Square Pattern
Vertical landing

Performance Standards

Practice items introduced during SFAM 1033.

Instructor. N/A

Prerequisite. SFAM-1033

FAM-1080 1.5 * B,R,AF,CI D A 1 MV-22

Goal. Timely execution of checklists, particularly cockpit pre-start (from APU run/engage) and engine start. Introduce nacelle drills, hover and CONV pattern in the aircraft. Develop PUI skill in using nacelle angle to control nose attitude and longitudinal aircraft control. An additional 30 minutes should be allotted for ground work and checklist practice.

Requirements

Discuss

CRM
Electrical system
VTOL Flying Qualities
HOT REFUELING checklist
H-V diagram

Introduce

CRM
Pilot Flying (PF) duties and callouts
Ground Taxi: Power steering on and off and Rearward Taxi
Vertical Takeoff
Hover Page
Normal Hover and Hover Turns
Hover Nacelle Drills
Air Taxi Nacelle Drills
Square Pattern
Vertical landing
Transition from Hover
Landing to a WYPT
CONV pattern
Normal Approach to a Hover Landing
Normal Approach to a No-Hover Landing

Practice

Checklists
COCKPIT PRE-ENTRY

COCKPIT PRE-START
BATTERY
ALL START
ENGINE START
POST ENGINE START
AFTER LANDING
SHUTDOWN

Review

Load Comp/Weight and Balance/TOLD
COCKPIT PRE-START
ENGINE START

Expose

Crew chief actions and callouts
APLN flight

Emergencies

Electrical system failures
Ground Emergencies.

Performance Standards

Understands all checklist items, knows where the required cockpit switches are, able to access required CMS functions, and demonstrates proper CRM during the startup and shutdown with some coaching.
Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.
Land within .03 nm of intended point of landing.
Be able to state indications, execute/recite memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.
PUI should perform PNF duties at least once during either airfield arrival or departure.

Instructor. FRSI

Prerequisite. SFAM-1072 flown within the past 7 days, ACAD-1013, LAB-1021.

FAM-1081 1.5 * B,R,MR,AF,CI D A 1 MV-22

Goal. To develop the landing phase of PF skills. Practice low work and CONV pattern. Introduce MGW takeoff / landing, steep approach, transitions and conversions. Introduce OLF operations and Course Rules.

Requirements

Discuss

CRM
Power plant systems
Engines
Engine control (FADEC, PDS)
APU
Single Engine Flight
APLN/CONV Flying Qualities
APLN/CONV course rules
Radar Altimeter Low Setting

Demonstrate

Run-On landing

Introduce

CRM
CMS HIGE/HOGE perf calc
Pilot Not Flying (PNF) duties and callouts

MGW transition from hover (CONV only)
MGW Landing
Steep Approach to a No-Hover
Nose Low Steep Approach
Level Speed Change (CONV Mode)
Course Rules
Transition to APLN

Transition straight and level
Transition constant rate climb

Conversion to CONV

Conversion straight and level
Conversion constant rate descent

Practice

Checklists
Vertical Takeoff
Hover Page
Normal Hover and Hover Turns
Hover Nacelle drills
Air Taxi Nacelle drills
Vertical Landing
CONV pattern
Landing to a WYPT
Normal Approach to a Hover Landing
Normal Approach to a No-Hover Landing

Emergencies

Single engine failure in hover (HIGE, HOGE)
Single engine failure in-flight
Single engine wave-off

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.
Properly recognize normal approach glideslope.
Be able to state indications, execute/recite memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.
Land within .03 nm of intended point of landing.

PUI shall perform PNF duties at least once during either airfield arrival or departure.

Instructor. FRSI

Prerequisite. FAM-1080

FAM-1082	1.5	*	B,R,AF	D	A	1	MV-22
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Goal. Develop the initial building blocks required for a tiltrotor to go from the enroute phase to landing. Introduce APLN pattern, short takeoff (STO) and run on landing (ROL). PUI shall practice PNF duties and callouts and Flight Director (FD) inputs.

Requirements

Discuss

CRM
Drive system
FFR indicator
SLL
VSLED
Automatic Flight Control System (AFCS)
Full time and selectable modes of operation
Cyclic grip and TCL switches (AFCS unique)

AFCS/PFCS Reset
Vortex Ring State

Introduce

CRM
APLN pattern
Level speed change (APLN mode)
PNF use of FD cues for CRM
Use of the Hover Page
STOs
Run-on Landing

Practice

CONV pattern
Normal Approach to a No-Hover Landing
Steep Approach to a Hover Landing
Steep Approach to a No-Hover Landing
Use of Hover page
Transition to APLN
Conversion to CONV
PF and PNF duties and callouts

Emergencies

Drive system malfunction
Gearbox Failure (Warning)
ICDS Failure (Warning)
Feathering/Flapping High Hot
Rotor Load High

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.
Properly recognize steep approach glideslope.
Be able to state indications, execute/recite memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.
PUI shall perform PNF duties at least once during either airfield arrival or departure.
Land within .03 nm of intended point of landing.

Instructor. FRSI

Prerequisite. 1081

FAM-1083	1.5	*	B,CI,AF	D	A	1	MV-22
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Goal. To develop the skills and considerations required for heavy or high altitude tiltrotor operations from the enroute phase to landing. Introduce short takeoff (STO) and run on landing (ROL). Interim power should be selected ON where appropriate and all maneuvers flown with simulated minimal power margin.

Requirements

Discuss

CRM
Drive system
FFR indicator
SLL
VSLED
Vehicle Management System (VMS)
Hydraulic system
FCS

AFCS / PFCS

Practice

CRM
STOs
Run-on Landing
APLN pattern
MGW Transition from Hover
MGW Landing
Normal approach
Steep approach
No-Hover landing
 HUD precision approach
PF and PNF duties and callouts

Emergencies

VMS Failures
Hydraulic System failures

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.
Be able to state indications, execute/recite memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.
PUI shall perform PNF duties at least once during either airfield arrival or departure.
Land within .03 nm of intended point of landing.

Instructor. FRSI

Prerequisite. 1082

FAM-1084 1.5 * B,R,MR,AF D A 1 MV-22

Goal. Develop understanding of APLN energy management. Review APLN pattern. Introduce slow flight, APLN maneuvers, high AOB turns and stalls. Emphasize PNF duties in the landing pattern.

Requirements

Discuss

CRM
Landing Gear System
APLN Slow flight characteristics
AOB/load factor vs. stall speed

Introduce

CRM
Slow flight (APLN Mode)
MAX RNG / MAX ENDUR
 CMS Cruise Performance
High AOB (APLN Mode)
Power on/off stalls
Overhead Break Entry
Touch and Go

Practice

STOs
APLN pattern
Run-on Landing
No-Hover Landing

NAVMC 3500.11E
16 Apr 18

MGW Transition from Hover
MGW Landing
Normal approach
Steep approach
No-Hover landing
PF and PNF duties and callouts

Emergencies

Single engine wave-off
Landing gear failures
 Landing gear fails to extend
 Landing with hung gear

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.
Be able to state indications, execute/recite memory items, exercise proper crew coordination, and maintain control of the aircraft during simulated emergency procedures.
PUI shall perform PNF duties at least once during either airfield arrival or departure.
Land within .03 nm of intended point of landing.

Instructor. FRSI

Prerequisite. FAM-1083

FAM-1085	1.5	*	B,AF	D	A	1	MV-22
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Goal. To prepare for FAM stage progress check and introduce the ELP.

Requirements

Discuss

CRM
ELP
Dual Engine Fail
Fuel system

Introduce.

CRM
ELP
Aborted Takeoff

Practice

Slow Flight (APLN Mode)
High AOB (APLN Mode)
Power on/off stalls
Touch and Go

Review

Hover Nacelle drills
Air Taxi Nacelle drills
CONV pattern
APLN pattern
STOs
Normal Approach
Steep approach
No-Hover Landing
Run-on Landing
Nose low steep approach
MGW Transition from Hover

MGW Landing
PF and PNF duties and callouts

Emergencies

Engine Fire
Fuel System Cautions

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.
Be able to state indications, execute/recite memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.
PUI shall perform PNF duties at least once during either airfield arrival or departure.
Land within .03 nm of intended point of landing.

Instructor. FRSI

Prerequisite. FAM-1084

FAM-1086 1.5 * B,R,MR,AF D A 1 MV-22

Goal. FAM Stage Progress check. Demonstrate appropriate level of learning for tiltrotor flying qualities, major systems, aircraft control, normal and emergency procedures.

Requirements

Discuss

CRM
Any major aircraft system
Any tiltrotor FQ or performance

Review

CRM
Load Comp, Weight and Balance
Checklists
STOs
APLN pattern
No-Hover Landing
Run-on Landing
Steep approach
MGW Transition from Hover
MGW Landing
Slow flight (APLN Mode)
High AOB (APLN Mode)
Practice power on/off stalls
Overhead Break Entry
PF and PNF duties and callouts

Emergencies.

Any major system EP

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS utilizing appropriate CRM.
Be able to state indications, execute/recite memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.
PUI shall perform PNF duties at least once during either airfield arrival or departure.
Land within .03 nm of intended point of landing.

Instructor. FRSI

Prerequisite. FAM-1085

2.8.2 Navigation (NAV)

2.8.2.1 Purpose.

To develop the ability to conduct day VFR navigation utilizing the navigation / mission management systems. FOE: CMS, JMPS, command levels of automation, and the NTRP 3-22.4-MV22B. The NAV stage also introduces the PUI to CRM as it pertains to the MV-22 and associated aircrew.

2.8.2.2 General.

The PUI will conduct route planning based on information provided by the IP. JMPS will be utilized to conduct route planning and to produce required printed documents and digital files. JMPS will be used to perform a thorough map study. The aircraft navigation system and the aircraft mission management system will be used to follow the planned route and to arrive at the planned destination at a predetermined time.

2.8.2.3 Admin Notes.

Ground training will include a Navigation Stage Brief; associated lessons on the Advanced Distributive Learning (ADL) system; and JMPS training.

Crew Requirement. CNAV: Maximum of 2 PUI to 1 IP; SNAV: P/P.

2.8.2.4 Navigation Overview

Table 2-17: Navigation Stage Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ADL-1101	2.0	*	B,R,MR,AF,CI		G		DMS AND INAV FUNCTIONS
ACAD-1110	1.0	*	B,AF,CI		G		NAV STAGE IN-BRIEF
ACAD-1111	1.0	*	B,AF,CI, R, MR		G		AUTOMATION
LAB-1120	6.0	*	B,R,MR,AF,CI		G		VMPS I
LAB-1121	2.0	*	B,R,MR,AF,CI		G		DMS AND MISSION MANAGEMENT SYSTEM
LAB-1122	1.0	*	B,R,MR,AF,CI		G		CMS AND DMS
LAB-1123	4.0	*	B,R,MR,AF,CI		G		VMPS 2
CNAV-1130	2.0	*	B,R,MR,AF,CI	D	S	1	FFS/FTD
SNAV-1131	2.0	*	B,AF,CI	D	S	1	FFS/FTD
SNAV-1132	2.0	*	B,R,AF,CI	D	S	1	FFS/FTD

ADL-1101 2.0 * B,R,MR,AF,CI G

DMS and INAV functions

Goal. The PUI has completed all modules with a basic understanding the DMS and INAV functions.

Requirements. The following modules are required.

Introduction to the DMS.

INAV and CMS Navigation Control System.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. ADL-0001

ACAD-1110 1.0 * B,AF,CI G

NAV stage in-brief

Goal. To introduce the PUI to the training syllabus for the Navigation phase. The following will be discussed: the documents and imagery available, the route planning considerations, the preflight planning requirements, the conduct of the training flights and performance standards.

Requirements

Discuss

Syllabus description

ADL lessons to be completed
Charts/Imagery
Aeronautical Charts
Satellite Imagery
Use of various scales
Route Planning
Effects of weather and/or wind
Waypoint/IP/Target selection
Expected visibility of selected waypoints at planned flight altitude
Mission planning using JMPS and the mission management system to meet a time on target
Final approach planning
Planning for INS Update
Pre-mission Planning/Brief
 JMPS
 Fuel planning
 FLPN MIN FUEL
 BINGO FUEL (Flight plan / No flight plan)
 Produce Smart Pack. Smart Pack contents
 Chart study: Linear/Limiting Features, Point Features, Timing Features, Catching Features, Funneling Features
 Final Approach Planning/Preparation.
 Conduct of flight
 PF duties
 PNF duties and CRM during automation
 Use of the FD Cues/Commands

Instructor. FRSI

Prerequisite. SFAM-1072, ADL-1101

ACAD-1111	1.0	*	B,R,MR,AF,CI	G
<u>Automation</u>				

Goal. The PUI will have an introductory knowledge of capabilities, limitations and integration associated with automation systems of the MV-22B.

Requirements

Discuss

Purpose of automation
Automation errors
 Levels of automation
 Cues
 Commands
 Coupled
 Core
 Nav
 Approach mode
 Hover Coupled
 NATOPS Limitations.
 CRM for Automation
 RVL procedures
 Search Pattern
 Other applications

Instructor. CI.

Prerequisite. ADL-0011

LAB-1120 6.0 * B,R,MR,AF,CI G

VMPS I

Goal. To introduce the PUI to the mission planning station and the JMPS program. Following this instruction, the PUI should be able to use the mission planning computer and the JMPS program to plan a route, create a mission binder, load the mission to a DTM, and print required documents.

Coordination. The digital mission files and printed documents created during this training session will be used during CNAV-1130.

Requirements

Discuss

Operate the Mission Planning Station and the JMPS Program

Create, Open, Save, Close Route files

Edit climb cruise and descent performance profiles

Create and edit a straight in tactical approach

Create and edit approach legs

Modify route properties

Add, edit, delete, aircraft load

Calculate and print Load Comp Form

Calculate aircraft CG and discuss Form DD-365-F

Create, open, save, and close Mission Binders

Load Waypoint Set

Load COMM Plan

Write Mission to DTM

Print required kneeboard cards

NAVLOG, load comp, TOLD

Instructor. CI

Prerequisite. LAB-0201,ADL-1101

External Syllabus Support. JMPS with color printer.

LAB-1121 2.0 * B,R,MR,AF,CI G

DMS and Mission Management System

Goal. To introduce the PUI to the cockpit operation of the navigation system, the Mission Management system, and the DIGMAP system operation.

Requirements

Discuss

Current aircraft navigation system flight restrictions and limitations

Introduce

Waypoint (WYPT) Management

Add, edit, display, and delete waypoints using CDU WYPT

Add waypoint using OFLY Store function

Flight Plan (FPLN) Management

Build, edit, delete, flight plans using CDU FPLN

Utilize INAV Functions (FPLN, DIREC OFF)

Activate and display the flight plan

Activate and display an Idle Leg

Edit and utilize the Cargo Summary (ACFT WHT/CG)

Edit and utilize the Bingo FPLN

Display and utilize Fuel Summary

Display and utilize FPLN Summary to edit flight plan legs

Adjust the Leg Type and method of Sequence

Utilize TSO. Adjust CAS and TOT

Edit leg Wind data
Adjust leg WT/BAL data
Bullseye Function
Look Ahead Function
Calculate Aircraft CG (WT/BAL NO FLT PLN)
Dual Digital Map Operation.
Display scales of Charts and Satellite Imagery (CIB)
Display DTED data and utilize the HAT and LOS functions
Add, edit, display, and delete waypoints
Utilize the declutter function
Build, activate, display, edit, and delete flight plans
Upload Mission Data from DTM

Instructor. CI

Prerequisite. LAB-1120

LAB-1122	1.0	*	B,R,MR,AF,CI	G
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CMS and DMS

Goal. To review cockpit operation of the navigation system, the CMS, and the DMS.

Requirements

Discuss

FENCE Checklist
Utilization of the CMS, CRM and Mission Management
CDU/EICAS and MC failure effects on CMS

Introduce

Digital Interoperability

Review

WYPT Management
Manual WYPT (HA/LZ)
Offset WYPT (IP)
FPLN Management
FPLN Summary
Edit leg
Insert WYPT
FPLN winds
Copy to legs function
WT/BAL manipulation
DIGMAP system operation
Line-of-sight (LOS)
Height above terrain (HAT) and Intervisibility (IVZ)
Bullseye
Fuel Management
DTM upload, mission verification and management
Look ahead function

Instructor. CI

Prerequisite. LAB-1121

CNAV-1130	2.0	*	B,R,MR,AF,CI	D	S	1	FFS/FTD
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Goal. To review and practice the operation of the mission planning station, the aircraft navigation system and the aircraft mission management system in preparation for a navigation flight.

Coordination. The digital mission files and printed documents created during LAB-1120 will be used during this training session.

Requirements

Preflight Preparation. Operate the mission planning station and the JMPS program

Calculate and print Load Comp Form

Calculate aircraft CG

Write the mission to DTM

Print kneeboard cards

Discuss

CRM

GPS

INS

INS Alignment

INS Updates

DIGMAP

Introduce.

Flight Director Operation

CRM

Utilize Flight Director Panel to adjust and activate the Flight Director Cues and Commands

Utilize the Commands in both the APLN and CONV modes of flight

Practice

Aircraft Navigation/CMS/mission management system

Conduct INS land alignment

Conduct Aircraft INIT

Upload mission data from DTM

Calculate Hover/Cruise Performance using the CMS (HIGE, HOGE, MAX RNG/ENDU)

Waypoint (WYPT) Management

(Add, edit, display, and delete waypoints using CDU WYPT

Add waypoint using Overfly Store function

Flight Plan (FPLN) Management

Build, edit, delete, flight plans using CDU FPLN

Utilize INAV Functions (FPLN, DIREC OFF)

Activate and display the flight plan

Activate and display an Idle Leg

Edit and utilize the Cargo Summary (ACFT WT/CG)

Edit and utilize the Bingo FPLN, Bingo No FPLN and Fuel Reserve

Display and utilize Fuel Summary

Display and utilize FPLN Summary to edit flight plan legs

Adjust the Leg Type and method of Sequence

Utilize TSO. Adjust CAS. Adjust TOT

Edit leg Wind data

Adjust leg WT/BAL data

FPLN winds

Dual Digital Map (DIGMAP) Operation

Display scales of Charts and Satellite Imagery (CIB)

Display DTED data and utilize the HAT and LOS functions

Add, edit, display, and delete waypoints

Utilize the declutter function

Build, activate, display, edit, and delete flight plans

Performance Standards

Be able to execute all functions with coaching utilizing appropriate CRM.

Basic understanding of flight plan, waypoint, CMS and DMS management.

Instructor. CI.

Prerequisites. 1120, 1121.

SNAV-1131 2.0 * B,AF,CI D S 1 FFS/FTD

Goal. Introduce day VFR navigation in the medium altitude environment to arrive at multiple objectives.

Coordination. The IP shall issue to the student the position of a departure point, an initial objective, and a second objective. The distance between points should be less than 150 NM (40 minutes enroute). The IP shall provide forecast weather and winds for preflight planning.

The PUI shall be prepared to perform all cockpit tasks as the PNF. The PUI shall utilize the mission planning system to select waypoints and plan the routes to both objectives. The PUI shall load the planned mission to a DTM. The PUI shall be prepared to utilize the aircraft navigation system and mission management system to navigate to the objectives.

This event shall be conducted with the GPS failed on the second leg of the route requiring both manual INS alignment and enroute INS updates. The first leg shall be flown with a fully functional GPS. The student shall be prepared to conduct INS updates using both OFLY and TACAN methods.

Requirements

Preflight preparation

Operate the mission planning station and the JMPS program

Plan the routes as assigned.

 Create and edit straight in and turning approach legs to both objectives

 Add appropriate waypoints as required to conduct INS update

Calculate and print a Load Comp Form

Calculate aircraft CG

Add an appropriate waypoint set to the mission binder, an appropriate Comm Plan and an appropriate route to the mission binder.

Write the mission to the DTM

Print kneeboard cards

Conduct chart study

Discuss

CRM

Route Planning

Pre-mission Planning/Brief

Conduct of flight

Introduce

Utilize the aircraft navigation/CMS

Utilize CRM during VFR navigation

INS update (OFLY/TACAN)

Practice

Preflight NAV/CMS/MMS

Conduct INS land alignment

Conduct Aircraft INIT

Upload mission data from DTM

Calculate Hover/Cruise Performance using the CMS (HIGE, HOGE, MAX RNG/ENDU)

Calculate aircraft CG (WT/BAL NO FLT PLN)

Flight Plan (FPLN) Management

 Utilize INAV Functions (FPLN, DIREC OFF)

 Activate and display the flight plan

 Edit and utilize the Bingo FPLN

 Display and utilize Fuel Summary

 Display and utilize FPLN Summary to edit flight plan legs

 Adjust the Leg Type and method of Sequence

 Utilize TSO. Adjust CAS. Adjust TOT

- Edit leg Wind data
- Adjust leg WHT/BAL data
- Dual Digital Map (DIGMAP) Operation
 - Display scales of Charts and Satellite Imagery (CIB)
 - Display DTED data and utilize the HAT and LOS functions
 - Add, edit, display, and delete waypoints
 - Utilize the declutter function
 - Build, activate, display, edit, and delete flight plans
- Flight Director Operation
 - Utilize the Flight Director Panel to adjust and activate the Flight Director Cues and Commands
 - Utilize the Commands in both the APLN and CONV modes of flight

Performance Standards

- Accurately conduct mission preflight planning utilizing the mission planning station and JMPS. Produce all required products
- Utilize accurate MSN Data Load, WYP FPLN, INAV, and MSN key functionality
- Execute a navigation route maintaining orientation ± 1 nautical mile enroute
- Demonstrate the knowledge of time on target (TOT), and fuel management
- Properly activate and operate the DMS during VFR navigation
- Be able to accurately conduct an INS alignment and update
- Utilize CRM principles

Instructor. CI

Prerequisite. 1130

SNAV-1132	2.0	*	B,R,AF,CI	D	S	1	FFS/FTD
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Goal. Utilize the aircraft navigation system, flight director system, and the aircraft mission management system, to arrive at the objective(s) at a predetermined time. Introduce the use of Flight Director commands, coupled modes, and AUTO NAC during enroute and APPR flight.

Coordination. The IP shall issue to the student a mission that requires the transport of a specific number/weight of troops/cargo from a departure point to an objective. The distance between the departure point and the first objective should be less than 200 NM (55 minutes enroute). An approach leg will be planned and conducted at the initial objective and a specific time for landing will be planned and flown. The aircraft will proceed to a second on-call objective to await the extraction of the troops. A coupled approach leg will be planned at the second objective. The IP shall provide forecast weather and winds for preflight planning.

The PUI shall be prepared to perform all cockpit tasks as the PNF. The PUI shall utilize the mission planning system to select waypoints and plan the routes to both objectives. A straight in tactical approach will be planned and flown at the initial objective with the landing at the specified time. A coupled approach will be planned and utilized at the second objective. The PUI shall compile the required digital files, and load the planned mission to a DTM. The PUI shall be prepared to upload the mission to the aircraft and to utilize the aircraft navigation system and mission management system to navigate to the objective and arrive at the assigned time.

Requirements

Preflight preparation:

- Operate the mission planning station and the JMPS program.
- Plan the routes as assigned.
 - Create and edit a straight in tactical approach the first objective.
 - Create and edit an approach leg to both objectives.
- Add, edit, and delete the Aircraft Load as assigned.
- Calculate and print a Load Comp Form.
- Calculate aircraft CG.
- Add an appropriate waypoint set, appropriate Comm Plan and appropriate route to the mission binder. Write the mission to the DTM.
- Print kneeboard cards.
- Conduct chart study.

Discuss.

Conduct route preflight brief (conduct of flight portion of PCL).

Introduce

Flight director commands and coupled modes (Core modes, INAV, APPR).
Activate and display a coupled approach (APPR) leg.
CMS TOT management.

Practice

Utilize the aircraft navigation/CMS to execute assigned mission.
NAV/CMS/MMS set-up.
Flight Plan (FPLN) Management.
DIGMAP Operation.

Performance Standards

Accurately conduct mission preflight planning utilizing the mission planning station and JMPS.
Accurately operate MSN Data Load, WYP FPLN, INAV, and MSN key functionality.
Execute a navigation route maintaining orientation +/- 1 nautical mile enroute; +/- 500 meters in the objective area; and landing in the objective within +/- 30 seconds.
Properly activate and operate the DMS and the Flight Director during VFR navigation.
Utilize CRM principles.

Instructor. CI.

Prerequisite. SNAV-1131.

2.8.3 Instruments (INST)

2.8.3.1 Purpose

To develop proficiency in instrument flight using all installed navigational equipment. FOE: JMPS, IFR planning and flying, CMS, CRM, and levels of automation.

2.8.3.2 General

Instrument flights should be conducted under both day and night conditions. All instrument sims, day or night, shall be conducted under instrument conditions for the PUI, using an instrument hood when necessary. One simulator and one flight shall be conducted at night.

Refresher and Modified Refresher pilots will complete their annual instrument check at the end of this stage (RQD-6032). Therefore, they are required to have their semi-annual minimums and instrument ground school complete prior to RQD-6032.

Basic pilots whose instrument check will expire within 3 months of leaving the FRS are required to have their semi-annual minimums and instrument ground school complete prior to RQD-6032.

Pilots whose instrument rating will remain current 3 months beyond designation as a T2P may waive the prerequisite requirement for the S-REV-1830, thus enabling all instrument simulator events to be flown prior to the instrument aircraft events. Additionally, the RQD-6032 instrument evaluation flight is waived.

Instrument ground school shall not be completed earlier than 60 days prior to the RQD-6032.

Crew Requirement. SINST-1233, RQD-6032: Maximum of 2 PUI to 1 IP; All others: P/P/(CC for aircraft events).

2.8.3.3 Instrument Overview

Table 2-18: Instrument Stage Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ADL-1201	1.0	*	B,R,MR,AF,CI		G		INST CMS
ADL-1202	1.0	*	B,R,MR,AF,CI		G		WX RADAR
ADL-1203	1.0	*	B,R,MR,AF,CI		G		IPS
ACAD-1210	1.0	*	B,AF,CI, CV		G		STAGE INTRO
ACAD-1211	1.0	*	B,R,MR,AF,CI		G		ICAO PLANNING
LAB-1220	5.0	*	B,R,MR,AF,CI		G		
SINST-1230	2.0	*	B,R,AF,CI	(N*)	S	1	FFS/FTD

SINST-1231	2.0	*	B,R,MR,AF,CI	(N*)	S	1	FFS/FTD
SINST-1232	2.0	*	B,R,MR,AF,CI	(N*)	S	1	FFS/FTD
SINST-1233	2.0	*	B,CI,AF	(N*)	S	1	FFS/FTD
INST-1240	2.0	*	B,R, MR,AF	(N*)	A	1	MV-22
INST-1241	2.0	*	B,R,MR,AF, CI	(N*)	A	1	MV-22
INST-1242	2.5	*	AF	(N*)	A	1	MV-22

ADL-1201 1.0 * B,R,MR,AF,CI G

DDMS and INAV functions

Goal. The PUI has completed the CBT with a basic understanding of the CMS as it pertains to instrument operations, procedures, and CRM.

Requirements. The following modules are required.

MV-22B instrumentation and CMS integration.

Performance Standards. Satisfactory completion of all modules.

Prerequisite: ADL-0003.

ADL-1202 1.0 * B,R,MR,AF,CI G

Wx Radar

Goal. The PUI has completed the CBT with a basic understanding of the MV-22

Requirements. The following modules are required.

MV-22 Wx Radar.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. ADL-0003.

ADL-1203 1.0 * B,R,MR,AF,CI G

Ice Protection System

Goal. The PUI has completed the CBT with a basic understanding of the MV-22

Ice Protection system capabilities and functionality.

Requirements. The following modules are required.

MV-22 Ice Protection System.

Performance Standards. Satisfactory completion of all modules.

Prerequisite. ADL-0003.

ACAD-1210 1.0 * B,AF,CI,CV G

Instrument phase introduction

Goal. To introduce the PUI to the training syllabus for the Instrument phase.

Requirements

Discuss

Annual Instrument Minimums requirements.

Instrument kneeboard card

Navigation equipment, current status and flight restrictions and filing differences.

ENAV – VOR/TACAN
INAV - GPS/INS.
Minimum aircraft equipment requirements.
Fuel considerations.
 Fuel burn rates.
 NATOPS limitations.
 Squadron SOP.
 Minimum fuel requirements.
Preflight planning.
 PUI preflight planning.
 Common flight planning airspeeds.
 Instrument Navigation Packet.
 Electronic filing of a DD-175 and receipt of a digital weather brief.
Glass/Digital Instrument scan.
 Instrument scanning techniques.
 Fixation tendencies.
Flight Director scan.
CRM
 PNF/PF Duties.
 Takeoff/Departure Brief.
 Instrument Approach Brief.
 Approach Checklist.

Instructor. FRSL.

Prerequisites. SFAM-1072, ADL-1203

ACAD-1211 1.0 * B,R,MR,AF,CI G

Goal. The PUI will have in introductory knowledge of the architecture, available planning tools, as well as filing and operating requirements for the ICAO environment.

Requirements

Discuss

DD-1801
DoD Foreign Clearance Guide
Optimum Path Aircraft Routing System (OPARS)
Aircraft and Personnel Clearance System (APACS)
Army Flight Operations Detachment (AFOD)
 Flight Information Region (FIR) boundaries
 Publications

Instructor. FRSL.

Prerequisites. ACAD-1210

LAB-1220 5.0 * B,R,MR,AF,CI G

Goal. To continue PUI introduction to the mission planning station and the JMPS program. Following this instruction the PUI will be able to use the mission planning computer and the JMPS program to; create a Waypoint Set, create a Communications Plan, create a flight plan and print a NAVLOG.

Requirements

Introduce

Create, open, edit, save, and close V-22 Waypoint set files.
Create waypoints using Graphical Tools, DAFIF Data, and Overlays.
 Print NAVLOG.
Create, open, edit, save, and close V-22 Communication Plan files.
Transport mission related digital files.

Practice

Operate the Mission Planning Station and the JMPS Program.

Create, Open, Edit, Save, Close Route files.

Edit climb cruise and descent performance profiles.

Print DD-175/1801 form.

Calculate and print Load Comp Form.

Load Waypoint Set.

Load COMM Plan.

Create, open, save, and close Mission Binders.

Write Mission to DTM.

Performance Standards

Accurately operate the JMPS planning station and software.

Successfully print required documents.

Successfully write the mission binder to the DTM and upload mission files to the aircraft.

Instructor. CI.

Prerequisite. SNAV-1132, ACAD-1210.

External Syllabus Support. JMPS.

SINST-1230 2.0 * B,R,AF,CI (N*) S 1 FFS/FTD

Goal. Introduce Basic Instrument flight and en route navigation. Introduce black cockpit operations, and unusual attitude recovery. Develop CRM skills by the proper use of Flight Director Cues.

Coordination. IP will designate both departure airfield and the destination airfields where training is to be conducted. IP will issue a clearance, including a standard instrument departure, to the planned destination initial approach fix (IAF). IP will issue a departure clearance to the planned training area. During this flight the PUI will act as the PF.

The PUI shall prepare a DTM with a flight plan, waypoint set, and comm plan based off the IP designated departure and destination airfields. He shall print a TOLD.

Requirements

Discuss

CRM.

Cockpit set up for IMC/IFR flight.

Instrument Takeoff.

Hover ITO.

STO ITO.

CLIMB Checklist.

Basic Instrument Maneuvers.

Unusual Attitudes.

Prevention of and overcoming Spatial Disorientation.

Recovery procedures from an unusual attitude.

Standby Flight Instruments/Partial Panel.

Approach Surveillance Radar (ASR).

Introduce

Cockpit setup and Ground procedures.

Instrument Takeoff.

Hover ITO.

STO ITO.

Transition in a climb.

Alt Command.FDP use during IFR flight.

Conversion in a descent.

Oscar pattern with and without FDP.

Unusual Attitudes.
Black Cockpit operations.
 Standby Flight Instruments/Partial Panel.
 FDP use during IFR flight.
Enroute airway navigation utilizing both ENAV and INAV.
Voice Procedures.

Practice

CRM

Emergencies:

Dual Mission Computer failures.
Dual DEU failures.

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.
Maintain positive control of the aircraft, and situational awareness, while performing the Basic Instrument (BI) maneuvers as described in the MV-22 Maneuver Description Guide (MDG) and NATOPS.
Accurately use the Flight Director panel cues; coupled core, coupled NAV.
Accurately identify and recover from unusual attitudes IAW MV-22 Maneuver Description Guide (MDG) and NATOPS without aggravating the unusual attitude.
Accurately navigate the route to the IAF utilizing no fewer than 3 NAVAIDs.
Recognize indications, execute memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.

Instructor. CI.

Prerequisites. SNAV-1132, LAB-1220.

SINST-1231 2.0 * B,R,MR,AF,CI (N*) S 1 FFS/FTD

Goal. Introduce Non Precision Approaches, both low and high altitude. Develop CRM skills by the proper use of the Flight Director. During this flight the PUI will perform duties as both the PF and the PNF. One instrument approach shall be completed while the PUI acts as the PNF.

Coordination. IP will designate both departure airfield and the destination airfields where training is to be conducted. IP will issue a clearance, including a standard instrument departure, to the planned destination training area. Cruise altitude shall be high enough to require both climb and descent checklists, and to execute a high altitude approach.

Preflight Planning. The PUI shall prepare a DTM with a flight plan, waypoint set, and comm plan based off the IP designated departure and destination airfields. He shall print a TOLD.

Requirements

Discuss

CRM
Aircraft navigation systems, operation, and limitations.
Enroute and descent procedures.
 ENAV Functions.
 DESCENT Checklist.
APPROACH checklist.
 High Altitude instrument approach.
Aircraft approach categories.
Circling approach.
CRM during IFR navigation.
Ice Protection System

Introduce

Pre-takeoff Preparation (Departure Brief and procedures).
Departure (Standard Instrument Departure).

NAVMC 3500.11E
16 Apr 18

CLIMB Checklist.
TACAN Point to point.
Descent procedures.
Holding.
Instrument APPROACH Brief.
APPROACH Checklist.
Non-precision approaches.
 High Altitude TACAN approach.
 TACAN approach.
 VOR approach.
 LOC or LOC BC approach.
 Flight Director Auto Nacelle
Missed approach.
CRM during IFR navigation.
Aircraft configuration.
Transition to visual landing.

Practice

CRM.
Voice Procedures.

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.
Execute Pilot Not Flying duties IAW with the MV-22 Maneuver Description Guide (MDG) and NATOPS in a timely manner with some coaching.
Panel cues; coupled core, coupled NAV. During airways navigation remain within the lateral limits of the assigned airspace.
Execute non-precision approaches accurately and safely conducting all checklists in a timely manner.

Instructor. CI.

Prerequisite. SINST-1230.

SINST-1232 2.0 * B,R,MR,AF,CI (N*) S 1 FFS/FTD

Goal. Introduce Precision Approaches. Develop CRM skills by the proper use of the Flight Director. During this flight the PUI will perform duties as both the PF and the PNF. One instrument approach shall be completed while the PUI acts as the PNF.

Coordination. IP will designate both departure airfield and the destination airfields where training is to be conducted. IP will issue a clearance to the planned destination training area(s).

Preflight Planning. The PUI shall prepare a DTM with a flight plan, waypoint set, and comm plan based off the IP designated departure and destination airfields. He shall print a TOLD.

Requirements

Discuss

Instrument Landing System (ILS).
 Approach lighting system (ALS).
Aircraft navigation systems, operation, and limitations. ENAV functions, operation, and limitations.
Aircraft approach categories.
CRM in IMC
Wx Radar

Introduce

Precision approaches (minimum PF x3, PNF x1)
PAR approach
Wx Radar

Practice

CRM.
Pre-takeoff Preparation.
Departure.
Voice Procedures.
En route procedures.
Descent procedures.
Instrument APPROACH Brief.
APPROACH Checklist.
Transition to visual landing.
Missed approach.

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.
Execute Pilot Not Flying duties IAW with the MV-22 Maneuver Description Guide (MDG) and NATOPS in a timely manner with minimal coaching.
During airways navigation remain within the lateral limits of the assigned airspace.

Instructor. CI.

Prerequisite. SINST-1231.

SINST-1233 2.0 * B,CI,AF (N*) S 1 FFS/FTD

Goal. Conduct IFR Flight operations. Demonstrate Flight Director operation and the Mission Management systems. A complete flight shall be conducted including; flight planning, filing, clearance, departure, en route/cruise, descent, and instrument approaches.

Coordination. IP shall designate a mission scenario with emphasis on fuel, cargo, wind and altitude considerations. The IP shall issue to the PUI appropriate information for preflight planning; including a DD-175-1, appropriate NOTAMS, and an aircraft load.

Preflight Planning. PUI will conduct all appropriate preflight planning to include: TOLD, completed DD-175, and loading flight plan, waypoint set, and comm plan, on a DTM.

Requirements

Discuss

CRM
JMPS flight planning (Flight plan flies loaded to the DTM).
Flight Plan/DD-175.
 Aircraft Designation/TD Code.
 Route, altitude, CAS vs TAS.
 Winds aloft.
V-22CNAF 3710.7 Minimum fuel requirements.
Alternate airfield selection.
Mission Management System
Fuel, cargo, wind and altitude considerations
CRM during IFR navigation.
Standard Terminal Arrivals (STAR).
Approach criteria for Multi-piloted aircraft.
Closing of the Flight Plan.

Introduce

Flight planning.
FD ENAV Commands.
FD Coupled Core.
Mission Management System Operation.
 Hover/Cruise/STO PERF.
 Fuel Summary (FPLN BINGO / BINGO No FPLN / Fuel Reserve).

Practice

CRM.

Pre-takeoff preparation.

Instrument Takeoff.

Departure.

En route procedures.

Airways navigation.

Communication, Navigation, and IFF equipment operation.

Descent procedures.

Non precision Approaches.

Precision Approaches.

Transition to visual landing.

Missed approach.

Performance Standards

Accurately conduct preflight planning and complete required documents to conduct an IFR flight.

Accurately operate the JMPS planning station and software; successfully print required documents; and successfully write the mission binder to the DTM and upload mission files to the aircraft.

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.

Execute Pilot Not Flying duties IAW mission management as pertains to the scenario.

Accurate and timely use of the Flight Director Cues, Commands, and Coupled modes for IMC flight. Accurately use the Flight Director panel cues; coupled core, coupled NAV during IMC flight.

Demonstrate appropriate CRM.

Instructor. CI.

Prerequisite. SINST-1232.

INST-1240	2.0	*	B,R,MR,AF	(N*)	A	1	MV-22
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Goal. Practice approaches. Use Flight Director throughout the flight. During this flight the PUI will perform duties as the PF and the PNF. The PUI shall complete one instrument approach as the PNF.

Coordination. The PUI will plan the mission on JMPS creating an IFR flight plan and waypoint set. Use the current web-based system for filing, weather brief and NOTAMS for the planned route of flight.

Requirements

Discuss

CRM

Levels of automation (Cues, Commands, Coupled).

Flight Operations above FL180.

Lost communications procedures.

IFF during Emergencies.

Flight operations in Icing Conditions.

Types of icing (structural, rime, clear).

Aircraft de-ice and anti-ice systems.

Associated WCAs.

Icing displays/CMS information.

Turbulence and Thunderstorms.

CRM during IFR navigation.

Introduce

Flight plan filing.

Practice

CRM.

Pre-takeoff preparation.

Clearance compliance.

Airways navigation.

Instrument APPROACH brief.
Conversion in a descent.
Holding.
Non-precision approaches.
Precision approaches.
Missed approach.
Transition in a Climb.

Performance Standards

Accurately conduct preflight planning and complete required documents to conduct an IFR flight.
Accurately operate the JMPS planning station and software; successfully print required documents; and successfully write the mission binder to the DTM and upload mission files to the aircraft.
Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.
Execute Pilot Not Flying duties IAW with the MV-22 Maneuver Description Guide (MDG) and NATOPS in a timely manner with minimal coaching.
Execute a minimum of 4 approaches.

Instructor. FRSL.

Prerequisite. SINST-1233, FAM-1083.

INST-1241 2.0 * B,R,MR,CLAF (N*) A 1 MV-22

Goal. Practice approaches. Use Flight Director throughout the flight. During this flight the PUI will perform duties as the PF and the PNF. The PUI shall complete one instrument approach as the PNF.

Coordination. The PUI will plan the mission on JMPS creating an IFR flight plan and waypoint set. Use the current web-based system for filing, weather brief and NOTAMS for the planned route of flight.

In preparation for the INST CHECK, consideration must be given to the number and type of approaches the PUI will require to meet annual instrument minimums.

Requirements

Discuss

CRM
Departure.
Standard Terminal Arrivals (STAR).
Type Approaches
 Visual approach.
 Contact approach.
Aircraft category.
Airspace classifications.
Terminal RADAR services.
Holding Procedures.
Ice Protection System.
Instrument Minimums.

Introduce

In flight filing.
IMC release.

Practice

CRM
Flight plan filing.
Pre-takeoff Preparation.
Clearance compliance.
Airways navigation.
Instrument APPROACH Brief.
Conversion in a descent.

Holding.
Precision approaches
Non-precision approaches
Missed approach.

Performance Standards

Instrument minimums (hours and approaches) met for the instrument check.
Accurately conduct preflight planning and complete required documents to conduct an IFR flight.
Accurately operate the JMPS planning station and software; successfully print required documents; and successfully write the mission binder to the DTM and upload mission files to the aircraft.
Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.
Execute Pilot Not Flying duties IAW with the MV-22 Maneuver Description Guide (MDG) and NATOPS in a timely manner with minimal coaching.
Execute a minimum of 3 approaches.

Instructor. FRSL.

Prerequisite. INST-1240

INST-1242	2.5	*	AF	(N*)	A	1	MV-22
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Goal. Practice non-precision and precision approaches. Use Flight Director for cues, commands and coupled core throughout the flight. During this flight the PUI will perform duties as the PF and the PNF. The PUI shall complete one instrument approach as the PNF.

Coordination. The PUI will plan the mission on JMPS creating an IFR flight plan and waypoint set. Use the current web-based system for filing, weather brief and NOTAMS for the planned route of flight.

In preparation for the INST CHECK, consideration must be given to the number and type of approaches the PUI will require to meet annual instrument minimums.

Requirements

Discuss

CRM
Departure.
Standard Terminal Arrivals (STAR).
Type Approaches
Visual approach.
Contact approach.
Aircraft category.
Airspace classifications.
Terminal RADAR services.
Holding Procedures.

Introduce

In flight filing.
IMC release.
Practice
CRM
Flight plan filing.
Pre-takeoff Preparation.
Clearance compliance.
Airways navigation.
Instrument APPROACH Brief.
Conversion in a descent.
Holding.
Precision approaches.
FD Commands.
FD Coupled Core.

Non-precision approaches.
Missed approach.

Performance Standards

Accurately conduct preflight planning and complete required documents to conduct an IFR flight.
Accurately operate the JMPS planning station and software; successfully print required documents; and successfully write the mission binder to the DTM and upload mission files to the aircraft.
Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.
Execute Pilot Not Flying duties IAW with the MV-22 Maneuver Description Guide (MDG) and NATOPS in a timely manner with minimal coaching.
Accurate and timely use of the Flight Director Cues, Commands, and Coupled modes for IMC flight.
Execute a minimum of 4 approaches.

Instructor. FRSL.

Prerequisite. INST-1241

2.8.4 Confined Area Landings (CAL)

2.8.4.1 Purpose.

To develop proficiency in performing single aircraft takeoffs and landings in confined areas in day VMC. FOE: CAL patterns, unimproved surface landings, and integration of onboard cueing/displays with outside scan. CRM will be a practice item throughout the CAL stage.

2.8.4.2 General

The PUI must demonstrate the capability to safely takeoff and land in a confined area during the day.

All CALS and RVL profiles will be flown in zones that will not create dust-out conditions.

CAL-1333 is part of the Air Force and Contract Instructor POI only; Marine POIs exclude these events.

Crew Requirement. IP/PUI (CC for aircraft event).

2.8.4.3 CAL Overview

Table 2-19: CAL Stage Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-1310	1.0	*	B,R,MR,AF,CI		G		ACAD-1310
ACAD-1311	0.5	*	B,R,MR,AF,CI		G		
LAB-1320	6.0	*	B,R,MR,AF,CI		G		
LAB-1321	2.0	*	B,R,MR,AF,CI		G		
LAB-1322	4.0	*	B,R,MR,AF,CI		G		
SCAL-1330	2.0	*	B,AF,CI	D	S	1	FFS/FTD
SCAL-1331	2.0	*	B,R,MR,AF,CI	D	S	1	FFS/FTD
SCAL-1332	2.0	*	B,R,MR,CI	D	S	1	FFS/FTD
SCAL-1333	2.0	*	B,R,MR,CI	D	S	1	FFS/FTD
CAL-1340	2.0	*	B,R,MR,AF	D	A	1	MV-22
CAL-1341	1.5	*	B,R,MR	D	A	1	MV-22
CAL-1342	1.5	*	AF	D	A	1	MV-22
CAL-1343	1.5	*	AF	D	A	1	MV-22

ACAD-1310 1.0 * B,R, MR,AF,CI G

CAL Sage Introduction

Goal. Be able to comprehend and understand the concepts and procedures for CALs, tactical approaches, and RVLs to unimproved surfaces. Be able to understand CMS, cockpit setup, CRM, and flight director / coupled modes related to the execution of CALs and RVLs.

Requirements

Introduce

Syllabus description.

NAVMC 3500.11E
16 Apr 18

Procedures / Performance standards.

Instructor. FRSI.

Prerequisite. 1080. Required Reading: ANTTP Ch. 3.

ACAD-1311 0.5 * B,R,MR,AF,CI G

Confined Area Landing / Reduced Visibility Landing procedures

Goal. The PUI will have an introductory knowledge of the procedures for confined area landings and reduced visibility landings in the MV-22.

Requirements

Discuss

LZ selection.

CMS.

MFD setup (VSD, PFD, HOVER, NAV).

 Symbology.

 FD (modes, cues, commands).

 CDU (vertical velocity, hover, INAV).

 CAL pattern.

Straight-in tactical approach.

HUD precision approach.

CAL departures.

Hover / No-hover landings.

H-V diagram.

 RVLs.

 Description.

 Profile.

 CRM.

 Setup.

 Departures.

Use of coupled automation.

Prerequisite. ACAD-1310. Required Reading ANTTP Ch 3.

LAB-1320 6.0 * B,R,MR,AF,CI G

Goal. Introduce JMPS functions for LAT mission planning and produce a loaded Data Transfer Module (DTM) for use on the LAB-1321.

Requirements

Discuss

Military Training Routes (MTRs) as they relate to the AP-1/B

Introduce

Route Study and preparation

MTR Overlays

Route creation: holding areas (HA), Initial Point (IP) considerations and landing zone selection,

TOT Management

Altitude Planning: Minimum Safe Altitude (MSA), Emergency Safe Altitude (ESA), and (Vertical Terrain Analysis using JMPS

Order of Battle

JMPS Drawing file properties/colors

Corridors

Avoid Areas
Phase Lines
Modification of default JMPS properties
Chart Update Manual (CHUM) properties
Vector Vertical Obstruction Data (VVOD)
Create Digital flight brief
JMPS NAVLOG Generation

Performance Standard.

Load DTM with all required mission data for the LAB-1123.

Instructor. CI.

Prerequisite. LAB-1220, ACAD-1311

External Syllabus Support. JMPS.

LAB-1321	2.0	*	B,R,MR,AF,CI	G	1	CMS/FSS/FTD
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Goal. Introduce LAT CMS functions and manipulation.

Requirements

Discuss

CRM
Digital Terrain Elevation Data (DTED) verification.
LAT CRM principles (PF/PNF).

Introduce

DDMS Threat manipulation.
Threat Placement.
Detection/Engagement parameters.
Use of intervisibility.
Dual Digital Map operation.
Line of Sight (LOS).
Height Above Terrain (HAT).
Chart selection/use.
Map Zoom.
Map CTR/DCTR use.
TRN/Sun azimuth/Elevation.
Advanced waypoint manipulation.
Use of Moving Waypoints.
Category declutter.
INAV operations.

Instructor. CI.

Prerequisite. LAB-1320.

LAB-1322	4.0	*	B,R,MR,AF,CI	G
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Goal. Successful completion of the JMPS progress check. Build and load a LAT mission from the AP-1/B to a DTM. PUI will create a digital flight brief.

Requirements

Introduce

Digital Flight Brief.

Practice

Route Study and Preparation.

MTR Overlays.

Route creation: holding areas (HA), Initial Point (IP) considerations and landing zone selection,

Leg Editor

TOTL-Hour Management

Altitude Planning.

Minimum Safe Altitude (MSA).

Emergency Safe Altitude (ESA).

Vertical Terrain Analysis using JMPS.

Order of Battle.

JMPS Drawing file properties/ colors.

Corridors.

Avoid Areas.

Phase lines.

Chart Update Manual (CHUM) properties.

Manual CHUM (MCHUM).

Vector Vertical Obstruction Data (VVOD)

JMPS NAVLOG Generation.

Performance Standards.

PUI successfully generates a complete JMPS LAT mission profile and loads it to a DTM with limited assistance.

Instructor. CI.

Prerequisite. LAB-1321.

External Syllabus Support. JMPS.

SCAL-1330	2.0	*	B,AF,CI	D	S	1	FFS/FTD
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Goal. Introduce CONV and Tactical CALs IOT introduce the fundamental elements of tactical inserts and extracts.

Requirements

Discuss

CRM

Phases of CALs (ingress, landing, egress).

LZ Selection criteria.

Scan, cockpit setup, commands and automation.

Power computations.

Closure Rate, Descent Rate.

Vortex Ring State (VRS).

Terminology.

LZ / Objective area naming conventions.

PF and PNF duties and callouts.

H-V diagram obstacle clearance considerations.

PRGB HOT / TAGB HOT / MWGB HOT.

Introduce

Scan, cockpit setup, commands and automation.

CONV CAL Pattern.

Straight-In Tactical Approaches.

Hover and No hover landings (Minimum of 5 landings).

Power computations.

Takeoff.

Normal.

Slope.

Max Gross Weight.

80 Jump Takeoff.

Waveoff.

Practice

CRM

Emergencies:

PRGB HOT / TAGB HOT.

FLAPPING CRITICAL.

Performance Standards

Conduct all maneuvers IAW MV-22 MDG, NATOPS, and the ANTP.

Recognize proper glideslope for CAL approaches.

Land within .03 nm of intended point of landing.

Recognize criteria and execute wave off.

Recognize indications and execute required memory items, know associated warnings, and demonstrate appropriate CRM during simulated emergency procedures and system failures.

Instructor. CI.

Prerequisite. ACAD-1311.

SCAL-1331 2.0 * B,R,MR,AF,CI D S 1 FFS/FTD

Goal. Practice the fundamental elements of tactical inserts and extracts, and introduce the use of FLIR.

Requirements

Discuss

CRM

Proper CRM cadence.

Dual Digital Map operation.

Scan, cockpit setup, aids and automation.

CAL application of FLIR.

Introduce

90-degree Offset Tactical approach.

180-degree Offset Tactical approach.

Scan, cockpit set up, aids and automation.

Takeoffs and departures with various levels of obscuration.

Hover page scan.

Practice

CRM

CONV CAL Patterns.

Straight-In Tactical Approach.

Power computations.

Waveoff.

Emergencies:

Single Engine failures.

Single Engine Waveoffs.

Performance Standards

Conduct all maneuvers IAW MV-22 ANTP.

Land within .03 nm of intended point of landing.
Recognize proper glideslope for CAL approaches.
Recognize criteria and execute wave off.
Recognize indications and execute required memory items, know associated warnings, and exercise proper CRM during simulated emergency procedures and system failures.

Instructor. CI.

Prerequisite. SCAL-1330.

SCAL-1332	2.0	*	B,R,MR,CI	D	S	1	FFS/FTD
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Goal. Practice CALS and introduce the RVL profile.

Requirements

Discuss

Effects of saturating control power.
Trim system.
RVL scale.
RVL LZ selection criteria.
RVL procedures and considerations.
RVL wave off criteria.
H-V diagram.

Introduce

RVL automated approaches.
Hand flown RVL approaches.
 RVL profile/procedures using automation.
 RVL profile/procedures without automation.
 HUD precision Scan Technique.
RVL wave off.

Practice

CONV CAL pattern.
Straight-in tactical approach.
90-degree Offset Tactical approach.
180-degree Offset Tactical approach.
Hover landing.
No-hover landing.
Augmented landings.

Emergencies

Single Engine failures.
Single Engine Waveoffs.
FEATHERING/FLAPPING HIGH HOT.
ENG HOT

Performance Standards

Conduct all maneuvers IAW MV-22 ANTP.
Land within .03 nm of intended point of landing. Recognize proper glideslope for normal and steep approaches.
Recognize RVL wave off criteria and execute wave off.
Recognize indications and execute required memory items, know associated warnings, and exercise proper CRM during simulated emergency procedures and system failures.

Instructor. FRSI.

Prerequisite. SCAL-1331.

SCAL-1333 2.0 * B,R,MR,CI D S 1 FFS/FTD

Goal. Practice CALS and RVL profile and introduce coupled approach procedures.

Requirements

Discuss

Standard approach procedures to RVLs.
Approach to hover (APPR) mode limitations (coupled and uncoupled).
APPR mode BARALT to RADALT transition.
Transition from APPR to HVR CPLD.
Go-Around (GA) function.
APPR transition to HVR CPLD.
VS mode.
HOVER DRIFT alert advisory.
Wave-off criteria for RVL.

Introduce

APPR to HVR CPLD.
Wave off utilizing Go-Around.

Practice

Straight-in tactical approach.
90-degree Offset Tactical approach.
180-degree Offset Tactical approach.
RVL automated approaches.
Hand flown RVL approaches.
Hover landing.
No-hover landing.
RVL profile/procedures.
Augmented landings.
Emergencies
APPR LO ALT.
POWER LIMITING.

Performance Standards

Conduct all maneuvers IAW MV-22 ANTP.
Recognize proper glideslope for normal and steep approaches.
Recognize RVL wave off criteria and execute wave off.
Recognize indications and execute required memory items, know associated warnings, and exercise proper CRM during simulated emergency procedures and system failures.

Instructor. FRSI.

Prerequisite. CAL-1080, CAL-1332

CAL-1340 2.0 * B,R,MR,AF D A 1 MV-22

Goal. Practice the fundamental elements of tactical inserts and extracts to include straight-in tactical approaches.

Requirements

Discuss

CRM
CMS setup.
CONV Pattern.
Straight-In Tactical Approach.
Position hold vs position select.
Scan, cockpit setup, aids and automation.

NAVMC 3500.11E
16 Apr 18

Downwash.
Slope Landings.
Terminology.
PF and PNF duties and callouts.
Crew chief actions and callouts.

Introduce

Straight-In Tactical Approach.
Scan, cockpit setup, aids and automation.

Practice

CRM
Power computations.
CONV CAL Patterns.
90-degree Offset Tactical approach.
180-degree Offset Tactical approach.
Hover and No-Hover landings (Minimum 4 landings).
Assisted hover and no hover landings.
Wave-off.

Emergencies:

PRGB/TAGB/MWGB HOT.
Single Engine Failure.

Performance Standards

Conduct all maneuvers IAW MV-22 ANTTP.
Land within .03 nm of intended point of landing.
Recognize proper glideslope for normal and steep approaches.
Recognize and execute wave off criteria.
Recognize indications and execute required memory items, know associated warnings, and exercise proper CRM during simulated emergency procedures and system failures.

Instructor. FRSL.

Prerequisite. FAM-1086, SCAL-1331.

CAL-1341	1.5	*	B,R,MR	D	A	1	MV-22
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Goal. Practice CALS and introduce RVL profile and coupled approach procedures.

Requirements

Discuss

Approach to hover (APPR) mode limitations (coupled and uncoupled).
APPR mode BARALT to RADALT transition.
Transition from APPR to HVR CPLD.
Go-Around (GA) function.
APPR transition to HVR CPLD.
VS mode.
HOVER DRIFT alert advisory

Introduce

APPR to HVR CPLD.
RVL automated approaches.
Hand flown RVL approaches. Wave off utilizing Go-Around.

Practice

Straight-in tactical approach.
90-degree Offset Tactical approach.
180-degree Offset Tactical approach.
Hover landing.
No-hover landing.
RVL profile/procedures.
Augmented landings.

Emergencies

APPR LO ALT.
POWER LIMITING.

Performance Standards

Conduct all maneuvers IAW MV-22 ANTTP.
Land within .03 nm of intended point of landing.
Recognize proper glideslope for normal and steep approaches.
Recognize RVL wave off criteria and execute wave off.
Recognize indications and execute required memory items, know associated warnings, and exercise proper CRM during simulated emergency procedures and system failures.

Instructor. FRSI.

Prerequisite. CAL-1340, CAL-1333

CAL-1342 1.5 * AF D A 1 MV-22

Goal. Practice CALS, and RVL Profile, and Introduce 90, 180 Offset Tactical Approaches.

Requirements

Discuss

CRM
Performance at high altitudes and high GW.
Effects of Saturating Control Power.
Trim System.
Failures Leading to the Loss of Flapping Control, Limiting, Cueing Functions.
H-V diagram.

Introduce

90-degree Offset Tactical approach.
180-degree Offset Tactical approach.
RVL profile.

Practice

CRM
CONV CAL Patterns.
Straight-IN Tactical approach.
Hover and No-Hover landings.
Assisted hover and no hover landings.

Emergencies

ABIU FAILURE.

Performance Standards

Conduct all maneuvers IAW MV-22 NTTP.
Land within .03 nm of intended point of landing.
Recognize proper glideslope for normal and steep approaches.
Recognize and execute wave off for RVL criteria.

Recognize indications and execute required memory items, know associated warnings, and exercise proper CRM during simulated emergency procedures and system failures.

Instructor. FRSL.

Prerequisite. CAL-1340.

CAL-1343	1.5	*	AF	D	A	1	MV-22
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Goal. Practice CALS, and RVL Profile, and Introduce 90, 180 Offset Tactical Approaches.

Requirements

Discuss

CRM

Performance at high altitudes and high GW.

Effects of Saturating Control Power.

Trim System.

Failures Leading to the Loss of Flapping Control, Limiting, Cueing Functions.

H-V diagram.

Introduce

90-degree Offset Tactical approach.

180-degree Offset Tactical approach.

RVL profile.

Practice

CRM

CONV CAL Patterns.

Straight-IN Tactical approach.

Hover and No-Hover landings.

Assisted hover and no hover landings.

Emergencies

ABIU FAILURE.

Performance Standards

Conduct all maneuvers IAW MV-22 NTTP.

Land within .03 nm of intended point of landing.

Recognize proper glideslope for normal and steep approaches.

Recognize and execute wave off for RVL criteria.

Recognize indications and execute required memory items, know associated warnings, and exercise proper CRM during simulated emergency procedures and system failures.

Instructor. FRSL.

Prerequisite. CAL-1342.

2.8.5 Formation (FORM)

2.8.5.1 Purpose.

To develop proficiency in cruise formation, rendezvous procedures, and execution of formation maneuvers. FOE: V-22 formation fundamentals in CONV and APLN flight.

2.8.5.2 General

At the completion of this stage, the PUI will be proficient at formation takeoffs and landings, section rendezvous, lead changes, formation maneuvers, and section IIMC procedures.

All SFORM flights should be conducted in a networked environment. Lead ship Record is acceptable if the network is unavailable.

Crew Requirements. P/P/(CC/AO for aircraft events).

2.8.5.3 Formation Overview

Table 2-20: Formation Stage Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-1410	1.0	*	B,AF,CI			G	
SFORM-1430	2.0	*	B,R,MR,AF,CI	D	S	2	FFS/FTD TEN+
FORM-1440	2.0	*	B,AF	D	A	2	MV-22

ACAD-1410 1.0 * B,AF,CI G

Formation Stage Introduction

Goal. To introduce the PUI to the training syllabus for the Formation phase. The following will be discussed: FORM syllabus, performance standards, CONV and APLN cruise and combat cruise position, and conduct of FORM flights.

Requirements

Discuss

Purpose of Formation
Syllabus description
Required readings
Performance Standards
CRM
Cruise and combat cruise Position
Visual Reference Points
Cruise principles.
Cross under / Crossovers
AFCS saturation due to wake interference turbulence
Sequence of Flight
PF and PNF duties and callouts
Crew chief actions and callouts

Instructor. FRSI

Prerequisite. ACAD-1310. Required Reading - MV-22B ANTP 3-22.3-MV-22 Ch. 3, 5

SFORM-1430 2.0 * B,R,MR,AF,CI D S 2 FFS/FTD TEN+

Goal. Introduce cruise and combat cruise formation during conversion and airplane modes and section landings.

Requirements

Discuss

CRM
Cruise position, combat cruise, and visual reference points
Radius of turn principles
Closure rates
Formation Transitions and Conversions
Formation aborts and wave-offs
Loss of visual contact/rejoining of flight/IIMC fan procedure
Intra-flight communications and responsibilities
ASTACSOP holding/rejoin and carrier RV
Section RVLs

Introduce

Section STO
Section takeoff
Running
Cross-over/cross-under
Turn patterns (APLN)
Over-run/under-run

NAVMC 3500.11E
16 Apr 18

Formation Transition and Conversion
Lead changes
Section CALs (Minimum of 5 as wingman)
PF and PNF duties and callouts

Practice

CRM

Emergencies.

Discuss inter- and intra-cockpit communications/coordination during section emergencies.

Performance Standards.

Conduct all maneuvers IAW MV-22NATOPS and the ANTP utilizing appropriate CRM

Instructor. CI.

Prerequisite. CAL-1331, FORM-1410, 1046

FORM-1440	2.0	*	B, AF	D	A	2	MV-22
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Goal. Introduce formation flight and procedures in the aircraft.

Requirements

Discuss

CRM
Cruise, combat cruise, and visual reference points.
Energy management as Lead/Wingman.
Sun position in reference to lead aircraft.
PF and PNF duties and callouts.
Crew chief actions and callouts.
Formation aborts and waveoffs.
ASTACSOP holding/carrier RV
Section RVLs
Landing Point selection

Introduce

Section STO.
Section takeoff.
Running rendezvous and/or ASTACSOP holding/rejoin.
Cruise position.
Combat Cruise position.
Cross-over/cross-under.
Turn pattern (APLN).
Over-run/under-run.
IIMC breakup and rejoin.
Formation Transition and Conversion.
Lead changes.
Section landings (Minimum of 5 as wingman).

Practice

CRM

Performance Standards.

Conduct all maneuvers IAW MV-22 NATOPS and the ANTP utilizing appropriate CRM.

Instructor. FRSL.

Prerequisites. FAM-1046, CAL-1340, FORM-1430

2.8.6 Field Carrier Landing Practice (FCLP)

2.8.6.1 Purpose.

To expose the PUI to flight operations in the shipboard environment under day conditions.

2.8.6.2 General.

Refer to CV/LHA/LHD/MCS NATOPS Manuals for carrier operations. Refer to NWP-42 for air capable ship operations.

IAW NATOPS and NAVMC 3500.14, a pilot is day upon completion of FCLP-1531. The IP will emphasize proper communication procedures, patterns, and aviation operations in the shipboard environment per aircraft and ship NATOPS and NAVMC 3500.14.

Crew Requirements. P/P/CC.

2.8.6.1 FCLP Overview

Table 2-21: Field Carrier Landing Practice Stage Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ADL-1501	1.0	*	B,R,MR, CI		G		
ACAD-1510	2.0	*	B,R,MR, CI	D	G	1	
SFCLP-1530	2.0	*	B,R,MR,CI	D	S	1	FFS/FTD
FCLP-1540	1.5	*	B,T	D	A	1	MV-22

ADL-1501 1.0 * B,R,MR,CI G

MV-22 Shipboard Operations

Goal. The PUI will be familiar with MV-22 Shipboard Operations.

Prerequisite. ADL-0001.

Required Reading NATOPS Ch 8, LHA/LHD NATOPS Ch 2-6, 7.2, 7.3, App A & D

ACAD-1510 2.0 * B,R,MR,CI G

MV-22 Shipboard Operations Lecture

Goal. The PUI will be familiar with MV-22 Shipboard Operations.

Prerequisite. SCAL-1330. Required Reading NATOPS 8, LHA/LHD NATOPS Ch 2-6, 7.2, 7.3, App A & D, Ships Facilities Resume, CV NATOPS.

SFCLP-1530 2.0 * B,R,MR,CI D S 1 FFS/FTD

Goal. Introduce day CQ pattern and procedures to various Classes of ships.

Requirements

Discuss

Shipboard CRM

Emergency procedures in the shipboard environment (engine failures, nacelle blower failures, and fires).

Various patterns around the ship.

Different Case departures and arrivals.

Nacelle control techniques.

Carrier rendezvous

Deck heating mitigation

Demonstrate/Introduce

Shipboard CRM

Carrier operation.

Airplane mode arrivals.

Charlie pattern for LHA/LHD and LPD/LSD (minimum of 5)

Instrument pattern (minimum of 1)

Communication procedures.

Lights and light signals.
LSE signals and procedures.
Waveoff.
Departure procedures.
Self-taxi procedures.
STOs.
Pitch-up with side-slip characteristics.
NATOPS shipboard approaches.
High gross weight operations.
Shipboard INS alignment procedures.
Shipboard emergencies (EXDEF failure
Checklists.

Performance Standards

Demonstrate proper knowledge of day shipboard procedures IAW the required reading.
Demonstrate appropriate CRM.
Maintain pattern parameters within 50 feet, 10 KCAS.
Maintain proper glideslope/departure profile for NATOPS shipboard approaches.
Maintain proper closure rate during approaches.
Land without unsafe delay within 3 feet of the intended point of landing and within 5 degrees of heading (BRC).

Prerequisite. ACAD-1510.

FCCLP-1540	1.5	*	B,T	D	A	1	MV-22
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Goal. Introduce day CQ patterns and procedures in a Field Carrier Landing Practice (FCLP) scenario.

Requirements

Discuss

CRM
Crewmember duties during CQs.
Any item discussed or introduced on SFCLP-1530.
Pitch-up with side-slip characteristics.
High gross weight operations.
Lights and light signals.
LSE signals and procedures.

Demonstrate/Introduce

CRM
Carrier operation.
Charlie pattern (minimum of 5 for initials).
Communication procedures.
Departure procedures.
Self-taxi procedures.
STOs.
High gross weight operations.
Carrier rendezvous.
NATOPS shipboard approaches.

Performance Standards

Demonstrate proper knowledge of day shipboard procedures IAW the required reading.
Demonstrate appropriate CRM.
Maintain pattern parameters within 50 feet, 10 KCAS.
Maintain proper glideslope/departure profile for NATOPS shipboard approaches.
Maintain proper closure rate during approaches.
Land without unsafe delay within 3 feet of the intended point of landing and within 5 degrees of heading (BRC).

Prerequisites. CAL-1341, SFCLP-1530.

External Syllabus Support, FCLP site.

2.8.7 Night Systems (NS)

2.8.7.1 Purpose

To introduce and develop proficiency in performing single and section aircraft takeoffs and landings in confined areas utilize night vision devices in VMC.

2.8.7.2 General

An NSFI is required for all unqualified pilots. A CI that has completed the simulator portion of the NSFI syllabus may instruct initial SNS events.

Prior to beginning flight training the PUI shall be familiar with the appropriate chapters of the MV-22 ANTP, the MAWTS-1 NVD Manual and the SLAP module.

Crew Requirements, P/P for simulators, P/P/CC/AO for aircraft events.

2.8.7.3 Night Systems Overview

Table 2-22: Night Systems Stage Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ADL-1601	2.0	*	B,R,MR,CI		G		
ACAD-1610	0.5	*	B,R,MR,CI		G		
ACAD-1611	1.0	*	B,R,MR,CI		G		
SNS-1630	2.0	*	B,R,MR,CI	NS	S	1	FFS/FTD
SNS-1631	2.0	*	B,R,MR,CI	NS	S	1	FFS/FTD
SNS-1632	2.0	*	B,R,MR,CI	NS	S	1	FFS/FTD
SNS-1633	2.0	*	B,CI	NS	S	2	FFS/FTD
SNS-1634	2.0	*	B,R,MR,CI	NS	S	2	FFS/FTD
NS-1640	2.0	*	B,T	NS	A	1	MV-22
NS-1641	2.0	*	B,R,MR	NS	A	1	MV-22
NS-1642	2.5	*	B,R,MR	NS	A	2	MV-22

ADL-1601 **2.0 ***** **B,R,MR, CI** **G****

Night Vision Devices and functions

Goal. The PUI has completed all modules with a basic understanding NVDs and the night environment.

Requirements. The following modules are required.

Introduction to the Night Vision Device.
Use of Night Vision Devices.
FLIR System Basic Theory.
The FLIR System.

Performance Standards. Satisfactory completion of all modules.

Prerequisites. ADL-0001.

ACAD-1610 **0.5 ***** **B,R,MR,CI** **G****

Goal. To prepare the PUI for the NS stage of the curriculum.

Requirements.

Discuss

CRM
Purpose of NS.
Syllabus description (PUI expectations).
Required readings.

Performance standards.

Introduce

Light level prediction software. NVG Composition.
NVG Setup and Focusing procedures.
NVD HUD.
FLIR Basics.

Instructor. NSI/NSFI.

Prerequisites. FAM-1083, ADL-1601.

ACAD-1611 1.0 * B,R,MR,CI G

MV-22 Night HUD Lecture

Goal. The PUI will have an introductory knowledge of the function and operation of the MV-22 HUD.

Required Reading. MV-22 NATIP Chapter 3.3.

Instructor. NSI/NSFI.

Prerequisite. ACAD-1610

SNS-1630 2.0 * B,CI NS S 1 FFS/FTD

Goal. Introduce HLL NVD FAM maneuvers in the simulator.

Requirements

Discuss

CRM

NVG Considerations.

NVG preflight and adjustments.
NVG field of view.
NVG Scan techniques/fixation tendencies.
NVG failures.

FLIR Considerations.

Calibration.
Field of View –vs- Field of Regard.
Atmospheric Considerations.

Weather /Atmospheric Considerations (Effects on FLIR/NVGs).

Goggle/de-goggle procedures.

Cockpit lighting/MFD preflight.

Visual illusions.

Emergency procedures during NVD operations.

Aircrew actions and callouts during NVD operations.

Introduce

HUD symbology and control panel

Ground taxi.

Normal Hover and Hover Turns.

CONV Pattern.

APLN Pattern.

STOs.

Normal approach.

Steep approach.

Run-on Landing.

No-hover landing.

Practice

CRM

Emergencies

HUD Failure.
PF NVG Failure.

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG), NATOPS and ANTPP.
Demonstrate proper NVD operation and HUD function IAW the MAWTS-1 NVD Manual and the MV-22 NATOPS Manual.
Recognize indications, execute memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.

Instructor. CI.

Prerequisite. FAM-1086, ACAD-1611.

SNS-1631 **2.0** ***** **B,R,MR,CI** **NS** **S** **1** **FFS/FTD**

Goal. Introduce NVD CALs (HLL) at various sites in the simulator.

Requirements

Discuss

CRM
Artificial Light Sources.
Cockpit setup for NVG landings.
CMS and DMS setup.
FLIR operations.
Terrain Shadowing.
Standard terminology.
Loss of visual contact with the ground/reference points.
Vortex ring state.
Aircrew actions and callouts during NVD operations.
Power requirements/performance charts (HIGE, HOGE, and height velocity diagram) with JMPS considerations.

Introduce

CAL site evaluation.
CONV CAL Pattern.
Straight-in / 90 / 180 Tactical approaches.
Steep approach.
Hover Landing.
No-Hover Landing.
Jump Takeoff.
Wave off.

Practice

CRM
HUD operations.
FLIR operations.
Scanning Techniques.
Hover Page Utilization
Power computations.
Emergencies
Single Engine Failures.
Sink Rate.
FLIR Failure.

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG), NATOPS and ANTPP.
Land within .03 nm of intended point of landing.
Demonstrate proper NVD operation and HUD function IAW MAWTS-1 NVD Manual and the MV-22 NATOPS Manual.
Recognize indications, execute memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.

Instructor. CI.

Prerequisites. SNS-1630.

SNS-1632	2.0	*	B,R,MR,CI	NS	S	1	FFS/FTD
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Goal. Introduce NVD CALs (HLL) in the simulator with emphasis on RVLs and automation.

Requirements

Discuss

CRM
NS considerations for RVLs
Terminology

Practice

CRM
HUD operations.
HUD Precision Approach Procedure.
Straight-in / 90 / 180 Tactical approaches.
FLIR operations.
Scanning Techniques.

Emergencies

Emergencies utilizing NVDs.
Single engine failures

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG), NATOPS and NTPP.
Land within .03 nm of intended point of landing.
Demonstrate proper NVD operation and HUD function IAW MAWTS-1 NVD Manual and the MV-22 NATOPS Manual.
Recognize indications, execute memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.

Instructor. CI.

Prerequisites. SNS-1631.

SNS-1633	2.0	*	B,CI	NS	S	2	FFS/FTD
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Goal. Introduce night FORM utilizing NVDs (HLL) in the simulator.

Requirements

Discuss

CRM
Aircraft lighting and use.
NVG formation considerations.
Wake Turbulence / Roll-off
Visual reference points at night.
Closure rates.
Night scan/fixation tendencies.
Depth perception/Distance estimation.
Use of NVG HUD.
Cruise principals / Formation Landings

Introduce

Section STO
Section Takeoff
Running rendezvous
Cruise / Combat cruise position
Cross-over/cross-under
Turn pattern (APLN)
Over-run/under-run
Formation Transition and Conversion
Lead changes
Straight-in / 90 / 180 Tactical approaches.
Wave-offs
Section landings to an improved surface or CAL site (Minimum of 5 landings as wingman)
IIMC breakup / Loss of visual contact and rejoin

Practice

CRM
Aircrew actions and callouts during NVD operations

Emergencies.

Take-off aborts

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG), NATOPS and ANTP.
Land within .03 nm of intended point of landing.
Demonstrate proper NVD operation and HUD function IAW MAWTS-1 NVD Manual and the MV-22 NATOPS Manual.
Recognize excessive closure rates.
Recognize indications, execute memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.

Instructor. CI.

Prerequisites. SFORM-1430, SNS-1632.

SNS-1634 2.0 * B,R,MR,CI NS S 2 FFS/FTD

Goal. Introduce section NVD CALs (HLL) in the simulator with emphasis on RVLs and automation.

Requirements

Discuss

CRM
NS considerations for section RVLs
Landing point selection

Introduce

Section NS RVLs
Section NS APPR mode

Practice

CRM
HUD operations.
FLIR operations.
Scanning Techniques.
STO
Vertical takeoff
Lead change
Wave-off / Go Around function

Straight-in / 90 / 180 Tactical approaches.

Emergencies

Emergencies while utilizing NVDs.

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG), NATOPS and ANTP.

Land within .03 nm of intended point of landing.

Demonstrate proper NVD operation and HUD function IAW MAWTS-1 NVD Manual and the MV-22 NATOPS Manual.

Recognize indications, execute memory items, exercise proper CRM, and maintain control of the aircraft during simulated emergency procedures.

Instructor. CI.

Prerequisites. SNS-1633.

NS-1640	2.0	*	B,T	NS	A	1	MV-22
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Goal. Introduce HLL NVD FAM maneuvers in the aircraft.

Requirements

Discuss

CRM

Review discussion items from SNS-1630.

NVD briefing guide.

Loss of visual acuity/ distance estimation using NVGs.

Scanning Techniques.

Trend dots.

Cockpit/aircraft configuration and lighting.

Use of SLAP.

Nautical twilight (C EEN BMNT).

Automatic brightness control / Bright source protection.

Introduce

Normal Hover and Hover Turns.

Transition from a Hover.

CONV Pattern.

APLN Pattern.

STOs.

Run-on Landing.

Normal approach.

Steep approach.

No-hover landing.

Aircrew actions and callouts during NVD operations.

Scanning Techniques.

HUD precision approach.

Practice

CRM

HUD operation.

Ground taxi.

Emergencies

Emergencies while utilizing NVDs

Goggle failures

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG), NATOPS and ANTP.

Land within .03 nm of intended point of landing.
Demonstrate proper NVD operation and HUD function IAW MAWTS-1 NVD Manual and the MV-22 NATOPS Manual.
Demonstrate appropriate CRM.

Instructor. NSI/NSFI.

Prerequisite. CAL-1341, SNS-1630.

NS-1641 2.0 * B,R,MR NS A 1 MV-22

Goal. Introduce NVD CALs (HLL) in the simulator with emphasis on RVLs and automation.

Requirements

Discuss

CRM
Review discussion items from SNS-1632.
Performance calculations.
Vortex Ring State.
Scanning Techniques.
Glide slope / Closure rate.
Use of searchlights.

Introduce

CAL site evaluation.
CONV CAL Pattern.
Straight-in / 90 / 180 Tactical Approach.
No-Hover Landing.
80 Jump Takeoff.
Wave-off / Go around function.
Practice
CRM
HUD precision approach

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG), NATOPS and ANTPP.
Land within .03 nm of intended point of landing.
Demonstrate proper NVD operation and HUD function IAW MAWTS-1 NVD Manual and the MV-22 NATOPS Manual.
Recognize excessive closure rates.
Demonstrate appropriate CRM.

Instructor. NSI/NSFI.

Prerequisites. SNS-1632.

NS-1642 2.0 * B,T NS A 2 MV-22

Goal. Introduce night FORM and CALs utilizing NVDs (HLL) in the aircraft.

Requirements

Discuss

NVD briefing guide.
Aircraft lighting and use.
Position/visual reference points at night.
Night scan/fixation tendencies.
Depth perception/Distance estimation.
Night formation hazards.
Use of NVD HUD.
Moon position/cultural lighting in reference to lead aircraft.
CRM.

Section RVLs

Demonstrate

Section approach mode

Introduce

Section STO.

Section Takeoff.

Running/Carrier rendezvous.

Cruise Position / Combat cruise.

Cross-over/cross-under.

Turn pattern (APLN).

Formation Transition and Conversion.

Lead changes.

Wave-offs.

Section landings to an improved surface or CAL site (Minimum of 5 as wingman).

IIMC breakup / Loss of visual contact and rejoin.

Practice

CRM

HUD precision approach

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG), NATOPS and ANTP.

Land within .03 nm of intended point of landing.

Demonstrate proper NVD operation and HUD function IAW MAWTS-1 NVD Manual and the MV-22 NATOPS Manual.

Recognize excessive closure rates.

Demonstrate appropriate level CRM.

Instructor. NSI/NSFI.

Prerequisites. FORM-1440, SNS-1634, NS-1641.

2.8.8 Core Skill Introduction Review (REV)

2.8.8.1 Purpose.

To review all areas of instruction and demonstrate proficiency and knowledge of all maneuvers to certify the PUI as a Tiltrotor Second Pilot (T2P). FOE: T2P Check-ride. CRM will be a review item throughout the Check stage.

2.8.8.2 General.

The PUI will demonstrate proficiency through the Core Skill Introduction phase. Upon completion of RQD-1840, the PUI will be designated a T2P. RQD-1840 meets the requirements for the 7532 MOS and will serve as the initial NATOPS evaluation. The NATOPS open and closed book exams shall be completed, graded, and recorded prior to beginning the Core Skill Introduction Check Stage.

The PUI will demonstrate instrument proficiency by completing RQD-6060.

Crew Requirement. P/P/CC.

2.8.8.3 Prerequisites.

All previous Core Skill Introduction phases complete.

2.8.8.4 Formation Overview

Table 2-23: Core Skill Introduction Review Stage Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
SREV-1830	2.0	*	B,AF,CI	(N*)	S	1	FFS/FTD
SREV-1831	2.0	*	B,R,MRAF,CI	(N)	S	1	FFS/FTD
SREV-1832	2.0	*	B,AF,CI	(N)	S	1	FFS/FTD
REV-1840	1.5	*	B,R,MR,AF	(N)	A	1	MV-22
REV-1841	1.5	*	B,R,MR,AF,CI	(N)	A	1	T2P CHECK

SREV-1830 2.0 * B,AF,CI (N*) S 1 FFS/FTD

Goal. Conduct IFR Flight operations. Introduce Emergency Procedures during IFR Flight operations. Practice operation of the Flight Director and the Mission Management System. During this flight the PUI will perform duties as both the PF and the PNF. The PUI shall complete one instrument approach as the PNF.

Coordination. In preparation for the INST CHECK consideration must be given to the number and type of approaches the PUI will require to meet annual instrument minimums. IP shall designate a departure and destination location where training is to be conducted. The IP shall issue to the PUI appropriate information for preflight planning; including a DD-175-1, appropriate NOTAMS, and an aircraft load.

Preflight Planning. PUI will conduct all appropriate preflight planning to include TOLD, a completed DD-175, and loading all appropriate mission files on a DTM.

Requirements

Discuss

CRM during in-flight emergencies.
Emergency services available.
Distress and Urgency Procedures.
Declaring an Emergency.
Use of AN/ARC-210 remote control head.
Transponder code considerations.

Introduce

Emergency return to the departure airfield.
AN/ARC-210 remote control head operation.
Emergency procedures.
 Nacelle Blower Failure.
 Black Cockpit operations.
 Single Engine Failure.

Practice

CRM

Review

Instrument Takeoff.
Departure.
Clearance compliance.
En route procedures.
Descent procedures.
Instrument APPROACH Brief.
APPROACH Checklist.
Non-precision approaches.
Precision approaches.
Missed approach.

Performance Standards

Accurately conduct preflight planning and complete required documents to conduct an IFR flight.
Accurately operate the JMPS planning station and software; successfully print required documents; and successfully write the mission binder to the DTM and upload mission files to the aircraft.
Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.
Execute Pilot Not Flying duties IAW with the MV-22 Maneuver Description Guide (MDG) and NATOPS in a timely manner with minimal coaching.
Accurate and timely use of the Flight Director Cues, Commands, and Coupled modes for IMC flight.
Recognize indications, execute memory items, exercise proper crew coordination, and maintain control of the aircraft during simulated emergency procedures.
Demonstrate appropriate level CRM.

Instructor. FRSI.

Prerequisite. INST-1241.

SREV-1831 2.0 * B,R,MR,AF,CI (N) S 1 FFS/FTD

Goal. Review emergency procedures.

Requirement.

Review/Evaluate

PUI will be prepared to describe and conduct any previously introduced emergency procedure. At a minimum, the following will be reviewed:

- CRM
- In-flight fires.
- Single Engine Failure.
- Gearbox Failure (Warning).
- ICDS Failure (Warning).
- Elevator Failure (Warning).
- Pilot Nacelle Controller Failure (Caution).
- Critical Elevator Fault (Caution).
- FCC 1/2 Fail (Caution).
- ADS Failures (Caution).
- Force Feel Failure.
- Single Engine Landing.
- Nacelle Blower Failure (Caution).
- SDC Failure (Caution).

Performance Standards.

Recognize indications, execute required memory items, know associated warnings, maintain control of the aircraft and exercise proper crew coordination during simulated Emergency Procedures.

Instructor. FRSI

Prerequisite. ACAD-6011

SREV-1832 2.0 * B, AF,CI (N) S 1 FFS/FTD

Goal. Review previous flight maneuvers.

Requirement.

Review/Evaluate.

The PUI will be prepared to describe and conduct maneuvers from FAM and CAL stages of training utilizing appropriate CRM. The following will be conducted at a minimum:

- Ground Taxi.
- Normal Hover and Hover Turns.
- CONV Pattern.
- Normal Approach.
- No Hover Landing.
- Steep Approach.
- STOs.
- APLN Pattern.
- Run-on Landing.
- Transition to APLN.
- Conversion to CONV.
- High AOB (APLN).
- Flight Director Operation.
- CONV CAL Patterns.
- Straight-in Tactical Approach.

Practice power on/off stalls.

Performance Standards.

Demonstrate proper procedures and execution of all previously introduced maneuvers utilizing appropriate CRM.

Instructor. FRSL.

Prerequisite. SREV-1831.

REV-1840 1.5 * B,R,MR,AF (N) A 1 MV-22

Goal. Review Core Skill Introduction phase maneuvers.

Coordination. The PUI shall bring a pre-coordinated DTM, and Load Comp.

Requirement

Discuss

CRM

All previously introduced flight maneuvers, emergency procedures, aircraft limitations, and aircraft systems.

Review

PUI must be able to safely demonstrate flight proficiency and knowledge of all maneuvers and procedures covered in the Core Skill Introduction stage. The IP will set the itinerary for the conduct of the event. At a minimum, conduct all FAM maneuvers (do not conduct stalls) listed in SREQ-1831.

Performance Standards.

Demonstrate the capability to perform all functions of a T2P utilizing appropriate CRM.

Instructor. FRSL.

Prerequisite. SREQ-1631.

REV 1841 1.5 * B,R,MR,AF,CI (N) A 1 MV-22

Goal. Initial T2P NATOPS check. Conduct an objective evaluation of the airman's knowledge of mission planning, briefing, normal operating procedures (flight and ground), CRM, aircraft systems, performance criteria, emergency procedures, and debriefing. The focus is on normal and emergency procedures, not tactical execution. Emphasis shall be placed on the aforementioned items with the addition of USMC Admin SOP, local course rules, local SOP addendum, and admin flight procedures. The NATOPS evaluation is intended to evaluate compliance with NATOPS procedures. The NATOPS evaluation is the means to measure the airman's efficiency in the execution of normal operating procedures and reaction to emergencies and malfunctions. The NATOPS evaluation process should be as much a learning tool and/or experience as it is an evaluation.

Coordination. The pilot under evaluation shall bring a completed NATOPS evaluation card, pre-coordinated DTM, and Load Comp.

Requirement

The proficiency expected by the evaluator in this flight shall be commensurate with the experience level and highest flight leadership designation of the pilot under evaluation.

Brief/discuss all previously introduced flight maneuvers, emergency procedures, aircraft limitations, and aircraft systems.

PUI must be prepared to safely demonstrate flight proficiency and knowledge of all maneuvers and procedures covered in the Core Skill Introduction phase of training while utilizing appropriate CRM. The IP may or may not require the PUI to perform maneuvers from each area of the Core Skill Introduction syllabus (do not conduct stalls). The IP will set the itinerary for the conduct of the event.

Performance Standards

The pilot under evaluation must be prepared to safely demonstrate flight proficiency and knowledge of all maneuvers and procedures described within the Maneuver Description Guide (MDG), NATOPS, ANTP, OPNAV 3710.6 and in accordance with all SOPs. Upon successful completion of this event, the evaluator shall log the appropriate training code for tracking purposes.

NAVMC 3500.11E

16 Apr 18

Demonstrate proficiency in all maneuvers performed in previous flight stages as selected by the IP.

Perform all functions of a T2P.

Demonstrate appropriate CRM.

Instructor. NI/ANI.

Prerequisite. ACAD-6011

2.9 CORE SKILL PHASE

2.9.1.1 Purpose.

To teach the PUI the enabling Core Skills required to support mission skill execution.

2.9.1.2 General

Refer to paragraph 2.09 of the Aviation T&R Program Manual for the ACPM lectures required for this phase of training.

All ACAD and LAB events can be found in the MAWTS-1 Academic Support Package (ASP).

All references to ANTTP are directed to the ANTTP 3.22.3 MV-22 (unclassified) unless otherwise noted.

A BIP is the minimum requirement to instruct an initial event. Additional instructor requirements are identified on each specific event if needed.

2.9.1.3 Stages. **Error! Reference source not found.**24 includes the stages in the Core Skill Phase of training.

Table 2-24: Core Skills Matrix

Stage Name
FAMILIARIZATION (FAM)
FORMATION (FORM)
CONFINED AREA LANDING (CAL)
REDUCED VISIBILITY LANDING (RVL)
NIGHT SYSTEMS HIGH LIGHT LEVEL (NS HLL)
NIGHT SYSTEMS LOW LIGHT LEVEL (NS LLL)
AIR TO AIR REFUELING (AAR)
TAIL GUNNERY (TG)
LOW ALTITUDE TACTICS (LAT)
MOUNTAIN AREA TRAINING (MAT)
DIVISION TACTICS (DIV)
GROUND THREAT REACTION (GTR)
CARRIER QUALIFICATIONS (CQ)

2.9.2 Familiarization (FAM)

2.9.2.1 Purpose

To review aircraft flight characteristics, limitations, emergency procedures, day/night familiarization maneuvers, instrument procedures and aircraft automation.

2.9.2.2 General

The PUI must be qualified as a T2P prior to beginning this stage of training.

Crew Requirements. P/P for simulators, P/P/CC if flown in aircraft.

2.9.2.3 FAM Overview. **Table**Core Skill FAM Overview Matrix

Table 2-25: Core Skill Familiarization Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-2010	1.0	*	B		G		
ACAD-2011	1.0	*	B		G		
ACAD-2012	1.0	*	B		G		
LAB-2020	2.0	*	B		A	2	
LAB-2021	2.0	*	B		G		
SFAM-2030	2.0	*	B	(N)	S	1	FFS/FTD
SFAM-2031	2.0	365	B,R,M	(N)	S	1	FFS/FTD

ACAD-2010 1.0 * B G

MV-22 SINGARS / HAVEQUICK Lecture

Goal. The PUI will have an introductory knowledge of SINGARS and HAVEQUICK radio waveforms and their utilization in the MV-22.

Prerequisite. T2P. Required Reading - NTRP Ch 12.

ACAD-2011 1.0 * B G

MV-22 SATCOM

Goal. The PUI will have an introductory knowledge of the SATCOM radio waveform and its utilization in the MV-22.

Prerequisite. T2P.

Required Reading - NTRP Ch 12.

ACAD-2012 1.0 B G

MV-22 TABLET FAMILIARIZATION

Goal. The PUI will have an introductory knowledge of the functions of KILSWITCH, Digital Globe, and how to build landing plans utilizing them. The PUI will also be introduced to the other applications used for mission planning and execution that are available on the tablet.

Prerequisites. T2P.

Required Reading – ANTTP Chapter 1.11, 3.5.5

LAB-2020 2.0 * B A 2

MV-22B Flight Line Radio Demo

Goal. The PUI will have an introductory knowledge of all of the functions of the ARC-210 through operating the CMS and the remote control head in an aircraft on APU or external power. Example comm demo can be found on the MAWTS-1 website and in the ACAD 2010 ASP courseware.

Prerequisite. ACAD-2010,-2011

Required Reading - NTRP Ch 12.

LAB-2021 2.0 * B G

MV-22 TABLET LAB

Goal. The PUI will have an introductory knowledge of the functions of KILSWITCH, Digital Globe, and how to build landing plans utilizing them. The PUI will also be introduced to the other applications used for mission planning and execution that are available on the tablet.

Prerequisites. ACAD-2012

SFAM-2030 2.0 * B (N) S/A 1 FFS/FTD

Goal. Review familiarization maneuvers and conduct an area familiarization if required.

Requirements

Discuss

- Squadron, MAG, Wing SOPs
- Local course rules
- Delegation of communication responsibilities
- Range Regulations

Review

- Familiarization maneuvers
- Day HUD utilization

Performance Standards

- Demonstrate the ability to utilize the ARC-210 to include HAVEQUICK, SINCGARS, and SATCOM communications.
- Demonstrate proficiency in familiarization maneuvers.

Prerequisites. LAB-2020, LAB-2021.

Required Reading - Local Airfield Operations Manual, Local Range Regulations, Squadron Flight Operations Manual, ANTTP Ch 1, ASTACSOP.

SFAM-2031 2.0 365 B,R,M (N) S 1 FFS/FTD

Goal. Review instrument procedures.

Requirements

Discuss

Squadron SOP for instrument flight
Icing
ICAO flight plans and procedures
Flight plans to MTRs, tanker tracks, and ships
Approach mode automation

Review

Instrument flight procedures
Emergency procedures
Automation, Commands, & Cues

Performance Standards.

Demonstrate proficiency in instrument flight planning, instrument procedures, and local squadron instrument SOPs.

Prerequisite. LAB-2020, LAB-2021.

Required Reading - NTRP Ch 13 & 14, ANTTP Ch 1 & 9.

2.9.3 **Formation (FORM)**

2.9.3.1 Purpose.

To introduce tactical formations and tactical formation maneuvering.

2.9.3.2 General.

All maneuver descriptions are in the ANTTP.

Crew Requirements. P/P for simulators, P/P/CC/AO for aircraft events.

2.9.3.3 FORM Overview. Table 26 provides the reference for Core Skill FORM Overview.

Table 2-26: Core Skill FORM Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-2110	1.0	*	B		G		
ACAD-2111	1.0	*	B		G		
LAB-2120	1.0	*	B		G		FORMATION WALK THROUGH
SFORM-2130	2.0	*	B	D	S	2	FFS/FTD
SFORM-2131	2.0	*	B,R,M	(NS)	S	2	FFS/FTD
FORM/NAV-2140	2.0	365	B,R,M	(NS)	A	2	MV-22

ACAD-2110 1.0 * B G

MV-22 Tactical Formation

Goal. The PUI will have an introductory knowledge of Tactical Formation Maneuvering in the MV-22.

Prerequisite. T2P.

Required Reading - ANTTP Ch 5.

ACAD-2111 1.0 * B G

MV-22 Trail Formation Flight

Goal. The PUI will have an introductory knowledge of Trail Formation Procedures in the MV-22.

Prerequisite. T2P.

Required Reading - ANTTP Ch 5.

LAB-2120 1.0 * B G

FORMATION WALK THROUGH

Goal. The PUI will have an introductory knowledge of the different MV-22 formations and tactical formation maneuvering.

Prerequisite. T2P. ACAD-2110, 2111.

Required Reading - ANTTP Ch 5.

SFORM-2130 2.0 * B D S 2 FFS/FTD

Goal. Introduce tactical formations, tactical formation maneuvering, navigation to a SYS TOT and lost contact procedures.

Requirements. Navigation route to a planned SYS TO each aircraft lead to a minimum of 1 SYS TO each leg must be a minimum of 5 checkpoints of sufficient distance to manage a system TOT. Execute tactical formation maneuvering during the navigation route.

Discuss

Formation principles.
Formation communications.
Lookout doctrine.
Inter/intra-plane coordination.
Roles and responsibilities.

Introduce

Combat spread and combat cruise.

All tactical formation maneuvers in the ANTTP (each in lead and wing).
Tactical lead changes.
IIMC break up and rendezvous.
Lost visual contact and rejoin.

Review

Cruise principles.

Performance Standards

Execute all tactical formation maneuvers IAW the ANTTP.
Demonstrate the ability to control the flight through the use of tactical formation maneuvers IAW ANTTP.
SYS TOT within 30 secs
Effective route and checkpoint planning
Fuel planning within +/- 500lbs of fuel ladder

Prerequisites. SFAM-2030, LAB-2120.

SFORM-2131 2.0 * B,R,M (NS) S 2 FFS/FTD

Goal. Introduce trail formation procedures.

Requirements. Prepare a flight plan to include a Standard Instrument Departure, Victor Route Navigation, Standard Terminal Area Arrival and Instrument approach procedures.

Discuss

CNAF M-3710.7 requirements for section IFR.
FAA JO 7110.65T requirements for section IFR.
Planning considerations.
Join up after individual departures.
Flight Director Panel utilization.
Departure, penetration, enroute, and arrival procedures.
Intra-flight communication.
Lead/wingman responsibilities and contracts.
Icing considerations.

Introduce

Section trail departure and arrival procedures in VMC and IMC.
ATC coordination (non-standard formation, radar vectors).
Enroute weather penetration.
Formation break up for individual arrivals.
Lost communications procedures.

Performance Standards.

Demonstrate proper procedural knowledge of section trail operations IAW the ANTTP.
Maintain proper trail formation positioning and execute proper procedures for all climbs/descents and routing changes.

Prerequisites. SFAM-2031.

FORM-2140 2.0 365 B,R,M (NS) A 2 MV-22

Goal. Introduce tactical formations, tactical formation maneuvering, navigation to a SYS TOT and lost contact procedures.

Requirements. Navigation route to a planned SYS TO each aircraft lead to a minimum of 1 SYS TO each leg must be a minimum of 5 checkpoints of sufficient distance to manage a system TOT. Execute tactical formation maneuvering during the navigation route.

Discuss

Tactical formation maneuvers.
Roles and responsibilities.
Turns (easy, hard, max performance) and energy management.

Introduce

Combat spread and combat cruise.
All ANTTP tactical formation maneuvers (each in lead and wing)
Tactical lead changes.
Simulated loss of visual contact with wingman with subsequent rejoin enroute and at a point.
Lost communications procedures.

Performance Standards

Execute all tactical formation maneuvers IAW the ANTTP.
Demonstrate the ability to control the flight through the use of tactical formation maneuvers IAW ANTTP.

Prerequisites. SFORM-2130, SFORM-2131.

2.9.4 Confined Area Landings (CAL)

2.9.4.1 Purpose

To develop proficiency in single and section takeoffs and landings and tactical approaches to confined areas.

2.9.4.2 General

All maneuver descriptions are in the ANTTP.

Crew Requirements. P/P for simulators, P/P/CC for aircraft events.

2.9.4.3 CAL Overview. Table 2-27 provides the reference for Core Skill CAL Overview.

Table 2-27: Core Skill CAL Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-2210	1.0	*	B		G		
SCAL-2230	2.0	*	B	D	S	1	FFS/FTD
SCAL-2231	2.0	365	B, R,M	D	S	2	FFS/FTD
CAL-2240	1.5	*	B	D	A	1	MV-22
CAL-2241	1.5	*	B	D	A	1	MV-22
CAL-2242	2.0	365	B,R,M	D	A	2	MV-22

ACAD-2210 1.0 * B G

Confined Area Landings

Goal. The PUI will have an introductory knowledge of the procedures for confined area landings in the MV-22.

Prerequisite. T2P.

Required Reading. ANTTP Ch 3.

SCAL-2230 2.0 * B D S FFS/FTD

Goal. Review single aircraft CALs. Demonstrate/introduce low and medium altitude tactical approaches and departures to a confined area.

Requirements. For planned landing zones, prepare LZ diagrams and brief the landing plan in accordance with the ASTACSOP and ANTTP. Evaluate useful load and determine eight digit grid landing points appropriate for each zone.

Discuss

Approach considerations (threat level, weather).
Landing zone considerations per the ASTACSOP and ANTTP.
Tactical approach planning JMPS and KILSWITCH considerations.
Cockpit set-up and CRM during tactical approaches.
Unplanned LZ considerations (shifting landing points, ITG, obstacles, threat)
H/V Diagram considerations

Introduce

Slope landings with respect to tail and nacelle clearance.

Low altitude tactical approaches, landings and departures to a confined area. (Minimum of 1 of each low altitude tactical approach in the ANTTP).
Medium altitude tactical approaches, landings, and departures to a confined area (minimum of 1 of each medium altitude tactical approach in the ANTTP).
CALs and departures at low power margins.
HUD Precision scan technique to land within .03nm of the intended point of landing.

Performance Standards

Demonstrate proper procedures for tactical CAL approaches IAW the ANTTP.
Maintain the proper glideslope/departure profile for obstacle clearance.
Maintain assigned landing heading within 10 degrees.
Land within 0.03 nm of the intended point of landing.

Prerequisite. SFAM-2030, ACAD-2210

Required Reading - ANTTP Ch 3.

SCAL-2231 2.0 365 B,R,M D S 2 FFS/FTD

Goal. Demonstrate/introduce section low and medium altitude tactical approaches and departures to a confined area.

Requirements. For planned landing zones, prepare LZ diagrams and brief landing plans in accordance with the ASTACSOP and ANTTP. Evaluate useful load and determine eight digit grid landing points appropriate for each zone.

Discuss

Lead and wingman responsibilities.
Loss of visual contact/rejoining the flight.
Lead ship wake interaction.
Section Approach Mode considerations.
Relationship between Landing Plan and Ground Tactical Plan.
Formation brevity codes/prowords (visual, blind, tally, no-joy).

Introduce

Section low altitude tactical approaches, landings and departures to a confined area (minimum of 1 of each low altitude tactical approach in the ANTTP as wing).
Section medium altitude tactical approaches, landings, and departures to a confined area (minimum of 1 of each medium altitude tactical approach in the ANTTP as wing).

Performance Standards

Demonstrate proper procedures for tactical CAL approaches IAW the ANTTP.
Maintain the proper glideslope/departure profile for obstacle clearance.
Maintain assigned landing heading within 10 degrees.
Wing land within 30 secs of lead.
With discrete landing waypoints, utilize the HUD precision scan for lead and wing to each land within 0.03nm of their assigned waypoint. Maintain the proper formation position for section CALs.

Prerequisite. SFORM-2130, SCAL-2230.

Required Reading - ANTTP Ch 3.

CAL-2240 1.5 * B D A 1 MV-22

Goal. Introduce low and medium altitude tactical approaches, landings, and departures to a confined area with a focus on visual landings to a landing point.

Requirements. For planned landing zones, prepare LZ diagrams and brief the landing plan in accordance with the ASTACSOP and ANTTP. Evaluate useful load for each zone.

Discuss

Approach considerations (threat, weather, automation considerations).
Landing zone considerations per the ASTACSOP and ANTTP.

Tactical approach planning, KILSWITCH and JMPS considerations.
Cockpit set-up and CRM during tactical approaches.
Initial Terminal Guidance
Visual Zone Clearance and Obstacle Avoidance

Introduce

Tactical approaches, landings and departures to a confined area (minimum of 5 for initial sorties) with a focus on visual landings without INAV waypoint guidance.

Performance Standards

Without reference to an INAV waypoint:
Demonstrate proper procedures for tactical CAL approaches IAW the ANTPP.
Maintain the proper glideslope/departure profile for obstacle clearance.
Maintain assigned landing heading within 10 degrees.

Prerequisite. SCAL-2230.

External Syllabus Support. Suitable airspace and landing site.

CAL-2241	1.5	*	B	D	A	1	MV-22
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Goal. Introduce low and medium altitude tactical approaches, landings, and departures to a confined area with a focus on landing to a defined INAV waypoint.

Requirements. For planned landing zones, prepare LZ diagrams and brief the landing plan in accordance with the ASTACSOP and ANTPP. Evaluate useful load and determine eight digit landing grid points appropriate for each zone.

Discuss

Approach considerations (threat, weather, automation considerations).
Landing zone considerations per the ASTACSOP and ANTPP.
Tactical approach planning, KILSWITCH and JMPS considerations.
Cockpit set-up and CRM during tactical approaches.

Introduce

Tactical approaches, landings and departures to a confined area (minimum of 5 for initial sorties).

Performance Standards

Demonstrate proper procedures for tactical CAL approaches IAW the ANTPP.
Demonstrate proper HUD precision scan technique to land within .03nm of the intended landing point.
Maintain the proper glideslope/departure profile for obstacle clearance.
Maintain assigned landing heading within 10 degrees.

Prerequisite. SCAL-2230.

External Syllabus Support. Suitable airspace and landing site.

CAL-2242	2.0	365	B, R, M	D	A	2	MV-22
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Goal. Introduce section low and medium altitude tactical approaches, landings, and departures to a confined area.

Requirements. For planned landing zones, prepare LZ diagrams and brief landing plans in accordance with ASTACSOP and ANTPP. Evaluate useful load and determine eight digit grid landing points appropriate for each zone.

Discuss

Closure rates.
Section departure considerations.
Landing formation considerations.
Formation VTOL/CONV minimum separation.
Loss of visual contact/rejoining of flight.

Introduce

Section tactical approaches, landings, takeoffs, and departures to a confined area (minimum of 3 as wing for initial sorties).

Review

Running and Carrier rendezvous.
Cruise principles.
Lead changes.

Performance Standards

Demonstrate proper procedures for tactical CAL approaches IAW the ANTPP.
Maintain assigned landing heading within 10 degrees.
With discrete landing waypoints, utilize the HUD precision scan for lead and wing to each land within 0.03nm of their assigned waypoint. Maintain the proper formation position for section CALs.
Without discrete landing waypoints, visually land to desired landing points as a section.
Maintain the proper glideslope/departure profile for obstacle clearance.

Prerequisite. FORM-2140, SCAL-2231, CAL-2240, CAL-2241.

External Syllabus Support. Suitable landing site.

2.9.5 Reduced Visibility Landings (RVL)

2.9.5.1 Purpose.

To introduce RVL procedures, landings, departures and EPs.

2.9.5.2 General.

All maneuver descriptions are in the ANTPP. All initial RVL events shall be conducted with a proficient RVL. If a pilot has lost proficiency in any event they must fly with a RVL to regain proficiency in that event. If the PUI is not NSQ for the appropriate light level, then he/she shall fly the event with a NSI.

All initial sorties shall be conducted during the day. Proficient aircrew may conduct subsequent sorties at night.

RVL-2282 is intended to be logged in conjunction with either the RVL-2280 or RVL-2281 when obscuration requires the pilot flying to use the hover page to safely land the aircraft. If the level of obscuration causes all crew members to lose visual reference with the deck, RVL-6900 will be logged in conjunction with either the RVL-2280 or RVL-2281. If the RVL procedures are conducted in a non-RVL environment, log only the RVL-2280 or RVL-2281 as appropriate.

Crew Requirements. P/P for simulators, P/P/CC/AO for aircraft events.

2.9.5.3 RVL Overview. Table8 provides the reference for Core Skill RVL Overview.

Table Error! No text of specified style in document.-28: Core Skill RVL Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-2250	1.0	*	B		G		
LAB-2260	1.0	*	B		G		
SRVL-2270	2.0	365	B,R	(NS)	S	1	FFS/FTD TEN+
SRVL-2271	2.0	365	B,R	(NS)	S	1	FFS/FTD TEN+
RVL-2280	2.0	240	B,R,M	(NS)	A	1	MV-22
RVL-2281	2.0	180	B, R,M	(NS)	A	1	MV-22
RVL-2282	0.0	365	B, R,M	(NS)	A	1	MV-22

ACAD-2250 1.0 * B G

Reduced Visibility Landings

Goal. The PUI will have an introductory knowledge of RVLs in the MV-22.

Instructor. RVL

Prerequisite. ACAD-2210

Required Reading - ANTPP Ch 3.

LAB-2260 1.0 * B G

Reduced Visibility Landings Procedures and Walkthrough

Goal. The PUI will be able to walk through all of the RVL procedures and CRM cadences prior to execution in the simulator.

Instructor. RVLI

Prerequisite. ACAD-2250.

Required Reading - ANTP Ch 3.

SRVL-2270 2.0 365 B (NS) S 1 FFS/FTD

Goal. Demonstrate/Introduce single ship automated RVL procedures (All approach and landing types that utilize coupled automation).

Requirements

Discuss

- Landing zone evaluation and selection.
 - Soil composition.
 - Elevation and density altitude.
 - Micro terrain, obstacles, and aircraft clearances.
 - Wind effects.
- Position hold vs position select.
 - Control detents.
- Landing point planning for multi-ship RVLs.
- Transition from the HUD precision scan to the MFD once reduced visibility is experienced.
- NATOPS RVL limitations.
- Engine degradation in an RVL environment.
- Emergencies in an RVL environment.
- Automation limitations and reduction of automation during an approach
- Vertical submodes of automation (RALT & VS)
- Horizontal submodes of automation (POSN & GNDSPD)
- Threat, ambient conditions, weather, terrain, obstacle, and ground tactical plan considerations on the use of automation.
- Standard approach procedures to RVL.
- Proper CRM cadence.
- RVL procedures.
- Cockpit set-up and crew resource management during RVLs.
- Wave-off criteria for RVLs.
- Takeoff procedures.
- Go Around functions.

Introduce

- RVL automated approaches in all levels of the landing scale (minimum of 2 of each for initial events).
- Takeoffs and departures with various levels of obscuration.
- Engine degradation and emergencies in an RVL environment.
- PF and PNF duties and CRM.
- RVL Waveoffs

Performance Standards

- Demonstrate the proper procedures for RVL automated approaches IAW the ANTP.
- Maintain assigned landing heading within 10 degrees.
- Transition from the HUD precision scan to the MFD in an RVL to land within .03nm of the discrete landing point.
- Execute NATOPS procedures for emergencies in an RVL environment.
- As PF and PNF, recognize and respond correctly to deviations from RVL profile conditions.
- Maintain assigned landing heading within 10 degrees during RVL waveoff

Instructor. RVLI

Prerequisite. SCAL-2230, LAB-2260.

Required Reading - ANTP Ch 3.

SRVL-2271 2.0 * B (NS) S 1 FFS/FTD

Goal. Demonstrate/Introduce single ship RVL procedures without the use of automation.

Requirements

Discuss

Landing zone evaluation and selection.
Soil composition.
Elevation and density altitude.
Micro terrain, obstacles, and aircraft clearances.
Wind effects.
Landing point planning for multi-ship RVLs.
MFD setup to include HUD Layer vs MFD hover page distinctions.
Transition from the HUD precision scan to the MFD once reduced visibility is experienced.
RVL chapter 4 limitations.
Engine degradation in an RVL environment.
Emergencies in an RVL environment.
Standard approach procedures to RVL.
Proper CRM cadence.
RVL procedures.
Crew resource management during RVLs.
Wave-off criteria for RVLs.
Takeoff procedures.

Introduce

Hand flown RVL approaches in all levels of the landing scale (minimum of 10 for initial events).
Takeoffs and departures with various levels of obscuration.
Engine degradation and emergencies in an RVL environment.
PF and PNF duties and CRM.
RVL Wave-off procedures.
Hover page scan.

Performance Standards

Demonstrate the proper procedures for RVL approaches IAW the ANTP.
Maintain assigned landing heading within 10 degrees.
Transition from the HUD precision approach to the MFD in an RVL to land within .03nm of the discrete landing point.
Execute NATOPS procedures for emergencies in an RVL environment.
As PF and PNF, recognize and respond correctly to deviations from RVL profile conditions.
Proper Hover page set-up.
Maintain assigned landing heading within 10 degrees during RVL waveoff

Instructor. RVLI

Prerequisite. SCAL-2230, LAB-2260.

Required Reading - ANTP Ch 3.

RVL-2280 2.0 240 B, R,M (NS) A MV-22

Goal. Demonstrate/Introduce single ship automated RVL procedures (All approach and landing types that utilize coupled automation).

Requirements

Discuss

Landing zone evaluation and selection.
Soil composition.

- Elevation and density altitude.
- Micro terrain, obstacles, and aircraft clearances.
- Wind effects.
- Position hold vs position select.
- Control detents.
- Landing point planning for multi-ship RVLs.
- Transition from the HUD precision approach to the MFD once reduced visibility is experienced.
- RVL chapter 4 limitations.
- Engine degradation in an RVL environment.
- Emergencies in an RVL environment.
- Automation limitations and reduction of automation during an approach due to unforeseen circumstances.
- Threat, ambient conditions, weather, terrain, obstacle, and ground tactical plan considerations on the use of automation.
- Standard approach procedures to RVL.
- Proper CRM cadence.
- RVL procedures.
- Cockpit set-up and crew resource management during RVLs.
- Wave-off criteria for RVLs.
- Takeoff procedures.
- Go Around functions.

Practice

- RVL automated approaches (minimum of 1 of each for initial events).
- Takeoffs and departures
- Engine degradation and emergencies in an RVL environment.
- PF and PNF duties and CRM.
- Waveoff with and without use of Go-Around

Performance Standards

- Demonstrate the proper procedures for RVL automated approaches IAW the ANTTP.
- Maintain assigned landing heading within 10 degrees.
- Transition from the HUD precision scan to the MFD in an RVL to land within .03nm of the discrete landing point.
- Execute NATOPS procedures for emergencies in an RVL environment.
- As PF and PNF, recognize and respond correctly to deviations from RVL profile conditions.
- Maintain assigned landing heading within 10 degrees during RVL waveoff

Instructor. RVL

Prerequisite. CAL-2240, CAL-2241, RVL-2270.

Required Reading - ANTTP Ch 3.

External Syllabus Support. Suitable landing site.

RVL-2281	2.0	180	B, R,M	(NS)	A	1	MV-22
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Goal. Demonstrate/Introduce single ship RVL procedures without the use of automation.

Requirements

Discuss

- Landing zone evaluation and selection.
 - Soil composition.
 - Elevation and density altitude.
 - Micro terrain, obstacles, and aircraft clearances.
 - Wind effects.
 - Landing point planning for multi-ship RVLs.
 - Transition from the HUD precision scan to the MFD once reduced visibility is experienced
 - RVL chapter 4 limitations.
 - Engine degradation in an RVL environment.

Emergencies in an RVL environment.
Standard approach procedures to RVLs, proper CRM cadence.
RVL procedures.
Cockpit set-up and crew resource management during RVLs.
Wave-off criteria for RVL.
Takeoff procedures.

Practice

Hand flown RVL approaches (minimum of 5 for initial events).
Takeoffs and departures
Engine degradation and emergencies in an RVL environment.
PF and PNF duties and CRM.
RVL Wave-off procedures.
Hover page scan.

Performance Standards

Demonstrate the proper procedures for RVL approaches IAW the ANTTP.
Maintain assigned landing heading within 10 degrees.
Transition from the HUD precision scan to the MFD in an RVL to land within .03nm of the discrete landing point.
Execute NATOPS procedures for emergencies in an RVL environment.
As PF and PNF, recognize and respond correctly to deviations from RVL profile conditions.
Proper Hover page set-up.
Maintain assigned landing heading within 10 degrees during RVL waveoff

Instructor. RVL I

Prerequisite. CAL-2240, CAL-2241, RVL-2271.

Required Reading - ANTTP Ch 3.

External Syllabus Support. Suitable landing site.

RVL-2282	0.0	365	B,R,M	(NS)	A	1	MV-22
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Goal. Demonstrate/Introduce single ship RVL procedures to actual RVL conditions. This code is to be logged concurrently with RVL-2280 or RVL-2281.

Requirements. Landing in reduced visibility conditions where the pilot flying loses visual reference to the ground and must utilize the hover page to safely land.

Instructor. RVL I

Prerequisite. SRVL-2270, SRVL-2271, (NSQ per appropriate light level if flown at night).

Required Reading - ANTTP Ch 3.

External Syllabus Support. Landing zone with reduced visibility conditions.

2.9.6 Night Systems (NS) High Light Level (HLL)

2.9.6.1 Purpose

To develop proficiency while using night vision goggles under light levels greater than 0.0022 lux as predicted by the SLAP module. Certify the PUI Night Systems Qualified (NSQ) HLL.

2.9.6.2 General

A NSI is required for all unqualified pilots.

The PUI is NS HLL qualified upon completion of this stage and written designation by the unit commanding officer.

Crew Requirements. P/P for simulators, P/P/CC/AO for aircraft events.

2.9.6.3 NS HLL Overview. Table29 provides the reference for Core Skill NS HLL Overview.

Table 2-29: Core Skill NS HLL Overview Matrix

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-2310	1.0	*	B		G		MV-22 NS EMPLOYMENT
SNS-2330	2.0	365	B, R	NS	S	1	FFS/FTD
SNS-2331	2.0	365	B, R	NS	S	2	FFS/FTD
SNS-2340	2.0	365	B,R,M	HLL	A	1	MV-22
NS-2341	2.0	365	B, R,M	HLL	A	2	MV22

ACAD-2310 1.0 * B G

MV-22 Night Systems Employment

Goal. The PUI will have an introductory knowledge of night systems employment of the MV-22.

Prerequisite. ACAD-2250.

Required Reading. MAWTS-1 NVD Manual Ch. 14 and 15.

Instructor: NSI

SNS-2330 2.0 365 B, R NS S 1 FFS/FTD

Goal. Review single aircraft CALs and introduce tactical approaches using NVDs in HLL conditions.

Requirement. For planned landing zones, prepare LZ diagrams and brief landing plans in accordance with the ASTACSOP and ANTTP. Evaluate useful load and determine eight digit grid landing points appropriate for each zone.

Discuss

NVDs set up and employment.
Night approach considerations (threat, weather, size of flight).
Night landing zone selection and analysis.
NVD scan techniques.
Sensor integration
Cockpit set-up and CRM during tactical approaches.
SLAP and EOTDA.

Introduce

Tactical approaches, landings and departures to a confined area (minimum of 6).
Crew comfort level during NVD CAL operations.
Single aircraft tactical approaches and CALs in HLL.
Waveoffs on NVDs

Performance Standards

Demonstrate proper procedural knowledge for NVD CALs IAW the ANTTP and the MAWTS-1 NVD Manual.
Demonstrate proper NVD scanning techniques IAW the MAWTS-1 NVD Manual.
Maintain assigned landing heading within 10 degrees.
With discrete landing waypoints, utilize the HUD precision approach scan technique to land within 0.03nm of assigned waypoint.
Maintain the proper glideslope/departure profile for obstacle clearance.
Maintain assigned landing heading within 10 degrees during waveoff.

Instructor. NSI.

Prerequisites. SCAL-2230.

Required Reading - T&R Program Manual chapter 3, MAWTS-1 NVD Manual Ch 14.

SNS-2331 2.0 365 B, R NS S 2 FFS/FTD

Goal. Introduce section CALs and review tactical approaches using NVDs in HLL conditions.

Requirement. Create a landing plan that facilitates landing to both an 8 digit grid and a visual landing point.

Discuss

Night landing zone selection and analysis.
NVD scan techniques.
Lead and wingman responsibilities at night.
Loss of visual contact/rejoining the flight.
Lead ship wake interaction.
Section Approach Mode considerations.

Introduce

Section low altitude tactical approaches, landings and departures to a confined area (minimum of 1 of each low altitude tactical approach in the ANTTP as wing).
Section medium altitude tactical approaches, landings, and departures to a confined area (minimum of 1 of each medium altitude tactical approach in the ANTTP as wing).
Section waveoffs at night (both flight and individual waveoffs)

Performance Standards

Demonstrate proper procedures for tactical CAL approaches IAW the ANTTP.
Maintain the proper glideslope/departure profile for obstacle clearance.
Maintain assigned landing heading within 10 degrees.
Wing land within 30 secs of lead.
With discrete landing waypoints, utilize the HUD precision scan for lead and wing to each land within 0.03nm of their assigned waypoint. Maintain the proper formation position for section CALs.
Maintain assigned landing heading within 10 degrees during waveoffs.

Prerequisite. SCAL-2231, SNS-2330.

Required Reading - ANTTP Ch 3, MAWTS-1 NVD Manual Ch 14.

Instructor. NSI.

NS-2340 2.0 365 B, R, M HLL A 1 MV-22

Goal. Introduce single ship familiarization maneuvers and tactical CALs.

Requirement. For planned landing zones, prepare LZ diagrams and brief landing plans in accordance with the ASTACSOP and ANTTP. Evaluate useful load and determine eight digit landing grid points appropriate for each zone.

Discuss

Pilot and aircrew duties during NVD CAL operations.
Aircraft lighting controls, regulations (FAA exemption) and conditions.
Use of the FLIR for LZ identification.
Night environment scene interpretation (NVG vs. FLIR).
Initial Terminal Guidance.
NVG Emergencies.

Introduce

FAM maneuvers utilizing NVDs.
NVD tactical approaches, landings, and departures to a confined area (minimum of 5 for initial events).
Use of aircraft lighting (visible and IR searchlight).
Initial Terminal Guidance.
Waveoff

Performance Standards

Demonstrate proper procedural knowledge for NVD CALs IAW the ANTTP and the MAWTS-1 NVD Manual.
Demonstrate proper NVD scanning techniques IAW the MAWTS-1 NVD Manual.
Maintain assigned landing heading within 10 degrees.
With discrete landing waypoints, utilize the HUD precision approach to land within 0.03nm of the assigned waypoint.
Maintain assigned landing heading within 10 degrees during waveoff.

Instructor. NSI.

Prerequisites. CAL-2240, CAL-2241, SNS-2330.

External Syllabus Support. Suitable landing site and airspace.

NS-2341 2.0 365 B, R,M HLL A 2 MV-22

Goal. Introduce section tactical CALs in HLL.

Requirement. For planned landing zones, prepare LZ diagrams and brief landing plans in accordance with the ASTACSOP and ANTTP. Evaluate useful load and determine eight digit grid landing points appropriate for each zone.

Discuss

- Night approach considerations (threat, weather, size of flight).
- Night landing zone selection and analysis.
- NVD scan techniques.
- Cockpit set-up and CRM during tactical approaches.
- SLAP and EOTDA.
- Night systems formation techniques.

Introduce

- Section tactical approaches, landings and departures to a confined area (minimum of 3 as lead and 3 as wing).
- Wingman responsibilities.
- Loss of visual contact/rejoining the flight.
- Crew comfort level during NVD CAL operations.
- Lead changes.

Review

- Single aircraft CALs in HLL.

Performance Standards

- Demonstrate proper procedural knowledge for NVD CALs IAW the ANTTP and the MAWTS-1 NVD Manual.
- Demonstrate proper NVD scanning techniques IAW the MAWTS-1 NVD Manual.
- Maintain assigned landing heading within 10 degrees.
- With discrete landing waypoints, utilize the HUD precision scan for lead and wing to each land within 0.03nm of their assigned waypoint. Wing land within 30 secs of lead.
- Without discrete landing waypoints, utilize the HUD precision scan for lead and wing to each land at their desired landing points in the briefed formation. Wing land within 30 secs of lead.
- Maintain the proper glideslope/departure profile for obstacle clearance.
- Recognize proper formation positions for NVD section CALs.

Instructor. NSI.

Prerequisites. CAL-2242, SNSHLL-2331, NSHLL-2340.

External Syllabus Support. Suitable landing zone and airspace.

2.9.7 Night Systems (NS) Low Light Level (LLL)

2.9.7.1 Purpose

To develop proficiency while using night vision goggles under light levels less than 0.0022 lux as predicted by the SLAP module. Certify the PUI Night Systems Qualified [NSQ].

2.9.7.2 General

A NSI is required for all unqualified pilots.

The PUI is NS qualified upon completion of this stage and written designation by the unit commanding officer.

Crew Requirements. P/P for simulators, P/P/CC/AO for aircraft events.

2.9.7.3 NS LLL Overview. Table30 provides the reference for Core Skill NS HLL Overview.

Table 2-30: Core Skill NS LLL Overview Matrix

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
SNS-2370	2.0	365	B,R,M	LLL	S	1	FFS/FTD
SNS-2371	2.0	365	B,R	LLL	S	2	FFS/FTD
NS-2380	1.5	240	B,R	LLL	A	1	MV-22
NS-2381	1.5	240	B,R	LLL	A	1	MV-22
NS-2382	1.5	*	B	LLL	A	2	MV-22
NS-2383	1.5	240	B, R,M	LLL	A	2	MV-22

SNS-2370 2.0 365 B,R,M LLL S 1 FFS/FTD

Goal. Introduce single aircraft NS RVLs using NVDs in LLL.

Requirement. Create an RVL landing plan that facilitates landing to an 8 digit grid in planned RVL conditions. Conduct the RVL profile to a discrete waypoint landing utilizing all of the RVL approach types.

Discuss

Landing zone evaluation and selection.
 Soil composition in the night environment.
 Elevation and density altitude.
 Micro terrain, obstacles, and aircraft clearances.
 Position hold vs position select.
 Control detents.
 Landing point planning for multi-ship RVLs.
 Automation limitations and reduction of automation during an approach due to unforeseen circumstances.
 Threat, ambient conditions, weather, terrain, obstacle, and ground tactical plan considerations on the use of automation in NS RVLs.
 Cockpit set-up and crew resource management during NS RVLs.
 Transition from the HUD precision approach to the MFD once reduced visibility is experienced.
 Peripheral scan and loss of peripheral speed rush during LLL landing.
 Wave-off criteria for RVL.
 Takeoff procedures.
 Go Around functions.
 Obscuration effects on NVDs.

Review

All RVL approach types.
 PF and PNF duties and CRM during LLL NS CALs.
 RVL Wave-off procedures.
 Scan within the NVD HUD Hover Layer.
 Scan within the MFD Hover Page.

Performance Standards

Demonstrate the proper procedures for RVL automated approaches IAW the ANTP.
 Maintain assigned landing heading within 10 degrees.
 Transition from the HUD precision approach to the MFD during the landing phase.
 Land within .03nm of the discrete landing point.
 As PF and PNF, recognize and respond correctly to deviations from RVL profile conditions.
 Proper Hover page set-up.
 Maintain assigned landing heading within 10 degrees during waveoff.

Instructor. NSI, RVLI.

Prerequisites. SRVL-2270, SRVL-2271, HLL NSQ.

SNS-2371 2.0 365 B, R NS S 2 FFS/FTD

Goal. Introduce section CALs and review tactical approaches using NVDs in LLL conditions.

Requirement. Create a landing plan that facilitates landing to both an 8 digit grid and a visual landing point.

Discuss

Night landing zone selection and analysis.
NVD scan techniques.
Lead and wingman responsibilities at night.
Loss of visual contact/rejoining the flight.
Lead ship wake interaction.
Section Approach Mode considerations.

Introduce

Section low altitude tactical approaches, landings and departures to a confined area (minimum of 1 of each low altitude tactical approach in the ANTTP as wing).
Section medium altitude tactical approaches, landings, and departures to a confined area (minimum of 1 of each medium altitude tactical approach in the ANTTP as wing).
Section waveoffs at night (both flight and individual waveoffs)

Performance Standards

Demonstrate proper procedures for tactical CAL approaches IAW the ANTTP.
Maintain the proper glideslope/departure profile for obstacle clearance.
Maintain assigned landing heading within 10 degrees.
Wing land within 30 secs of lead.
With discrete landing waypoints, utilize the HUD precision scan for lead and wing to each land within 0.03nm of their assigned waypoint. Maintain the proper formation position for section CALs.
Maintain assigned landing heading within 10 degrees during waveoffs.

Instructor. NSI.

Prerequisite. NSQ HLL.

Required Reading - ANTTP Ch 3, MAWTS-1 NVD Manual Ch 14.

NS-2380 1.5 240 B,R LLL A 1 MV-22

Goal. Introduce FAM maneuvers, single aircraft CALs to a visual point, and tactical approaches using NVDs in LLL.

Requirement. For planned landing zones, prepare LZ diagrams and brief landing plans in accordance with the ASTACSOP and ANTTP. Evaluate useful load and determine eight digit grid landing points appropriate for each zone.

Discuss

LLL CAL considerations.
LLL planning considerations.
Initial Terminal Guidance (ITG) employment considerations.
Environmental considerations.
LLL scene interpretation.
Sensor integration.

Introduce

NVD tactical approaches, landings, and departures to ITG in LLL (minimum of 5 for initial events).

Performance Standards

Execute proper procedures for NVD LLL CALs IAW the ANTTP and the MAWTS-1 NVD Manual.
Maintain assigned landing heading within 10 degrees.
With discrete landing waypoints, utilize the HUD precision scan to land within 0.03nm of the assigned waypoint.
Maintain the proper glideslope/departure profile for obstacle clearance.
Demonstrate proper NVD scanning techniques IAW the MAWTS-1 NVD Manual.

Instructor. NSI.

Prerequisites. SNS LLL-2370, SNS LLL-2371.

External Syllabus Support. Suitable landing site and airspace.

NS-2381 1.5 240 B,R LLL A 1 MV-22

Goal. Introduce single aircraft CALs to a visual point and review tactical approaches using NVDs in LLL.

Requirement. For planned landing zones, prepare LZ diagrams and brief landing plans in accordance with the ASTACSOP and ANTP. Evaluate useful load and determine eight digit grid landing points appropriate for each zone.

Discuss

- LLL CAL considerations.
- LLL planning considerations.
- Initial Terminal Guidance (ITG) employment considerations.
- Environmental considerations.
- LLL scene interpretation.
- Sensor integration.
- Landing Point talk on and CRM

Introduce

NVD tactical approaches, landings, and departures to ITG in LLL (minimum of 5 for initial events).

Performance Standards

- Execute proper procedures for NVD LLL CALs IAW the ANTP and the MAWTS-1 NVD Manual.
- Maintain assigned landing heading within 10 degrees.
- With discrete landing waypoints, utilize the HUD precision scan to land within 0.03nm of desired landing point.
- Maintain the proper glideslope/departure profile for obstacle clearance.
- Demonstrate proper NVD scanning techniques IAW the MAWTS-1 NVD Manual.
- Maintain assigned landing heading within 10 degrees during waveoff.

Instructor. NSI.

Prerequisites. SNS LLL-2370, SNS LLL-2371.

External Syllabus Support. Suitable landing site and airspace.

NS-2382 1.5 * B LLL A 2 MV-22

Goal. Introduce NS tactical formations, tactical formation maneuvering, navigation to a SYS TOT and lost contact procedures.

Requirements. Navigation route to a planned SYS TOT, each aircraft lead a minimum of 1 SYS TOT. Each route should be a minimum of 5 checkpoints of sufficient distance to manage a system TOT. Execute tactical formation maneuvering during the navigation route.

Discuss

- Tactical formation maneuvers.
- NS formation roles and responsibilities.
- Turns (easy, hard, max performance) and energy management.
- CRM and formation lookout doctrine during LLL.

Introduce

- NS Combat spread and combat cruise.
- Simulated loss of visual contact with wingman with subsequent rejoin enroute and at a point.
- Sensor integration and distance estimation.

Performance Standards

- Execute all tactical formation maneuvers IAW the ANTP.
- Demonstrate the ability to control the flight through the use of tactical formation maneuvers IAW ANTP.

Instructor. NSI.

Prerequisites. SNSLLL-2371.

NS-2383 2.0 240 B, R, M LLL A 2 MV-22B

Goal. Introduce section navigation to an L-Hour and section tactical CALs in LLL.

Requirement. Navigation route to a planned L-Hour, each aircraft lead to a minimum of 1 L-Hour, each leg must be a minimum of 5 checkpoints of sufficient distance to manage a system TOT. For planned landing zones, prepare LZ diagrams and brief landing plans in accordance with the ASTACSOP and ANTTP. Evaluate useful load and determine eight digit grid landing points appropriate for each zone.

Discuss

NVDs set up and employment.
Night approach considerations (threat, weather, size of flight).
Night landing zone selection and analysis.
NVD scan techniques.
Cockpit set-up and CRM during tactical approaches.
SLAP and EOTDA.
Night systems formation techniques.
Considerations for navigating at night.
Map study.

Introduce

Section tactical approaches, landings and departures to a confined area (minimum of 3 as lead and 3 as wing).
Wingman responsibilities.
Loss of visual contact/rejoining the flight.
Crew comfort level during NVD CAL operations.
Lead changes.

Review

Section aircraft CALs in LLL.

Performance Standards

Lead a navigation route to a tactical CAL within 30 secs of a planned L-Hour.
Demonstrate proper procedural knowledge for NVD CALs IAW the ANTTP and the MAWTS-1 NVD Manual.
Demonstrate proper NVD scanning techniques IAW the MAWTS-1 NVD Manual.
Maintain assigned landing heading within 10 degrees.
With discrete landing waypoints, utilize the HUD precision approach for lead and wing to each land within 0.03nm of their assigned waypoint. Wing land within 30 secs of lead.
Maintain the proper glideslope/departure profile for obstacle clearance.
Recognize proper formation positions for NVD section CALs.

Instructor. NSI.

Prerequisites. NS LLL-2380, NS LLL-2381, NS LLL-2382.

External Syllabus Support. Suitable landing site and airspace.

2.9.8 Air to Air Refueling (AAR)

2.9.8.1 Purpose

To develop proficiency in day and NVD AAR.

2.9.8.2 General

All maneuver descriptions are in the ANTTP and ATP-3.3.4.2-NATO Air to Air Refueling Part 4.

A minimum of 5 contacts and movement to the refueling position are required to successfully complete each initial flight.

An AARI is required for all initial sorties. Aircrew who have completed their initial AAR sortie (day or night) and have lost proficiency in that sortie may regain proficiency by flying with an aircraft commander who is proficient in that sortie. If the PUI is not NSQ for the appropriate light level, then he/she shall fly event 2433 with a NSI.

Crew Requirements. P/P for simulators, P/P/CC for day aircraft events, P/P/CC/AO for night aircraft events.

2.9.8.3 AAR Overview. Table1 provides the reference for Core Skill AAR Overview.

Table 2-31: Core Skill AAR Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-2410	0.5	*	B,R		G		
ACAD-2411	1.0	*	B,		G		
LAB-2420	1.0	*	B,		G		
SAAR-2430	1.0	*	B	D	S	1	FFS/FTD
SAAR-2431	1.0	*	B	NS	S	1	FFS/FTD
AAR-2440	1.5	365	B,R	D	A	1	MV-22
AAR-2441	1.5	365	B,R,M	NS	A	1	MV-22

ACAD-2410 0.5 * B,R G

MV-22 Air to Air Refueling Lecture

Goal. The PUI will have a familiarity with MV-22 air to air refueling.

Instructor. AARI.

Prerequisite. ACAD-2110, ACAD-2111.

Required reading - NATOPS 9.2, ANTPP Ch 6, ATP-3.3.4.2-NATO Air to Air Refueling Ch 1 and 4, United States ATP-3.3.4.2 Standard Related Document (SRD) Ch 3, 5, 7, and 8E.

ACAD-2411 1.0 * B G

ICAO Procedures

Goal. The PUI will have a familiarity with MV-22 international flight planning and long range tanker movements.

Instructor. AARI.

Prerequisite. ACAD-2410.

Required Reading – General Planning (GP) Ch 7, 8.

LAB-2420 1.0 * B G

Long Range Fuel Planning Practical Application

Goal. The PUI will be able plan a long range flight plan utilizing aerial refueling.

Instructor. AARI

Requirements. Build a flight plan on JMPS and prepare a NAVLOG for a route of more than 2,000 NM for two MV-22s utilizing aerial refueling. Identify the Point of No Return, tanker tracks, abort points, and End AAR points. At least one tanking evolution must take place in a MOA IAW the AP-1.

Prerequisite. ACAD-2411

SAAR-2430 1.0 * B D S 1 FFS/FTD

Goal. Introduce day AAR.

Requirements

Discuss

AAR terminology.
CRM during AAR and crew comfort level.
Rendezvous procedures, both VMC and IMC.
AAR performance envelope and limitations.
Cross-overs.
Inadvertent disconnects.
Emergency disconnect.

EMCON refueling.
MOA and Warning area procedures.
AAR aircraft configurations.
Dead band considerations during high altitudes.
High closure rates with drogue and possible drogue contact.
Low altitude tanking considerations.

Introduce

Basic scan and flight techniques required for AAR.
Medium and high altitude, high gross weight AAR profiles.
Rendezvous (minimum of 2 for initial events).
Join-up.
Contact/fuel transfer.
Post AAR procedures.
Emergency breakaway.

Performance Standards

Demonstrate proper knowledge of AAR procedures IAW the ANTTTP and the ATP-3.3.4.2-NATO Air to Air Refueling Part 4.
Recognize proper visual reference points IAW the ANTTTP.
Demonstrate proper closure rates.
Demonstrate proper missed contact procedures

Instructor. AARI.

Prerequisites. SFORM-2130, SFORM-2131, LAB-2420.

Required Reading - ANTTTP Ch 6.

SAAR-2431	1.0	*	B	NS	S	1	FFS/FTD
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Goal. Introduce night aided AAR.

Requirements.

Discuss

CRM during NVD AAR.
Comfort level.
Closure rates.
Depth perception.
Receiver/tanker lighting.
Visual illusions.
Inadvertent IMC.
Emergency procedures.
Visual signals.
Tanker sequence.

Introduce. NVD AAR.

Performance Standards

Demonstrate proper knowledge of night/NVD AAR procedures IAW the ANTTTP and the ATP-56.
Recognize proper night/NVD visual reference points IAW the ANTTTP.
Demonstrate proper closure rates
Demonstrate proper missed contact procedures

Instructor. AARI.

Prerequisites. SNS-2330, SAAR-2430.

Required Reading - ANTP Ch 6, MAWTS-1 NVD Manual.

AAR-2440 1.5 365 B,R D A 1 MV-22

Goal. Introduce day AAR.

Requirements

Discuss

AAR planning and coordination (AAR card).
CRM during AAR and crew comfort level.
Rendezvous procedures.
Enroute AAR considerations.
Fuel boost.
Cross-under.
Reel response.
Inadvertent disconnects.
Fuel siphoning.
Emergency disconnect.
Dead band considerations during high altitudes.
High closure rates with drogue and possible drogue contact.
Low altitude tanking considerations.
Inadvertent IMC
AAR checklist.
Abort Point
Divert Planning
Knock it off.
Must plug scenarios

Introduce

Rendezvous (minimum of 2).
Tanker flow.
Contact/fuel transfer (minimum of 5 for initial events).
Post AAR procedures.
Emergency breakaway.

Performance Standards

Execute proper AAR procedures IAW the ANTP and the ATP-56.
Maintain proper visual reference points IAW the ANTP.
Execute 5 successful contacts with 5 minutes sustained contact (actual or simulated fuel transfer).
Demonstrate proper closure rates
Demonstrate proper missed contact procedures

Instructor. AARI.

Prerequisites. FORM-2140, SAAR-2430.

External Syllabus Support. Approved tanker.

AAR-2441 1.5 365 B,R,M NS A 1 MV-22

Goal. Review NVD AAR.

Requirements. Introduce night AAR while using NVDs.

Discuss

CRM during NVD AAR.
Comfort level.

Closure rates.
Depth perception.
Receiver/tanker lighting.
Visual illusions.
Emergency procedures.
Visual signals.
Tanker sequence.
NVD failures.
NVD rendezvous.
Simultaneous/alternate AAR operations.
Threat response during AAR operations.

Introduce

Rendezvous (minimum of 2).
Tanker flow.
Contact/fuel transfer.
Post AAR procedures.
Emergency breakaway.
EMCON tanker procedures (EMCON condition 3 or 4).

Performance Standards.

Execute proper AAR procedures IAW the ANTTP and the ATP-3.3.4.2.
Maintain proper visual reference points IAW the ANTTP.
Execute 5 successful contacts with 5 minutes sustained contact (actual or simulated fuel transfer).
Demonstrate proper closure rates
Demonstrate proper missed contact procedures

Instructor. AARI.

Prerequisites. SAAR-2431, AAR-2440

External Syllabus Support. Approved tanker.

2.9.9 Tail Gunnery (TG)

2.9.9.1 Purpose

To develop the ability to plan for and employ the MV-22 ramp mounted weapon system.

2.9.9.2 General

At the completion of this stage, the PUI will demonstrate the ability to control the employment of the MV-22 ramp mounted weapon system from a hover, approaching the landing zone, departing the landing zone and enroute to the landing zone. Either the M240D or the GAU-16/21, may be used to satisfy the flight events in this stage. Initials shall be done as a section, proficiency can then be maintained as a single aircraft event. If the PUI is not NSQ for the appropriate light level, then he/she shall fly NS events with a NSI.

Crew Requirements. P/P/CC/AO for aircraft events.

2.9.9.3 TG Overview. **Error! Reference source not found.**2 provides the reference for Core Skill TG Overview Matrix

Table 2-32: Core Skill TG Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-2510	0.5	*	B		G		
ACAD-2511	0.5	*	B		G		
TG-2541	1.5	*	B	D	A	2	Section Tail Guns
TG-2543	1.5	365	B,R,M	NS	A	2	NS Section Tail Guns

ACAD-2510 0.5 * B,T G

Weapons Systems Lecture

Goal. The PUI will have a familiarity with the operation of the weapons utilized on the ramp mounted weapon system.

Instructor. TGI.

Prerequisite. T2P. Required Reading – NTRP Ch 1, ANTTP Ch 7.

ACAD-2511 0.5 * B,T G

Weapons Employment

Goal. The PUI will have familiarity with the tactical employment of the MV-22 RMWS.

Instructor. LAT-I.

Prerequisite. T2P.

Required Reading - NTRP Ch 1, ANTTP Ch 7.

TG-2541 1.5 * B,T D A 2 MV-22

Goal. To introduce MV-22 ramp mounted weapon system employment during the day.

Requirement. Objective area diagram with assault sectors of fire annotated and surface danger zones identified for an urban environment. Conduct a minimum of 5 live-fire STARS.

Discuss

Objective area planning (fires integration, weapons conditions, target reference points, escort location).
Fields of Fire and Sectors of Fire.
Standard terminology for control of crew served weapons.
ICS procedures.
ICS Failure
Weapons safety and things falling off aircraft (TFOA).
Weapon malfunctions/stoppages for weapons.
Emergencies (aircraft & weapons).
Specifications of MV-22 crew served weapons (tracer burnout range, maximum range, time of flight).
MV-22 crew served weapons ammunition and effects on various targets (buildings, unarmored vehicles, armored vehicles).
Rules of engagement (ROE).
Wingman awareness and formation considerations during aerial gunnery.
Range regulations and procedures.
Training pattern types and selection

Introduce

Preparation of weapons and aircraft.
Weapon conditions and standard weapon commands.
PF and PNF duties during air-to-ground gunnery.

Performance Standards.

Execute proper procedures for ordnance delivery IAW the ANTTP.

Instructor: BIP

Prerequisites. FORM-2140, ACAD-2511

Ordnance. 600 rounds per gunner of appropriate ammunition.

Range. Appropriate gunnery range.

External Syllabus Support. Moving Land or Sea Target.

TG-2543 1.5 365 B,R,M NS A 2 MV-22

Goal. To introduce RMWS employment utilizing the NVDs.

Requirement. Objective area diagram with assault sectors of fire annotated and surface danger zones identified for an austere environment.

Discuss

CRM during night AG.
Effects of weapon employment on NVGs.
Target identification at night and EOTDA.
Use of IR LASER pointers (performance characteristics, operating procedures, ICS procedures, safety considerations, nominal ocular hazard distance (NOHD) and LASER eye protection (LEP)).
Emergencies (aircraft & weapons).
NVD procedures/failures.
Wingman awareness during NVG AG.

Introduce

Preparation of weapons and aircraft for night gunnery operations.
PF and PNF duties during night air-to-ground gunnery.
Multiple aircraft Tail Gunnery at night.
Utilization of IR pointer.

Review

Fields of Fire and Sectors of Fire.
Weapon conditions and standard weapon commands.

Performance Standards.

Execute proper procedures for NVD aerial gunnery IAW the ANTTP.

Instructor: BIP. NSI if not NSQ for light level.

Prerequisites. NSQ for light level, TG-2540.

Required Reading - MAWTS-1 NVD Manual Ch 16 (I-IV, VI).

Ordnance. 600 rounds per gunner of appropriate ammunition.

Range. Appropriate gunnery range.

External Syllabus Support. Moving Land Target (MLT) if available.

2.9.10 Low Altitude Tactics (LAT)

2.9.10.1 Purpose.

To develop proficiency in MV-22 Low Altitude Tactics.

2.9.10.2 General.

All maneuver descriptions are in the ANTTP.

Non-proficient aircrew are required to fly with a LATI for day events and an NSI for night events.

The PUI is day LAT qualified upon completion of LAT-2641.

The PUI is NS LAT qualified upon completion of LAT-2643.

LAT altitude restrictions and currency requirements are IAW the T&R Program Manual.

Events should be flown in areas with significant vertical relief.

The instructor shall conduct all flight briefs for initial events.

A HUD shall be utilized for all events.

Crew Requirements. P/P for simulators, P/P/CC/AO for aircraft events.

2.9.10.3 LAT Overview. Table 2-33 provides the reference for Core Skill LAT Overview.

Table 2-33: Core Skill LAT Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-2610	0.5	*	B		G		
ACAD-2611	0.5	*	B		G		
ACAD-2612	0.5	*	B		G		
ACAD-2613	0.5	*	B		G		
ACAD-2614	0.5	*	B		G		
LAB-2620	0.5	*	B		G		
SLAT-2630	2.0	*	B	D	S	1	FFS/FTD TEN
SLAT-2631	2.0	365	B,R	D	S	2	FFS/FTD TEN
SLAT-2632	2.0	365	B,R	NS	S	2	FFS/FTD TEN
LAT-2640	1.5	*	B	D	A	1	MV-22
LAT-2641	1.5	365	B,R,M	D	A	2	MV-22
LAT-2642	1.5	240	B,R	HLL	A	2	MV-22
LAT-2643	1.5	180	B,R,M	LLL	A	2	MV-22

ACAD-2610 0.5 * B G

LAT IV: Planning, Briefing and Debriefing

Goal. The PUI will have an introductory knowledge of planning, briefing, and debriefing a LAT sortie.

Instructor: LATI.

Prerequisite. T2P.

Required Reading - AP-1B Ch 1-1 through 1-3, 2-1, 2-2, ANTP Ch 5.

ACAD-2611 0.5 * B G

Tactical Aircrew Coordination

Goal. The PUI will have an introductory knowledge of required coordination between the pilots and aircrew during LAT.

Instructor: LATI.

Prerequisite. ACAD-2610.

ACAD-2612 0.5 * B G

Route Planning Considerations Lecture

Goal. The PUI will have an introductory knowledge of systems route planning considerations.

Instructor: LATI.

Prerequisites. ACAD-2611.

Required Reading - ANTP Ch 1.

ACAD-2613 0.5 * B G

Ps E/M

Goal. The pilot will have an introductory knowledge of Specific Power and Energy-Maneuverability and Energy-Maneuverability Diagrams.

Instructor: LATI.

Prerequisites. ACAD-2612.

Required Reading – NTRP-Ch 6.

ACAD-2614 0.5 * B G

Tactics in the Night Environment

Goal. The pilot will have an introductory knowledge of MV-22 tactics in the night environment.

Instructor: NSI.

Prerequisites: 2613.

Required Reading – NVD Manual, NTRP-Ch 6.

LAB-2620 0.5 * B G

LAT Maneuver Walk Through

Goal. The PUI will be able to walk through all LAT maneuvers prior to executing them in the aircraft.

Instructor: LATI.

Prerequisites. ACAD-2610-2613.

Required Reading - ANTTP Ch 4.

SLAT-2630 2.0 * B D S 1 FFS/FTD TEN

Goal. Introduce LAT maneuvers and navigation on a route in the contour profile.

Requirement. Plan a contour profile route of 150nm (One leg in CONV) incorporating no fewer than 5 check points with significant vertical relief and threats. Prepare all applicable JMPS/DTM handouts and briefing products. The LATI shall conduct the brief.

Discuss

- Dive Recovery Rules
 - Small descent rule
 - Optical flow
 - Speed rush baseline
 - LAT risk assessment
 - Time to impact calculations
 - Turning and looking
 - G available / required
- Crew Responsibilities
 - Terrain Clearance Tasks (TCT)
 - Mission Tasks (MT): Critical (CT) and Non Critical (NCT)
 - Mission Crosscheck Time (MCT)
- Display utilization
 - DIGMAP
 - HAT
 - Terrain and Sun shading
 - LOS
- FLIR
- Route Properties
 - Weather, SLAP & Wind Considerations
 - Route Checkpoint Selection (Tactically relevant vs. MTR)
 - Vertical Planning
 - Altitude/Speed Profiles
 - L-Hour Planning
 - Aircraft Performance
- CONV mode altitude/airspeed combinations
- LAT Briefing Requirements (including LAT ROC)
- Turbulence
- Airspeed planning considerations (route length, forecasted winds, weather, threat, ambient conditions, fuel)
- TOT management and CMS integration (commanded speed indicator functions, leg timing, clock time)

Introduce

- Max Performance Turns
- Vertical Maneuvers
- Dive entry using 50% rule

Specific excess power available performance charts.

Review

Navigation of a route
Minimum of one leg in CONV mode
.
LAT maneuvers
Mission Management
Route
Fuel
L-hour management
Flight Director usage
Day HUD utilization
Emergencies in the LAT environment

Performance Standards

Complete all mission planning tasks related to JMPS and DTM loads, to include selecting tactically relevant checkpoints.
Execute all LAT maneuvers IAW the ANTTP.
Remain oriented within the planned lateral boundaries of the route.
Land at the planned LZ within .03 nm of a discrete landing point and +/- 30 seconds of L-hour.
Employ proper CRM in the LAT regime.
Comply with ROC IAW T&R Program Manual and other governing directives.

Instructor. LATI.

Prerequisites. SCAL-2130, LAB-2620.

Required Reading - ANTTP Ch 4.

SLAT-2631	2.0	365	B,R	D	S	2	FFS/FTD TEN+
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Goal. Introduce section LAT maneuvers and navigation on a route in the contour profile.

Requirement. Plan a contour profile route of 150nm, one leg in CONV mode, incorporating no fewer than 5 check points with significant vertical relief and threats. Prepare all applicable JMPS/DTM handouts and briefing products. The LATI shall brief the route.

Discuss

Lookout doctrine during section LAT.
Formation considerations in restricted terrain.
Airspeed selection.
Energy Management, Ps-EM considerations.
Loss of visual contact.
Loss of communications.
Terminate and Knock-It-Off Criteria/Procedures.
Magellan parameters

Introduce

Section LAT maneuvers.
Max Performance Turns.
Vertical Maneuvers.
5 degree rule.
50% rule dive entry.
Navigation of a route in the wing position while in the contour profile in both combat cruise and combat spread.
Minimum of 100nm in airplane mode.
Minimum of 50nm in conversion mode.

Performance Standards

Complete all mission planning tasks related to JMPS and DTM loads, to include selecting tactically relevant checkpoints.
Execute all LAT maneuvers IAW the ANTTP.

Remain oriented within the planned lateral boundaries of the route. Employ proper tactical formation maneuvers to control the flight.
Properly insert and edit threat utilizing CMS.
Land at the planned LZ within .03nm of a discrete landing point and +/- 30 seconds of L-hour.
Employ proper CRM in the LAT regime.
Comply with ROC IAW T&R Program Manual and other governing directives.

Instructor. LATI.

Prerequisites. SCAL-2231, SLAT-2630.

SNS LAT-2632 2.0 365 B,R NS S 2 FFS/FTD TEN+

Goal. Introduce single aircraft and section NVD LAT maneuvers during HLL and LLL.

Requirement. Plan a contour profile route of 150nm (incorporating both airplane and conversion mode) incorporating no fewer than 5 check points with significant vertical relief and threats. Prepare all applicable JMPS/DTM handouts and briefing products. The NSI shall brief the route.

Discuss

NVD LAT techniques.
NVD Section/formation considerations.
NVD Optical flow and speed rush
NVG HUD use in the LAT environment.
HLL vs LLL route planning considerations and JMPS utilization.
Conversion mode NS LAT.

Introduce

NVD LAT navigation of 150 nm route in the contour profile.
Tactical formation flight in the NVD LAT environment.
NVD LAT maneuvers.

Performance Standards

Maintain proper flight integrity IAW the ANTTP during NVD LAT flight.
Complete all mission planning tasks related to JMPS and DTM loads, to include selecting tactically relevant checkpoints.
Execute all LAT maneuvers IAW the ANTTP.
Remain oriented within the planned lateral boundaries of the route. Employ proper tactical formation maneuvers to control the flight.
Properly insert and edit threat utilizing CMS.
Employ proper CRM in the LAT regime.
With discrete landing waypoints, lead and wing each land within 0.03nm of their assigned waypoint, lead within 30secs of L-hour, dash 2 within 30secs of lead.

Instructor. NSI.

Prerequisites NSQ HLL, ACAD-2614, SLAT-2631.

LAT-2640 1.5 * B D A 1 MV-22

Goal. Review LAT maneuvers and navigation on a route in the contour profile.

Requirement. Plan a contour profile route of 100nm incorporating no fewer than 5 check points with significant vertical relief and threats. Prepare all applicable JMPS/DTM handouts and briefing products. The LATI shall brief the route.

Discuss

Stress and fatigue while flying LAT
Aircrew coordination during LAT
Squadron SOP for required equipment
T&R Program Manual
Altitude Restrictions and Currency Requirements

- LAT Training with Embarked Troops
- FENCE Checks
- Sensor Integration
- FLIR calibration
- Bird strikes
- LAT Briefing Requirements (including LAT ROC)
- Turbulence
- Airspeed planning considerations (route length, forecasted winds, weather, threat, ambient conditions, fuel)
- TOT management and CMS integration (commanded speed indicator functions, leg timing, clock time)
- Emergencies
 - Emergencies in the LAT environment
 - Bird Strikes
 - Proprotor over torque

Review

- Route Briefing
- Max Performance Turns
- Vertical Maneuvers
- Dive entry using 50% rule
- Navigation of a route of 100 nautical miles in the contour profile
- Update EOB inflight

Performance Standards

- Complete all mission planning tasks related to JMPS and DTM loads, to include selecting tactically relevant checkpoints
- Execute all LAT maneuvers IAW the ANTPP
- Remain oriented within the planned lateral boundaries of the route
- Properly insert and edit threat utilizing CMS
- Land at the planned LZ within .03nm of the discrete landing point and +/- 30 seconds of L-hour
- Employ proper CRM in the LAT regime
- Comply with ROC IAW T&R Program Manual and other governing directives

Instructor. LATI.

Prerequisites. SLAT-2630.

External Syllabus Support. Approved route/range space with vertical relief.

LAT-2641	1.5	365	B,R,M	D	A	2	MV-22
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Goal. Review section LAT maneuvers and navigation on a route in the contour profile.

Requirement. Plan a contour profile route of 150nm (incorporating airplane and conversion) incorporating no fewer than 5 check points with significant vertical relief and threats. Prepare all applicable JMPS/DTM handouts and briefing products. The LATI shall brief the route.

Discuss

- Any previously discussed item.
- Section communications in the LAT regime.
- LAT related brevity codes/prowords.
- L-Hour management techniques.
- Magellan and Columbus parameters.

Review

- Section LAT maneuvers.
 - Max Performance Turns.
 - Vertical Maneuvers.
 - 5 degree rule.
 - 50% rule dive entry.
- Navigation of a route in the wing position while in the contour profile in both combat cruise and combat spread.

Incorporate both airplane and conversion mode LAT.

Performance Standards

Complete all mission planning tasks related to JMPS and DTM loads, to include selecting tactically relevant checkpoints.
Execute all LAT maneuvers IAW the ANTP.
Remain oriented within the planned lateral boundaries of the route. Employ proper tactical formation maneuvers to control the flight.
Properly insert and edit threat utilizing CMS.
Lead and wing each land within 0.03nm or +/- 100 meters of their assigned waypoint, wing land within 30secs of lead.
Land within +/- 30 seconds of L-Hour
Employ proper CRM in the LAT regime.
Comply with ROC IAW T&R Program Manual and other governing directives.

Instructor. LATI.

Prerequisites. FORM-2140, SLAT-2631, LAT-2640.

External Syllabus Support. Approved route/range space with vertical relief.

NS LAT-2642 1.5 240 B,R HLL A 2 MV-22

Goal. Introduce NVD section tactical formation maneuvers, LAT maneuvers and navigation under HLL conditions.

Requirement. Plan a contour profile route of 100 nm incorporating no fewer than 5 check points with significant vertical relief and threats. Prepare all applicable JMPS/DTM handouts and briefing products. The NSI shall brief the flight.

Discuss

Pilot and crew chief/observer duties in the LAT environment.
Section communications in the LAT regime.
LAT related brevity codes/prowords.
L-Hour management techniques.
Magellan and Columbus parameters.
Section considerations and wingman awareness.
Sensor integration
Fatigue.
Comfort level.
Dive considerations.

Introduce

NVD LAT navigation of 100nm route in the contour profile.
Tactical formation maneuvering in HLL.
LAT maneuvers in HLL.

Review

Tactical formation maneuvers during NVD LAT.
NVD LAT maneuvers.
NVD LAT navigation of 100nm route in the contour profile.
NS CALS.

Performance Standards

Complete all mission planning tasks related to JMPS and DTM loads, to include selecting tactically relevant checkpoints.
Execute LAT maneuvers IAW the ANTP.
Remain oriented within the planned lateral boundaries of the route. Employ proper tactical formation maneuvers to control the flight.
With discrete landing waypoints, lead and wing each land within 0.03nm of their assigned waypoint, lead within 30secs of L-hour, dash 2 within 30secs of lead.
Employ proper CRM in the LAT regime.
Comply with ROC IAW T&R Program Manual and other governing directives.

Instructor. NSI.

Prerequisites. NSQ HLL, SLAT-2632, LAT-2641.

External Syllabus Support. Approved route/range space with vertical relief.

NS LAT-2643 1.5 180 B,R,M LLL A 2 MV-22

Goal. Introduce NVD section tactical formation maneuvers, LAT maneuvers and navigation under LLL conditions.

Requirement. Plan a contour profile route of 100 nm incorporating no fewer than 5 check points with significant vertical relief and threats. Prepare all applicable JMPS/DTM handouts and briefing products. The NSI shall brief the route.

Discuss

- LLL LAT considerations.
- L-Hour management techniques.
- Magellan and Columbus parameters.
- Section considerations and wingman awareness.
- Tactical formation maneuvering in LLL.
- LLL Rules of Conduct and Dive recovery rules.
- Fatigue in LLL.
- Comfort level in LLL.
- HLL vs LLL lighting considerations.
- CFIT and visual acuity at lower altitudes.

Introduce

- NVD LAT navigation of 100nm route in the contour profile.
- Tactical formation maneuvering in LLL.
- LAT maneuvers in LLL.

Review

- Tactical formation maneuvers during NVD LAT.
- NVD LAT maneuvers.
- NVD LAT navigation of 100nm route in the contour profile.
- NS CALS.

Performance Standards

- Complete all mission planning tasks related to JMPS and DTM loads, to include selecting tactically relevant checkpoints.
- Execute LAT maneuvers IAW the ANTTP.
- Remain oriented within the planned lateral boundaries of the route. Employ proper tactical formation maneuvers to control the flight.
- With discrete landing waypoints, lead and wing each land within 0.03nm of their assigned waypoint, lead within 30secs of L-hour, dash 2 within 30secs of lead.
- Employ proper CRM in the LAT regime.
- Comply with ROC IAW T&R Program Manual and other governing directives.
- Maintain proper flight integrity IAW the ANTTP during NVD LAT flight.
- Maintain terrain awareness and avoidance during NVD LAT maneuvers.

Instructor. NSI.

Prerequisites. NSQ, NSLAT-2642.

2.9.11 Mountain Area Training (MAT)

2.9.11.1 Purpose.

To develop proficiency in day and NVD mountainous terrain and high/hot/heavy operations.

2.9.11.2 General.

All maneuver descriptions are in the ANTTP.

Crew Requirements. P/P/CC/AO.

2.9.11.3 MAT Overview. **Error! Reference source not found.**4 provides the reference for Core Skill MAT Overview

Table 2-34: Core Skill MAT Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-2710	0.5	*	B		G		
ACAD-2711	0.5	*	B		G		
SMAT-2730	1.0	365	B,R	D	S	1	FFS/FTD
SMAT-2731	1.0	365	B,R,M	NS	S	1	FFS/FTD
SMAT-2732	1.0	365	B,R,M	(NS)	S	1	FFS/FTD

ACAD-2710 0.5 * B G

MV-22 High Altitude Operations Lecture

Goal. The PUI has a familiarity with MV-22 high altitude operations.

Instructor: BIP.

Prerequisites. ACAD-2210

Required Reading - NATOPS Ch 22, 23, 30, 31, ANTTP Ch 3.

ACAD-2711 0.5 * B G

MV-22 Advanced Tiltrotor Aerodynamics

Goal. The PUI has an increased familiarity of MV-22 aerodynamics with a focus on high PA and DA characteristics.

Instructor: BIP.

Prerequisites. ACAD-2210

Required Reading - NATOPS Ch 22, 23, 30, 31, ANTTP Ch 3.

SMAT-2730 1.0 365 B,R D S 1 FFS/FTD

Goal. Introduce CALs in mountainous terrain in day conditions.

Requirements. Conduct performance calculations to include a TOLD card for high density altitude landing environment (6,000' PA). Landings shall be conducted at where mountainous terrain is a significant factor, utilizing pinnacles, bowls, valleys, and canyons.

Discuss

High altitude physiology Emergencies.
Wind and weather effects.
Terrain classifications

Power available vs power required.
Calibrated airspeed versus ground speed (acceleration, deceleration).
Considerations for LZ selection and evaluation at high altitudes.

Introduce

Mountainous area operations.
Pinnacle landings.
Slope landings.
Confined area landings.
Landings and operations in valleys and canyons.
Crosswind landings.
Various short/rolling takeoff techniques at high elevation.

Performance Standards

Demonstrate knowledge of proper MAT procedures IAW the ANTTP and NATOPS.
Execute up-slope/down-slope and cross-slope landings.

Properly calculate power available and power required for high altitude LZs.
Properly utilize the CMS performance layer for inflight power planning
Land within 0.03 nm of the discrete landing point.

Instructor: BIP.

Prerequisites. CAL-2230, ACAD-2710, ACAD-2711.

SMAT-2731 1.0 365 B,R,M NS S 1 FFS/FTD

Goal. Introduce CALs in mountainous terrain in night conditions using NVDs.

Requirement. Conduct performance calculations to include a TOLD card for high density altitude night landing environment (6000' PA with ISA +20). Aircraft landings shall be conducted at zones where mountainous terrain is a significant factor.

Discuss

Waveoffs during mountainous terrain NVD operations.
Visual illusions on NVDs in mountainous terrain.
Sensor utilization in mountainous terrain.

Introduce

NVD mountainous terrain operations.
Pinnacle landings.
Slope landings.
Confined area landings.
Landings and operations in valleys and canyons.
Crosswind landings.
Various short/rolling takeoff techniques at high elevation.

Performance Standards

Demonstrate knowledge of proper MAT procedures IAW the ANTPP and NATOPS.
Execute up-slope/down-slope and cross-slope landings.
Properly calculate power available and power required for high altitude LZs.
Land within 0.03 nm of the discrete landing point.

Instructor: NSI.

Prerequisites. SNS-2330, SMAT-2730.

SMAT-2732 1.0 365 B,R,M (NS) S 1 FFS/FTD

Goal. Introduce operations in a High/Hot/Heavy environment with limited power margins.

Requirement. Conduct performance calculations to include a TOLD card for 8,000' and 10,000' DA. Conduct landings in areas where mountainous terrain is a significant factor and the power margin ranges from 5% HOGE to 0% HIGE

Discuss

Power margins
Power/rate of descent control
Lift vector control
High altitude operations
Wind effects on power required
MGT/NG limitations
Power assurance checks
High DA/Gross weight runway arrivals/departures
Aircraft handling qualities (turn radius, CONV corridor, FFR, rate of climb, stall margin).

Introduce

Zero power margin operations

Performance Standards.

Demonstrate knowledge of proper MAT procedures IAW the ANTPP and NATOPS.

Properly calculate power available and power required for high altitude LZs.
Land within 0.03 nm of the discrete landing point.

Instructor: BIP.

Prerequisites. SCAL-2230, ACAD-2710, ACAD-2711.

2.9.12 **Division Tactics (DIV)**

2.9.12.1 Purpose.

To develop proficiency in MV-22 Division Tactics.

2.9.12.2 General.

All maneuver descriptions are in the ANTP.

Crew Requirements. P/P for simulators, P/P/CC/AO for aircraft events.

2.9.12.3 DIV Overview. Table 2-35 provides the reference for Core Skill DIV Overview.

Table 2-35: Core Skill DIV Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-2750	1.0	*	B		G		
DIV-2780	1.5	*	B	(NS)	A	3	
DIV-2781	1.5	*	B	D	A	3	
DIV-2782	1.5	*	B	HLL	A	3	
DIV-2783	1.5	365	B,R,M	LLL	A	3	
DIV-2784	1.5	365	B,R,M	(NS)	A	3	

ACAD-2750 1.0 * B G

Large Flight Leadership

Goal. The PUI will have an introductory knowledge of planning, briefing, leading and debriefing a flight of 3 or more aircraft.

Instructor: WTI.

Prerequisite. T2P.

Required Reading – ANTP Ch. 5.

DIV-2780 1.5 * B (NS) A 3 MV-22

Goal. Introduce division formations.

Requirements

Discuss

Division formations.
Division tactical formation maneuvers.
Roles and responsibilities.
Air to Air TACAN Considerations.
Loss of visual contact/rendezvous and holding.
IIMC break up and rendezvous procedures.

Introduce

Division formations.
Division formation maneuvers.
Loss of visual contact/rendezvous and holding.

Performance Standards

Maintain proper formation position during division formation maneuvers.
Demonstrate situational awareness during division formation maneuvers.

Instructor: BIP.

Maintain awareness of all wingmen and provide adequate landing area during NVD HLL CALs.
Maintain flight integrity during NVD division CALs.

Instructor. NSI.

Prerequisites. NS-2341, DIV-2781.

External Syllabus Support. Suitable landing site and airspace.

DIV-2783	1.5	365	B,R,M	LLL	A	3	MV-22
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Goal. Introduce division formations and division CALs using NVDs under LLL conditions.

Requirement. For planned landing zones, prepare LZ diagrams and brief landing plans in accordance with the ASTACSOP and ANTTP. Evaluate useful load and determine eight digit grid landing points appropriate for each zone.

Discuss

Division formation and landing considerations.
LZ selection.
Tactical approaches.

Introduce

NVD LLL division formation principles and tactical formation maneuvering.
NVD division tactical approaches, departures, takeoffs and landings (minimum of 3 as dash 3 or 4 for initial events).
NVD LLL division lead changes.
Division Box.
Division Fluid Four.

Performance Standards

Maintain proper position during NVD LLL division landings IAW the ANTTP.
Maintain assigned landing heading within 10 degrees.
With discrete landing waypoints, utilize the HUD precision approach for lead and wingmen to each land within 0.03nm of their assigned waypoint. Wingmen land within 30 secs of the preceding aircraft.
Maintain the proper formation position for division CALs.
Maintain the proper glideslope/departure profile for obstacle clearance.
Maintain awareness of all wingmen and provide adequate landing area during NVD LLL CALs.
Maintain flight integrity during NVD division CALs.

Instructor. NSI.

Prerequisites. NS-2383, DIV-2782.

External Syllabus Support. Suitable landing site and airspace.

DIV-2784	1.5	365	B,R,M	(NS)	A	3	MV-22
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Goal. Introduce division tactical formation maneuvers, LAT maneuvers and navigation.

Requirement. Plan a contour profile route of 100 nm incorporating no fewer than 5 check points with significant vertical relief and threats. Prepare all applicable JMPS/DTM handouts and briefing products. The LATI/NSI shall brief the route.

Discuss

Division formations in the LAT environment
Division LAT considerations
Division considerations and wingman awareness.
Division tactical formation maneuvering.

Introduce

Division tactical formation maneuvering.
Division LAT maneuvers.

Review

LAT navigation of 100nm route in the contour profile
LAT maneuvers.
LAT navigation of 100nm route in the contour profile.
DIV CALS.

Performance Standards

Complete all mission planning tasks related to JMPS and DTM loads, to include selecting tactically relevant checkpoints.
Execute LAT maneuvers IAW the ANTP.
Remain oriented within the planned lateral boundaries of the route. Employ proper tactical formation maneuvers to control the flight.
With discrete landing waypoints, lead and wing each land within 0.03nm of their assigned waypoint, lead within 30secs of L-hour, dash 2 within 30secs of lead.
Employ proper CRM in the LAT regime.
Comply with ROC IAW T&R Program Manual and other governing directives.
Maintain proper flight integrity IAW the ANTP during LAT flight.
Maintain terrain awareness and avoidance during LAT maneuvers.

Instructor. DAY~LATI, NS~NSI.

Prerequisites. DIV-2780. DAY~LAT-2641, HLL~LAT-2642, LLL~LAT-2643

External Syllabus Support. Approved route/range space with vertical relief.

2.9.13 Ground Threat Reaction (GTR)

2.9.13.1 Purpose.

To develop proficiency in counter-tactics versus enemy surface-to-air threats.

2.9.13.2 General.

All maneuver descriptions are in the Classified ANTP. RADAR principles are listed in the NTRP Appendix G.

A GTR-2832 proficient WTI (7577 MOS) shall brief and lead all sorties in which any pilot within the flight is not proficient.

Pilots who have completed their initial GTR sorties and have lost proficiency in that sortie may regain proficiency by flying with a LATI who is proficient in that sortie.

The flight lead shall brief all applicable GTR training rules IAW the ANTP.

GTR-2832 shall be conducted against a threat emitter; e.g. SA-6, ZSU-23-4, etc. and requires an electronic warfare range.

All initial sorties shall be conducted during the day following completion of LAT-2641. Proficient aircrew may conduct subsequent sorties at night if they are LAT-Q.

Once proficiency is attained in GTR-2832, proficiency may be maintained by completion of GTR-2831.

The above rules apply to all POIs.

Crew Requirements. P/P for simulators, P/P/CC/AO for aircraft events.

2.9.13.3 GTR Overview. Error! Reference source not found.6 provides the reference for Core Skill GTR Overview.

Table 2-36: Core Skill GTR Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-2810	1.0	730	B,R		G		
ACAD-2811	1.0	730	B,R		G		
ACAD-2812	1.0	730	B,R		G		
ACAD-2813	1.0	*	B		G		
ACAD-2814	1.0	*	B		G		
ACAD-2815	1.0	*	B		G		
ACAD-2816	1.0	*	B		G		
ACAD-2817	1.0	730	B,R		G		
LAB-2820	0.5	*	B,R		G		
SGTR-2830	2.0	*	B	(NS)	S	1	FFS/FTD TEN
SGTR-2831	2.0	365	B,R,M	(NS)	S	2	FFS/FTD TEN+
GTR-2840	1.5	365	B,R	(NS)	A	2	MV-22

ACAD-2810 1.0 730 B,R G

MV-22 ALE-47 Lecture

Goal. The PUI will be familiar with the operation of the MV-22 ALE-47.

Instructor. WTI.

Prerequisites. T2P.

Required Reading - NTRP Ch5, APP F, Classified ANTTP Ch 2.

ACAD-2811 1.0 730 B,R G

MV-22 APR-39 Lecture

Goal. The PUI will be familiar with the operation of the MV-22 APR-39.

Instructor. WTI.

Prerequisite. T2P.

Required Reading - NTRP Ch5, APP F, Classified ANTTP Ch 2.

ACAD-2812 1.0 730 B,R G

MV-22 AAR-47 Lecture

Goal. The PUI will be familiar with the operation of the MV-22 AAR-47.

Instructor. WTI.

Prerequisites. T2P.

Required Reading - NTRP Ch5, APP F, Classified ANTTP Ch 2.

ACAD-2813 1.0 * B G

ADA Threat to Assault Support Lecture

Goal. The PUI will be familiar with the threat of ADA to assault support.

Instructor. WTI.

Prerequisites. T2P.

Required Reading - AFTTP 3-1 ADA Ch.

ACAD-2814 1.0 * B G

IR SAM Threat to Assault Support Lecture

Goal. The PUI will be familiar with the threat of IR SAMS to assault support.

Instructor. WTI.

Prerequisites. T2P.

Required Reading - AFTTP 3-1 IR SAM Ch.

ACAD-2815 1.0 * B G

RADAR principles

Goal. The PUI will be familiar with radar principles.

Instructor. WTI.

Prerequisites. T2P.

Required Reading – MV-22 NTRP APP G.

ACAD-2816 1.0 * B G

RADAR SAM Threat to Assault Support Lecture

Goal. The PUI will be familiar with the threat of RADAR SAMS to assault support.

Instructor. WTI.

Prerequisites. T2P.

Required Reading - AFTTP 3-1 RADAR SAM Ch.

ACAD-2817 1.0 730 B,R G

MV-22 Ground Threat Reaction Lecture

Goal. The PUI will be familiar with the reaction maneuvers executed by the MV-22 as a result of a ground threats.

Instructor. WTI.

Prerequisites. ACAD-2810-2816.

Required Reading - Classified ANTPP Ch 2.

LAB-2820 0.5 * B,R G

MV-22 Ground Threat Reaction Walk through

Goal. The PUI will have a solid understanding of all GTR maneuvers, inflight CRM, and GTR line numbers prior to inflight execution.

Instructor. WTI.

Prerequisites. ACAD-2817.

Required Reading - ANTPP Appendix A.

SGTR-2830 2.0 * B (NS) S 1 FFS/FTD TEN

Goal. Introduce operation of onboard ASE to include strengths and weaknesses of ASE. Introduce counter-tactics vs ADA, RF and IR threats.

Discuss

Operation of the ALE-47, APR-39, AAR-47.
Strengths and weaknesses of each ASE system vs ADA, RF and IR threat.
CRM as it applies to the use of onboard ASE and threat detection.
Counter-tactics against ADA, RF and IR threats.
All available expendables.
ROC per T&R Program Manual.
GTR training rules.
Threat reaction and escort coordination in the landing environment (in the objective area).

Introduce

Use of all onboard ASE.

Counter-tactics against ADA, RF and IR threats.

Performance Standards

Properly operate all ASE IAW the ANTP.
Employ proper counter-tactics vs ADA, RF and IR threats.

Instructor. WTI.

Prerequisites. LAT-2630, LAB-2820.

SGTR-2831 2.0 365 B,R,M (NS) S 2 FFS/FTD TEN+

Goal. Review operation of onboard ASE to include strengths and weaknesses of ASE vs RADAR SAMs. Introduce defensive tactics vs RADAR and non-RADAR ADA and IR SAMs.

Requirement. Given an ADA, RF and IR threat, the WTI will guide the student through a threat planning problem utilizing the AFTTP 3-1 and produce a threat reaction matrix.

Discuss

CRM as it applies to the defensive maneuvers and threat detection.
Intraflight CRM, interflight CRM, and non-verbal cues to threat react (lead's flares).
Effective fires vs non-effective fires.
ROC per T&R Program Manual.
Threat counter-tactic matrix.
GTR line numbers.

Introduce

Section maneuvering and threat reaction against RADAR and non-RADAR threats.

Review

Counter-tactics against RADAR and non-RADAR threats.

Performance Standards

Properly operate all ASE IAW the ANTP.
Employ proper counter-tactics vs ADA, RF and IR threats.
Demonstrate knowledge of basic RADAR principles.

Instructor. WTI.

Prerequisite. SLAT-2631, SGTR-2830.

GTR-2840 1.5 365 B,R (NS) A 2 MV-22

Goal. Review procedures to counter non-RADAR and RADAR threats with a multi-aircraft flight.

Requirement. Given an ADA, RF and IR threat, the WTI will guide the student through a threat planning problem utilizing the AFTTP 3-1 and produce a threat reaction matrix.

Discuss

Selection of countermeasure programs.
Set-up of ASE to defend against a ground threat.
Threat reaction and post engagement reaction.
SPOT reporting.
Kill chain (susceptibility and vulnerability)
ROE, returning fire.

Review

Section maneuvering and threat reaction against RADAR and non-RADAR threats.

Performance Standards

Execute threat reaction maneuvers IAW the ANTP.

SCQ-2930 1.0 365 B,R D S 1 FFS/FTD

Goal. Practice day CQ pattern and procedures to various Classes of ships.

Requirements

Discuss

Emergency procedures in the shipboard environment (engine failures, nacelle blower failures, fires).
Various patterns around the ship.
Different Case departures and arrivals.
Nacelle control techniques.

Practice

Carrier operation.
 Airplane and conversion mode arrivals.
 Charlie pattern for LHA/LHD and LPD/LSD (minimum of 5 for initial events).
 Communication procedures.
 Lights and light signals.
 LSE signals and procedures.
 Waveoff.
 Departure procedures.
Self-taxi procedures.
STOs.
Pitch-up with side-slip characteristics.
NATOPS shipboard approaches.
High gross weight operations.
Shipboard INS alignment procedures.
Shipboard emergencies (EXDEF failure)
Checklists (interim power and ANTTP take-off cadence).

Performance Standards

Demonstrate proper knowledge of day shipboard procedures IAW the LHA/LHD/MCS NATOPS, and NWP-42.
Maintain pattern parameters within 50 feet, 10 KCAS, and 10 degrees alignment with the BRC.
Maintain proper glideslope/departure profile for NATOPS shipboard approaches.
Maintain proper closure rate during approaches.
Land without unsafe delay within 3 feet of the intended point of landing and within 5 degrees of heading (BRC).

Instructor: BIP.

Prerequisite. SCAL-2230, ACAD-2910, ACAD-2911.

SCQ-2931 1.0 365 B,R NS S 1 FFS/FTD

Goal. Introduce NVD CQ pattern and procedures.

Requirements.

Discuss

Emergency procedures in the shipboard environment (engine failures, nacelle blower failures, fires).

Demonstrate/Introduce

Carrier operations using NVDs.
 Arrival.
 Night landing patterns (minimum of 5 for initials).
 Communication procedures.
 Night shipboard lighting and light signals.
 LSE signals and procedures.
 (Waveoff.
 Departure.
Self-taxi procedures.

STOs.
High gross weight operations.
NATOPS shipboard approaches.

Performance Standards

Demonstrate proper knowledge of day shipboard procedures IAW the LHA/LHD/MCS NATOPS, and NWP-42.
Maintain pattern parameters within 50 feet, 10 KCAS, and 10 degrees alignment with the BRC.
Maintain proper glideslope/departure profile for NATOPS shipboard approaches.
Maintain proper closure rate during approaches.
Land without unsafe delay within 3 feet of the intended point of landing and within 5 degrees of heading (BRC).

Instructor. NSI.

Prerequisites. SNS-2330, SCQ-2930.

Required Reading - MAWTS-1 NVD Manual Ch 17.

CQ-2940 1.5 365 B,R D A 1 MV-22

Goal. Practice day CQ patterns and procedures in a Field Carrier Landing Practice (FCLP) scenario.

Requirements

Discuss

Crewmember duties during CQs.
Any item discussed or introduced on SFCLP-2830.

Practice

Carrier operation.
 Charlie pattern (minimum of 5 for initials).
 Communication procedures.
 Lights and light signals.
 LSE signals and procedures.
 Departure procedures.
Self-taxi procedures.
STOs.
Pitch-up with side-slip characteristics.
High gross weight operations.
NATOPS shipboard approaches.

Performance Standards

Demonstrate proper knowledge of day shipboard procedures IAW the LHA/LHD/MCS NATOPS, and NWP-42.
Maintain pattern parameters within 50 feet, 10 KCAS, and 10 degrees alignment with the BRC.
Maintain proper glideslope/departure profile for NATOPS shipboard approaches.
Maintain proper closure rate during approaches.
Land without unsafe delay within 3 feet of the intended point of landing and within 5 degrees of heading (BRC).

Instructor: BIP.

Prerequisites. CAL-2240, SCQ-2930.

External Syllabus Support. FCLP site.

CQ-2941 1.5 365 B,R D A 1 MV-22

Goal. Day qualification flight.

Requirements

Discuss

Any FCLP discussed/introduced item.
Shipboard instrument procedures.

Review

- Air capable amphibious ship operations.
 - Airplane and conversion mode arrivals.
 - Charlie pattern (minimum of 5 for initial events).
 - Instrument marshalling and recovery.
 - Communication procedures.
 - Lights and light signals.
 - LSE signals and procedures.
 - Departure procedures.
- Self-taxi procedures.
- STOs.
- Pitch-up with side-slip characteristics.
- High gross weight operations.
- NATOPS shipboard approaches.
- Wake interaction with other aircraft.

Performance Standards.

- Demonstrate proper knowledge of day shipboard procedures IAW the LHA/LHD/MCS NATOPS, and NWP-42.
- Maintain pattern parameters within 50 feet, 10 KCAS, and 10 degrees alignment with the BRC.
- Maintain proper glideslope/departure profile for NATOPS shipboard approaches.
- Maintain proper closure rate during approaches.
- Land without unsafe delay within 3 feet of the intended point of landing and within 5 degrees of heading (BRC).

Instructor: BIP.

Prerequisite. CQ-2940.

External Syllabus Support. Landing platform afloat.

CQ-2942	1.5	365	B,R,M	NS	A	1	MV-22
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Goal. Introduce night aided CQ patterns and procedures in a FCLP scenario.

Requirements

Discuss

- Differences and similarities of day and night takeoff and landing techniques.
- Crewmember duties during NVD CQs.
- Any item discussed or introduced on SCQ-301.

Introduce

- Carrier operations using NVDs.
 - Airplane and conversion mode arrivals.
 - Night takeoff/landing patterns (minimum of 5 for initial events).
 - Communication procedures.
 - Night shipboard lighting and light signals peculiar to night operations.
 - LSE signals and procedures.
 - Departure procedures.
- Self-taxi procedures.
- High gross weight operations.
- STOs.
- Pitch-up with side-slip characteristics.
- NATOPS shipboard approaches.

Performance Standards

- Demonstrate proper knowledge of day shipboard procedures IAW the LHA/LHD/MCS NATOPS, and NWP-42.
- Maintain pattern parameters within 50 feet, 10 KCAS, and 10 degrees alignment with the BRC.
- Maintain proper glideslope/departure profile for NATOPS shipboard approaches.
- Maintain proper closure rate during approaches.
- Land without unsafe delay within 3 feet of the intended point of landing and within 5 degrees of heading (BRC).

Instructor. NSI.

Prerequisites. NS-2340, SCQ-2931, CQ-2940.

External Syllabus Support. FCLP site.

CQ-2943	1.5	365	B,R,M	NS	A	1	MV-22
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Goal. NVD qualification flight.

Requirements

Discuss

- Aircraft lighting configurations.
- Deck lighting configurations.
- LSE signals and NVD requirements.
- Voice procedures at night.
- Closure rates and depth perception over water at night.
- Night waveoff signals and procedures.
- Egress peculiar to shipboard operations at night utilizing NVDs.
- Any previously discussed/introduced FCLP/CQ item.

Practice

- Air capable amphibious ship operations.
 - Airplane and conversion mode arrivals.
 - Night landing patterns (minimum of 5 for initial events).
 - Communication procedures.
 - Lights and light signals.
 - LSE signals and procedures.
 - Departure procedures.
- Self-taxi procedures.
- STOs.
- High gross weight operations.
- Pitch-up with side-slip characteristics.
- NATOPS shipboard approaches.

Performance Standards

- Demonstrate proper knowledge of day shipboard procedures IAW the LHA/LHD/MCS NATOPS, and NWP-42.
- Maintain pattern parameters within 50 feet, 10 KCAS, and 10 degrees alignment with the BRC.
- Maintain proper glideslope/departure profile for NATOPS shipboard approaches.
- Maintain proper closure rate during approaches.
- Land without unsafe delay within 3 feet of the intended point of landing and within 5 degrees of heading (BRC).

Instructor. NSI.

Prerequisites. NSQ for appropriate light level, CQ-2941, CQ-2942

External Syllabus Support. Landing platform afloat.

2.10 MISSION SKILL PHASE

2.10.1 Purpose

To establish training designed to enable pilots to achieve proficiency in mission skills. Mission Skills Phase events are designed to fulfill the requirements of the VMM Mission Essential Task List as defined by the associated Marine Corps Task (MCT).

2.10.2 General.

2.10.2.1 Admin Notes.

Events in this phase of training should be based on tactical scenarios designed to focus on the specific items delineated in the different training codes and will be developed by the squadron WTI. To the greatest extent possible the scenarios should incorporate the employment of escort aircraft (fixed or rotary wing), Aircraft Survivability Equipment and use of defensive weapon systems. On certain events, integration with other ACE assets is required. Whenever practical, the use of GCE planners for integrated events will provide added training value.

Discuss items for each event in this stage are designed to be the focus of scenario-based training for planning and execution, not necessarily for discussion during individual cockpit briefs. However, this does not preclude these items from being discussed during cockpit briefs and emphasized during flight.

Specific planning responsibilities should be delegated to PUIs in order to obtain a broad exposure to mission planning. Instructors shall ensure sufficient time is provided to complete all planning tasks.

ROC will be per the T&R Program Manual.

Refer to paragraph 2.16 for the ACPM lectures required for this phase of training. Lectures listed in each stage must be completed in order to successfully complete the stage. However, they can be taught at any time and are not necessarily prerequisites for the simulator or flight events in the stage, unless listed otherwise.

Aircrew shall complete all initial simulator and flight events in this phase of training in accordance with the requirements in the individual event header. Certain initial events are designated to be conducted in the simulator using the Tactical Environment Network. This is to capitalize on the additive weather and threat conditions that the simulator enables; however, this does not preclude those events from being conducted in the aircraft if the proper conditions are achieved.

2.10.2.2 Stages. The following stages are included in the Mission Skill Phase of training in **Error! Reference source not found.8.**

Table 2-38: Mission Skill Phase Overview

Stage Name
AIR LOGISTICS SUPPORT (ALS)
EXPEDITIONARY SHORE-BASED AVIATION OPERATIONS (EXP)
EXPEDITIONARY SEA-BASED AVIATION OPERATIONS (SEA)
TACTICAL RECOVERY OF PERSONNEL AND AIRCRAFT (TRAP)
COMBAT ASSAULT TRANSPORT (CAT)

2.10.3 Air Logistics Support (ALS)

2.10.3.1 Purpose.

To introduce air logistics support planning, briefing and execution specific. This stage of training is designed to fulfill the requirement set in MCT 4.3.8.

Crew Requirement. P/P/CC/AO.

2.10.3.2 ALS Overview. Table 2-39 provides the reference for Mission Skill ALS Overview

Table 2-39: Mission Skill ALS Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-3010	0.5	*	B		G		ALS INTRO AND PLANNING
ALS-3040	2.0	365	B,R,M	(NS)	A	2	ALS MSN

ACAD-3010 0.5 * B G

ALS Introduction and Planning

Goal. The PUI will be familiar with Air Logistics planning and execution.

Prerequisite. T2P. .

ALS-3040 2.0 365 B,R,M (NS) 2 A MV-22

Goal. Conduct air logistics support in a low threat environment.

Instructor. LATI

Prerequisites. NSQ

2.10.4 Expeditionary Shore-Based Aviation Operations (EXP)

2.10.4.1 Purpose.

This stage of training is designed to fulfill the requirement set in MCT 1.3.3.3.2, Conduct Aviation Operations From Expeditionary Shore-Based Sites.

Crew Requirement. P/P/CC/AO.

2.10.4.2 SHORE Overview. **Error! Reference source not found.** provides the reference for Mission Skill EXP Overview.

Table 2-40: Mission Skill EXP Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACPM-8630	1.0	*	B		G		TAC C2
ACPM-8660	1.0	*	B		G		JOINT AIR OPS
ACAD-3110	0.5	*	B		G		ACEOI & TRIAD
EXP-3140	2.0	365	B,R,M	(NS)	A/S	2	GS MSN

ACPM-8630 1.0 * B G

Tactical Airspace Command and Control

Goal. The PUI will be familiar with tactical airspace command and control agencies.

Prerequisite. T2P.

ACPM-8660 1.0 * B, G

Joint Air Operations

Goal. The PUI will be familiar with air operations in a joint environment.

Prerequisite. T2P.

ACAD-3110 0.5 * B G

MV-22 ACEOI and TRIAD Authenticator

Goal. The PUI will be familiar with effectively using an ACEOI and TRIAD authentication.

Instructor: BIP.

Prerequisite. T2P. .

EXP-3140 2.0 365 B, R,M (NS) 2 A/S MV-22

Goal. Conduct assault support in a low threat environment from an expeditionary shore-based site.

Instructor: LATI.

Prerequisites. NSQ, MAT

Required Reading - ANTTP Chapters 8 & 13.

2.10.5 Expeditionary Sea-Based Aviation Operations (SEA)

2.10.5.1 Purpose

This stage of training is designed to fulfill the requirement set in MCT 1.3.3.3.1, Conduct Aviation Operations From Expeditionary Sea-Based Sites.

Crew Requirement. P/P/CC/AO.

2.10.5.2 SEA Overview. **Error! Reference source not found.** provides the reference for Mission Skill SEA Overview

Table 2-41: Mission Skill SEA Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACPM-8350	0.8	*	B,		G		PHASING CONTROL ASHORE
ACPM-8351	0.5	*	B,		G		TACRON ORG AND FUNCTION
ACPM-8620	0.5	*	B,		G		ESG/CSG INTEGRATION
ACAD-3210	1.0	*	B,		G		SHIPBOARD OPERATIONS PLANNING
ACAD-3211	1.0	*	B		G		R2P2
SEA-3240	2.0	365	B,R,M	(NS)	A/S	2	SHIP TO SHORE MSN

ACPM-8350 0.8 * B, G

Phasing Control Ashore

Goal. The PUI will have an understanding of how to Phase Control Ashore.

Prerequisite. T2P.

ACPM-8351 0.5 * B, G

TACRON Organization and Functions

Goal. The PUI will have an understanding of the organization of the TACRON and its Functions.

Prerequisite. T2P.

ACPM-8620 0.5 * B, G

ESG/CSG Integration

Goal. The PUI will have an understanding of the integration between the ESG and CSG.

Prerequisite. T2P.

ACAD-3210 0.5 * B G

Shipboard Operations Planning

Goal. The PUI will have an understanding of operations planning afloat.

Prerequisite. T2P.

ACAD-3211 1.0 * B G

R2P2

Goal. The PUI will have an understanding of the Rapid Response Planning Process.

Instructor: WTI.

Prerequisite. T2P.

SEA-3140 2.0 365 B, R,M (NS) 2 A/S MV-22

Goal. Conduct assault support in a low threat environment from an expeditionary sea-based site.

Instructor: LATI.

Prerequisites. NSQ, CQ-2943

Required Reading. ANTPP Chapters 8 & 13.

2.10.6 Tactical Recovery of Aircraft and Personnel (TRAP)

2.10.6.1 Purpose.

To introduce tactical mission planning, briefing, and execution specific to TRAP. This stage of training is designed to fulfill the requirement set in MCT 6.2.1.1 Conduct Aviation Support of Tactical Recovery of Aircraft and Personnel (TRAP).

Crew Requirement. P/P/CC/AO.

2.10.6.2 TRAP Overview. Table 2-42 provides the reference for Mission Skill TRAP Overview

Table 2-42: Mission Skill TRAP Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-3310	4.0	*	B		G		JKO PR102
ACAD-3311	1.0	*	B		G		TRAP TTPS
TRAP-3330	2.0	365	B,R,M	(NS)	A	2	TRAP MISSION

ACAD-3310 (PR-102) 4.0 * B G

Joint Personnel Recovery

Goal. The PUI will be familiar with Joint Personnel Recovery. This course requirement is met upon successful completion of PR 102 located on Joint Knowledge Online (JKO).

Prerequisite. T2P.

Required Reading – JP 3-50.

ACAD-3311 1.0 * B G

TRAP TTPs

Goal. The PUI will be familiar with MV-22 TRAP TTPs.

Instructor: LATI.

Prerequisite. T2P.

Required Reading - ANTTP 8.7.

TRAP-3340 2.0 365 B,R,M (NS) A 2 MV-22

Goal. Introduce a tactical recovery of aircraft or personnel mission.

Requirements. Given a TRAP scenario, conduct appropriate mission planning. Assume the appropriate alert posture, and execute a TRAP mission.

Discuss

TRAP mission analysis.
Threat analysis.
ASTACSOP TRAP Template.
Alert postures.
Tactical route planning considerations.
Use of onboard navigation systems.
Use of ASE in a medium threat environment.
CRM during ingress, objective area actions, and egress.

Introduce

Tactical planning, briefing, and execution of a TRAP mission. The PUI will assist in the planning and conduct of the tactical brief.

Performance Standards

Develop briefing and execution documents IAW ANTTP, ASTACSOP, and squadron SOP.
Maintain situational awareness relative to friendly and enemy situation and mission progress.

Select an appropriate ASE configuration relative to the briefed threat.
Develop an integrated Landing Plan that supports the Ground Tactical Plan.
Develop an Objective Area Diagram that integrates a Fire Support and Escort Plan that support the Landing Plan and Ground Tactical Plan.
Develop an Air Movement Plan relative to the briefed threat and maintain appropriate formation and tactics.
Maximize useful load / allowable combat load in order to maximize the Ground Tactical Plan.
Land within 0.03 nm of intended point of landing.
Execute assigned contingencies IAW Air Mission Brief and Flight Leader direction.

Instructor. LATI.

Prerequisites. NSQ, LATQ, GTR-2840.

Ordnance. 600 7.62, 40 chaff, 50 flares.

Range. Aerial gunnery and expendable capable range.

External Syllabus Support. Aircraft to perform OSC, RESCORT/RESCAP, approved LZ.

2.10.7 **Combat Assault Transport (CAT)**

2.10.7.1 Purpose.

To introduce day and night combat assault transport tactical mission planning, briefing, and execution. This stage of training is designed to fulfill the requirement set in MCT 1.3.4.1, Conduct Combat Assault Transport.

2.10.7.2 Admin Note.

For SCAT-3431, role players in the TEN may be utilized to represent the second and fourth aircraft if training resources are not available.

Crew Requirement. P/P/CC/AO

2.10.7.3 CAT Overview. **Error! Reference source not found.**3 provides the reference for Mission Skill CAT Overview.

Table 2-43: Mission Skill CAT Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-3410	1.0	*	B,		G		PLANNING PRODUCTS
ACAD-3411	1.0	*	B,		G		AIR ASSAULT OPS
ACAD-3412	1.0	*	B,		G		AIR ASSAULT KEY PLYRS
ACAD-3413	1.0	*	B,		G		OBJ AREA PLANNING
ACAD-3414	1.0	*	B,		G		TILTROTOR ESCORT
ACAD-3415	1.0	*	B,		G		NEO EXECUTION
ACAD-3416	1.0	*	B		G		CASEVAC
LAB-3420	6.0	*	B		G		AS PLANNING PROB
SCAT-3430	3.0	365	B,R,M	(NS)	S/A	2	NEO MSN
SCAT-3431	3.0	365	BR	NS	S/A	3	MED THRT DIV
CAT-3440	2.0	365	B,R	NS	A	2	LOW THREAT SEC
CAT-3441	2.0	365	B,R,M	(NS)	A	2	ESCORT SEC

ACAD-3410 1.0 * B G

Air Assault Planning Products

Goal. The PUI will have a familiarity with the Assault Support mission planning process and associated products planning and execution.

Instructor. WTI.

Prerequisite. T2P.

Required Reading – ANTTP Ch. 8.

ACAD-3411 1.0 * B G

Air Assault Operations

Goal. The PUI will have a familiarity with Air Assault Operations.

Instructor: WTI.

Prerequisite. T2P.

Required Reading – How to plan a heloborne assault, ANTTP Ch. 8.

ACAD-3412 1.0 * B G

Air Assault Key Players

Goal. The PUI will have a familiarity with Air Assault Key Players.

Instructor: WTI.

Prerequisite. T2P.

Required Reading – ANTTP Ch. 8.

ACAD-3413 1.0 * B G

Objective Area Planning

Goal. The PUI will have a familiarity with Objective Area planning.

Instructor: WTI.

Prerequisite. T2P.

Required Reading – ANTTP Ch.8

ACAD-3414 1.0 * B G

MV-22 Tiltrotor Escort Tactics

Goal. The PUI will have a familiarity with Tiltrotor Escort Tactics.

Instructor: WTI.

Prerequisite. T2P.

Required Reading - ANTTP.

ACAD-3415 1.0 * B G

NEO Execution

Goal. The PUI will have a familiarity with the planning and execution of a NEO mission.

Instructor: WTI.

Prerequisite. ACAD-3410, 3411, 3412, 3413, 3414.

Required Reading – ANTTP Ch.8.

ACAD-3416 1.0 * B G

CASEVAC

Goal. The PUI will have a familiarity with CASEVAC planning and execution.

Instructor: WTI.

Prerequisite. T2P.

Required Reading – ANTTP Ch.8.

LAB-3420 6.0 * B G

Assault Support Planning Problem

Goal. Given an Assault Support mission problem, the PUI will conduct Problem Framing, Mission Analysis and Assault Support Mission Planning, with particular emphasis on integrating the Landing Plan with the Ground Tactical Plan and developing an Air Movement Plan appropriate to the threat, while developing the appropriate briefing and execution support documents. Instructors should also focus on initial estimates of support.

Instructor: WTI.

Prerequisite. ACAD-3211, 3410-3414, 3416.

Required Reading – ANTTP Ch.8.

SCAT-3430 2.0 365 B,R,M (NS) S/A 2 FFS/FTD TEN+

Goal. Introduce a NEO mission in a low threat environment utilizing a section.

Requirements. Given a NEO mission, the PUI will conduct mission analysis and planning, assisting in the development of the Landing Plan, Air Movement Plan, Loading and Staging Plan, while developing appropriate briefing and execution documents.

Discuss

Integration of Landing Plan with Ground Tactical Plan.
Development of Objective Area Diagram through integration of Fire Support Plan with Landing Plan.
Development of Air Movement Plan relative to threat, to include attached and detached escort utilization.
Development of efficient Loading Plan.
Command and Control of Air Assault operations.
Utilization of JMPS to create appropriate threat files.
Mission GO/NO-GO criteria.
LZ Criteria and considerations.
Extract considerations.
Communications Plan.
Execution Checklist.

Introduce

Mission Analysis.
Developing a Landing Plan.
Developing a low threat Air Movement Plan.
Developing a Loading Plan.
Developing appropriate contingency plans.
Developing Communications Plan.
Developing Execution Checklist.
Creating briefing and execution documents
NEO Mission Briefing.
Threat analysis and ASE optimization.

Performance Standards

Develop briefing and execution documents IAW ANTTP, ASTACSOP, and squadron SOP.
Maintain situational awareness relative to friendly and enemy situation and mission progress.
Develop an Air Movement Plan relative to the briefed threat.
Maximize useful load in order to maximize the Ground Tactical Plan.
Maintain appropriate formation and tactics during the Air Movement Plan.
Land within 0.03 nm of intended point of landing and 30 seconds of L-Hour.
Execute assigned contingencies IAW Air Mission Brief and Flight Leader direction.

Instructor. LATI.

Prerequisites. TG-2541, DIV-2783, ACAD-3415, LAB-3420, NQS, GTR-2840.

SCAT-3431 3.0 365 B,R NS S/A 3 FFS/FTD TEN+

Goal. Introduce an Air Assault mission in a medium threat environment utilizing a division.

Requirements. Given a Battalion Air Assault Task Force and associated mission, the PUI will conduct mission analysis and planning, assisting in the development of the Landing Plan, Air Movement Plan, Loading and Staging Plan, while developing appropriate briefing and execution documents.

Discuss

Definition of low and medium threat.
Integration of Landing Plan with Ground Tactical Plan.
Development of Objective Area Diagram through integration of Fire Support Plan with Landing Plan.
Development of Air Movement Plan relative to threat, to include attached and detached escort utilization.
FARP Planning.
Utilization of JMPS to create appropriate threat files.
Sectors of fire.
Rules of engagement.
Casualty Evacuation.
Downed Aircraft/Asset Attrition.
Resupply via Air Delivery.
ASE planning and utilization.
Comm Degradation vs Chattermark.
Emissions Control Conditions.

Introduce

Air Assault mission planning.
Mission Analysis.
Developing a Landing Plan.
Developing an Objective Area Diagram to include Fire Support Plan, Escorts, and Sectors of fire.
Developing a medium threat Air Movement Plan.
Developing a Loading Plan.
Developing appropriate contingency plans.
Developing ASLT.
Developing ASSAT.
Developing Communications Plan.
Developing Execution Checklist.
Creating briefing and execution documents.
Air Assault Mission Briefing.
Threat analysis and ASE optimization.

Performance Standards

Develop briefing and execution documents IAW ANTP, ASTACSOP, and squadron SOP.
Maintain situational awareness relative to friendly and enemy situation and mission progress.
Select an appropriate ASE configuration relative to the briefed threat.
Develop an integrated Landing Plan that supports the Ground Tactical Plan.
Develop an Objective Area Diagram that integrates a Fire Support and Escort Plan that support the Landing Plan and Ground Tactical Plan.
Develop an Air Movement Plan relative to the briefed threat and maintain appropriate formation and tactics.
Maximize useful load / allowable combat load in order to maximize the Ground Tactical Plan.
Land within 0.03 nm of intended point of landing and 30 seconds of L-Hour.
Execute assigned contingencies IAW Air Mission Brief and Flight Leader direction.

Instructor. LATI.

Prerequisites. TG-2541, DIV-2783, DIV-2784, LAB-3420, NSQ, LATQ, GTR-2840.

CAT-3440 2.0 365 B,R NS A 2 MV-22

Goal. Introduce an urban long range Air Assault Raid mission in a low threat environment utilizing a section.

Requirements. Given a Platoon (REIN) Air Assault Task Force and associated mission, the PUI will conduct mission analysis and planning, assisting in the development of the Landing Plan, Air Movement Plan, Loading and Staging Plan, while developing appropriate briefing and execution documents.

Discuss

- Air Assault Raid considerations.
- Landing to X, Y, Offset.
- En route Air to Air refueling.
- Aviation operations in an urban environment.
- Integration of Landing Plan with Ground Tactical Plan.
- Development of Objective Area Diagram through integration of Fire Support Plan with Landing Plan.
- Development of Air Movement Plan relative to threat, to include attached and detached escort utilization.
- Extract considerations.

Introduce

- En route Air to Air Refueling.
- Aviation operations in an urban area.

Review

- Air Assault mission planning.
- Mission Analysis.
- Developing a Landing Plan.
- Developing an Objective Area Diagram to include Fire Support Plan, Escorts, and Sectors of fire.
- Developing a medium threat Air Movement Plan.
- Developing a Loading Plan.
- Developing appropriate contingency plans.
- Developing ASLT.
- Developing ASSAT.
- Developing Communications Plan.
- Developing Execution Checklist.
- Creating briefing and execution documents.
- Air Assault Mission Briefing.
- Threat analysis and ASE optimization.

Performance Standards

- Develop briefing and execution documents IAW ANTP, ASTACSOP, and squadron SOP.
- Maintain situational awareness relative to friendly and enemy situation and mission progress.
- Select an appropriate ASE configuration relative to the briefed threat.
- Develop an integrated Landing Plan that supports the Ground Tactical Plan.
- Develop an Objective Area Diagram that integrates a Fire Support and Escort Plan that support the Landing Plan and Ground Tactical Plan.
- Develop an Air Movement Plan relative to the briefed threat and maintain appropriate formation and tactics.
- Maximize useful load / allowable combat load in order to maximize the Ground Tactical Plan.
- Land within 0.03 nm of intended point of landing and 30 seconds of L-Hour.
- Execute assigned contingencies IAW Air Mission Brief and Flight Leader direction.

Instructor. LATI.

Prerequisites. TG-2541, LAB-3420, NSQ, LATQ, GTR-2840.

CAT-3441 2.0 365 B,R,M (NS) A 2 MV-22

Goal. Introduce an Air Assault mission incorporating escorts, troops, and fire support agencies.

Requirements. Given an Air Assault mission, the PUI will conduct mission analysis and planning, assisting in the development of the Landing Plan, Air Movement Plan, Loading and Staging Plan, while developing appropriate briefing and execution documents.

Discuss

- Utilization of JMPS to create .DRW files relative to FSCMs and ACAs.

Sectors of fire.
LZ Criteria and considerations.
Downed Aircraft / Asset Attrition.
Communications Plan.
Execution Checklist.
Comm Degradation vs Chattermark.

Introduce

Air Assault mission planning.
Mission Analysis.
Developing a Landing Plan.
Developing an Objective Area Diagram to include Fire Support Plan, Escorts, and Sectors of fire.
Developing a medium threat Air Movement Plan.
Developing a Loading Plan.
Developing appropriate contingency plans.
Developing ASLT.
Developing ASSAT.
Developing Communications Plan.
Developing Execution Checklist.
Creating briefing and execution documents.
Air Assault Mission Briefing.
Threat analysis and ASE optimization.

Performance Standards

Develop briefing and execution documents IAW ANTTP, ASTACSOP, and squadron SOP.
Maintain situational awareness relative to friendly and enemy situation and mission progress.
Select an appropriate ASE configuration relative to the briefed threat.
Develop an integrated Landing Plan that supports the Ground Tactical Plan.
Develop an Objective Area Diagram that integrates a Fire Support and Escort Plan that support the Landing Plan and Ground Tactical Plan.
Develop an Air Movement Plan relative to the briefed threat and maintain appropriate formation and tactics.
Maximize useful load / allowable combat load in order to maximize the Ground Tactical Plan.
Land within 0.03 nm of intended point of landing and 30 seconds of L-Hour.
Execute assigned contingencies IAW Air Mission Brief and Flight Leader direction.

Instructor. LATI.

Prerequisites. TG-2541, LAB-3420, NSQ, LATQ, GTR-2840.

Ordnance. 600 7.62, 40 chaff, 50 flares.

Range. Aerial gunnery and expendable capable range.

External Syllabus Support. Approved LZ.

2.11 CORE PLUS SKILL PHASE

2.11.1 Purpose.

To establish training for Core Plus Skill (theater specific, low-probability of occurrence) events.

2.11.2 General.

ROC will be per the T&R Program Manual.

Pilots may fly night flights using NVDs in this level under HLL or LLL conditions provided they are NSQ for that light level.

Prior to training in this phase a pilot should be complete with core skills training.

2.11.3 Stages.

The Core Plus Skill Phase of training is defined below on Table 2-44.

Table 2-44: Core Plus Skill Phase Matrix

Stage Name
AIR DELIVERY (AD)
ALTERNATE INSERTION/EXTRACTION TECHNIQUES (A/E)
MOUNTAINOUS AREA TRAINING (MAT)
DEFENSIVE WEAPON SYSTEM (DWS)
DEFENSIVE COMBAT MANEUVERS (DCM)
CHEMICAL, BIOLOGICAL, RADIOLOGICAL AND NUCLEAR (CBRN)
CARRIER QUALIFICATION (CQ)
COMBAT ASSAULT TRANSPORT (HTT)
RAPID INSERTION/EXTRACTION (R/E)
AVIATION DELIVERED GROUND REFUELING (ADGR)
AVIATION-DELIVERED BATTLEFIELD ILLUMINATION (BI)
AIR DELIVERY (AD)
AIRBORNE COMMAND AND CONTROL (AC2)

2.11.4 Air Delivery (AD)

2.11.4.1 Purpose.

To develop proficiency in personnel parachute operations (PARAOPS), air delivery of cargo, and day/NVD external load operations from confined areas.

2.11.4.2 General

All maneuver descriptions are in the MV-22 ANTPP.

An NSI is required for initial NVD external events.

Crew Requirements. P/P/CC/AO for aircraft events and P/P for simulators.

2.11.4.3 AD Overview. Table 2-45 provides the reference for Core Plus Skill AD Overview

Table 2-45: Core Plus Skill AD Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-4010	1.0	*	B		G		
SAD-4030	2.0	365	B,R	(NS)	S	1	FFS/FTD
PARA-4040	1.5	365	B,R,M	(NS)	A	1	MV-22
AD-4041	1.5	365	B,R,M	(NS)	A	1	MV-22
SEXT-4070	2.0	*	B	D/NS	S	1	FFS/FTD
EXT-4081	1.5	365	B,R	D	A	1	MV-22
EXT-4083	1.5	365	B,R,M	NS	A	1	MV-22

ACAD-4010 1.0 * B G

MV-22 Air Delivery - PARAOPS

Goal. The PUI will have an introductory knowledge of procedures to execute air delivery of cargo and PARAOPS from the MV-22.

Instructor: BIP.

Prerequisites. T2P.

Required Reading. Cargo Handling Manual (CLG), NTRP Ch 7, ANTPP Ch 10, AFI 11-231: Parachute Ballistic Data.

SAD-4030 2.0 365 B,R (NS) S 1 FFS/FTD

Goal. Introduce air delivery of cargo procedures and PARAOPS procedures.

Requirement. Using mission planning software, prepare multiple computed air release points (CARPs) for Container Delivery System (CDS), door bundle delivery profiles, and PARAOPS.

Discuss

Mission planning software and applicable AD CMS capabilities.
CRM during air deliveries to include TPG AD checklist.
Standard terminology during air delivery.
Tactical considerations for air delivery.
Proper rigging and preflight of equipment to be inserted by air delivery.
Drop Zone survey.
Mission planning coordination.
CRM during PARAOPS (aircrew / jumpmaster responsibilities).
Voice communication/standard terminology during PARAOPS.
Tactical considerations for air delivery of troops.
MV-22 TPG air delivery briefing guide.
AD mission planning software.
Procedures for achieving TOT.

Introduce

Use of TPG AD checklist.
Air delivery of door bundles.
Air delivery of CDS.
AD flight profiles.
AD Emergency procedures.
PARAOPS.
Inspection of static line.
AD formations.

Performance Standards

Execute air delivery procedures IAW the references.
Demonstrate proper CRM during air delivery operations.
Airspeed within 5 kts.
Altitude within 50 ft.
Aircraft at release point within 30 sec of TOT.
Release command given within 2 sec of arriving at release point.
Execute PARAOPS procedures IAW the MV-22 ANTPP.
Demonstrate proper crew coordination during PARAOPS operations.

Instructor: BIP

Prerequisites. ACAD-4010

PARA-4040 1.5 365 B,R,M (NS) A 1 MV-22

Goal. Review PARAOPS procedures.

Requirement.

Discuss

CRM during PARAOPS (aircrew / jumpmaster responsibilities).
Voice communication/standard terminology during PARAOPS.
Tactical considerations for air delivery of troops.
MV-22 TPG air delivery briefing guide.

AD mission planning software.
Procedures for achieving TOT.

Review

PARAOPS.
Inspection of static line.
AD formations.

Performance Standards

Execute PARAOPS procedures IAW the MV-22 ANTP.
Demonstrate proper crew coordination during PARAOPS operations.

Instructor. BIP

Prerequisites. SAD-4030.

Range. Certified Drop Zone.

External Syllabus Support. Jumpmaster, qualified troops.

AD-4041	1.5	365	B,R,M	(NS)	A	1	MV-22
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Goal. Review air delivery of cargo procedures.

Requirement. Using mission planning software prepare computed air release point(s) (CARPs) for planned load and drop zone.

Discuss

Mission planning software and applicable AD CMS capabilities.
CRM during air deliveries to include TPG AD checklist.
Standard terminology during air delivery.
Tactical considerations for air delivery.
Proper rigging and preflight of equipment to be inserted by air delivery.
Drop Zone survey.
Mission planning coordination.

Review

Use of TPG AD checklist.
Air delivery of cargo.
AD flight profiles.

Performance Standards

Execute air delivery procedures IAW the references
Demonstrate proper CRM during air delivery operations
Airspeed within 5 kts
Altitude within 50 ft
Aircraft at release point within 30 sec of TOT
Release command given within 2 sec of arriving at release point
Cargo impact within DZ boundaries.

Instructor. BIP

Prerequisites. SAD-4030.

Range. Certified drop zone.

External Syllabus Support. Air Delivery Platoon, appropriate cargo load.

SEXT-4070	2.0	*	B	D/NS	S	1	FFS/FTD
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Goal. Introduce day and NVD external load hook-ups and drops to a confined area (conversion and airplane modes).

Requirement.

Discuss

- NVD considerations during external lift operations.
- Use of the FLIR to monitor the load.
- NVD emergencies with external load.
- Performance considerations to include the effect of wind on hover mast torque required.
- Load stability.
- CMS monitoring during flight.
- Hook release system.
- H/V diagram.
- External pattern.
- External load rigging.
- Landing zone marking.
- Emergencies: Cargo jettison criteria and procedures, emergency procedures with external loads, loss of ICS.

Demonstrate/Introduce

- Power Checks.
- Approach to pick up zone.
- Single or dual point cargo hookup.
- Approach and cargo release procedures.
- Wave-off with external load.
- Departure from pickup zone.
- Transition to APLN mode at least once with external.
- Use of FLIR.

Performance Standards

Conduct all maneuvers IAW MV-22 ANTTP.
Successfully conduct 5 single point hookups and releases.
Recognize indications, execute memorized items, exercise proper crew coordination, and maintain control of the aircraft during simulated emergency procedures.

Instructor. BIP

Prerequisites. SNS-2330.

Required Reading - NATOPS 9.4, ANTTP Ch 9, MAWTS-1 NVD Manual Ch 14.

EXT-4080	1.5	365	B,R	D	A	1	MV-22
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Goal. Review single point and/or dual point external load hook-ups and drops to a confined area.

Requirement.

Discuss

- Crew responsibilities and communications during external operations.
- Aircraft hook release systems. Hook preflight and checks.
- Approach to LZ. Downwash, static electricity, FOD, and precision hover.
- Cargo hook-up procedures and heading control.
- Power checks, switchology, and HST brief.
- HST composition, functions, and signals.
- HST safety brief.
- Power settling.
- Pilot induced oscillations.
- Reduced visibility conditions.
- Terrain/obstacle clearance.
- Inadvertent IMC procedures.
- Aircraft emergencies with external load (flight control system failures).
- Tactical considerations during external lift operations.
- Aerodynamic characteristics of external loads.
- Light and heavy external load considerations.

Review

External load hook-ups and drops to a confined area (minimum of 5 for initial events).
Waveoff with external load.

Performance Standards

Execute proper external procedures IAW the ANTTTP.
Demonstrate proper ICS terminology during external operations.
Place the load within 10 meters of desired location.

Instructor. BIP

Prerequisites. CAL-2240, SEXT-4070.

External Syllabus Support. External load, HS approved LZ with 7nm of protected airspace to 1000' AGL.

EXT-4083	1.5	365	B,R,M	NS	A	1	MV-22
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Goal. Review single point external cargo operations at night using NVDs.

Requirement

Discuss

Any previously introduced EXT stage item.
Performance charts and JMPS considerations.
MAWTS-1 NVD Manual Ch 15.
Aircraft and landing zone lighting.
Aircraft emergencies with external load (Cargo hook fault caution, auto jettison not active caution, any previously discussed EP).

Review

Identifying the zone and load using NVDs.
External load hook-ups and drops to a confined area (minimum of 5 for initial events).
Power checks.

Performance Standards

Execute proper NVD external procedures IAW the ANTTTP.
Demonstrate proper ICS terminology during external operations.
Place load within 10 meters of desired location.

Instructor. NSI.

Prerequisites. HLL-2340, LLL-2380 (if flown LLL), EXT-4081.

External Syllabus Support. External load, HS approved LZ with 7nm of protected airspace to 1000' AGL.

2.11.5 Alternate Insertion/Extraction Techniques (AI/E)

2.11.5.1 Purpose

To develop proficiency in tiltrotor alternate insertion and extraction techniques and procedures.

2.11.5.2 General

Initial AIE-4140 through AIE-4143 shall be conducted during the day. Subsequent execution of AIE-4140 through AIE-4143 may be conducted at night. Pilots shall be NSQ for the appropriate light level if conducting AIE-4140 through AIE-4143 using NVDs.

Crew Requirement. P/P/CC/AO.

2.11.5.3 AI/E Overview. Table 2-46 provides the reference for Core Plus Skill AI/E Overview

Table 2-46: Core Plus Skill A/E Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-4110	0.5	*	B		G		
ACAD-4111	0.5	*	B		G		
ACAD-4112	0.5	*	B		G		
AIE-4140	1.5	365	B,R,M	(NS)	A	1	MV-22
AIE-4141	1.5	365	B,R,M	(NS)	A	1	MV-22
AIE-4142	1.5	365	B,R,M	(NS)	A	1	MV-22
AIE-4143	1.5	365	B,R,M	(NS)	A	1	MV-22

ACAD-4110 0.5 * B G

Fastrope, Rappel, SPIE Operations

Goal. The PUI will have an introductory knowledge of procedures to execute Fastrope, Rappel, and SPIE operations from the MV-22.

Instructor: BIP.

Prerequisite. T2P.

Required Reading - NATOPS 9.7 - 9.8, ANTTP Ch 11.1 - 11.5, 11.7, NTRP 8.2 - 8.4

ACAD-4111 0.5 * B G

Helocast Operations

Goal. The PUI will have an introductory knowledge of procedures to execute Helocast from the MV-22.

Instructor: BIP.

Prerequisite. T2P.

Required Reading - ANTTP 11.6.

ACAD-4112 0.5 * B G

Hoist Operations

Goal. The PUI will have an introductory knowledge of procedures to execute hoist operations from the MV-22.

Instructor: BIP.

Prerequisite. T2P.

Required Reading - ANTTP 11.7, NTRP 8.6.

AIE-4140 1.5 365 B,R,M (NS) A 1 MV-22

Goal. Introduce insertion procedures via fast rope and rappel.

Requirement

Discuss

- HIGE/HOGE requirements.
- Pilot flying, pilot monitoring, and crew chief duties.
- RST brief.
- Voice communication/standard terminology.
- ICS failure/hand and arm signals.
- Current Force Order/Wing SOP.
- Obstacle clearance/wave-off.
- Emergency procedures: Engine failure, uncommanded nacelle movement, nacelle blower failure.
- Coupled mode operation.

Introduce

- Preflight of fast rope/rappel rigging.

Skills involved for holding an extended hover.
Troop insertion via fast rope/rappelling.

Performance Standards

Maintain stable hover when deploying troops.
Execute proper AIE procedures IAW the MV-22 ANTTP.
Maintain obstacle clearance.

Instructor: BIP.

Prerequisites. SEXT-4070, ACAD 4110.

External Syllabus Support. HRST Master, qualified troops.

AIE-4141	1.5	365	B,R,M	(NS)	A	1	MV-22
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Goal. Introduce insertion and extraction procedures via hoisting.

Requirement

Discuss

HIGE/HOGE requirements.
Pilot flying, pilot monitoring, and crew chief duties.
Voice communication/standard terminology.
ICS failure/hand and arm signals.
Obstacle clearance/wave-off.
Hoist system operation.
Emergency procedures: Engine failure, uncommanded nacelle movement, nacelle blower failure.
Coupled mode operation.
SAR patterns and over-water hoisting operations.

Introduce

Preflight of hoist system.
Skills involved for holding an extended hover.
Troop insertion via hoisting.
Extraction via hoist

Performance Standards

Maintain stable hover when deploying troops.
Execute proper AIE procedures IAW the MV-22 ANTTP.
Maintain obstacle clearance.

Instructor: BIP.

Prerequisites. SEXT-4070, ACAD 4112.

AIE-4142	1.5	365	B,R,M	(NS)	A	1	MV-22
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Goal. Introduce conduct of SPIE.

Requirement

Discuss

HIGE/HOGE requirements.
CRM. Pilots, crew chief, RST Master and RST Safety Observer brief together.
Voice communication/standard terminology.
ICS failures/hand and arm signals.
Current Force Order/Wing SOP.
Obstacle clearance.
Emergency procedures.

Introduce

Inspection of SPIE Rig.
Skills involved for holding extended hover.
Troop insertion/extraction via SPIE Rig.

Performance Standards

Maintain stable hover when extracting/inserting troops.
Execute proper SPIE procedures IAW the MV-22 ANTP.

Instructor: BIP.

Prerequisites. SEXT-4070, ACAD-4110.

External Syllabus Support. HRST Master, qualified troops.

AIE-4143 1.5 365 B,R,M (NS) A 1 MV-22

Goal. Introduce aerial insertion of troops and equipment via helo cast and/or soft duck (deflated rubber boat).

Requirement

Discuss

CRM while performing helo cast or soft duck.
Proper rigging and preflight of equipment to be inserted via helo cast and soft duck.
Low altitude aircraft emergencies over water.
Ditching/water landing.
Salt encrustation/compressor stall
Helo cast/soft duck air delivery altitudes and airspeeds.
Voice communications/standard terminology.
Flight Director search patterns.

Introduce

Insertion of troops and equipment by helo cast or soft duck.
Preflight of aircraft, troops and equipment for helo cast or soft duck.
SAR patterns and over-water hoisting operations.

Performance Standards

Execute helo cast or soft duck procedures IAW the MV-22 ANTP.
Demonstrate proper crew coordination during helo cast or soft duck operations.

Instructor: BIP.

Prerequisite. SRVL-2280, SRVL-2281ACAD-4111.

External Syllabus Support. Castmaster, qualified troops.

2.11.6 Mountain Area Training (MAT)

2.11.6.1 Purpose.

To develop proficiency in day and NVD mountainous terrain operations. Aircraft landings shall be conducted at zones above 6000' DA and where mountainous terrain is a significant factor.

2.11.6.2 General.

All maneuver descriptions are in the ANTP.

Crew Requirements. P/P/CC/AO.

2.11.6.3 MAT Overview. Table 2-47 provides the reference for Core Skill MAT Overview

Table 2-47: Core Plus Skill MAT Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
MAT-4180	1.5	365	B,R	D	A	1	MV-22
MAT-4181	1.5	365	B,R,M	NS	A	1	MV-22

MAT-4180 **1.5** **365** **B,R** **D** **A** **1** **MV-22**

Goal. Review operations and landings in mountainous terrain.

Requirement. Conduct performance calculations to include a TOLD card for planned landing site.

Discuss

Aircraft performance at higher density altitudes.
Any previously discussed MAT item.

Review

Mountainous area operations.
Pinnacle landings.
Slope landings.
Landings and operations in valleys and canyons.
Crosswind landings.

Performance Standards

Execute proper MAT procedures IAW the ANTTP.
Execute up-slope/down-slope and cross-slope landings.
Properly calculate power available and power required for high altitude LZs.
Land within 0.03 nm of intended landing point.

Instructor: BIP.

Prerequisites. SMAT-2730.

MAT-4181 **1.5** **365** **B,R,M** **NS** **A** **1** **MV-22**

Goal. Review NS operations and landings in mountainous terrain.

Requirement. Conduct performance calculations to include a TOLD card for planned landing site.

Discuss

Aircraft performance at higher density altitudes.
Any previously discussed MAT item.

Review

NVD mountainous terrain operations.
NVD CALs in mountainous areas.

Performance Standards

Execute proper NVD MAT procedures IAW the ANTTP.
Execute up-slope/down-slope and cross-slope NVD landings.
Properly calculate power available and power required for high altitude LZs.
Land within 0.03 nm of intended landing point.

Instructor: NSI

Prerequisites. HLL~HLL-2340, LLL~LLL-2380, LLL-2381, SMAT-2731, MAT-4180.

2.11.7 Defensive Weapon System (DWS)

2.11.7.1 Purpose.

To develop the ability to control the employment of the MV-22 Defensive Weapon System (DWS) to deliver accurate air-to-ground fire and provide defensive fire on targets of opportunity.

2.11.7.2 General.

At the completion of this stage, the PUI will have demonstrated the ability to control the employment of the MV-22 Defensive Weapon System from a hover, approaching the landing zone, departing the landing zone and enroute to the

landing zone. Initial DWS-4336 event shall be done as a section, proficiency can then be maintained as a single aircraft event.

Crew Requirements. P/P/CC/CC/AO.

2.11.7.3 DWS Overview. Table 2-48 provides the reference for Core Plus Skill DWS Overview

Table 2-48: Core Plus Skill DWS Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-4210	1.0	*	B		G		
LAB-4220	1.0	*	B		G		DWS PTT
LAB-4221	1.0	*	B		A	1	MV-22
DWS-4242	1.5	365	B,R	D	A	1+	MV-22
DWS-4245	1.5	365	B,R,M	NS	A	2	MV-22

ACAD-4210 1.0 * B G

DWS Familiarization Lecture

Goal. The PUI will have a familiarity with the components, characteristics, and operation of the Defensive Weapon System (DWS).

Instructor: DWSI.

Prerequisites. T2P.

Required reading - ANTTP CH 7, NTRP 1.5, BAE Systems DWS Technical and Flight Manual.

LAB-4220 1.0 * B G DWS PTT

DWS CRM and Procedures Familiarization

Goal. To introduce pilot and gunner CRM and procedures associated with the DWS using the desktop simulator.

Requirement

Discuss

- CRM.
- DWS positions.
- Target talk-on techniques.
- Weapons conditions.
- Weapons commands.
- Weapon system malfunctions/stoppages/Emergencies.

Introduce

- Target talk on techniques using TSAR format.
- DWS deployment, T-Stow, and maintenance positions
- Employing the weapon on targets of opportunity.
- DWS fields of fire.

Performance Standards.

Demonstrate knowledge of the defensive weapon system operating procedures.

Instructor. DWSI

Prerequisites. ACAD 4210.

LAB-4221 1.0 * B A 1 MV-22

DWS Lab

Goal. To introduce pilot to the DWS installation and functionality using an aircraft on jacks.

Requirement

Discuss

- DWS installation.

Cabin configuration with DWS installed.
DWS position.
DWS reloading procedures.
Weapon system malfunctions/stoppages/Emergencies.

Introduce

Cabin configuration constraints.
DWS deployment, T-Stow, and maintenance positions
DWS reloading procedures
DWS manual retraction procedures

Performance Standards.

Demonstrate knowledge of the defensive weapon system operating procedures.

Instructor. DWSI.

Prerequisites. ACAD-4210, LAB-4220.

DWS-4242	1.5	365	B,R	D	A	1+	MV-22
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Goal. To introduce defensive weapon system employment in a day environment. This event may be completed with a single ship or section of aircraft. Only one aircraft is required to have the DWS installed. A DWS shall be installed and operable for a PUI to complete the event.

Requirement.

Discuss

CRM.
ICS procedures.
Safety.
Weapons malfunctions/stoppages/Emergencies.
Turret awareness.
Keep out zones (KOZ).
Sensor utilization.
Fields of fire/Sectors of fire.
Auto retract.

Introduce

Range estimation at medium and low altitude.
Target talk on techniques using TSAR format.
Target acquisition from a reference point.
En route lookout doctrine and target acquisition.
Defensive weapon system operations.
Fields of fire.
Sectors of fire.
Simulated approach to landings while engaging targets.
Over watch procedures

Performance Standards

Demonstrate knowledge of the three weapons control procedures.
Demonstrate verbally and practically all fire control voice and hand signals.
Demonstrate the ability to talk-on gunners so they may acquire, sight-on, and simulate firing on multiple targets in a day single aircraft environment using the TSAR format.
Verbally demonstrate knowledge of weapons parameters.

Prerequisites. TG-2540, LAB-4221.

Ordnance. 2000 rounds per gunner.

Range. Appropriate aerial gunnery range and moving land target (MLT) if available.

DWS-4245 1.5 365 B,R,M NS A 2 MV-22

Goal. To introduce multi-aircraft Defensive Weapons System employment at night under HLL or LLL conditions.

Requirement.

Discuss

CRM.
ICS procedures.
Safety.
Weapons malfunctions/stoppages/Emergencies.
Muzzle/Turret awareness in a multi-aircraft environment.
Weapons preparation/nomenclature.
Weapons effects on NVDs.

Introduce

Firing techniques in a multi-aircraft environment at night.
Target acquisition at night in a multi-aircraft environment.
Multi-aircraft defensive weapon system operations at night.

Performance Standards

Demonstrate the ability to talk-on gunners so they may acquire, sight-on, and simulate firing on multiple targets in a night section environment utilizing NVDs.
Demonstrate use of fire control procedures to suppress targets at night.
Demonstrate over watch procedures.

Prerequisites. TG-2541, DWS-4240, NSQ for appropriate light level.

Ordnance. 2000 rounds per gunner.

Range. Appropriate aerial gunnery range and moving land target (MLT) if available.

2.11.8 **Defensive Combat Maneuvers (DCM)**

2.11.8.1 Purpose.

To introduce and develop proficiency in tactics and aerial defensive measures used to evade enemy air-to-air threats.

2.11.8.2 General.

PUIs in this stage shall be LAT qualified and proficient in LAT-2641 and GTR-2840

A DCMI is required for all non-proficient PUIs.

The flight lead shall be a DCMI and specifically brief all applicable DCM training rules per the ANTP, the Aviation T&R Program Manual, and this Manual.

After completion of DCM-4340 the PUI is DCM Qualified (DCMQ).

The flight lead shall brief aggressor aircrew per Aviation T&R Program Manual and brief training rules prior to each flight.

Sequences for all DCM flights shall be flown as outlined in the MV-22 ANTP DCM Program Guide.

Crew Requirements. P/P for simulators, P/P/CC/AO for aircraft events.

2.11.8.3 DCM Overview. Table 2-49 provides the reference for Core Plus Skill DCM Overview

Table 2-49: Core Plus Skill DCM Overview =

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-4310	1.0	*	B		G		
ACAD-4311	1.0	*	B		G		
ACAD-4312	1.0	*	B		G		
ACAD-4313	1.0	*	B		G		
LAB-4320	0.5	*	B		G		
SDCM-4330	2.0	365	B,R	D	S	2	FFS/FTD TEN+
DCM-4340	1.0	365	B,R,M	D	A	2	MV-22

ACAD-4310 1.0 * B G

Attack Helicopter Threat to Assault Support

Goal. The PUI will have an introductory knowledge specific attack helicopter threats to assault support aircraft.

Instructor. WTI.

Prerequisite. LATQ.

Required Reading - AFTTP 3-1 Threat Helicopter Ch.

ACAD-4311 1.0 * B G

Fixed Wing Threat to Assault Support

Goal. The PUI will have an introductory knowledge of the fixed wing threat to assault support.

Instructor. WTI.

Prerequisites. LATQ.

Required Reading - AFTTP 3-1 Fixed Wing Threat Ch.

ACAD-4312 1.0 * B,T G

MV-22 Air to Air Defensive Tactics

Goal. The PUI will have an introductory knowledge of MV-22 air to air defensive tactics.

Instructor. DCMI

Prerequisite. ACAD-4310, ACAD-4311.

ACAD-4313 1.0 * B G

MV-22 Defensive Combat Maneuvers

Goal. The PUI will have an introductory knowledge of MV-22 Defensive Combat Maneuvers.

Instructor. DCMI.

Prerequisite. ACAD-4312.

Required Reading - ANTPP Appendix B, T&R Program Manual paragraph 3.12.1 and 3.12.4.

LAB-4320 0.5 * B G

Defensive Combat Maneuver Walk-through

Goal. The PUI will have a satisfactory knowledge of MV-22 defensive combat maneuvers prior to inflight execution.

Instructor. DCMI.

Prerequisites. ACAD-4313.

SDCM-4330 2.0 365 B,R D S 2 FFS/FTD TEN+

Goal. Introduce DCM against a FW aggressor.

Requirement.

Discuss

- Crew comfort level.
- Lookout doctrine.
- Common terminology.
- Situational awareness.
- Closure rate, radius of turn and energy state.
- FW weapons parameters and considerations.
- DCM training rules.

DCM line numbers.
Tactical formation maneuvering versus a FW aggressor.

Introduce

Tiltrotor DCM versus a single FW aggressor per the MV-22 ANTP.

Review

Intraplane and interplane communication.

Performance Standards

Execute proper DCM vs a FW threat IAW the MV-22 ANTP.
Maintain DCM ROC IAW the Aviation T&R Program Manual.

Instructor. DCMI.

Prerequisites. GTR-2831, LAB-4320.

DCM-4340 1.0 365 B,R,M D A 2 MV-22

Goal. Introduce section DCM against a FW aggressor.

Requirement.

Discuss

Lookout doctrine.
Situational awareness.
Adversary aircraft parameters.
Adversary weapons parameters, envelopes, and considerations.
Mutual support.

Demonstrate/Introduce

Tiltrotor DCM versus a single FW aggressor per the MV-22 ANTP.
DCM line numbers in accordance with the MV-22 ANTP.
Aggressor attacks at various altitudes.

Performance Standards.

Execute proper DCM vs a FW threat IAW the MV-22 ANTP.
Maintain DCM ROC IAW the Aviation T&R Program Manual.

Instructor. DCMI.

Prerequisites. GTR-2840, SDCM-4330.

Range. ACM range space.

External Syllabus Support. FW adversary.

2.11.9 Chemical, Biological, Radiological and Nuclear (CBRN)

2.11.9.1 Purpose.

To introduce aircrew CBRN equipment.

2.11.9.2 General.

For safe execution of all flights, 1 pilot shall remain unmasked during flights in the aircraft.
Crew Requirement. P/P.

2.11.9.3 CBRN Overview. Table 2-50 provides the reference for Core Plus Skill CBRN Overview

Table 2-50: Core Plus Skill CBRN Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
LAB-4420	0.5	*	B		G		
SCBRN-4430	1.0	*	B	D	S	1	FFS/FTD
SCBRN-4431	1.0	730	B,R,M	NS	S	1	FFS/FTD

LAB-4420 0.5 * B G

CBRN Equipment Fitting and Familiarization

Goal. The PUI is introduced to CBRN protective equipment and is fitted with the required gear for flight operations.

Instructor: BIP.

Prerequisites. T2P.

Required Reading - NTRP CBRN

SCBRN-4430 1.0 * B D S 1 FFS/FTD

Goal. Demonstrate the ability to conduct flight in a CBRN environment with mask and gear donned during day conditions.

Requirement.

Discuss

- CRM while masked, to include emergency procedures and ground handling signals.
- Mask limitations pertaining to vision and scan.
- Physiological limitations and fatigue factors imposed by CBRN protective equipment.
- Mask maintenance and factors that render the mask unserviceable.

Demonstrate

- Proper mask use (donning and doffing).

Introduce

- CBRN defensive suit.
- Start while masked.
- Taxi while masked.
- Takeoff and landings while masked.
- Normal flight operations while masked.

Performance Standards

- Properly don CBRN protective equipment and conduct flight maneuvers.
- Demonstrate knowledge of CBRN operations IAW the MV-22 ANTTP.

Instructor: BIP.

Prerequisites. LAB-4420.

Required Reading - NATOPS 2.11, NAVAIR 00-80T-121.

SCBRN-4431 1.0 730 B,R,M NS S 1 FFS/FTD

Goal. Demonstrate the ability to conduct flight in a CBRN environment with mask and gear donned during NVD conditions.

Requirement.

Discuss

- NVD limitations pertaining to vision and scan.
- CRM while wearing the mask and NVDs.

Demonstrate

- Proper mask use (donning and doffing).

Introduce

CBRN defensive suit.
Start while masked.
Taxi while masked.
Takeoff and landings while masked.
Normal flight operations while masked.

Performance Standards

Properly don CBRN protective equipment and conduct flight maneuvers with NVDs.
Demonstrate knowledge of CBRN operations IAW the MV-22 ANTP.

Instructor: BIP.

Prerequisites: NSQ, SCBRN-4430.

2.11.10 Carrier Qualification (CQ)

2.11.10.1 Purpose.

Qualify the PUI in flight operations from a carrier deck or ship platform under night unaided conditions.

2.11.10.2 General.

Refer to the LHA/LHD/MCS/CV NATOPS Manuals for carrier operations. Refer to NWP-42 for air capable ship operations.

IPs will emphasize proper communication procedures, patterns, and aviation operations in the shipboard environment per aircraft and ship NATOPS, and T&R Program Manual.

Crew Requirement. P/P/CC/AO.

2.11.10.3 CQ Overview. Table 2-51 provides the reference for Core Plus Skill CQ Overview.

Table 2-51: Core Plus Skill CQ Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
SCQ-4470	1.0	365	B,R	N*	S	1	FFS/FTD
CQ-4480	1.0	365	B,R	N*	A	1	MV-22
CQ-4481	1.5	365	B,R,M	N*	A	1	MV-22

SCQ-4470 1.0 365 B,R N* S 1 FFS/FTD

Goal. Introduce night unaided CQ pattern and procedures.

Requirement.

Discuss

Any previously discussed/introduced CQ item.

Introduce

Carrier operation.

Night takeoff/landing patterns (min of 5 for initials).
Communication procedures.
Lights and light signals peculiar to night operations.
LSE signals and procedures.

Self-taxi procedures.
STOs.
Pitch-up side slip characteristics.
Steady heading approach (port winds).
Balanced flight approach.
45° slide approach (starboard winds).

Performance Standards

Demonstrate proper knowledge of night unaided shipboard procedures IAW the LHA/LHD/MCS NATOPS, and NWP-42.
Maintain proper glideslope for steady heading, balanced flight, and 45° slide night unaided approaches.
Maintain proper closure rate during approaches.

Instructor: BIP.

Prerequisites: SCQ-2931.

CQ-4480	1.0	365	B,R	N*	A	1	MV-22
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Goal. Introduce night unaided CQ patterns and procedures in an FCLP scenario.

Requirement.

Discuss

Differences and similarities of day and night landing and takeoff techniques.
Review CQ-2942 discussion items.

Introduce

Shipboard operation.

Night unaided takeoff/landing patterns (min of 5 for initials).
Lights and light signals peculiar to night operations.
Carrier aided and unaided lighting configurations.

Performance Standards

Properly execute the night unaided CQ pattern IAW LHA/LHD/MCS NATOPS.
Maintain proper glideslope for steady heading, balanced flight, and 45° slide night unaided approaches.
Maintain proper closure rate during night unaided approaches.

Instructor: BIP.

Prerequisites: CQ-2942, SCQ-4470.

External Syllabus Support: FCLP area.

CQ-4481	1.5	365	B,R,M	N*	A	1	MV-22
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Goal. Night unaided qualification flight.

Requirement

Discuss

Aircraft ditching.
Emergency egress procedures.

Introduce

Procedures for unaided landings and takeoffs.
Night unaided patterns (minimum of 5 for initials).
Unaided approaches and landings.
Aircraft lighting configuration.
Deck lighting configuration.
Unaided closure rates.

Review

CRM.
Emergency Egress Lighting System (EELS).
LSE signals.
Voice procedures.

Performance Standards

Properly execute the night unaided CQ pattern IAW LHA/LHD/MCS NATOPS.

Maintain proper glideslope for steady heading, balanced flight, and 45° slide night unaided approaches.
Maintain proper closure rate during night unaided approaches.

Instructor: BIP.

Prerequisites: CQ-2943, CQ-4480.

External Syllabus Support: Landing platform afloat.

2.11.11 **Combat Assault Transport (CAT)**

2.11.11.1 Purpose.

To introduce day and/or NVD high threat tactical mission planning, briefing and execution.

2.11.11.2 General.

Initial tactics flight events should be based on tactical scenarios designed to focus on the specific items delineated in the different training codes and will be developed by the squadron WTI. A WTI is required to build and run the scenario in the Tactical Environment Network. To the greatest extent possible the scenarios should incorporate the employment of escort aircraft (fixed or rotary wing), ASE (ALE-47, APR-39, etc.) and use of the defensive gun.

Discuss items for each event in this stage are designed to be the focus of scenario-based training for planning and execution, not necessarily for discussion during individual cockpit briefs. However, this does not preclude these items from being discussed during cockpit briefs.

Specific planning responsibilities should be delegated to PUIs in order to obtain a broad exposure to mission planning.

Initial flights will be instructed by a WTI.

Crew Requirement. P/P.

2.11.11.3 CAT Overview. Table 2-52 provides the reference for Core Plus Skill CAT Overview

Table Error! No text of specified style in document.-52: Core Plus Skill CAT Overview Matrix

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
SHTT-4490	3.0	365	B,R,M	NS	S	2	FFS/FTD TEN+

SHTT-4490 3.0 365 B,R,M NS S 2 FFS/FTD TEN+

Goal. Introduce an assault support mission in a high threat environment using a minimum of a section.

Requirement.

Discuss

- High threat escort considerations.
- Immediate re-embarkation/emergency extract.
- NVD mission planning.
- Onboard navigation systems.
- ASE use at night.
- NS CBRN considerations as required for the tactical scenario.

Introduce

Tactical planning, briefing, and execution of a high threat mission during the night. The PUI will assist in the planning and conduct of the tactical brief.

Performance Standards

- Maintain situational awareness with respect to the friendly and enemy situation and mission progress.
- Properly employ all ASE IAW the MV-22 ANTP.
- Execute proper weapons employment procedures IAW the MV-22 ANTP.
- Properly plan the use of available escorts versus the threat.
- Demonstrate proper knowledge of NVD tactical considerations IAW the MV-22 ANTP and MAWTS-1 NVD Manual as applicable for the mission.

Instructor. WTI.

Prerequisites. CAT-3431.

2.11.12 Rapid Insertion/Extraction (RI/E)

2.11.12.1 Purpose.

To demonstrate proficiency in Tiltrotor rapid insertion and extraction techniques and procedures. This stage of training is designed to fulfill the requirement set in MCT 1.3.4.1.1 Conduct Airborne Rapid Insertions / Extraction.

2.11.12.2 General.

Initial RIE-4180 may be conducted day or night. Pilots shall be complete in the appropriate AIE skill prior to conducting RIE-4180 and NSQ for the appropriate light level if conducting RIE-4180 using NVDs.

Crew Requirement. P/P/CC/AO.

2.11.12.3 RI/E Overview. Table 2-53 provides the reference for Core Plus Mission RI/E Overview

Table Error! No text of specified style in document.-53: Core Plus Mission RI/E Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
RI/E-4540	2.5	365	B,R,M	(NS)	A	1	MV-22

RI/E-4540 2.5 365 B,R,M (NS) A 1 MV-22

Goal. Demonstrate the ability to execute rapid insertion / extraction operations in a tactical environment.

Requirement.

Discuss

CRM during AIE.

Tactical considerations for applicable AIE mission.

Review.

Appropriate AIE skill.

Performance Standards

Execute AIE procedures IAW the MV-22 ANTP.

Demonstrate proper crew coordination during AIE operations.

Complete the assigned mission.

Instructor. LATI.

Prerequisite. Appropriate AIE skill proficient.

External Syllabus Support. Jumpmaster/Castmaster/HRST Master, qualified troops.

2.11.13 Aviation Delivered Ground Refueling (ADGR)

2.11.13.1 Purpose.

To introduce day/night aviation-delivered ground refueling and FARP procedures.

2.11.13.2 General.

ADGR-4640 initial event shall be completed in the aircraft. Subsequent LAB-4620 will forward chain ADGR-4640.

Crew Requirement. P/P/CC/AO.

2.11.13.3 ADGR Overview. Table 2-54 provides the reference for Core Plus Skill ADGR Overview

Table Error! No text of specified style in document.-54: Core Plus Skill ADGR Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-4610	1.0	*	B		G		
LAB-4620	2.0	365	B,R,M		A	1	MV-22
ADGR-4640	0.5	365	B,R,M	(NS)	A	1	MV-22

ACAD-4610 1.0 * B G

MV-22 Aviation-Delivered Ground Refueling and FARP Lecture

Goal. The PUI will have an introductory knowledge of the MV-22 Rapid Ground Refueling equipment and FARP setup.

Prerequisite. T2P.

Instructor. BIP.

Required Reading - NATOPS 9.11, ANTPP Ch 12, NTRP 7.6.

LAB-4620 2.0 * B,R,M A 1 MV-22

Aviation-Delivered Ground Refueling Lab

Goal. The PUI will have an introductory knowledge of the set-up of a MV-22 ADGR site.

Instructor. BIP.

Prerequisite. ACAD-4610.

ADGR-4640 0.5 365 B,R,M (NS) A 1 MV-22

Goal. Introduce an ADGR mission.

Requirement

Discuss

ADGR site evaluation and selection.
Fuel planning.
ADGR site security considerations.
Ordnance and arming considerations.
FARP site aircraft control considerations.
Command and control considerations.
High gross weight takeoff and landing data.
JMPS ADGR considerations.

Introduce

Tactical planning, briefing, and execution of an ADGR mission during day or night. The PUI will assist in the planning and conduct of the ADGR brief.

Performance Standards

Maintain situational awareness with respect to the friendly and enemy situation and mission progress.
Safely control all aircraft through the ADGR site.
Provide fuel and/or ordnance as required to receivers.

Instructor. BIP.

Prerequisites. CAL-2240, CAL-2241, HLL~HLL-2340, LLL~LLL-2380, LLL-2381, LAB-4620.

External Syllabus Support. Approved site for refueling operations, receiver.

2.11.14 Aviation-Delivered Battlefield Illumination (BI)

2.11.14.1 Purpose.

To develop the ability to safely and accurately plan, brief and deploy Aircraft Parachute Flares (APF) from the MV-22, in support of air or ground forces.

2.11.14.2 General.

Initial BI codes shall be instructed by a BI proficient basic instructor pilot.

IPs will observe and oversee BI planning and ensure proper ordnance and range coordination.

IPs will focus the brief and cockpit discussion on the dangers of carrying and employing APFs as well as the required emergency procedures.

A Crew Chief Quality Assurance Safety Officer (QASO) and BI team lead (TL) are required for all battlefield illumination flights.

Crew Requirements. P/P/QASO/TL.

2.11.14.3 BI Overview. Table 2-55 provides the reference for Core Plus Skill BI Overview

Table 2-55: Core Plus Skill BI Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-4710	2.0	*	B		G		
BI-4740	1.5	365	B,R,M	(NS)	A	1	MV-22

ACAD-4710 2.0 * B G

MV-22 Battlefield Illumination

Goal. The PUI will have a familiarity with the components, characteristics, and operation of APFs and be capable of planning the employment of APFs in all light levels and threat environments.

Instructor: BIP.

Prerequisites. T2P.

Required reading - ANTTP CH 15, TPG BI Section, NTRP.

BI-4740 1.5 365 B,R,M NS A 1 MV-22

Goal. Introduce BI planning and employment in a night environment.

Requirement

Discuss

APF components.
Artificial Light Level and number of APFs.
Forecast wind and APF drift calculations.
Required Airspace Coordination Measures (ACM).
ICS Procedures and deployment commands.
APF Time On Target (TOT).
Threat considerations.

Introduce

APF deployment.

Performance Standards

Demonstrate knowledge of the APF.
Demonstrate the ability to plan the number of APFs, fall rate, drift and burn-out based on ambient conditions.
Demonstrate the ability to plan and implement ACMs to safely and effectively deploy APFs.
Demonstrate knowledge of appropriate emergency procedures.
Demonstrate the ability to meet a TOT.
Demonstrate the ability to deploy APFs.

Instructor: BIP

Prerequisites. ACAD-4710, NSQ for appropriate light level.

Ordnance. 6 LUU-2 and/or LUU-19 Series APFs.

Range. SUAS authorized for use of APFs.

External Syllabus Support. Supported aviation or ground unit.

2.11.15 Air Delivery (AD)

2.11.15.1 Purpose.

To demonstrate proficiency in Tiltrotor air delivery techniques and procedures. This stage of training is designed to fulfill the requirement set in MCT 4.3.4 Conduct Air Delivery.

2.11.15.2 General.

Initial AD-4840 may be conducted day or night. Pilots shall be complete in the appropriate AD skill prior to conducting AD-4840 and NSQ for the appropriate light level if conducting AD-4840 using NVDs.

Crew Requirement. P/P/CC/AO.

2.11.15.3 AD Overview. Table 2-56 provides the reference for Core Plus Mission AD Overview Matrix

Table Error! No text of specified style in document.-56: Core Plus Mission AD Overview Matrix

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
AD-4840	2.5	365	B,R,M	(NS)	A/S	1	MV-22

AD-4840 2.5 365 B,R,M (NS) A/S 1 MV-22

Goal. Demonstrate the ability to execute air delivery operations in a tactical environment.

Requirement

Discuss

CRM during AD.

Tactical considerations for applicable AD mission.

Review

Appropriate AD skill.

Performance Standards

Execute AD procedures IAW the MV-22 ANTTP.

Demonstrate proper crew coordination during AD operations.

Complete the assigned mission.

Instructor. LATI.

Prerequisite. Appropriate AD skill proficient.

Range. Range requirements are per each specific AD skill.

External Syllabus Support. Support requirements are per each specific AD skill.

2.11.16 Airborne Command and Control (AC2)

2.11.16.1 Purpose.

To develop the ability to provide an Airborne Command and Control vehicle, communications and situational awareness to command elements.

2.11.16.2 General.

Event to be flown in conjunction with a Mission Skills event. Upon the completion of the AC2 event the pilot will be considered capable of performing that particular mission profile.

Crew Requirements. Crew. P/P/CC/AO.

2.11.16.3 AC2 Overview. Table 2-57 provides the reference for Core Plus Skill AC2 Overview

Table Error! No text of specified style in document.-57: Core Plus Skill AC2 Overview Matrix

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-4910	0.5	*	B		G		
LAB-4920	1.0	*	B		A	1	MV-22
AC2-4940	1.0	730	B,R,M	(NS)	A	1	MV-22

ACAD-4910 0.5 * B G

MV-22 Airborne Command and Control

Goal. The PUI will have a familiarity with the aircraft capabilities, communications and situational awareness components/access points and their operation in support of AC2 missions.

Instructor: BIP.

Prerequisite. T2P.

LAB-4920 1.0 * B A 1 MV-22

Airborne Command and Control Lab

Goal. The PUI will have an introductory knowledge of the cabin set-up of an MV-22 for AC2 missions.

Instructor: BIP.

Prerequisite. ACAD-4910.

AC2-4940 1.0 730 B,R,M (NS) A 1 MV-22

Goal. Tactically employ the MV-22 in a command and control mission.

Requirement

Discuss

- Aircrew coordination.
- Cabin setup.
- Radio setup (organic and carry-on).
- Other situational awareness/communications capabilities (chat, full motion video, DWS targeting FLIR).
- Radio responsibilities during a command and control mission.
- MCA planning, selection, and routing.
- Aircraft maximum endurance profiles/configurations.

Introduce

- Aircraft systems setup.
- Aircraft employment.

Performance Standards.

Effectively utilize all aircraft systems ISO the mission requirements.

Instructor: BIP.

Prerequisites. LAB-4920, NSQ for appropriate light level (if flown at night).

External Syllabus Support. Supported aviation or ground unit.

2.12 INSTRUCTOR TRAINING PHASE (5000)

2.12.1 Purpose.

To establish training for instructor designations.

2.12.2 General.

ROC will be per the T&R Program manual.

Pilots may fly night flights using NVDs in this phase under HLL or LLL conditions provided they are NSQ for that light level

Refer to the MAWTS-1 Course Catalog for specific syllabus information.

2.12.3 Stages

The following of the Instructor Training Phase are included in Table.

Table 2-58: Instructor Training Phase Overview

Stage Name
BASIC INSTRUCTOR PILOT (BIP)
FRS INSTRUCTOR/CONTRACT INSTRUCTOR TRAINING (FIT)/ NIGHT SYSTEMS FAMILIARIZATION INSTRUCTOR
FLIGHT LEADERSHIP STANDARDIZATION EVALUATOR (FLSE)
AIR TO AIR REFUELING INSTRUCTOR (AARI)
LOW ALTITUDE TACTICS INSTRUCTOR (LATI)
REDUCED VISIBILITY LANDING INSTRUCTOR
DEFENSIVE COMBAT MANEUVERS INSTRUCTOR (DCMI)
NIGHT SYSTEMS INSTRUCTOR (NSI)
WEAPONS AND TACTICS INSTRUCTOR (WTI)

2.12.4 Basic Instructor Pilot (BIP)

2.12.4.1 Purpose.

To develop qualified Basic Instructor Pilots (BIPs) using a standardized instructor training program. This syllabus is designed to prepare aircraft commanders to instruct initial events in the simulator and aircraft. This portion of the syllabus shall be used by VMM squadrons to assist in instructor standardization.

2.12.4.2 General.

All maneuver descriptions are in the MV-22 NATOPS and ANTP.

Conduct Instructor Under Training (IUT) events with a WTI.

IUT flights will emphasize instructional techniques, briefing, and debriefing. The IUT will be capable of demonstrating all training objectives listed for the referenced syllabus flight. Emphasis on all flights is on training objectives, method of instruction, and student problem areas.

Crew Requirements. P/P for simulators.

2.12.4.3 Instructor Overview. Table 2-59 provides the reference for Basic Instructor Pilot Overview.

Table 2-59: Basic Instructor Pilot Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-5010	8.0	*	B		G		
LAB-5020	1.0	*	B		G		
SBIP-5030	2.0	*	B	D	S	1	FFS/FTD
SBIP-5031	2.0	*	B	D	S	1	FFS/FTD

ACAD-5010 8.0 * B,R G

Basic Instructor Training Course

Goal. The PUI will have an introductory knowledge of instructional techniques, briefing and debriefing styles, and tactical risk mitigation for instructional sorties.

Prerequisite. Recommended by the Squadron Standardization Board.

LAB-5020 1.0 * B G

Trainer IOS Functions and Operations

Goal. The PUI has an introductory knowledge of the functions and operation of the trainer's IOS.

Instructor. BIP.

Prerequisite. Recommended by the Squadron Standardization Board.

SBIP-5030 2.0 * B D S 1 FFS/FTD

Goal. Introduce Familiarization, Confined Area Landing, and Formation instruction techniques.

Requirements.

Discuss.

All "discuss" items in the FAM, CAL, and FORM stage events with emphasis on IUT instructional technique.
Comfort level.
Simulator preparation for a networked event
Review. All FAM, CAL, and FORM stage maneuvers with emphasis on instructional technique.

Performance Standards.

Execute proper CAL approaches IAW MV-22 ANTTP and provide accompanying inflight description.
Provide accurate instruction on glideslope correction to achieve proper normal and steep approach glideslope.
Maintain proper formation positioning while flying in combat cruise and combat spread

Instructor. WTI.

Prerequisites. ACAD-5010, LAB-5020, FAM, FORM, CAL stage complete.

SBIP-5031 2.0 * B D S 1 FFS/FTD

Goal. Introduce instructional techniques regarding air delivery operations, mountain area training, and carrier qualification.

Requirements.

Discuss

Simulator set-up for externals.
All AD, MA or CQ stage discuss items.

Review. All AD, MA and CQ stage maneuvers with emphasis on instructional technique.

Performance Standards

Execute proper MAT approaches IAW MV-22 ANTTP and provide accompanying inflight description.
Provide accurate instruction CMS and mission planning skills during air delivery operations.
Maintain proper glideslope and closure rate during CQs.

Instructor. WTI.

Prerequisites. ACAD-5010, LAB-5020, AD, MA and CQ stage complete, and recommended by the Squadron Standardization Board.

2.12.5 FRS Instructor/Contract Instructor Training

2.12.5.1 Purpose.

To develop qualified FRS Instructor Pilots (IPs), Contract Instructors (CIs) and Night Systems Familiarization Instructor (NSFI) using a standardized instructor training program. This syllabus is designed to prepare FRS IPs to instruct Core Skill Introduction phase events in the simulator and aircraft and CIs to instruct Core Skill Introduction phase events in the simulator.

2.12.5.2 General

The PUI must be a Section Leader prior to beginning this stage of training.

Conduct Instructor Under Training (IUT) events with a designated Standardization Pilot.

IUTs should fly in the right seat.

CIIs will complete all events in the simulator.

For CV-22 to MV-22 conversion pilots, the syllabus events will emphasize the CV/MV differences, focus on the NAVMC training policies, and emphasize common student problem areas. Upon completion of the CV-22 to MV-22 differences portion of the FRS IP Syllabus, Instrument evaluation, and NATOPS evaluation, the FRS Commanding Officer may designate the PUI as an MV-22 Aircraft Commander.

Completion of an IUT event will qualify an instructor to instruct that phase of training.

Completion of SFIT-5146 qualifies CIIs to instruct the Core Skill Introduction phase simulator LAT event.

Completion of the simulator portion of the MV-22 NSFI syllabus in accordance with the MAWTS-1 Course Catalog qualifies CIIs to instruct Core Skill Introduction simulator NS events. IPs shall be designated an NSI or NSFI prior to instructing Core Skill Introduction NS events.

Prerequisites listed with each event apply to the IP syllabus.

All FRS instructor pilots and Contract Instructors will complete the FIT syllabus beginning with ACAD-5111. ACAD-5110 through FIT-5136 is designed for CV-22 conversion pilots.

2.12.5.3 Admin Notes

All IUT flights emphasize instructional techniques, briefing, and debriefing. The IUT will be capable of demonstrating all training objectives listed for the referenced syllabus flight.

Emphasis on all flights is on training objectives, method of instruction, and student problem areas.

At the completion of this stage of training, the FRS IP will be qualified to instruct Core Skill Introduction events in the aircraft and simulator and CIIs will be qualified to instruct corresponding Core Skill Introduction events in the simulator.

Crew Requirements. P/P for simulators, P/P/CC if flown in aircraft.

2.12.5.4 FRS Instructor/Contract Instructor Overview. Table provides the reference for FRS Instructor/Contract Instructor Overview.

Table 2-60: FRS Instructor/Contract Instructor Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-5110	1.0	*	CV		G		
SFIT-5130	2.0	*	CV	N*	S	1	FFS/FTD
SFIT-5131	2.0	*	CV		S	1	FFS/FTD
SFIT-5132	2.0	*	CV		S	1	FFS/FTD
SFIT-5133	2.0	*	CV	(N)	S	1	FFS/FTD
FIT-5134	3.0	*	CV		A	1	MV-22
SFIT-5135	2.0	*	CV		S	2	FFS/FTD TEN+
FIT-5136	2.0	*	CV		A	2	MV-22
ACAD-5111	8.0	*	B,R,C,ICV		G		
FIT-5140	2.0	*	B,R,C,ICV	D	A/S	1	MV-22
FIT-5141	1.0	*	B,R,C,ICV	N*	A/S	1	MV-22
SFIT-5142	2.0	*	B,R,C,ICV	(N)	S	1	FFS/FTD
FIT-5143	1.5	*	B,R,C,ICV	D	A/S	1	MV-22
SFIT-5144	1.5	*	B,R,C,ICV	D	S	1	FFS/FTD
FIT-5145	1.5	*	B,R,C,ICV	D	A/S	2	MV-22
FIT-5146	2.0	*	B,R,C,ICV	(N)	S	1	MV-22
ACAD-5112	1.0	*	B,T		G		
SNSFI-5150	2.0	*	B,T	NS, E	S	1	FFS/FTD
NSFI-5151	2.0	*	B,T	NS, E	A	1	MV-22
NSFI-5152	2.0	*	B,R	NS, E	A	2	MV-22

ACAD-5110 1.0 * CV G

CV-MV Pilot Stage In brief

Goal. The PUI will have an introductory knowledge of the CV-22 to MV-22 syllabus and expectations.

Instructor. Operations.

SFIT-5130 2.0 * CV (N*) S 1 FFS/FTD

Goal. Review FAM maneuvers (day and night) and Course Rules.

Requirements.

Discuss.

Local course rules.
Single engine failure.
Dual engine failure.

Review

Hover Nacelle Drills.
Air Taxi Nacelle Drills.
CONV pattern.
Normal Approach to a Hover Landing.
Normal Approach to a No-Hover Landing.
Steep Approach to a Hover Landing.
Steep Approach to a No-Hover Landing.
Nose Low Steep Approach.
APLN pattern.
Emergency Landing Pattern (ELP).

Performance Standards

Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG).
Be able to state indications, execute/recite memorized items, exercise proper crew coordination, and maintain control of the aircraft during simulated emergency procedures.

Instructor. FRSL.

Prerequisites. ADL-0001, LAB-0200, ADL-0012, ADL-0014, ACAD-0109, LAB-1020, ACAD-5110.

SFIT-5131 2.0 * CV S 1 FFS/FTD

Goal. Practice day VFR navigation (no lower than 500 feet AGL) utilizing the aircraft navigation system, the flight director system, and the aircraft mission management system, to arrive at the objective(s). Review the use of Flight Director commands, coupled modes, and AUTO NAC during enroute and APPR flight.

Requirements

Discuss

Conduct route preflight brief (conduct of flight portion of PCL).

Introduce

Preflight preparation.
Operate the mission planning station and the JMPS program.
Plan the route as assigned.
Add, edit, and delete the Aircraft Load as necessary.
Calculate and print a Load Comp Form.
Calculate aircraft CG.
Add an appropriate waypoint set to the mission binder.
Add an appropriate Comm Plan to the mission binder.
Write the mission to the DTM.
Develop appropriate graphics for route brief.
Print kneeboard cards.

Review

Flight director commands and coupled modes (core modes, INAV, APPR).
Activate and display a coupled approach (APPR) leg.
Utilize the aircraft navigation/CMS to execute assigned mission.

Preflight NAV/CMS/MMS.
Flight Plan (FPLN) Management.
Dual Digital Map Operation.
Utilize CRM during VFR navigation.

Performance Standards

Accurately conduct mission preflight planning utilizing the mission planning station and JMPS.
Accurately operate MSN Data Load, WYP FPLN, INAV, and MSN key functionality.
Execute a navigation route maintaining orientation +/- 1 nautical mile enroute; +/- 500 meters in the objective area; and landing in the objective within +/- 1 minute.
Properly activate and operate the DDMS and the Flight Director during VFR navigation.
Utilize CRM principles.

Instructor. FRSL.

Prerequisites. SFIT-5130.

SFIT-5132 2.0 * CV S 1 FFS/FTD

Goal. Review the fundamental elements of tactical inserts and extracts, the RVL profile, and use of FLIR.

Requirements

Discuss

Pitch up with side slip.
Hover Coupled.
Augmented Hover Coupled Landing.
RVL Profile.
Dual Digital Map Operation.
Scan, cockpit setup, aids and automation.
CAL application of FLIR.
Single Engine failure.
Single Engine Waveoffs.

Review

CONV CAL Patterns.
Straight-in Tactical Approach.
Waveoff.
RVL Profile.
Jump Takeoff.

Performance Standards

Conduct all maneuvers IAW MV-22 FTM.
Recognize proper glideslope for CAL approaches.
Recognize criteria and execute wave off.
Recognize indications and execute required memory items, know associated warnings, and exercise proper crew coordination during simulated emergency procedures and system failures.

Instructor. FRSL.

Prerequisites. SFIT-5131.

SFIT-5133 2.0 * CV (N) S 1 FFS/FTD

Goal. Conduct IFR Flight operations. Introduce operation of Flight Director Commands and the Mission Management systems. A complete flight shall be conducted including: flight planning, filing, clearance, departure, enroute/cruise, descent, and instrument approaches.

Requirements. Coordination - IP shall designate a departure and destination location where training is to be conducted. The IP shall issue to the PUI appropriate information for preflight planning; including a DD-175-1, appropriate NOTAMS, and an aircraft load.

Preflight Planning - PUI will conduct all appropriate preflight planning to include: completed DD-175, loading flight plan, waypoint set, and comm plan on a DTM.

Discuss

JMPS flight planning. Flight plan files loaded to the DTM.
Flight Plan/DD-175.

Aircraft Designation/TD Code.
Route, altitude, CAS vs TAS.
MV-22 Minimum fuel requirements.
Alternate airfield selection.

Flight Director operation and limitations.

Pre-takeoff preparation.
During takeoff and departure.
During the enroute and descent.
During the instrument approach.

CRM during IFR navigation.
Standard Terminal Arrivals (STAR).
Approach criteria for Multi-piloted aircraft.
Closing of the Flight Plan.

Review

Instrument Takeoff.
Departure.
Enroute procedures.
Communication, Navigation, and IFF equipment operation.
Descent procedures.
Non precision approaches.
Precision approaches.
Transition to visual landing.
Missed approach procedures.

Performance Standards

Accurately conduct preflight planning and complete required documents to conduct an IFR flight.
Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG).
Execute Pilot Not Flying duties IAW with the MV-22 Maneuver Description Guide (MDG).
Accurate and timely use of the Flight Director Cues, Commands, and Coupled modes for IMC flight.

Instructor. FRSL.

Prerequisites. SFIT-5131.

FIT-5134	3.0	*	CV	A	1	MV-22
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Goal. Review FAM maneuvers and CAL procedures/patterns to include tactical approaches.

Requirements

Discuss

Major aircraft systems/differences.
Effects of Saturating Control Power.
Trim System.
Failures Leading to the Loss of Flapping Control, Limiting, Cueing Functions.
TAC aircraft signing procedures.
MAF procedures.
HOTSEAT procedures.
Any major system EP.

Review

STO and RTO.
CONV pattern.
APLN pattern.
Normal Approach to a Hover Landing.
Normal Approach to a No-Hover Landing.
Run-on Landing.
Steep Approach to a Hover Landing.
Steep Approach to a No-Hover Landing.
TOLD (Takeoff and Landing Data calculations).
MGW Transition from Hover.
MGW Landing.
Slow flight (APLN Mode).
High AOB (APLN Mode).
Practice power on/off stalls.
Overhead Break Entry.
CONV CAL Pattern.
Straight-in Tactical Approach.
RVL profile.
Augmented Hover Coupled Landing.
90 degree Tactical entry.
180 degree Tactical entry.
PF and PNF duties and callouts.

Performance Standards

Conduct all maneuvers IAW MV-22 FTM and ANTP.
Recognize indications and execute required memory items, know associated warnings, and exercise proper crew coordination during simulated emergency procedures and system failures.

Instructor. FRSL.

Prerequisites. SFIT-5130, SFIT-5132.

SFIT-5135	2.0	*	CV	S	2	FFS/FTD TEN+
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Goal. Review formation flight, introduce sections landings to an LZ and IIMC procedures.

Requirements.

Discuss

Cruise position and visual reference points.
Considerations of close formation, closure rates and situational awareness.
Lost Communication Procedures.

Review

Section takeoff.
Section RTO.
Running/Carrier rendezvous.
Cruise position.
Cross-over/cross-under.
Turn pattern (CONV).
Turn pattern (APLN).
Over-run or under-run.
IIMC breakup and rejoin.
Formation Transition and Conversion.
Lead changes.
Section landings to an improved surface or large CAL site.

Performance Standard. Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.

NAVMC 3500.11E
16 Apr 18

Instructor. FRSL.

Prerequisites. SFIT-5132.

FIT-5136 **2.0** ***** **CV** **A** **2** **MV-22**

Goal. Review formation flight and procedures in the aircraft.

Requirements.

Discuss

Cruise position and visual reference points.
Formation aborts and waveoffs.

Review

Section RTO.
Section takeoff.
Running/Carrier rendezvous.
Cruise position.
Cross-over/cross-under.
Turn pattern (CONV).
Turn pattern (APLN).
Over-run/under-run.
IIMC breakup and rejoin.
Formation Transition and Conversion.
Lead changes.
Section landings to an improved surface or large CAL site.
TAC signing procedures.

Performance Standards. Conduct all maneuvers IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.

Instructor. FRSL.

Prerequisites. FIT-5134, SFIT-5135.

ACAD-5111 **8.0** ***** **B,R,CL, CV** **G**

Basic Flight Instructor Course

Goal. The PUI has an introductory knowledge of instructional techniques, briefing and debriefing styles, and defensive positioning for instructional sorties.

Prerequisite. Recommended by the Squadron Standardization Board.

FIT-5140 **2.0** ***** **B,R,CL, CV** **D** **E** **A/S** **1** **MV-22**

Goal. Introduce the IP brief and demonstrate standardized procedures for flight planning, preflight, and all day FAM stage maneuvers.

Requirement. IP and IUT will discuss preflight and post-flight pilot briefings. IUT will observe preflight, cockpit procedures, techniques of instruction, and local course rules. Instructors shall emphasize the ability to teach, evaluate problems, and apply corrective instruction.

Review (at a minimum):

Ground Taxi.
Hover and Air Taxi.
Normal Approach to a Hover Landing.
Normal Approach to a No-Hover Landing.
Steep Approach to a Hover Landing.
Steep Approach to a No-Hover Landing.
APLN Pattern.
Run-on Landing.
Transition to APLN.

Conversion to CONV.
High AOB (APLN Mode).
Flight Director Operation.
Practice power on/off stalls.

Performance Standards

Successfully describe all FAM maneuvers IAW MV-22 Maneuver Description Guide (MDG).
Successfully execute all FAM maneuvers IAW MV-22 Maneuver Description Guide (MDG) with accompanying in-flight description.

Instructor. STANI.

Prerequisites. SL-6234, FIT-5136 for AF only.

FIT-5141 1.0 * B,R,CL,CV N* E A/S 1 MV-22

Goal. Review familiarization stage maneuvers at night.

Requirement. IUT will discuss all items and perform all maneuvers in the night familiarization stage events with emphasis on IUT instructional technique.

Performance Standards

Successfully describe all FAM maneuvers and night considerations IAW MV-22 Maneuver Description Guide (MDG).
Successfully execute all night FAM maneuvers IAW MV-22 Maneuver Description Guide (MDG) with accompanying inflight description.

Instructor. STANI.

Prerequisites. FAM-5140.

SFIT-5142 2.0 * B,R,CL,CV (N) E S 1 FFS/FTD

Goal. Review basic instrument, IFR planning, filing, airway navigation, and instrument approach procedures.

Requirements

Discuss

IFR planning.
Filing a DD-175.
Airway procedures.
Precision/non-precision approaches.

Review

CLIMB Checklist.
APPROACH Checklist.
Attitude instrument flight.
Standard rate climbing and descending turns.
Recovery from unusual attitudes.
Vertical S-1.
Oscar pattern.
Fly a minimum of 1 precision and 1 non-precision approach.

Performance Standards

Successfully describe BI maneuvers, IFR Planning, filing, airways navigation, and instrument approach procedures IAW MV-22 Maneuver Description Guide (MDG) and NATOPS Instrument Flight Manual.
Execute BI maneuvers, airways navigation, and instrument approaches IAW MV-22 Maneuver Description Guide (MDG) and NATOPS Instrument Flight Manual with accompanying in-flight description.

Instructor. STANI.

Prerequisites. SL-6234.

FIT-5143 1.5 * B,R,CL,CV E D A/S 1 MV-22

Goal. Review CAL and FCLP instruction techniques.

Requirements.

Discuss

All “discuss” items in the CAL and FCLP stage events with emphasis on IUT instructional technique.
Comfort level.

Review. All CAL and FCLP stage maneuvers with emphasis on instructional technique.

Performance Standards

Execute proper CAL and FCLP approaches IAW MV-22 Maneuver Description Guide (MDG) and provide accompanying inflight description.

Provide accurate instruction on glideslope correction to achieve proper normal and steep approach glideslope.

Instructor. STANI.

Prerequisites. SL-6234.

SFIT-5144 1.5 * B,R,CL,CV E D S 1 FFS/FTD

Goal. Review navigational instructional techniques.

Requirement. Brief and fly a navigational flight introducing all onboard navigational equipment. Discuss all items and perform all maneuvers in the navigation stage events with emphasis on IUT instructional technique.

Performance Standards. Provide accurate flight instruction on navigation procedures and systems.

Instructor. STANI.

Prerequisites. SL-6234.

FIT-5145 1.5 * B,R,CL,CV E D A/S 2 MV-22

Goal. Review formation instructional techniques, formation stage maneuvers and emphasize closure rates and radius of turn.

Requirement. Brief and fly a formation flight introducing all formation maneuvers. Discuss all items and perform all maneuvers in the formation stage events with emphasis on IUT instructional technique. Emphasize cruise turns and section CALs.

Performance Standards

Successfully brief a formation flight to accomplish all formation maneuvers.

Conduct formation maneuvers and section CALs IAW MV-22 Maneuver Description Guide (MDG) and MV-22 NTP.

Instructor. STANI.

Prerequisites. SL-6234.

FIT-5146 2.0 * B,R,CL,CV E (N) S 1 MV-22

Goal. Stan Pilot check flight.

Requirement. Instructors shall evaluate the prospective Stan Pilot in all previously introduced stages of instruction for standardized flight procedures and instrument flight techniques.

Performance Standards

The prospective Stan Pilot shall demonstrate knowledge of all chapters of the MV-22 Maneuver Description Guide (MDG).
Demonstrate a high level of instructional capability to certify IPs capable of instructing all stages of the Core Skill Introduction phase of training IAW MV-22 Maneuver Description Guide (MDG) and NATOPS.

Instructor. STANI.

Prerequisites. CIs must complete all FRS IUT flights in the simulator. FRS IPs must be a Section Leader SL-6234 and must have completed FIT 5140-5145.

2.12.6 Night Systems Familiarization Instructor (NSFI)

Purpose. To certify the MV-22 pilot as a Night Systems Familiarization Instructor (NSFI) capable of instructing Core Skill Introduction Phase NVD flights.

General. Reference the MAWTS-1 Course Catalog for the NSFI POI.

2.12.7 Flight Leadership Standardization Evaluator (FLSE)

Purpose. To certify the MV-22 pilot as a Flight Leadership Standardization Evaluator (FLSE) capable of safely conducting academic and airborne instruction in the MV-22 Flight Leadership syllabus.

General. Reference the MAWTS-1 Course Catalog for the FLSE POI.

2.12.8 Air to Air Refueling Instructor (AARI)

Purpose. To certify the MV-22 pilot as an Air to Air Refueling Instructor (AARI) capable of safely conducting academic and airborne instruction in the MV-22 Air to Air Refueling syllabus.

General. Reference the MAWTS-1 Course Catalog for the AARI POI.

2.12.9 Low Altitude Tactics Instructor (LATI)

Purpose. To certify the MV-22 pilot as a Low Altitude Tactics Instructor (LATI) capable of safely conducting academic and airborne instruction in the MV-22 Low Altitude Tactics syllabus.

General. Reference the MAWTS-1 Course Catalog for the LATI POI.

2.12.10 Reduced Visibility Landing Instructor

Purpose. To certify the MV-22 pilot as a Reduced Visibility Landing Instructor (RVLI) capable of safely conducting academic and airborne instruction in the MV-22 Reduced Visibility Landing syllabus.

General. Reference the MAWTS-1 Course Catalog for the RVLI POI.

2.12.11 Defensive Combat Maneuvers Instructor (DCMI)

Purpose. To certify the MV-22 pilot as a Defensive Combat Maneuvers Instructor (DCMI) capable of safely conducting academic and airborne instruction in the MV-22 Defensive Combat Maneuvers syllabus.

General. Reference the MAWTS-1 Course Catalog for the DCMI POI.

2.12.12 Night Systems Instructor (NSI)

Purpose. To certify the MV-22 pilot as a Night Systems Instructor (NSI) capable of safely conducting academic and airborne instruction in the MV-22 Night Systems syllabus.

General. Reference the MAWTS-1 Course Catalog for the NSI POI.

2.12.13 Weapons and Tactics Instructor (WTI)

2.12.13.1 Purpose.

To certify the MV-22 pilot as a Weapons and Tactics Instructor (WTI) capable of safely conducting ground and airborne instruction of the MV-22 tactical flight syllabus.

2.12.13.2 General.

Reference the MAWTS-1 WTI Course Catalog for the detailed WTI POI.

Crew Requirements. Reference the MAWTS-1 Course Catalog for individual event requirements.

2.12.13.3 WTI Overview. Table 7 provides the reference for WTI Overview.

Table 2-67: WTI Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
WTI-5950		*	B				

WTI-5950 * B,T E

Goal. The PUI will receive all academic and flight instruction in accordance with the MAWTS-1 WTI Course Catalog.

2.13 **REQUIREMENTS, QUALIFICATIONS AND DESIGNATIONS (RQD) PHASE (6000)**

2.13.1 **Purpose**

To establish training for specific requirements and flight leadership designations.

2.13.2 **General**

Squadrons will use this phase of training for check flights and designations. The PUI will demonstrate sound levels of aircraft/flight leadership and judgment required in a combat environment.

Requirement and flight leadership codes in the 6000 Phase should be logged in conjunction with other 2000-4000 codes completed during the event. For example, SL-6234 may be flown in conjunction with TRAP-3340. When the flight to attain the requirement / designation is complete, a letter from the squadron Commanding Officer awarding the designation shall be placed in the NATOPS and APR before that designation may be utilized.

After the Commanding Officer has designated the PUI in writing as gaining a designation, the required qualification or designation entry shall be made in M-SHARP.

2.13.3 **Stages**

Table8 depicts the Requirements, Qualifications and Designations Phase of training.

Table 2-68: RQD Phase of Training

Stage Name
REQUIREMENTS (RQD)
TILTROTOR AIRCRAFT COMMANDER (TAC)
SECTION LEADER (SL)
DIVISION LEADER (DL)
FLIGHT LEADER (FL)
AIR MISSION COMMANDER (AMC)
FUNCTIONAL CHECK PILOT (FCP)

2.13.4 **Requirements**

2.13.4.1 **Purpose.**

To track requirements as outlined in the MV-22 NATOPS, OPNAVINST 3710.7 and OPNAVINST 1542.7.

2.13.4.2 **General.**

This section allows squadrons to document and track annual NATOPS and Instrument check flights as well as CRM training.

Crew Requirements. All checks will be per all applicable directives. NATOPS and Instrument checks may be accomplished in the trainer or the aircraft.

2.13.4.3 **RQD Overview.** Table9 provides the reference for RQD Overview.

Table 2-69: RQD Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-6010	3.0	365	B,R,CI,CV,M		G		OPEN BOOK NATOPS
ACAD-6011	1.0	365	B,R,CI,CV,M		G		CLOSED BOOK NATOPS
ACAD-6012	1.0	365	B,R,CI,CV,M		G		NATOPS ORAL EXAM
RQD-6030	2.0	365	B,R,CI,CV,M	(N)	A/S	1	NATOPS CHECK
RQD-6031	0.0	365	B,R,CI,CV,M	(N)	A/S	1	ANI/NI CHECK
RQD-6032	0.0	365	B,R,CI,CV,M	(N)	A/S	1	NI CHECK
ACAD-6040	6.0	365	B,R,CI,CV,M		G		IGS
ACAD-6041	2.0	365	B,R,CI,CV,M		G		WRITTEN INST EXAM
ACAD-6042	1.0	365	B,R,CI,CV,M		G		ORAL INST EXAM
RQD-6060	2.0	365	B,R,CI,CV,M	(N)	S/A	1	INSTRUMENT CHECK
RQD-6061	0.0	365	B,R,CI,CV,M	(N)	S	1	INST EVALUATOR
ACAD-6070	1.0	365	B,R,CI,CV,M		G		CRM REFRESH LECTURE
RQD-6080	1.5	365	B,R,CI,CV,M	(N)	S/A	1	CRM CHECK
ACAD-6090	0.0	365	B,R,CI,CV,M		G		CRMF LECTURE
RQD-6091	0.0	365	B,R,CI,CV,M	(N)	S/A	1	CRMF EVAL
ACAD-6093	0.0	*	B,R,CI,CV,M		G		CRM COURSE
RQD-6033	1.0	90	B,R,CI,CV,M	(N)	S/A	1	EP REVIEW

ACAD-6010 3.0 365 B,R,CL,CV,M E G

Open Book NATOPS Examination

Goal. The Open Book Examination shall consist of, but not be limited to the NATOPS question bank. The purpose of the open book examination is to evaluate the airman's knowledge of the appropriate publications and the aircraft.

Instructor. NI/ANI.

Performance Standard. Achieve a minimum grade of qualified on the Open Book examination.

ACAD-6011 1.0 365 B,R,CL,CV,M E G

Closed Book NATOPS Examination

Goal. The Closed Book Examination shall be limited to the NATOPS question bank. The purpose of the closed book examination portion is to evaluate the airman's knowledge of emergency procedures and aircraft limitations.

Performance Standard. Achieve a minimum grade of qualified on the Closed Book examination.

Instructor. NI/ANI.

Prerequisite. ACAD-6010

ACAD-6012 1.0 365 B,R,CL,CV,M E G

Oral NATOPS Examination

Goal. The Oral Examination shall consist of, but not be limited to, the NATOPS question bank. The evaluator may draw upon their experience to propose questions of a direct and positive manner and in no way be opinionated to evaluate the airman's knowledge of normal/emergency procedures, aircraft limitations, and performance.

Performance Standard. Achieve a minimum grade of qualified on the Oral examination.

Instructor. NI/ANI.

Prerequisite. ACAD-6011

RQD-6030 2.0 365 B,R,CL,CV,M (N) E A/S 1 FFS/FTD

Goal. Conduct an objective evaluation of the airman's knowledge of mission planning, briefing, normal operating procedures (flight and ground), crew resource management, aircraft systems, performance criteria, emergency procedures, and debriefing. The focus is on normal and emergency procedures, not tactical execution. Emphasis shall be placed on the aforementioned items with the addition of USMC Admin SOP, local course rules, local SOP addendum, and admin flight procedures. The NATOPS evaluation is intended to evaluate compliance with NATOPS procedures. The NATOPS evaluation is the means to measure the airman's efficiency in the execution of normal operating procedures and reaction to emergencies and malfunctions. The NATOPS evaluation process should be as much a learning tool and/or experience as it is an evaluation.

Requirement.

The pilot under evaluation shall bring a completed NATOPS evaluation card, pre-coordinated DTM and load comp. The proficiency expected by the evaluator in this flight shall be commensurate with the experience level and highest flight leadership designation of the pilot under evaluation.

Performance Standards.

The pilot under evaluation must be prepared to safely demonstrate flight proficiency and knowledge of all maneuvers and procedures described within the NATOPS, CNAF 3710.7 and in accordance with all SOPs.

Instructor. NI/ANI.

Prerequisite. ACAD-6012

RQD-6031 0.0 365 B,R,CL,CV,M (N) E A/S 1 FFS/FTD

Goal. Tracking code for when a NATOPS check is conducted as a NI or ANI check. Log this code in place of a 6030.

Requirement.

The pilot under evaluation shall bring a completed NATOPS evaluation card, pre-coordinated DTM and load comp. The proficiency expected by the evaluator in this flight shall be commensurate with the experience level and highest flight leadership designation of the pilot under evaluation.

Performance Standards.

The pilot under evaluation must be prepared to safely demonstrate flight proficiency and knowledge of all maneuvers and procedures described within the NATOPS, CNAF 3710.7 and in accordance with all SOPs.

Instructor. NE/NI.

Prerequisite. ACAD-6012

RQD-6032 0.0 365 B,R,CL,CV,M (N) E A/S 1 FFS/FTD

Goal. Tracking code for when a NATOPS check is conducted as a NI check. Log this code in place of a 6030.

Requirement.

The pilot under evaluation shall bring a completed NATOPS evaluation card, pre-coordinated DTM and load comp. The proficiency expected by the evaluator in this flight shall be commensurate with the experience level and highest flight leadership designation of the pilot under evaluation.

Performance Standards.

The pilot under evaluation must be prepared to safely demonstrate flight proficiency and knowledge of all maneuvers and procedures described within the NATOPS, CNAF 3710.7 and in accordance with all SOPs.

Instructor. NE.

Prerequisite. ACAD-6012

ACAD-6040 6.0 365 B,R,CL,CV,M E G

Instrument Ground School

Goal. The Instrument Ground School shall be a Commander Naval Air Forces (CNAF) approved syllabus and at a minimum cover the following topics:

- Spatial disorientation.
- CNO GPS Policy Statement and GPS fundamentals to include RNAV (GPS) and Required Navigation Performance (RNP).
- Vertical Separation Minimums (RVSM) procedures.
- Requirements and denial reports.
- Use of non-DoD instrument approach/departure reports.
- Use of non-DoD GPS NOTAMS systems (Jeppesen GPS NOTAMS and Databases).

Performance Standards. Successful completion of Instrument Ground School.

Instructor. INSTEVAL.

ACAD-6041 2.0 365 B,R,CL,CV,M E G

Open Book NATOPS Instrument Examination

Goal. The Open Book Instrument Examination shall consist of, but is not limited to knowledge of the NATOPS, NATOPS Instrument Flight Manual, FAR/AIM and/or aeronautical publications which are applicable, normal/emergency instrument ground and flight procedures, weather, aircraft limitations, and performance, and any subject listed in OPNAVINST 3710.7 Series. The examination shall include questions on the following subjects:

- Pertinent Navy or Marine Corps regulations, orders, and instructions.
- Pertinent parts of the Federal Aviation Regulations (FAR), other regulations, and/or aeronautical publications which are applicable.
- Interpretation of weather information normally used in flight planning.

Performance Standard. Achieve a minimum grade of qualified on the Open Book examination.

Instructor. INSTEVAL.

Prerequisite. ACAD-6040.

ACAD-6042	1.0	365	B,R,CL,CV,M	E	G
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Oral NATOPS Instrument Examination

Goal. The Oral Examination shall consist of, but is not be limited to, knowledge of the NATOPS, NATOPS Instrument Flight Manual, FAR/AIM and/or aeronautical publications which are applicable, normal/emergency instrument ground and flight procedures, weather, aircraft limitations, and performance. Additionally, the instructor/evaluator may draw upon their individual experience to propose questions of a direct and positive manner to evaluate the airman's knowledge and understanding.

Performance Standards. Achieve a minimum grade of qualified on the Oral examination.

Instructor. INSTEVAL.

Prerequisite. ACAD-6041.

RQD-6060	2.0	365	B,R,CL,CV,M	(N)	E	S/A	1	FFS/FTD
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Goal. Following completion of the ground evaluation events, an instrument flight/simulator evaluation event shall be flown and completed with a grade of "Qualified." The evaluator shall conduct an objective evaluation of the airman's knowledge of flight planning, filing, briefing, conduct of flight under normal operating conditions, emergency procedures, closing out flight plans, and debriefing.

Performance Standards.

Execute flight and/or ground operations safely IAW CNAF 3710.7 Series, Platform NATOPS, NATOPS Instrument Flight Manual, and local training SOPs. All areas on the instrument flight evaluation are critical. An "Unsatisfactory" grade in any area shall result in an "Unsatisfactory" grade for the flight.

Instructor. INSTEVAL.

Prerequisite. ACAD-6042.

RQD-6061	0.0	365	B,R,CL,CV,M	(N)	E	S	1	FFS/FTD
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Goal. Tracking code for an Instrument Evaluator.

ACAD-6070	1.0	365	B,R,CL,CV,M	E	G
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Crew Resource Management Refresher Lecture

Goal. Review the 7 critical CRM skills during a mission scenario as well as during emergencies and system failures.

Performance Standards. Successful completion of the CRM lecture.

Instructor. CRMF/I.

RQD-6080	1.5	365	B,R,CL,CV,M	(N), E	S/A	1	FFS/FTD
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Goal. Review CRM principles while executing a simulated mission scenario.

Requirement. Review the 7 critical CRM skills during a mission scenario as well as during emergencies and system failures.

Performance Standards. Pilots shall demonstrate effective use of the 7 critical CRM skills in accordance with OPNAVINST 1542.7, MV-22 NATOPS, and applicable directives.

Instructor. CRMF/I.

Prerequisites. ACAD-6070

RQD-6090	0.0	365	B,R,CL,CV,M	E	G
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Goal. Tracking code for CRMF lecture.

Performance Standards. Successful completion of the CRMF lecture.

Instructor. CRMI.

RQD-6091 0.0 365 B,R,CL,CV,M (N), E S/A 1 FFS/FTD

Goal. Tracking code for CRMF evaluation.

Requirement. Review the 7 critical CRM skills during a mission scenario as well as during emergencies and system failures.

Performance Standards. Pilots shall demonstrate effective use of the 7 critical CRM skills in accordance with OPNAVINST 1542.7, MV-22 NATOPS, and applicable directives.

Instructor. CRMI.

Prerequisites. ACAD-6090

RQD-6092 0.0 * B,R,CL,CV,M E G

Goal. Tracking code for CRMI course.

Performance Standards. Successful completion of the CRMI course.

RQD-6033 1.0 90 B,R,CL,CV,M (N), E S/A 1 FFS/FTD

Goal. Emergency Procedures review.

Requirement. This flight will review MV-22 emergency procedures and fulfills the requirement of the 90 day EP review requirement.

Performance Standards. Comply with MV-22 NATOPS procedures while dealing with non-normal conditions.

Prerequisites. T2P.

2.13.5 **Tiltrotor Aircraft Commander (TAC)**

2.13.5.1 Purpose.

To prepare and evaluate PUI's ability to plan, brief, and command an MV-22 in a tactical environment.

2.13.5.2 General.

All Basic pilots are required to complete the entire syllabus.

Aircraft Commander re-designation is at the discretion of the Commanding Officer for previously designated MV-22/CV-22 aircraft commanders that do not require Core Skill Introduction Refresher training. The minimum re-designation requirement for aircrew that require Core Skill Introduction Refresher training will be determined by the Commanding Officer.

The TAC-6130 should be flown in a simulator and will serve as a NATOPS evaluation for the Aircraft Commander position; however, any event may serve as the NATOPS evaluation.

BIP syllabus completion is not required for Aircraft Commander designation but is required to instruct as an Aircraft Commander.

Pilots may begin the Aircraft Commander syllabus prior to meeting CNAF 3710.7 minimum hours requirements at the discretion of the Commanding Officer however the hours requirements shall be met prior to designation.

2.13.5.3 Prerequisites

Core Skill complete. Any event deferred or waived for syllabus progression is required to be completed under instruction before the PUI may serve as an Aircraft Commander for that event.

Recommended by the Squadron Standardization Board.

Crew Requirements. NI/ANI, WTI, other senior pilot designated by the Commanding Officer/T2P/CC/AO for aircraft events. NI/ANI/T2P/CC/AO for NATOPS evaluations.

2.13.5.4 TAC Overview. Table70 provides the reference for TAC Overview.

Table 2-70: TAC Overview Matrix

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-6110	3.0	*	B		G		
TAC-6130	2.0	*	B	(N)	S/A	1	FFS/FTD
TAC-6131	2.0	*	B	NS,	S/A	1	FFS/FTD
TAC-6132	2.0	*	B	(N),	A	1	MV-22

ACAD-6110 3.0 * B E G

Tiltrotor Aircraft Commander Oral Examination

Goal. Conduct a Tiltrotor Aircraft Commander Oral Examination.

Requirement. Squadrons shall evaluate pilots for the TAC designation per the criteria in the MV-22 NATOPS Flight Manual, CNAF-M3710.7, and local SOPs. The composition and conduct of the board is to be determined by the squadron standardization board and Commanding Officer. It is recommended to provide the PUI a single ship mission representative of the current or anticipated deployment. Additive conditions and mission changes will be discussed during the oral board. The PUI will be evaluated on his knowledge, planning, and decision making logic.

Discuss

Mission Planning
Joint Mission Planning Software.
Load Computation & Take-off and Landing Data.
Flight Plan.

NATOPS

CNAF-M3710.7.
Systems & limitations.
Emergency Procedures.
Local Standard Operating Procedures.

Maintenance

COMNAVAIRFOR 4790.
Aircraft Discrepancy Book (ADB).
Maintenance Action Forms (MAF).
Troubleshooting Procedures.
Quality Assurance (QA).
Safe for Flight (SFF).
Mission Essential Subsystems Matrix (MESM).

Tactics

AFTTP 3-1.
Low Altitude Tactics.
Ground Threat Reaction.
Aircraft Survivability Equipment.
Objective Area Mechanics.
Fire Support.
Escort considerations.
Communications.

Operational Risk Management

Deliberate Risk Management.
Time Critical Risk Management.
Decision Making.
Headwork.
Maturity.

Instructor. NI/ANI, WTI, other senior pilot designated by the Commanding Officer.

Prerequisites. Recommendation by Squadron Standardization Board, Core Skill Complete.

TAC-6130 2.0 * B (N) E S/A 1 FFS/FTD

Goal. Conduct a Tiltrotor Aircraft Commander (TAC) review.

Requirement. This flight will review day operations and procedures contained in the T&R syllabus in preparation for the TAC check.

Performance Standards

Conduct day Core Skill and Mission Skill events IAW applicable manuals.
Demonstrate sound knowledge of NATOPS limits, EPs, and aircraft systems.

Instructor. NI/ANI, WTI, other senior pilot designated by the Commanding Officer.

Prerequisites. Core Skill Complete, ACAD-6110.

TAC-6131 2.0 * B NS E S/A 1 FFS/FTD

Goal. Conduct a night TAC review.

Requirement. Continuation of review flight to include night operations and procedures.

Performance Standards.

Conduct night/NVD Core Skill and Mission Skill events IAW applicable manuals.
Demonstrate sound knowledge of SOPs, T&R Program Manual regulations, and CNAF 3710.7 regulations.

Instructor. NI/ANI, WTI, other senior pilot designated by the Commanding Officer.

Prerequisites. Core Skill Complete, ACAD-6110.

TAC-6132 2.0 * B,R (N), E A 1 MV-22

Goal. Conduct a TAC check.

Requirement. Squadrons shall evaluate pilots for the TAC designation per the criteria in the MV-22 NATOPS Flight Manual, CNAF-M3710.7, and local SOPs. This flight will cover all practicable operations and procedures contained in the T&R syllabus.

Performance Standards

Conduct day, night, and/or NVD Core Skill and Mission Skill events IAW applicable manuals.
Demonstrate situational awareness, CRM, and operational knowledge necessary to be a TAC.
Demonstrate sound knowledge of the MV-22 ANTTP and MV-22 tactical employment.

Instructor. NI/ANI, WTI, other senior pilot designated by the Commanding Officer.

Prerequisites. Core Skill Complete, NSQ, RQD-6030, RQD-6060, RQD-6080, TAC-6130, TAC-6131

2.13.6 Section Leader (SL)

2.13.6.1 Purpose.

To prepare and evaluate PUI's ability to plan, brief, and lead a section of MV-22s in a tactical environment.

2.13.6.2 General

All pilots are required to complete the entire syllabus.

Section Leader re-designation is at the discretion of the Commanding Officer for previously designated MV-22/CV-22 section leaders that do not require Core Skill Introduction Refresher training. Re-designation of aircrew that require Core Skill Introduction Refresher training is successful completion of the core skill and mission skill refresher POI.

Formal assignment to the section leader syllabus shall be preceded by a build-up period established by Group or Squadron SOP. This training, which would normally include leading training flights under the supervision of a designated section leader, shall be designed to provide the board with an indication of an individual's readiness to enter the syllabus and will be recorded with the SL-6230 tracking code.

PUI shall conduct the following day and night workup sorties in order to develop the prospective section lead's flight leadership skills.

Either the SSL-6233 or SL-6234 shall be a FLSE event.

For tactical events, the Operations Department shall provide adequate time for the PUI, evaluator, and mission planners / participants to conduct mission analysis and planning.

Pilots who complete the SL-6234 event may be designated an MV-22 Section Leader. A letter designating the pilot as a section leader shall be placed in the NATOPS jacket and APR.

The SL-6240 tracking code shall be logged on each subsequent Section Lead event to document proficiency.

2.13.6.3 Prerequisites

Mission Skill Proficient (MSP) prior to starting the syllabus.

Recommended by the Squadron Standardization Board.

Minimum of 50 Hours as Tiltrotor Aircraft Commander (TAC) prior to designation.

2.13.6.4 External Syllabus Support.

Scenarios shall be designed to accommodate the dominant elements listed in the event description but should be tailored to the unit's next deployment (i.e. shore based versus MEU).

2.13.6.5 Crew Requirements. Sim: PUI/T2P, Aircraft: SL/PUI/CC/AO.

Table 2-71: Section Lead Syllabus Required Reading

SELF PACED READINGS	SELF PACED READINGS NAME	DATE COMP
MCWP 5-1	MARINE CORPS PLANNING PROCESS	
ANTTP 3-22.5	ASTACSOP TACTICAL POCKET GUIDE	
ANTTP 3-22.3	MV-22 ANTTP CHAPTERS 1-9	
ANTTP 3-22.1	MV-22 SECRET ANTTP CHAPTERS 1-5	
ACPM-8630	TACC	
ACPM-8660	JOINT OPS INTRO	

SL Overview. Table 72 provides the reference for SL Overview.

Table 2-72: SL Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-6210	1.0	*	B		G		
ACAD-6211	1.0	*	B		G		
LAB-6220	0.3	*	B,CV		G		
LAB-6221	0.3	*	B,CV		G		
LAB-6222	0.3	*	B,CV		G		
LAB-6223	0.3	*	B,CV		G		
LAB-6224	0.3	*	B,CV		G		
LAB-6225	0.3	*	B,CV		G		
SL-6230	0.0	*	B,CV		E		
SL-6231	2.0	*	B,CV	(NS)	A	2	MV-22
SSL-6232	4.0	*	B,CV	NS	S/A	2	FFS/FTD/TEN+
SSL-6233	4.0	*	B, CV	(NS)	S/A	2	FFS/FTD/TEN+
SL-6234	3.0	*	B,CV	(NS)	A	2	MV-22
SL-6240	0.0	180	M				

ACAD-6210 1.0 * B,T G

Problem Framing

Goal. The PUI will have an understanding of how to appropriately analyze a mission.

Required Reading. How to Plan an Air Assault.

Instructor. WTI.

Prerequisite. TAC-6132.

ACAD-6211 1.0 * B G

Tactical Flight Briefing

Goal. The PUI will have an understanding of how to accurately plan and brief an assault flight.

Instructor. WTI.

Prerequisite. SL-6210.

LAB-6220 0.3 * B,CV G

Section IFR Departure and Arrival Chalk Talk

Goal. The PUI will have an understanding of how to lead a section through an IFR Departure and Arrival.

Instructor. Section Leader.

Prerequisite. ACAD-6211.

LAB-6221 0.3 * B,CV G

IIMC Break-up and Rejoin Chalk Talk

Goal. The PUI will have an understanding of how to lead a section through an IIMC Break-up and rejoin.

Instructor. Section Leader.

Prerequisite. LAB-6220.

LAB-6222 0.3 * B,CV G

Section Medium Altitude Tactical Approach Chalk Talk

Goal. The PUI will have an understanding of how to lead a section through high altitude tactical approach.

Instructor. Section Leader.

Prerequisite. LAB-6221.

LAB-6223 0.3 * B,CV G

LAT Chalk Talk

Goal. The PUI will have an understanding of how to lead a section through a LAT route.

Instructor. Section Leader.

Prerequisite. LAB-6222.

LAB-6224 0.3 * B,CV G

Section Air to Air Refueling Chalk Talk

Goal. The PUI will have an understanding of how to lead a section through an air to air refueling operation.

Instructor. Section Leader.

Prerequisite. LAB-6223.

LAB-6225 0.3 * B,CV G

Section Contingencies Chalk Talk

Goal. The PUI will have an understanding of how to manage standard tactical contingencies.

Instructor. WTI.

Prerequisite. LAB-6224

SL-6230 0.0 * B,CV E (N/S)

Goal. To be used as a tracking code for all “brief and lead” events prior to entry into the formal section leader syllabus.

Instructor. Section Leader.

Prerequisite. TAC-6132, MSP.

SL-6231 2.0 * B,CV (NS), E A 2 MV-22

Goal. Demonstrate the ability to discuss, brief, and execute section responses for section leader skills to include various off-normal and additive conditions in a training environment.

Requirement. Given a section training mission, plan, brief, lead, and debrief a flight consisting of Trail formation, Low Altitude Tactics, and Confined Area Landings. If able, incorporate Air to Air Refueling, Tail Gunnery, and Ground Threat Reaction.

Discuss

LAT and Night ROC.
Fuel Planning and intra-flight CMS management.
Lighting.
TOT planning.
Divert planning and procedures.
Section IFR departure.
Section Abort.
Section IFR Arrival.
Deliberate enroute weather penetration.
Inadvertent IMC.
Tanker rendezvous.
Lost sight during LAT in mountainous terrain.
Rendezvous and rejoin procedures (day and night).
Wingman Lost Comm.
Wingman emergency or system failure.
Downed aircraft/OSC duties.

Introduce

Flight preparation to include DTM loading, briefing and execution products.
Flight brief.
Turn-up, check-in, taxi procedures.
Section IFR procedures.
Military Training Route activation/entry.
Tactical Formation Maneuvering.
Tactical approach and landing.
Contingencies.

Performance Standards

Conduct flight brief in accordance with ANTP and applicable SOPs.
Conduct RIO in accordance with ASTACSOP.
Execute all LAT maneuvers IAW the ANTP.
Remain oriented within the planned lateral boundaries of the route. Employ proper tactical formation maneuvers to control the flight.
Demonstrate proper procedures for tactical CAL approaches IAW the ANTP.
Maintain assigned landing heading within 10 degrees.
Land within 0.03 nm of intended point of landing.
When confronted with various off-normal or additive conditions control the flight IAW the flight brief, applicable directives, and local SOP.

Instructor. Section Leader.

Prerequisite. TAC-6132, Mission Skill Phase proficient, recommended by the Squadron Standardization Board.

SSL-6232	4.0	*	B,CV	NS, E	S/A	2 FFS/FTD	TEN+
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Goal. Demonstrate the ability to plan, brief, lead, and debrief a medium threat air assault mission incorporating TRAP or CASEVAC.

Requirements. Given an air assault mission, plan, brief, and lead the execution of a section air assault mission with appropriate contingencies. This event should be flown in conjunction with a SCAT-3231 event. The SLUI should serve as the AFL.

Discuss

Definition of low and medium threat.
Integration of Landing Plan with Ground Tactical Plan.
Development of Objective Area Diagram through integration of Fire Support Plan with Landing Plan.
Development of Air Movement Plan relative to threat, to include attached and detached escort utilization.
Development of efficient Loading Plan.
FARP Planning.

- Air Assault Task Force.
- Command and Control of Air Assault operations.
- Utilization of JMPS to create .DRW files relative to FSCMs and ACAs.
- Utilization of JMPS to create appropriate threat files.
- Sectors of fire.
- Rules of engagement.
- Mission GO/NO-GO criteria.
- Hot LZ Criteria and considerations.
- Extract considerations.
- Casualty Evacuation.
- Immediate re-embarkation.
- Emergency Extract.
- Downed Aircraft.
- Resupply via Air Delivery.
- Assault Landing Table.
- Assault Wave Serial Assignment Table.
- Communications Plan.
- Execution Checklist.
- ASE planning and utilization.
- Comm Degradation v Chattermark.
- Emissions Control Conditions.

Review

- Mission Analysis.
- Air Assault mission planning.
- Developing a Landing Plan.
- Developing an Objective Area Diagram to include Fire Support Plan, Escorts, and Sectors of fire.
- Developing a medium threat Air Movement Plan.
- Developing a Loading Plan.
- Developing appropriate contingency plans.
- Developing ASLT.
- Developing ASSAT.
- Developing Communications Plan.
- Developing Execution Checklist.
- Creating briefing and execution documents.
- Air Assault Mission Briefing.
- Threat analysis and ASE optimization.
- Turn-up, check-in, taxi procedures.
- Threat Update/DASC Coordination.
- FENCE Checks.
- Fuel planning (route and timeline changes).
- Threat reaction.
- Actions in the objective area.
- Tactical Reports.
- Contingencies.

Performance Standards

- Direct and supervise mission planning cell.
- Conduct coordination with supported and supporting agencies during planning.
- Properly assess the threat and identify counter tactics.
- Select an appropriate ASE configuration relative to the briefed threat.
- Develop an integrated Landing Plan that supports the Ground Tactical Plan.
- Develop a coherent, effective objective area plan that integrates a Fire Support and Escort Plan that support the Landing Plan and Ground Tactical Plan.
- Develop an Air Movement Plan relative to the briefed threat.
- Maximize useful load / allowable combat load in order to maximize the Ground Tactical Plan.

Develop briefing and execution documents IAW ANTP, ASTACSOP, and squadron SOP.
Develop and deliver a logical, chronological AFL Brief in accordance with ANTP and ASTACSOP.
Maintain situational awareness relative to friendly and enemy situation and mission progress.
Maintain appropriate formation and tactics during the Air Movement Plan.
Land within 0.03 nm of intended point of landing and 30 seconds of L-Hour.
Demonstrate sound decision making in response to off-normal and additive conditions to ensure mission success.
Successfully complete the assigned mission while preserving assigned assets.

Instructor. Section Leader.

Prerequisite. SL-6231.

SSL-6233 4.0 * B,CV (NS) E S/A 2 FFS/FTD TEN+

Goal. Demonstrate the ability to plan, brief, lead, and debrief a medium threat long range urban air assault raid mission incorporating AAR.

Requirements. Given a Platoon (REIN) Air Assault Task Force and associated mission, plan, brief, and lead the execution of a section air assault raid mission with appropriate contingencies. This event should be flown in conjunction with a SCAT-3232 event. The SLUI should serve as the AFL.

Discuss

Air Assault Raid considerations.
Landing to X, Y, Offset.
Enroute Air to Air refueling.
Aviation operations in an Urban Environment.
Definition of low and medium threat.
Integration of Landing Plan with Ground Tactical Plan.
Development of Objective Area Diagram through integration of Fire Support Plan with Landing Plan.
Development of Air Movement Plan relative to threat, to include attached and detached escort utilization.
Development of efficient Loading Plan.
FARP / AAR Planning.
Air Assault Task Force.
Command and Control of Air Assault operations.
Utilization of JMPS to create .DRW files relative to FSCMs and ACAs.
Utilization of JMPS to create appropriate threat files.
Sectors of fire.
Rules of engagement.
Mission GO/NO-GO criteria.
Hot LZ Criteria and considerations.
Extract considerations.
Casualty Evacuation.
Immediate re-embarkation.
Emergency Extract.
Downed Aircraft.
Resupply via Air Delivery.
Assault Landing Table.
Assault Wave Serial Assignment Table.
Communications Plan.
Execution Checklist.
ASE planning and utilization.
Comm Degradation v Chattermark.
Emissions Control Conditions.

Review

Mission Analysis.
Air Assault mission planning.
Developing a Landing Plan.

Developing an Objective Area Diagram to include Fire Support Plan, Escorts, and Sectors of fire.
Developing a medium threat Air Movement Plan.
Developing a Loading Plan.
Developing appropriate contingency plans.
Developing ASLT.
Developing ASSAT.
Developing Communications Plan.
Developing Execution Checklist.
Creating briefing and execution documents.
Air Assault Mission Briefing.
Threat analysis and ASE optimization.
En route Air to Air Refueling.
Aviation operations in an urban area.
Turn-up, check-in, taxi procedures.
Threat Update/DASC Coordination.
FENCE Checks.
Fuel planning (route and timeline changes).
Threat reaction.
Actions in the objective area.
Tactical Reports.
Contingencies.

Performance Standards

Direct and supervise mission planning cell.
Conduct coordination with supported and supporting agencies during planning.
Properly assess the threat and identify counter tactics.
Select an appropriate ASE configuration relative to the briefed threat.
Develop an integrated Landing Plan that supports the Ground Tactical Plan.
Develop a coherent, effective objective area plan that integrates a Fire Support and Escort Plan that support the Landing Plan and Ground Tactical Plan.
Develop an Air Movement Plan relative to the briefed threat.
Maximize useful load / allowable combat load in order to maximize the Ground Tactical Plan.
Develop briefing and execution documents IAW ANTP, ASTACSOP, and squadron SOP.
Develop and deliver a logical, chronological AFL Brief in accordance with ANTP and ASTACSOP.
Maintain situational awareness relative to friendly and enemy situation and mission progress.
Maintain appropriate formation and tactics during the Air Movement Plan.
Land within 0.03 nm of intended point of landing and 30 seconds of L-Hour.
Demonstrate sound decision making in response to off-normal and additive conditions to ensure mission success.
Successfully complete the assigned mission while preserving assigned assets.

Instructor. FLSE/Division Leader.

Prerequisite. SL-6232.

SL-6234 3.0 * B,R,CV (NS), E A 2 MV-22

Goal. Section leader certification flight. Demonstrate the ability to lead a section in a low to medium threat environment. At the discretion of the evaluator, the PUI may be assigned any assault support mission.

Requirement. The PUI will be evaluated from mission receipt to mission completion. The PUI shall conduct mission analysis, direct and complete planning tasks based on resources and time available, deliver the brief, and successfully lead the section to execute the assigned mission. This event should be flown in conjunction with a CAT-3233 event. The SLUI should serve as the AFL. When possible, this event should be flown in support of a ground combat element with actual escort aircraft and/or fire support agencies. Live fire is preferred.

Discuss

Definition of low and medium threat.
Integration of Landing Plan with Ground Tactical Plan.

Development of Objective Area Diagram through integration of Fire Support Plan with Landing Plan.
Development of Air Movement Plan relative to threat, to include attached and detached escort utilization.
Development of efficient Loading Plan.
FARP Planning.
Air Assault Task Force.
Command and Control of Air Assault operations.
Utilization of JMPS to create .DRW files relative to FSCMs and ACAs.
Utilization of JMPS to create appropriate threat files.
Sectors of fire.
Rules of engagement.
Mission GO/NO-GO criteria.
Hot LZ Criteria and considerations.
Extract considerations.
Casualty Evacuation.
Immediate re-embarkation.
Emergency Extract.
Downed Aircraft.
Resupply via Air Delivery.
Assault Landing Table.
Assault Wave Serial Assignment Table.
Communications Plan.
Execution Checklist.
ASE planning and utilization.
Comm Degradation vs. Chattermark.
Emissions Control Conditions.

Review

Air Assault mission planning.
Mission Analysis.
Developing a Landing Plan.
Developing an Objective Area Diagram to include Fire Support Plan, Escorts, and Sectors of fire.
Developing a medium threat Air Movement Plan.
Developing a Loading Plan.
Developing appropriate contingency plans.
Developing ASLT.
Developing ASSAT.
Developing Communications Plan.
Developing Execution Checklist.
Creating briefing and execution documents.
Air Assault Mission Briefing.
Threat analysis and ASE optimization.
Turn-up, check-in, taxi procedures.
Threat Update/DASC Coordination.
FENCE Checks.
Fuel planning (route and timeline changes).
Threat reaction.
Actions in the objective area.
Tactical Reports.
Contingencies.

Performance Standards

Direct and supervise mission planning cell.
Conduct coordination with supported and supporting agencies during planning.
Properly assess the threat and identify counter tactics.
Select an appropriate ASE configuration relative to the briefed threat.
Develop an integrated Landing Plan that supports the Ground Tactical Plan.

Develop a coherent, effective objective area plan that integrates a Fire Support and Escort Plan that support the Landing Plan and Ground Tactical Plan.
Develop an Air Movement Plan relative to the briefed threat.
Maximize useful load / allowable combat load in order to maximize the Ground Tactical Plan.
Develop briefing and execution documents IAW ANTP, ASTACSOP, and squadron SOP.
Develop and deliver a logical, chronological AFL Brief in accordance with ANTP and ASTACSOP.
Maintain situational awareness relative to friendly and enemy situation and mission progress.
Maintain appropriate formation and tactics during the Air Movement Plan.
Land within 0.03 nm of intended point of landing and 30 seconds of L-Hour.
Demonstrate sound decision making in response to off-normal and additive conditions to ensure mission success.
Successfully complete the assigned mission while preserving assigned assets.

Instructor. FLSE/Division Leader.

Prerequisite. LAB-6225, SSL-6233.

SL-6240 0.0 180 M

Goal. Section Leader proficiency tracking code. This code shall be logged to document Section Lead proficiency when applicable.

2.13.7 Division Leader (DL)

2.13.7.1 Purpose.

To prepare and evaluate PUI's ability to plan, brief, and lead a division of MV-22s in a tactical environment.

2.13.7.2 General

All pilots are required to complete the entire syllabus. Division Leader re-designation is at the discretion of the Commanding Officer for previously designated MV-22/CV-22 division leaders that do not require Core Skill Introduction Refresher training. The minimum re-designation requirement for aircrew that require Core Skill Introduction Refresher training is completion of the core skill and mission skill refresher POI. Formal assignment to the division leader syllabus shall be preceded by a build-up period established by Group or Squadron SOP. The build-up period provides the squadron standardization board with an indication of an individual's aptitude to enter the syllabus. "Brief and lead" events will be recorded with the DL-6330 tracking code and an ATF.

PUI shall conduct the following day and night workup sorties in order to develop the prospective division lead's flight leadership skills.

Either DL-6332 or DL-6333 shall be evaluated by a Flight Leader designated a FLSE.

For tactical events, flight scheduling shall provide for adequate planning time for the PUI, the evaluator, and mission planners/participants.

Pilots who complete the DL-6333 may be designated an MV-22 Division Leader. A letter designating the pilot as a division leader shall be placed in the NATOPS jacket and APR.

The DL-6340 tracking code shall be logged on each subsequent Division Lead event to document proficiency.

2.13.7.3 Prerequisites

Led a minimum of three flights as a designated MV-22 Section Leader prior to starting the division lead syllabus. "Brief and lead" events (recorded with the DL-6330 tracking code) may be conducted prior to meeting this pre-requisite to evaluate the PUI's potential for advancement.

Recommended by the Squadron Standardization Board.

Mission Skill Proficient (MSP) prior to starting the syllabus.

Minimum of 600 total flight hours and 200 flight hours in MV-22 prior to designation.

2.13.7.4 External Syllabus Support.

Scenarios shall be designed to accommodate the dominant elements listed in the event descriptions but should be tailored to the units next deployment (i.e. shore based versus MEU).

2.13.7.5 Crew Requirements. Sim: PUI/T2P, Aircraft: Division Leader/PUI/CC/AO.

Table 2-73: Division Lead Syllabus Required Readings

SELF PACED READINGS	SELF PACED READINGS NAME	DATE COMP
	MAWTS-1 ASSAULT SUPPORT PLANNING GUIDE	
ANTTP 3-22.5	ASTACSOP TACTICAL POCKET GUIDE	
ACPM-8640	JOINT DATA NETWORK	
ACPM-8641	THEATER AND NATIONAL ISR	

DL Overview. Table 74 provides the reference for DL Overview.

Table 2-74: DL Overview

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
LAB-6320	0.3	*	B		G		
LAB-6321	0.3	*	B		G		
DL-6330	0.0	*	B	(NS)	A	3+	MV-22
DL-6331	2.0	*	B	(NS)	A	3+	MV-22
SDL-6332	2.0	*	B	NS	S/A	3+	FFS/FTD /TEN+
DL-6333	3.0	*	B	(NS)	A	3+	MV-22
DL-6340	0.0	180	B,M	(NS)	A/S	3+	MV-22/FFS/FTD

LAB-6320 0.3 * B,CV G

Division IFR Departure and Arrival Chalk Talk

Goal. The PUI will have an understanding of how to lead a division through an IFR Departure and Arrival.

Instructor. Division Leader.

Prerequisite. SL-6234.

LAB-6321 0.3 * B,CV G

Tactical Division Formations Chalk Talk

Goal. The PUI will have an understanding of how to lead each of the tactical division formations.

Instructor. Division Leader.

Prerequisite. LAB-6320.

DL-6330 0.0 * B,CV E

Goal. To be used as a tracking code for all “brief and lead” events prior to entry into the formal division leader syllabus.

Instructor. Division Leader.

Prerequisite. SL-6234, MSP.

DL-6331 2.0 * B,CV (NS), E A/S 3+ MV-22

Goal. Demonstrate the ability to discuss, brief, and execute division responses for division leader skills to include various off-normal and additive conditions in a training environment.

Requirement. Given a division training mission, plan, brief, lead, and debrief a flight consisting of Trail formation, Low Altitude Tactics, and Confined Area Landings. If able, incorporate Air to Air Refueling, Tail Gunnery, and Ground Threat Reaction.

Discuss

Division IFR departure and VFR On Top Rendezvous.
Division separation On Top and IFR Arrival.
Deliberate enroute weather penetration.
Inadvertent IMC.
Tanker rendezvous and flow.
Rendezvous and rejoin procedures (day and night).
Division formation maneuvering.

Review

Flight preparation to include DTM loading, briefing and execution products.
Flight brief.
Turn-up, check-in, taxi procedures.
Division IFR procedures.
Division Tactical Formation Maneuvering.
Tactical approach and landing.
Contingencies.

Performance Standards

Conduct flight brief in accordance with ANTTP and applicable SOPs.
Conduct RIO in accordance with ASTACSOP.
Execute all LAT maneuvers IAW the ANTTP.
Remain oriented within the planned lateral boundaries of the route. Employ proper tactical formation maneuvers to control the flight.
Demonstrate proper procedures for tactical CAL approaches IAW the ANTTP.
Maintain assigned landing heading within 10 degrees.
Land within 0.03 nm of intended point of landing.
When confronted with various off-normal or additive conditions control the flight IAW the flight brief, applicable directives, and local SOP.

Instructor. Division Leader.

Prerequisite. Mission Skill Proficient. Led a minimum of three flights as a designated MV-22 Section Leader. Recommended by the squadron Standardization Board.

SDL-6332	2.0	*	B,CV	(NS)	E	S/A	3	FFS/FTD TEN+
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Goal. Demonstrate the ability to plan, brief, lead, and debrief a medium threat air assault mission incorporating TRAP or CASEVAC.

Requirement. Given an air assault mission, plan, brief, and lead the execution of a section air assault mission with appropriate contingencies. This event should be flown in conjunction with a SCAT-3231 event. The SLUI should serve as the AFL.

Discuss

Definition of low and medium threat.
Integration of Landing Plan with Ground Tactical Plan.
Development of Objective Area Diagram through integration of Fire Support Plan with Landing Plan.
Development of Air Movement Plan relative to threat, to include attached and detached escort utilization.
Development of efficient Loading Plan.
FARP Planning.
Air Assault Task Force.
Command and Control of Air Assault operations.
Utilization of JMPS to create .DRW files relative to FSCMs and ACAs.
Utilization of JMPS to create appropriate threat files.
Sectors of fire.
Rules of engagement.
Mission GO/NO-GO criteria.
Hot LZ Criteria and considerations.
Extract considerations.
Casualty Evacuation.
Immediate re-embarkation.
Emergency Extract.
Downed Aircraft.
Resupply via Air Delivery.
Assault Support Landing Table.
Assault Support Serial Assignment Table.
Communications Plan.
Execution Checklist.

ASE planning and utilization.
Comm Degradation v Chattermark.
Emissions Control Conditions.
Division weather penetration considerations.

Review

Air Assault mission planning.
Mission Analysis.
Developing a Landing Plan.
Developing an Objective Area Diagram to include Fire Support Plan, Escorts, and Sectors of fire.
Developing a medium threat Air Movement Plan.
Developing a Loading Plan.
Developing appropriate contingency plans.
Developing ASLT.
Developing ASSAT.
Developing Communications Plan.
Developing Execution Checklist.
Creating briefing and execution documents.
Air Assault Mission Briefing.
Threat analysis and ASE optimization.
Turn-up, check-in, taxi procedures.
Threat Update/DASC Coordination.
FENCE Checks.
Fuel planning (route and timeline changes).
Threat reaction.
Actions in the objective area.
Tactical Reports.
Contingencies.

Performance Standards

Direct and supervise mission planning cell.
Conduct coordination with supported and supporting agencies during planning.
Properly assess the threat and identify counter tactics.
Select an appropriate ASE configuration relative to the briefed threat.
Develop an integrated Landing Plan that supports the Ground Tactical Plan.
Develop a coherent, effective objective area plan that integrates a Fire Support and Escort Plan that support the Landing Plan and Ground Tactical Plan.
Develop an Air Movement Plan relative to the briefed threat.
Maximize useful load / allowable combat load in order to maximize the Ground Tactical Plan.
Develop briefing and execution documents IAW ANTTP, ASTACSOP, and squadron SOP.
Develop and deliver a logical, chronological AFL Brief in accordance with ANTTP and ASTACSOP.
Maintain situational awareness relative to friendly and enemy situation and mission progress.
Maintain appropriate formation and tactics during the Air Movement Plan.
Land within 0.03 nm of intended point of landing and 30 seconds of L-Hour.
Demonstrate sound decision making in response to off-normal and additive conditions to ensure mission success.
Successfully complete the assigned mission while preserving assigned assets.

Instructor. FLSE/Flight Leader.

Prerequisite. DL-6331, MSP.

DL-6333 3.0 * B,R,CV (NS) E A 3+ MV-22

Goal. Division Leader certification flight. Demonstrate the ability to lead a division in a low to medium threat environment. At the discretion of the evaluator, the PUI may be assigned any assault support mission.

Requirement. The PUI will be evaluated from mission receipt to mission completion. The PUI shall conduct mission analysis, direct and complete planning tasks based on resources and time available, deliver the brief, and successfully lead the section to execute the

assigned mission. This event should be flown in conjunction with a CAT-3441 event. The DLUI should serve as the AFL. When possible, this event should be flown in support of a ground combat element with actual escort aircraft and/or fire support agencies. Live fire is preferred.

Discuss

- Definition of low and medium threat.
- Integration of Landing Plan with Ground Tactical Plan.
- Development of Objective Area Diagram through integration of Fire Support Plan with Landing Plan.
- Development of Air Movement Plan relative to threat, to include attached and detached escort utilization.
- Development of efficient Loading Plan.
- FARP Planning.
- Air Assault Task Force.
- Command and Control of Air Assault operations.
- Utilization of JMPS to create .DRW files relative to FSCMs and ACAs.
- Utilization of JMPS to create appropriate threat files.
- Sectors of fire.
- Rules of engagement.
- Mission GO/NO-GO criteria.
- Hot LZ Criteria and considerations.
- Extract considerations.
- Casualty Evacuation.
- Immediate re-embarkation.
- Emergency Extract.
- Downed Aircraft.
- Resupply via Air Delivery.
- Assault Landing Table.
- Assault Wave Serial Assignment Table.
- Communications Plan.
- Execution Checklist.
- ASE planning and utilization.
- Comm Degradation v Chattermark.
- Emissions Control Conditions.

Review

- Air Assault mission planning.
- Mission Analysis.
- Developing a Landing Plan.
- Developing an Objective Area Diagram to include Fire Support Plan, Escorts, and Sectors of fire.
- Developing a medium threat Air Movement Plan.
- Developing a Loading Plan.
- Developing appropriate contingency plans.
- Developing ASLT.
- Developing ASSAT.
- Developing Communications Plan.
- Developing Execution Checklist.
- Creating briefing and execution documents.
- Air Assault Mission Briefing.
- Threat analysis and ASE optimization.
- Turn-up, check-in, taxi procedures.
- Threat Update/DASC Coordination.
- FENCE Checks.
- Fuel planning (route and timeline changes).
- Threat reaction.
- Actions in the objective area.
- Tactical Reports.
- Contingencies.

Performance Standards

Direct and supervise mission planning cell.
Conduct coordination with supported and supporting agencies during planning.
Properly assess the threat and identify counter tactics.
Select an appropriate ASE configuration relative to the briefed threat.
Develop an integrated Landing Plan that supports the Ground Tactical Plan.
Develop a coherent, effective objective area plan that integrates a Fire Support and Escort Plan that support the Landing Plan and Ground Tactical Plan.
Develop an Air Movement Plan relative to the briefed threat.
Maximize useful load / allowable combat load in order to maximize the Ground Tactical Plan.
Develop briefing and execution documents IAW ANTP, ASTACSOP, and squadron SOP.
Develop and deliver a logical, chronological AFL Brief in accordance with ANTP and ASTACSOP.
Maintain situational awareness relative to friendly and enemy situation and mission progress.
Maintain appropriate formation and tactics during the Air Movement Plan.
Land within 0.03 nm of intended point of landing and 30 seconds of L-Hour.
Demonstrate sound decision making in response to off-normal and additive conditions to ensure mission success.
Successfully complete the assigned mission while preserving assigned assets.

Instructor. FLSE/Flight Leader.

Prerequisite. MSP, LAB-6321, DL-6332.

DL-6340	0.0	180	M
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Goal. Division Leader proficiency tracking code. This code shall be logged to document Division Lead proficiency when applicable.

2.13.8 Flight Leader (FL)

2.13.8.1 Purpose.

To qualify a PUI's ability to plan, brief, and lead a multiple assault element flight composed five or more assault aircraft and incorporating fire support, strike or escort flight support.

2.13.8.2 General.

All pilots are required to complete the entire syllabus.

Flight Leader re-designation is at the discretion of the Commanding Officer for previously designated MV-22/CV-22 flight leaders that do not require Core Skill Introduction Refresher training. The minimum re-designation requirement for aircrew that require Core Skill Introduction Refresher training is completion of the Core Skill and Mission Skill refresher POI.

The FL-6430 shall be evaluated by a Flight Leader designated as a FLSE.

For tactical events, flight scheduling shall provide for adequate planning time for the PUI, the evaluator, and mission planners/participants.

Pilots who complete the FL-6430 may be designated an MV-22 Flight Leader. A letter designating the pilot as a flight leader shall be placed in the NATOPS jacket and APR.

The FL-6440 tracking code shall be logged on each subsequent Flight Lead event to document proficiency.

2.13.8.3 Prerequisites

Have flown a minimum of three flights as a designated MV-22 Division Leader.

Minimum of 750 total flight hours prior to designation.

Recommended by the Squadron Standardization Board.

If not flown in conjunction with MEU workups, WTI, or a MAGTF level exercise, this event requires a scenario monitored and administered by an AMC/LATI utilizing human-in-the-loop escorts and GCE participants.

Mission Skills Proficient (MSP) prior to starting the syllabus.

2.13.8.4 External Syllabus Support.

Scenarios shall be designed to accommodate the dominant elements listed in the unit's current or planned deployment workup.

2.13.8.5 Crew Requirements. FL/PUI/CC/AO.

Table 2-75: MV-22 Flight Leader Reading

SELF PACED READINGS	DATE COMP
AIR ASSAULT OPERATIONS	

FL-6430 3.0 * B,R,CV (NS) E A 2+ MV-22/5+ Aslt A/C

Goal. Flight Leader certification flight. Demonstrate the ability lead an assault flight with multiple maneuver elements in addition to escort and ground units within a METL based tactical scenario. At the discretion of the evaluator, the PUI may be assigned a deliberate air assault, raid, NEO, or QRF response mission during planning.

Requirement. The PUI will be evaluated from mission receipt to mission completion. The PUI shall conduct mission analysis, direct and complete planning tasks based on resources and time available, deliver the brief, and successfully lead the section to execute the assigned mission. This event should be flown in conjunction with a CAT-3241 event. The FLUI should serve as the AFL. When possible, this event should be flown in support of a ground combat element with actual escort aircraft and/or fire support agencies. Live fire is preferred.

Discuss

Definition of low and medium threat.
Integration of Landing Plan with Ground Tactical Plan.
Development of Objective Area Diagram through integration of Fire Support Plan with Landing Plan.
Development of Air Movement Plan relative to threat, to include attached and detached escort utilization.
Development of efficient Loading Plan.
FARP Planning.
Air Assault Task Force.
Command and Control of Air Assault operations.
Utilization of JMPS to create .DRW files relative to FSCMs and ACAs.
Utilization of JMPS to create appropriate threat files.
Sectors of fire.
Rules of engagement.
Mission GO/NO-GO criteria.
Hot LZ Criteria and considerations.
Extract considerations.
Casualty Evacuation.
Immediate re-embarkation.
Emergency Extract.
Downed Aircraft.
Resupply via Air Delivery.
Assault Support Landing Table.
Assault Support Serial Assignment Table.
Communications Plan.
Execution Checklist.
ASE planning and utilization.
Comm Degradation vs. Chattermark.
Emissions Control Conditions.

Review

Air Assault mission planning.
Mission Analysis.
Developing a Landing Plan.
Developing an Objective Area Diagram to include Fire Support Plan, Escorts, and Sectors of fire.
Developing a medium threat Air Movement Plan.
Developing a Loading Plan.
Developing appropriate contingency plans.

- Developing ASLT.
- Developing ASSAT.
- Developing Communications Plan.
- Developing Execution Checklist.
- Creating briefing and execution documents.
- Air Assault Mission Briefing.
- Threat analysis and ASE optimization.
- Turn-up, check-in, taxi procedures.
- Threat Update/DASC Coordination.
- FENCE Checks.
- Fuel planning (route and timeline changes).
- Threat reaction.
- Actions in the objective area.
- Tactical Reports.
- Contingencies.

Performance Standards

- Direct and supervise mission planning cell.
- Conduct coordination with supported and supporting agencies during planning.
- Properly assess the threat and identify counter tactics.
- Select an appropriate ASE configuration relative to the briefed threat.
- Develop an integrated Landing Plan that supports the Ground Tactical Plan.
- Develop a coherent, effective objective area plan that integrates a Fire Support and Escort Plan that support the Landing Plan and Ground Tactical Plan.
- Develop an Air Movement Plan relative to the briefed threat.
- Maximize useful load / allowable combat load in order to maximize the Ground Tactical Plan.
- Develop briefing and execution documents IAW ANTP, ASTACSOP, and squadron SOP.
- Develop and deliver a logical, chronological AFL Brief in accordance with ANTP and ASTACSOP.
- Maintain situational awareness relative to friendly and enemy situation and mission progress.
- Maintain appropriate formation and tactics during the Air Movement Plan.
- Land within 0.03 nm of intended point of landing and 30 seconds of L-Hour.
- Demonstrate sound decision making in response to off-normal and additive conditions to ensure mission success.
- Successfully complete the assigned mission while preserving assigned assets.

Instructor. FLSE.

Prerequisite. 3 flights as a designated MV-22 Division Leader, 750 total flight hours, FL academics complete, MSP.

FL-6440 0.0 * M

Goal. Flight Leader proficiency tracking code. This code shall be logged to document Flight Lead proficiency when applicable.

2.13.9 Air Mission Commander (AMC)

2.13.9.1 Purpose

To qualify a PUI's ability to plan, brief, and command a multi-element tactical flight.

2.13.9.2 General

All Basic pilots are required to complete the entire syllabus.

Transition pilots previously designated as an AMC in their legacy platform may be designated an AMC upon designation as a TAC in the MV-22 at the discretion of the Commanding Officer.

Air Mission Commander re-designation is at the discretion of the Commanding Officer for previously designated Air Mission Commanders that do not require Core Skill Introduction Refresher training. The minimum re-designation requirement for pilots that require Core Skill Introduction Refresher training is successful completion of the core skill and mission skill refresher POI. Flight scheduling shall provide for adequate planning time for the check pilot, the evaluator, the strike or escort flight lead, and all mission planners/participants.

AMC-6530 shall be evaluated by an Air Mission Commander designated as a FLSE.

Pilots who complete this event may be designated an Air Mission Commander. A letter designating the pilot as an Air Mission Commander shall be placed in the NATOPS jacket and APR.

The AMC-6540 tracking code shall be logged on each subsequent Air Mission Commander event to document proficiency.

2.13.9.3 Prerequisites

Designated MV-22 Flight Leader. (See General Notes above.)

Recommended by the Squadron Standardization Board.

If not flown in conjunction with MEU workups, WTI, or a MAGTF level exercise, this event requires a scenario monitored and administered by an AMC/WTI utilizing human-in-the-loop escorts and GCE participants.

2.13.9.4 External Syllabus Support.

Scenarios shall be designed to accommodate the dominant elements listed in the unit's current or planned deployment workup.

2.13.9.5 Crew Requirements. AMC, FLSE/PUI

AMC-6530	0.0	*	B,CV	(NS)	A/S	3+	Elements
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Goal. Conduct an Air Mission Commander (AMC) check.

Requirement. The PUI should be evaluated on ability to integrate the 6 Functions of Marine aviation. The PUI may lead the mission from a command and control node (if available) or from an aircraft.

Performance Standards

Plan, brief, and lead a successful mission of multiple T/M/S aircraft in a low or medium threat scenario.

Per the tactical scenario, demonstrate the ability to integrate all applicable functions of Marine Aviation in support of the MAGTF.

Instructor. AMC/FLSE/WTI.

Prerequisite. Flight Leader.

AMC-6540	0.0	*
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Goal. Air Mission Commander proficiency tracking code. This code shall be logged to document Air Mission Commander proficiency when applicable.

2.13.10 Functional Check Pilot (FCP)

2.13.10.1 Purpose.

To track requirements as outlined in the COMNAVAIRFOR 4790.2.

2.13.10.2 General.

This section allows squadrons to document and track initial functional check pilot training as well as functional check flight proficiency.

2.13.10.3 Prerequisites

Designated MV-22 Tiltrotor Aircraft Commander. It is recommended that this designation be pursued simultaneously to TAC. Designation may not occur until the PUI is a designated TAC.

Recommended by the Squadron Standardization Board.

2.13.10.4 Crew Requirements.

Events will be per all applicable directives and local maintenance SOPs. Events may be accomplished in the trainer or the aircraft.

ACAD-6610 1.0 * B, CV G

Functional Check Flight QA Lecture

Goal. The PUI will have an understanding of the procedures to conduct MV-22 functional check flights.

Required Reading. Per squadron directives.

Instructor. FCP.

Prerequisite. Recommended by the Squadron Standardization Board.

SFCP-6630 1.0 * B, CV D,E S/A 1 FFS/FTD

Goal. Conduct an evaluation of Rotor Track and Balance (RT&B) procedures.

General. Squadrons shall evaluate pilots for designation at the discretion of the Commanding Officer per the criteria in the MV-22 NATOPS Flight Manual, CNAF-M 3710.7, COMNAVAIRFOR 4790.2, and local SOPs. Prospective FCPs shall complete the ground-training syllabus per Squadron Order prior to commencing flight training. Requirements. A pilot in the FCP syllabus will receive a brief from a Quality Assurance Representative (QAR) or from Maintenance Control personnel on QA and Maintenance Control procedures related to FCFs, use of IETMS and other publications, phase Inspections, discussion of logbooks, ADBs, Test Cards and general paperwork related to FCFs, use of VSLED for track and balance procedures and use of the AMEGS for maintenance data downloads, Maintenance Control debriefs and vibration trend analysis.

Discuss

- COMNAVAIRFOR 4790 and CNAF 3710 FCF requirements.
- Level 1 and Level 2 vibration criteria.
- Use of optical sensors.
- Flight regimes, airspeed and vertical speed constraints.
- IETMS RT&B requirements.
- CMS RT&B functions (moves made, performance calculation and configurations edited).
- AMEGS review of RT&B and trend analysis data.

Evaluate

- Data collection in all RT&B regimes.
- Post flight data processing using the CMS.
- Post flight data processing using the AMEGS.
- Squadrons shall base this evaluation on completion of a locally prepared syllabus.

Performance Standards. Perform RT&B IAW the MV-22 NATOPS.

Instructor. FCP.

Prerequisite. ACAD-6610, Recommended by Squadron Standardization Board.

Required Reading - COMNAVAIRFOR 4790.2G Volume I, Ch 12.1.4 Functional Check Flights, OPNAVINST 3710.7R Paragraph 3.8, A1-V22AB-NFM-000, IETM rotor track and balance procedures and V-22 Periodic Maintenance Information Cards.

SFCP-6631 1.5 * BCV D,E S/A 1 FFS/FTD

Goal. Conduct an evaluation of FCF procedures. After the completion of this flight the pilot will receive the FCP designation.

Discuss

- COMNAVAIRFOR 4790 and CNAF 3710 FCF requirements.
- Systems checks.
- Engine performance checks, with and without VSLED.
- Flight control checks.

Evaluate

- Systems checks.
- Engine performance checks.
- Flight control checks.
- Stall check.

Fire toggle check.

Performance Standards. Perform a complete FCF IAW the MV-22 NATOPS.

Instructor. FCP.

Prerequisite. TAC-6132, SFCP-6630

2.13.11 Tracking Strategic Tanking (TRK)

TRK-6800	0.0	365	B,R,CV,M	(NS)	A	1	MV-22
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Goal. Track qualification and currency for tanking with USAF and other strategic aerial refueling platforms IAW United States ATP-3.3.4.2 Standard Related Document (SRD).

Requirement. Conduct aerial refueling from a strategic tanking platform. Should be flown day or night as appropriate for upcoming mission.

Performance Standard. As outlined in ATP-3.3.4.2-NATO Air to Air Refueling and United States ATP-3.3.4.2 Standard Related Document (SRD) Ch 5, 7, and 8E.

Prerequisite. AAR-2440, (AAR-2431 if at night).

External Syllabus Support. Strat Tanker

2.13.12 Reduced Visibility Landing Tracking (RVL)

RVL-6900	0.0	180	B, R,CV,M	(NS)	A	1	MV-22
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Goal. Track pilot landings in actual RVL conditions using any of the approach or landing types. This code is intended to be logged in addition to RVL-2232 or RVL-2233.

Requirement. Landing in reduced visibility conditions where all crew members lose visual reference to the ground and no crew member can visually provide drift or altitude corrections.

Performance Standard. As outlined in ANTP

External Syllabus Support. Suitable Landing Zone with reduced visibility conditions.

2.14 MISSION ESSENTIAL TASK (MET) PHASE (7000)

2.14.1 Purpose

To assess CMMR representative crews during the execution of the unit's specified METs in order to ensure standardization and combat readiness.

To fulfill the requirements of a Marine Corps Combat Readiness Evaluation (MCCRE) as specified in MCO 3501.1, Marine Corps Combat Readiness Evaluation.

2.14.2 General

Prerequisite. Aircrew assessed during this phase shall be crews meeting the requirements of a Force Generating Order. The crews should be comprised of deploying personnel to the maximum extent practical.

2.14.3 Admin Notes

The Proficiency Period for conducting elements of the 7000 Phase are: Active component units – no less than once every 2 years; for Reserve component units – no less than once every 5 years.

The MAW Flight Leadership Standardization and Evaluation (FLSE) cadre is the resource used to assess VMMs for MET capability in accordance with the MCCRE Order. The unit assessor will be designated by the Wing of the unit to be assessed.

Units must be trained to CMMR prior to beginning the 7000-stage event for that MET.

Multiple Events may be accomplished during the same sortie.

Results of the MCCRE assessment shall be routed IAW local directives.

Event completion results in unit proficiency. Individual proficiency is not achieved or tracked through the MET Phase.

Upon completion of the 7000-phase evaluation, units may report the MET "observed" in DRRS-MC.

2.14.4 Stages.

All Core and/or assigned METs may be evaluated if the unit is trained to CMMR.

2.14.5 MISSION ESSENTIAL TASK (MET) STAGE

2.14.5.1 Purpose.

To assess squadrons or detachments executing community specific MET(s) or MET preparatory Events.

2.14.5.2 Prerequisite.

If an event requires prerequisites in addition to those listed for the MET Phase, they will be covered in the individual event.

2.14.5.3 Crew Requirements

The participants required for the 7000 Phase are the evaluated unit and the assessor. The crew requirement is based on the specific event. At the discretion of the assessor, observation of mission planning, briefing/debriefing, and execution may satisfy a portion of the assessment. For events conducted in the simulator, crews should be comprised of pilots, crew chiefs, and AO/G.

Respectively, the primary, alternate, and tertiary assessors shall be a MATSS representative, WTI (FLSE) from within the parent command designated by the owning Wing, or MAWTS-1 representative. The number of crews evaluated will be based on the mission skill or mission plus skill conducted.

MET-7000	A/S	E
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Goal. Conduct Air Logistics Support.

Requirement. Demonstrate the ability to conduct Air Logistics Support.

Performance Standard. Conduct Air Logistics Support per MCT 4.3.8 and the MV-22 Mission Skill Phase.

Prerequisite. CMMR crews proficient in ALS-3040.

Instructor. Unit assessor designated by the responsible Wing of the assessed unit.

Ordnance Requirement. Per applicable T&R event.

Range/Target Requirement. Per applicable T&R event.

External Syllabus Support. Per applicable T&R event.

Crew. Per applicable T&R event.

Reference. Per applicable T&R event.

MET-7010 **A/S** **E**

Goal. Conduct Aviation Operations for Expeditionary Shore-Based Sites.

Requirement. Demonstrate the ability to conduct Aviation Operations from Expeditionary Shore-Based sites.

Performance Standard. Conduct Aviation Operations for Expeditionary Shore-Based Sites per MCT 1.3.3.3.2 and the MV-22 Mission Skill Phase.

Prerequisite. CMMR crews proficient in EXP-3140.

Instructor. Unit assessor designated by the responsible Wing of the assessed unit.

Ordnance Requirement. Per applicable T&R event.

Range/Target Requirement. Per applicable T&R event.

External Syllabus Support. Per applicable T&R event.

Crew. Per applicable T&R event.

Reference. Per applicable T&R event.

MET-7020 **A/S** **E**

Goal. Conduct Aviation Operations from Expeditionary Sea-Based Sites.

Requirement. Demonstrate the ability to conduct Aviation Operations from Expeditionary Sea-Based Sites.

Performance Standard. Conduct Aviation Operations from Expeditionary Sea-Based Sites per MCT 1.3.3.3.2 and the MV-22 Mission Skill Phase.

Prerequisite. CMMR crews proficient in SEA-3240.

Instructor. Unit assessor designated by the responsible Wing of the assessed unit.

Ordnance Requirement. Per applicable T&R event.

Range/Target Requirement. Per applicable T&R event.

External Syllabus Support. Per applicable T&R event.

Crew. Per applicable T&R event.

Reference. Per applicable T&R event.

MET-7030 **A/S** **(NS)** **E**

Goal. Conduct Aviation Support of Tactical Recovery of Aircraft and Personnel (TRAP).

Requirement. Demonstrate the ability to conduct Tactical Recovery of Aircraft and Personnel.

Performance Standard. Conduct Tactical Recovery of Aircraft and Personnel per MCT 6.2.1.1 and the MV-22 Mission Skill Phase.

Prerequisite. CMMR crews proficient in TRAP-3340.

Instructor. Unit assessor designated by the responsible Wing of the assessed unit.

Ordnance Requirement. Per applicable T&R event.

Range/Target Requirement. Per applicable T&R event.

External Syllabus Support. Per applicable T&R event.

Crew. Per applicable T&R event.

Reference. Per applicable T&R event.

MET-7040 **A/S** **(NS)** **E**

Goal. Conduct Combat Assault Transport.

Requirement. Demonstrate the ability to Combat Assault Transport.

Performance Standard. Conduct Combat Assault Transport per MCT 1.3.4.1 and the MV-22 Mission Skill Phase.

Prerequisite. CMMR crews proficient in CAT-3441.

Instructor. Unit assessor designated by the responsible Wing of the assessed unit.

Ordnance Requirement. Per applicable T&R event.

Range/Target Requirement. Per applicable T&R event.

External Syllabus Support. Per applicable T&R event.

Crew. Per applicable T&R event.

Reference. Per applicable T&R event.

MET-7050	A/S	(NS)	E
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Goal. Conduct Airborne Rapid Insertion/Extraction.

Requirement. Demonstrate the ability to Conduct Airborne Rapid Insertion/Extraction.

Performance Standard. Conduct Airborne Rapid Insertion/Extraction per MCT 1.3.4.1.1 and the MV-22 Core Plus Mission Skill Phase.

Prerequisite. CMMR crews proficient in RI/E-4540.

Instructor. Unit assessor designated by the responsible Wing of the assessed unit.

Ordnance Requirement. Per applicable T&R event.

Range/Target Requirement. Per applicable T&R event.

External Syllabus Support. Per applicable T&R event.

Crew. Per applicable T&R event.

Reference. Per applicable T&R event.

MET-7060	A/S	(NS)	E
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Goal. Provide Aviation-Delivered Ground Refueling.

Requirement. Demonstrate the ability to Provide Aviation-Delivered Ground Refueling.

Performance Standard. Provide Aviation-Delivered Ground Refueling per MCT 1.3.4.2.1 and the MV-22 Core Plus Mission Skill Phase.

Prerequisite. CMMR crews proficient in ADGR-4640.

Instructor. Unit assessor designated by the responsible Wing of the assessed unit.

Ordnance Requirement. Per applicable T&R event.

Range/Target Requirement. Per applicable T&R event.

External Syllabus Support. Per applicable T&R event.

Crew. Per applicable T&R event.

Reference. Per applicable T&R event

MET-7070	A/S	NS	E
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Goal. Provide Aviation-Delivered Battlefield Illumination.

Requirement. Demonstrate the ability to Provide Aviation-Delivered Battlefield Illumination.

Performance Standard. Provide Aviation-Delivered Battlefield Illumination per MCT 1.3.4.3 and the MV-22 Core Plus Mission Skill Phase.

Prerequisite. CMMR crews proficient in BI-4740.

Instructor. Unit assessor designated by the responsible Wing of the assessed unit.

Ordnance Requirement. Per applicable T&R event.

Range/Target Requirement. Per applicable T&R event.

External Syllabus Support. Per applicable T&R event.

Crew. Per applicable T&R event.

Reference. Per applicable T&R event

MET-7080 **A/S** **(NS)** **E**

Goal. Conduct Air Delivery.

Requirement. Demonstrate the ability to Conduct Air Delivery.

Performance Standard. Conduct Air Delivery per MCT 4.3.4 and the MV-22 Core Plus Mission Skill Phase.

Prerequisite. CMMR crews proficient in AD-4840.

Instructor. Unit assessor designated by the responsible Wing of the assessed unit.

Ordnance Requirement. Per applicable T&R event.

Range/Target Requirement. Per applicable T&R event.

External Syllabus Support. Per applicable T&R event.

Crew. Per applicable T&R event.

Reference. Per applicable T&R event

MET-7090 **A/S** **(NS)** **E**

Goal. Provide an Airborne Command and Control Platform for Command Elements.

Requirement. Demonstrate the ability to provide an Airborne Command and Control Platform for Command Elements.

Performance Standard. Provide an Airborne Command and Control Platform for Command Elements per MCT 5.3.2.7.4 and the MV-22 Core Plus Mission Skill Phase.

Prerequisite. CMMR crews proficient in AC2-4940.

Instructor. Unit assessor designated by the responsible Wing of the assessed unit.

Ordnance Requirement. Per applicable T&R event.

Range/Target Requirement. Per applicable T&R event.

External Syllabus Support. Per applicable T&R event.

Crew. Per applicable T&R event.

Reference. Per applicable T&R event

2.15 AVIATION CAREER PROGRESSION MODEL (ACPM)

2.15.1 Purpose

To establish provide specific academic requirements that supplement the 2000-6000 syllabus. These courses are designed to broaden the PUIs understanding of Marine Aviation.

2.15.2 General

The courses are not prerequisites for a specific flight event.

These courses must be complete to be considered complete in the corresponding phase or stage of training.

2.15.3 Stages

Table6 depicts the stages in the Aviation Career Progression Model Phase of training.

Table 2-76: Career Aviation Progression Overview

Stage Name
CORE SKILL ACPM CLASSES
MISSION SKILL ACPM CLASSES
SECTION/DIVISION/FLIGHT LEADER ACPM CLASSES

2.15.4 Core Skill ACPM Classes

ACPM-8200 0.5 * G

MACCS Agencies, Functions, and Control of Aircraft and Missiles

Goal. The PUI will have an understanding of the MACCS Agencies, Functions, and Control of Aircraft and Missiles.

Prerequisites. T2P. Required Reading - MACCS Workbook (MAWTS-1 WTI Read Ahead), and Control of Aircraft and Missiles (MAWTS-1 WTI Read Ahead).

ACPM-8201 0.5 * G

MWCS Brief

Goal. The PUI will have an understanding of the MWCS.

Prerequisite. T2P.

ACPM-8202 0.8 * G

ACA and Airspace

Goal. The PUI will have an understanding of ACAs and airspace.

Prerequisites. T2P. Required Reading - Fire Support Coordination Measures (MAWTS-1 WTI Read Ahead).

ACPM-8210 0.7 * G

Aviation Ground Support

Goal. The PUI will have an understanding of Aviation Ground Support.

Prerequisites. T2P. Required Reading - Aviation Ground Support (MAWTS-1 WTI Read Ahead).

ACPM-8230 0.5 * G

ACE Battle Staff

Goal. The PUI will have an understanding of the ACE Battle Staff.

Prerequisite. T2P.

ACPM-8231 0.5 * G

Battle Command Display

Goal. The PUI will have an understanding of the Battle Command Display.

Prerequisite. T2P.

ACPM-8240 1.7 * G

Six Functions of Marine Aviation

Goal. The PUI will have an understanding of the Six Functions of Marine Aviation.

Prerequisites. T2P. Required Reading - Six Functions of Marine Aviation (MAWTS-1 WTI Read Ahead).

ACPM-8241 1.3 * G

JTAR / ASR Introduction and Practical Application

Goal. The PUI will have an understanding of the JTAR and ASR process.

Prerequisite. T2P.

ACPM-8242 0.5 * G

Site Command Primer

Goal. The PUI will have an understanding of Site Command.

Prerequisite. T2P.

ACPM-8250 0.8 * G

Theater Air Ground System

Goal. The PUI will have an understanding of the Theater Air Ground System.

Prerequisite. T2P.

2.15.5 Mission Skill ACPM Classes

ACPM-8300 0.8 * G

Air Defense

Goal. The PUI will have an understanding of Air Defense.

Prerequisite. T2P.

ACPM-8310 0.8 * G

Forward Arming and Refueling Point (FARP) Operations

Goal. The PUI will have an understanding of the FARP operations.

Prerequisite. T2P.

ACPM-8311 0.8 * G

Marine Corps Tactical Fuel Systems

Goal. The PUI will have an understanding of the Marine Corps Tactical Fuel Systems.

Prerequisite. T2P.

ACPM-8320 1.0 * G

Joint Structure and Joint Air Operations

Goal. The PUI will have an understanding of the Joint Structure and Joint Air Operations.

Prerequisite. T2P.

ACPM-8321 0.4 * G

Joint Air Tasking Cycle Phase 1: Strategy Development

Goal. The PUI will have an understanding of the Strategy Development portion of the Joint Air Tasking Cycle.

Prerequisite. T2P.

ACPM-8322 0.4 * G

Joint Air Tasking Cycle Phase 2: Target Development

Goal. The PUI will have an understanding of the Target Development portion of the Joint Air Tasking Cycle.

Prerequisite. T2P.

ACPM-8323 0.4 * G

Joint Air Tasking Cycle Phase 3: Weaponeering and Allocation

Goal. The PUI will have an understanding of the Weaponeering and Allocation portion of the Joint Air Tasking Cycle.

Prerequisite. T2P.

ACPM-8324 0.4 * G

Joint Air Tasking Cycle Phase 4: Joint ATO Production

Goal. The PUI will have an understanding of the Joint ATO Production portion of the Joint Air Tasking Cycle.

Prerequisite. T2P.

ACPM-8325 0.4 * G

Joint Air Tasking Cycle Phase 5: Force Execution

Goal. The PUI will have an understanding of the Force Execution portion of the Joint Air Tasking Cycle.

Prerequisite. T2P.

ACPM-8326 0.4 * G

Joint Air Tasking Cycle Phase 6: Combat Assessment

Goal. The PUI will have an understanding of the Combat Assessment portion of the Joint Air Tasking Cycle.

Prerequisite. T2P.

ACPM-8340 0.5 * G

Integrating Fires & Airspace within the MAGTF

Goal. The PUI will have an understanding of how to integrate fires and airspace within the MAGTF.

Prerequisite. T2P.

ACPM-8350 0.8 * G

Phasing Control Ashore

Goal. The PUI will have an understanding of how to Phase Control Ashore.

Prerequisite. T2P.

ACPM-8351 0.5 * G

TACRON Organization and Functions

Goal. The PUI will have an understanding of the organization of the TACRON and its Functions.

Prerequisite. T2P.

2.15.6 Section Leader ACPM Classes

ACPM-8630	1.0	*	G
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Tactical Air Command Center

Goal. The PUI will have an understanding of the TACC.

Prerequisite. T2P.

ACPM-8660	0.5	*	G
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Joint Operations Introduction

Goal. The PUI will have an understanding of Joint Operations.

Prerequisite. T2P.

2.15.7 Division Leader ACPM Classes

ACPM-8640	0.8	*	G
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Joint Data Network

Goal. The PUI will have an understanding of the Joint Data Network.

Prerequisite. T2P.

ACPM-8641	1.3	*	G
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Theater & National ISR Employment

Goal. The PUI will have an understanding of theater and national ISR employment.

Prerequisite. T2P.

2.15.8 Flight Leader ACPM Classes

ACPM-8620	0.5	*	G
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ESG/CSG Integration

Goal. The PUI will have an understanding of the integration between the ESG and CSG.

Prerequisite. T2P.

VMM MV-22B PILOT T&R MATRIX (2000-8000 Phase)																											
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ATTAIN		MAINTAIN	ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	TEN	TEN+	NETWORK	# NETWORK	PROF INTERVAL	PREREQUISITE	PREREQUISITE NOTES	CHAINING	EVAL	INST	EOM	EVENT CONV
				B	R		#	TIME	#	TIME	#	TIME															
2000 PHASE CORE SKILLS																											
FAMILIARIZATION (FAM)																											
FAM	ACAD	MV-22 SINGARS	2010	X				1.0						G						*					BIP		2010
	ACAD	MV-22 SATCOM	2011	X				1.0						G						*					BIP		2011
	ACAD	MV-22 TABLET FAM	2012	X				1.0						G						*					BIP		
	LAB	FLIGHT LINE RADIO DEMO	2020	X				2.0						A	2					*	2010,2011				BIP		2020
	LAB	TABLET FAM	2021	X				2.0						G						*	2012				BIP		
	SFAM	FAM	2030	X						2.0			(N)	S	1					*	2020,2021				BIP		2030
	SFAM	INST	2031	X	X	X				2.0			(N)	S	1					365	2020,2021				BIP		2031
FAM TOTAL							5	7.0	2	4.0	0	0.0															
FORMATION (FORM)																											
FORM	ACAD	TACFORM	2110	X				1.0						G						*					BIP		2160
	ACAD	TRAIL FORM	2111	X				1.0						G						*					BIP		2161
	LAB	TACFORM/TRAIL WALK THROUGH	2120	X				1.0						G						*	2110,2111				BIP		2180
	SFORM	TACFORM / NAV	2130	X						2.0			D	S	2			X	2	*	2111,2120				BIP		2180
	SFORM	TRAIL FORMATION	2131	X						2.0			(NS)	S	2			X	2	*	2031,2120				BIP		2181
	FORM/NAV	TAC FORM / NAV	2140	X	X	X						2.0	(NS)	A	2					365	2130,2131				BIP		2182
FORM TOTAL							3	3.0	2	4.0	1	2.0															
CONFINED AREA LANDING (CAL)																											
CAL	ACAD	CAL PROCEDURES	2210	X				1.0						G						*					BIP		2110
	SCAL	SINGLE CAL	2230	X						2.0			D	S	1					*	2030,2210				BIP		2130
	SCAL	SECTION CAL	2231	X	X	X				2.0			D	S	2			X	2	365	2130,2230				BIP		2134
	CAL	SINGLE CAL VISUAL	2240	X								1.5	D	A	1					*	2230		2230		BIP		2132
	CAL	SINGLE CAL WYPT	2241	X								1.5	D	A	1					*	2230		2230		BIP		2132
	CAL	SECTION CAL	2242	X	X	X						2.0	D	A	2					365	2140,2231,2240,2241		2231, 2240,2241		BIP		2135
CAL TOTAL							1	1.0	2	4.0	3	5.0															
REDUCED VISIBILITY LANDINGS (RVL)																											
RVL	ACAD	RVL	2250	X				1.0						G						*	2210				RVLI		2110
	LAB	RVL LAB	2260	X				1.0						G						*	2250				RVLI		2110
	SRVL	RVL AUTOMATED	2270	X	X					2.0			(NS)	S	1					365	2230,2260				RVLI		2131
	SRVL	RVL UNASSISTED	2271	X	X					2.0			(NS)	S	1					365	2230,2260				RVLI		2131
	RVL	RVL AUTOMATED	2280	X	X	X						2.0	(NS)	A	1					240	2240,2241,2270		2240,2241,2270		RVLI		2133
	RVL	RVL UNASSISTED	2281	X	X	X						2.0	(NS)	A	1					180	2240,2241,2271		2240,2241,2271		RVLI		2133
	RVL	RVL (ACTUAL COND/TRACKING)	2282	X	X	X						0.0	(NS)	A	1					365					RVLI		2133
RVL SKILL TOTAL							2	2.0	2	4.0	3	4.0															
NIGHT SYSTEMS HIGH LIGHT LEVEL (NS HLL)																											
NS HLL	ACAD	MV-22 NS EMPLOYMENT	2310	X				1.0						G						*	2250				NSI		2310
	SNS	HLL SGL CAL	2330	X	X					2.0			NS	S	1					365	2230		2230		NSI		2330
	SNS	HLL SEC CAL	2331	X	X					2.0			NS	S	2			X	2	365	2231,2330		2231,2330		NSI		2330
	NS	HLL SGL CAL	2340	X	X	X						2.0	HLL	A	1					365	2240,2241,2330		2240,2241,2330		NSI		2331
	NS	HLL SEC CAL	2341	X	X	X						2.0	HLL	A	2					365	2242,2331,2340		2242,2331,2340		NSI		2332

VMM MV-22B PILOT T&R MATRIX (2000-8000 Phase)																											
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ATTAIN		MAINTAIN	ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	TEN	TEN+	NETWORK	# NETWORK	PROF INTERVAL	PREREQUISITE	PREREQUISITE NOTES	CHAINING	EVAL	INST	EOM	EVENT CONV
				B	R		#	TIME	#	TIME	#	TIME															
NS HLL SKILL TOTAL							0	0.0	2	4.0	2	4.0															
NIGHT SYSTEMS LOW LIGHT LEVEL (NS LLL)																											
NS LLL	SNS	LLL RVL	2370	X	X	X				2.0			LLL	S	1					365	NSQ HLL, 2270, 2271		2270,2271,2330		NSI		2380
	SNS	LLL SGL/SEC CAL	2371	X	X					2.0			LLL	S	2			X	2	365	NSQ HLL		2330,2331		NSI		2380
	NS	LLL SGL CAL VISUAL	2380	X	X							1.5	LLL	A	1					240	2370,2371		2340		NSI		2381
	NS	LLL SGL CAL WYPT	2381	X	X							1.5	LLL	A	1					240	2370,2371		2340		NSI		2381
	NS	LLL SEC NAV/TACFORM	2382	X								1.5	LLL	A	2					*	2371		2140		NSI		2382
	NS	LLL SEC CAL	2383	X	X	X						2.0	LLL	A	2					240	2380, 2381, 2382		2341,2371,2380, 2381, 2382		NSI		2382
NS LLL SKILL TOTAL							0	0.0	2	4.0	4	6.5															
AIR to AIR REFUELING (AAR)																											
AAR	ACAD	MV-22B AAR ACAD	2410	X				0.5						G						*	2110, 2111				AARI		2410
	ACAD	ICAO PROCEDURES	2411	X				1.0						G						*	2410				AARI		
	LAB	LONG RANGE PLNG LAB	2420	X				1.0						G						*	2411				AARI		
	SAAR	DAY AAR	2430	X						1.0			D	S	1					*	2130,2131,2420				AARI		2430
	SAAR	NIGHT AAR	2431	X						1.0			NS	S	1					*	2330,2430				AARI		2432
	AAR	DAY AAR	2440	X	X							1.5	D	A	1					365	2140,2430		2430		AARI		2431
	AAR	NIGHT AAR	2441	X	X	X						1.5	NS	A	1					365	2431,2440		2431, 2440		AARI		2433
AAR SKILL TOTAL							3	2.5	2	2.0	2	3.0															
TAIL GUNNERY (TG)																											
TG	ACAD	WEAPONS SYSTEMS	2510	X				0.5						G						*					BIP		2510, 2511, 2512
	ACAD	WEAPONS EMPLOYMENT	2511	X				0.5						G						*	2510				BIP		
	TG	DAY SECTION TG	2541	X							1.5		D	A	2					*	2140,2511		2140		BIP		2532
	TG	NIGHT SECTION TG	2543	X	X	X						1.5	NS	A	2					365	2541		2541		BIP/NSI IF NOT NSQ		2535
TG SKILL TOTAL							2	1.0	0	0.0	2	3.0															
LOW ALTITUDE TACTICS (LAT)																											
LAT	ACAD	LAT I	2610	X				0.5						G						*					LATI		2210
	ACAD	LAT II	2611	X				0.5						G						*	2610				LATI		2211
	ACAD	LAT III	2612	X				0.5						G						*	2611				LATI		2212
	ACAD	Ps E/M	2613	X				0.5						G						*	2612				LATI		2816
	ACAD	TACTICS IN THE NIGHT ENV	2614	X				0.5						G						*	2613				NSI		2314
	LAB	LAT WALK-THR	2620	X				0.5						G						*	2613				LATI		2220
	SLAT	LAT MAN / RTE	2630	X						2.0			D	S	1					*	2130,2620				LATI		2230
	SLAT	SEC LAT	2631	X	X					2.0			D	S	2			X	2	365	2231,2630		2630		LATI		2232
	SNS LAT	NS SEC LAT	2632	X	X					2.0			NS	S	2			X	2	365	NSQ HLL,2614,2631		2631		NSI		2383
	LAT	LAT MAN / RTE	2640	X								1.5	D	A	1					*	2630		2630		LATI		2231
	LAT	SEC LAT	2641	X	X	X						1.5	D	A	2					365	2140,2631,2640		2140,2631,2640		LATI		2233
	NS LAT	HLL SEC LAT	2642	X	X							1.5	HLL	A	2					240	NSQ HLL,2632,2641		2140,2632,2641		NSI		2335
	NS LAT	LLL SEC LAT	2643	X	X	X						1.5	LLL	A	2					180	NSQ 2642		2642		NSI		2384

VMM MV-22B PILOT T&R MATRIX (2000-8000 Phase)																											
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ATTAIN		MAINTAIN	ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	TEN	TEN+	NETWORK	# NETWORK	PROF INTERVAL	PREREQUISITE	PREREQUISITE NOTES	CHAINING	EVAL	INST	EOM	EVENT CONV
				B	R		#	TIME	#	TIME	#	TIME															
LAT SKILL TOTAL							6	3.0	3	6.0	4	6.0															
MOUNTAIN AREA TRAINING																											
MAT	ACAD	HIGH ALTITUDE OPS	2710	X				0.5					G							*	2210				BIP		2710
	ACAD	ADV MV-22 AERO	2711	X				0.5					G							*	2210				BIP		2710
	SMAT	DAY MAT SIM	2730	X	X					1.0		D	S	1						365	2230,2710,2711				BIP		2730
	SMAT	NS MAT SIM	2731	X	X	X				1.0		NS	S	1						365	2330,2730		2330,2730		NSI		2731
	SMAT	HIGH/HOT/HEAVY SIM	2732	X	X	X				1.0		(NS)	S/A	1						365	2230,2710,2711		2730		BIP		
MAT SKILL TOTAL							2	1.0	3	3.0	0	0.0															
DIVISION (DIV)																											
DIV	ACAD	LARGE FLIGHT LEADERSHIP	2750	X				1.0					G							*					WTI		
	DIV	DIV TACFORM/NAV	2780	X							1.5	(NS)	A	3						*	2140		2140		BIP		2183
	DIV	DIV CAL	2781	X							1.5	D	A	3						*	2242,2780		2242		BIP		2136
	DIV	HLL DIV CAL	2782	X							1.5	HLL	A	3						*	2341,2781		2341,2781		NSI		2336
	DIV	LLL DIV CAL	2783	X	X	X					1.5	LLL	A	3						365	2383,2782		2383,2782		NSI		2385
	DIV	DIV LAT	2784	X	X	X					1.5	(NS)	A	3						365	2780,2641~D,2642~HLL,2643~LLL		2780,2641~D,2642~HLL,2643~LLL		LATI~D,NSI~NS		
DIV TOTAL							1	1.0	0	0.0	5	7.5															
GROUND THREAT REACTION (GTR)																											
GTR	ACAD	MV-22 ALE-47	2810	X	X			1.0					G							730					WTI		2810
	ACAD	MV-22 APR-39	2811	X	X			1.0					G							730					WTI		2811
	ACAD	MV-22 AAR-47	2812	X	X			1.0					G							730					WTI		2812
	ACAD	ADA THREAT	2813	X				1.0					G							*					WTI		2813
	ACAD	IR SAM THREAT	2814	X				1.0					G							*					WTI		2814
	ACAD	RADAR PRINCIPLES	2815	X				1.0					G							*					WTI		2815
	ACAD	RADAR SAMS	2816	X				1.0					G							*					WTI		2815
	ACAD	GTR	2817	X	X			1.0					G							730	2810,2811,2812,2813,2814,2815,2816				WTI		2817
	LAB	GTR WALK-THR	2820	X				0.5					G							*	2817				WTI		2820
	SGTR	SINGLE TR	2830	X						2.0		(NS)	S	1	X					*	2630,2820				WTI		2830
	SGTR	SECTION TR	2831	X	X	X				2.0		(NS)	S	2	X		X	2	365	2631,2830		2810,2811,2812,2817,2830,2840		WTI		2831	
	GTR	SECTION TR	2840	X	X						1.5	(NS)	A	2						365	2641,2831		2641~HLL,2642~LLL,2643,2830,2831		WTI		2832
GTR SKILL TOTAL							9	8.5	2	4.0	1	1.5															
CARRIER QUALIFICATION (CQ)																											
CQ	ACAD	MV-22 SHIP OPS	2910	X				1.0					G							*					BIP		2910
	ACAD	AIR CAPABLE SHIPS	2911	X				0.5					G							*					BIP		2910
	SCQ	DAY SIM	2930	X	X					1.0		D	S	1						365	2230,2910,2911				NSI		2930
	SCQ	NIGHT SIM	2931	X	X					1.0		NS	S	1						365	2330,2930		2930		NSI		2933
	CQ	DAY FCLP	2940	X	X						1.5	D	A	1						365	2240,2930		2230,2930		BIP		2931
	CQ	DAY CQ	2941	X	X						1.5	D	A	1						365	2940		2940		BIP		2932
	NS CQ	NIGHT FCLP	2942	X	X	X					1.5	NS	A	1						365	2340,2931,2940		2340,2931,2940		NSI		2934
	NS CQ	NIGHT CQ	2943	X	X	X					1.5	NS	A	1						365	NSQ for light level,2941,2942		2941,2942		NSI		2935

VMM MV-22B PILOT T&R MATRIX (2000-8000 Phase)																											
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ATTAIN		MAINTAIN	ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	TEN	TEN+	NETWORK	# NETWORK	PROF INTERVAL	PREREQUISITE	PREREQUISITE NOTES	CHAINING	EVAL	INST	EOM	EVENT CONV
				B	R		#	TIME	#	TIME	#	TIME															
CQ SKILL TOTAL							2	1.5	2	2.0	4	6.0															
2000 PHASE TOTAL							35	30.5	24	41.0	26	48.5															
3000 PHASE MISSION SKILLS																											
AIR LOGISTICS SUPPORT (ALS)																											
ALS	ACAD	ALS INTRO AND PLANNING	3010	X				0.5					G							*	T2P				LATI	3030	
	ALS	ALS MSN	3040	X	X	X					2.0	(NS)	A	2						365	NSQ				LATI	3030	
ALS SKILL TOTAL							1	0.5	0	0.0	0	2.0															
EXPEDITIONARY SHORE BASED OPERATIONS (EXP)																											
EXP	ACPM	TAC C2	8630	X				1.0					G							*	T2P					8630	
	ACPM	JOINT AIR OPS	8660	X				1.0					G							*	T2P					8660	
	ACAD	ACEOI & TRIAD	3110	X				0.5					G							*	T2P				BIP	3012	
	EXP	GS MSN	3140	X	X	X		0.0			2.0	(NS)	A/S	2						365	NSQ, MAT				LATI	3030	
EXP SKILL TOTAL							0	2.5	0	0.0	1	2.0															
EXPEDITIONARY SEA BASED OPERATIONS (SEA)																											
SEA	ACPM	PHASING CONTROL ASHORE	8350	X				0.8					G							*	T2P					8350	
	ACPM	TACRON ORG AND FUNCTION	8351	X				0.5					G							*	T2P					8351	
	ACPM	ESG/CSG INTEGRATION	8620	X				0.5					G							*	T2P					8620	
	ACAD	SHIPBOARD OPERATIONS PLANNING	3210	X				1.0					G							*	T2P				BIP	3130	
	ACAD	R2P2	3211	X				1.0					G							*	T2P				WTI	3215	
	SEA	SHIP TO SHORE MSN	3240	X	X	X					2.0	(NS)	A/S	2						365	NSQ, CQ				LATI	3130	
SEA SKILL TOTAL							5	3.8	0	0.0	1	2.0															
TACTICAL RECOVERY OF AIRCRAFT AND PERSONNEL (TRAP)																											
TRAP	ACAD	PR 102 JKO	3310	X				4.0					G							*	T2P						
	ACAD	TRAP TTPs	3311	X				1.0					G							*	T2P				WTI	3410	
	TRAP	TRAP MISSION	3340	X	X	X					2.0	(NS)	A/S	2						365	NSQ, LATQ, GTR-2840				LATI	3430	
TRAP SKILL TOTAL							2	5.0	0	0.0	1	2.0															
COMBAT ASSAULT TRANSPORT (CAT)																											
CAT	ACAD	PLANNING PROD	3410	X				1.0					G							*	T2P				WTI	3210	
	ACAD	AIR ASLT OPS	3411	X				1.0					G							*	T2P				WTI	3211	
	ACAD	AIR ASLT KEY PLAYERS	3412	X				1.0					G							*	T2P				WTI	3212	
	ACAD	OBJ PLAN	3413	X				1.0					G							*	T2P				WTI	3213	
	ACAD	TROTOR ESCORT	3414	X				1.0					G							*	T2P				WTI	3214	
	ACAD	NEO EXECUTION	3415	X				1.0					G								3410,3411,3412,3413,3414				WTI	3311	
	ACAD	CASEVAC	3416	X				1.0					G							*	T2P				WTI	3310	
	LAB	ASLT SPT PLANNING PROB	3420	X				6.0					G							*	3211, 3410-3414,3416				WTI	3220	
	SCAT	NEO MSN	3430	X	X	X				3.0			(NS)	S/A	2					365	2541,2783,3415, 3420,NSQ,GTR-2840				LATI	3330	
	SCAT	MED THRT DIV	3431	X	X					3.0			NS	S/A	3					365	2541,2783,2784,3420, NSQ, LATQ, GTR-2840				LATI	3231	
	CAT	LOW THRT SEC	3440	X	X							2.0	NS	A	2					365	2541,3420, NSQ, LATQ, GTR-2840				LATI	3230	
	CAT	ESCORT SEC	3441	X	X	X						2.0	(NS)	A	2					365	2541,3420, NSQ, LATQ, GTR-2840			3440,3431	LATI	3233	

VMM MV-22B PILOT T&R MATRIX (2000-8000 Phase)																											
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ATTAIN		MAINTAIN	ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	TEN	TEN+	NETWORK	# NETWORK	PROF INTERVAL	PREREQUISITE	PREREQUISITE NOTES	CHAINING	EVAL	INST	EOM	EVENT CONV
				B	R		#	TIME	#	TIME	#	TIME															
CAT SKILL TOTAL							8	13.0	2	6.0	2	4.0															
3000 PHASE TOTAL							16	24.8	2	6.0	5	12.0															
4000 PHASE CORE PLUS SKILLS																											
AERIAL DELIVERY (AD)																											
AD	ACAD	AD / PARAOPS	4010	X				1.0					G							*					BIP		2610
	SAD	AD OF CARGO / PARAOPS	4030	X	X					2.0			(NS)	S	1					365	4010				BIP		2630
	PARA	PARAOPS	4040	X	X	X						1.5	(NS)	A	1					365	4030		4030		BIP		4030
	AD	CARGO	4041	X	X	X						1.5	(NS)	A	1					365	4030		4030,4040		BIP		2631
	SEXT	DAY/NS EXTERNALS	4070	X						2.0			D/NS	S	1					*	2330				BIP		4031
	EXT	DAY EXTERNALS	4080	X	X							1.5	D	A	1					365	2240,4070				BIP		4032
	EXT	NS EXTERNALS	4083	X	X	X						1.5	NS	A	1					365	2340~HLL, 2380~LLL, 4081		4081		NSI		4034
AD SKILL TOTAL							1	1.0	2	4.0	4	6.0															
ALTERNATE INSERTION/EXTRACTION TECHNIQUES (A/E)																											
A/E	ACAD	FASTROPE/RAPPEL/SPIE	4110	X				0.5		1.0				G						*					BIP		4111
	ACAD	HELOCAST OPS	4111	X				0.5		1.0				G						*					BIP		4112
	ACAD	HOIST OPS	4112	X				0.5						G						*					BIP		4111
	AIE	FASTROPE / RAPPEL	4140	X	X	X						1.5	(NS)	A	1					365	4070,4110				BIP		4130
	AIE	HOISTING	4141	X	X	X						1.5	(NS)	A	1					365	4070,4112				BIP		4131
	AIE	SPIE	4142	X	X	X						1.5	(NS)	A	1					365	4070,4110				BIP		4132
	AIE	HELO CAST	4143	X	X	X						1.5	(NS)	A	1					365	2280,2281,4111				BIP		4133
A/E SKILL TOTAL							3	1.5	2	2.0	4	6.0															
MOUNTAIN AREA TRAINING (MAT)																											
MAT	MAT	DAY MAT	4180	X	X							1.5	D	A	1					365	2730		2240,2241,2730		BIP		2732
	MAT	NS MAT	4181	X	X	X						1.5	NS	A	1					365	2340~HLL,2380,2381~LLL,2731,4180		2340~HLL,2380,2381~LLL,2731		NSI		2733
MAT SKILL TOTAL							0	0.0	0	0.0	2	3.0															
DEFENSIVE WEAPONS SYSTEM (DWS)																											
DWS	ACAD	DWS FAM	4210	X				1.0						G						*					DWSI		4510
	LAB	DWS CRM & PROCEDURES FAM	4220	X				1.0						G						*	4210				DWSI		4520
	LAB	DWS LAB	4221	X				1.0						A	1					*	4210,4220				DWSI		4521
	DWS	DAY DWS EMPLOYMENT	4242	X	X							1.5	D	A	1+					365	2540, 4221				BIP		4533
	DWS	NIGHT DWS EMPLOYMENT	4245	X	X	X						1.5	NS	A	2					365	25414240		4240		BIP		4536
DWS SKILL							3	3.0	0	0.0	2	3.0															
DEFENSIVE COMBAT MANEUVERING (DCM)																											
DCM	ACAD	HELO THREAT	4310	X				1.0						G						*					WTI		4810
	ACAD	FW THREAT TO AS	4311	X				1.0						G						*					WTI		4811
	ACAD	MV-22 DEFTAC	4312	X				1.0						G						*	4310,4311				WTI		
	ACAD	DCM	4313	X				1.0						G						*	4312				DCMI		4812
	LAB	DCM WALKTHROUGH	4320	X				0.5						G						*	4313				DCMI		4820
	SDCM	DCM AGAINST FW AGGRESSOR	4330	X	X					2.0			D	S	2		X			365	2831,4320				DCMI		4830

VMM MV-22B PILOT T&R MATRIX (2000-8000 Phase)																											
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ATTAIN		MAINTAIN	ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	TEN	TEN+	NETWORK	# NETWORK	PROF INTERVAL	PREREQUISITE	PREREQUISITE NOTES	CHAINING	EVAL	INST	EOM	EVENT CONV
				B	R		#	TIME	#	TIME	#	TIME															
	DCM	DCM AGAINST FW AGGRESSOR	4340	X	X	X						1.0	D	A	2					365	2840,4330		4330,2641		DCMI		4831
DCM SKILL TOTAL							5	4.5	1	2.0	1	1.0															
CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR (CBRN)																											
CBRN	LAB	EQUIPMENT FIT & FAM	4420	X				0.5						G						*					BIP		4620
	SCBRN	DAY CBRN	4430	X						1.0			D	S	1					*	4420				BIP		4630
	SCBRN	NIGHT CBRN	4431	X	X	X				1.0			NS	S	1					730	4430, NSQ LLL		4430		BIP		4631
DCM SKILL TOTAL							1	0.5	2	2.0	0	0.0															
CARRIER QUALIFICATION (CQ)																											
CQ	SCQ	NIGHT UNAIDED SIM	4470	X	X					1.0			N*	S	1					365	2931				BIP		4780
	CQ	NIGHT UNAIDED FCLP	4480	X	X						1.0		N*	A	1					365	2942,4470		4470		BIP		4781
	CQ	NIGHT UNAIDED CQ	4481	X	X	X					1.5		N*	A	1					365	2943,4480		4480		BIP		4782
DCM SKILL TOTAL							0	0.0	1	1.0	2	2.5															
COMBAT ASSAULT TRANSPORT (HTT)																											
HTT	SHTT	HIGH THREAT TACTICAL SIM	4490	X	X	X				3.0			NS	S	2		X			365	3431		2831		WTI		4930
CBRN / CQ / HTT							0	0.0	1	3.0	0	0.0															
RAPID INSERTION / EXTRACTION																											
R/E	R/E	RAPID INSERT/EXTRACT	4540	X	X	X						2.5	(NS)	A	1					365	APPROPRIATE AIE SKILL				LATI		4180
R/E							0	0.0	0	0.0	1	2.5															
AVIATION DELIVERED GROUND REFUELING																											
ADGR	ACAD	ADGR LECTURE	4610	X				1.0						G						*					BIP		4210
	LAB	ADGR LAB	4620	X	X	X		2.0						A	1					365	4610		4640		BIP		4220
	ADGR	ADGR MISSION	4640	X	X	X					0.5		(NS)	A	1					365	2240,2241,2340~HLL,2380,2381~LLL,4620		4620		BIP		4230
AAR / ADGR							2	3.0	0	0.0	1	0.5															
BATTLEFIELD ILLUMINATION (BI)																											
BI	ACAD	BI LECTURE	4710	X				2.0						G						*					BIP		4310
	BI	BI MISSION	4740	X	X	X					1.5		(NS)	A	1					365	4710				BIP		4330
BI MISSION							1	2.0	0	0.0	1	1.5															
AIR DELIVERY (AD)																											
AD	AD	AD MISSION	4840	X	X	X						2.5	(NS)	A/S	1					365	APPROPRIATE AD SKILL				LATI		3530
AD MISSION							0	0.0	0	0.0	1	2.5															
AIRBORNE COMMAND AND CONTROL (AC2)																											
AC2	ACAD	AIRBORNE C2	4910	X				0.5						G						*					BIP		4410
	LAB	AIRBORNE C2 LAB	4920	X				1.0						A	1					*	4910				BIP		4420
	AC2	AIRBORNE C2 MISSION	4940	X	X	X					1.0		(NS)	A	1					730	4920				BIP		4430
AC2 MISSION							2	1.5	0	0.0	1	1.0															

VMM MV-22B PILOT T&R MATRIX (2000-8000 Phase)																											
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ATTAIN		MAINTAIN	ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	TEN	TEN+	NETWORK	# NETWORK	PROF INTERVAL	PREREQUISITE	PREREQUISITE NOTES	CHAINING	EVAL	INST	EOM	EVENT CONV
				B	R		#	TIME	#	TIME	#	TIME															
5000 PHASE INSTRUCTOR																											
BASIC INSTRUCTOR PILOT (BIP)																											
BIP	ACAD	BITC	5010	X				8.0					G							*					BIP		5010
	LAB	TRAINER IOS FUNCTIONS AND OPS	5020	X				1.0					G							*					BIP		5511
	SBIP	FAM / CAL / FORM	5030	X						2.0			D	S	1					*	5020			E	WTI		5030
	SBIP	AD / MAT / CQ	5031	X						2.0			D	S	1					*	5020			E	WTI		5031
BIP SKILL TOTAL							2	9.0	2	4.0	0	0.0															
FLIGHT LEADERSHIP STANDARDIZATION EVALUATOR (FLSE)																											
FLSE	ACAD	FLSE STAN COURSE	5210	X				1.0					G							*	MAWTS-1 FLSE PROGRAM GUIDE			E	FLSE		5210
FLSE SKILL TOTAL							1	1.0	0	0.0	0	0.0															
AARI																											
AARI	ACAD	INSTRUCT MV-22 AAR ACAD	5310	X				1.0					G							*	MAWTS-1 COURSE CATALOG			E	AARI		5310
	LAB	INSTRUCT MV-22 AAR CHALK TALK	5320	X				1.0					G							*	MAWTS-1 COURSE CATALOG			E	WTI		
	SAARI	DAT / NT AAR SIM	5330	X						2.0			D/NS	S	1					*	MAWTS-1 COURSE CATALOG			E	AARI		5330
	AARI	NIGHT AAR CERT	5331	X								2.0	NS	A	1					*	MAWTS-1 COURSE CATALOG			E	WTI		5331
AARI SKILL TOTAL							2	2.0	1	2.0	1	2.0															
LOW ALTITUDE TACTICS INSTRUCTOR (LATI)																											
LATI	ACAD	INSTRUCT LAT ACAD	5610	X				1.0					G							*	MAWTS-1 COURSE CATALOG				WTI		5610
	ACAD	TACTICAL SCENARIO DEV	5611	X				1.0					G							*	MAWTS-1 COURSE CATALOG				WTI		5512
	ACAD	INST DEBRIEFING TECHNIQUES	5612	X				1.0					G							*	MAWTS-1 COURSE CATALOG				WTI		
	ACAD	INSTRUCT LAT CHALK TALK	5620	X				1.0					G							*	MAWTS-1 COURSE CATALOG				WTI		
	SLATI	LAT INSTRUCTIONAL TECHNIQUES	5630	X						2.0			D	S	1					*	MAWTS-1 COURSE CATALOG			E	LATI		5630
	LATI	LAT INSTRUCTIONAL TECHNIQUES	5631	X								2.0	D	A	2					*	MAWTS-1 COURSE CATALOG			E	LATI		5631
	LATI	LATI CERTIFICATION	5632	X								2.0	D	A	2					*	MAWTS-1 COURSE CATALOG			E	WTI		5632
LATI SKILL TOTAL							4	4.0	1	2.0	2	4.0															
REDUCED VISIBILITY LANDING INSTRUCTOR (RVLI)																											
RVLI	ACAD	INSTRUCT RVL ACAD	5710	X				1.0					G							*	MAWTS-1 COURSE CATALOG			E	WTI		5710
	ACAD	INSTRUCT RVL CHALK TALK	5720	X				1.0					G							*	MAWTS-1 COURSE CATALOG			E	WTI		
	SRVLI	RVL SINGLE SHIP INST TECHNIQUES	5730	X						2.0			(NS)	S	1					*	MAWTS-1 COURSE CATALOG			E	RVLI		5730
	SRVLI	RVL SECTION INST TECHNIQUES	5731	X						2.0			(NS)	S	2			X	2	*	MAWTS-1 COURSE CATALOG			E	RVLI		5731
	RVLI	RVLI CERTIFICATION	5732	X								2.0	NS	A	2					*	MAWTS-1 COURSE CATALOG			E	WTI/RVLI		5732
RVLI SKILL TOTAL							2	2.0	2	4.0	1	2.0															
DEFENSIVE COMBAT MANEUVERS INSTRUCTOR (DCMI)																											
DCMI	ACAD	INSTRUCT DCM ACAD	5810	X				1.0					G							*	MAWTS-1 COURSE CATALOG			E	DCMI		5810
	ACAD	INSTRUCT DCM CHALK TALK	5820	X				1.0					G							*	MAWTS-1 COURSE CATALOG			E	DCMI OR WTI		
	SDCMI	DCMI SIM INST TECHNIQUES	5830	X						2.0			D	S	2		X	X	2	*	MAWTS-1 COURSE CATALOG			E	DCMI		5830
	DCMI	DCMI AIRCRAFT INST TECHNIQUES	5831	X								2.0	D	A	2					*	MAWTS-1 COURSE CATALOG			E	DCMI		5831
	DCMI	DCMI CERT	5832	X								2.0	D	A	2					*	MAWTS-1 COURSE CATALOG			E	MAWTS-1 DCMI		5832
DCMI SKILL TOTAL							2	2.0	1	2.0	2	4.0															

VMM MV-22B PILOT T&R MATRIX (2000-8000 Phase)																												
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ATTAIN		MAINTAIN	ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	TEN	TEN+	NETWORK	# NETWORK	PROF INTERVAL	PREREQUISITE	PREREQUISITE NOTES	CHAINING	EVAL	INST	EOM	EVENT CONV	
				B	R		#	TIME	#	TIME	#	TIME																
NIGHT SYSTEMS INSTRUCTOR (NSI)																												
NSI	ACAD	INSTRUCT NS ACAD	5910	X				1.0						G						*	MAWTS-1 COURSE CATALOG			E	WTI		5910	
	ACAD	INSTRUCT NS CHALK TALK	5920	X				1.0						G						*	MAWTS-1 COURSE CATALOG			E	WTI			
	SNSI	NSI SINGLE SIM INSTR TECHNIQUES	5930	X						2.0			NS	S	1					*	MAWTS-1 COURSE CATALOG			E	NSI		5930	
	NSI	NSI SINGLE AIRCRAFT INST TECH	5931	X								2.0	NS	A	1					*	MAWTS-1 COURSE CATALOG			E	NSI		5931	
	SNSI	NSI SECTION SIM INST TECH	5932	X							2.0		NS	S	2			X	2	*	MAWTS-1 COURSE CATALOG			E	NSI		5932	
	NSI	NSI SECTION AIRCRAFT INST TECH	5933	X								2.0	NS	A	2					*	MAWTS-1 COURSE CATALOG			E	NSI		5933	
	NSI	NSI SINGLE CERT	5934	X								2.0	NS	A	1					*	MAWTS-1 COURSE CATALOG			E	MAWTS-1 NSI		5934	
	NSI	NSI SECTION CERTIFICATION	5935	X								2.0	NS	A	2					*	MAWTS-1 COURSE CATALOG			E	MAWTS-1 NSI		5935	
NSI SKILL TOTAL							2	2.0	2	4.0	4	8.0																
WEAPONS AND TACTICS INSTRUCTOR (WTI)																												
WTI	WTI	MAWTS-1 WTI Course	5950	X																*	MAWTS-1 WTI PLANNING GUIDE			E	MAWTS-1		5950	
WTI SKILL TOTAL							0	0.0	0	0.0	0	0.0																
6000 PHASE (REQUIREMENTS, CERTIFICATIONS, QUALIFICATIONS AND DESIGNATIONS (R,C,Q,D))																												
NATOPS (NTPS)																												
NTPS	ACAD	NATOPS OPEN BOOK	6010	X	X	X		3.0						G						365				E	NI/ANI	X	6010	
	ACAD	NATOPS CLOSED BOOK	6011	X	X	X		1.0						G						365	6010			E	NI/ANI	X	6011	
	ACAD	NATOPS ORAL EXAM	6012	X	X	X		1.0						G						365	6011			E	NI/ANI	X	6012	
	RQD	NATOPS EVAL	6030	X	X	X						1.5	(N)	A/S	1					365	6012			E	NI/ANI	X	6030	
	RQD	ANI EVALUATOR	6031	X	X	X						0.0	(N)	A/S	1					365	6012			E	NI	X		
	RQD	NI EVALUATOR	6032	X	X	X						0.0	(N)	A/S	1					365	6012		6030	E	NE	X		
	NTPS SKILL TOTAL							1	1.0	0	0.0	3	1.5															
INSTRUMENT (INST)																												
INST	ACAD	IGS	6040	X	X	X		6.0						G						365				E	INSTEVAL	X	6013	
	ACAD	INSTRUMENT EXAM	6041	X	X	X		2.0						G						365	6040			E	INSTEVAL	X	6014	
	ACAD	INSTRUMENT ORAL EXAM	6042	X	X	X		1.0						G						365	6041			E	INSTEVAL	X	6015	
	RQD	INST EVAL	6060	X	X	X					2.0		(N)	S/A	1					365	6042			E	INSTEVAL	X	6032	
	RQD	INST EVALUATOR	6061	X	X	X					0.0		(N)	S/A	1					365	6060			E	INST EVAL	X		
	INST SKILL TOTAL							2	3.0	2	2.0	0	0.0															
CREW RESOURCE MANAGEMENT (CRM)																												
CRM	ACAD	CRM REFRESHER	6070	X	X	X		1.0						G						365				E	CRMF/I	X	6016	
	RQD	CRM EVAL	6080	X	X	X					1.5		(N)	S/A	1					365	6070			E	CRMF/I	X	6031	
	ACAD	CRMF LECTURE	6090	X	X	X		0.0						G						365	-	6070		E	CRMF/I	X		
	RQD	CRMF EVAL	6091	X	X	X					0.0		(N)	S/A	1					365	6090		6080	E	CRMF/I	X		
	ACAD	CRM COURSE	6092	X				0.0						G						*								
	CRM SKILL TOTAL							2	0.0	2	1.5	0	0.0															
EMERGENCY PROCEDURES (EP)																												
EP	RQD	EP REVIEW	6033	X	X	X					1.0			(N)	S/A	1					90	T2P			E			6033
EP SKILL TOTAL							2	0.0	2	2.5	1	0.0																

VMM MV-22B PILOT T&R MATRIX (2000-8000 Phase)																											
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ATTAIN		MAINTAIN	ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	TEN	TEN+	NETWORK	# NETWORK	PROF INTERVAL	PREREQUISITE	PREREQUISITE NOTES	CHAINING	EVAL	INST	EOM	EVENT CONV
				B	R		#	TIME	#	TIME	#	TIME															
TILTROTOR AIRCRAFT COMMANDER (TAC)																											
TAC	ACAD	ORAL TAC BOARD	6110	X				3.0					G							*				E	NI/ANI/WTI		6110
	STAC	TAC REVIEW	6130	X						2.0		(N)	S/A	1						*	6110			E	NI/ANI/WTI		6130
	STAC	NIGHT TAC REVIEW	6131	X						2.0		NS	S/A	1						*	6110			E	NI/ANI/WTI		6131
	TAC	TAC CHECK	6132	X							2.0	(N)	A	1						*	NSQ,6030,6060,6080,6130,6131			E	NI/ANI/WTI		6132
TAC SKILL TOTAL							1	3.0	2	4.0	1	2.0															
SECTION LEADER (SL)																											
SL	ACAD	PROBLEM FRAMING	6210	X				1.0					G							*	6132				WTI		6210
	ACAD	TACTICAL FLIGHT BRIEFING	6211	X				1.0					G							*	6210				WTI		6211
	LAB	SECTION IFR CHALK TALK	6220	X				0.3					G							*	6211				SL		6220
	LAB	IIMC CHALK TALK	6221	X				0.3					G							*	6220				SL		6221
	LAB	SECTION MATA CHALK TALK	6222	X				0.3					G							*	6221				SL		6222
	LAB	LAT CHALK TALK	6223	X				0.3					G							*	6222				SL		6223
	LAB	SECTION TAAR CHALK TALK	6224	X				0.3					G							*	6223				SL		6224
	LAB	SEC CONTINGENCIES CHALK TALK	6225	X				0.3					G							*	6224				WTI		6225
	SL	SL BRIEF & LEAD	6230	X							0.0	(NS)	A							*	MSP,6132			E	SL		6230
	SL	ADMIN TRAINING SCENARIO	6231	X							2.0	(NS)	A	2						*	MSP,6132, STAN BOARD			E	SL		6231
	SSL	NIGHT MED THREAT MISSION	6232	X						4.0		NS	S/A	2			X	2		*	MSP,6231			E	SL		6232
	SSL	MED THREAT LONG RANGE RAID TAAR	6233	X						4.0		(NS)	S/A	2		X	X	2		*	MSP,6232			E	FLSE,DL		6233
	SL	SL CERT	6234	X							3.0	(NS)	A	2						*	MSP,6225,6233			E	FLSE,DL		6234
	SL	SL PROF TRACKER	6240	X		X					0.0	(NS)	A/S	2						180	6234						6240
SL SKILL TOTAL							8	3.8	2	8.0	4	5.0															
DIVISION LEADER (DL)																											
DL	LAB	DIVISION IFR CHALK TALK	6320	X				0.3					G							*	6234				DL		6320
	LAB	DIVISION FORMATION CHALK TALK	6321	X				0.3					G							*	6320				DL		6321
	DL	DL BRIEF & LEAD	6330	X							0.0	(NS)	A	3+						*	MSP,6234				DL		6330
	DL	ADMIN TRAINING SCENARIO	6331	X							2.0	(NS)	A/S	3+			X	3		*	3X6240, 600 TOTAL HOURS, 200 MV-22 HOURS, STAN BOARD, MSP			E	DL		6331
	SDL	MED THREAT MISSION TRAP / CASEVAC	6332	X						2.0		(NS)	S/A	3		X	X	3		*	MSP,6331			E	FL,FLSE		6332
	DL	DL CERT	6333	X							3.0	(NS)	A	3+						*	MSP,6332			E	FL,FLSE		6333
	DL	DL PROF TRACKER	6340	X		X					0.0	(NS)	A/S	3+			X	3	180	6333		6240					6340
DL SKILL TOTAL							2	0.6	1	2.0	4	5.0															
FLIGHT LEADER (FL)																											
FL	FL	FL CERT	6430	X								3.0	(NS)	A/S	5+		X	X	5+	*	3X6340,750 TOTAL HOURS, STAN BOARD,MSP			E	FL,FLSE		6430
	FL	FL PROF TRACKER	6440	X		X					0.0	(NS)	A/S	5+		X	X	5+	180	6430		6340					6440
FL SKILL TOTAL							0	0.0	0	0.0	2	3.0															
AIR MISSION COMMANDER (AMC)																											
AMC	AMC	AMC CERT	6530	X								0.0	(NS)	A/S	3+EL		X	X	3+EL	*	6430,STAN BOARD			E	AMC,FLSE,WTI		6530
	AMC	AMC TRACKER	6540	X		X					0.0	(NS)	A/S	3+EL		X	X	3+EL	180	6530							6540

VMM MV-22B PILOT T&R MATRIX (2000-8000 Phase)																											
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ATTAIN		MAINTAIN	ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	TEN	TEN+	NETWORK	# NETWORK	PROF INTERVAL	PREREQUISITE	PREREQUISITE NOTES	CHAINING	EVAL	INST	EOM	EVENT CONV
				B	R		#	TIME	#	TIME	#	TIME															
AMC SKILL TOTAL							0	0.0	0	0.0	2	0.0															
FUNCTIONAL CHECK PILOT (FCP)																											
FCP	ACAD	QA LECTURE	6610	X				1.0						G						*					FCP		6610
	SFCP	RTB	6630	X						1.0			D	S/A	1					*	6610				FCP		6630
	SFCP	FCF CERT	6631	X						1.5			D	S/A	1					*	6132,6630				FCP		6631
FCP SKILL TOTAL							1	1.0	2	2.5	0	0.0															
TRACKING STRATEGIC TANKING (TRK)																											
TRK	TRK	Tracking Strategic Tanking	6800	X	X	X	X					0.0	(NS)	A	1					365	2440,2441~NS						6800
TRK SKILL TOTAL							0	0.0	0	0.0	1	0.0															
REDUCED VISIBILITY LANDINGS AND AUTOMATION TRACKING (RVL)																											
RVL	RVL	HIGH OBSCURATION RVL	6900	X	X	X	X					0.0	(NS)	A	1					180	2270,2271			2282			4730
RVL SKILL TOTAL							0	0.0	0	0.0	1.0	0.0															
8000 PHASE (UNIT EVALUATION)																											
AIR LOGISTICS SUPPORT (ALS)																											
ALS	ALS	ALS MSN	7000	X	X	X	X					2.0	(NS)	A/S	2					730	3040,REQUIRED TRAINED CREWS				WTI/FLSE		
ALS TOTAL							0	0.0	0	0.0	1	2.0															
EXPEDITIONARY SHORE BASED OPERATIONS (EXP)																											
EXP	EXP	GS MSN	7010	X	X	X	X					2.0	(NS)	A/S	2					730	3140,REQUIRED TRAINED CREWS				WTI/FLSE		
EXP TOTAL							0	0.0	0	0.0	1	2.0															
EXPEDITIONARY SEA BASED OPERATIONS (SEA)																											
SEA	SEA	SHIP TO SHORE MSN	7020	X	X	X	X					2.0	(NS)	A/S	2					730	3240,REQUIRED TRAINED CREWS				WTI/FLSE		
SEA TOTAL							0	0.0	0	0.0	0	2.0															
TACTICAL RECOVERY OF AIRCRAFT AND PERSONNEL (TRAP)																											
TRAP	TRAP	TRAP MISSION	7030	X	X	X	X					2.0	(NS)	A/S	2					730	3340,REQUIRED TRAINED CREWS				WTI/FLSE		
TRAP TOTAL							0	0.0	0	0.0	1	2.0															
COMBAT ASSAULT TRANSPORT (CAT)																											
CAT	CAT	CAT MISSION	7040	X	X	X	X					2.0	NS	A/S	2					730	3441,REQUIRED TRAINED CREWS				WTI/FLSE		
CAT TOTAL							0	0.0	0	0.0	1	2.0															
RAPID INSERTION / EXTRACTION																											
R/E	R/E	R/E MISSION	7050	X	X	X	X					2.0	(NS)	A/S	2					730	4540,REQUIRED TRAINED CREWS				WTI/FLSE		
R/E TOTAL							0	0.0	0	0.0	1	2.0															
AVIATION DELIVERED GROUND REFUELING																											
ADGR	ADGR	ADGR MISSION	7060	X	X	X	X					2.0	(NS)	A/S	2					730	4640,REQUIRED TRAINED CREWS				WTI/FLSE		
ADGR TOTAL							0	0.0	0	0.0	1	2.0															
BATTLEFIELD ILLUMINATION (BI)																											
BI	BI	BI MISSION	7070	X	X	X	X					2.0	NS	A/S	2					730	4740,REQUIRED TRAINED CREWS				WTI/FLSE		
BI TOTAL							0	0.0	0	0.0	1	2.0															
AIR DELIVERY (AD)																											
AD	AD	AD MISSION	7080	X	X	X	X					2.0	(NS)	A/S	2					730	4840,REQUIRED TRAINED CREWS				WTI/FLSE		

VMM MV-22B PILOT T&R MATRIX (2000-8000 Phase)																											
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ATTAIN		MAINTAIN	ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	TEN	TEN+	NETWORK	# NETWORK	PROF INTERVAL	PREREQUISITE	PREREQUISITE NOTES	CHAINING	EVAL	INST	EOM	EVENT CONV
				B	R		#	TIME	#	TIME	#	TIME															
AD TOTAL							0	0.0	0	0.0	1	2.0															
AIRBORN COMMAND AND CONTROL (AC2)																											
AC2	AC2	AC2 MISSION	7090	X	X	X					2.0	(NS)	A/S	2						730	4940,REQUIRED TRAINED CREWS				WTI/FLSE		
AC2 TOTAL							0	0.0	0	0.0	1	2.0															
8000 PHASE ACPM																											
AVIATION CAREER PROGRESSION MODEL (ACPM)																											
ACPM	ACPM	MACCS AGENCIES AND FUNCTIONS	8200	X				0.5						G						*							8200
	ACPM	MWCS	8201	X				0.5						G						*							8201
	ACPM	ACA AND AIRSPACE	8202	X				0.8						G						*							8202
	ACPM	AVIATION GROUND SUPPORT	8210	X				0.7						G						*							8210
	ACPM	ACE BATTLE STAFF	8230	X				0.5						G						*							8230
	ACPM	BATTLE COMMAND DISPLAY	8231	X				0.5						G						*							8231
	ACPM	SIX FUNCTIONS OF MARINE AVIATION	8240	X				1.7						G						*							8240
	ACPM	JTAR / ASR INTRO AND PRAC APP	8241	X				1.3						G						*							8241
	ACPM	SITE COMMAND PRIMER	8242	X				0.5						G						*							8242
	ACPM	THEATER AIR GROUND SYSTEM	8250	X				0.8						G						*							8250
	ACPM	AIR DEFENSE	8300	X				0.8						G						*							8300
	ACPM	FARP	8310	X				0.8						G						*							8310
	ACPM	USMC TACTICAL FUEL SYSTEMS	8311	X				0.8						G						*							8311
	ACPM	JOINT STRUCTURE AND JOINT AIR OPS	8320	X				1.0						G						*							8320
	ACPM	JOINT AIR TASKING CYCLE, PHASE 1	8321	X				0.4						G						*							8321
	ACPM	JOINT AIR TASKING CYCLE, PHASE 2	8322	X				0.4						G						*							8322
	ACPM	JOINT AIR TASKING CYCLE, PHASE 3	8323	X				0.4						G						*							8323
	ACPM	JOINT AIR TASKING CYCLE, PHASE 4	8324	X				0.4						G						*							8324
	ACPM	JOINT AIR TASKING CYCLE, PHASE 5	8325	X				0.4						G						*							8325
	ACPM	JOINT AIR TASKING CYCLE, PHASE 6	8326	X				0.4						G						*							8326
	ACPM	INTEGRATING FIRES AND AIRSPACE	8340	X				0.5						G						*							8340
	ACPM	PHASING CONTROL ASHORE	8350	X				0.8						G						*							8350
	ACPM	TACRON ORG AND FUNCTIONS	8351	X				1.0						G						*							8351
	ACPM	TACC	8630	X				1.0						G						*							8630
	ACPM	JOINT OPS INTRO	8660	X				0.5						G						*							8660
	ACPM	JOINT DATA NETWORK	8640	X				0.8						G						*							8640
ACPM	THEATER AND NATIONAL ISR	8641	X				1.3						G						*							8641	
ACPM	ESG/CSG INTEGRATION	8620	X				0.5						G						*							8620	
ACPM TOTAL							28	20.0	0	0.0	0	0.0															

2.17 MV-22B PILOT RANGE AND ORDNANCE MATRIX

VMM MV-22B PILOT RANGE AND ORDNANCE MATRIX										
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ORDNANCE	ORDNANCE QUANTITY	ORDNANCE NOTES	RANGE	RANGE NOTES	EXTERNAL SYLLABUS SUPPORT	EXTERNAL SYLLABUS NOTES
2000 PHASE CORE SKILLS										
CONFINED AREA LANDING (CAL)										
CAL	CAL	SINGLE CAL VISUAL	2240					SUITABLE LZ AND AIRSPACE		
	CAL	SINGLE CAL WYPT	2241					SUITABLE LZ AND AIRSPACE		
	CAL	SECTION CAL	2242					SUITABLE LZ AND AIRSPACE		
REDUCED VISIBILITY LANDINGS (RVL)										
RVLI	RVL	RVL AUTOMATED	2280					SUITABLE LZ AND AIRSPACE		
	RVL	RVL UNASSISTED	2281					SUITABLE LZ AND AIRSPACE		
	RVL	RVL (ACTUAL COND/TRACKING)	2282					LZ WITH REDUCED VISIBILITY CONDITIONS		
NIGHT SYSTEMS HIGH LIGHT LEVEL (NS HLL)										
NS HLL	NS	HLL SGL CAL	2340					SUITABLE LZ AND AIRSPACE		
	NS	HLL SEC CAL	2341					SUITABLE LZ AND AIRSPACE		
NIGHT SYSTEMS LOW LIGHT LEVEL (NS LLL)										
NS LLL	NS	LLL SGL CAL VISUAL	2380					SUITABLE LZ AND AIRSPACE		
	NS	LLL SGL CAL WYPT	2381					SUITABLE LZ AND AIRSPACE		
	NS	LLL SEC NAV/TACFORM	2382					SUITABLE LZ AND AIRSPACE		
	NS	LLL SEC CAL	2383					SUITABLE LZ AND AIRSPACE		
AIR to AIR REFUELING (AAR)										
AAR	AAR	DAY AAR	2440					SUITABLE AIRSPACE	APPROVED TANKER	
	AAR	NIGHT AAR	2441					SUITABLE AIRSPACE	APPROVED TANKER	
TAIL GUNNERY (TG)										
TG	TG	DAY SECTION TG	2541	7.62/.50	600	ROUNDS PER GUNNER OF APPROPRIATE AMMUNITION			AG CAPABLE RANGE	MOVING LAND TARGET (MLT) IF AVAILABLE
	TG	NIGHT SECTION TG	2543	7.62/.50	600	ROUNDS PER GUNNER OF APPROPRIATE AMMUNITION			AG CAPABLE RANGE	MOVING LAND TARGET (MLT) IF AVAILABLE
LOW ALTITUDE TACTICS (LAT)										
LAT	LAT	LAT MAN / RTE	2640					APPROVED ROUTE/RANGE SPACE WITH VERTICAL RELIEF		
	LAT	SEC LAT	2641					APPROVED ROUTE/RANGE SPACE WITH VERTICAL RELIEF		
	NS LAT	HLL SEC LAT	2642					APPROVED ROUTE/RANGE SPACE WITH VERTICAL RELIEF		
	NS LAT	LLL SEC LAT	2643					APPROVED ROUTE/RANGE SPACE WITH VERTICAL RELIEF		
DIVISION (DIV)										
DIV	DIV	DIV TACFORM/NAV	2780							
	DIV	DIV CAL	2781					SUITABLE LZ AND AIRSPACE		
	DIV	HLL DIV CAL	2782					SUITABLE LZ AND AIRSPACE		
	DIV	LLL DIV CAL	2783					SUITABLE LZ AND AIRSPACE		
	DIV	DIV LAT	2784					APPROVED ROUTE/RANGE SPACE WITH VERTICAL RELIEF		

VMM MV-22B PILOT RANGE AND ORDNANCE MATRIX										
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ORDNANCE	ORDNANCE QUANTITY	ORDNANCE NOTES	RANGE	RANGE NOTES	EXTERNAL SYLLABUS SUPPORT	EXTERNAL SYLLABUS NOTES
GROUND THREAT REACTION (GTR)										
GTR	GTR	SECTION TR	2840	CHAFF, FLARES	60,30			CHAFF AND FLARE CAPABLE RANGE		EW EMITTER, GROUND FIRE INDICATION
CARRIER QUALIFICATION (CQ)										
CQ	CQ	DAY FCLP	2940							FCLP SITE
	CQ	DAY CQ	2941							AIR CAPABLE SHIP
	NS CQ	NIGHT FCLP	2942							FCLP SITE
	NS CQ	NIGHT CQ	2943							AIR CAPABLE SHIP
3000 PHASE MISSION SKILLS										
EXPEDITIONARY SEA BASED OPERATIONS (SEA)										
SEA	SEA	SHIP TO SHORE MSN	3240							AIR CAPABLE SHIP
TACTICAL RECOVERY OF AIRCRAFT AND PERSONNEL (TRAP)										
TRAP	TRAP	TRAP MISSION	3340	7.62 / .50, CHAFF, FLARES	600,40,50			AERIAL GUNNERY AND EXPENDABLE CAPABLE RANGE	YES	OSC, RESCORT/RESCAP, RMC
COMBAT ASSAULT TRANSPORT (CAT)										
CAT	CAT	LOW THRT SEC	3440							
	CAT	ESCORT SEC	3441	7.62 / .50, CHAFF, FLARES	600,40,50			AERIAL GUNNERY AND EXPENDABLE CAPABLE RANGE	YES	ESCORTS
4000 PHASE CORE PLUS SKILLS										
AERIAL DELIVERY (AD)										
AD	PARA	PARAOPS	4040					CERTIFIED DROP ZONE		
	AD	CARGO	4041					CERTIFIED DROP ZONE		
	EXT	DAY EXTERNALS	4080						EXTERNAL LOAD, HST, APPROVED LZ WITH 7NM OF PROTECTED AIRSPACE TO 1000' AGL	
	EXT	NS EXTERNALS	4083						EXTERNAL LOAD, HST, APPROVED LZ WITH 7NM OF PROTECTED AIRSPACE TO 1000' AGL	
ALTERNATE INSERTION/EXTRACTION TECHNIQUES (AIE)										
AIE	AIE	FASTROPE / RAPPEL	4140						HRST MASTER QUALIFIED TROOPS	/
	AIE	HOISTING	4141							
	AIE	SPIE	4142						HRST MASTER QUALIFIED TROOPS	/
	AIE	HELO CAST	4143						CAST MASTER QUALIFIED TROOPS	/
DEFENSIVE WEAPONS SYSTEM (DWS)										
DWS	DWS	DAY DWS EMPLOYMENT	4242	7.62	2000	ROUNDS PER GUNNER		AIR TO GROUND GUNNERY RANGE AND MOVING LAND TARGET (MLT) IF AVAILABLE		
	DWS	NIGHT DWS EMPLOYMENT	4245	7.62	2000	ROUNDS PER GUNNER		AIR TO GROUND GUNNERY RANGE AND MOVING LAND TARGET (MLT) IF AVAILABLE		
DEFENSIVE COMBAT MANEUVERING (DCM)										
DCM	DCM	DCM AGAINST FW AGGRESSOR	4340				ACM RANGE SPACE		FW ADVERSARY	

VMM MV-22B PILOT RANGE AND ORDNANCE MATRIX										
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ORDNANCE	ORDNANCE QUANTITY	ORDNANCE NOTES	RANGE	RANGE NOTES	EXTERNAL SYLLABUS SUPPORT	EXTERNAL SYLLABUS NOTES
CARRIER QUALIFICATION (CQ)										
CQ	CQ	NIGHT UNAIDED FCLP	4480							FCLP SITE
	CQ	NIGHT UNAIDED CQ	4481							AIR CAPABLE SHIP
RAPID INSERTION / EXTRACTION										
R/E	R/E	RAPID INSERT/EXTRACT	4540						JUMPMaster / CASTMASTER / HRST MASTER, QUALIFIED TROOPS AS REQUIRED	
AVIATION DELIVERED GROUND REFUELING										
ADGR	ACAD	ADGR LECTURE	4610							
	LAB	ADGR LAB	4620							
	ADGR	ADGR MISSION	4640						APPROVED SITE FOR REFUELING OPERATIONS, RECEIVER	
BATTLEFIELD ILLUMINATION (BI)										
BI	ACAD	BI LECTURE	4710							
	BI	BI MISSION	4740	LUU-2/LUU-19	6		AIR TO GROUND RANGE	SUAS AUTHORIZED FOR USE OF APFS	SUPPORTED AVIATION OR GROUND UNIT	
AIR DELIVERY (AD)										
AD	AD	AD MISSION	4840				RANGE REQUIREMENTS ARE PER EACH SPECIFIC AD SKILL.		SUPPORT REQUIREMENTS ARE PER EACH SPECIFIC AD SKILL.	
AIRBORNE COMMAND AND CONTROL (AC2)										
AC2	ACAD	AIRBORNE C2	4910							
	LAB	AIRBORNE C2 LAB	4920							
	AC2	AIRBORNE C2 MISSION	4940							
5000 PHASE INSTRUCTOR										
AARI										
AARI	AARI	NIGHT AAR CERT	5331						Approved Tanker	
LOW ALTITUDE TACTICS INSTRUCTOR (LATI)										
LATI	LATI	LAT INSTRUCTIONAL TECHNIQUES	5631							
	LATI	LATI CERTIFICATION	5632							
REDUCED VISIBILITY LANDING INSTRUCTOR (RVLI)										
RVLI	RVLI	RVLI CERTIFICATION	5732							
DEFENSIVE COMBAT MANEUVERS INSTRUCTOR (DCMI)										
DVMI	DCMI	DCMI AIRCRAFT INST TECHNIQUES	5831							
	DCMI	DCMI CERT	5832							
NIGHT SYSTEMS INSTRUCTOR (NSI)										
NSI	NSI	NSI SINGLE AIRCRAFT INST TECH	5931							
	NSI	NSI SECTION AIRCRAFT INST TECH	5933							
	NSI	NSI SINGLE CERT	5934							
	NSI	NSI SECTION CERTIFICATION	5935							

VMM MV-22B PILOT RANGE AND ORDNANCE MATRIX										
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ORDNANCE	ORDNANCE QUANTITY	ORDNANCE NOTES	RANGE	RANGE NOTES	EXTERNAL SYLLABUS SUPPORT	EXTERNAL SYLLABUS NOTES
7000 PHASE (UNIT EVALUATION)										
EXPEDITIONARY SHORE BASED OPERATIONS (EXP)										
EXP	EXP	GS MSN	7010	7.62 / .50, CHAFF, FLARES	600,40,50		YES	AERIAL GUNNERY AND EXPENDABLE CAPABLE RANGE		
EXPEDITIONARY SEA BASED OPERATIONS (SEA)										
SEA	SEA	SHIP TO SHORE MSN	7020	7.62 / .50, CHAFF, FLARES	600,40,50		YES	AERIAL GUNNERY AND EXPENDABLE CAPABLE RANGE		
TACTICAL RECOVERY OF AIRCRAFT AND PERSONNEL (TRAP)										
TRAP	TRAP	TRAP MISSION	7030	7.62 / .50, CHAFF, FLARES	600,40,50		YES	AERIAL GUNNERY AND EXPENDABLE CAPABLE RANGE	YES	OSC, RESCORT/RESCAP, RMC
COMBAT ASSAULT TRANSPORT (CAT)										
CAT	CAT	CAT MISSION	7040	7.62 / .50, CHAFF, FLARES	600,40,50		YES	AERIAL GUNNERY AND EXPENDABLE CAPABLE RANGE	YES	ESCORTS
RAPID INSERTION / EXTRACTION										
R/E	R/E	R/E MISSION	7050	7.62 / .50, CHAFF, FLARES	600,40,50		YES	AERIAL GUNNERY AND EXPENDABLE CAPABLE RANGE		
AVIATION DELIVERED GROUND REFUELING										
ADGR	ADGR	ADGR MISSION	7060	7.62 / .50, CHAFF, FLARES	600,40,50		YES	AERIAL GUNNERY AND EXPENDABLE CAPABLE RANGE		RECEIVERS
BATTLEFIELD ILLUMINATION (BI)										
BI	BI	BI MISSION	7070	7.62 / .50, CHAFF, FLARES, LUU-2/19	600,40,50, AS REQUIRED		YES	AERIAL GUNNERY AND EXPENDABLE CAPABLE RANGE		
AIR DELIVERY (AD)										
AD	AD	AD MISSION	7080	7.62 / .50, CHAFF, FLARES	600,40,50		YES	AERIAL GUNNERY AND EXPENDABLE CAPABLE RANGE	YES	AD PLATOON/HST/JUMPMaster
AIRBORNE COMMAND AND CONTROL (AC2)										
AC2	AC2	AC2 MISSION	7090	7.62 / .50, CHAFF, FLARES	600,40,50		YES	AERIAL GUNNERY AND EXPENDABLE CAPABLE RANGE	YES	

2.18 MV-22B PILOT FRS T&R MATRIX (1000, 5000, 6000 Phase)

MV-22B FRS T&R MATRIX (1000, 5000, 6000 Phase)																											
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ATTAIN						MAINTAIN	ACAD		SIM		FLIGHT		CONDITION	TYPE	# or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	RANGE	INSTRUCTOR	EOM	EVENT CONV	
				BASIC	REFRESHER	MOD REF	CONT INST	AIR FORCE	CV TO MV		#	TIME	#	TIME	#	TIME											
1000 PHASE (CORE INTRODUCTION)																											
GROUND SCHOOL																											
GS	ADL	COURSEWARE INTRO	0001	X	X	X	X	X				1.5					G		*							0001	
	ADL	AIRFRAME BASICS	0002	X	X	X	X	X				2.5					G		*	0001						0002	
	ADL	INTRO COCKPIT MGMT SYS	0003	X	X	X	X	X				2.5					G		*	0001						0003	
	ADL	ELECTRICAL SYSTEM	0004	X	X	X	X	X				3.0					G		*	0001						0004	
	ADL	HYDRAULIC SYSTEM	0005	X	X	X	X	X				2.0					G		*	0001						0005	
	ADL	FLIGHT CONTROL SYSTEM	0006	X	X	X	X	X				3.5					G		*	0001						0006	
	ADL	DRIVE SYSTEM	0007	X	X	X	X	X				2.5					G		*	0001						0007	
	ADL	POWERPLANT	0008	X	X	X	X	X				2.5					G		*	0001						0008	
	ADL	FUEL SYSTEM	0009	X	X	X	X	X				2.0					G		*	0001						0009	
	ADL	ECS,OBOGS/ OBIGGS	0010	X	X	X	X	X				2.0					G		*	0001						0010	
	ADL	INTRO TO COMM,NAV,FD	0011	X	X	X	X	X				2.5					G		*	0001						0011	
	ADL	NORMAL PROCEDURE CHKLST	0012	X	X	X	X	X	X			2.0					G		*	0001						0012	
	ADL	MAINT-VSLED,AMEGS,BFWS	0013	X	X	X	X	X				1.5					G		*	0001						0013	
	ADL	LOCAL COURSE RULES	0014	X	X	X	X	X				1.0					G		*	0001						0014	
	ADL	PERF CHARTS, WT BAL(FORM F)	0015	X	X	X	X	X				2.0					G		*	0001						0015	
	ACAD	1000 LVL INBRIEF	0100	X	X	X	X	X	X			1.0					G		*							0100	
	ACAD	ELECTRICAL SYSTEM	0101	X	X	X	X	X				2.0					G		*	0004						0102	
	ACAD	HYDRAULIC SYSTEM	0102	X	X	X	X	X				4.0					G		*	0005						0103	
	ACAD	FLIGHT CONTROL SYSTEM	0103	X	X	X	X	X				3.0					G		*	0006						0104	
	ACAD	DRIVE SYSTEM	0104	X	X	X	X	X				3.0					G		*	0007						0105	
	ACAD	POWERPLANT	0105	X	X	X	X	X				3.0					G		*	0008						0106	
	ACAD	FUEL SYSTEM	0106	X	X	X	X	X				2.0					G		*	0009						0107	
	ACAD	ECS,OBOGS/ OBIGGS	0107	X	X	X	X	X				2.0					G		*	0010						0108	
	ACAD	COURSE RULES EXAM	0108	X	X	X	X	X				3.0					G		*	0014						0109	
	ACAD	PERF CHARTS,WT BAL, LD COMP	0109	X	X	X	X	X				3.0					G		*	0015						0110	
	ACAD	AERODYNAMIC BASICS REVIEW	0110	X	X	X	X	X				5.0					G		*	0002						0111	
	ACAD	TILTROTOR AERO	0111	X	X	X	X	X				5.0					G		*	0110						0112	
	ACAD	CRM INITIAL	0112	X	X	X	X	X				2.5					G		*	0112				CRMF		0101	
	ACAD	MV-22B CRM	0113	X	X	X	X	X				2.0					G		*	0011				CRMF		0113	
	LAB	CMS LAB-OVERVIEW BASICS	0200	X	X	X	X	X				2.0					G		*	0011				CI		0200	
	LAB	COMM (CDU), NAV, LOAD BRICK	0201	X	X	X	X	X				2.0					G		*	0012				CI		0201	
GS TOTAL											31	77.5	0	0.0	0	0.0											

MV-22B FRS T&R MATRIX (1000, 5000, 6000 Phase)

SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ATTAIN						MAINTAIN	ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	RANGE	INSTRUCTOR	EOM	EVENT CONV	
				BASIC	REFRESHER	MOD REF	CONT INST	AIR FORCE	CV TO MV		#	TIME	#	TIME	#	TIME											
FAM																											
FAM	ADL	FLIR	1001	X	X	X	X	X				1.0					G		*	0001						0013	
	ACAD	FAM STAGE INBRIEF	1010	X	X	X	X	X				1.0					G		*	0001-0015,0100-0113,0200,0201				FRSI		1010	
	ACAD	FLIR THEORY	1011	X			X	X				2.0					G		*	1010				NSI/NSFI		1011	
	ACAD	MV-22B DAY HUD	1012	X			X	X				0.5					G		*	1011				FRSI		1015	
	ACAD	AERO	1013	X	X	X	X	X				2.0					G		*	1036				CI		1016	
	LAB	DEVICE OPERATOR TRAINING	1020	X	X	X	X	X	X			2.0					S	1	*	0100				CI		1020	
	LAB	A/C PREFLT, EGRESS, SQDN PROC A/C SYS HARDWARE FAM	1021	X	X	X	X	X	X			2.5					G		*	1070				FRSI		1020	
	CFAM	CHECKLIST	1030	X	X		X	X						2.0			D	S	*	0110,1010				CI		1030	
	CFAM	CHECKLIST PRACTICE	1031	X			X	X						2.0			D	S	*	1030				CI		1031	
	CFAM	NORM PROC, BFWS,GND EP'S	1032	X	X		X	X						2.0			D	S	*	1031				CI		1032	
	SFAM	CHKLST,NAC DRILLS,HVR WORK	1033	X			X	X						2.0			D	S	1	*	1032,1015				CI		1033
	SFAM	CHKLST,NAC DRILLS,CONV PTRN	1034	X	X		X	X						2.0			D	S	1	*	1033				CI		1034
	SFAM	CHKLST,CONV PTRN,STEEP APPR	1035	X			X	X						2.0			D	S	1	*	1034				CI		1035
	SFAM	CONV PTRN, TRNS/CONV	1036	X			X	X						2.0			D	S	1	*	1035,1012				CI		1036
	SFAM	STO,ROL,CONV PTRN,APLN PTRN	1037	X	X	X	X	X						2.0			D	S	1	*	1016,1036				CI		1037
	SFAM	APLN PTRN,HIGH AOB,SLOW FLT	1038	X			X	X						2.0			D	S	1	*	1037				CI		1038
	SFAM	APLN PTRN,STALLS,ELP	1039	X	X	X	X	X						2.0			D	S	1	*	1038				CI		1039
	SFAM	EMERG PROC	1070	X	X	X	X	X						2.0			D	S	1	*	1039				CI		1040
	SFAM	FLT CONT EPs, DEGRADED HAND	1071	X	X	X	X	X						2.0			D	S	1	*	1070				CI		1041
	SFAM	FAM STAGE REVIEW	1072	X			X	X						2.0			D	S	1	*	1071				CI		1042
	SFAM	NIGHT FAM	1073	X	X	X	X	X						2.0			N*	S	*	1072				CI		1050	
	SFAM	CHKLST,NAC DRILLS,CONV PTRN	1074					X						2.0			D	S	1	*	1033				CI		1060
	SFAM	CHKLST,NAC DRILLS,CONV PTRN	1075					X						2.0			D	S	1	*	1033				CI		1061
	SFAM	CHKLST,NAC DRILLS,CONV PTRN	1076					X						2.0			D	S	1	*	1033				CI		1062
	SFAM	CHKLST,NAC DRILLS,CONV PTRN	1077					X						2.0			D	S	1	*	1033				CI		1063
	SFAM	CHKLST,NAC DRILLS,CONV PTRN	1078					X						2.0			D	S	1	*	1033				CI		1064
	FAM	ENG START,NAC DRILL,CONV PAT	1080	X	X		X	X								1.5	D	A	1	*	1013,1021,1072				FRSI		1043
	FAM	CONV PTRN,STP APP,MGW	1081	X	X	X	X	X								1.5	D	A	1	*	1080				FRSI		1044
	FAM	CONV PTRN, TRNS/CONV,LSC	1082	X	X			X								1.5	D	A	1	*	1081				FRSI		1045
	FAM	APLN PTRN	1083	X				X								1.5	D	A	1	*	1082,1013				FRSI		1046
	FAM	APLN PTRN,HIGH AOB,STALLS	1084	X	X	X		X								1.5	D	A	1	*	1083				FRSI		1047
	FAM	APLN PTRN,STALLS,ELP	1085	X				X								1.5	D	A	1	*	1084				FRSI		1048
	FAM	FAM PROGRESS CHK	1086	X	X	X		X								1.5	D	A	1	*	1085				FRSI		1049
FAM TOTAL											6	11.0	14	38.0	7	10.5											

MV-22B FRS T&R MATRIX (1000, 5000, 6000 Phase)

MV-22B FRS T&R MATRIX (1000, 5000, 6000 Phase)																											
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ATTAIN						MAINTAIN	ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	RANGE	INSTRUCTOR	EOM	EVENT CONV	
				BASIC	REFRESHER	MOD REF	CONT INST	AIR FORCE	CV TO MV		#	TIME	#	TIME	#	TIME											
NAV																											
NAV	ADL	DMS,INAV FUNCTIONS	1101	X	X	X	X	X				2.0						G		*	0001						1101
	ACAD	NAV STAGE INBRIEF	1110	X			X	X				1.0						G		*	1101,1072				FRSI		1110
	ACAD	AUTOMATION	1111	X	X	X	X	X				1.0						G		*	0011				CI		1111
	LAB	VMPS 1 BUILD WP,RTS,COM PLN	1120	X	X	X	X	X				6.0						G		*	1101,0201				CI		1120
	LAB	DMS,MSN, INAV,ENAV, WYPT, FLPN	1121	X	X	X	X	X				2.0						G		*	1120				CI		1121
	LAB	NAV,CMS,MISSION MANAGEMENT	1122	X	X	X	X	X				1.0						G		*	1121				CI		1122
	LAB	VMPS 2	1123	X	X	X	X	X				4.0						G		*	1321				CI		1322
	CNAV	DMS,MSN, INAV,ENAV, WYPT, FLPN	1130	X	X	X	X	X						2.0			D	S	1	*	1120,1121				CI		1130
	SNAV	FLT PLNS, TOT,FUEL MAN,FD CORE	1131	X			X	X						2.0			D	S	1	*	1130				CI		1131
	SNAV	FLT PLNS,TOT, FUEL,FD INAV	1132	X	X		X	X						2.0			D	S	1	*	1131				CI		1132
NAV TOTAL											5	11.0	3	6.0	0	0.0											
INST																											
INST	ADL	INST CMS, DMS AND INAV	1201	X	X	X	X	X				1.0						G		*	0003						1201
	ADL	WX RADAR	1202	X	X	X	X	X				1.0						G		*	0003						1202
	ADL	ICE PROTECTION SYSTEM	1203	X	X	X	X	X				1.0						G		*	0003						1202
	ACAD	INST STAGE INBRIEF	1210	X								1.0						G		*	1072,1201,1202,1203				FRSI		1210
	ACAD	ICAO PLANNING AND PROCEDURES	1211	X	X	X	X	X				1.0						G		*	1210				FRSI		1211
	LAB	VMPS 3	1220	X	X	X	X	X				5.0						G		*	1132,1210				CI		1220
	SINST	BASIC INST / EN ROUTE NAV	1230	X	X		X	X					2.0			(N*)	S	1	*	1132,1220				CI		1230	
	SINST	NON-PRECISION APP, HIGH ALT	1231	X	X	X	X	X					2.0			(N*)	S	1	*	1050,1230				CI		1231	
	SINST	PRECISION APP	1232	X	X	X	X	X					2.0			(N*)	S	1	*	1231				CI		1232	
	SINST	IFR FLIGHT OPS	1233	X			X	X					2.0			(N*)	S	1	*	1232				CI		1233	
	INST	INSTRUMENT APPROACHES	1240	X	X	X		X							2.0	(N*)	A	1	*	1083,1233				CI		1234	
	INST	ENROUTE, HIGH/LOW APP	1241	X	X	X	X	X						2.0	(N*)	A	1	*	1240				CI			1235	
	INST	NON-PRECISION APP, PRECISION APP	1242					X							2.5	(N*)	A	1	*	1241				CI			1237
INST TOTAL											6	10.0	4	8.0	2	4.0											
CAL																											
CAL	ACAD	CAL STAGE INBRIEF	1310	X	X	X	X	X				1.0						G		*	1080				FRSI		1310
	ACAD	RVL PROCEDURES	1311	X	X	X	X	X				0.5						G		*	1310				FRSI		1311
	LAB	VMPS, MTRS, DRW FILES	1320	X	X	X	X	X				6.0						G		*	1220				CI		1320
	LAB	MAP, FUNC, LOS, HAT	1321	X	X	X	X	X				2.0						G		*	1320				CI		1321
	LAB	VMPS PROG CHECK	1322	X	X	X	X	X				4.0						G		*	1321				CI		1322
	SCAL	CAL PRTN,TAC STRT-IN, LAND	1330	X			X	X					2.0			D	S	1	*	1310				CI		1330	
	SCAL	CAL PTRN,STR 90 180	1331	X	X	X	X	X					2.0			D	S	1	*	1330				CI		1331	
	SCAL	CAL,RVL	1332	X	X	X	X						2.0			D	S	1	*	1331				CI		1334	
	SCAL	CAL,RVL,APPR	1333	X	X	X							2.0			D	S	1	*	1080,1332			CAL	CI		1335	
	CAL	CAL PTRN,STR 90 180	1340	X	X	X		X							2.0	D	A	1	*	1086,1331			CAL	FRSI			1332

MV-22B FRS T&R MATRIX (1000, 5000, 6000 Phase)

SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ATTAIN						MAINTAIN	ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	RANGE	INSTRUCTOR	EOM	EVENT CONV
				BASIC	REFRESHER	MOD REF	CONT INST	AIR FORCE	CV TO MV		#	TIME	#	TIME	#	TIME										
	CAL	CAL,RVL,APPR	1341	X	X	X									1.5	D	A	1	*	1340,1333		CAL	FRSI		1336	
	CAL	RVL PROFILE,COUPLE LANDINGS	1342					X							2.0	D	A	1	*	1340		CAL	FRSI		1333	
	CAL	RVL PROFILE,COUPLE LANDINGS	1343					X							2.0	D	A	1	*	1342		CAL	FRSI		1337	
CAL TOTAL											5	13.5	4	8.0	2	3.5										
FORM																										
FORM	ACAD	FORM STAGE INBRIEF	1410	X			X	X				1.0					G		*	1310				FRSI		1410
	SFORM	FORM PRINCIPLES	1430	X	X	X	X	X						2.0		D	S	2	*	1331,1410				CI		1430
	FORM	SEC FORM, RVL, AUTOMATION	1440	X				X							2.0	D	A	2	*	1046,1340,1430		FORM		FRSI		1431
FORM TOTAL											1	1.0	1	2.0	1	2.0										
FCLP																										
FCLP	ADL	FIELD CARRIER LANDING PRACTICE	1501	X	X	X						1.0					G		*	0001						
	ACAD	MV-22 SHIP OPERATIONS	1510	X	X	X						1.0					G		*	1330				FRSI		2910
	SFCLP	CQ	1530	X	X	X	X							2.0		D	S		*	1510				CI		2930
	FCLP	DAY FCLP	1540	X											1.5	D	A		*	1340,1530				FRSI		2931
CQ TOTAL											2	2.0	1	2.0	1	1.5										
NS HLL																										
NS	ADL	NVD SYSTEMS	1601	X	X	X	X					1.0					G		*	0001						1601
	ACAD	NS STAGE BRIEF	1610	X	X	X	X					0.5					G		*	1083,1601				FRSI		1610
	ACAD	MV-22B HUD	1611	X	X	X	X					0.5					G		*	1610				FRSI		1611
	SNS	NVD FAM, FLIR USE	1630	X			X							2.0		NS	S	1	*	1086, 1611				CI		1630
	SNS	NVD CALS, STR,90,180	1631	X	X	X	X							2.0		NS	S	1	*	1630				CI		1632
	SNS	NVD CALS, RVL	1632	X	X	X								2.0		NS	S	2	*	1631,1430		NS,CAL		CI		1634
	SNS	FORM SEQUENCE / CALs	1633	X			X							2.0		NS	S	2	*	1430,1632				CI		
	SNS	SEC CAL, RVL, AUTOMATION	1634	X	X	X	X							2.0		NS	S	2	*	1633				CI		
	NS	NVD FAM, FLIR USE	1640	X	X										2.0	NS	A	1	*	1341,1630		NS		FRSI		1631
	NS	NVD CALS, STR,90,180	1641	X	X	X									2.0	NS	A	1	*	1640		NS,CAL		FRSI		1633
	NS	SEC FORM,CAL,RVL	1642	X											2.0	NS	A	2	*	1440,1634,1641				FRSI		1635
NS TOTAL											3	2.0	3	10.0	3	6.0										
REV																										
REV	SREV	INST REV, EP	1830	X			X	X						2.0		(N*)	S	1	*	1241				FRSI		1236
	SREV	EP REV	1831	X	X	X	X	X						2.0		(N)	S	1	*	6011				FRSI		1830
	SREV	REV ALL MANEUVERS	1832	X				X	X					2.0		(N)	S	1	*	1831				FRSI		1831
	REV	REV ALL MANEUVERS	1840	X	X	X		X							1.5	(N)	A	1	*	1832				FRSI		1832
	REV	T2P CHECK / CRM FLIGHT	1841	X	X	X	X	X	X						1.5	(N)	A	1	*	1840				NI/ANI		6030
REV TOTAL											3	0.0	2	6.0	2	3.0										
1000 PHASE TOTAL											62	128.0	32	80.0	18	30.5										

MV-22B FRS T&R MATRIX (1000, 5000, 6000 Phase)

MV-22B FRS T&R MATRIX (1000, 5000, 6000 Phase)																										
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ATTAIN						MAINTAIN	ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	RANGE	INSTRUCTOR	EOM	EVENT CONV
				BASIC	REFRESHER	MOD REF	CONT INST	AIR FORCE	CV TO MV		#	TIME	#	TIME	#	TIME										
5000 PHASE INSTRUCTOR TRAINING																										
FLEET REPLACEMENT SQUADRON INSTRUCTOR (FRSI)																										
FRSI	ACAD	CV-22 to MV-22 Stg Inbrief	5110						X			1.0					G		*							
	ACAD	BASIC FLIGHT INST COURSE	5111	X	X							8.0					G		*							5111
	SFIT	Rev FAM	5130						X			2.0					(N*)	S	1	*	0001,0200,0012,0014,0109,1020,5110			FRSI		
	SFIT	Day VFR NAV	5131						X			2.0					(N)	S	1	*	5130			FRSI		
	SFIT	Rev Insert/Extract/RVL	5132						X			2.0					(N)	S	1	*	5131			FRSI		
	SFIT	INST	5133						X			2.0					(N)	S	1	*	5131			FRSI		
	FIT	Rev FAM/CAL	5134						X			2.0					(N)	A	1	*	5130,5132			FRSI		
	SFIT	Rev FORM	5135						X			2.0					(N)	S	2	*	5132			FRSI		
	FIT	Rev FORM	5136						X			2.0					(N)	A	2	*	5134,5135			FRSI		
	FIT	DAY FAM MANEUVERS	5140	X	X											2.0	D	A/S	1	*	6234			STANI		5130
	FIT	NIGHT FAM MANEUVERS	5141	X	X											1.0	N*	A/S	1	*	5140			STANI		5141
	SFIT	IFR	5142	X	X										2.0		(N)	S	1	*	6234			STANI		5142
	FIT	CAL/FCLP INST TECHNIQUES	5143	X	X											1.5	D	A/S	1	*	6234			STANI		5143
	SFIT	NAV INSTRUCTION TECHNIQUES	5144	X	X										1.5		D	S	1	*	6234			STANI		5144
	FIT	FORM INSTRUCTION TECHNIQUES	5145	X	X											1.5	D	A/S	2	*	6234			STANI		5145
	FIT	STAN PILOT CHECK FLIGHT	5146	X	X										2.0		(N)	S	1	*	6234, 5140-5145			STANI		5147
FRSI TOTAL											1	8.0	4	7.5	4	6.0										
NIGHT SYSTEMS FAM INSTRUCTOR																										
NSFI	ACAD	NSFI LECTURE	5112	X								1.0					G		*					NSI		5112
	SNSFI	HLL LOW WORK/FAM/CAL	5150	X										2.0			NS	S	1	*				NSI		5150
	NSFI	HLL FAM/FORM/CAL	5151	X											2.0		NS	A	1	*				NSI		5151
	NSFI	NSFI CERT FLIGHT	5152	X	X										2.0		NS	A	2	*				NSI		5152
NSFI TOTAL											1	1.0	1	2.0	2	4.0										
6000 PHASE REQUIREMENTS, CERTIFICATIONS, QUALIFICATIONS, DESIGNATIONS (R,C,Q,D)																										
NATOPS (NTPS)																										
NTPS	ACAD	NATOPS OPEN BOOK	6010	X	X	X	X	X	X	X		3.0					G		365					NI/ANI	X	6010
	ACAD	NATOPS CLOSED BOOK	6011	X	X	X	X	X	X	X		1.0					G		365	6010				NI/ANI	X	6011
	ACAD	NATOPS ORAL EXAM	6012	X	X	X	X	X	X	X		1.0					G		365	6011				NI/ANI	X	6012
	RQD	NATOPS EVAL	6030	X	X	X	X	X	X	X					1.5	(N)	A/S	1	365	6012				NI/ANI	X	6030
	RQD	ANI EVALUATOR	6031	X	X	X	X	X	X	X					0.0	(N)	A/S	1	365	6012				NI	X	
	RQD	NI EVALUATOR	6032	X	X	X	X	X	X	X	X					0.0	(N)	A/S	1	365	6012	6030			NE	X
NTPS TOTAL											3	5.0	0	0.0	3	1.5										
INSTRUMENT (INST)																										
INST	ACAD	IGS	6040	X	X	X	X	X	X	X		6.0					G		365					INSTEVAL	X	6013
	ACAD	INSTRUMENT EXAM	6041	X	X	X	X	X	X	X		2.0					G		365	6040				INSTEVAL	X	6014
	ACAD	INSTRUMENT ORAL EXAM	6042	X	X	X	X	X	X	X		1.0					G		365	6041				INSTEVAL	X	6015
	RQD	INST EVAL	6060	X	X	X	X	X	X	X				2.0			(N)	S/A	1	365	6042			INSTEVAL	X	6032
	RQD	INST EVALUATOR	6061	X	X	X	X	X	X	X	X				0.0			(N)	S/A	1	365	6060			INST EVAL	X
INST TOTAL											3	9.0	2	2.0	0	0.0										

16 Apr 18

MV-22B FRS T&R MATRIX (1000, 5000, 6000 Phase)

SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ATTAIN							MAINTAIN	ACAD		SIM		FLIGHT		CONDITION	TYPE	# or SIM	AIRCRAFT	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	RANGE	INSTRUCTOR	EOM	EVENT CONV					
				BASIC	REFRESHER	MOD REF	CONT INST	AIR FORCE	CV TO MV	#		TIME	#	TIME	#	TIME																	
CREW RESOURCE MANAGEMENT (CRM)																																	
CRM	ACAD	CRM REFRESHER	6070	X	X	X	X	X	X	X			1.0						G		365					CRMF/I	X	6016					
	RQD	CRM EVAL	6080	X	X	X	X	X	X	X					1.5			(N)	S/A	1	365	6070		6070			CRMF/I	X	6031				
	ACAD	CRMF LECTURE	6090	X	X	X				X	X		0.0						G		365					CRMF/I	X						
	RQD	CRMF EVAL	6091	X	X	X				X					0.0			(N)	S/A	1	365	6090					CRMF/I	X					
	ACAD	CRM COURSE	6092	X									0.0						G		*			6090		6090			CRMF/I	X			
CRM TOTAL											3		1.0	2		1.5	0		0.0														
EMERGENCY PROCEDURES (EP)																																	
EP	RQD	EP REVIEW	6033	X	X				X	X	X		0		0.0	1		1.0		0		0.0	(N)	S/A	1	90	T2P					X	6033
EP TOTAL											0		0.0	1		1.0	0		0.0														

Table of Contents

CHAPTER 3	MV-22 CREW CHIEF/6176	3-3
3.1	CREW CHIEF SYLLABUS T&R REQUIREMENTS	3-3
3.2	TRAINING PROGRESSION MODEL	3-3
3.3	PROGRAMS OF INSTRUCTION (POI)	3-3
3.3.1	Basic (B)	3-3
3.3.2	Transition (T)	3-4
3.3.3	Refresher (R)	3-4
3.4	PROFICIENCY AND CURRENCY	3-4
3.4.1	Event Proficiency	3-4
3.4.2	Skill Proficiency	3-4
3.4.3	Skill Currency	3-5
3.5	REQUIREMENTS, CERTIFICATIONS, QUALIFICATIONS, AND DESIGNATION TABLES	3-5
3.6	SYLLABUS NOTES	3-6
3.6.1	Event Environmental Conditions	3-6
3.6.2	Device Matrix	3-6
3.6.3	Simulator Training	3-6
3.6.4	Event Terms	3-6
3.6.5	Training Event Performance Requirements	3-7
3.7	CORE INTRODUCTION PHASE (1000-1999)	3-9
3.7.1	Ground School Stage	3-9
3.7.2	Flight Stage	3-21
3.8	CORE PHASE	3-40
3.8.1	Familiarization (FAM)	3-41
3.8.2	Formation (FORM)	3-42
3.8.3	Confined Area Landings (CAL)	3-44
3.8.4	Reduced Visibility Landing (RVL)	3-46
3.8.5	Night Systems (NS) High Light Level (HLL)	3-47
3.8.6	Night Systems (NS) Low Light Level (LLL)	3-50
3.8.7	Tail Gunnery (TG)	3-52
3.8.8	Low Altitude Tactics (LAT)	3-60
3.8.9	Division	3-65
3.8.10	Ground Threat Reaction (GTR)	3-69
3.8.11	Carrier Qualification (CQ)	3-72
3.9	MISSION PHASE	3-77
3.9.1	Air Logistics Support (ALS)	3-78
3.9.2	Expeditionary Shore-Based Aviation Operations (EXP)	3-79
3.9.3	Expeditionary Sea-Based Aviation Operations (SEA)	3-79
3.9.4	Tactical Recovery of Aircraft and Personnel (TRAP)	3-80
3.9.5	Combat Assault Transport (CAT)	3-81
3.10	CORE PLUS PHASE	3-83
3.10.1	Air Delivery (AD)	3-84
3.10.2	Alternate Insertion/Extraction Techniques (AIE)	3-89
3.10.3	Mountain Area Training (MAT)	3-91
3.10.4	Defensive Weapon System (DWS)	3-93
3.10.5	Defensive Combat Maneuvers (DCM)	3-100
3.10.6	Chemical, Biological, Radiological, and Nuclear (CBRN)	3-102
3.10.7	Carrier Qualification Unaided (CQ)	3-103
3.10.8	Rapid Insertion/Extraction Mission (RI/E)	3-105

3.10.9	Aviation Delivered Ground Refueling (ADGR).....	3-106
3.10.10	Aviation Delivered Battlefield Illumination (BI)	3-107
3.10.11	Air Delivery Mission	3-109
3.10.12	Airborne Command and Control (AC2)	3-109
3.11	INSTRUCTOR TRAINING PHASE (5000)	3-110
3.11.1	Basic Instructor Crew Chief (BICC)	3-110
3.11.2	Crew Chief FRS Instructor Training (FIT)	3-112
3.11.3	Tail Gunnery Instructor (TGI).....	3-114
3.11.4	Defensive Weapon System Instructor (DWSI).....	3-114
3.11.5	Low Altitude Tactics Instructor (LATI).....	3-114
3.11.6	Night Systems Familiarization Instructor (NSFI)	3-114
3.11.7	Defensive Combat Maneuvers Instructor (DCMI).....	3-115
3.11.8	Night Systems Instructor (NSI)	3-115
3.11.9	Weapons and Tactics Instructor (WTI)	3-115
3.12	REQUIREMENTS, QUALIFICATIONS, AND DESIGNATIONS (RQD) PHASE (6000)	3-115
3.12.1	NATOPS Requirements Tracking.....	3-115
3.12.2	Crew Resource Management Requirements Tracking.....	3-117
3.12.3	Reduced Visibility Landing Tracking (RVL)	3-118
3.13	MV-22B CREW CHIEF T&R MATRIX (2000-6000 Phase)	
3.14	MV-22B CREW CHIEF RANGE AND ORDNANCE MATRIX	
3.15	MV-22B FRS CREW CHIEF T&R MATRIX (1000,5000,6000 Phase)	

CHAPTER 3 MV-22 CREW CHIEF/6176

INDIVIDUAL TRAINING AND READINESS REQUIREMENTS

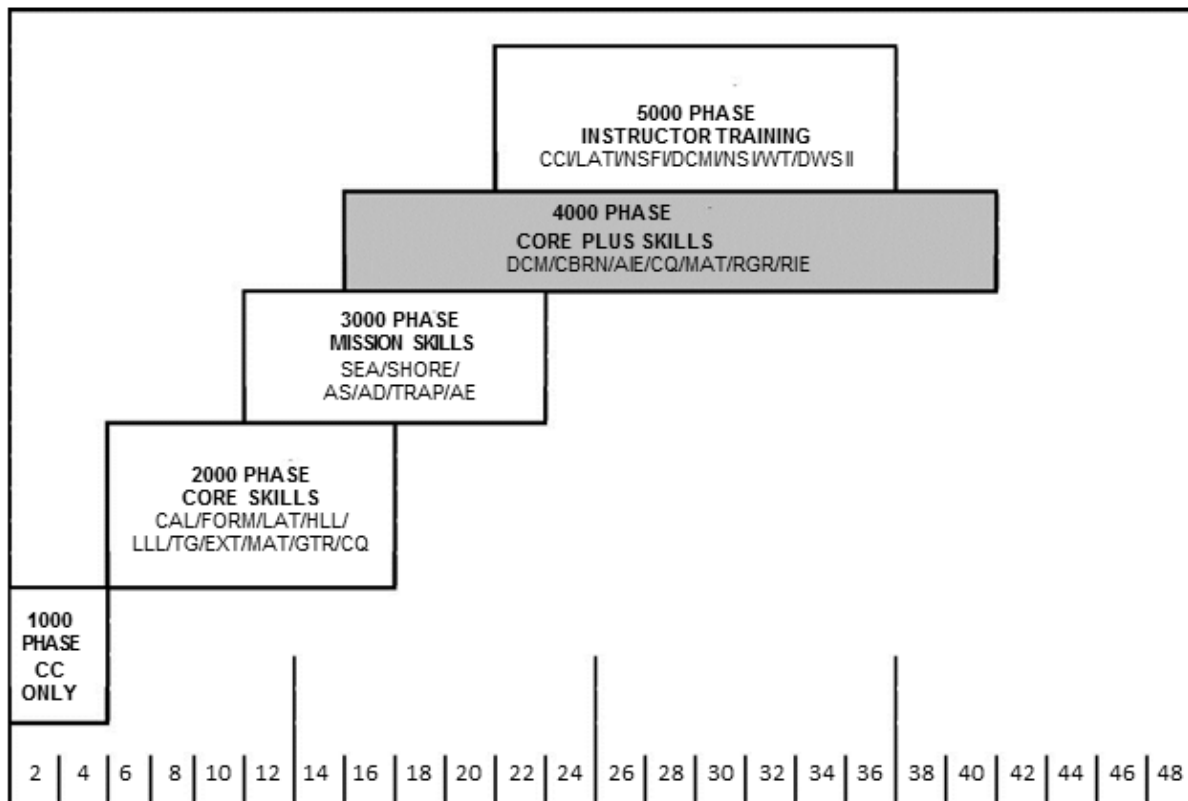
3.1 CREW CHIEF SYLLABUS T&R REQUIREMENTS

This T&R Syllabus is based on specific goals and performance standards designed to ensure individual proficiency in Core and Mission skills. The goal of this chapter is to develop individual and unit warfighting capabilities.

3.2 TRAINING PROGRESSION MODEL

This model represents the recommended training progression for the average MV-22 crew chief. Units should use the model as a point of departure to generate individual training plans.

Figure 3-1: Crew Chief Progression Model



3.3 PROGRAMS OF INSTRUCTION (POI)

A Program Of Instruction (POI) is a training track assigned to a Marine based on proficiency in a skill. All Marines undergoing training are assigned to at least one POI. The following POIs represent the average time-to-train.

3.3.1 Basic (B)

The entire syllabus as listed in Table 3-1 shall be completed for personnel assigned to this category.

Table 3-1: Basic Crew Chief

Weeks	Course/Phase	Activity
1-10	MV-22 Tiltrotor Mechanics Course	CNATT
11-28	Core Introduction Phase	Training Squadron
29-40	Core Phase	Tactical Squadron
41-50	Mission Phase	Tactical Squadron

3.3.2 Transition (T)

Previously qualified crew chiefs from rotary wing platforms shall be placed in the Transition POI and shall complete all events designated by a 'T' for the 1000-6000 phase. This is defined below in Table 3-2. This assumes that the transition crew chief has had previous proficiency in that stage of training. If the transition crew chief has no previous proficiency in a stage or particular event, then the transition crew chief should fly the entire stage or all events not previously flown. Crew Chief Instructors who were previously designated in another Type/Model/Series aircraft must complete the applicable instructor syllabus in its entirety in order to regain that designation in accordance with the MAWTS-1 Course catalog. Event proficiency updating for aircrew assigned to the Transition syllabus is per Chapter 2 of the Aviation T&R Program Manual. When all 'T' events in a stage are successfully completed, all remaining events in that stage are updated. Upon completion of the Transition POI, aircrew shall be assigned to the Refresher POI and follow Refresher POI proficiency updating procedures.

Table 3-2: Transition Crew Chief

Weeks	Course/Phase	Activity
1-5	MV-22 Tiltrotor Mechanics Course	CNATT
6-21	Core Introduction Phase	Training Squadron
22-32	Core Phase	Tactical Squadron
33-42	Mission Phase	Tactical Squadron

3.3.3 Refresher (R)

Previously designated MV-22 crew chiefs who have been out of the MV-22 for more than 730 days shall be placed in the Refresher POI, to be completed at the tactical squadron. When all R-coded events in a stage are successfully completed, the remaining events in that stage that are delinquent are updated. NBA and Incomplete events are not updated and must be completed in addition to R-coded events. If the Refresher crew chief has no previous proficiency in a stage or particular event, then the Refresher should fly the entire stage or all events not previously flown.

A Modified Refresher syllabus for personnel out of the aircraft for 486-730 days can be directed by the commanding officer of the tactical squadron. It will be based upon the Refresher syllabus but may be tailored to fit the experience of the crew chief. Any modification to the Refresher syllabus by the unit commanding officer shall be documented in Section 3 of the crew chief's APR prior to commencement of training. Table 3-3 below provides an example of this syllabus. The Refresher syllabus applies only up to the stage achieved during the prior tour. After that, the crew chief will complete the entire remaining syllabus.

Table 3-3: Modified Refresher

Weeks	Course/Phase	Activity
1-2	MV-22 Familiarization	Training/Tactical Squadron
3-4	Ground Schools / OJT	Training/Tactical Squadron
5-7	Core Introduction Phase	Tactical Squadron
8-10	Core Phase	Tactical Squadron
11-12	Mission Phase	Tactical Squadron

3.4 PROFICIENCY AND CURRENCY

3.4.1 Event Proficiency

Event proficiency is defined as successful completion of the performance standard as determined by the instructor or evaluator. Event completion is predicated upon demonstrated proficiency. Once completed, it is logged in M-SHARP by entering the appropriate event code. M-SHARP automatically updates the event proficiency date to reflect the completion date.

3.4.2 Skill Proficiency

Proficiency is a measure of achievement of a specific skill. To attain Individual Skill proficiency, an individual must be simultaneously proficient in all events for that Skill. Individuals may be attaining proficiency in some skills while maintaining proficiency in others.

3.4.2.1 Maintaining Skill Proficiency

Once attained, skill proficiency is maintained by executing those events which have a Proficiency Period (Maintain events). Proficiency Periods establish the maximum time between Event demonstration. Should proficiency be lost in any maintain event, for a specific skill, that skill proficiency is temporarily lost. Skill proficiency can be re-attained by again demonstrating proficiency

in the Event(s) that are not proficient. For flying communities, an individual shall complete delinquent events with a proficient instructor, crewman/flight lead as delineated by the T/M/S Syllabus Sponsor (see Chapter 3 of the Program Manual on specific instructor requirements for Low Altitude Flight, Night Systems, ACM, DM, DACM, DCM, FAC(A)).

Loss of Individual Skill Proficiency. Should an individual lose proficiency in all maintain events in a skill, the individual will be assigned to the Refresher POI for the skill. To regain skill proficiency, the individual must demonstrate proficiency in all R-coded events for the skill.

Loss of Unit Skill Proficiency. If an entire unit loses proficiency in an Event, unit instructors shall regain proficiency by completing the Event with an instructor from a like unit. If not feasible, the instructor shall regain proficiency by completing the Event with another instructor. For flying communities, if a unit has only one instructor and cannot complete the Event with an instructor from another unit, the instructor shall regain proficiency with another aircraft commander or as designated by the commanding officer.

Proficiency Status. Proficiency is a “Yes/No” status by skill assigned to an individual. When an individual attains and maintains Core Skill Proficiency (CSP), Mission Skill Proficiency (MSP), Core Plus Skill Proficiency (CPSP), or Mission Plus Skill Proficiency (MPSP), the individual may count towards CMMR or CMTS.

3.4.3 Skill Currency

Currency is a control measure used to provide an additional margin of safety based on exposure frequency to a particular skill and applies to all MOSs that must comply with NATOPS and OPNAV requirements. It is a measure of time since the last event demanding that specific skill. For example, currency determines minimum altitudes in rules of conduct based upon the most recent low altitude fly date. Specific currency requirements for aircrew individual type mission profiles can be found in Chapter 3 of the Program Manual.

Management of individual CSP/MSP/CPSP/CPMP serves as the foundation for developing proficiency requirements in DRRS.

3.5 REQUIREMENTS, CERTIFICATIONS, QUALIFICATIONS, AND DESIGNATION TABLES

Commanders may issue certification, qualification or designation letters when individual personnel complete applicable training requirements. A copy of these letters shall be included in Section 4 of Aircrew Performance Records per Chapter 2 of the Program Manual. Only after successfully completing certification, qualification or designation requirements and being issued a letter signed by the commanding officer will an individual be considered certified, qualified or designated. Do not confuse certifications with qualifications or designations as defined below.

Table 3-4: Individual Qualification Requirements

Qualification	Event Requirements
NATOPS	6010R, 6011R, 6012R, 1841, 6030R
NSQ HLL	2310,2311,2340,2341
NSQ LLL	2380,2381,2382,2383
Day TGQ	2510,2511/2512/2513,2520/2521/2522,2540,2541
NS TGQ	2514,2515, 2542,2543
Day LATQ	2610,2611,2620,2640,2641
NS LATQ	2642,2643
GTR	2810,2811,2812,2813,2814,2815,2820,2831,2840
CQ	2930,2931,2940,2941,2942,2943
DWSQ	4210,4211,4220,4221,4222,4223,4240,4241,4242,4243,4244,4245
DCMQ	4310,4311,4312,4320,4340

Table 3-5: Individual Designation Requirements

Designation	Event Requirements
CC INITIAL	Successful completion of the Core Introduction phase. RQD-1841 also serves as the initial NATOPS Evaluation
BICC	5010R,5020R,5040R
FRS CCI	5010R,5140R,5141R,5142R,5143R
LATI	5631
TGI	M240D-5410,5420, 5432 GAU-16 – 5421, 5434. GAU-21 – 5422,5436
DWSI	5511,5520,5521,5523,5533
NSFI	5732
DCMI	5810,5832
NSI	5934,5935

WTI	See MAWTS-1 WTI Course Catalog for syllabus requirements.
ANI	6031
NI	6032
CRMF	6090,6091
CRMI	6092

3.6 SYLLABUS NOTES

3.6.1 Event Environmental Conditions

Table 3-6: Environmental Conditions

Code	Description (Environmental Condition)
D	SHALL BE CONDUCTED DURING DAY
N	SHALL BE CONDUCTED AT NIGHT, AIDED OR UNAIDED, AT LEAST 30 MINUTES AFTER OFFICIAL SUNSET.
(N)	MAY BE CONDUCTED DAY OR NIGHT. IF AT NIGHT, AIDED OR UNAIDED.
NS	SHALL BE CONDUCTED AT NIGHT AIDED UNDER HIGH LIGHT LEVEL OR LOW LIGHT LEVEL AT LEAST 30 MINUTES AFTER OFFICIAL SUNSET.
HLL	SHALL BE CONDUCTED AT NIGHT AIDED UNDER HIGH LIGHT LEVEL CONDITIONS.
LLL	SHALL BE CONDUCTED AT NIGHT AIDED UNDER LOW LIGHT LEVEL CONDITIONS.
(NS)	MAY BE CONDUCTED DAY OR NIGHT. IF AT NIGHT, SHALL BE AIDED UNDER HIGH LIGHT LEVEL OR LOW LIGHT LEVEL AT LEAST 30MINUTES AFTER OFFICIAL SUNSET.
(HLL)	MAY BE CONDUCTED DAY OR NIGHT. IF AT NIGHT, SHALL BE AIDED AND UNDER HIGH LIGHT LEVEL CONDITIONS.
(LLL)	MAY BE CONDUCTED DAY OR NIGHT. IF AT NIGHT, SHALL BE AIDED AND UNDER LOW LIGHT LEVEL CONDITIONS.
N*	SHALL BE CONDUCTED AT NIGHT UNAIDED, AT LEAST 30 MINUTES AFTER OFFICIAL SUNSET
(N*)	MAY BE CONDUCTED DAY OR NIGHT. IF AT NIGHT, SHALL BE UNAIDED.
D/N*	SHALL BE CONDUCTED IN THE SIMULATOR DURING DAY AND NIGHT AIDED.

3.6.2 Device Matrix

The nomenclature in the table below is used to differentiate aircraft, simulator, part task trainer, computer-based trainer, and classroom events. Particular device information is found on the far right of the header. The aircraft is used for those events designated with an A, a simulator or part task trainer is used for those events designated with an S, and ground/academic training, labs, self-paced learning, or the computer based trainer is used for those events designated with a G in the event header. To give commanding officers the maximum amount of flexibility for training, some events allow for the optional use of simulators or aircraft.

Table 3-7: Device Matrix

Symbol	Meaning
A	CONDUCTED IN AIRCRAFT
A/S	AIRCRAFT PREFERRED/SIMULATOR OPTIONAL
S	CONDUCTED IN SIMULATOR
S/A	SIMULATOR PREFERRED/AIRCRAFT OPTIONAL
G	GROUND/ACADEMIC TRAINING. MAY INCLUDE COMPUTER-BASED TRAINING, LECTURES, OR LABS.
NOTE – IF THE EVENT IS TO BE FLOWN IN THE SIMULATOR THE SIMULATOR INSTRUCTOR SHALL SET THE DESIRED ENVIRONMENTAL CONDITIONS FOR THE EVENT.	

3.6.3 Simulator Training

While it is recognized that the simulator does not specifically train to the crew chief position, the Flight Training Device (FTD), Full Flight Simulator (FFS), Interactive Cockpit Learning Environment (ICLE) and Consolidated V-22 Enhanced Maintenance Trainer (CVEMT) have been incorporated into the Core Introduction and the Core phases of the syllabus to integrate the crew chief into cockpit and cabin procedures prior to entering the aircraft. To further clarify the use of the simulator, an event marked as ESFAM designates that the enlisted aircrewman is the priority for that particular simulator event and a dedicated Contract Instructor or Pilot is required. Any other simulator event in the crew chief syllabus can be conducted in conjunction with pilot training vice having a dedicated pilot for crew chief-only training.

3.6.4 Event Terms

3.6.4.1 Discuss

The CCI shall discuss a system, procedure, or maneuver during the brief, in flight, or debrief.

The CCUI shall demonstrate an understanding of all discussed items listed in the event description.

Demonstrate/Introduce flight events shall be discussed during the brief.

Emergencies listed in the event description are treated as discussion items during the brief and may be simulated during the flight at the option of the CCI and in accordance with unit SOP. EPs for Simulator events will be treated as Demonstrate/Introduce items on the event in which they are listed and are subject to review during any subsequent event.

3.6.4.2 Demonstrate

CCI performs the maneuver or procedure with accompanying description. At CCI discretion, the CCUI may perform the maneuver or procedure, but is not graded. The CCUI observes the maneuver and is responsible for knowledge of the procedures during the brief.

3.6.4.3 Introduce

The CCI may perform the maneuver or procedure with an accompanying description followed by the CCUI performing the maneuver or procedure, the CCI may coach the CCUI through the maneuver or procedure without demonstration.

The CCUI shall perform the maneuver with coaching as necessary and is responsible for knowledge of the procedures prior to the flight. In general, the expectation is that the CCUI will not consistently recognize errors and will frequently be outside performance standards.

Safe but limited proficiency. Requires frequent input from the instructor.

3.6.4.4 Practice

The CCUI shall perform, with occasional coaching, a maneuver or procedure that has been previously introduced. The purpose is to continue to work towards attaining a specified level of performance.

Correct. Recognizes and corrects errors. Requires occasional input from the instructor.

3.6.4.5 Review

The CCI observes and grades the maneuver or procedure with only minimal coaching.

The CCUI is expected to perform the maneuver or procedure with minimal coaching and with only minor procedural errors. In general, the expectation is that the CCUI will consistently recognize errors; however occasionally, corrections will not be timely with some excursions outside performance standards.

Correct, efficient, skillful and without hesitation. Requires minimal input from the instructor.

3.6.4.6 Evaluate

The CCI observes and grades the maneuver or procedure without coaching the CCUI. An airborne critique of the CCUI's performance is at the option of the instructor.

The CCUI is expected to perform the maneuver or procedure without coaching, with minor or no procedural errors, and at a level acceptable to warrant progress in the syllabus. The expectation is that the CCUI will consistently apply timely corrections with very few and quickly corrected excursions outside performance standards.

Unusually high degree of ability. Requires no input from instructor.

3.6.4.7 Expose

The CCI shall expose the CCUI to the procedure or consideration during the brief, in flight or debrief. The CCUI is not responsible for the knowledge of the procedure or consideration prior to the flight.

3.6.5 Training Event Performance Requirements

3.6.5.1 Purpose

To familiarize the CCUI with general syllabus expectations, definitions, and the observation scale found on the Aircrew Training Forms (ATF).

3.6.5.2 General

CCUIs shall be familiar with, but not be required to memorize, numerical system limitations for those systems with indications displayed with a green, yellow or red scale on either the EICAS or MFDs.

All flights shall terminate with a comprehensive debrief with emphasis on aircrew performance and procedures or systems discussed. Instructors should use all available debriefing techniques. The culmination of the debrief shall be an ATF for initial events or those events listed with an X at the discretion of the Commanding Officer.

3.6.5.3 Levels of Learning

Table 3-8 describes how the MAWTS-1 grading scale correlates to the numerical observations for graded events. The MAWTS-1 scale comments are designed to evaluate a CCUI's performance.

Table 3-7: Observation Scale			
Observation	Level of Learning	General	MAWTS Scale
5	CORRELATION (EVALUATE)	PROACTIVE. AHEAD OF THE SITUATION. REACTS CORRECTLY WITH CHANGING CONDITIONS. AND/OR CHANGING MISSION.	UNUSUALLY HIGH DEGREE OF ABILITY. REQUIRES NO INPUT FROM INSTRUCTOR.
4	APPLICATION (REVIEW)	SELF / CREW RECOGNITION OF ERRORS. CORRECT APPLICATION OF RESOURCES.	CORRECT, EFFICIENT, SKILLFUL, AND WITHOUT HESITATION. REQUIRES MINIMAL INPUTS FROM THE INSTRUCTOR.
3	UNDERSTANDING (PRACTICE)	MINOR ERRORS NOT DETECTED. CREW REDUNDANCY DIMINISHED.	CORRECT. RECOGNIZES AND CORRECTS ERRORS. REQUIRES OCCASIONAL INPUT FROM THE INSTRUCTOR.
2	ROTE (INTRODUCE)	TASK ACCOMPLISHED MECHANICALLY AND/OR WITH LIMITED SITUATIONAL AWARENESS. CREW REDUNDANCY LOST. RISK INCREASED.	SAFE BUT LIMITED PROFICIENCY. REQUIRES FREQUENT INPUT FROM THE INSTRUCTOR.
1	UNFAMILIAR	UNABLE	UNSAT – UNSAFE OR COMPLETE LACK OF ABILITY AND/OR KNOWLEDGE. REQUIRES SUBSTANTIAL INPUT FROM INSTRUCTOR FOR SAFE EXECUTION AND /OR MISSION ACCOMPLISHMENT.

3.6.5.4 Aircrew Training Forms (ATFs)

Also known as syllabus evaluation forms, ATFs are required for any initial event completed by crew members in one of the formal POIs, or as recommended by the Squadron Standardization Board, to include ACAD and LAB events. Events that were converted from a previous version of the T&R do not require a new ATF. However, events that did not previously exist will require an ATF.

If the commanding officer has waived or deferred a syllabus event, the squadron training officer shall place a waiver or deferral letter in Section 3 of the APR.

3.6.5.5 Aircrew Evaluation Flights

All crew chiefs shall have an appropriate NATOPS evaluation form completed annually upon completion of the NATOPS Check (RQD-6030) (RQD-1841 for Core Introduction completion). A designated FRSCCI NATOPS Evaluator or NATOPS Instructor/Assistant NATOPS instructor shall evaluate RQD-1841. A designated NATOPS Evaluator or NATOPS Instructor/Assistant NATOPS Instructor shall evaluate RQD-6030.

3.6.5.6 Instructor Requirements

An instructor requirement is noted for each event. If the case an event does not list an instructor requirement, then the minimum requirement is a Basic Instructor Crew Chief (BICC) proficient in the given event.

For Core Introduction flight events, the minimum instructor requirement is an FRSCCI. An FRSCCI, once designated by the FRS Commanding Officer, may instruct Core Skill Introduction flight events as qualified by stage of flight.

For Core Skill Introduction simulator events, the minimum instructor requirement is an FRS Instructor qualified to operate the device.

3.6.5.7 Crew Requirements/Position Designations

Crew requirements are listed for each stage of training. This Manual requires an aerial observer for all external cargo, NS, Ground Threat Reaction (GTR), and Defensive Combat Maneuvers (DCM) flights. However, the squadron commanding officer may, at his or her discretion, employ an aerial observer on any flight event. The requirement for an aerial observer is intended to provide a second crewmember in the aircraft cabin section. A designated aerial observer or crew chief may fill this requirement. On training flights a crew chief or aerial observer under instruction (CCUI/AOUI) may fill this requirement when flying with an appropriate syllabus instructor.

3.6.5.8 Event Completion

Event completion is predicated upon demonstrated proficiency. When an individual successfully accomplishes the requirements of an event per the performance standards, the individual should log completion of the event (enter the appropriate T&R code) in M-SHARP. When the event is entered into M-SHARP, the individual's proficiency date for that event is automatically updated to reflect the date the event was completed. When supervising individual events, unit instructors/leaders shall ensure that trainees demonstrate proficiency per T&R standards prior to logging successful event completion. Evaluating individual proficiency in an event normally requires both objective and subjective assessment. If, in the instructor's opinion, the CCUI does not adequately perform a required event, then all or parts of the sortie shall be repeated until adequate performance is demonstrated. If an individual fails to accomplish the requirements of an event per the performance standards, the individual should not log that event and the proficiency status for that event remains unchanged. Times indicated for each event are for planning purposes only.

3.6.5.9 Sequence

Training should be accomplished by flying events within a stage in sequence and stages in sequence when practical.

3.6.5.10 Crew Resource Management (CRM)

Aircrew shall brief techniques of CRM for all flights and/or events.

3.6.5.11 Operational Risk Management (ORM)

Aircrews shall brief those factors that affect risk mitigation decisions for every flight or mission.

3.7 CORE INTRODUCTION PHASE (1000-1999)

The purpose of this phase is to instruct the crew chief in basic MV-22 systems and fundamental procedures. Emphasis is placed on Cockpit Management System (CMS), plane captain duties, and specific mission roles. The Core Introduction phase is further divided into the Ground School and Flight stages. At the completion of this phase the CCUI will be a NATOPS qualified crew chief and rate the 6176 MOS.

3.7.1 Ground School Stage

Ground school is organized into nine major blocks of instruction. The blocks of instruction build progressively on the preceding blocks. Each major block of instruction consists of lessons guided by a crew chief certified to give academic instruction, along with accompanying lab sessions interspaced within in order to amplify and apply the LMS and classroom instruction. Certification for academic instruction shall be conducted per the USN Navy Instructor Training Course (CIN A-012-0077) or equivalent instructor training program.

The blocks of academic instruction may be followed by practical application for plane captain Daily and Turnaround Inspection responsibilities. This training will be documented in ASM records in accordance with COMNAVAIRFORINST 4790.2 and NAVMC 4790.1.

Specific lessons as well as Terminal (TLOs) and Enabling Learning Objectives (ELOs) for periods of instruction are defined in the Training Course Control Document (TCCD) for MV-22 Enlisted Aircrew Training.

The Commanding Officer of the resident FRS has the responsibility to define the required content, conduct reviews, forward required changes, and approve the content for all ground school events.

The Commanding Officer of the FRS has waiver authority over any event within Ground School.

Table 3-8: Ground School Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-0100	1.0	*	B,T		CLSRM		GROUND SCHOOL INBRIEF
ACAD-0101	11.5	*	B,T		CBT		ACAD BLK 1
LAB-0200	1.0	*	B,T		A	1	FIRE EXT LAB
LAB-0201	1.0	*	B,T	C/A	CVEMT		INGRESS, EGRESS
LAB-0202	5.0	*	B,T		S	1	INTRO TO APU, CMS STARTUP
ACAD-0102	15.0	*	B,T		CBT		ACAD BLK 2
LAB-0203	5.0	*	B,T		S	1	APU, CMS STARTUP
ACAD-0103	13.5	*	B,T		CBT		ACAD BLK 3
LAB-0204	5.0	*	B,T		S	1	CONTROLS AND DISPLAYS
LAB-0205	5.0	*	B,T		S	1	COMM AND NAV
ACAD-0104	9.0	*	B,T		CBT		ACAD BLK 4
LAB-0206	4.0	*	B,T		S/A	1	NAVIGATION AND IEWS
ACAD-0105	16.0	*	B,T		CBT		ACAD BLK 5
LAB-0207	5.0	*	B,T		A	1	ENGINE FAMILIARIZATION
LAB-0208	2.0	*	B,T		A	1	APU AND FIRE PROTECTION
LAB-0209	4.0	*	B,T		S	1	WEIGHT AND BALANCE
LAB-0210	3.0	*	B,T	C/A	CVEMT		CARGO LOADING
ACAD-0106	12.0	*	B,T		CBT		ACAD BLK 6
LAB-0211	3.0	*	B,T		A	1	PROPTOR SYD
LAB-0212	6.0	*	B,T		S	1	HYD, ENG START, EAPS
ACAD-0107	12.5	*	B,T		CBT		ACAD BLK 7
LAB-0213	2.0	*	B,T		A	1	LANDING GEAR
LAB-0214	2.0	*	B,T		A	1	SERVICING
LAB-0215	11.0	*	B,T		S	1	INTRO TO BFWS
LAB-0216	6.0	*	B,T		A/S	1	BFWS
ACAD-0108	22.0	*	B,T		CBT		ACAD BLK 8
LAB-0217	40.0	*	B,T		A	1	INTRO PLANE CAPTAIN DUTIES
ACAD-0109	17.0	*	B,T		CBT		ACAD BLK 9
LAB-0218	5.0	*	B,T		A	1	STARTUP, TAXI, SHUTDOWN
LAB-0219	2.0	*	B,T		A	1	MOORING
LAB-0220	4.0	*	B,T		CLSRM		ALSS EQUIPMENT
LAB-0221	4.0	*	B,T		C/A		EMERGENCY PROCEDURES
LAB-0222	2.0	*	B,T		A	1	MISSION PREP/BRIEFING
ACAD-0110	4.0	*	B,T		CLSRM		CRM INITIAL
ACAD-0111	8.0	*	B,T		CLSRM		NITE LAB
ACAD-0114	2.0	*	B,T		CLSRM		MV-22 CRM

ACAD-0100 1.0 * B,T CLSRM

Ground School Intro In-Brief

Goal. The CCUI understands the expectations during Ground School and has the requisite knowledge of the course and where all the necessary references can be accessed to complete the Core Skill Introduction Phase.

Requirements.

Discuss

Overall Course Design for Ground School and the Core Skill Introduction Phase.

Student Guide materials

Class Schedule

Systems reference material

ACAD handouts

Simulator and Flight Events Student Guides

- List, Location, and access to all appropriate references that will be required through the Core Skill Introduction Phase
- Expectations of CCUI during Ground School to include work schedule, ACAD preparation, and event prerequisites
- Squadron and MATSS processes, particularly scheduling
- Demonstrate
 - Computer based training access. All students will log-on to the network and access the first ADL
 - Basic operation of the ADL

Performance Standard. Students are introduced to expectations during ground school.

ACAD-0101 11.5 * B,T CBT

Academic Block One

Goal. The CCUI demonstrates understanding of the listed modules of instruction by successful completion of a computer-based test on the following modules.

Requirements.

- Modules:
 - V-22 familiarization and aircraft missions
 - Manuals and Publications
 - Safety and ORM
 - Aerodynamics
 - Airframe
 - Introduction to ingress/egress systems

Performance Standard. Successful completion of computer-based test on all modules. Passing score is 80%

Prerequisite. ACAD-0100

LAB-0200 1.0 * B,T A 1 MV-22

Flightline Fire Extinguisher Lab

Goal. Familiarize CCUI with operation and inspection of flightline fire bottles.

Requirements.

- Discuss
 - Preflight procedures and operation.
- Introduce
 - Hand and arm signals for aircraft fire
 - Preflight, positioning, and operation of levers and pins
 - Hazardous materials, e.g. HALON

Performance Standard. Demonstrate fire bottle preflight inspection and operating procedures.

Prerequisite. ACAD-0100

LAB-0201 1.0 * B,T C/A CVEMT

Ingress/Egress Lab

Goal. Familiarize CCUI with squadron procedures for flight. Complete required V-22 Egress.

Requirements

- Discuss
 - Flight equipment checkout
- Introduce
 - V-22 Egress

Performance Standard. Execute the V-22 egress procedures without reference or coaching.

Prerequisite. 0100

LAB-0202	5.0	*	B,T	S	1	FFS/FTD
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Intro to APU and CMS Start-up Lab

Goal. Introduce CCUI to APU and CMS start-up procedures.

Requirements.

Introduce
Pre-entry/Safety
Cockpit Pre-Entry
Cockpit Pre-Start
All Start

Performance Standard. Student is introduced to APU and CMS start-up procedures.

Prerequisite. ACAD-0100

ACAD-0102	15.0	*	B,T	CBT
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Academic Block Two

Goal. The CCUI demonstrates understanding of the listed modules of instruction by successful completion of a computer-based test on the following modules.

Requirements.

Modules:
Electrical systems
Lighting systems
Avionics systems
Environmental control system
Cockpit management system

Performance Standard. Successful completion of computer-based test on all modules. Passing score is 80%.

Prerequisite. 0101

LAB-0203	5.0	*	B,T	S	1	FFS/FTD
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APU and CMS Start-up Lab

Goal. CCUI is to practice APU and CMS start-up procedures.

Requirements.

Practice
Pre-Entry/Safety
Cockpit Pre-Entry
Cockpit Pre-Start
All Start

Performance Standard. Student practices and attains proficiency with APU and CMS start-up procedures.

Prerequisite. ACAD-0101

ACAD-0103	13.5	*	B,T	CBT
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Academic Block Three

Goal. The CCUI demonstrates understanding of the listed modules of instruction by successful completion of a computer-based test on the following modules.

Requirements

Modules:
Control and display, Advance Mission Computers
ICS and communication systems
GPS, INS, and DIGIMAP systems

Performance Standard. Successful completion of computer-based test on all modules. Passing score is 80%.

Prerequisite. ACAD-0102

LAB-0204 5.0 * B,T S 1 FFS/FTD

Control and Display Lab

Goal. Introduce CCUI to use of controls, displays, and CMS.

Requirements

Introduce:

Multifunction Displays
Control Display Unit
Keyboard Panels
Radio Frequency Indicator Selector
Circuit Breakers

Performance Standard. Student is introduced to use of controls, displays, and CMS.

Prerequisite. 0102

LAB-0205 5.0 * B,T S 1 FFS/FTD

Communication and Navigation Lab

Goal. Demonstrate to CCUI to use of communications, INS, and GPS.

Requirements

Introduce

Intercommunication System (ICS)
AN/ARC 210 UHF/VHF Communication System
Satellite Communication System (SATCOM)
Identification Friend of Foe (IFF) System
Global Positioning System (GPS)
Lightweight Inertial Navigation System (LWINS)
Digital Map System (DMS)

Performance Standard. Student is introduced to the use of communication and navigation equipment.

Prerequisite. ACAD-0102

ACAD-0104 9.0 * B,T CBT

Academic Block Four

Goal. The CCUI demonstrates understanding of the listed modules of instruction by successful completion of a computer-based test on the following modules.

Requirements

Modules

RADALT, TACAN
Radio navigation equipment
VOR/ILS, FLIR
Integrated Electronic Warfare Suite

Performance Standard. Successful completion of computer-based test on all modules. Passing score is 80%.

Prerequisite. ACAD-0103

LAB-0206 4.0 * B,T S/A 1 FFS/FTD

Navigation and IEWS Lab

Goal. Introduce CCUI to use of radio navigation equipment and Integrated Electronic Warfare Suite (IEWS).

Requirements.

Introduce

- Radar Altimeter
- Tactical Air Navigation System (TACAN)
- FM Homing System
- VHF/UHF Automatic Direction Finder (ADF) System
- Very High Frequency Omnidirectional Range (VOR), Instrument Landing System (ILS), Marker Beacon (MB)
- Forward Looking Infrared (FLIR) System
- Integrated Electronic Warfare Suite

Performance Standard. Student is introduced to use of radio navigation equipment and Integrated Electronic Warfare Suite (IEWS).

Prerequisite. ACAD-0103

ACAD-0105	16.0	*	B,T	CBT
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Academic Block Five

Goal. The CCUI demonstrates understanding of the listed modules of instruction by successful completion of a computer-based test on the following modules.

Requirements.

Modules:

- O2/N2 system
- IPS
- Engine
- APU
- Fire detection and suppression systems
- Hoist and winch systems
- Weight and Balance

Performance Standard. Successful completion of computer-based test on all modules. Passing score is 80%.

Prerequisite. ACAD-0104

LAB-0207	5.0	*	B,T	A	1	MV-22
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Engine Familiarization Lab

Goal. Familiarize the CCUI with V-22 engine systems.

Requirements

Introduce

- Torquemeter Assembly
- Accessory Drive Gearbox Assembly
- Gas Generator Assembly
- Power Turbine Assembly
- Lubrication System
- Bleed Air Systems
- Fuel System
- Ignition and Control System
- Exhaust System
- Coanda Deflector System

Performance Standard. Student is introduced to the MV-22 engine systems.

Prerequisite. ACAD-0104

LAB-0208	2.0	*	B,T	A	1	MV-22
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APU and Fire Protection System Lab

Goal. Familiarize the CCUI with the APU and fire protection systems.

Requirements.

Introduce

APU Systems
Engine System
Exhaust System
Engine Indicating System
Engine Control System
Engine Fuel and Control System
Ignition/Starting System
Oil System
APU Inspection and Operational Check
Nacelle Fire Detection and Suppression System
Wing Fire Protection System (WFPS)

Performance Standard. The student is introduced the MV-22 APU and fire protection systems.

Prerequisite. ACAD-0104

LAB-0209	4.0	*	B,T	S	1	FFS/FTD
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Weight and Balance Lab

Goal. Introduce aircraft weight and balance calculations.

Requirements.

Introduce

Weight and Balance on CMS
Cargo Zones

Performance Standard. Student is introduced to aircraft weight and balance calculations.

Prerequisite. ACAD-0104

LAB-0210	3.0	*	B,T	C/A	CVEMT
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Cargo Loading Lab

Goal. Introduce cargo loading procedures.

Requirements

Introduce

Cargo Loading/Handling Fundamentals
Cargo Loading/Handling Provisions
Cargo Restraint Criteria
Cabin Preparation/Cargo Load

Performance Standard. Student is introduced to MV-22 cargo loading procedures.

Prerequisite. ACAD-0104

ACAD-0106	12.0	*	B,T	CBT
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Academic Block Six

Goal. The CCUI demonstrates understanding of the listed modules of instruction by successful completion of a computer-based test on the following modules.

Modules

Drive system
VSLED and engine monitoring system
Flight control system
Hydraulic systems
Utility systems

Performance Standard. Successful completion of computer-based test on all modules. Passing score is 80%.

Prerequisite. ACAD-0105

LAB-0211 3.0 * B,T A 1 MV-22

Proprotor System Lab

Goal. Familiarize the CCUI with V-22 proprotor system.

Requirements.

Introduce

- Spinner Assembly
- Fairing Assembly
- Blade Assembly
- Pendulum Damper Assembly
- Proprotor Hub Assembly
- Rotating Controls
- Blade fold components

Performance Standard. Student is introduced to the MV-22 proprotor system.

Prerequisite. ACAD-0105

LAB-0212 6.0 * B,T S 1 FFS/FTD

Hydraulics, engine start, and EAPS Lab

Goal. Introduce use of hydraulic systems and engine start procedures.

Requirements.

Introduce

- Hydraulic Systems
- Hydraulic System Inspection and Operational Check
- Engine Start Systems
- Engine Air Particle Separator (EAPS) System

Performance Standard. Student is introduced to the MV-22 hydraulic systems and engine start procedures.

Prerequisite. ACAD-0105

ACAD-0107 12.5 * B,T CBT

Academic Block Seven

Goal. The CCUI demonstrates understanding of the listed modules of instruction by successful completion of a computer-based test on the following modules.

Requirements.

Modules

- Landing gear system
- Fuel system
- Aircraft servicing
- Rotor brake system
- BFWS system

Performance Standard. Successful completion of computer-based test on all modules. Passing score is 80%.

Prerequisite. ACAD-0106

LAB-0213 2.0 * B,T A 1 MV-22

Landing gear lab

Goal. Familiarize CCUI with components and operation of the landing gear.

Requirements.

Introduce

Main Landing Gear
Nose Landing Gear
Wheels and Brakes and Emergency Extension
Main Landing gear fire suppression system

Performance Standard. Student is introduced with the components and operations of the MV-22 landing gear.

Prerequisite. ACAD-0106

LAB-0214 2.0 * B,T A 1 MV-22

Servicing Lab

Goal. Familiarize CCUI with aircraft servicing procedures.

Requirements

Introduce:

Ground Refuel/Defuel Panel (GRDP) Operation
Component Servicing
 Engine
 APU
 SDC
 PRGB
 TAGB
 MWGB
 ELS Reservoir
 VFG
Hydraulic System Servicing
Tire, Landing Gear, and Accumulator Servicing

Performance Standard. Student is introduced to MV-22 aircraft servicing procedures.

Prerequisite. ACAD-0106

LAB-0215 11.0 * B,T S 1 FFS/FTD

INTRO to BFWS Lab

Goal. Familiarize CCUI with operation of the APU and BFWS systems.

Requirements

Introduce

Blade Fold/Wing Stow (BFWS) Major Components
Blade Fold/Wing Stow (BFWS) Operation

Performance Standard. Student is introduced to MV-22 BFWS system.

Prerequisite. ACAD-0106

LAB-0216 6.0 * B,T A/S 1 MV-22

BFWS Lab

Goal. Familiarize CCUI with components and operation of the APU and BFWS system.

Requirements.

Practice

Blade Fold/Wing Stow (BFWS) Major Components
Blade Fold/Wing Stow (BFWS) Operation

Performance Standard. Student practices to attain proficiency with APU and BFWS operations.

Prerequisite. ACAD-0106

ACAD-0108	22.0	*	B,T	CBT
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Academic Block Eight

Goal. The CCUI demonstrates understanding of the listed modules of instruction by successful completion of a computer-based test on the following modules.

Requirements

Modules

- Plane captain responsibilities
- Performance of daily and turnaround inspections
- Fuel sampling

Performance Standard. Successful completion of computer-based test on all modules. Passing score is 80%.

Prerequisite. ACAD-0107

LAB-0217	40.0	*	B,T	A	1	MV-22
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Introduction to Plane Captain responsibilities

Goal. Familiarize CCUI with procedures for daily and turnaround inspections and with responsibilities associated with the designation of Plane Captain.

Requirements

Introduce:

- Duties and responsibilities of a Plane Captain
- Daily inspection procedures
- Turnaround inspection procedures
- Aircraft hazard areas

Performance Standard. Student is introduced to Plane Captain responsibilities.

Prerequisite. ACAD-0107

ACAD-0109	17.0	*	B,T	CBT
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Academic Block Nine

Goal. The CCUI demonstrates understanding of the listed modules of instruction by successful completion of a computer-based test on the following modules.

Requirements.

Modules

- Crew Chief ground procedures
- Crew Chief emergency procedures
- ALSS equipment
- Crew Chief in-flight duties

Performance Standard. Successful completion of computer-based test on all modules. Passing score is 80%.

Prerequisite. ACAD-0108

LAB-0218	5.0	*	B,T	A	1	MV-22
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Start-up/taxi/shut-down Lab

Goal. Familiarize CCUI with flightline procedures for aircraft start-up, shut-down, and taxi.

Requirements.

Introduce

- Crew communications

Proper hand and arm signals
Start-up duties
Shutdown duties

Performance Standard. Student is introduced to MV-22 start-up, taxi, and shut-down procedures.

Prerequisite. ACAD-0108

LAB-0219 2.0 * B,T A 1 MV-22

Mooring Lab

Goal. Familiarize CCUI with aircraft tiedown and securing procedures.

Requirements.

Discuss
 Weather Conditions
Introduce
 Aircraft Mooring Procedures
 Proper Aircraft Mooring

Performance Standard. Student is introduced to MV-22 tiedown and securing procedures.

Prerequisite. ACAD-0108

LAB-0220 4.0 * B,T CLSRM

ALSS equipment Lab

Goal. Familiarize CCUI with ALSS equipment.

Requirements.

Introduce
 ALSS Equipment
 ALSS Equipment Inspections
 Survival Vest Inspection
 LPU-34/P Inspection
 SRU-40/P Helicopter Aircrew Breathing Device (HABD) Pre-Flight/Post Flight.
 HGU-84/8P Flight Helmet Inspection Procedures
 MBU-23 (V) 8/P Oxygen Mask
 CRU-103/P Regulator

Performance Standard. Student is introduced to ALSS equipment and inspection criteria.

Prerequisite. ACAD-0108

LAB-0221 4.0 * B,T C/A CVENT

Emergency procedures Lab

Goal. Familiarize CCUI with aircraft emergency equipment, survival equipment, and its use.

Requirements.

Discuss:
 Aviate, Navigate, Communicate.
 Terminology and Emergency Procedures.
 Landing Criteria.
 Memory Items.
 Crew chief Emergency Equipment.
Introduce:
 Crew chief Ground Emergency Procedures.
 Aircraft Fire.
 Wheel Brake Overheat/Fire.

Crew chief In-Flight Emergency Procedures
Fuselage Fire In-Flight.
Smoke and Fume Elimination.
Crew chief Landing Emergency Procedures:
Emergency Landing.

Performance Standard. Student is introduced to aircraft emergency equipment and emergency procedures.

Prerequisite. ACAD-0108

LAB-0222	2.0	*	B,T	A	1	MV-22
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Mission preparation/Briefing Lab

Goal. Familiarize CCUI with procedures for flight preparation.

Requirements.

Introduce
Pre-Flight procedures
Gear Checkout
Tools
Flight Gear
Cabin Preparation
Time Management
Pre-flight Checklists
ODO Brief
Passenger Briefing Guide

Performance Standard. Student is introduced to flight preparation procedures.

Prerequisite. ACAD-0108

ACAD-0110	4.0	*	B,T	CLSRM
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Crew Resource Management (CRM) Initial

Goal. The CCUI understands the Risk and Resource Management (RRM) model and how the icons, processes, and seven principles apply to Crew Resource Management.

Requirements.

Discuss
Seven principles
RRM model
Icons and processes
Available resources
Decision model

Performance Standard. Student receives initial CRM training.

Instructor. Crew Resource Management Instructor (CRMI).

ACAD-0111	8.0	*	B,T	CLSRM
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Night Imaging and Threat Evaluation (NITE) Lab

Goal. The CCUI is introduced to the night environment, utilization of NVDs, and light discipline.

Requirements. Per NITE lab syllabus.

Performance Standard. Per NITE lab syllabus.

Instructor. AMSO/AMSC.

ACAD-0114 2.0 * B,T CLSRM

MV-22 CRM

Goal. The CCUI will have an introductory knowledge of CRM concepts and procedures with emphasis on the MV-22 cockpit and aircrew integration.

Requirements.

Discuss

- CRM
- ORM
- Lookout doctrine
- PF responsibilities and procedures
- PNF responsibilities and procedures
- Crew Chief responsibilities and procedures
- FD and automation CRM procedures and techniques

Instructor. FRSI.

Prerequisite. ACAD-0100.0100

3.7.2 Flight Stage

General. The purpose is to develop a Core Introduction phase complete crew chief. At the completion of this phase the CCUI will be a NATOPS qualified crew chief and rate the 6176 MOS as specified in RQD-1841. All cockpit trainer, simulator, and flight events require an ATF.

Admin Notes. ROC will be per the T&R Manual. An FRSCCI is required on all Core Introduction phase events.

Flight Stage Overview. The following stages are included in the Flight Stage of the Core Introduction Phase of training.

Table 3-9 Core Introduction Phase

Stage Name
Familiarization (FAM)
Instrument (INST)
Confined Area Landings (CAL)
Formation (FORM)
Field Carrier Landing Practice (FCLP)
Night Systems (NS)
Cargo Operations (CARGO)
Requirements, Qualifications, Designations (RQD)

*ROC will be per the T&R Manual.
An FRSCCI is required on all 1000 phase events.*

3.7.2.1 Familiarization (FAM)

Purpose. To introduce the crew chief to the initial flight stage of training and the requirements associated with it. Focus of Effort (FOE): aircraft preparation, aircrew callouts, application of Crew Resource Management and NATOPS Chapters: 2, 4, 7, 11, & 12.

General. Aircrew may fly these events in conjunction with the pilot syllabus. Aircrew shall complete all day FAM stage flights prior to flying any subsequent flights.

Crew requirements. P/P/CC or CCI/CCUI. A CCI shall instruct the CCUI during all simulator flights.

Prerequisite. Aircrew must complete a flight physical, Naval Aviation Water Survival Training Program (NAWSTP), and Naval Aviation Physiology Training Program (NAPTP) prior to beginning flight training.

Familiarization Stage Overview. The events included in the FAM stage of the Core Introduction Phase of training are depicted below.

Table 3-10: Familiarization Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-1010	1.0	*	B,T		G		FAM Stage In-brief
ESFAM-1032	2.0	*	B,T		S/A	1	CMS Checklist
ESFAM-1033	2.0	*	B,T		S/A	1	Crew Chief Call-outs and Start-up
FAM-1080	1.5	*	B,T	D	A	1	Engine Start and FAM Maneuvers
FAM-1081	1.5	*	B,T	D	A	1	Conversion Mode Maneuvers and Intro to Airplane Mode
FAM-1082	1.5	*	B,T	D	A	1	Introduction to Airplane Mode Maneuvers
FAM-1083	1.5	*	B	D	A	1	Airplane Mode Maneuvers
FAM-1084	1.5	*	B,T	D	A	1	Introduction to High Angle-of-bank Turns and Stalls
FAM-1085	1.5	*	B	D	A	1	FAM Stage Review
FAM-1086	1.5	*	B,T	D	A	1	FAM Stage Progress Check

ACAD-1010 1.0 * B,T G

FAM Stage In-Brief

Goal. The CCUI should have an introductory knowledge of the training syllabus for the familiarization stage and gain familiarity with the expectations and performance standards.

Requirements.

Discuss

Introduction

Purpose/FOE of the syllabus

Syllabus outline and flow

Applicable publications

CCUI performance expectations

Squadron Scheduling

Squadron distribution of flight schedule

Performance Standard. Student is introduced to FAM stage of training

Prerequisite. Completion of MV-22 crew chief ground school.

ESFAM-1032 2.0 * B,T S/A 1 FFS/FTD

CMS Checklist

Goal. Introduce the crew chief to positioning and responsibilities during pre-start checks, weight and balance computations, frequency changes, engine start, and taxi.

Requirements.

Discuss

CMS weight and balance operations

Crew chief responsibilities during pre-start

Crew chief responsibilities during engine start

Crew resource management

Introduce

Conduct cockpit pre-entry through All-Start checklist using CMS

Weight and balance scenarios

Crew positions and hand-and-arm signals and ICS and crew coordination call-outs during:

All-Start checklist

Engine start

Taxi

Frequency changes on CMS

Performance Standards

Use the CMS to successfully complete 3 weight and balance scenarios.

Use NATOPS PCL to conduct pre-start checks in CMS.

Input 2 frequency changes using the CMS.

Prerequisite. ACAD-1010.

ESFAM-1033 2.0 * B,T S/A 1 FFS/FTD

Crew Chief Call-outs and Start-up

Goal. Introduce crew chief responsibilities and call outs during FAM maneuvers in a day environment.

Requirements.

Discuss

CRM

Standard operating procedures and local command procedures for airfield facilities, pattern description and radio/ICS calls

Crew chief call outs

Crew day and crew rest

Introduce

CRM

Crew chief calls and positions during:

Takeoff

Vertical

STO

RTO

Pattern work and approaches

ICS procedures

Stat checks

Performance Standards

Respond to ICS command prompts in a timely manner.

Recite all crew chief emergency procedures verbatim.

Prerequisite. ESFAM-1032

Instructor. FRSCCI

FAM-1080 1.5 * B,T A 1 MV-22 FRSCCI

Engine Start and FAM Maneuvers

Goal. Introduce crew chief responsibilities and call outs during aircraft start-up and FAM maneuvers in a day environment.

Requirements

Discuss

CRM

Firefighting equipment operation

Hand and arm signals for Turn-up & Taxi, aircraft fires, and hot brakes

Aircraft fires on the ground, abnormal starts, and emergency shutdown procedures

Cabin configuration

Standard traffic calls (clock code, high, level, low, factor or no-factor)

Demonstrate

Proper pre-start, start, taxi, air taxi, pre takeoff, after takeoff, landing, and shutdown procedures IAW NATOPS

Pocket Check List (PCL)

Introduce

CRM

Pre-flight and post-flight inspections

Systems troubleshooting through use of the Cockpit Management System (CMS)

Aircraft start-up and shutdown

Taxi procedures

Lookout doctrine and areas of responsibility

Hover work

Patterns/approaches in CONV mode

Landing profiles

Distance estimation

- Upper crew door operation/limitations
- ICS operation/procedures
- Fueling operations
- Practice
 - Crew chief calls and positions introduced in ESFAM-1033
 - ICS procedures
 - Standard terminology
- Expose
 - APLN flight

Emergencies:

- Electrical system failure(s)
- Ground emergencies

Performance Standards

- Perform crew chief duties and required calls during pre-start, start, taxi, air taxi, pre takeoff, after takeoff, landing, and shutdown IAW applicable publications utilizing CRM.
- Be able to state indications, execute/recite memorized items and exercise proper crew coordination during simulated emergency procedures.
- Position fire bottle and self to conduct an aircraft start-up.

Prerequisite. ESFAM-1033

Instructor. FRSCCI

FAM-1081 1.5 * B,T A 1 MV-22 FRSCCI

Conversion Mode Maneuvers and Introduction to Airplane Mode

Goal. Review crew chief duties during FAM maneuvers in a day environment. Introduce transition to airplane mode and conversion mode maneuvers.

Requirements

- Discuss:
 - CRM
 - Time management and procedures as they apply to aircraft preparation and crew chief readiness for:
 - Flight brief
 - Pre-flight/hotseat
 - Aircraft limitations pertaining to STOs and ROLs
 - Cabin preparation for airplane mode
 - Safety precautions and procedures for servicing and troubleshooting while rotors are turning
 - Ramp operations and limitations during ground and flight operations
- Introduce
 - CRM
 - Cabin preparation for APLN mode/upper crew door operation
 - Transition/conversion
- Practice
 - Preflight and post flight inspections
 - Aircraft startup/shutdown procedures
 - Taxi procedures
 - Lookout doctrine and areas of responsibility
 - ICS procedures
 - Standard terminology
- Expose
 - Max gross weight takeoff and landing
 - Steep approach
 - No hover landing

Emergencies

Hydraulic System failures

Performance Standards.

Perform crew chief duties and required calls during pre-start, start, taxi, pre takeoff, after takeoff, landing, and shutdown IAW applicable publications utilizing CRM.
Be able to state indications, execute/recite memorized items and exercise proper crew coordination during simulated emergency procedures.
Conduct aircraft preflight or post-flight inspection.
Operate ramp and ramp door from all control stations.
Proper management and manipulation of upper crew door.

Prerequisite. FAM-1080

Instructor. FRSCCI

FAM-1082 1.5 * B,T A 1 MV-22

Introduction to Airplane Mode Maneuvers.

Goal. Introduce airplane mode maneuvers.

Requirements.

Discuss
 CRM
 Lookout doctrine during APLN mode
 Standard rate turns in APLN mode
 Airsickness

Introduce
 CRM
 Use of oxygen mask

Practice
 Pre-flight/post-flight inspection requirements
 Aircraft startup/shutdown procedures
 Lookout doctrine and areas of responsibility
 Cabin preparation for airplane mode/upper crew door operation
 ICS procedures
 Standard terminology.
 Crew Resource Management.

Emergencies

Cabin Fire in Flight.

Performance Standards.

Perform crew chief duties and required calls during pre-start, start, taxi, air taxi, pre takeoff, after takeoff, landing, and shutdown IAW applicable publications utilizing CRM.
Be able to state indications, execute/recite memorized items and exercise proper crew coordination during simulated emergency procedures.
Conduct a timely and thorough preflight inspection/hotseat and ensure proper cabin configuration prior to flight.
Provide pilots with clear and concise traffic/clearance calls using proper ICS terminology.
Perform crew duties in APLN mode with use of oxygen mask.
Proper management and manipulation of the upper crew door.

Prerequisite. FAM-1081

Instructor. FRSCCI

FAM-1083 1.5 * B A 1 MV-22 FRSCCI

Airplane Mode Maneuvers

Goal. Introduce airplane mode maneuvers (continued from FAM1082).

Requirements.

Discuss

CRM

Safety regulations and required flight/safety equipment for passengers, combat troops, and litter patients over land and water

Passenger briefing

Location and purpose of AOA and FFR indicators on MFD

Introduce

CRM

Various takeoff and landing profiles

STO

RTO

ROL

Practice

Weight and balance entries utilizing CMS

ICS procedures

Standard terminology

Crew Resource Management

Emergencies.

Drive System malfunctions.

Gearbox failure (Warning).

ICDS failure (Warning).

Feathering/Flapping High Hot.

Rotor Load High.

PRGB/TAGB/MWGB Hot.

Performance Standards.

Perform crew chief duties and required calls during pre-start, start, taxi, pre takeoff, after takeoff, landing, and shutdown IAW applicable publications utilizing CRM.

Be able to state indications, execute/recite memorized items and exercise proper crew coordination during simulated emergency procedures.

Perform a passenger brief with CCI.

Perform proper weight and balance entries via CMS.

Prerequisite. FAM-1082

Instructor. FRSCCI

FAM-1084 1.5 * B,T A 1 MV-22

Introduction to High Angle-of-bank Turns and Stalls

Goal. Introduce slow flight airplane mode maneuvers, high AOB turns, and power on/off stalls.

Requirements. CCUI to act in the capacity of the crew chief.

Discuss

CRM

Lookout responsibilities

Aircraft stall characteristics, practice stall limitations, and crew chief positions during practice stalls

Single Engine Profile

Introduce

CRM

Emergency Landing Profile (ELP)

- Cabin preparation for practice stalls
- Practice
 - Various takeoff and landing profiles
 - ICS procedures
 - Standard terminology
- Expose
 - Slow flight in airplane mode.
 - High AOB turns in airplane mode (>45 degrees AOB).
 - Practice stalls.

Emergencies.

- Single Engine Failure in Hover.
- Single Engine Failure in Flight.
- Avionics cautions.
- Rotor Brake on Caution.

Performance Standards.

- Perform crew chief duties and required calls during pre-start, start, taxi, pre takeoff, after takeoff, landing, fueling and shutdown IAW applicable publications.
- Be able to state indications, execute/recite memorized items and exercise proper crew coordination during simulated emergency procedures.

Prerequisite. FAM-1083

Instructor. FRSCCI

FAM-1085 1.5 * B A 1 MV-22

FAM Stage Review

Goal. Review previously introduced FAM procedures and flight control emergency procedures.

Requirement.

- Discuss
 - CRM
 - Lookout responsibilities
 - Aircraft stall characteristics, practice stall limitations, and crew chief positions during practice stalls
 - Single Engine Profile
 - ELP
- Introduce
 - CRM
- Practice
 - ELP
- Review
 - Various takeoff and landing profiles
 - CONV and APLN patterns
 - ICS procedures
 - Standard terminology

Emergencies.

- Dual Engine failure
- Fuel System Cautions

Performance Standards.

- All previously listed performance standards from FAM-1080 through FAM-1084.
- Utilize CRM in order to conduct a safe flight.

Prerequisite. FAM-1084

Instructor. FRSCCI

FAM-1086 1.5 * B,T A 1 MV-22

FAM Stage Progress Check

Goal. FAM stage progress check. Review all normal and emergency procedures in stage. Demonstrate knowledge of aircraft systems.

Requirements.

- Discuss
 - CRM
 - Lookout responsibilities
 - FAM stage maneuvers
- Review
 - CRM
 - Pre-flight and post-flight inspections
 - CMS power-up
 - Aircraft start-up and shutdown procedures
 - Taxi
 - Takeoff and landing profiles
 - CONV and APLN patterns
 - Fueling
 - Lookout doctrine and areas of responsibilities

Emergencies.

Any major system EP.

Performance Standards

- Perform all crew chief duties from engine start-up to shutdown in accordance with NATOPS, and SOPs.
- Complete a verbal or written systems knowledge exam.
- Be able to utilize CRM.

Prerequisite. FAM-1085

Instructor. FRSCCI

3.7.2.2 Instrument Flight (INST)

Purpose. To expose the CCUI to the instrument environment, increase overall knowledge of the CMS, and reinforce the importance of CRM. FOE: use of CMS and aircrew coordination.

General. Initial Instrument flights will be flown with a CCI. INST-1240 may be flown in conjunction with any pilot instrument flight. If flown in the simulator at least one pilot or CSI is required. All manipulation of the CMS will be done by, or performed under the direction of, the pilot or CSI.

Crew Requirement. P/P/CC or CCI/CCUI

Instrument Stage Overview. The events included in the INST stage of the Core Introduction Phase of training are depicted below.

Table 3-11: Instrument Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-1210	1.0	*	B,T		G		INST Stage In-brief
INST-1240	1.5	*	B,T	(N*)	A/S	1	Basic Instrument Flight

ACAD-1210 1.0 * B,T CLSRM

Instrument Stage In-brief

Goal. To introduce the CCUI to the training syllabus for the Instrument stage.

Requirements.

- Discuss
 - Introduction
 - Purpose of the syllabus

Syllabus events
Applicable publications
CCUI performance expectations
Aircraft navigation equipment and systems
Navigation equipment
VOR
TACAN
ENAV
INAV - GPS/INS
Minimum aircraft equipment requirements
Crew integration during instrument and navigation flight
In-flight publications
Use of FDP
Fuel management

Performance Standard. Student is introduced to the Instrument stage training syllabus.

Prerequisite. FAM-1083

INST-1240 1.5 * B,T (N*) A/S 1 MV-22 FRSCCI

Instrument Stage In-brief

Goal. Introduce crew chief duties during instrument flight. All manipulation of the CMS will be done by, or performed under the direction of, the pilot or CSI.

Requirements.

Discuss
Navigation systems to include INAV, ENAV, TACAN, and the flight director panel
CMS/DMS features and navigation information
Lookout doctrine, monitoring radios
Spatial disorientation/vertigo
CRM as it pertains to crew chief CMS inputs
Demonstrate
Flight director panel inputs
IFF transponder code changes
TACAN frequency changes
Use of publications to include approach plates and IFR sectionals
Practice
CRM

Performance Standards.

CCUI maintains situational awareness on radio traffic and ATC compliance
CCUI assists pilots with lookout doctrine
CCUI familiar with CMS/moving map features

Prerequisites. ACAD-1210

Instructor. FRSCCI

3.7.2.3 Confined Area Landings

Purpose. To develop proficiency in performing single aircraft takeoffs and landings in confined areas in day VMC. FOE: CAL patterns, unimproved surface landings, scan, and aircrew call-outs.

Crew Requirement. P/P/CC or CCI/CCUI.

Confined Area Landing Stage Overview. The events included in the CAL stage of the Core Introduction Phase of training are depicted below.

Table 3-12: Confined Area Landing Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-1310	1.0	*	B,T		G		CAL Stage In-brief
CAL-1340	2.0	*	B,T	D	A	1	Intro to CALs
CAL-1341	1.5	*	B,T	D	A	1	RVL Procedures

ACAD-1310 1.0 * B,T CLSRM

Confined Area Landing Stage In-brief

Goal. Be able to comprehend and understand the concepts of CALS and tactical approaches to an unimproved surface. Be able to understand the relationship of the CMS and aircraft unique systems and setup interrelated to the CAL environment.

Requirements

Discuss

- Introduction
- Syllabus description
- Performance standards, CAL pattern CONV/APLN
 - Tactical Approaches
 - Hover/No-Hover Landings
- CAL Departures
- LZ Selection
- Use of Interim Power
- Use of FLIR
- INS/GPS
- CRM (Terminology during CAL)
- Augmented Hover CPLD
- Reduced Visibility Landings (RVL)

Performance Standard. Student is introduced to Confined Area Landings and Tactical Approaches.

Prerequisite. FAM-1086

CAL-1340 2.0 * B,T A 1 MV-22

Introduction to Confined Area Landings

Goal. Introduce CALs at various sites.

Requirements.

Discuss

- CRM
- Standard terminology and Crew positions and responsibilities during CALs
- Lookout doctrine
- Proprotor, nacelle, and lower fuselage to obstacle clearance
- Uneven/sloped terrain
- LZ suitability
- Normal vs. Steep glide slopes
- Brown out/White out procedures
- Interim Power
- Tactical straight-in approach
- 80 jump takeoff
- CONV landing pattern

Introduce

- LZ selection and evaluation
- Distance estimation
- Wave-off
- Direct pilots to avoid obstacles
- Drift correction

Practice

- CRM

Emergencies.

PRGB/TAGB/MWGB HOT

Performance Standards.

Establish suitability of LZ through communication with pilots.

Recognize and communicate any excessive closure rates and lateral or rearward drift during landings. Communicate obstacles and hazards in LZ.

Perform CC duties during approaches, landings and departures to a confined area (minimum 4 or until proficient).

Prerequisite. CAL-1310.

Instructor. FRSCCI

CAL-1341 1.5 * B,T D A 1 MV-22

Reduced Visibility Landing Procedures

Goal. Introduce day Reduced Visibility Landing procedures.

Requirement.

Discuss:

Landing zone evaluation and selection.

Soil composition.

Elevation and density altitude/pressure altitude.

Micro terrain, obstacles, and aircraft clearances.

Wind effects.

Standard approach procedures to RVLs.

RVL profile/procedures.

Height-Velocity diagram.

Cabin set-up and CRM during RVLs.

Wave-off procedures for RVLs.

Takeoff procedures.

RVL scale.

Brown out considerations.

Nacelle dust abatement.

Aircraft signature during RVLs.

Introduce:

RVL procedures (minimum of 5 or until proficient).

No-hover/Hover coupled landing.

RVL Scale.

Emergencies.

Compressor stall/single engine failure in a hover

EAPS fail

Performance Standard.

Demonstrate the proper procedures for RVLs IAW the MV-22 ANTTP Manual.

Recognize and communicate any excessive closure rates and lateral or rearward drift during landings.

Communicate obstacles and hazards in LZ.

Recognize RVL wave off criteria and execute wave off.

Recognize indications, associated warnings, and exercise proper CRM during simulated emergency procedures.

Prerequisite. CAL-1340

Required Reading. NATOPS Ch 7.28.7, 7.29, ANTTP Ch 3 pg 20-39

Instructor. FRSCCI

3.7.2.4 Formation (FORM)

Purpose. To develop proficiency in cruise formation, rendezvous procedures, and execution of formation maneuvers. FOE: V-22 formation fundamentals in CONV and APLN flight.

General. CCUI observes and assists the CCI for the initial 0.5 hour of the flight, then for the remainder of the flight acts in the capacity of crew chief under the supervision of a designated CCI.

Crew Requirements. P/P/CC/AO OR CCI/CCUI

Formation Stage Overview. The events included in the FORM stage of the Core Introduction Phase of training are depicted below.

Table 3-13: Formation Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-1410	1.0	*	B,T		G		Form Stage In-brief
FORM-1440	2.0	*	B,T	D	A	2	Formation Flight

ACAD-1410 1.0 * B,T G

Formation Stage In-brief

Goal. To introduce the CCUI to the training syllabus for the Formation phase. The following will be discussed: FORM syllabus, performance standards, CONV and APLN Cruise positions, Combat Cruise, and conduct of FORM flights.

Requirements

Discuss

- Introduction
- Purpose of Formation
- Syllabus description
- Required Readings
- Performance standards
- Cruise Formation
- Combat Cruise Formation
- AFCs saturation due to wake interference
- Sequence of Flight
- Aircrew Responsibilities and Callouts

Performance Standard. Student is introduced to the FORM stage of training.

Prerequisite. FAM-1086

FORM-1440 2.0 * B,T D A 2 MV-22

Formation Flight

Goal. Introduce cruise and combat cruise formation in the aircraft.

Requirements

Discuss

- CRM
- Cruise positions
- Closure rate and crew comfort levels
- Standard terminology and crew positions during formation flight
- Aircrew responsibilities during formation flights
- IIMC fan break
- Over-run/under-run
- Roll-off and wake turbulence (burble)

Introduce

- Formation lookout doctrine
- Crew responsibilities and positions
- Running/carrier rendezvous
- Lead changes
- Formation landings

Practice

CRM

Performance Standards

Provide pilot with accurate and timely information on the position of wingman using standard terminology.
Perform CC duties during formation flight with a minimum of 3 landings as lead to an improved surface or a CAL site.
Recognize and communicate excessive closure rates and any drift during landing evolutions.

Prerequisites. CAL-1340 (if landing in an unimproved LZ), ACAD-1410.

3.7.2.5 Field Carrier Landing Practice (FCLP)

Purpose. To develop Familiarization of shipboard operations and day FCLPs.

General. Maneuver descriptions can be found in the MV-22 ANTP manual, MV22 NATOPS NFM-000 CH. 8 and 00-80T-106 LHA/LHA NATOPS

Crew Requirement. P/P/CC/AO or FRSCCI/CCUI

Field Carrier Landing Practice Stage Overview. The events included in the FCLP stage of the Core Introduction Phase of training are depicted below.

Table 3-14: Field Carrier Landing Practice Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-1510	1.0	*	B,T		G		FCLP Stage In-brief
FCLP-1540	1.5	*	B,T	D	A	1	Day FCLP

ACAD-1510 1.0 * B,T G

Field Carrier Landing Practice Stage In-brief

Goal. To prepare the CCUI for the FCLP stage of the curriculum.

Requirement.

Discuss

FCLP terminology, and definitions
Hand and arm signals
Deck Markings and landing spots
Shipboard procedures
Shipboard CRM cadence

Performance Standard. Student is introduced to the FCLP stage of training.

Prerequisite. FAM-1086

Instructor. FRSCCI

FCLP-1540 1.5 * B,T D A 1 MV-22

Day Field Carrier Landing Practice Flight

Goal. Introduce day CQ patterns and procedures in a Field Carrier Landing Practice (FCLP) scenario.

Requirements

Discuss

CRM
Crewmember duties during CQs
Shipboard specific ICS procedures
Hand and Arm signals for shipboard operations
Flight deck operations
Wave offs
Shipboard lighting
Ship traffic patterns

Introduce

Carrier operation
 Airplane and conversion mode arrivals
 Charlie pattern for LHA/LHD and LPD/LSD (minimum 5 for initial sorties)
 Communication procedures
 Aircraft lighting
 Departure procedures
 STOs
 Pitch-up with side-slip characteristics
 Steady heading approach
 45° slide approach
 Stern Approach

Performance Standards.

Properly execute the CQ pattern IAW LHA/LHD NATOPS.
 Demonstrate knowledge of ship landing deck configuration.
 Demonstrate proper clearance calls prior to landing.
 Correction calls over the spot are accurate, clear, and timely.

Prerequisites. CAL-1340, ACAD-1510

Instructor. FRSCCI

External Syllabus Support. FCLP site

3.7.2.6 Night Systems (NS) High Light Level (HLL)

Purpose. To provide initial exposure to operations while using night vision goggles under light levels greater than .0022 lux (HLL) as predicted by the Solar/Lunar Almanac Program (SLAP) module. FOE: NVGs and NVG scan/distance estimation.

General. All aircraft events require a Crew Chief Night Systems Instructor or Night Systems Familiarization Instructor (CCNSI or CCNSFI) for initial sign-off of student.

Crew Requirement. P/P/CC/AO, CCNSI/CCUI, or CCNSFI/CCUI.

Night Systems Stage Overview. The events included in the NS stage of the Core Introduction Phase of training are depicted below.

Table 3-15: Night Systems Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-1610	1.5	*	B,T		G		NS Stage In-brief
NS-1640	1.5	*	B	NS	A	1	Mv-22 nsi/nsfi
NS-1641	1.5	*	B,T	NS	A	1	Mv-22 nsi/nsfi
NS-1642	2.0	*	B,T	NS	A	2	Mv-22 nsi/nsfi

ACAD-1610 1.5 * B,T G

Night Systems Stage In-brief

Goal. To prepare the CCUI for the NS stage of the curriculum.

Requirements.

Discuss
 CRM
 Purpose of NS
 Syllabus description: CCUI expectations
 Required Readings
 Performance standards
 Introduce
 NVG composition
 NVG set-up and focusing procedures
 Light level calendar/SLAP data
 Practice
 CRM

Performance Standard. Student is introduced to NS stage of training.

Prerequisite. FAM-1086

Instructor. NSFI/NSI

NS-1640 1.5 * B HLL A 1 MV-22

Night Systems Familiarization

Goal. Introduce HLL NVD FAM maneuvers.

Requirements.

Discuss

- CRM
- NVG Briefing Guide
- NVG adjustment procedures
- Aircraft lighting for NVG flight
- Misperceptions and Illusions
- Sensor Integration (FLIR/ NVG)
- NVG field of view (FOV) vs. normal FOV
- Light level calendar/SLAP data
- MAWTS-1 Night Vision Device (NVD) manual

Introduce

- Use of NVDs at varying locations under HLL conditions
- Takeoff and landing profiles
- CONV and APLN patterns

Practice

- CRM
- Use of cabin lighting, ICS control panel lighting, and Emergency Egress Lighting System (EELS)

Review

- Pre-flight and post-flight procedures
- Aircraft start-up and shutdown procedures
- Taxi procedures
- Lookout doctrine and areas of responsibility

Performance Standards.

- Demonstrate the proper procedures for NVG adjustment and preflight.
- Demonstrate effective NVD scan and call-outs.

Prerequisite. ACAD-1610, ACAD-0111

Instructor. NSFI/NSI

NS-1641 1.5 * B,T HLL A 1 MV-22

Night Systems Confined Area Landings

Goal. Introduce night CALs at various CAL sites utilizing NVDs (HLL).

Requirements.

Discuss

- CRM
- NVD briefing guide
- Use of external lights during CALs
- Visual illusions during CALs
- Closure rate during landings
- Standard calls
- Night scan/fixation tendencies
- Distance estimation/relative motion at night

Introduce

- LZ selection and evaluation
- Distance estimation using NVDs
- Waveoff
- Direct pilots to avoid obstacles
- Drift correction
- Practice
 - CRM
 - Use of NVDs at varying locations under HLL conditions
- Review
 - CAL procedures

Performance Standards

- Recognize and communicate any excessive closure rates and lateral or rearward drift during landings. Communicate obstacles and hazards in CAL sites.
- Demonstrate proficiency in NVD CALs.
- Perform CC duties during approaches, landings and departures to a confined area (minimum 4 or until proficient).

Prerequisites. CAL-1340, NS-1640

Instructor. NSFI/NSI

NS-1642 2.0 * B,T HLL A 2 MV-22

Night Systems Formation Flight

Goal. Introduce night formation utilizing NVDs (HLL).

Requirement

- Discuss
 - NVD briefing guide
 - Aircraft lighting
 - Standard calls
 - Night scan/fixation tendencies
 - Distance estimation/relative motion at night
 - Night formation hazards
 - Moon position in reference to lead aircraft
 - CRM
- Practice
 - CRM
- Review
 - Formation procedures and section landings
 - Use of NVDs at varying locations under HLL conditions

Performance Standards.

- Provide pilot with accurate and timely information on the position of wingman using standard terminology.
- Perform CC duties during formation flight with a minimum of 3 landings as lead to an improved surface or a CAL site.
- Recognize and communicate any excessive closure rates and any drift during landing evolutions.

Prerequisites. FORM-1440, NS-1641

Instructor. NSFI/NSI

3.7.2.7 Cargo Operations (CARGO)

Purpose. To develop proficiency with cargo operations. FOE: Aircraft setup for different missions, use of aircraft cargo handling equipment, and aircrew coordination during internal and external cargo operations.

General. The cargo operations phase will consist of academic instruction, labs conducted in the CVEMT, and simulator events.

Crew Requirement. P/P/CCI/CCUI.

Cargo Stage Overview. The events included in the CARGO stage of the Core Introduction Phase of training are depicted below.

Table 3-16: Cargo Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-1710	2.0	*	B,T		CLSRM		CARGO Stage In-brief
ACAD-1711	2.0	*	B,T	C/A	CLSRM		Mission Configurations
LAB-1720	2.0	*	B,T	C/A	CVEMT		Internal Cargo Ops
SCARGO-1730	1.5	*	B,T	C/A	CVEMT		Internal Cargo Ops

ACAD-1710 1.0 * B,T CLSRM

Cargo Operations Stage In-brief

Goal. To prepare the CCUI for the Cargo Operations stage of the curriculum.

Requirements.

Discuss:

Introduction

Cargo handling operations.

Syllabus description.

Required Readings.

Performance standards.

Aircraft cargo handling systems.

Cargo Loading Manual, weight and balance, and restraint.

Equipment preflight and operational checks.

Aircrew/ground crew communications/coordination during cargo operations.

Performance Standards. Student is introduced to CARGO stage of training.

Prerequisite. FAM-1086

Instructor. FRSCCI

ACAD-1711 2.0 * B,T C/A CLSRM

Mission Configurations

Goal. To prepare the CCUI for various mission requirements and aircraft change of role.

Requirements

Introduce:

Alternate aircraft configurations for roles required by the METL.

Mission equipment for externals, AIE, Airdrop, ADGR/MATs, and MEDEVAC.

Performance Standard. Student is introduced to mission configurations and aircraft change of role.

Prerequisite. 1710

LAB-1720 2.0 * B,T C/A 1 CVEMT

Internal Cargo Operations

Goal. To prepare the CCUI for operation of cargo systems used in internal cargo operations.

Requirements.

Demonstrate

CRM

Use of cargo loading systems

Use of Cargo Loading Manual and restraint procedures

Performance Standard. Student is introduced to internal cargo operations.

Prerequisite. ACAD-1710

Instructor. FRSCCI

SCARGO-1730 1.5 * B,T C/A 1 CVEMT

Internal Cargo Operations

Goal. Introduce internal cargo loading mission requirements and procedures.

Requirements

Discuss

CRM
Cargo Handling Manual
Cabin set-up for different mission profiles
Cargo roller rails, guide rails, rail extenders
Cargo winch and pulley operations
Tie down fittings and restraint
Shoring and floor limitations
Approach with load and fuselage clearance procedures
Hand-and-arm signals
HWOG operations
Cargo jettison procedures, emergency procedures

Demonstrate/Introduce

Proper load planning
Loading/unloading procedures
Proper restraint procedures
Weight and Balance computations

Performance Standards.

Demonstrate knowledge of basic internal cargo procedures.
Successfully load and restrain simulated loads.

Prerequisite. ACAD-1720

Instructor. FRSCCI

3.7.2.8 Core Introduction Check (RQD)

Purpose. To review all areas of instruction and demonstrate proficiency and knowledge of all maneuvers to certify the CCUI as a Core Skill Introduction complete crew chief. FOE: CC check flight.

General. A designated crew chief NATOPS Evaluator / Instructor (CCNE/CCNI/CCANI) shall evaluate the REQ-1841.

The CCUI will demonstrate proficiency in all events within the Core Skill Introduction phase. Upon completion of REQ-1841, the CCUI will be designated a crew chief. RQD-1841 meets the requirements for the 6176 MOS and will serve as the initial NATOPS evaluation.

Crew Requirement. P/P/CC or CCI/CCUI or CCNE,CCNI,CCANI/CCUI

Core Introduction Check Stage Overview. The events included in the RQD stage of the Core Introduction Phase of training are depicted below.

Table 3-17: Core Introduction Check Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-6010	3.0	365	B,T,R,M		G		Open Book NATOPS Exam
ACAD-6011	1.0	365	B,T,R,M		G		Closed Book NATOPS Exam
ESREV-1830	1.0	*	B	E	A/S	1	EP Review
ESREV-1831	2.0	*	B	(N)	A/S	1	Review Maneuvers
REV-1840	1.5	*	B,T		A	1	Review Maneuvers
ACAD-6012	3.0	365	B,T,R,M	E	G		NATOPS Oral Exam
RQD-1841	1.5	365	B,T,R,M	E	A	1	Initial NATOPS Evaluation

ACAD-6010 3.0 365 B,T,R, M G

Open Book NATOPS Examination

Goal. The Open Book Examination shall consist of, but not be limited to the question bank. The purpose of the open book examination portion of the written examination is to evaluate the airman's knowledge of the appropriate publications and the aircraft.

Performance Standard. Achieve a minimum grade of qualified on the Open Book examination.

ACAD-6011 1.0 365 B,T,R, M G

Closed Book NATOPS Examination

Goal. The Closed Book Examination shall be limited to the question bank. The purpose of the closed book examination portion of the written examination is to evaluate the airman's knowledge of the concerning normal/emergency procedures and aircraft limitations.

Performance Standard. Achieve a minimum grade of qualified on the Closed Book examination.

Prerequisite. 6010

ESREV-1830 1.0 * B E A/S 1 MV-22 FFS/FTD

Emergency Procedures Review

Goal. Review emergency procedures, CMS functions, systems knowledge and limitations.

Requirements. Respond to emergencies given to CCUI during period of instruction.

Performance Standards.

CCUI must verbally respond to simulated emergencies and use systems knowledge to effectively troubleshoot warnings, cautions, and advisories.

Proper use of NATOPS pocket checklist.

Proper use of CRM.

Prerequisites. Core Skill Intro Complete

ESREV-1831 2.0 * B (N) A/S 1 MV-22 FFS/FTD

Maneuvers Review

Goal. Review previous flight maneuvers, day and night.

Requirements.

Review

The CCUI will be prepared to describe and identify maneuvers from the following stages of training.

Familiarization

Instruments

Confined Area Landings

Field Carrier Landing Practice

Formation

Night Systems

Performance Standard.

Demonstrate proper procedures and execution of all previously introduced maneuvers.

Prerequisites. ESREV-1830

Instructor. FRSCCI

REV-1840 1.5 * B,T D A 1 MV-22

Maneuvers Review

Goal. Review Core Skill Introduction phase maneuvers.

Requirements.

Review

The CCUI will be prepared to describe and identify maneuvers from the following stages of training.

Familiarization
Instruments
Confined Area Landings
Formation
Field Carrier Landing Practice
Night Systems

Systems knowledge of the MV-22B

Performance Standard.

Act in the capacity of crew chief to be evaluated by a CCI on any maneuver, procedure, or terminology previously introduced during Core Skill Introduction phase of training.

Prerequisite. ESREV-1831

Instructor. FRSCCI

ACAD-6012 3.0 365 B,T,R,M G

Oral NATOPS Examination

Goal. The Oral shall consist of, but not be limited to the question bank. The evaluator may draw upon experience to propose questions of a direct and positive manner and in no way be opinionated to evaluate the airman's knowledge concerning normal/emergency procedures, aircraft limitations, and performance.

Performance Standard.

Achieve a minimum grade of qualified on the Oral examination.

Prerequisite. RQD-6011

Instructor. CCNI/CCANI

RQD-1841 1.5 * B,T,R,M E A 1 MV-22

Goal. To certify the CCUI as a tiltrotor crew chief.

Requirements.

Evaluate
Systems knowledge of the MV-22
Comply with all NATOPS and maintenance SOPs
Respond to any emergencies given by the CCI

Performance Standards.

Brief and demonstrate proficiency of aircraft emergency procedures per the MV-22 NATOPS Flight Manual.
Act in the capacity of the crew chief, utilizing CRM while being evaluated by a CCNI/CCANI on any maneuver, procedure, or terminology previously introduced during Core Introduction phase of training.

Prerequisite. REV-1840, ACAD-6012

Instructor. CCNI/CCANI

3.8 CORE PHASE

Purpose. The Core Phase is designed to provide the fundamental skills that will allow the crew chief to support the basic functions of the VMM.

General.

All references to ANTP are directed to the ANTP 3.22.3 MV-22 (unclassified) unless otherwise noted.

A BICC is the minimum requirement to instruct an initial event. Additional instructor requirements are identified for each specific event if needed.

Core Phase Overview. The following stages are included in the Core Phase of training.

Table 3-18: Core Phase Stage Name
Familiarization (FAM)
Formation (FORM)
Confined Area Landing (CAL)
Reduced Visibility Landing (RVL)
Night Systems High Light Level (NS HLL)
Night Systems Low Light Level (NS LLL)
Tail Gunnery (TG)
Low Altitude Tactics (LAT)
Division (DIV)
Ground Threat Reaction (GTR)
Carrier Qualification (CQ)

3.8.1 Familiarization (FAM)

Purpose. To prepare the CCUI for the Core Phase. This stage introduces the crew chief to Air-to-Air Refueling; Mission Auxiliary Tank System (MATS) installation and mission utilization; and cargo loading and forklift operations.

General. The CCUI must be NATOPS qualified as a crew chief prior to beginning this stage of training.

Familiarization Stage Overview. The events included in the FAM stage of the Core Phase of training are depicted below.

Table 3-19: Familiarization Stage							
Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-2012	1.0	*	B,T		G		Reference Publication
ACAD-2013	1.0	*	B,T		G		Air-to-air Refueling
LAB-2020	2.0	*	B,T		G		Mission Auxiliary Tank System
LAB-2027	1.5	*	B,T		G		Cargo Loading

ACAD-2012 1.0 * B,T G

Reference Publications

Goal. The CCUI has a familiarity with manuals that governing operations and procedures in the MV-22.

Requirements. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to reference publications.

Prerequisite. RQD-1841

Instructor. BICC

ACAD-2013 1.0 * B,T G

MV-22 Air-to-Air Refueling

Goal. The CCUI has a familiarity with air-to-air refueling procedures in the MV-22.

Requirements. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to aerial refueling procedures.

Prerequisite. RQD-1841

Instructor. BICC

Required Reading. NATOPS Operating limitations MAWTS-1 NVD Manual Ch 18

LAB-2020 2.0 * B,T A 1 MV-22

Mission Auxiliary Tank System Lab

Goal. The CCUI has an introductory knowledge of the installation and set-up of the MV-22 MATS.

Requirement. IAW IETMS

Performance Standard. Student is introduced to installation procedures for Mission Auxiliary Tanks.

Prerequisite. RQD-1841

Instructor. BICC

Required Reading. ANTTP Ch 6, 9

LAB-2027 1.5 * B,T S/A 1 CVEMT

Cargo Loading

Goal. To prepare the CCUI for cargo and forklift operations.

Requirements.

Discuss

- Cargo Handling Manual
- Cabin set-up for different mission profiles
- Cargo winch and pulley systems
- Tie down fittings and restraints
- Aircrew communication with ground personnel during cargo operations
- Approach with load and fuselage clearance procedures
- Hand and arm signals and forklift operations
- Proper restraint procedures

Introduce

- Proper load planning
- Loading and unloading procedures
- Weight and balance computations

Performance Standards.

- Demonstrate knowledge of internal cargo procedures.
- Successfully load, restrain and unload an internal cargo load.

Prerequisite. RQD-1841

Instructor. BICC

Required Reading. A1-V22AB-CLG-000

3.8.2 Formation (FORM)

Purpose. To introduce tactical formations and tactical formation maneuvering.

General. All maneuver descriptions are in the MV-22 ANTTP Manual.

Crew Requirements. P/P/CC/AO

Formation Stage Overview. The events included in the FORM stage of the Core Phase of training are depicted below.

Table 3-20: Formation Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-2110	1.0	*	B,T		G		EA TACFORM
FORM-2140	2.0	365	B,T,R,M	(NS)	A	2	TACFORM/NAV

ACAD-2110 1.0 * B,T G

TACFORM for Enlisted Aircrew

Goal. The CCUI is introduced to basic tactical formation maneuvers.

Requirement. Utilize MAWTS-1 courseware

Performance Standard. Student is introduced to MV-22 TACFORM maneuvers.

Prerequisite. RQD-1833

Instructor. BICC

Required Reading. NATOPS Ch 9.1-9.1.14, ANTP Ch 4

FORM-2140 2.0 365 B,T,R,M (NS) A 2 MV-22

Goal. Introduce tactical formations, tactical formation maneuvering, navigation to a SYS TOT, and lost contact procedures.

Requirement.

Discuss

- CRM
- Standard terminology
- Lookout doctrine
- Crew comfort level
- Inter/intra-plane coordination
- Lead/wingman responsibilities
- Bullseye calls
- Inadvertent IMC

Introduce

- Combat spread and combat cruise
- Tactical formation maneuvers in the ANTP
- Tactical lead changes
- Simulated lost contact with wingman with subsequent rejoin en route and at a point.
- Lost communications procedures

Practice

- Formation lookout doctrine

Review

- CMS power-up

Expose

- EMCON procedures.
- Types of escort operations.
- CMS tactical considerations (e.g. Threat Ring).
- Split section operations.

Performance Standards

- Demonstrate procedural knowledge of tactical formation maneuvers IAW MV-22 ANTP manual.
- Recognize proper tactical formations IAW MV-22 ANTP manual.
- Distance estimation calls to wingman are performed to a reasonable margin of error.

Prerequisites. ACAD-2110

Instructor. BICC

Required Reading. Review NATOPS Ch 9.1-9.1.14, MV-22 ANTTP *Formation*

3.8.3 Confined Area Landings (CAL)

Purpose. To develop proficiency in single and section takeoffs and landings and tactical approaches to confined areas.

General. All maneuver descriptions are in the MV-22 ANTTP Manual.

Crew Requirements. P/P/CC

Confined Area Landing Stage Overview. The events included in the CAL stage of the Core Phase of training are depicted below.

Table 3-21: Confined Area Landings Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
CAL-2240	1.5	*	B	D	A	1	Single-ship CAL
CAL-2242	2.0	365	B,T,R,M	D	A	2	Section CAL

CAL-2240 1.5 * B D A 1 MV-22

Single-ship Confined Area Landings

Goal. Introduce low- and medium-altitude tactical approaches, landings, and departures to a confined area.

Requirements.

Discuss

- CRM
- Standard terminology
- Crew chief responsibilities
- Obstacle clearance
- Crew comfort level
- Tactical approaches
- Initial terminal guidance (ITG)
- Glide slope
- Distance Estimation
- Wave-off procedures

Introduce

- Tactical approaches, landings and departures to a confined area (minimum 5 for initial sorties)

Practice

- Standard terminology
- Obstacle clearance
- Distance estimation
- Drift correction

Review

- Fuel burn considerations
- Proper restraint procedures
- Weight and balance computations
- CG limitations
- Procedures and safety precautions for transporting passengers, internal cargo, and/or tactical vehicles
- Major system EP

Expose

- LZ diagram
- Final Approach Course (FAC), or ingress heading
- L-Hour and Time on Target (TOT)
- METT-TC

Performance Standards

Perform obstacle clearance calls during approach, landing, and takeoff.
Evaluate suitability of LZ terrain and communicate information to pilots.
Perform drift correction, accurate and timely distance estimation calls to the pilot prior to aircraft touchdown.

Instructor. BICC

Prerequisite. RQD-1841

Required Reading. MV-22 ANTTP *Takeoff, Departure, and Landing*

External Syllabus Support. Suitable airspace and landing site.

CAL-2242 2.0 365 B,T,R,M D A 2 MV-22

Section Confined Area Landings

Goal. Introduce section low- and medium-altitude tactical approaches, landings, and departures to a confined area.

Requirements.

Discuss

- CRM
- Standard terminology
- Crew chief responsibilities during section CALs
- Closure rates
- Air-to-air TACAN
- Crew comfort level
- Lookout doctrine
- Wingman considerations
- Wave-off procedures

Introduce

- Section tactical approaches, takeoffs and landings (minimum 3 as lead for initial sorties).

Review

- Standard terminology
- Obstacle clearance
- Distance estimation
- Drift correction

Expose

- Assault Support Serial Assignment Table (ASSAT).
- Assault Support Landing Table (ASLT).
- Objective area diagram
- Initial point(IP), Holding area(HA), and Battle position(BP).
- Rules of engagement.
- Wind considerations with high gross weight.
- Discuss Air-Defense Artillery (ADA).

Performance Standards.

- Provide pilots with accurate and timely information on the position of wingman.
- Distance estimation calls to wingman are performed to a reasonable margin of error in terms of DME.
- Provide obstacle clearance calls for the section during approach, landing, and takeoff.
- Inform pilots of wingman's position prior to landing to ensure both aircraft have adequate clearance to land.

Instructor. BICC

Prerequisite. CAL-2240

Required Reading. ANTTP Ch.1, Ch. 5

External Syllabus Support. Suitable landing site.

3.8.4 Reduced Visibility Landing (RVL)

Purpose. To introduce RVL procedures and landings.

General. All maneuver descriptions are in the MV-22 ANTTP Manual. All initial sorties shall be conducted during the day. Proficient aircrew may conduct subsequent sorties at night. If the level of obscurity causes all crew members to lose visual reference with the deck, RVL-6900 will be logged.

Crew Requirements. P/P/CC/AO

Reduced Visibility Landing Stage Overview. The events included in the RVL stage of the Core Phase of training are depicted below.

Table 3-22: Reduced Visibility Landing Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
SRVL-2270	1.0	*	B,T	(NS)	S	1	RVL Simulator
RVL-2282	2.0	365	B,T,R,M	(NS)	A	1	RVL Flight

SRVL-2270 1.0 * B,T (NS) S 1 FFS/FTD

Reduced Visibility Landing Procedures

Goal. Introduce single-ship RVL procedures, placing emphasis on CRM cadence.

Requirements.

Discuss

NATOPS RVL limitations

Landing zone evaluation and selection

Soil composition

Micro terrain, obstacles, and aircraft clearances

Standard approach to RVLs

Brown out considerations

Crew resource management during RVLs

Proper CRM cadence

Introduce

Crew resource management during RVLs

Proper CRM cadence

Performance Standards.

Demonstrate proper CRM when making calls during RVLs

Instructor. BICC

Prerequisite. CAL-2240

Required Reading. MV-22 ANTTP *Takeoff, Departure, and Landing*

RVL-2282 2.0 365 B,T,R,M (NS) A 1 MV-22

Reduced Visibility Landings

Goal. Introduce single-ship RVL procedures in actual RVL conditions.

Requirements.

Discuss

Landing zone evaluation and selection

Soil composition
Elevation and density altitude/pressure altitude
Micro terrain, obstacles, and aircraft clearances
RVL scale
RVL procedures
Cabin set-up and CRM during RVLs
Wind effects
Wave-off procedures for RVLs
Takeoff procedures
Brown out/White out
Nacelle dust abatement
Aircraft signature during RVLs
Introduce
Cabin set-up and CRM during RVLs
RVLs with various levels of obscuration (minimum of 5 for initial sorties).
No-hover/Hover coupled landing.
Wave-off procedures for RVLs
Takeoffs with various levels of obscuration.
RVL Scale

Performance Standard.

Demonstrate the proper procedures for RVLs IAW the MV-22 ANTTP Manual.

Instructor. BICC

Prerequisite. SRVL-2270

Required Reading. MV-22 ANTTP *Takeoff, Departure, and Landing*

3.8.5 Night Systems (NS) High Light Level (HLL)

Purpose. To develop proficiency while using night vision devices under light levels greater than or equal to .0022 lux as predicted by the SLAP application. Certify the crewmember Night Systems Qualified High Light Level (NSQ HLL).

General. An NSI is required for all unqualified aircrew. Upon completion of this stage and receipt of a qualification letter signed by the unit commanding officer the crewmember is NSQ HLL.

Crew Requirements. P/P/CC/AO

Night Systems High Light Level Stage Overview. The events included in the NS HLL stage of the Core Phase of training are depicted below.

Table 3-22: Night Systems High Light Level Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-2310	1.0	*	B,T,R		G		Night Vision Training
ACAD-2311	1.0	*	B,T,R		G		MV-22 FLIR
NS HLL-2340	2.0	365	B	HLL	A	1	Single-ship CAL
NS HLL-2341	2.0	365	B,T,R,M	HLL	A	2	Section CAL

ACAD-2310 1.0 * B,T G

Night Vision Training

Goal. The CCUI has an introductory knowledge of the Night Vision Goggles, Night Environment, Human factors, and NVG Weapons employment procedures.

Requirement. Utilize MAWTS-1 Courseware

Performance Standard. Student is introduced to night vision devices.

NAVMC 3500.11E
16 Apr 18

Instructor. NSI

Prerequisite. RQD-1841

Required Reading. MAWTS-1 NVD Manual

ACAD-2311 1.0 * B,T,R G

MV-22 FLIR for Enlisted Aircrew

Goal. The CCUI has an introductory knowledge of the MV-22 FLIR.

Requirement. Utilize MAWTS-1 courseware

Performance Standard. CCUI is introduced to the MV-22 FLIR.

Prerequisite. ACAD-2310

Instructor. NSI

Required Reading. MV-22 NATOPS Chapter 16.8, NVD Manual CH. 4

NSHLL-2340 2.0 365 B HLL A 1 MV-22

High Light Level Familiarization Maneuvers and Confined Area Landings

Goal. Introduce single ship familiarization maneuvers and tactical CALs.

Requirements.

Discuss

- NVD briefing guide
- CRM
- Automatic gain control system
- Aircraft lighting
- Lighting conditions
- Night illumination sources
- Aircrew duties during NS CALs
- Crew comfort level
- Human factors considerations
- Night environment considerations
- NVD and FLIR theory
- Scanning techniques
- Monocular cues
- Depth perception
- Distance estimation
- Obstacle clearance
- Drift correction
- NVG failure
- Brown out/white out
- FLIR utilization

Introduce

- NVD tactical approaches, landings, and departures to a confined area (minimum of 5 for initial sorties)

Practice

- NVG Set-up and focusing procedures
- Cabin configuration
- Distance estimation
- ITG

Expose

Light discipline

Performance Standards:

Execute proper procedures for NS CALs IAW the MV-22 ANTPP Manual and the MAWTS-1 NVD Manual.
Demonstrate proper NVG scanning techniques.
Provide timely and accurate information to the pilots with regard to terrain clearance, LZ topography, aircraft drift, and distance estimation calls prior to landing.

Instructor. NSI

Prerequisite. CAL-2242, ACAD-2311

Required Reading. NATOPS Ch 2.3.9, 2.12, NVD Manual Ch. 2,3,7,14, 3-22.5-ASTACSOP

External Syllabus Support. Suitable landing site and airspace.

NSHLL-2341	2.0	240	B,T,R,M	HLL	A	2	MV-22
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High Light Level Section Confined Area Landings

Goal. Introduce section tactical CALs in HLL.

Requirements

Discuss

- CRM
- Aircraft lighting
- Loss of visual contact with wingman
- Closure rates
- FLIR functions
- Sensor integration

Introduce

- Formation flight
- Section CALs in HLL (minimum 3 as lead for initial sorties)
- Section tactical approaches, departures, takeoffs and landings in HLL

Practice

- NVG emergencies

Review

- NVG Set-up and focusing procedures
- Cabin configuration
- Distance estimation

Performance Standards

Maintain an aggressive NVG scan and provide the pilots with timely information on LZ topography and aircraft drift.
Maintain awareness of wingman's position and provide timely information to the pilots.
Distance estimation calls prior to landing are within a reasonable margin of error.

Instructor. NSI

Prerequisite. NSHLL-2340

External Syllabus Support. Suitable landing and airspace.

Required Reading. NVD Manual Ch. 5, 15.8

3.8.6 Night Systems (NS) Low Light Level (LLL)

Purpose. To develop proficiency while using night vision goggles under light levels less than 0.0022 lux as predicted by the SLAP application. Certify the CCUI Night Systems Qualified Low Light Level (NSQ LLL).

General. All maneuver descriptions are in the MV-22 ANTTP Manual.

An NSI is required for all unqualified aircrew. Upon completion of this stage and receipt of a qualification letter signed by the unit commanding officer the crewmember is NSQ LLL.

Crew Requirements. P/P/CC/AO

Night Systems Low Light Level Stage Overview. The events included in the NS HLL stage of the Core Phase of training are depicted below.

Table 3-23: Night Systems Low Light Level Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
NS LLL-2380	1.5	240	B	LLL	A	1	FAM and Single-ship CAL
NS LLL-2381	1.5	*	B	LLL	A	1	Single-ship CAL
NS LLL-2382	1.5	*	B,T	LLL	A	2	Section NAV/TACFORM
NS LLL-2383	2.0	240	B,T,R,M	LLL	A	2	Section CAL

NS LLL-2380 1.5 240 B LLL A 1 MV-22

Low Light Level Familiarization Maneuvers, Confined Area Landings, and Tactical Approaches

Goal. Introduce FAM maneuvers single aircraft CALs and tactical approaches in LLL.

Requirements.

Discuss

- CRM
- LLL CAL considerations
- Cultural lighting considerations
- NVG scan
- Shadowing, moon angle, azimuth

Introduce

- Tactical approaches, landings, and departures to a confined area in LLL (minimum 5 for initial sorties).

Practice

- Aircraft lighting
- NVG emergencies
- Distance estimation

Performance Standards

- Execute proper procedures for NS CALs IAW the MV-22 ANTTP Manual and the MAWTS-1 NVD Manual.
- Demonstrate proper NVG scanning techniques.
- Provide timely and accurate information to the pilots with regard to terrain clearance, LZ topography, aircraft drift, and distance estimation calls prior to landing.

Instructor. NSI

Prerequisites. NSQ HLL

Required Reading. NTRP Ch. 3, Review NVD Manual

External Syllabus Support. Suitable landing site and airspace.

NS LLL-2381 1.5 * B LLL A 1 MV-22

Low Light Level Confined Area Landings, and Tactical Approaches

Goal. Practice single -ship CALs and tactical approaches in LLL.

Requirements.

Discuss

- CRM
- LLL CAL considerations
- Cultural lighting considerations
- NVG scan
- Moon angle/azimuth and terrain shadowing

Practice

- Tactical approaches, landings, and departures to a confined area in LLL (minimum 5 for initial sorties).
- NVG emergencies
- Aircraft lighting
- Distance estimation

Performance Standards.

- Execute proper procedures for NS CALs IAW the MV-22 ANTTP Manual and the MAWTS-1 NVD Manual.
- Demonstrate proper NVG scanning techniques.
- Provide timely and accurate information to the pilots with regard to terrain clearance, LZ topography, aircraft drift, and distance estimation calls prior to landing.

Instructor. NSI

Prerequisites. NS LLL-2380

External Syllabus Support. Suitable landing site and airspace.

NS LLL-2382 1.5 * B,T LLL A 2 MV-22

Low Light Level Section Navigation and Tactical Formations

Goal. Introduce NS tactical formations, tactical formation maneuvering, navigation to a SYS TOT and lost contact procedures.

Requirements.

Discuss

- Crew duties during NS formation operations
- Aircraft lighting
- Sensor integration
- Night tactical formation maneuvering
- Moon angle/azimuth and terrain shadowing

Practice

- Tactical formation maneuvers in the ANTTP
- Tactical lead changes
- Simulated lost contact with wingman with subsequent rejoin en route and at a point.
- NVG Emergencies

Review

- Formation lookout doctrine
- Closure rates

Performance Standards.

Demonstrate procedural knowledge of tactical formation maneuvers IAW MV-22 ANTTTP manual.
Recognize proper tactical formations IAW MV-22 ANTTTP manual.
Distance estimation calls to wingman are performed to a reasonable margin of error.
Maintain proper lighting configuration.

Instructor. NSI

Prerequisite. NS LLL-2381

Required Reading. NTRP Ch. 4, Review NVD Manual Ch. 5

External Syllabus Support. Suitable landing site and airspace.

NS LLL-2383 2.0 240 B,T,R,M LLL A 2 MV-22

Low Light Level Section Confined Area Landings

Goal. Introduce division formations and division CALs using NVDs under LLL conditions.

Requirement.

Discuss

- CRM
- Crew comfort levels
- Moon angle/azimuth and terrain shadowing
- Inadvertent IMC
- Obstacle clearance
- Distance estimation and depth perception
- Wave-offs

Introduce

- Section tactical approaches, departures, takeoffs, and landings in LLL
- Section CALs in LLL (minimum of 3 as lead for initial sorties)

Review

- NVG set-up and focusing procedures
- Aircraft lighting
- NVG Emergencies

Performance Standards

- Provide feedback to pilots about the integrity of the flight.
- Maintain awareness of both wingmen and provide adequate landing area information to the pilots during CALs.
- Provide pilots with timely information with regard to LZ topography, aircraft drift, and distance estimation prior to landing.

Instructor. NSI

Prerequisites. NS LLL-2382

Required Reading. Review NVD Manual Ch. 8,9

External Syllabus Support. Suitable landing site and airspace.

3.8.7 Tail Gunnery (TG)

Purpose. To develop the ability to employ the MV-22 Ramp Mounted Weapon System (RMWS), deliver accurate air-to-ground fire, and provide defensive fire on targets of opportunity.

General. A TGI designated for the appropriate weapon system is required for all lectures and labs and initial training flights, or flights when aircrew have lost proficiency.

These sorties are ordnance driven. Ordnance expenditure requirements shall be adhered to in order for the CCUI to attain TG qualification, maintain, or regain proficiency. Flights should be scheduled to maximize range time so that ordnance expenditure requirements can be met.

Successful completion of TG-2541 and TG-2543 constitutes Day TGQ and NS TGQ; respectively. Initial TG qualification may be attained with any of the three weapon systems. After initial qualification requirements are met, qualification with subsequent weapon systems requires completion of TG-2540 and TG-2542 only in addition to the listed prerequisites. A qualification letter signed by the unit commanding officer stating the crew chief is TGQ for the appropriate weapon system is to be placed in the crew member's NATOPS jacket prior to conducting any tail gunnery flight without a designated TGI.

The appropriate TG-255X code shall be logged in conjunction with the TG-254X codes to denote the weapon system used.

Crew Requirements. P/P/CC/AO

Tail Gunnery Stage Overview. The events included in the NS HLL stage of the Core Phase of training are depicted below.

Table 3-24: Tail Gunnery Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-2510	1.0	*	B,T		G		Fundamentals of Aerial Gunnery
ACAD-2511	0.5	*	B,T		G		M240D Machine Gun
ACAD-2512	0.5	*	B,T		G		GAU-16/A Machine Gun
ACAD-2513	0.5	*	B,T		G		GAU-21 Machine Gun
ACAD-2514	0.5	*	B,T		G		Laser Aiming Devices
ACAD-2515	0.5	*	B,T		G		Laser Bore Sighting Procedures
LAB-2520	0.5	*	B,T,R		G		M240D Machine Gun
LAB-2521	0.5	*	B,T,R		G		GAU-16/A Machine Gun
LAB-2522	0.5	*	B,T,R		G		GAU-21 Machine Gun
TG-2540	1.5	*	B,T	D	A	1	Single-ship Tail Guns
TG-2541	1.5	365	B,T,R,	D	A	2	Section Tail Guns
TG-2542	1.5	*	B,T	NS	A	1	NS Single-ship Tail Guns
TG-2543	1.5	365	B,T,R,M	NS	A	2	NS Section Tail Guns
TG-2550	0.0	*	B,T	(NS)	A	1	M240D Under Instruction
TG-2551	0.0	365	B,T,R,M	(NS)	A	1	M240D Qualified
TG-2552	0.0	*	B,T	(NS)	A	1	GAU-16/A Under Instruction
TG-2553	0.0	365	B,T,R,M	(NS)	A	1	GAU-16/A Qualified
TG-2554	0.0	*	B,T	(NS)	A	1	GAU-21 Under Instruction
TG-2555	0.0	365	B,T,R,M	(NS)	A	1	GAU-21 Qualified

ACAD-2510 1.0 * B,T G

Fundamentals of Aerial Gunnery

Goal. The CCUI has a familiarity with the basic fundamentals of aerial gunnery.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to the fundamentals for proper aerial gunnery.

Instructor. TGI

Required Reading. MV-22 ANTPP Defensive Weaponry

Prerequisites. RQD-1841

ACAD-2511	0.5	*	B,T	G
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M240 Machine Gun

Goal. The CCUI has a familiarity with the components, characteristics, and operation of the M240 machine gun.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to the M240D machine gun.

Instructor. TGI

Required Reading. NAVAIR 11-95M240D1-1

Prerequisites. ACAD-2510

ACAD-2512	0.5	*	B,T	G
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GAU-16/A Machine Gun

Goal. The CCUI will be familiar with the components, characteristics, and operation of the GAU-16/A machine gun.

Requirement. Utilize MAWTS-1 courseware

Performance Standard. Student is introduced to the GAU-16/A machine gun.

Instructor. TGI

Required Reading. NAVAIR 11-95-13

Prerequisites. ACAD-2510

ACAD-2513	0.5	*	B,T	G
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GAU-21 Machine Gun

Goal. The CCUI will be familiar with the components, characteristics, and operation of the GAU-21 machine gun.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to the GAU-21 machine gun.

Instructor. TGI

Required Reading. NAVAIR 11-95GAU21-1

Prerequisites. ACAD-2510

ACAD-2514	0.5	*	B,T	G
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Laser Aiming Devices

Goal. The CCUI has a familiarity with laser aiming devices and their utilization.

Requirement. Utilize MAWTS-1 courseware

Performance Standard. Student is introduced to approved laser aiming devices and laser eye protection.

Instructor. TGI

Required Reading. MV-22 NTRP Chapter 2 and Appendix D, NAVAIR 11-95IZLID-1 WP 3,7

Prerequisites. ACAD-2510

ACAD-2515	0.5	*	B,T	G
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Laser Bore Sighting

Goal. The CCUI has a familiarity with laser bore sighting procedures.

Requirements.

Discuss

- Administrative Laser Safety Officers (ALSO)
- Safety considerations
- Laser Eye Protection (LEP)
- Specular reflection
- Diffuse reflection

Performance Standard. Student is introduced to laser bore sighting procedures and safety considerations.

Instructor. TGI

Required Reading. NAVAIR 11-95 IZLID-1

Prerequisites. ACAD-2514

LAB-2520	0.5	*	B,T,R	G
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M240D Breakdown, Inspection, and Cleaning Procedures

Goal. The CCUI will be familiar with the breakdown, inspection, function check, and cleaning procedures of the M240D machine gun.

Requirements

Discuss

- Nomenclature
- Inspection procedures
- Weapon emergencies
- Cleaning procedures

Introduce

- Cycle of operation
- Weapons checklist
- Immediate action procedures
- RMWS inspection and mounting procedures

Performance Standards.

- Demonstrate knowledge of nomenclature, cycle of operation, and inspection procedures for the M240 machine gun.
- Demonstrate RMWS inspection procedures and operation.
- Demonstrate immediate action procedures.

Instructor. TGI

Required Reading. NAVAIR 11-95M240D1-1, NTRP 3-22.4-MV-22B

Prerequisite. ACAD-2511

LAB-2521 0.5 * B,T,R G

GAU-16/A Breakdown, Inspection, and Cleaning Procedures

Goal. The CCUI will be familiar with the breakdown, inspection, function check, and cleaning procedures of the GAU-16/A machine gun.

Requirements

- Discuss
 - Nomenclature
 - Inspection procedures
 - Weapon emergencies
 - Cleaning procedures
- Introduce
 - Cycle of operation
 - Weapons checklist
 - Immediate action procedures
 - RMWS inspection and mounting procedures

Performance Standards

- Demonstrate knowledge of nomenclature, cycle of operation, and inspection procedures for the GAU-16/A machine gun.
- Demonstrate RMWS inspection procedures and operation.
- Demonstrate immediate action procedures.

Instructor. TGI

Required Reading. NAVAIR 11-95-13, NTRP 3-22.4-MV-22B

Prerequisite. ACAD-2512

LAB-2522 0.5 * B,T,R G

GAU-21 Breakdown and Cleaning Procedures

Goal. The CCUI will be familiar with the breakdown, inspection, function check, and cleaning procedures of the GAU-21 machine gun.

Requirements.

- Discuss
 - Nomenclature
 - Inspection procedures
 - Weapon emergencies
 - Cleaning procedures
- Introduce
 - Cycle of operation
 - Weapons checklist
 - Immediate action procedures
 - RMWS inspection and mounting procedures

Performance Standards

- Demonstrate knowledge of nomenclature, cycle of operation, and inspection procedures for the GAU-21 machine gun.
- Demonstrate RMWS inspection procedures and operation.
- Demonstrate immediate action procedures.

Instructor. TGI

Required Reading. NAVAIR 11-95GAU21-1, NTRP 3-22.4-MV-22B Ch. 1

Prerequisite. ACAD-2513

TG-2540 1.5 * B,T D A 1 MV-22

Single-ship Tail Gun Employment

Goal. To introduce MV-22 ramp mounted weapon system employment during the day.

Requirements

Discuss

- CRM
- ICS procedures
- Safety
- Cabin configuration
- Crew-served weapons checklist
- Weapon preparation/nomenclature
- Weapons conditions
- Weapons commands
- Muzzle awareness
- Target identification
- Aiming techniques (Port/Starboard effect)
- Fields of fire/Sectors of fire
- Weapon malfunctions/stoppages/emergencies

Introduce

- Weapon parameters and limitations
- Preparation of weapon and ramp mount
- Ammunition preparation and reloading
- STAR
- Target acquisition
- Firing on pre-briefed targets with crew-served weapons

Performance Standards

- Demonstrate use of the crew-served weapons checklist.
- Demonstrate knowledge of the three weapons control procedures.
- Demonstrate proper utilization of all weapons commands.
- Demonstrate appropriate weapon emergency procedures.
- Demonstrate knowledge of weapon parameters.
- Maintain positive control and muzzle awareness at all times during live-fire evolution.
- Demonstrate the ability to conduct day, single-ship tail gunnery.

Instructor. TGI

Prerequisites. ACAD-2510

Required Reading. ANTPP *Defensive Weaponry*, Classified ANTPP Ch 3, NTRP Ch 1

Ordinance. 600 rounds per gunner of appropriate ammunition.

External Syllabus Support. Appropriate TG range, moving land target (MLT) if available.

TG-2541 1.5 365 B,T,R D A 2 MV-22

Multi-aircraft Tail Gun Employment

Goal. To introduce MV-22 ramp mounted weapon system employment in a multi-aircraft environment during the day.

Requirements

- Discuss
 - CRM
 - ICS procedures
 - Safety
 - Weapon preparation/nomenclature
 - Muzzle awareness in a multi-aircraft environment
 - Weapon effects on targets
 - Weapon malfunctions/stoppages/emergencies
- Introduce
 - Surface danger zone (SDZ)
 - Fields of fire/Sectors of fire
 - Target acquisition
 - Firing techniques in a multi-aircraft environment
 - Target hand-off between aircraft
 - Multi-aircraft tail gunnery operations
- Practice
 - Weapon parameters and limitations
 - Preparation of weapon and ramp mount
 - Ammunition preparation and reloading
 - STAR
 - Target acquisition
 - Firing on pre-briefed targets with crew-served weapons

Performance Standards

- Maintain positive control and muzzle awareness at all times during live-fire evolutions.
- Demonstrate the ability to engage pre-briefed targets in a multi-aircraft environment.
- Demonstrate use of fire control procedures to suppress targets.
- Demonstrate proper utilization of all weapons commands.

Instructor. TGI

Prerequisites. FORM-2140, TG-2540

Required Reading. NAVAIR 11-95-13, NAVAIR 11-95-M240D-1-1, NAVAIR 11-95GAU21-1 as applicable

Ordnance. 600 rounds per gunner of appropriate ammunition

External Syllabus Support. Appropriate TG range, moving land target (MLT) if available.

TG-2542 1.5 * B,T NS A 1 MV-22

Night Systems Single-ship Tail Gun Employment

Goal. To introduce MV-22 ramp mounted weapon system employment while using NVGs.

Requirements.

- Discuss
 - CRM
 - ICS procedures

- Safety considerations
- Weapon preparation/nomenclature
- Laser aiming devices/procedures
- Laser eye protection
- Weapon effects on NVDs
- Muzzle awareness
- Weapon malfunctions/stoppages/emergencies
- Introduce
 - Laser utilization
 - Target acquisition utilizing NVGs
 - Firing techniques utilizing NVGs
 - Single aircraft aerial gunnery operations at night
- Review
 - Weapon parameters and limitations
 - Preparation of weapon and ramp mount
 - STAR

Performance Standards

- Demonstrate proper utilization of weapons commands.
- Demonstrate use of laser aiming device for target acquisition and engagement.
- Demonstrate the ability to engage pre-briefed targets at night utilizing NVGs.
- Demonstrate use of fire control procedures to suppress targets while utilizing NVGs.
- Maintain positive control and muzzle awareness at all times during live-fire evolutions.

Instructor. TGI

Prerequisites. ACAD-2515, TG-2541

Required Reading. MAWTS-1 NVD Manual Ch 15.9, NAVAIR 11-95IZLID-1

Ordnance. 600 rounds per gunner of appropriate ammunition.

External Syllabus Support. Appropriate TG and laser approved range, moving land target (MLT) if available.

TG-2543 1.5 365 B,T,R,M NS A 2 MV-22

Night Systems Multi-aircraft Tail Gun Employment

Goal. To introduce MV-22 ramp mounted weapon system employment in a multi-aircraft flight while using NVGs.

Requirements.

- Discuss
 - CRM
 - ICS procedures
 - Safety considerations
 - Weapons preparation/nomenclature
 - Laser aiming devices/procedures
 - Muzzle awareness in a multi-aircraft environment
 - Weapon malfunctions/stoppages/emergencies
 - Weapons effects on NVDs
- Introduce
 - Laser utilization in a multi-aircraft environment
 - Multi-aircraft aerial gunnery operations at night
- Practice
 - Target acquisition utilizing NVGs
 - Firing techniques utilizing NVGs

Review

Weapon parameters and limitations
Preparation of weapon and ramp mount
STAR

Performance Standards

Demonstrate use of laser aiming device for target acquisition and engagement in a multi-aircraft environment.
Demonstrate the ability to engage pre-briefed targets in a multi-aircraft environment while utilizing NVGs.
Demonstrate use of fire control procedures to suppress targets while utilizing NVGs.
Maintain positive control and muzzle awareness at all times during multi-aircraft live-fire evolutions at night.

Instructor. TGI

Prerequisites. TG-2542

Ordinance. 600 rounds per gunner of appropriate ammunition.

External Syllabus Support. Appropriate TG and Laser approved range, moving land target (MLT) if available.

TG-2550	0.0	*	B,T	(NS)	A	1	MV-22
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M240D Under Instruction

Goal. Track use of the M240D machine gun prior to qualification. This code is intended to be logged in addition to TG-254X.

TG-2551	0.0	365	B,T,R,M	(NS)	A	1	MV-22
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M240D Qualified

Goal. Track use of the M240D machine after qualification. This code is intended to be logged in addition to TG-254X.

TG-2552	0.0	*	B,T	(NS)	A	1	MV-22
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GAU-16/A Under Instruction

Goal. Track use of the GAU-16/A machine gun prior to qualification. This code is intended to be logged in addition to TG-254X.

TG-2553	0.0	365	B,T,R,M	(NS)	A	1	MV-22
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GAU-16/A Qualified

Goal. Track use of the GAU-16/A machine gun after qualification. This code is intended to be logged in addition to TG-254X.

TG-2554	0.0	*	B,T	(NS)	A	1	MV-22
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GAU-21 Under Instruction

Goal. Track use of the GAU-21 machine gun prior to qualification. This code is intended to be logged in addition to TG-254X.

TG-2555	0.0	365	B,T,R,M	(NS)	A	1	MV-22
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GAU-21 Qualified

Goal. Track use of the GAU-21 machine gun after qualification. This code is intended to be logged in addition to TG-254X.

3.8.8 Low Altitude Tactics (LAT)

Purpose. To develop proficiency in MV-22 Low Altitude Tactics.

General. All maneuver descriptions are in the MV-22 ANTP Manual.

Non-proficient aircrew are required to fly with a LAT Instructor for day events and an NSI for night events.

The CCUI is Day LAT qualified upon completion of LAT 2641, and NS LAT qualified upon completion of LAT-2643.

LAT altitude restrictions and currency requirements are IAW the T&R Program Manual.

Events should be flown in areas with significant vertical relief.

Crew Requirements. P/P/CC/AO

Low Altitude Tactics Stage Overview. The events included in the LAT stage of the Core Phase of training are depicted below.

Table 3-25: Low Altitude Tactics Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-2610	0.5	*	B,T		G		LAT for EAC
ACAD-2611	0.5	*	B,T		G		Tactical Aircrew Considerations
LAB-2620	0.5	*	B,T		G		LAT Walk-through
LAT-2640	1.5	*	B,T	D	A	1	LAT Maneuvers and Route
LAT-2641	1.5	365	B,T,R,M	D	A	2	Section LAT
NS LAT-2642	1.5	240	B,T,R	HLL	A	2	HLL Section LAT
NS LAT-2643	1.5	180	B,T,R,M	LLL	A	2	LLL Section LAT

ACAD-2610 1.0 * B,T G

LAT For Enlisted Aircrew

Goal. The CCUI has introductory knowledge of LAT terms and definitions.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to MV-22 Low Altitude Tactics.

Instructor. LATI

Required Reading. MV-22 ANTTP Chapters 4&5, NAVMC 3500.14 Chapter 3

Prerequisites. RQD-1841

ACAD-2611 1.0 * B,T G

Tactical Aircrew Considerations and Responsibilities

Goal. The CCUI has a familiarity with responsibilities specific to a tactical environment.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to aircrew responsibilities in a tactical environment.

Instructor. LATI

Prerequisites. ACAD-2610

LAB-2620 0.5 * B,T G

LAT Maneuver Walk Through

Goal. The CCUI is able to walk through all LAT maneuvers prior to executing them in the aircraft.

Requirement. Conduct IAW ANTTP.

Performance Standard. Demonstrate all LAT maneuvers prior to executing.

NAVMC 3500.11E
16 Apr 18

Instructor. LATI

Prerequisites. ACAD-2611

LAT-2640 1.5 * B,T D A 1 MV-22

Low Altitude Tactics Maneuvers and Navigation Route

Goal. Introduce LAT maneuvers and navigation on a route in the contour profile.

Requirements.

Discuss

- Rules of Conduct (ROC)
- Squadron SOP for required equipment
- CRM
- ICS procedures
- Crew chief duties in the LAT environment
- Lookout doctrine
- Aircraft clearance
- Physiological considerations
- Crew comfort levels
- Climb to cope
- Dive Recovery rules
- MSA/ESA
- L-hour
- Cabin Situational Awareness Device (CSAD)

Introduce

- Route cards
- Fire control, Emissions, Navigation, Communication, Expendables (FENCE) checks
- LAT maneuvers
- Vertical maneuvers
- Low level and contour flight
- Low altitude emergencies
- Height Above Terrain (HAT)

Expose

- CSAD
- Surface-to-Air missiles (SAMs)
- Go/No Go criteria

Performance Standards.

- Maintain situational awareness during each maneuver with regard to aircraft orientation to the terrain.
- Provide timely feedback to the pilots for terrain avoidance and obstacle clearance.
- Execute all LAT maneuvers IAW the MV-22 ANTTP Manual.
- Demonstrate proper CRM principles in the LAT regime.
- Comply with ROC IAW T&R Program Manual and other governing directives.
- Assist pilot with navigational assistance, route card, and fuel burn considerations.

Instructor. LATI

Prerequisite. LAB-2620

Required Reading. Review ANTTP En Route Tactics

External Syllabus Support. Approved route/range space with vertical relief.

LAT-2641 1.5 365 B,T,R,M D A 2 MV-22

Section Low Altitude Tactics

Goal. Introduce section LAT maneuvers and navigation on a route in the contour profile.

Requirements.

Discuss

- ROC
- CRM
- ICS procedures
- Crew chief duties in the LAT environment
- Lookout doctrine
- Fuel considerations
- Crew comfort levels
- Wingman considerations
- Combat cruise
- Combat spread
- Vertical maneuvers

Introduce

- Max performance turns
- Section vertical maneuvers

Practice

- Route cards
- Fire control, Emissions, Navigation, Communication, Expendables (FENCE) checks
- Combat spread and combat cruise
- LAT maneuvers
- Tactical formation maneuvers in the ANTTTP
- Tactical lead changes
- Low level and contour flight
- Low altitude emergencies

Review

- Climb to Cope
- Dive recovery rules
- MSA/ESA

Expose

- Man-Portable Air Defense Systems (MANPADS)

Performance Standards

- Provide pilots with timely information concerning terrain clearance and obstacle avoidance for the section.
- Demonstrate awareness of and comply with all LAT ROC and SOPs.
- Maintain geographical orientation throughout the navigation route.
- Maintain situational and terrain awareness.
- Demonstrate proper CRM principles in the LAT regime.
- Demonstrate ability to utilize route card for navigational assistance.
- Provide pilots with timely information concerning wingman position during LAT maneuvers.

Instructor. LATI

Prerequisites. FORM-2140, LAT- 2640

Required Reading. Review ANTTTP Formation

External Syllabus Support. Approved route/range space with vertical relief.

LAT-2642 1.5 240 B,T,R HLL A 2 MV-22

High Light Level Section Low Altitude Tactics

Goal. Introduce NVD section tactical formation maneuvers, LAT maneuvers and navigation under HLL conditions.

Requirements

Discuss

- Standard terminology
- Crew chief duties in the NS LAT environment
- Aircraft lighting
- Altitude awareness
- Spatial orientation
- Crew comfort level
- Sensor integration
- Obstacle/hazard avoidance
- Combat cruise
- Combat spread
- Vertical maneuvers
- Route card and navigational assistance in a night environment

Introduce

- Tactical formation maneuvering in HLL
- LAT maneuvers in HLL

Practice

- Route cards
- Fire control, Emissions, Navigation, Communication, Expendables (FENCE) checks
- Combat spread and combat cruise
- Tactical lead changes
- Low level and contour flight
- Low altitude emergencies

Review

- ESA/MSA
- Vertical maneuvers

Performance Standards

Provide pilots with timely information on wingman position, terrain clearance, and obstacle avoidance.
Maintain geographical awareness along the LAT route.

Instructor. NSI

Prerequisites. NSQ HLL, LAT-2641

Required Reading. NVD Manual Ch. 6,15.2

External Syllabus Support. Approved route/range space with vertical relief

LAT-2643 1.5 180 B,T,R,M LLL A 2 MV-22

Low Light Level Section Low Altitude Tactics

Goal. Introduce NVD section tactical formation maneuvers, LAT maneuvers and navigation under LLL conditions.

Requirements.

Discuss

- Standard terminology
- Crew chief duties in the NS LAT environment

- Aircraft lighting
- Altitude awareness
- Spatial orientation
- Crew comfort level
- Obstacle/hazard avoidance
- Speed rush baseline/optical flow
- Introduce
 - Tactical formation maneuvering in LLL
 - LAT maneuvers in LLL
- Review
 - Aircraft lighting
 - Route cards
 - Fire control, Emissions, Navigation, Communication, Expendables (FENCE) checks
 - Combat spread and combat cruise
 - Tactical lead changes
 - Low level and contour flight
 - Low altitude emergencies

Performance Standards

Provide pilots with timely information on wingman position, terrain clearance, and obstacle avoidance.
Maintain geographical awareness along the route.

Instructor. NSI

Prerequisites. NSQ LLL, LAT-2642

Required Reading. NTRP App. F, Review NVD Manual Ch. 6

External Syllabus Support. Approved route/range space with vertical relief.

3.8.9 Division

Purpose. To develop proficiency in MV-22 Division Tactics.

General.

All maneuver descriptions are in the MV-22 ANTP Manual.

Crew Requirements. P/P/CC/AO

Division Tactics Stage Overview. The events included in the DIV stage of the Core Phase of training are depicted below.

Table 3-26: Division Tactics Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
DIV-2780	1.5	*	B,T	(NS)	A	3	Division TACFORM/NAV
DIV-2781	1.5	*	B,T	D	A	3	Division CAL
DIV-2782	1.5	*	B,T	HLL	A	3	HLL Division CAL
DIV-2783	1.5	365	B,T,R,M	LLL	A	3	LLL Division CAL
DIV-2784	1.5	365	B,T,R,M	(NS)	A	3	Division LAT

DIV-2780 1.5 * B,T (NS) A 3 MV-22

Division Formation and Navigation

Goal. Introduce division formations.

Requirements.

- Discuss
 - CRM
 - Crew comfort level
 - Standard terminology
 - Division formations
 - Tactical formation maneuvering
- Introduce
 - Division formations in the ANTTTP
 - Division formation maneuvers in the ANTTTP
 - Loss of visual contact/rendezvous and holding
- Expose
 - Threat levels

Performance Standards

- Maintain proper lookout doctrine during division formation maneuvers.
- Distance estimation calls to wingman are performed to a reasonable margin of error in terms of DME.
- Maintain situational awareness during division formation maneuvers.

Instructor. BICC

Prerequisite. FORM-2140, NS LLL-2382~LLL

Required Reading. Review ANTTTP Formation

DIV-2781 1.5 * B,T D A 3 MV-22

Division Confined Area Landings

Goal. Introduce division low- and medium-altitude tactical approaches, landings, and departures to a confined area.

Requirements

- Discuss
 - CRM
 - Standard terminology
 - Crew comfort level
 - Combat cruise with 3 or more aircraft
- Introduce
 - Division tactical approaches, landings, and takeoffs from a confined area (minimum 3 as lead for initial sorties)
 - Division terminal area procedures
- Expose
 - Sectors of fire
 - Mutual support
 - Contingency operations
 - Pickup zone (PZ) operations

Performance Standard.

- Provide pilots with accurate and timely information on the position of wingmen.
- Distance estimation calls to wingmen are performed to a reasonable margin of error in terms of DME.
- Provide obstacle clearance calls for the division during approaches, landings, and takeoffs.
- Inform pilots of wingmen's position prior to landing to ensure all aircraft have adequate clearance to land.
- Evaluate suitability of LZ terrain and communicate information to pilots
- Perform drift corrections, accurate and timely distance estimation calls to the pilot prior to aircraft touchdown

Instructor. BICC

Prerequisite. CAL-2242, FORM-2780

External Syllabus Support. Suitable landing site.

Required Reading. ANTTP Ch. 8

DIV-2782 1.5 * B,T HLL A 3 MV-22

High Light Level Division Confined Area Landings

Goal. Introduce division CALs using NVDs under HLL conditions.

Requirements.

Discuss

- CRM
- Crew comfort levels
- Moon illumination/shadow effects on terrain
- Division formation and landing considerations
- Obstacle clearance
- Inadvertent IMC
- Distance estimation and depth perception
- Wave-offs

Introduce

- Division tactical approaches, departures, takeoffs, and landings(minimum of 3 CALs as lead)

Practice

- Division formations in the ANTTP
- Division formation maneuvers in the ANTTP

Performance Standards.

- Provide feedback to pilots about the integrity of the flight.
- Maintain awareness of wingmen and provide adequate landing area information to the pilots during NVD HLL CALs.
- Provide pilots with timely information with regard to aircraft drift and LZ topography.

Instructor. NSI

Prerequisites. NS HLL-2341, DIV-2781

Required Reading. NVD Manual Ch. 8,9

External Syllabus Support. Suitable landing site and airspace.

DIV-2783 1.5 365 B,T,R,M LLL A 3 MV-22

Low Light Level Division Formation and Confined Area Landings

Goal. Review division formations and introduce division CALs using NVDs under LLL conditions.

Requirements.

Discuss

- CRM
- Crew comfort levels
- Moon illumination/shadow effects on terrain
- Division formation and landing considerations
- Obstacle clearance
- Inadvertent IMC

- Distance estimation and depth perception
- Wave-offs
- Practice
 - Division tactical approaches, departures, takeoffs, and landings(minimum of 3 CALs as lead)
- Review
 - Division formations in the ANTTP
 - Division formation maneuvers in the ANTTP

Performance Standards.

- Provide feedback to pilots about the integrity of the flight.
- Maintain awareness of wingmen and provide adequate landing area information to the pilots during NVD LLL CALs.
- Provide pilots with timely information with regard to aircraft drift and LZ topography.
- Demonstrate procedural knowledge of tactical formation maneuvers IAW MV-22 ANTTP manual.
- Recognize proper tactical formations IAW MV-22 ANTTP manual.
- Distance estimation calls to wingman are performed to a reasonable margin of error.

Instructor. NSI

Prerequisites. NS LLL-2383, DIV-2782

Required Reading. NVD Manual Ch. 8,9

External Syllabus Support. Suitable landing site and airspace.

DIV-2784 1.5 365 B,T,R,M (NS) A 3 MV-22

Division Low Altitude Tactics and Navigation

Goal. Review division tactical formation maneuvers, LAT maneuvers and navigation.

Requirements.

- Discuss
 - CRM
 - Crew chief duties in the LAT environment
 - Crew comfort levels
 - Division formations in the LAT environment
 - Division LAT considerations
 - Division considerations and wingman awareness
 - Division tactical formation maneuvering
- Introduce
 - Division LAT maneuvers
- Review
 - Division formations in the ANTTP
 - Division formation maneuvers in the ANTTP
 - Route cards
 - Fire control, Emissions, Navigation, Communication, Expendables (FENCE) checks
 - Tactical lead changes
 - Low level and contour flight

Performance Standards.

- Provide feedback to pilots about the integrity of the flight.
- Provide pilots with timely information with regard to aircraft drift and LZ topography.
- Demonstrate procedural knowledge of tactical formation maneuvers IAW MV-22 ANTTP manual.
- Recognize proper tactical formations IAW MV-22 ANTTP manual.
- Distance estimation calls to wingman are performed to a reasonable margin of error.

Provide pilots with timely information concerning terrain clearance and obstacle avoidance for the section.
Demonstrate awareness of and comply with all LAT ROC and SOPs.
Maintain geographical orientation throughout the navigation route.
Demonstrate proper CRM principles in the LAT regime.

Instructor. NSI

Prerequisites. LAT-2641~D, NSLAT-2642~HLL, NSLAT-2643~LLL, FORM-2780 Required Reading. Review ANTPP *En Route Tactics and Formation*

3.8.10 Ground Threat Reaction (GTR)

Purpose. To develop proficiency in counter-tactics versus enemy surface-to-air threats.

General

All maneuver descriptions are in the Classified MV-22 ANTPP Manual. RADAR principles are listed in the NTRP Appendix G.

A WTI is required for all initial sorties. Aircrew who have completed their initial GTR sorties and have lost proficiency may regain proficiency by flying with a LATI who is proficient in that sortie.

The flight lead shall be GTR-2832 proficient and specifically brief all applicable GTR training rules per the MV-22 ANTPP Manual and T&R Program Manual.

GTR-2832 shall be conducted against a threat emitter; e.g. SA-6, ZSU-23-4, etc. and requires an electronic warfare range.

All initial sorties shall be conducted during the day following completion of LAT-2641. Proficient aircrew may conduct subsequent sorties at night if they are LAT-Q.

Once proficiency is attained in GTR-2832, proficiency may be maintained by completion of GTR-2831.

Crew Requirements. P/P/CC/AO

Ground Threat Reaction Stage Overview. The events included in the GTR stage of the Core Phase of training are depicted below.

Table 3-27: Ground Threat Reaction Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-2810	1.0	730	B,T,R		G		Aircraft Survivability Equipment
ACAD-2811	1.0	*	B,T		G		Basic Principles of EW
ACAD-2812	1.0	*	B,T		G		ADA Threat
ACAD-2813	1.0	*	B,T		G		IR SAM Threat
ACAD-2814	1.0	*	B,T		G		Radar SAM Threat
ACAD-2815	1.0	*	B,T		G		GTR
LAB-2820	0.5	*	B,T		G		GTR Walk-through
GTR-2831	2.0	365	B,T,R	(NS)	S	1	Section GTR Simulator
GTR-2840	1.5	365	B,T,R,M	(NS)	A	2	Section GTR

ACAD-2810 1.0 730 B,T,R G

EA Aircraft Survivability Equipment

Goal. The CCUI has a familiarity with the Aircraft Survivability Equipment (ASE).

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to Aircraft Survivability Equipment and theory of operation.

Instructor. WTI

Required Reading. MV-22 NTRP Ch 5, App B, C, and G

Prerequisites. ACAD-2611

ACAD-2811	1.0	*	B,T	G
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EA Basic Principles of Electronic Warfare

Goal. The CCUI has a familiarity with the basic principles of Electronic Warfare.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to the concepts associated with Electronic Warfare.

Instructor. WTI

Required Reading. MV-22 NTRP App F

Prerequisites. ACAD-2810

ACAD-2812	1.0	*	B,T	G
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Air Defense Artillery Threat to Assault Support (S)

Goal. The CCUI has a familiarity with the various ADA threats to assault support aircraft.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to ADA threats to assault support.

Instructor. WTI

Required Reading. AFTTP 3-1

Prerequisites. ACAD-2811

ACAD-2813	1.0	*	B,T	G
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IR Surface-to-air Missile Threat to Assault Support (S)

Goal. The CCUI has a familiarity with the threat of IR SAMS to assault support.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to SAM threats to assault support.

Instructor. WTI

Required Reading. AFTTP 3-1

Prerequisites. ACAD-2811

ACAD-2814	1.0	*	B,T	G
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RADAR SAM Threat to Assault Support(S)

Goal. The CCUI has a familiarity with the threat of RADAR SAMS to assault support.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to RADAR threats to assault support.

Instructor. WTI

Required Reading. AFTTP 3-1

Prerequisites. ACAD-2811

ACAD-2815 1.0 * B,T G

MV-22 Ground Threat Reaction (S)

Goal. The CCUI has a familiarity with the reaction maneuvers executed by the MV-22 as a result of a ground threats.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to Ground Threat Reaction theory and maneuvers.

Instructor. WTI

Required Reading. NATOPS Ch 18, ANTPP Appendix A, Classified ANTPP Ch 2

Prerequisites. ACAD-2810, ACAD-2811, ACAD-2812, ACAD-2813, ACAD-2814

LAB-2820 0.5 * B,T G

MV-22 Ground Threat Reaction Walk Through

Goal. The CCUI has a solid understanding of all GTR maneuvers prior to in-flight execution.

Required Reading. ANTPP GTR Program Guide Appendix A

Instructor. WTI

Prerequisites. ACAD-2815

SGTR-2831 2.0 365 B,T,R (NS) S 2 FFS/FTD TEN

Ground Threat Reaction Simulator

Goal. Introduce operation of onboard ASE to include strengths and weaknesses of ASE. Introduce defensive tactics vs RADAR and non-RADAR ADA and IR SAMs.

Discuss

- Operation of the ALE-47, APR-39, AAR-47
- CRM as it applies to the use of onboard ASE and threat detection
- Strengths and weaknesses of each ASE system vs ADA, RF and IR threat
- Verbal and non-verbal cues for threat reaction (e.g. lead's flares)
- Counter-tactics against ADA, RF and IR threats
- All available expendables
- Effective fires vs non-effective fires
- SPOT reporting
- ROC per T&R Program Manual
- GTR training rules
- Threat reaction and escort coordination in the objective area
- Transient gearbox pressures while maneuvering

Introduce

- Use of all onboard ASE
- Counter-tactics against ADA, RF and IR threats
- Threat indications and symbols

Performance Standards.

- Properly operate ASE IAW the ANTPP.
- Employ proper counter-tactics vs ADA, RF and IR threats.

Recognize and correctly identify displayed threat indications.

Instructor. WTI.

Prerequisites. LAB-2820

GTR-2840 1.5 365 B,T,R,M (NS) A 2 MV-22

Goal. Review operation of onboard ASE and practice procedures to counter non-RADAR and RADAR threats in a multi-aircraft flight.

Requirements.

Discuss

- CRM
- Operation of ASE
- Lookout doctrine
- Threat reaction and post engagement reaction
- Defensive weapons considerations
- GTR line numbers
- GTR training rules

Practice

- Threat avoidance maneuvers and/or tactics to defeat threat systems
- Use of expendables to defeat threat systems

Review

- Set-up of ASE to defend against a ground threat
- Threat indications and symbols

Performance Standards.

- Demonstrate knowledge of IR and RADAR SAMs and countermeasures.
- Execute GTR vs a ground threat IAW the MV-22 ANTP manual.
- Call for maneuvers in response to a threat IAW the MV-22 ANTP Manual.
- Employ all ASE IAW the MV-22 ANTP Manual and NTRP.
- Maintain situational awareness of wingman position and provide information to pilots in a timely manner.

Instructor. WTI

Prerequisites. FORM-2140, LAT-2641, SGTR-2831

Ordnance. 60 chaff and 30 flares (initial and refresher events). Subsequent events inside the proficiency interval may be conducted in training mode with no actual chaff or flare loadout.

External Syllabus Support. EW emitter, chaff and flare capable range, ground fire indication.

3.8.11 Carrier Qualification (CQ)

Purpose. To qualify the CCUI in flight operations from a carrier deck or ship platform under day and NVD conditions.

General

Refer to NAVAIR 00-80T-106 LHA/LHD NATOPS and NAVAIR 00-80T-105 CV NATOPS Manuals for carrier operations.
Refer to NAVAIR 00-80T-122 for air capable ship operations.

CQ-2943 shall be flown under HLL conditions for initial qualifications. An NSI is required for unqualified aircrew on NVD CQ flights.

IAW NATOPS and NAVMC 3500.14, a crew member is day CQ upon completion of CQ-2932 and is NVG CQ upon completion of CQ-2935. A qualification letter signed by the commanding officer stating the crew member is day CQ/NVG CQ shall be placed in the crewmember's NATOPS jacket upon completion of the appropriate flight.

Crew Requirement. P/P/CC (AO required for NVD CQ)

Carrier Qualification Stage Overview. The events included in the CQ stage of the Core Phase of training are depicted below.

Table 3-28: Carrier Qualification Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
CQ-2930	1.0	*	B,T	D	S	1	Day CQ Simulator
CQ-2931	1.0	*	B,T	NS	S	1	NS CQ Simulator
CQ-2940	1.5	365	B,T,R	D	A	1	Day FCLP
CQ-2941	1.5	365	B,T,R	D	A	1	Day CQ Flight
NSCQ-2942	1.5	365	B,T,R	NS	A	1	NS FCLP
NSCQ-2943	1.5	365	B,T,R,M	NS	A	1	NS CQ Flight

SCQ-2930 1.0 365 B,T D S 1 FFS/FTD

Day Carrier Qualification Simulator

Goal. Introduce day CQ pattern and procedures to various classes of ships.

Requirements.

Discuss

- CRM
- Crewmember duties during CQs
- Shipboard ICS procedures
- Flight deck status lights
- Flight deck crew
- Hand-and-arm signals for shipboard operations
- Flight deck operations
- Ship traffic patterns
- Wave offs
- Various patterns around the ship
- Pitch-up with side-slip characteristics
- Emergency procedures in the shipboard environment

Introduce

- Carrier operation
 - Airplane and conversion mode arrivals
 - Charlie pattern for LHA/LHD and LPD/LSD (minimum of 5 for initial events)
 - Communication procedures
 - Lights and light signals
 - LSE signals and procedures
 - Waveoff
 - Departure procedures
- Self-taxi procedures
- STOs
- NATOPS shipboard approaches
- High gross weight operations
- Checklists

Performance Standards

- Demonstrate knowledge of flight deck crew.
- Demonstrate knowledge of day shipboard procedures IAW the CV/LHA/LHD NATOPS and Air Capable Ships NATOPS.
- Demonstrate proper clearance calls prior to landing.

Instructor. BICC

Prerequisite. CAL-2240

SCQ-2931	1.0	365	B,T	NS	S	1	FFS/FTD
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NS Carrier Qualification Simulator

Goal. Introduce NVD CQ pattern and procedures to various classes of ships.

Requirements.

Discuss

- CRM
- Crewmember duties during CQs
- Shipboard ICS procedures
- Flight deck crew
- Shipboard lighting and light signals
- Aircraft lighting
- Hand-and-arm signals for shipboard operations
- Emergency procedures in the shipboard environment

Introduce

- Carrier operations using NVDs
 - Arrival
 - Night landing patterns (minimum of 5 for initials)
 - Communication procedures
 - Shipboard lighting and light signals
 - LSE signals and procedures
 - Waveoff
 - Departure
- Self-taxi procedures
- STOs
- NATOPS shipboard approaches
- High gross weight operations
- Checklists

Performance Standards

- Demonstrate knowledge of flight deck crew.
- Demonstrate knowledge of NS shipboard procedures IAW the CV/LHA/LHD NATOPS and Air Capable Ships NATOPS.
- Demonstrate proper clearance calls prior to landing.

Instructor. BICC

Prerequisite. SCQ-2930

CQ-2940	1.5	365	B,T,R	D	A	1	MV-22
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Field Carrier Landing Practice

Goal. Introduce day CQ patterns and procedures in a Field Carrier Landing Practice (FCLP) scenario.

Requirements.

Discuss

- CRM
- Crewmember duties during CQs
- Shipboard ICS procedures
- Hand-and-arm signals for shipboard operations
- Flight deck status lights
- Flight deck operations
- Ship traffic patterns

- Wave offs
- Practice
 - Carrier operation
 - Communication procedures
 - Airplane and conversion mode arrivals
 - Aircraft lighting
 - Charlie pattern for LHA/LHD and LPD/LSD (minimum 5 for initial sorties)
 - LSE signals and procedures
 - Departure procedures
 - Self-taxi procedures
 - STOs
 - Pitch-up with side-slip characteristics
 - Technique A and B approaches
 - Stern Approach

Performance Standards

- Demonstrate knowledge of ship landing deck configuration.
- Demonstrate proper clearance calls prior to landing.
- Properly execute the CQ pattern IAW LHA/LHD NATOPS.
- Correction calls over the spot are accurate, clear, and timely.

Instructor. BICC

Prerequisites. SCQ-2930

Required Reading. MV-22 NATOPS Ch 8, LHA/LHD NATOPS Ch 2, 3, 4, 5, 6, App A, ANTPP Ch. 13

External Syllabus Support. FCLP site

CQ-2941 1.5 365 B,T,R D A 1 MV-22

Goal. Day qualification flight.

Requirements

- Discuss
 - CRM
 - Crewmember duties during CQs
 - Shipboard ICS procedures
 - Hand-and-arm signals for shipboard operations
 - Flight deck operations
 - Nacelle modulation procedures
 - Waveoffs
 - Ditching
- Review
 - Carrier operation
 - Communication procedures
 - Airplane and conversion mode arrivals
 - Aircraft lighting
 - Charlie pattern for LHA/LHD or LPD/LSD (minimum 5 for initial sorties)
 - LSE signals and procedures
 - Departure procedures
 - Self-taxi procedures
 - STOs
 - NATOPS shipboard approaches
 - Checklists

Performance Standards

Demonstrate knowledge of ship landing deck configuration.
Demonstrate proper clearance calls prior to landing.
Properly execute the CQ landing pattern IAW applicable NATOPS Manual (minimum 5 for initial sorties).
Correction calls over the spot are accurate, clear, and timely.

Instructor. BICC

Prerequisites. CQ-2940

External Syllabus Support. Landing platform afloat

CQ-2942	1.5	365	B,T,R	NS	A	1	MV-22
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Goal. Introduce night aided CQ patterns and procedures in an FCLP scenario.

Requirements.

Discuss

- CRM
- Aircraft lighting
- Crewmember duties during NVD CQs
- NVD CQ patterns
- Ditching

Practice

- Carrier operations using NVDs
 - Arrival
 - Night landing patterns (minimum of 5 for initials)
 - Communication procedures
 - Shipboard lighting and light signals
 - LSE signals and procedures
 - Waveoff
 - Departure
- Self-taxi procedures
- STOs
- NATOPS shipboard approaches
- High gross weight operations
- Checklists

Performance Standards

Maintain an active NVG scan to acquire hazards and recognize improper landing profiles.
Correction calls over the spot are accurate, clear, and timely.
Perform standard CQ landing procedures utilizing NVDs (minimum 5 for initial sorties).

Instructor. NSI

Prerequisites. SCQ-2931, CQ-2940

Required Reading. MAWTS-1 NVD Manual Ch 15

External Syllabus Support. FCLP site

CQ-2943	1.5	365	B,T,R,M	NS	A	1	MV-22
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Goal. NVD qualification flight.

Requirements

Discuss

- CRM.
- Aircraft lighting
- Ship lighting
- NVD CQ patterns
- Crewmember duties during NVD CQs
- LSE signals at night
- Low contrast environment utilizing NVDs
- Ditching

Review

- Carrier operations using NVDs
 - Arrival
 - Night landing patterns (minimum of 5 initial sorties).
 - Communication procedures
 - Shipboard lighting and light signals
 - LSE signals and procedures
 - Waveoff
 - Departure
- Self-taxi procedures
- STOs
- NATOPS shipboard approaches
- High gross weight operations
- Checklists

Performance Standards

- Perform standard CQ landing procedures while utilizing NVDs (minimum 5 for initial sorties).
- Maintain an active NVG scan to acquire hazards and recognize improper landing profiles.
- Correction calls over the spot are accurate, clear, and timely.

Instructor. NSI

Prerequisites. NSQ for appropriate light level, CQ-2942

External Syllabus Support. Landing platform afloat

3.9 MISSION PHASE

Purpose.

To establish training designed to enable crew chiefs to achieve proficiency in mission skills. Mission Phase events are designed to fulfill the requirements of the VMM Mission Essential Task List (METL) as defined by the associated Marine Corps Task List (MCTL).

General.

Events in this stage of training should be based on tactical scenarios designed to focus on the specific items delineated in the different training codes and will be developed by the squadron WTI. To the greatest extent possible the scenarios should incorporate the employment of escort aircraft (fixed or rotary wing), ASE, and use of the weapon systems. On certain events integration with other ACE assets is required.

Discuss items for each event in this stage are designed to be the focus of scenario-based training for planning and execution, not necessarily for discussion during individual crew briefs. However, this does not preclude these items from being discussed during crew briefs and emphasized during flight.

SEA-3240 2.0 365 B,T,R,M (NS) A 2 MV-22

Ship-to-shore Mission

Goal. Conduct assault support in a low threat environment from an expeditionary sea-based site.

Requirement. Proficiency in SEA-3240 is attained once NSQ, TGQ, CQ, ALS, and EXP complete.

Performance Standard. Successful completion of NSQ, TGQ, ALS, and EXP.

Instructor. LATI

Required Reading. ANTPP MEU Operations, NATOPS Shipboard procedures

Prerequisites. CQ, GTR-2840, EXP-3140

3.9.4 Tactical Recovery of Aircraft and Personnel (TRAP)

Purpose. To introduce tactical mission planning, briefing, and execution specific to TRAP. This stage of training is designed to fulfill the requirement set in MCT 6.2.1.1 Conduct Aviation Support of Tactical Recovery of Aircraft and Personnel (TRAP).

Crew Requirement. P/P/CC/AO.

Tactical Recovery of Aircraft and Personnel Stage Overview. The events included in the TRAP stage of the Mission Phase of training are depicted below.

Table 3-30: TRAP Mission Skill Phase

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-3310	1.0	*	B,T		G		Personnel Recovery
TRAP-3340	2.0	365	B,T,R,M	(NS)	A		TRAP Mission

ACAD-3310 1.0 * B,T G

Personnel Recovery

Goal. The CCUI has a familiarity with responsibilities associated with a TRAP mission.

Requirement. Utilize JKO online courseware.

Performance Standard. Student is introduced to all responsibilities during a TRAP mission.

Instructor. JKO

Required Reading. ASTACSOP TRAP

Prerequisite. ACAD-3110

TRAP-3340 2.0 365 B,T,R,M (NS) A 2 MV-22

Tactical Recovery of Aircraft and Personnel Mission

Goal. Introduce a tactical recovery of aircraft or personnel mission.

Requirement.

Discuss

CRM
Enlisted aircrew responsibilities
TRAP mission analysis
Threat analysis

Alert postures
Assault Support Tac SOP
Use of standardized TRAP template
Use of Mission Kits (Medevac, Hoist, etc.)
Use of ASE
Quick reaction force
Go/No-go criteria
TRAP COAs
Introduce
Execution of a TRAP mission
TRAP Template
ISOPREP data
Types of TRAP
Authentication

Performance Standards

Maintain situational awareness with respect to the friendly and enemy situation and mission progress.
Configure the cabin for TRAP mission.
Properly execute assigned mission utilizing appropriate COA.

Instructor. LATI

Prerequisites. EXP-3140, ACAD-3311

Ordnance. 600 rds appropriate ammunition, 40 chaff and 50 flares

External Syllabus Support. Aerial gunnery and expendable capable range, aircraft to perform RMC, RESCORT/RESCAP, approved LZ

3.9.5 Combat Assault Transport (CAT)

Purpose. To introduce day and night combat assault transport tactical mission planning, briefing, and execution. This stage of training is designed to fulfill the requirement set in MCT 1.3.4.1, Conduct Combat Assault Transport.

Crew Requirement. P/P/CC/AO

Stages. The following stages are included in the CAT Mission Skill Phase of training, depicted below

Table 3-32 Combat Assault Transport Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-3415	1.0	*	B,T		G		NEO Execution
ACAD-3416	1.0	*	B,T		G		CASEVAC
CAT-3440	2.0	365	B,T,R	NS	A	2	Low-threat Section
CAT-3441	2.0	365	B,T,R,M	(NS)	A	2	Escort Section

ACAD-3415 1.0 * B,T G

NEO Execution

Goal. The CCUI has a familiarity with responsibilities associated with a NEO mission.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to the execution and responsibilities during a NEO mission.

Instructor. WTI

Prerequisite. ACAD-3110

ACAD-3416 1.0 * B,T G

CASEVAC

Goal. The CCUI has a familiarity with responsibilities associated with a casualty evacuation mission.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to CASEVAC operations and responsibilities.

Instructor. WTI

Prerequisite. NSQ, 3011, 3110

Required Reading. MV-22 TPG litter provisions and 9-line, ASTACSOP CASEVAC

CAT-3440 2.0 365 B,T,R,M (NS) A 2 MV-22

Low-threat Air Assault Mission

Goal. Introduce an urban long range Air Assault Raid mission in a low-threat environment utilizing a section.

Requirement.

Discuss

- Cabin configuration
- Use of SERE information
- ROE
- GCE Scheme of maneuver
- Threat considerations
- PZ and LZ operations
- Objective area planning
- Objective area actions
- Sectors of fire/Fields of fire
- Route considerations
- Execution Checklists
- Contingency plans
- Fire Support Coordination Measures
- ACEOI
- Aircraft Survivability Equipment

Introduce

- Execution of a low threat assault support mission using a section
- Execution checklists

Performance Standards

- Maintain situational awareness with respect to the friendly and enemy situation and mission progress.
- Properly employ all ASE IAW the MV-22 ANTTP Manual.
- Execute proper weapons employment procedures IAW the MV-22 ANTTP Manual.
- Demonstrate weapons employment procedures in a low threat tactical environment.

Instructor. LATI

Prerequisites. LATQ, EXP-3140, ACAD-3415, ACAD-3416

Ordnance. 600 rds appropriate ammunition, 40 chaff and 50 flares

External Syllabus Support. Aerial gunnery and expendable capable range, approved LZ.

CAT-3441 2.0 365 B,T,R,M (NS) A 2 MV-22

Air Assault Mission Utilizing Escorts

Goal. Introduce an Air Assault mission incorporating escorts, troops, and fire support agencies.

Requirements.

Discuss

- Cabin configuration
- Use of SERE information
- ROE
- GCE Scheme of maneuver
- Threat considerations
- PZ and LZ operations
- Objective area planning
- Objective area actions
- Sectors of fire/Fields of fire
- Escort operations
- Route considerations
- Execution Checklists
- Contingency plans
- Fire Support Coordination Measures
- ACEOI
- Aircraft Survivability Equipment

Introduce

- Escort operations
- Integrated objective areas

Performance Standards

- Maintain situational awareness with respect to the friendly and enemy situation and mission progress.
- Properly employ all ASE IAW the MV-22 ANTTP Manual.
- Execute proper weapons employment procedures IAW the MV-22 ANTTP Manual.
- Demonstrate weapons employment procedures in a tactical environment.

Instructor. LATI

Required Reading. ANTTP *Assault Support*

Prerequisites. CAT-3440

Ordnance. 600 rds of appropriate ammunition, 40 chaff and 50 flares.

External Syllabus Support. Aerial gunnery and expendable capable range, EW emitter, approved LZ, and FW/RW escort.

3.10 CORE PLUS PHASE

Purpose. To establish training for Core Plus Skill events. (theater specific, low-probability of occurrence)

General.

ROC will be per T&R Program manual.

Crew chiefs may fly night flights using NVGs in this phase under HLL or LLL conditions provided they are NSQ for that light level.

Prior to training in this phase, a crew chief should be complete with Core Phase training.

Stages. The following stages are included in the Core Plus Phase of training.

Table 3-33: Core Plus Phase

Stage Name
Air Delivery (AD)
Alternate Insertion/Extraction Techniques (A/E)
Mountainous Area Training (MAT)
Defensive Weapon System (DWS)
Defensive Combat Maneuvers (DCM)
Chemical, Biological, Radiological And Nuclear (CBRN)
Carrier Qualification (CQ)
Rapid Insertion/Extraction (R/E)
Aviation Delivered Ground Refueling (ADGR)
Aviation-Delivered Battlefield Illumination (BI)
Air Delivery Mission (AD)
Airborne Command And Control (AC2)

3.10.1 Air Delivery (AD)

Purpose. To develop proficiency in personnel parachute operations (PARAOPS), air delivery of cargo, and day/NVD external load operations from confined areas.

General. All maneuver descriptions are in the ANTP.

An NSI is required for initial NVD external events.

Crew Requirements. P/P/CC/AO for aircraft events.

Air Delivery Stage Overview. The events included in the AD stage of the Core Plus Phase of training are depicted below.

Table 3-34: Air Delivery Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-4010	1.0	*	B,T		G		EA Air Delivery
PARA-4041	1.5	365	B,T,R,M	(NS)	A	1	PARAOPS
AD-4042	1.5	365	B,T,R,M	(NS)	A	1	CDS
AD-4043	1.5	365	B,T,R,M	(NS)	A	1	Door Bundle
EXT-4081	1.5	365	B,T,R	D	A	1	Day Single-point Externals
EXT-4082	1.5	365	B,T,R	D	A	1	Day Dual-point Externals
EXT-4083	1.5	365	B,T,R,M	NS	A	1	NS Single-point Externals
EXT-4084	1.5	365	B,T,R,M	NS	A	1	NS Dual-point Externals

ACAD-4010 1.0 * B,T G

EA MV-22 Air Delivery

Goal. The CCUI has an introductory knowledge of procedures to execute air delivery and PARAOPS from the MV-22.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to MV-22 air delivery procedures and appropriate checklists.

Instructor. BICC

Required Reading. ANTP *Air Delivery*, NATOPS Operating limitations

Prerequisite. ACAD-2610

PARA-4041 1.5 365 B,T,R,M (NS) A 1 MV-22

Personnel Parachute Operations

Goal. Introduce PARAOPS procedures.

Requirements.

- Discuss
 - CRM during PARAOPS (aircrew/jumpmaster responsibilities)
 - Tactical considerations for air delivery of troops
 - MV-22 TPG air delivery briefing guide
 - Voice communication/standard terminology during PARAOPS
 - Cargo handling manual
- Introduce
 - Inspection of anchor cable
 - Air delivery checklist

Performance Standards

- Execute PARAOPS procedures IAW the MV-22 ANTTP.
- Demonstrate proper crew coordination during PARAOPS operations.

Prerequisites. LAT-2640~D, LAT-2642~HLL, LAT-2643~LLL, ACAD-4010

External Syllabus Support. Certified Drop Zone, Jumpmaster, qualified troops.

AD-4042 1.5 365 B,T,R,M (NS) A 1 MV-22

Air Delivery of Cargo via Door Bundle

Goal. Introduce air delivery of cargo via Door Bundle.

Requirements.

- Discuss
 - CRM
 - Voice communication/standard terminology
 - Tactical considerations for air delivery of cargo
 - Rigging and preflight of equipment and cargo
 - Air delivery checklist/briefing guide
- Introduce:
 - Cabin configuration for air delivery of cargo
 - Door bundle rigging procedures
 - Load inspection procedures
 - Execution of the air delivery checklist

Performance Standards.

- Execute air delivery procedures IAW the MV-22 ANTTP Manual.
- Demonstrate proper crew coordination during air delivery operations.
- Demonstrate proper cabin configuration for air delivery of cargo.
- Demonstrate proper loading and rigging procedures for Door Bundle.

Instructor. BICC

Prerequisites. LAT-2640~D, LAT-2642~HLL, LAT-2643~LLL, ACAD-4010

External Syllabus Support. Aerial Delivery Platoon, door bundles.

AD-4043 1.5 365 B,T,R,M (NS) A 1 MV-22

Air Delivery of Cargo via Container Delivery System

Goal. Introduce air delivery of cargo via Container Delivery System (CDS).

Requirements.

- Discuss
 - CRM
 - Tactical considerations for air delivery of cargo

- Rigging and preflight of equipment and cargo
- Air delivery checklist/briefing guide
- Voice communication/standard terminology
- Introduce
 - Cabin configuration for air delivery of cargo
 - Container Release System (CRS)
 - Container Delivery System (CDS)
 - Container rigging procedures
 - Load inspection procedures
 - Execution of the air delivery checklist

Performance Standards

- Execute air delivery procedures IAW the MV-22 ANTPP Manual.
- Demonstrate proper crew coordination during air delivery operations.
- Demonstrate proper cabin configuration for air delivery of cargo.
- Demonstrate proper loading and rigging procedures for CDS.

Instructor. BICC

Prerequisites. LAT-2640~D, LAT-2642~HLL, LAT-2643~LLL, ACAD-4010

External Syllabus Support. Aerial Delivery Platoon, CDS bundles.

EXT-4081	1.5	365	B,T,R	D	A	1	MV-22
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Single-point External Cargo Operations

Goal. Introduce single-point external load hook-up and delivery to a confined area

Requirements

- Discuss
 - Aircraft hook system
 - Pendant preflight
 - HWOG operation
 - HST composition, functions, and signals
 - HST safety brief
 - Crew responsibilities and communications during external operations
 - Standard terminology
 - Cargo hook-up procedures
 - Reduced visibility conditions
 - Terrain/obstacle clearance
 - Inadvertent IMC procedures
 - Aircraft emergencies with single-point external load
 - Tactical considerations during external lift operations
 - Aerodynamic characteristics of external loads
 - Light and heavy external load considerations
 - Load jettison procedures
- Introduce
 - Pendant preflight
 - Hook checks
 - External load and rigging inspection.
 - Single-point external load hook-up and delivery to a confined area (minimum of 5 for initial sorties)
 - Wave-off with external load

Performance Standards

- Demonstrate Proper aircraft hook system and pendant preflight checks IAW Crew Chief Pocket Checklist (NFM-800).
- Demonstrate proper ICS terminology during external operations.

Place the load within 10 meters of desired location.
Execute single-point external procedures IAW the MV-22 ANTTP Manual.

Instructor. BICC

Prerequisites. CAL-2240, ACAD-4010

Required Reading. ANTTP *Cargo Operations*, NATOPS Operating limitations

External Syllabus Support. External load, HST, approved LZ with 7nm of protected airspace to 1,000' AGL

EXT-4082 1.5 365 B,T,R D A 1 MV-22

Dual-point External Cargo Operations

Goal. Introduce dual-point external load hook-up and delivery to a confined area.

Requirements

Discuss

CRM
Standard terminology
HWOOG operation
Dual-point cargo hook-up procedures
Terrain/obstacle clearance
Reduced visibility conditions
Inadvertent IMC procedures
Aircraft emergencies with dual-point external load
Tactical considerations during external lift operations
Aerodynamic characteristics of dual-point external loads
Light and heavy external load considerations
Auto-jettison functionality
70/30-30/70

Introduce

Dual point external load hook-up and delivery to a confined area (minimum of 5 for initial sorties)
Wave-off with external load

Performance Standards

Demonstrate aircraft hook system and pendant preflight checks IAW Crew Chief Pocket Checklist (NFM-800).
Demonstrate proper ICS terminology during dual-point external operations.
Place the load within 10 meters of desired location.
Execute dual-point external procedures IAW the MV-22 ANTTP Manual.

Instructor. BICC

Prerequisites. AD-4081

External Syllabus Support. External load, HST, approved LZ with 7nm of protected airspace to 1,000' AGL

EXT-4083 1.5 365 B,T,R,M NS A 1 MV-22

NS Single-point External Cargo Operations

Goal. Introduce single-point external cargo operations utilizing NVGs.

Requirements

Discuss

All previously introduced EXT stage items
NVD briefing guide
Aircraft and landing zone lighting

- Aircraft emergencies with external load
- Introduce
 - Identifying the zone and load using NVDs
 - Single-point external load hook-up and delivery to a confined area using NVGs (minimum of 5 for initial sorties)
 - Use of aircraft lighting (search light, belly light)
- Practice
 - Pendant preflight
 - Hook checks
 - External load and rigging inspection

Performance Standards

- Demonstrate aircraft hook system and pendant preflight checks IAW Crew Chief Pocket Checklist (NFM-800).
- Demonstrate proper ICS terminology during external operations.
- Place load within 10 meters of desired location.
- Execute proper NVD external procedures IAW the MV-22 ANTTP Manual.

Instructor. NSI

Required Reading. MAWTS-1 NVD Manual *Low Light Level External Operations Considerations*

Prerequisites. NS-2340~HLL, NS-2380~LLL, AD-4081

External Syllabus Support. External load, HST, approved LZ with 7nm of protected airspace to 1,000' AGL.

EXT-4084 1.5 365 B,T,R,M NS A 1 MV-22

NS Dual-point External Cargo Operations

Goal. Introduce dual-point external cargo operations utilizing NVGs.

Requirements.

- Discuss
 - All previously introduced EXT stage items
 - NVD briefing guide
 - Aircraft and landing zone lighting
 - Aircraft emergencies with external load
- Introduce
 - Dual-point external load hook-up and delivery to a confined area using NVGs (minimum of 5 for initial sorties)
- Practice
 - Identifying the zone and load using NVDs
 - Use of aircraft lighting (search light, belly light)
- Review
 - Pendant preflight
 - Hook checks
 - External load and rigging inspection

Performance Standards

- Demonstrate aircraft hook system and pendant preflight checks IAW Crew Chief Pocket Checklist (NFM-800).
- Demonstrate proper ICS terminology during external operations.
- Place load within 10 meters of desired location.
- Execute proper NVD external procedures IAW the MV-22 ANTTP Manual.

Instructor. NSI

Prerequisites. NS-2340~HLL, NS-2380~LLL, AD-4082

External Syllabus Support. External load, HST, approved LZ with 7nm of protected airspace to 1,000' AGL.

3.10.2 Alternate Insertion/Extraction Techniques (AIE)

Purpose. To develop proficiency in tiltrotor alternate insertion and extraction techniques and procedures.

General. Initial AIE-4140 through AIE-4143 shall be conducted during the day. Subsequent execution of AIE-4130 through AIE-4132 may be conducted at night. Crew chiefs shall be NSQ for the appropriate light level if conducting AIE-4130 through AIE-4143 using NVGs

Crew Requirement. P/P/CC/AO

Alternate Insertion/Extraction Techniques Stage Overview. The events included in the AIE stage of the Core Plus Phase of training are depicted below.

Table 3-35: Alternate Insertion/Extraction Techniques Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-4111	0.5	*	B,T		G		Alternate Insertion/Extraction
ACAD-4112	0.5	*	B,T		G		Hoist Operations
AIE-4140	1.5	365	B,T,R,M	(NS)	A	1	Fastrope/Rappel
AIE-4141	1.5	365	B,T,R,M	(NS)	A	1	Hoisting
AIE-4142	1.5	365	B,T,R,M	(NS)	A	1	SPIE
AIE-4143	1.5	365	B,T,R,M	(NS)	A	1	HELOCAST

ACAD-4111 0.5 * B,T G

EA MV-22 Alternate Insertion/Extraction

Goal. The CCUI has an introductory knowledge of procedures to execute Fastrope, Rappel, SPIE, and Helocast operations from the MV-22.

Requirement. Utilize MAWTS-1 Courseware

Performance Standard. Student is introduced to procedures for AIE techniques.

Instructor. BICC

Required Reading. ANTTP *Alternate Insertion and Extraction*

Prerequisite. ACAD-2611

ACAD-4112 0.5 * B,T G

EA MV-22 Hoist Operations

Goal. The CCUI has an introductory knowledge of procedures to execute hoist operations from the MV-22.

Requirement. Utilize MAWTS-1 Courseware

Performance Standard. Student is introduced to Hoist procedures.

Instructor. BICC

Required Reading. ANTTP *Alternate Insertion and Extraction*

Prerequisite. ACAD-2611

AIE-4140 1.5 365 B,T,R,M (NS) A 1 MV-22

Alternate Insertion Procedures via Fastrope or Rappel

Goal. Introduce insertion procedures via fastrope or rappel.

Requirements.

Discuss

- HIGE/HOGE power requirements
- HRST brief
- Voice communication/standard terminology
- ICS failure/hand and arm signals
- Obstacle clearance/wave-off
- Emergency procedures

Introduce

- Preflight of fast rope/rappel rigging
- Troop insertion via fastrope/rappel

Performance Standards

- Maintain proper lookout for hover operations when deploying troops.
- Maintain obstacle clearance.
- Execute proper AIE procedures IAW the MV-22 ANTTP Manual.

Instructor. BICC

Prerequisites. EXT-4081, EXT-4083~NS, ACAD-4111

External Syllabus Support. HRST Master, qualified troops.

AIE-4141 1.5 365 B,T,R,M (NS) A 1 MV-22

Alternate Insertion/Extraction Procedures via Hoisting

Goal. Introduce insertion/extraction procedures via hoisting.

Requirements.

Discuss

- HIGE/HOGE power requirements
- CRM
- Voice communication/standard terminology
- ICS failures/hand and arm signals
- Obstacle clearance
- Emergency procedures

Introduce

- Hoist cable inspection
- Troop insertion/extraction via hoisting

Performance Standards

- Maintain proper lookout for extended hover when inserting/extracting troops.
- Execute proper hoist procedures IAW the MV-22 ANTTP Manual.
- Maintain obstacle clearance.

Instructor. BICC

Prerequisites. EXT-4081, EXT-4083~NS, ACAD-4112

AIE-4142 1.5 365 B,T,R,M (NS) A 1 MV-22

Special Patrol Insertion/Extraction Operations

Goal. Introduce insertion/extraction procedures via Special Patrol Insertion/Extraction (SPIE) operations.

Requirements

Discuss

- HIGE/HOGE power requirements

CRM
Pilot, crew chief, HRST Master and HRST Safety Observer brief
Voice communication/standard terminology
ICS failures/hand and arm signals
Obstacle clearance
Emergency procedures
Introduce
SPIE rigging inspection
Troop insertion/extraction via SPIE

Performance Standards.

Maintain proper lookout for extended hover when extracting/inserting troops.
Maintain obstacle clearance.
Execute proper SPIE procedures IAW the MV-22 ANTTP Manual.

Instructor. BICC

Prerequisites. EXT-4081, EXT-4083~NS, ACAD-4111

External Syllabus Support. HRST master, qualified troops.

AIE-4143 1.5 365 B,T,R,M (NS) A 1 MV-22

Helocast and Soft Duck Operations

Goal. Introduce insertion procedures via helocast and/or soft duck (deflated rubber boat) and introduce SAR operations.

Requirements

Discuss
CRM while performing helocast or soft duck
Proper rigging and preflight of equipment to be inserted via helocast and soft duck
Low altitude aircraft emergencies over water
Ditching/water landing
Salt encrustation/compressor stall
Helocast/soft duck aerial delivery altitudes and airspeeds
Voice communications/standard terminology
Flight Director search patterns
Cargo handling manual
Introduce
Insertion of troops and equipment by helocast or soft duck
Preflight of aircraft, troops and equipment for helo cast or soft duck
SAR patterns and over-water hoisting operations

Performance Standards

Execute helo cast or soft duck procedures IAW the MV-22 ANTTP Manual.
Demonstrate proper crew coordination during helo cast or soft duck operations.

Instructor. BICC

Prerequisite. CAL-2240, ACAD-4111, EXT-4081, EXT-4083 ~NS

3.10.3 Mountain Area Training (MAT)

Purpose. To develop proficiency in day and NVD mountainous terrain operations. Aircraft landings shall be conducted at zones above 6000' DA and where mountainous terrain is a significant factor.

General. All maneuver descriptions are in the ANTTP.

Crew Requirements. P/P/CC/AO.

Mountain Area Training Stage Overview. The events included in the MAT stage of the Core Plus Phase of training are depicted below.

Table 3-36: Mountain Area Training Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
MAT-4180	1.5	365	B,T,R	D	A	1	Day MAT
MAT-4181	1.5	365	B,T,R,M	NS	A	1	NS MAT

MAT-4180 1.5 365 B,T,R D A 1 MV-22

Mountain Area Training

Goal. Introduce operations and landings in mountainous terrain.

Requirements.

- Discuss
 - Mountainous area operations
 - Pinnacle landings
 - Slope landings
 - Landings and operations in valleys and canyons
 - Crosswind landings
 - Orographic turbulence
 - Aircraft performance considerations
- Introduce
 - Landings at high altitude
 - Aircraft performance at high altitude
- Review
 - CAL-2240

Performance Standards

- Execute proper MAT procedures IAW the MV-22 ANTP Manual.
- Execute up-slope/down-slope and cross-slope landings.
- Provide pilots with timely and accurate information about LZ topography, aircraft drift, and distance estimation prior to landing.

Instructor. BICC

Required Reading. NATOPS *Extreme weather operations*, ANTP *Mountain and Rough Terrain Flying*

Prerequisites. CAL-2240

MAT-4181 1.5 365 B,T,R,M NS A 1 MV-22

Night Systems Mountain Area Training

Goal. Introduce operations and landings in mountainous terrain utilizing NVGs.

Requirements.

- Discuss
 - Previously discussed MAT items
- Introduce
 - NVD mountainous terrain operations
 - NVD landings at high altitude
- Review
 - NS-2341, MAT-4180

Performance Standards

- Execute proper NVD MAT procedures IAW the MV-22 ANTP Manual.
- Execute up-slope/down-slope and cross-slope NVD landings.

Provide pilots with timely and accurate information about LZ topography, aircraft drift, and distance estimation prior to landing.

Instructor. BICC

Prerequisites. NSQ for appropriate light level, MAT-4180

3.10.4 Defensive Weapon System (DWS)

Purpose. To develop the ability to control the employment of the MV-22B Defensive Weapon System (DWS), deliver accurate air-to-ground fire employing crew-served weapons, and provide defensive fire on targets of opportunity.

General

The aircraft weapon system lectures must be conducted by a designated DWSI.

A DWSI is required for unqualified aircrew.

At the completion of this stage, the aircrew will demonstrate knowledge of the DWS and ordnance delivery with the system.

These sorties are ordnance driven. Ordnance expenditure requirements shall be adhered to in order for the crew member to attain DWS qualification, maintain, or regain proficiency. Flights should be scheduled to maximize range time so that ordnance expenditure requirements can be met.

Successful completion of this stage constitutes DWSQ. A qualification letter signed by the commanding officer stating the crew member is DWSQ is to be placed in the crewmember's NATOPS jacket prior to conducting any defensive weapon system flight without a designated DWSI.

Crew Requirements. P/P/CC/AO/AO.

Defensive Weapon System Stage Overview. The events included in the DWS stage of the Core Plus Phase of training are depicted below.

Table 3-37: Defensive Weapon System Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-4210	1.0	*	B,T		G		GAU-17/A
ACAD-4211	1.0	*	B,T		G		EA MV-22 DWS
LAB-4220	0.5	*	B,T		A		DWS Installation
LAB-4221	1.5	*	B,T		S/A		DWS Functionality
LAB-4222	1.0	180	B,T		S/A		DWS EPs
LAB-4223	1.0	*	B,T		G		GAU-17/A
DWS-4240	1.5	365	B,T,R	D	A	1	Day w/No Rounds
DWS-4241	1.5	*	B,T,R	D	A	1	Day DWS Employment
DWS-4242	1.5	365	B,T,R	D	A	2	Day Section DWS Employment
DWS-4243	2.0	365	B,T,R	NS	A	1	Night w/No Rounds
DWS-4244	1.5	*	B,T,R	NS	A	1	Night DWS Employment
DWS-4245	1.5	365	B,T,R,M	NS	A	2	Night Section DWS Employment

ACAD-4210 1.0 * B,T G

GAU-17/A

Goal. The CCUI has a familiarity with the GAU-17/A minigun and how to properly utilize it.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to the GAU-17/A minigun.

Instructor. DWSI

Required Reading. NAVAIR 11-95GAU-17-1

Prerequisites. ACAD-2510

ACAD-4211	1.0	*	B,T	G
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EA MV-22 DWS

Goal. The CCUI has a familiarity with the components, characteristics, and operation of the Defensive Weapon System.

Requirement. Utilize MAWTS-1 courseware.

Instructor. DWSI

Required Reading. MV-22 ANTPP *Defensive Weaponry*

Prerequisites. ACAD-4210

LAB-4220	0.5	*	B,T	A
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Weapon Installation and Ammo Can Loading Procedures

Goal. The CCUI has a familiarity with installing the GAU-17/A on the turret and with ammo can loading procedures.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to DWS weapon installation and ammunition can loading, and understand how to manually retract the weapon system.

Instructor. DWSI

Required Reading. MV-22 ANTPP *Defensive Weaponry*

Prerequisites. ACAD-4211

External Syllabus Support. MV-22 configured with DWS system, aircraft placed on jacks, 1000 rounds 7.62mm ammunition.

LAB-4221	1.5	*	B,T	S/A
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Defensive Weapon System Functionality

Goal. The CCUI has a familiarity with all functions and controls associated with the DWS.

Instructor. DWSI

Required Reading. ACS 16982 DWS technical and flight manual

Prerequisites. LAB-4220

External Syllabus Support. DWS simulator or MV-22 configured with DWS system and aircraft placed on jacks.

LAB-4222	1.0	180	B,T	S/A
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Defensive Weapon System Emergency Procedures

Goal. The CCUI has a familiarity with all emergency procedures associated with the DWS and the GAU-17/A.

Instructor. DWSI

Required Reading. ACS 16982 DWS technical and flight manual, A1-V22AB-NFM-800 Weapons checklist.

Prerequisites. LAB-4221

External Syllabus Support. DWS simulator if available.

LAB-4223 1.0 * B,T G

GAU-17/A Breakdown and Cleaning Procedures

Goal. The CCUI will be familiar with the breakdown, inspection, function check, and cleaning procedures of the GAU-17/A minigun.

Requirements

- Discuss
 - Nomenclature
 - Inspection procedures
 - Cleaning procedures
 - Weapon emergencies
- Introduce
 - Cycle of operation
 - Weapons checklist
 - Troubleshooting procedures
- Practice
 - DWS inspection and weapon mounting procedures

Performance Standards

- Demonstrate knowledge of nomenclature, cycle of operation, and inspection procedures for the GAU-17/A machine gun.
- Demonstrate DWS inspection procedures and operation.
- Demonstrate trouble shooting procedures.

Instructor. DWSI

Required Reading. NAVAIR 11-95GAU17-1

Prerequisite. ACAD-4210

DWS-4240 1.5 365 B,T,R D A 1 MV-22

Day Sensor Employment

Goal. Introduce DWS Charged Coupled Device (CCD) sensor employment.

Requirements

- Discuss
 - CRM
 - ICS procedures
 - Safety considerations
 - Weapons conditions
 - Weapons commands
 - Weapon system malfunctions/stoppages/emergencies
 - Crew-served weapons checklist
 - Aiming techniques
 - Muzzle awareness
 - Weapon preparation/nomenclature
 - Target identification
 - Sensor utilization
 - Gunner station symbols
 - STAR
 - Shifting fires and target handoff procedures
- Introduce
 - Preparation of weapon and aircraft configuration
 - Engagement of pre-briefed targets with DWS in training mode

Weapon parameters and limitations
Add waypoint and utilize the capture point function

Performance Standards

Demonstrate knowledge of the DWS operating procedures.
Demonstrate the ability to deploy the DWS to all positions.
Demonstrate proper execution of all weapons commands.
Demonstrate emergency weapons procedures.
Demonstrate knowledge of weapons parameters.
Demonstrate use of the crew-served weapons checklist.
Demonstrate the ability to operate the DWS controls to acquire and simulate engagement on multiple targets.

Instructor. DWSI

Required Reading. A1-V22AB-NFM-800 Weapons checklist.

Prerequisites. TGQ, LAB-4222, LAB-4223

DWS-4241 1.5 * B,T,R D A 1 MV-22

Single-ship Defensive Weapon System Employment

Goal. Introduce DWS employment in a single-aircraft environment.

Requirements

Discuss

CRM
ICS procedures
Safety
Weapons malfunctions/stoppages/emergencies
Muzzle awareness
Weapons preparation/nomenclature
Sensor utilization
Fields of fire/Sectors of fire

Introduce

Defensive weapon system operations
Fields of fire
Sectors of fire
Simulated approach to landings while engaging targets

Practice

Preparation of weapon and aircraft configuration
Engagement of pre-briefed targets with DWS
Weapon parameters and limitations
Add waypoint and utilize the capture point function

Performance Standards

Demonstrate knowledge of the three weapons control procedures.
Demonstrate use of crew-served weapons checklists.
Demonstrate proper utilization of all fire control voice and hand signals.
Demonstrate the ability to operate the defensive weapon system controls to acquire and engage multiple targets in a day single aircraft environment.
Demonstrate the ability to perform weapon system troubleshooting and emergency procedures.
Demonstrate knowledge of weapons parameters.
Demonstrate knowledge of cabin configuration limitations while utilizing the DWS.

Instructor. DWSI

Prerequisites. TGQ, DWS-4240

Ordnance. 2000 rounds per gunner of appropriate ammunition

External Syllabus Support. Appropriate aerial gunnery range and moving land target (MLT) if available

DWS-4242 1.5 365 B,T,R D 2 MV-22

Section Defensive Weapon System Employment

Goal. To introduce DWS employment in a multi-aircraft environment.

Requirements

Discuss

- CRM
- ICS procedures
- Safety
- Weapons system malfunctions/stoppages/emergencies
- Muzzle awareness in a multi-aircraft environment
- Weapons preparation/nomenclature
- Integrating sectors of fire
- Surface danger zones

Introduce

- Firing techniques in a multi-aircraft environment
- Target hand off to other aircraft
- Muzzle awareness in a multi-aircraft environment
- Formation flight patterns for weapons employment

Practice

- Preparation of weapon and aircraft configuration
- Defensive weapon system operations
- Simulated approach to landings while engaging targets
- Engagement of pre-briefed targets with DWS
- Weapon parameters and limitations
- Add waypoint and utilize the capture point function

Performance Standards

- Demonstrate the ability to operate the defensive weapon system controls to acquire and engage multiple targets in a day multi-aircraft environment.
- Demonstrate use of fire control procedures to suppress targets.
- Demonstrate use of system sensors for target acquisition and engagement in a multi-aircraft environment.
- Maintain muzzle awareness at all times during multi-aircraft live fire evolution.
- Demonstrate the ability to perform weapon system troubleshooting and emergency procedures.
- Demonstrate the ability to successfully suppress targets while conducting target hand-off from the gunners station to another weapon system within the flight.

Instructor. DWSI

Prerequisites. DWS-4241

Ordnance. 2000 rounds per gunner of appropriate ammunition.

External Syllabus Support. Appropriate aerial gunnery range and moving land target (MLT) if available.

DWS-4243 2.0 365 B,T,R NS A 1 MV-22

Night Sensor Employment

Goal. Introduce DWS Forward Looking Infrared (FLIR) sensor employment

Requirements

Discuss

- CRM
- ICS procedures
- Safety considerations
- Weapons conditions
- Weapons commands
- Weapon system malfunctions/stoppages/emergencies
- Crew served weapons checklist
- Aiming techniques at night
- Muzzle awareness
- Weapons preparation/nomenclature
- Target identification at night
- Sensor utilization
- Training mode

Introduce

- Preparation of weapons and aircraft
- Acquiring pre-briefed targets with DWS at night
- Weapon parameters

Performance Standards

- Demonstrate knowledge of the defensive weapons system operating procedures.
- Demonstrate understanding of all sensor modes of operation.
- Demonstrate proper utilization of all fire control voice and hand signals at night.
- Demonstrate appropriate emergency weapons procedures.
- Verbally demonstrate knowledge of weapons parameters.
- Demonstrate use of the crew served weapons checklist.
- Demonstrate the ability to operate the defensive weapon system controls to acquire and simulate engagement on multiple targets in a night, single-aircraft environment.

Instructor. DWSI

Prerequisites. DWS-4240

DWS-4244	1.5	*	B,T,R	NS	A	1	MV-22
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Night Single-ship Defensive Weapon System Employment

Goal. Introduce DWS employment in a single-aircraft HLL or LLL environment.

Requirements

Discuss

- CRM
- ICS procedures
- Safety
- Weapons malfunctions/stoppages/emergencies
- Muzzle awareness
- Weapons preparation/nomenclature
- Weapons effects on NVDs
- Sensor utilization at night

Introduce

- Firing techniques utilizing NVDs
- Single aircraft defensive weapon system operations at night

Review

- Preparation of weapon and aircraft configuration
- Weapon parameters and limitations
- Add waypoint and utilize the capture point function

Performance Standards

- Demonstrate the ability to operate the defensive weapon system controls to acquire, sight on, and fire on multiple targets in a single aircraft environment at night utilizing NVDs.
- Demonstrate use of fire control procedures to suppress targets at night.
- Demonstrate use of system sensors for target acquisition and engagement in a single aircraft environment at night utilizing NVDs.
- Demonstrate the ability to perform weapon system troubleshooting and emergency procedures at night.
- Demonstrate knowledge of cabin configuration limitations while utilizing the DWS.

Instructor. DWSI

Prerequisites. DWS-4241, DWS-4243

Ordinance. 2000 rounds per gunner of appropriate ammunition.

External Syllabus Support. Appropriate aerial gunnery range and moving land target (if available).

DWS-4245 1.5 365 B,T,R,M NS A 2 MV-22

Night Section Defensive Weapon System Employment

Goal. Introduce DWS employment in a multi-aircraft HLL or LLL environment.

Requirements.

Discuss

- CRM
- ICS procedures
- Safety
- Weapons malfunctions/stoppages/emergencies
- Muzzle awareness in a multi-aircraft environment
- Weapons preparation/nomenclature
- Weapons effects on NVDs

Introduce

- Firing techniques in a multi-aircraft environment at night
- Target acquisition at night in a multi-aircraft environment
- Multi-aircraft defensive weapon system operations at night

Practice

- Firing techniques utilizing NVDs

Review

- Preparation of weapon and aircraft configuration
- Defensive weapon system operations
- Simulated approach to landings while engaging targets
- Engagement of pre-briefed targets with DWS
- Weapon parameters and limitations
- Add waypoint and utilize the capture point function

Performance Standards

- Demonstrate the ability to operate the defensive weapon system controls to acquire and engage multiple targets in a multi-aircraft environment at night.
- Demonstrate use of fire control procedures to suppress targets at night.
- Maintain muzzle awareness at all times during multi-aircraft live fire evolutions.
- Demonstrate use of system sensors for target acquisition and engagement in a multi-aircraft environment at night.
- Demonstrate the ability to perform weapon system troubleshooting and emergency procedures at night.
- Demonstrate the ability to successfully suppress targets while conducting target hand-off from the gunners station to another weapon system within the flight.

Instructor. DWSI

Prerequisites. DWS-4242, DWS-4244

Ordnance. 2000 rounds per gunner of appropriate ammunition.

External Syllabus Support. Appropriate aerial gunnery and moving land target (MLT) if available.

3.10.5 Defensive Combat Maneuvers (DCM)

Purpose. To introduce and develop proficiency in tactics and aerial defensive measures used to evade enemy air-to-air threats.

General.

CCUI in this stage must be LAT qualified and proficient and proficient in GTR.

A DCMI is required for all non-proficient aircrew.

The flight lead shall be a DCMI and specifically brief all applicable DCM training rules per the ANTP, the Aviation T&R Program Manual, and this Manual.

After completion of DCM-4340 the CCUI is DCM Qualified (DCMQ).

Sequences for all DCM flights shall be flown as outlined in the MV-22 ANTP Manual.

Crew Requirements. P/P/CC/AO

Defensive Combat Maneuvers Stage Overview. The events included in the DCM stage of the Core Plus Phase of training are depicted below.

Table 3-38: Defensive Combat Maneuvers Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-4310	1.0	*	B,T		G		Rotary-wing Threat to Assault Support
ACAD-4311	1.0	*	B,T		G		Fixed-wing Threat to Assault Support
ACAD-4312	1.0	*	B,T		G		MV-22 DEFTAC
ACAD-4313	1.0	*	B,T		G		DCM
LAB-4320	0.5	*	B,T		G		DCM Walk-through
DCM-4340	1.0	365	B,T,R,M		A	2	DCM Flight

ACAD-4310 1.0 * B,T G

Rotary-wing Threat to Assault Support (S)

Goal. The CCUI has an introductory knowledge specific attack helicopter threats to assault support aircraft.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. The student is introduced to specific attack helicopter threats to assault support.

Instructor. DCMI

Required Reading. Classified MV-22 ANTP *Defensive Combat Maneuvers Program*

Prerequisites. LATQ, GTR-2840

ACAD-4311 1.0 * B,T G

Fixed-wing Threat to Assault Support (S)

Goal. The CCUI has an introductory knowledge of the fixed wing threat to assault support.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. The student is introduced to the fixed wing threats to assault support.

Instructor. DCMI

Required Reading. Classified MV-22 ANTTP *Defensive Combat Maneuvers Program*

Prerequisites. LATQ, GTR-2840

ACAD-4312 1.0 * B,T G

MV-22 Defensive Tactics

Goal. The CCUI has an introductory knowledge of MV-22 air-to-air defensive tactics.

Requirement. Utilize MAWTS-1 courseware

Performance Standard. Student is introduced to MV-22 air-to-air defensive tactics.

Instructor. DCMI

Prerequisite. ACAD-4310, ACAD-4311

ACAD-4313 1.0 * B,T G

Defensive Combat Maneuvers

Goal. The CCUI has an introductory knowledge of MV-22 defensive combat maneuvers.

Requirement. Utilize MAWTS-1 courseware

Performance Standard. Student is introduced to MV-22 defensive combat maneuvers.

Instructor. DCMI

Required Reading. Classified MV-22 ANTTP *Defensive Combat Maneuvers Program*

Prerequisite. ACAD-4312

LAB-4320 0.5 * B,T G

Defensive Combat Maneuver Walk-through

Goal. The CCUI has a satisfactory knowledge of MV-22 defensive combat maneuvers prior to in-flight execution.

Requirement. DCMI

Performance Standard. Student completes a walk-through of all briefed DCM flight maneuvers and line numbers.

Required Reading. Classified MV-22 ANTTP *Defensive Combat Maneuvers Program*

Prerequisite. ACAD-4313

DCM-4340 1.0 365 B,T,R,M D A 2 MV-22

Defensive Combat Maneuvers

Goal. Introduce section DCM against a fixed-wing aggressor.

Requirement

Discuss

Lookout doctrine

Situational awareness

Adversary aircraft parameters

Adversary weapons parameters, envelopes, and considerations
Mutual support
Introduce
Tiltrotor DCM versus a single FW aggressor per the MV-22 ANTTTP Manual
DCM line numbers in accordance with the MV-22 ANTTTP
Aggressor attacks at various altitudes

Performance Standards

Execute DCM vs. a FW threat IAW the MV-22 ANTTTP Manual.
Maintain DCM ROC IAW the Aviation T&R Program Manual.
Maintain proper lookout doctrine during DCM.

Instructor. DCMI

Prerequisites. LAB-4320

Ordinance. 60 flares, RMWS

External Syllabus Support. FW adversary, ACM range space.

3.10.6 Chemical, Biological, Radiological, and Nuclear (CBRN)

Purpose. To introduce the AR-5 CBRN protective mask and associated CBRN equipment.

General. For safe execution of all flights, 1 aircrewman shall remain unmasked during flights in the aircraft.

Crew Requirement. P/P/CC/AO

Chemical, Biological, Radiological, and Nuclear Stage Overview. The events included in the CBRN stage of the Core Plus Phase of training are depicted below.

Table 3-39: Chemical, Biological, Radiological, and Nuclear Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
LAB-4420	0.5	*	B,T		G		Equipment Fitting and Familiarization
SCBRN-4430	1.0	*	B,T		S	1	Day CBRN
SCBRN-4431	1.0	730	B,T,R,M	NS	S	1	Night CBRN

LAB-4420 0.5 * B,T G

CBRN Equipment Fitting and Familiarization

Goal. The CCUI is introduced to CBRN protective equipment and is fitted with the required gear for flight operations.

Performance Standard. Student is provided introductory training with the flight equipment utilized in a CBRN environment.

Instructor. BICC

Required Reading. NAVAIR 00-80T-121

Prerequisite. CAL-2240

SCBRN-4430 1.0 * B,T S 1 FFS/FTD

CBRN Operations

Goal. Demonstrate the ability to conduct flight in a CBRN environment with mask and gear donned during day conditions.

Requirements.

Discuss
CRM while masked, to include emergency procedures and ground handling signals

- Mask limitations pertaining to vision and scan
- Physiological limitations and fatigue factors imposed by CBRN protective equipment
- Mask maintenance and factors that render the mask unserviceable
- Demonstrate
 - Proper mask use (donning and doffing)
- Introduce
 - CBRN defensive suit
 - Start while masked
 - Taxi while masked
 - Takeoff and landings while masked
 - Normal flight operations while masked

Performance Standards

- Properly don CBRN protective equipment and conduct flight maneuvers.
- Demonstrate knowledge of CBRN operations IAW the MV-22 ANTP Manual.

Instructor. BICC

Prerequisites. LAB-4420

SCBRN-4431 1.0 730 B,T,R,M NS S 1 FFS/FTD

NS CBRN Operations

Goal. Demonstrate the ability to conduct flight in a CBRN environment with mask and gear donned during NS conditions.

Requirements

- Discuss
 - NVD limitations pertaining to vision and scan
 - CRM while wearing the mask and NVGs
- Introduce
 - CBRN defensive suit
 - Start while masked
 - Taxi while masked
 - Takeoff and landings while masked
 - Normal flight operations while masked

Performance Standards

- Properly don CBRN protective equipment and conduct flight maneuvers with NVDs.
- Demonstrate knowledge of CBRN operations IAW the MV-22 ANTP Manual.
- Demonstrate proper mask donning procedures.

Instructor. BICC

Prerequisites. NSQ, SCBRN-4430

3.10.7 Carrier Qualification Unaided (CQ)

Purpose. Qualify the CCUI in flight operations from a carrier deck or ship platform under night unaided conditions.

General. Refer to NAVAIR 00-80T-106 LHA/LHD NATOPS and NAVAIR 00-80T-105 CV NATOPS Manuals for carrier operations. Refer to NAVAIR 00-80T-122 for air capable ship operations.

Crew Requirement. P/P/CC/AO

Carrier Qualification Unaided Stage Overview. The events included in the CQ stage of the Core Plus Phase of training are depicted below.

Table 3-40: Carrier Qualification Unaided Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
CQ-4480	1.0	365	B,T,R	N*	A	1	Unaided FCLPs
CQ-4481	1.5	365	B,T,R,M	N*	A	1	Unaided CQ

CQ-4480 1.0 365 B,T,R N* A 1 MV-22

Unaided Field Carrier Landing Practice

Goal. Introduce night unaided CQ patterns and procedures in an FCLP scenario.

Requirement

Discuss:

- CRM
- Crewmember duties during CQs
- Shipboard ICS procedures
- Hand-and-arm signals for shipboard operations
- Flight deck status lights
- Flight deck operations
- Ship traffic patterns
- Night landing and takeoff techniques
- Wave offs

Introduce:

- Unaided carrier operation
- Night takeoff/landing patterns (minimum 5 for initial sorties)
- Communication procedures
- Lights and light signals specific to night operations
- LSE signals and procedures
- Carrier aided and unaided lighting configurations
- Self-taxi procedures
- STOs
- Pitch-up and side slip characteristics

Performance Standards

- Properly execute the night unaided CQ pattern IAW LHA/LHD/ NATOPS.
- Provide accurate drift correction calls to the pilots in the landing environment.

Instructor. BICC

Required Reading. NATOPS Ch 8, LHA/LPH/LHD NATOPS Ch 2, 3, 4, 5, 6, 7.2, 7.3 App A,D

Prerequisites. CQ-2940

External Syllabus Support. FCLP site

CQ-4481 1.5 365 B,T,R,M N* A 1 MV-22

Unaided Carrier Qualification

Goal. Night unaided carrier qualification flight.

Requirements

Discuss

- Aircraft ditching.
- Emergency egress procedures.

Introduce

- Procedures for unaided landings and takeoffs.
- Night unaided patterns.

Unaided approaches and landings (minimum 5 for initial sorties).
Aircraft lighting configuration.
Deck lighting configuration.
Unaided closure rates.

Review

CRM.
Emergency Egress Lighting System (EELS).
LSE signals.
Voice procedures.

Performance Standards

Properly execute the night unaided CQ pattern IAW LHA/LHD/ NATOPS.
Provide accurate drift correction calls to the pilots in the landing environment.

Instructor. BICC

Prerequisites. CQ-2941, CQ-4461

External Syllabus Support. Landing platform afloat.

3.10.8 Rapid Insertion/Extraction Mission (RI/E)

Purpose. To demonstrate proficiency in tiltrotor rapid insertion and extraction techniques and procedures. This stage of training is designed to fulfill the requirement set in MCT 1.3.4.1.1 Conduct Airborne Rapid Insertions / Extraction.

General. Initial RIE-4180 may be conducted day or night. Aircrew shall be complete in the appropriate AIE skill prior to conducting RIE-4180 and NSQ for the appropriate light level if conducting RIE-4180 using NVDs.

Crew Requirement. P/P/CC/AO

Rapid Insertion/Extraction Mission Stage Overview. The events included in the RI/E Mission stage of the Core Plus Phase of training are depicted below.

Table 3-41: Rapid Insertion/Extraction Mission Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
RIE-4540	2.5	365	B,T,R,M	(NS)	A	1	RI/E Mission

RIE-4540 2.5 365 B,T,R,M (NS) A 1 MV-22

Rapid Insertion/Extraction Mission

Goal. Demonstrate the ability to execute rapid insertion / extraction operations in a tactical environment.

Requirements

Discuss:

CRM during AIE.
Tactical considerations for applicable AIE mission.

Review

Appropriate AIE skill.

Performance Standards

Execute AIE procedures IAW the MV-22 ANTP.
Demonstrate proper crew coordination during AIE operations.
Complete the assigned mission.

Instructor. LATI

Prerequisite. Appropriate AIE skill proficient

External Syllabus Support. Jumpmaster/Castmaster/HRST Master, qualified troops

3.10.9 Aviation Delivered Ground Refueling (ADGR)

Purpose. To introduce ADGR/FARP procedures.

General. ADGR-4640 initial event shall be completed in the aircraft. Subsequent LAB-4620 will forward chain ADGR-4640.

Crew Requirement. P/P/CC/AO

Aviation Delivered Ground Refueling Stage Overview. The events included in the ADGR stage of the Core Plus Phase of training are depicted below.

Table 3-42: Aviation Delivered Ground Refuel Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-4610	1.0	*	B,T		G		MV-22 Aviation Delivered Ground Refueling
LAB-4620	2.0	*	B,T		A		ADGR Lab
ADGR-4640	0.5	365	B,T,R,M	(NS)	A	1	ADGR Mission

ACAD-4610 1.0 * B,T G

EA MV-22 Aviation Delivered Ground Refueling

Goal. The CCUI has an introductory knowledge of the MV-22 Aviation Delivered Ground Refueling equipment and FARP setup.

Requirement. Utilize MAWTS-1 courseware

Performance Standard. Student is introduced to ADGR equipment set-up and mission execution

Instructor. BICC

Required Reading. NATOPS Operating limitations, NTRP RGR and FARE kits, MV-22 ANTTP *Aviation Delivered Ground Refueling*

Prerequisites. CAL-2240

LAB-4620 2.0 * B,T 1 MV-22

Aviation Delivered Ground Refueling Lab

Goal. The CCUI has an introductory knowledge of the setup of a FARP.

Requirement. Set up a FARP utilizing at least one MAT and a FARE kit.

Performance Standard. Student demonstrates practical knowledge of ADGR set-up procedures.

Instructor. BICC

Required Reading. MV-22 ANTTP *Aviation Delivered Ground Refueling*, ASTACSOP FARP operations

Prerequisite. ACAD-4610

ADGR-4640 0.5 365 B,T,R,M (NS) A 1 MV-22

Aviation Delivered Ground Refuel Mission

Goal. Introduce an ADGR mission.

Requirements

Discuss

- Fuel planning
- FARP site evaluation and selection
- FARP security considerations

Introduce

Tactical planning, briefing, and execution of an RGR mission during day or night. The CCUI will assist in the set-up of the FARP.

Performance Standards

Maintain situational awareness with respect to the friendly and enemy situation and mission progress.
Demonstrate proper knowledge and set up of the ADGR mission kit.
Safely conduct refueling operations in the ADGR site.
Provide fuel and/or ordnance to receivers.
Demonstrate proper knowledge of NVD tactical considerations IAW the MV-22 ANTTP Manual and MAWTS-1 NVD Manual as applicable for the mission.

Prerequisites. NS HLL-2340~HLL, NS LLL-2380~LLL, LAB-4620

External Syllabus Support. Approved site for refueling operations, receiver.

3.10.10 Aviation Delivered Battlefield Illumination (BI)

Purpose. To introduce, qualify, attain and/or maintain proficiency in Aircraft Parachute Flare (APF) delivery for Battlefield Illumination (BI).

General. Initial codes will be instructed by a BI proficient and qualified BICC. Battlefield Illumination Lead codes will be instructed by a qualified and proficient WTI.

At the completion of this stage, the aircrew shall be qualified to act as a BI team member/team leader.

Crew Requirements. P/P/CC/AO.

Aviation Delivered Battlefield Illumination Stage Overview. The events included in the BI stage of the Core Plus Phase of training are depicted below.

Table 3-43: BI Core Plus Skill Phase

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-4710	1.0	*	B,T		G		Battlefield Illumination
BI-4740	1.5	365	B,T,R,M	NS	A	1	Battlefield Illumination Assistant
BI-4741	1.5	365	B,T,R,M	NS	A	1	Battlefield Illumination Lead

ACAD-4710 1.0 * B,T G

EA Battlefield Illumination

Goal. The CCUI has a familiarity with battlefield illumination procedures.

Requirement. Utilize MAWTS-1 courseware

Performance Standards. Student is introduced to Battlefield Illumination equipment and mission execution.

Instructor. BICC

Required Reading. MV-22 ANTTP *Battlefield Illumination*, NTRP 3-22.4-MV-22B Aircraft Parachute Flares.

Prerequisites. ACAD-2310

BI-4740 1.5 365 B,T,R,M NS A 1 MV-22

Aviation Delivered Battlefield Illumination Assistant

Goal. Introduce or maintain proficiency in battlefield illumination as a Battlefield Illumination Assistant.

Requirements

Discuss

- CRM
- ICS procedures
- APF characteristics
- APF malfunctions
- Cabin configuration
- Required equipment
- APF emergency procedures

Introduce

- Cabin configuration for BI
- APF preparation and loading
- Safety Procedures
- BI checklist
- APF delivery (minimum 6 LUU-2 or LUU-19 APFs)

Performance Standards

- Demonstrate the ability to prepare APFs.
- Demonstrate proper crew coordination procedures for BI.
- Demonstrate understanding of emergency procedures for APFs.
- Demonstrate proper procedures for delivering APFs.

Instructor. BICC

Prerequisite. ACAD-4710, NSQ for appropriate light level

Ordinance. (6) LUU-2 or LUU-19 Series APFs.

BI-4741	1.5	365	B,T,R,M	NS	E	A	1	MV-22
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Battlefield Illumination Lead

Goal. Introduce, qualify, or maintain proficiency in Battlefield Illumination as a Battlefield Illumination Lead.

Requirements.

Discuss

- CRM
- ICS procedures
- APF inspection
- APF malfunctions
- Cabin configuration
- APF emergency procedures
- Safety precautions
- BI Lead duties

Introduce

- APF inspection and acceptance
- BI Lead communication responsibilities

Practice

- Cabin configuration for BI
- APF preparation and loading
- Safety Procedures
- BI checklist
- APF delivery (minimum 6 LUU-2 or LUU-19 APFs)

Performance Standards

- Demonstrate capability to brief emergency procedures during flight brief.
- Demonstrate inspection and acceptance procedures for APFs.

Demonstrate proper crew coordination procedures for BI.
Demonstrate understanding of emergency procedures for APFs.
Demonstrate proper procedures for verification and setting of APF timers.
Supervise delivery of a minimum of (6) LUU-2 or LUU-19 APFs.
Perform the duties of BI Lead during the BI mission.

Instructor. WTI

Prerequisites. BI-4740

Ordinance. Minimum 6 LUU-2 and/or LUU-19 Series APFs are required for initial event.

3.10.11 Air Delivery Mission

Purpose. To demonstrate proficiency in tiltrotor air delivery techniques and procedures. This stage of training is designed to fulfill the requirement set in MCT 4.3.4 Conduct Air Delivery.

General. Initial AD-4830 may be conducted day or night. Aircrew shall be complete in the appropriate AD skill prior to conducting AD-4840 and NSQ for the appropriate light level if conducting AD-4840 using NVGs.

Crew Requirements. P/P/CC/AO

Air Delivery Mission Stage Overview. The events included in the AD Mission stage of the Core Plus Phase of training are depicted below.

Table 3-42: Air Delivery Mission Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
AD-4840	2.5	365	B,T,R,M	(NS)	A	1	AD Mission

AD-4840 2.5 365 B,T,R,M (NS) A 1 MV-22

Air Delivery Mission

Goal. Demonstrate the ability to execute aerial delivery operations in a tactical environment.

Requirements

Discuss
 CRM during AD
 Tactical considerations for applicable AD mission
Review
 Appropriate AD skill

Performance Standards

Execute AD procedures IAW the MV-22 ANTP.
Demonstrate proper crew coordination during AD operations.
Complete the assigned mission.

Instructor. BICC

Prerequisite. Appropriate AD skill proficient

External Syllabus Support. Per specific AD skill

3.10.12 Airborne Command and Control (AC2)

Purpose. To develop the ability to provide an Airborne Command and Control vehicle, communications and situational awareness to command elements.

Airborne Command and Control Stage Overview. The events included in the AC2 stage of the Core Plus Phase of training are depicted below.

Table 3-44: Airborne Command and Control Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
LAB-4920	1.0	*	B,T		A	1	MV-22

LAB-4920 1.0 * B,T A 1 MV-22

Airborne Command and Control Lab

Goal. The CCUI will have an introductory knowledge of the cabin set-up of an MV-22 for AC2 missions.

Requirement. Prepare the aircraft cabin for MV-22 command and control missions, to include installation of radios and equipment used by the Command and Control personnel. A block C aircraft should be used for setup demonstration.

Performance Standard.

Introduce the student to set-up, preparation, and understanding of MV-22 command and control procedures.

Instructor. BICC

Prerequisite. NSQ

3.11 INSTRUCTOR TRAINING PHASE (5000)

Purpose. To establish training for instructor designations.

General. ROC will be per T&R Program Manual. CCUI may fly night flights using NVGs in this phase under HLL or LLL conditions provided they are NSQ for that light level. Refer to the MAWTS-1 MV-22 Course Catalog for specific syllabus information.

Stages. The following stages are included in the Instructor Training Phase of training.

Table 3-45: Instructor Training Phase

Stage Name
Basic Instructor Crew Chief (BICC)
Crew Chief FRS Instructor Training (FIT)/Night Systems Familiarization Instructor (NSFI)
Tail Gunnery Instructor (TGI)
Defensive Weapons Instructor (DWSI)
Low Altitude Tactics Instructor (LATI)
Defensive Combat Maneuvers Instructor (DCMI)
Night Systems Instructor (NSI)
Weapons and Tactics Instructor (WTI)

3.11.1 Basic Instructor Crew Chief (BICC)

Purpose. To develop qualified Basic Instructor Crew Chiefs using a standardized instructor training program. This syllabus is designed to prepare crew chiefs to instruct specific T&R events that do not otherwise have an instructor requirement. This portion of the syllabus shall be used by VMM squadrons to assist in instructor standardization.

General. IUT events will emphasize instructional techniques, briefing and debriefing, and applicable aircrew training publications. Emphasis on all events within the syllabus is on training objectives, method of instruction, and student problem areas.

Conduct IUT events with a designated ANI, NI or WTI.

Crew Requirement. P/P/CC/AO

Prerequisites. Crew chiefs shall be NSQ and recommended by the squadron standardization board prior to beginning the IUT syllabus.

Basic Instructor Crew Chief Stage Overview. The events included in the BICC stage of the Instructor Training Phase of training are depicted below.

Table 3-46: Basic Instructor Crew Chief Stage

Event	Time	Reffy	POI	Conditions	Device	Num	Description
ACAD-5010	8.0	*	B,T		G		Basic Instructor Training Course
LAB-5020	3.0	*	B,T,R		G		Aircrew Training Manuals
BICC-5040	1.0	*	B,T,R		A	1	BICC Certification Flight

ACAD-5010 8.0 * B,T G

Basic Instructor Training Course

Goal. The CCUI will have an introductory knowledge of instructional techniques, briefing and debriefing styles, and tactical risk mitigation for instructional sorties.

Requirement. Utilize Basic Instructor Training Course courseware.

Performance Standard. Successfully complete all training requirements of the BITC course curriculum.

Prerequisites. NSQ, Recommended by squadron standardization board.

LAB-5020 3.0 * B,T,R G

Aircrew Training Manuals

Goal. Introduce the IUT to training manuals crew chiefs utilize for instructing students.

Requirements

Discuss:

MV-22 T&R Ch. 1, 3, and 4.
T&R Program Manual Ch. 2 and 3
MV-22 ANTTP
ATF writing procedures
M-SHARP discussion
Brevity code manual

Performance Standard. IUT demonstrates familiarity with all aircrew training manuals and publications.

Instructor. WTI

Required Reading. NAVMC 3500.11, NAVMC 3500.14

Prerequisites. ACAD-5010

BICC-5040 1.0 * B,T,R A 1 MV-22

Goal. Demonstrate the ability to brief, debrief, and instruct events that do not otherwise have an instructor requirement.

Requirements

Discuss

All “discuss” items for events that do not otherwise have an instructor requirement in the Core Skill phase
CRM
Lookout doctrine
Comfort levels
Aircraft emergencies/system failures
Aircraft weight and balance
CG limitations

How to read a flight schedule
Proper PPE
Introduce
Instructor techniques
T&R briefing items

Performance Standards

Demonstrate the ability to brief and debrief a crew chief student.
Demonstrate the capability to recognize and correct student errors in the aircraft.

Instructor. WTI, NE, NI, or ANI

Prerequisites. LAB-5020

3.11.2 Crew Chief FRS Instructor Training (FIT)

Purpose. To certify a qualified MV-22 crew chief in instructional procedures and techniques to support crew chief training at the FRS.

General. All Instructor Under Training (IUT) events are intended to emphasize standardization of crew chief procedures and techniques. The Crew Chief Instructor Under Training (CCIUT) should be capable of demonstrating and verbalizing all training objectives associated with the Core Introduction Phase of instruction.

For academic support and certification criteria for NS and LAT Instructors refer to the MAWTS-1 MV-22 Course Catalog.

Crew Requirement. P/P/FRSCCI/CCIUT

Prerequisites. Recommended by the Squadron Standardization Board.

Crew Chief FRS Instructor Training Stage. The events included in the BICC stage of the Instructor Training Phase of training are depicted below.

Error! Reference source not found. **Table 3-47: Crew Chief FRS Instructor Stage**

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-5010	8.0	*	B,T		G		Basic Instructor Training Course
FIT-5140	2.0	*	B,T,R		A	1	FAM IUT
FIT-5141	1.5	*	B,T,R		A	1	CAL IUT
FIT-5142	1.5	*	B,T,R		A	2	FORM IUT
FIT-5143	2.0	*	B,T,R		A	1	FRSCCI Certification

ACAD-5010 8.0 * B,T G

Basic Instructor Training Course

Goal. The CCUI will have an introductory knowledge of instructional techniques, briefing and debriefing styles, and tactical risk mitigation for instructional sorties.

Requirement. Utilize Basic Instructor Training Course courseware.

Performance Standard. Successfully complete all training requirements of the BITC course curriculum.

Prerequisites. NSQ, Recommended by squadron standardization board.

FIT-5140 2.0 * B,T,R A 1 MV-22

Familiarization Instructor Under Training

Goal. Demonstrate standardized procedures for pre-flight, mission preparation, and post-flight to include plane captain duties.

Requirements

- Discuss
 - Instructional techniques
 - Student tendencies
 - Standardized procedures
 - Common student mistakes
 - Crew day/crew rest
- Introduce
 - Instructional techniques
 - Student tendencies
 - Standardized procedures
- Review
 - Crew chief FAM procedures

Performance Standards

- Demonstrate the ability to thoroughly brief and debrief students.
- Demonstrate the ability to instruct standardized procedures outlined in the MV-22 NATOPS.

Instructor. FRSCCI

Prerequisites. ACAD-5010.

FIT-5141 1.5 * B,T,R A 1 MV-22

Confined Area Landing Instructor Under Training

Goal. Review CAL instructional techniques.

Requirements

- Discuss
 - ICS procedures and common tendencies
 - Closure rates to the ground
 - Wave-off procedures
 - Ramp operations
 - Obstacle clearance calls
 - Common student mistakes
- Review
 - Lookout doctrine
 - Aircraft clearances
 - Crew chief duties during CAL landings and takeoffs
 - CRM

Performance Standard.

- Demonstrate standard CAL procedures and verbally correct students when standardized procedures are not executed.

Instructor. FRSCCI

Prerequisites. ACAD-5010.

FIT-5142 1.5 * B,T,R A 2 MV-22

Formation Instructor Under Training

Goal. Review formation flight instructional techniques.

Requirements

- Discuss
 - Parade and cruise formations and positioning

Closure rates between aircraft
Lookout doctrine techniques in formation flight
Inter and intra-aircraft coordination
Common student mistakes

Review

Crew chief duties

Performance Standards.

Demonstrate standard FORM procedures previously outlined and show the ability to instruct a student on standard FORM procedures and terminology.

Instructor. FRSCCI

Prerequisites. ACAD-5010.

FIT-5143 2.0 * B,T,R A 1 MV-22

Crew Chief FRS Instructor Certification

Goal. Crew chief instructor standardization check.

Requirement. Evaluate the prospective crew chief instructor for standardization of instructional techniques and flight procedures. All stages of training should be evaluated if possible. The evaluator will set itinerary.

Review

FIT-5030, FIT-5031, FIT-5032

Performance Standard.

Demonstrate the ability to instruct students on standardized procedures covered in the Core Introduction Phase of training.

Instructor. NE/NI/ANI

Prerequisites. NSQ, FIT-5140, FIT-5141, FIT-5142.

3.11.3 Tail Gunnery Instructor (TGI)

Purpose. To certify the MV-22 crew chief as a TGI capable of safely conducting academic and airborne instruction in the employment of crew-served weapons in all aspects of tactical flight from the ramp position.

General. Reference the MAWTS-1 Course Catalog for the TGI POI.

3.11.4 Defensive Weapon System Instructor (DWSI)

Purpose. To certify the MV-22 crew chief as a DWSI capable of safely conducting academic and airborne instruction in the employment of crew-served weapons in all aspects of tactical flight.

General. Reference the MAWTS-1 Course Catalog for the DWSI POI.

3.11.5 Low Altitude Tactics Instructor (LATI)

Purpose. To certify the MV-22 crew chief as a Low Altitude Tactics Instructor (LATI) capable of safely conducting academic and airborne instruction in the MV-22 Low Altitude Tactics syllabus.

General. Reference the MAWTS-1 Course Catalog for the LATI POI.

3.11.6 Night Systems Familiarization Instructor (NSFI)

Purpose. To certify the MV-22 crew chief as a Night Systems Familiarization Instructor (NSFI) capable of instructing Core Introduction Phase NVD flights.

General. Reference the MAWTS-1 Course Catalog for the NSFI POI.

3.11.7 Defensive Combat Maneuvers Instructor (DCMI)

Purpose. To certify the MV-22 crew chief as an instructor capable of safely conducting instruction of the MV-22 Defensive Combat Maneuvers (DCM) syllabus.

General. Reference the MAWTS-1 Course Catalog for the DCMI POI.

3.11.8 Night Systems Instructor (NSI)

Purpose. To certify the MV-22 crew chief as a Night Systems Instructor (NSI) capable of safely conducting ground and airborne instruction of the MV-22 Night Vision Device (NVD) flight syllabus.

General. Reference the MAWTS-1 Course Catalog for the NSI POI.

3.11.9 Weapons and Tactics Instructor (WTI)

Purpose. To certify the MV-22 crew chief as a Weapons and Tactics Instructor (WTI) capable of safely conducting ground and airborne instruction of the MV-22 tactical flight syllabus.

General. Reference the MAWTS-1 WTI Course Catalog for the detailed WTI POI. This event is administrative in nature and must be manually entered into M-SHARP. There is no requirement for an ATF to be filled out for this event.

3.12 REQUIREMENTS, QUALIFICATIONS, AND DESIGNATIONS (RQD) PHASE (6000)

Purpose. To establish training for specific requirements.

General. Squadrons will use this phase of training for check flights, qualifications and designations. The CCUI will demonstrate sound levels of aircraft/flight leadership and judgment required in a combat environment.

Requirement and qualification codes in the 6000 phase should be logged in conjunction with other 2000-4000 codes completed during the event. For example, RQD-6030 may be logged in conjunction with any flight in the training syllabus provided that all the requirements for that flight have been met. When the flight to attain the requirement/qualification/designation is complete, a letter from the squadron commanding officer awarding the qualification or designation shall be placed in the NATOPS and APR before that designation may be utilized.

After the commanding officer has designated the CCUI in writing as gaining a designation or qualification, Operations shall make the required qualification or designation entry into M-SHARP.

Purpose. To track requirements as outlined in OPNAVINST 3710.7, the MV-22 NATOPS, and CNAFINST 1542.7.

General. This section allows squadrons to document and track annual NATOPS and Instrument check flights and CRM training.

Crew Requirements. All checks will be per applicable directives.

Stages. The following stages are included in the Requirements, Qualifications, and Designations Phase of training.

Stage Name
NATOPS
Crew Resource Management (CRM)
Reduced Visibility Landing (RVL)

3.12.1 NATOPS Requirements Tracking

Purpose. To track requirements as outlined in OPNAVINST 3710.7 and the V-22 NATOPS Manuals

ACAD-6010 3.0 365 B,T,R,M E G

Open-book NATOPS Examination

Goal. The Open-book Examination shall consist of, but not be limited to, questions from the V-22 NATOPS question bank. The purpose of the of the written examination is to evaluate the aircrewman's knowledge of the appropriate publications and the aircraft.

Performance Standard. Achieve a minimum grade of Qualified on the Open-book examination.

Instructor. NI/ANI

ACAD-6011 1.0 365 B,T,R,M E G

Closed-book NATOPS Examination

Goal. The Closed-book Examination shall be limited to the V-22 NATOPS question bank. The purpose of the closed book examination portion of the written examination is to evaluate the aircrewman's knowledge of normal/emergency procedures and aircraft limitations.

Performance Standard. Achieve a minimum grade of Qualified on the Closed-book Examination.

Instructor. NI/ANI

Prerequisite. ACAD-6010

ACAD-6012 1.0 365 B,T,R,M E G

Oral NATOPS Examination

Goal. The Oral Examination shall consist of, but not be limited to, the V-22 NATOPS question bank. The evaluator may draw upon personal experience to propose questions of a direct and positive manner and in no way be opinionated to evaluate the aircrewman's knowledge of normal/emergency procedures, aircraft limitations, and performance.

Performance Standard. Achieve a minimum grade of Qualified on the Oral Examination.

Instructor. NI/ANI

Prerequisite. ACAD-6011

RQD-6030 1.5 365 B,T,R,M (N) E A 1 MV-22

NATOPS Evaluation

Goal. Conduct an objective evaluation of the aircrewman's knowledge of briefing, normal operating procedures (flight and ground), crew resource management, aircraft systems, performance criteria, emergency procedures, and debriefing. The focus is on normal and emergency procedures, not tactical execution. Emphasis shall be placed on the aforementioned items with the addition of local course rules, local SOPs, and admin flight procedures. The NATOPS evaluation is intended to evaluate compliance with NATOPS procedures. The NATOPS evaluation is the means to measure the aircrewman's efficiency in the execution of normal operating procedures and reaction to emergencies and malfunctions. The NATOPS evaluation process should be as much a learning tool and/or experience as it is an evaluation.

Requirement. The crew chief under evaluation shall bring a completed NATOPS evaluation card. The proficiency expected by the evaluator in this flight shall be commensurate with the experience level and highest qualification or designation of the crew chief under evaluation.

Performance Standard. The crew chief under evaluation must be prepared to safely demonstrate emergency procedures and knowledge of all maneuvers and procedures described within the NATOPS, OPNAV 3710.7 and in accordance with all SOPs. Upon successful completion of this event, the evaluator shall log the appropriate training code for tracking purposes.

Instructor. NI/ANI

Prerequisite. ACAD-6012

RQD-6031 1.5 365 B,T,R,M (N) E A 1 MV-22

Assistant NATOPS Instructor Evaluation

Goal. Tracking code for an NI/ANI evaluation. Log this code in place of RQD-6030.

Requirement. The crew chief under evaluation shall bring a completed NATOPS evaluation card. The proficiency expected by the evaluator in this flight shall be commensurate with the experience level qualification of the crew chief under evaluation.

Performance Standards. The crew chief under evaluation must be prepared to safely demonstrate flight proficiency and knowledge of all maneuvers and procedures described within the NATOPS, OPNAV 3710.7 and in accordance with all SOPs.

Instructor. NE/NI.

Prerequisite. ACAD-6012

RQD-6032 1.5 365 B,T,R,M (N) E A 1 MV-22

NATOPS Instructor Evaluation

Goal. Tracking code for an NI evaluation. Log this code in place of RQD-6030.

Requirement. The crew chief under evaluation shall bring a completed NATOPS evaluation card. The proficiency expected by the evaluator in this flight shall be commensurate with the experience level qualification of the crew chief under evaluation.

Performance Standards. The crew chief under evaluation must be prepared to safely demonstrate flight proficiency and knowledge of all maneuvers and procedures described within the NATOPS, OPNAV 3710.7 and in accordance with all SOPs.

Instructor. NE.

Prerequisite. ACAD-6012

RQD-6033 1.0 90 B,T,R,M (N) E A/S 1 MV-22

Emergency Procedures Review

Goal. Emergency Procedures review.

Requirement. This flight will review MV-22 emergency procedures and fulfills the requirement of the 90 day EP review requirement.

Performance Standard. Comply with MV-22 NATOPS procedures while dealing with non-normal conditions.

3.12.2 Crew Resource Management Requirements Tracking

Purpose. To track requirements as outlined in CNAFINST 1542.7.

ACAD-6070 1.0 365 B,T,R,M E G

Crew Resource Management Refresher Lecture

Goal. Review the 7 critical CRM skills during a mission scenario, as well as during emergencies and system failures.

Instructor. CRMI/F

Prerequisites. RQD-6030

RQD-6080 1.5 365 B,T,R,M (N), E A 1 MV-22

Crew Resource Management Flight

Goal. Review CRM principles while executing a simulated mission scenario.

Requirement. Review the 7 critical CRM skills during a mission scenario as well as during emergencies and system failures.

Performance Standards. Crew chiefs shall demonstrate effective use of the 7 critical CRM skills in accordance with OPNAVINST 1542.7, MV-22 NATOPS, and applicable directives.

Instructor. CRMF/I.

Prerequisites. ACAD-6070

RQD-6090 0.0 365 B,T,R,M E G

Crew Resource Management Facilitator Lecture

Goal. Tracking code for CRMF lecture.

Performance Standards. Successful completion of the CRMF lecture.

Instructor. CRMI.

RQD-6091 0.0 365 B,T,R,M (N), E A 1 MV-22

Crew Resource Management Facilitator Evaluation

Goal. Tracking code for CRMF evaluation.

Requirement. Review the 7 critical CRM skills during a mission scenario as well as during emergencies and system failures.

Performance Standards. Crew chiefs shall demonstrate effective use of the 7 critical CRM skills in accordance with OPNAVINST 1542.7, MV-22 NATOPS, and applicable directives.

Instructor. CRMI.

Prerequisites. ACAD-6090

RQD-6092 0.0 * B,T,R,M E G

Crew Resource Management Instructor Course

Goal. Tracking code for CRMI course.

Performance Standards. Successful completion of the CRMI course.

3.12.3 Reduced Visibility Landing Tracking (RVL)

RVL-6900 0.0 180 B,T,R,M (NS) A 1 MV-22

Goal. Track landings in actual RVL conditions using any of the approach or landing types. This code is intended to be logged in addition to RVL-2234.

Requirement. Landing in reduced visibility conditions where all crew members lose visual reference to the ground and no crew member can visually provide drift or altitude corrections.

3.13 **MV-22B CREW CHIEF T&R MATRIX (2000-6000 Phase)**

MV-22B CREW CHIEF T&R MATRIX (2000-6000 Phase)																					
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	POI				ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	INSTRUCTOR	EVENT CONV
				BASIC	TRANSITION	REFRESHER	MAINTAIN	#	TIME	#	TIME	#	TIME								
2000 PHASE (CORE)																					
FAMILIARIZATION (FAM)																					
FAM	ACAD	REFERENCE PUBLICATIONS	2012	X	X				1.0					(N)	G		*	1841		BICC	
	ACAD	AIR-TO-AIR REFUELING	2013	X	X				1.0					(N)	G		*	1841		BICC	2012
	LAB	MISSION AUXILIARY TANK SYSTEM	2020	X	X				2.0					(N)	A	1	*	1841		BICC	2020
	LAB	CARGO LOADING	2027	X	X				1.5					(N)	A/S	1	*	1841		BICC	
FAM TOTAL								4	5.5	0	0.0	0	0.0								
FORMATION (FORM)																					
FORM	ACAD	EA TACFORM	2110	X	X				1.0					(N)	G		*	1841		BICC	2160
	FORM	TAC FORM / NAV	2140	X	X	X	X					2.0		(NS)	A	2	365	2110		BICC	2182
FORM TOTAL								1	1.0	0	0.0	1	2.0								
CONFINED AREA LANDING (CAL)																					
CAL	CAL	SINGLE CAL	2240	X								1.5		D	A	1	*	1841		BICC	2132
	CAL	SECTION CAL	2242	X	X	X	X					2.0		D	A	2	365	2140, 2240	2240	BICC	2135
CAL TOTAL								0	0.0	0	0.0	2	3.5								
REDUCED VISIBILITY LANDINGS (RVL)																					
RVL	SRVL	RVL PROCEDURES INTRODUCTION	2270	X	X					1.0				(NS)	S		*	2240		BICC	
	RVL	RVL (ACTUAL COND)	2282	X	X	X	X					2.0		(NS)	A	1	365	2270	2240	BICC	2133
RVL SKILL TOTAL								0	0.0	1	1.0	1	2.0								
NIGHT SYSTEMS HIGH LIGHT LEVEL (NS HLL)																					
HLL	ACAD	EA NIGHT VISION TRAINING	2310	X	X	X			1.0					(N)	G		*	1841		NSI	2310
	ACAD	MV-22 FLIR FOR EAC	2311	X	X	X			1.0					(N)	G		*	2310		NSI	2311
	NS HLL	HLL SGL CAL	2340	X								2.0		HLL	A	1	365	2311, 2240	2240	NSI	2331
	NS HLL	HLL SEC CAL	2341	X	X	X	X					2.0		HLL	A	2	365	2340	2242, 2340	NSI	2332
NS HLL SKILL TOTAL								2	2.0	0	0.0	2	4.0								
NIGHT SYSTEMS LOW LIGHT LEVEL (NS LLL)																					
LLL	NS LLL	FAM/LLL SGL CAL	2380	X								1.5		LLL	A	1	240	NSQ HLL	2340	NSI	2381
	NS LLL	LLL SGL CAL	2381	X								1.5		LLL	A	1	*	2380		NSI	2381
	NS LLL	LLL SEC NAV/TACFORM	2382	X	X							1.5		LLL	A	2	*	2381	2140	NSI	2382
	NS LLL	LLL SEC CAL	2383	X	X	X	X					2.0		LLL	A	2	240	2382	2341, 2380	NSI	2382
NS LLL SKILL TOTAL								0	0.0	0	0.0	4	6.5								

MV-22B CREW CHIEF T&R MATRIX (2000-6000 Phase)																					
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	POI				ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	INSTRUCTOR	EVENT CONV
				BASIC	TRANSITION	REFRESHER	MAINTAIN	#	TIME	#	TIME	#	TIME								
TAIL GUNNERY (TG)																					
TG	ACAD	FUNDAMENTALS OF AERIAL GUNNERY	2510	X	X				1.0					(N)	G		*	1841		TGI	2510
	ACAD	M240D MACHINE GUN	2511	X	X				0.5					(N)	G		*	2510		TGI	2511
	ACAD	GAU-16/A MACHINE GUN	2512	X	X				0.5					(N)	G		*	2510		TGI	2512
	ACAD	GAU-21 MACHINE GUN	2513	X	X				0.5					(N)	G		*	2510		TGI	
	ACAD	LASER AIMING DEVICES	2514	X	X				0.5					(N)	G		*	2510		TGI	2513
	ACAD	LASER BORESIGHTING PROCEDURES	2515	X	X				0.5					(N)	G		*	2514		TGI	2514
	LAB	M240D MACHINE GUN	2520	X	X	X			0.5					(N)	G		*	2510		TGI	2520
	LAB	GAU-16/A MACHINE GUN	2521	X	X	X			0.5					(N)	G		*	2510		TGI	2521
	LAB	GAU-21 MACHINE GUN	2522	X	X	X			0.5					(N)	G		*	2510		TGI	
	TG	SINGLE SHIP TAIL GUN EMPLOYMENT	2540	X	X								1.5	D	A	1	*	2510		TGI	2530, 2531
	TG	SECTION TAIL GUN EMPLOYMENT	2541	X	X	X							1.5	D	A	2	365	2140, 2540	2540	TGI	2532
	TG	NS SINGLE-SHIP TAIL GUN EMPLOYMENT	2542	X	X								1.5	NS	A	1	*	2515, 2541	2540	TGI	2533, 2534
	TG	NS SECTION TAIL GUN EMPLOYMENT	2543	X	X	X	X						1.5	NS	A	2	365	2542	2541, 2542	TGI	2535
	TG	M240D UNDER INSTRUCTION	2550	X	X								0.0	(NS)	A	1	*	2520		M240D TGI	2530
	TG	M240D QUALIFIED	2551	X	X	X	X						0.0	(NS)	A	1	365	2550		M240D TGI	
	TG	GAU-16/A UNDER INSTRUCTION	2552	X	X								0.0	(NS)	A	1	*	2521		GAU-16 TGI	2531
	TG	GAU-16/A QUALIFIED	2553	X	X	X	X						0.0	(NS)	A	1	365	2552		GAU-16 TGI	
	TG	GAU-21 UNDER INSTRUCTION	2554	X	X								0.0	(NS)	A	1	*	2522		GAU-21 TGI	
	TG	GAU-21 QUALIFIED	2555	X	X	X	X						0.0	(NS)	A	1	365	2554		GAU-21 TGI	
TG SKILL TOTAL								9	5.0	0	0.0	10	6.0								
LOW ALTITUDE TACTICS (LAT)																					
LAT	ACAD	LAT FOR EAC	2610	X	X				0.5					(N)	G		*	1841		LATI	2210
	ACAD	TAC AIRCREW CONSIDERATIONS	2611	X	X				0.5					(N)	G		*	2610		LATI	2211
	LAB	LAT WALK-THROUGH	2620	X	X				0.5					(N)	G		*	2611		LATI	2220
	LAT	LAT MAN / RTE	2640	X	X							1.5	D	A	1	*	2620		LATI	2231	
	LAT	SECLAT	2641	X	X	X	X					1.5	D	A	2	365	2640	2140, 2640	LATI	2233	
	NS LAT	HLL SEC LAT	2642	X	X	X						1.5	HLL	A	2	240	NSQ HLL, 2641	2641	NSI	2335	
NS LAT	LLL SEC LAT	2643	X	X	X	X					1.5	LLL	A	2	180	NSQ LLL, 2642	2642, 2382	NSI	2384		
LAT SKILL TOTAL								3	1.5	0	0.0	4	6.0								
DIVISION (DIV)																					
DIV	FORM	DIV TACFORM/NAV	2780	X	X							1.5	(NS)	A	3	*	2140	2140, 2382~LLL	BICC	2183	
	CAL	DIV CAL	2781	X	X							1.5	D	A	3	*	2242, 2780	2242	BICC	2136	
	CAL	HLL DIV CAL	2782	X	X							1.5	HLL	A	3	*	2341, 2781	2341, 2781	NSI	2336	
	CAL	LLL DIV CAL	2783	X	X	X	X					1.5	LLL	A	3	365	2383, 2782	2782	NSI	2385	

MV-22B CREW CHIEF T&R MATRIX (2000-6000 Phase)

MV-22B CREW CHIEF T&R MATRIX (2000-6000 Phase)																					
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	POI				ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	INSTRUCTOR	EVENT CONV
				BASIC	TRANSITION	REFRESHER	MAINTAIN	#	TIME	#	TIME	#	TIME								
	CAL	DIV LAT	2784	X	X	X	X						1.5	(NS)	A	3	365	2780, 2641~D, 2642~HLL, 2643~LLL	2642~HLL, 2643~LLL	LATI~D, NSI~NS	2183
DIV TOTAL								0	0.0	0	0.0	5	7.5								
GROUND THREAT REACTION (GTR)																					
GTR	ACAD	ASE	2810	X	X	X			1.0					(N)	G		730	2611		WTI	2810
	ACAD	BASIC PRINCIPLES OF EW	2811	X	X				1.0					(N)	G		*	2810		WTI	2811
	ACAD	AIR DEFENSE ARTILLERY THREAT	2812	X	X				1.0					(N)	G		*	2811		WTI	2812
	ACAD	IR SURFACE-TO-AIR MISSILE THREAT	2813	X	X				1.0					(N)	G		*	2811		WTI	2813
	ACAD	RADAR SURFACE-TO-AIR MISSILE	2814	X	X				1.0					(N)	G		*	2811		WTI	2814
	ACAD	GTR	2815	X	X				1.0					(N)	G		*	2810,2811,2812,2813,2814		WTI	2815
	LAB	GTR WALK-THROUGH	2820	X	X				0.5					(N)	G		*	2815		WTI	2820
	SGTR	SECTION TR SIM	2831	X	X	X					2.0			(NS)	S	2	*	2820		WTI	
GTR	SECTION TR	2840	X	X	X	X						1.5	(NS)	A	2	365	2140,2641,2831	2641, 2642~HLL, 2643~LLL	WTI	2832	
GTR SKILL TOTAL								7	6.5	1	2.0	1	1.5								
CARRIER QUALIFICATION (CQ)																					
CQ	SCQ	DAY SIM	2930	X	X					1.0				D	S	1	*	2240		BICC	
	SNSCQ	NIGHT SIM	2931	X	X					1.0				NS	S	1	*	2930		BICC	
	CQ	DAY FCLP	2940	X	X	X						1.5		D	A	1	365	2930		BICC	2931
	CQ	DAY CQ	2941	X	X	X						1.5		D	A	1	365	2940	2940	BICC	2932
	NSCQ	NIGHT FCLP	2942	X	X	X						1.5		NS	A	1	365	2931, 2940	2940	NSI	2934
	NSCQ	NIGHT CQ	2943	X	X	X	X						1.5		NS	A	1	365	2942	2941, 2942	NSI
CQ SKILL TOTAL								0	0.0	2	2.0	4	6.0								
BASIC CC 2000 PHASE TOTAL								26	21.5	4	5.0	29	45.0								
3000 PHASE (MISSION)																					
AIR LOGISTICS SUPPORT (ALS)																					
ALS	ACAD	SIX FUNCTIONS	3011	X	X				0.5					(N)	G		*	NSQ		WTI	3217
	ALS	ALS MSN	3040	X	X	X	X						2.0	(NS)	A	2	365	3011		LATI	3030
ALS SKILL TOTAL								1	0.5	0	0.0	1	2.0								
EXPEDITIONARY SHORE BASED OPERATIONS (EXP)																					
EXP	ACAD	EA ACEOI	3110	X	X				0.5					(N)	G		*	3011		WTI	3012
	EXP	GS MSN	3140	X	X	X	X						2.0	(NS)	A	2	365	TGQ,2840,3040,3110		LATI	3030
EXP SKILL TOTAL								1	0.5	0	0.0	1	2.0								
EXPEDITIONARY SEA BASED OPERATIONS (SEA)																					
SEA	SEA	SHIP TO SHORE MSN	3240	X	X	X	X						2.0	(NS)	A	2	365	CQ,2840,3140		LATI	3130
SEA SKILL TOTAL								0	0.0	0	0.0	1	2.0								
TACTICAL RECOVERY OF AIRCRAFT AND PERSONNEL (TRAP)																					
TRAP	ACAD	PR 102 JKO	3310	X	X				1.0					(N)	G		*	3110			3410
	TRAP	TRAP MISSION	3340	X	X	X	X						2.0	(NS)	A	2	365	2840,3140,3310	3140,3040	LATI	3430

MV-22B CREW CHIEF T&R MATRIX (2000-6000 Phase)																					
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	POI				ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	INSTRUCTOR	EVENT CONV
				BASIC	TRANSITION	REFRESHER	MAINTAIN	#	TIME	#	TIME	#	TIME								
TRAP SKILL TOTAL								1	1.0	0	0.0	1	2.0								
COMBAT ASSAULT TRANSPORT (CAT)																					
CAT	ACAD	NEO EXECUTION	3415	X	X				1.0					(N)	G		*	3110		WTI	3311
	ACAD	CASEVAC	3416	X	X				1.0					(N)	G		*	3110		WTI	3310
	CAT	LOW THRT SEC	3440	X	X	X	X					1	2.0	NS	A	2	365	LATQ,3140,3415,3416	3140,3040	LATI	3230
	CAT	ESCORT SEC	3441	X	X	X	X					1	2.0	(NS)	A	2	365	3440	3140,3040	LATI	3233
CAT SKILL TOTAL								2	2.0	0	0.0	2	4.0								
3000 PHASE TOTAL								5	4.0	0	0.0	6	12.0								
4000 PHASE (CORE PLUS)																					
AERIAL DELIVERY (AD)																					
AD	ACAD	EA AIR DELIVERY	4010	X	X			1	1.0					(N)	G		*	2610		BICC	2610
	PARA	PARAOPS	4041	X	X	X						1.5	(NS)	A	1	365	LATQ,NSQ for appropriate light level,4010	2240	BICC	4030	
	AD	DOOR BUNDLE	4042	X	X							1.5	(NS)	A	1	365	2641,2642~HLL,2643~LLL,4010	2240	BICC	2631	
	AD	CDS	4043	X	X	X	X					1.5	(NS)	A	1	365	2641,2642~HLL,2643~LLL,4010	2240	BICC	2631	
	EXT	DAY SINGLE POINT EXTERNALS	4081	X	X	X						1.5	D	A	1	365	2240,4010	2240	BICC	4031	
	EXT	DAY DUAL POINT EXTERNALS	4082	X	X	X						1.5	D	A	1	365	4081	4081	BICC	4032	
	EXT	NS SINGLE POINT EXTERNALS	4083	X	X	X	X					1.5	NS	A	1	365	2340~HLL,2380~LLL,4081	4081	NSI	4033	
	EXT	NS DUAL POINT EXTERNALS	4084	X	X	X	X					1.5	NS	A	1	365	2340~HLL,2380~LLL,4082	4083,4082,4081	NSI	4034	
AD SKILL TOTAL								1	1.0	0	0.0	7	10.5								
ALTERNATE INSERTION/EXTRACTION TECHNIQUES (A/E)																					
A/E	ACAD	ALTERNATE INSERT/EXTRACT	4111	X	X				0.5					(N)	G		*	2611		BICC	4111
	ACAD	HOIST OPS	4112	X	X				0.5					(N)	G		*	2611		BICC	4112
	AIE	FASTROPE / RAPPEL	4140	X	X	X	X					1.5	(NS)	A	1	365	4081,4083~NS,4111	2240,4081,4083~NS	BICC	4130	
	AIE	HOISTING	4141	X	X	X	X					1.5	(NS)	A	1	365	4081,4083~NS,4112	2240	BICC	4131	
	AIE	SPIE	4142	X	X	X	X					1.5	(NS)	A	1	365	4081,4083~NS,4111	2240,4081,4083~NS	BICC	4132	
	AIE	HELO CAST	4143	X	X	X	X					1.5	(NS)	A	1	365	2240,4111,4081,4083~NS	2240	BICC	4133	
A/E SKILL TOTAL								2	1.0	0	0.0	4	6.0								
MOUNTAIN AREA TRAINING (MAT)																					
MAT	MAT	DAY MAT	4180	X	X	X						1.5	D	A	1	365	2240	2240	BICC	2732	
	MAT	NS MAT	4181	X	X	X	X					1.5	NS	A	1	365	2240,2340~HLL,2380~LLL,4180	2240,2340~NS,2380~LLL,	NSI	2733	
MAT SKILL TOTAL								0	0.0	0	0.0	2	3.0								

MV-22B CREW CHIEF T&R MATRIX (2000-6000 Phase)

MV-22B CREW CHIEF T&R MATRIX (2000-6000 Phase)																					
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	POI				ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	INSTRUCTOR	EVENT CONV
				BASIC	TRANSITION	REFRESHER	MAINTAIN	#	TIME	#	TIME	#	TIME								
DEFENSIVE WEAPONS SYSTEM (DWS)																					
DWS	ACAD	GAU-17/A	4210	X	X				1.0					(N)	G		*	2510		DWSI	4510
	ACAD	EA MV-22 DWS	4211	X	X				1.0					(N)	G		*	4210		DWSI	4511
	LAB	DWS INSTALLATION	4220	X	X				0.5					(N)	A	1	*	4210,4211		DWSI	4520
	LAB	DWS FUNCTIONALITY	4221	X	X				1.5					(N)	S/A	1	*	4210,4211,4220		DWSI	4521
	LAB	DWS EPs	4222	X	X				1.0					(N)	S/A	1	180	4210,4211,4220,4221		DWSI	4522
	LAB	GAU-17/A	4223	X	X				1.0					(N)	G	1	*	4210		DWSI	4523
	DWS	DAY W/NO ROUNDS	4240	X	X	X							1.5	D	A	1	*	TGQ, 4222,4223		DWSI	4531
	DWS	DAY DWS EMPLOYMENT	4241	X	X	X							1.5	D	A	1	*	4240	4240	DWSI	4532
	DWS	DAY SECTION DWS EMPLOYMENT	4242	X	X	X							1.5	D	A	2	365	4241	4241	DWSI	4533
	DWS	NIGHT W/NO ROUNDS	4243	X	X	X							2.0	NS	A	1	*	4231	4242	DWSI	4534
	DWS	NIGHT DWS EMPLOYMENT	4244	X	X	X							1.5	NS	A	1	365	4232,4234	4243	DWSI	4535
	DWS	NIGHT SECTION DWS EMPLOYMENT	4245	X	X	X	X						1.5	NS	A	2	365	4235	4244	DWSI	4536
DWS SKILL								6	6.0	0	0.0	6	9.5								
DEFENSIVE COMBAT MANEUVERING (DCM)																					
DCM	ACAD	RW THREAT TO AS	4310	X	X				1.0					(N)	G		*	2840		WTI	4810
	ACAD	FW THREAT TO AS	4311	X	X				1.0					(N)	G		*	2840		WTI	4811
	ACAD	MV-22 DEFTAC	4312	X	X				1.0					(N)	G		*	4310,4311		DCMI	4812
	ACAD	DCM	4313	X	X				1.0					(N)	G		*	4310,4311,4312		DCMI	4812
	LAB	DCM WALKTHROUGH	4320	X	X				0.5					(N)	G		*	4313		DCMI	4820
	DCM	DCM AGAINST FW AGGRESSOR	4340	X	X	X	X						1.0	D	A	2	365	4320	2840	DCMI	4831
DCM SKILL TOTAL								5	4.5	0	0.0	1	1.0								
CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR (CBRN) / CARRIER QUALIFICATION (CQ) / COMBAT ASSAULT TRANSPORT (HTT)																					
CBRN	LAB	EQUIPMENT FIT & FAM	4420	X	X				0.5					(N)	G		*	2240		BICC	4620
	SCBRN	DAY CBRN	4430	X	X						1.0			D	S	1	*	4420		BICC	4630
	SCBRN	NIGHT CBRN	4431	X	X	X	X					1.0		NS	S	1	730	NSQ,4430	4430	BICC	4631
CBRN SKILL TOTAL								1	0.5	2	2.0	0	0.0								
CARRIER QUALIFICATION (CQ)																					
CQ	CQ	NIGHT UNAIDED FCLP	4480	X	X	X							1.0	N*	A	1	365	2940	4470	BICC	4781
	CQ	NIGHT UNAIDED CQ	4481	X	X	X	X						1.5	N*	A	1	365	2941,4480	4481	BICC	4782
CQ SKILL TOTAL								0	0.0	0	0.0	2	2.5								
RAPID INSERTION / EXTRACTION																					
R/E	R/E	RAPID INSERT/EXTRACT	4540	X	X	X	X						2.5	(NS)	A	1	365	APPROPRIATE AIE SKILL		LATI	4180
R/E SKILL TOTAL								0	0.0	0	0.0	1	2.5								
AVIATION DELIVERED GROUND REFUELING																					
ADGR	ACAD	ADGR	4610	X	X				1.0					(N)	G		*	2240		BICC	4210
	LAB	ADGR LAB	4620	X	X				2.0					(N)	A	1	365	4610	4640	BICC	4220
	ADGR	ADGR MISSION	4640	X	X	X	X						0.5	(NS)	A	1	365	2240,2340~HLL,2380~LLL,4620	4620	BICC	4230

MV-22B CREW CHIEF T&R MATRIX (2000-6000 Phase)																					
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	POI				ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	INSTRUCTOR	EVENT CONV
				BASIC	TRANSITION	REFRESHER	MAINTAIN	#	TIME	#	TIME	#	TIME								
ADGR SKILL TOTAL								2	3.0	0	0.0	1	0.5								
BATTLEFIELD ILLUMINATION (BI)																					
BI	ACAD	EA BATTLEFIELD ILLUMINATION	4710	X	X				1.0					(N)	G		*			BICC	4310
	BI	BI ASSISTANT	4740	X	X	X	X					1.5		NS	A	1	365	NSQ FOR APPROPRIATE LIGHT LEVEL, 4710		BICC	4330
	BI	BI LEAD	4741	X	X	X	X					1.5		NS	A	1	365	NSQ FOR APPROPRIATE LIGHT LEVEL, 4740		WTI	6653
BI SKILL TOTAL								1	1.0	0	0.0	2	3.0								
AIR DELIVERY (AD)																					
AD	AD	AD MISSION	4840	X	X	X	X					2.5		(NS)	A	1	365	APPROPRIATE AD SKILL		LATI	3530
AD SKILL TOTAL								0	0.0	0	0.0	1	2.5								
AIRBORNE COMMAND AND CONTROL (AC2)																					
AC2	LAB	AIRBORNE C2 LAB	4920	X	X				1.0					(N)	A	1	*	NSQ		BIP	4420
AC2 SKILL TOTAL								1	1.0	0	0.0	0	0.0								
5000 PHASE (INSTRUCTOR TRAINING)																					
BASIC INSTRUCTOR CREW CHIEF (BICC)																					
BICC	ACAD	BASIC INST TRAINING COURSE	5010	X	X				8.0					(N)	G		*	NSQ, LLL STAN BOARD		BICC	5010
	LAB	AIRCREW TRAINING MANUALS	5020	X	X	X			3.0					(N)	G		*	5010		NI/ANIWTI	5020
	BICC	BICC CERTIFICATION	5040	X	X	X						1.0		D	A	1	*	5020		NI/ANIWTI	5030
BICC SKILL TOTAL								2	11.0	0	0.0	1	1.0								
TAIL GUNNERY INSTRUCTOR (TGI)																					
TGI	ACAD	Training the Aerial Gunner	5411	X					1.0					(N)	G		*	2543, 2551, STAN BOARD		M240D TGI	5411
	TGI	TG IUT (M240D)	5430	X	X							1.5		D	A	1	*	5411		M240D TGI	5430
	TGI	TG IUT (M240D)	5431	X	X							1.5		NS	A	1	*	5430		M240D TGI	5431
	ACAD	FUNDAMENTALS OF AERIAL GUNNERY	5410	X					1.0					(N)	G		*	5431		MAWTS-1 CC	5410
	LAB	M240D LAB	5420	X					1.5					(N)	G		*	5431,5410		MAWTS-1 CC	5420
	TGI	TGI CERTIFICATION (M240D)	5432	X								1.5		NS	A	2	*	5431		MAWTS-1 CC	5432
	TGI	TG IUT (GAU-16/A)	5433	X								1.5		(NS)	A	1	*	2543, 2553, STAN BOARD		GAU-16/A TGI	5433
	LAB	GAU-16/A LAB	5421	X	X				1.5					(N)	G		*	5433		GAU-16/A TGI	5421
	TGI	TGI CERTIFICATION (GAU-16/A)	5434	X	X							1.5		NS	A	1	*	5433, 5421		GAU-16/A TGI	5434
	TGI	GAU-21 IUT	5435	X								1.5		(NS)	A	1	*	2543, 2555, GAU-21 STAN BOARD		GAU-21 TGI	
	LAB	GAU-21 LAB	5422	X	X				1.5					(N)	G		*	5435		MAWTS-1 TGI(GAU-21)	
	TGI	TGI CERTIFICATION (GAU-21)	5436	X	X				1.5					(N)	A	1	*	5435, 5422		MAWTS-1 TGI(GAU-21)	
TGI SKILL TOTAL								0	8.0	0	0.0	0	9.0								

MV-22B CREW CHIEF T&R MATRIX (2000-6000 Phase)

MV-22B CREW CHIEF T&R MATRIX (2000-6000 Phase)																					
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	POI				ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	INSTRUCTOR	EVENT CONV
				BASIC	TRANSITION	REFRESHER	MAINTAIN	#	TIME	#	TIME	#	TIME								
DEFENSIVE WEAPON SYSTEM INSTRUCTOR (DWSI)																					
DWSI	DWSI	DWS IUT	5530	X	X	X						1.5	D	A	1	*	DWSQ, 5432, STAN BOARD		DWSI	5530	
	DWSI	DWS IUT	5531	X	X	X						1.5	NS	A	2	*	5530		DWSI	5531	
	ACAD	DWSI ACAD	5511	X	X	X			1.0				(N)	G		*	5530, 5531		MAWTS-1 DWSI	5511	
	LAB	DWSI LAB	5520	X	X	X			1.0				(N)	G		*	5511		MAWTS-1 DWSI	5520	
	LAB	DWSI LAB	5521	X	X	X			1.0				(N)	G		*	5520		MAWTS-1 DWSI	5521	
	LAB	DWSI LAB	5523	X	X	X			1.0				(N)	G		*	5521		MAWTS-1 DWSI	5523	
	DWSI	DWSI CERTIFICATION	5533	X	X	X						1.5	NS	A	2	*	5511, 5520, 5521, 5523		MAWTS-1 DWSI	5533	
DWSI SKILL TOTAL								0	4.0	0	0.0	0	4.5								
LOW ALTITUDE TACTICS INSTRUCTOR (LATI)																					
LATI	LATI	LAT IUT	5630	X	X	X						1.5	D	A	1	*	LATQ, BICC		LATI	5630	
	ACAD	LATI CERTIFICATION	5610	X	X	X			1.0				(N)	G		*	5630		WTI	5610	
	LATI	LATI CERTIFICATION	5631	X	X	X						2.0	D	A	2	*	5630		WTI	5631	
LATI SKILL TOTAL								0	1.0	0	0.0	0	3.5								
DEFENSIVE COMBAT MANEUVERS INSTRUCTOR (DCMI)																					
DCMI	DCMI	DCM IUT	5831	X	X							1.5	D	A	2	*	LATI,DCMQ,3040,3140, 3340,3441		DCMI	5831	
	ACAD	DCMI ACAD	5810		X				1.0				(N)			*	5831		MAWTS-1 CC DCMI	5810	
	DCMI	DCMI CERTIFICATION	5832	X	X							1.5	D	A	2	*	5831, 5810		MAWTS-1 CC DCMI	5832	
DCMI SKILL TOTAL								0	1.0	0	0.0	0	3.0								
NIGHT SYSTEMS INSTRUCTOR (NSI)																					
NSI	NSI	NS IUT	5931	X	X	X						3.0	NS	A	1		LATI, NSQ (HLL/LLL)		NSI	5931	
	NSI	NS IUT	5933	X	X	X						2.0	NS	A	2		LATI, NSQ (HLL/LLL)		NSI	5933	
	ACAD	NSI ACAD	5910	X	X	X			1.0				(N)	G			5931, 5933		MAWTS-1 CC	5910	
	NSI	NSI CERTIFICATION	5934	X	X	X						1.5	NS	A	1		5931, 5933, 5910		MAWTS-1 CC	5934	
	NSI	NSI CERTIFICATION	5935	X	X	X						1.5	NS	A	2		5931, 5933, 5910		MAWTS-1 CC	5935	
NSI SKILL TOTAL								0	1.0	0	0.0	0	8.0								
6000 PHASE (REQUIREMENTS, CERTIFICATIONS, QUALIFICATIONS AND DESIGNATIONS (R,C,Q,D))																					
NATOPS (NTPS)																					
NTPS	ACAD	NATOPS OPEN BOOK	6010	X	X	X	X		3.0				(N)	G		365			NI / ANI	6010	
	ACAD	NATOPS CLOSED BOOK	6011	X	X	X	X		1.0				(N)	G		365	6010		NI / ANI	6011	
	ACAD	NATOPS ORAL EXAM	6012	X	X	X	X		1.0				(N)	G		365	6011		NI / ANI	6012	
	RQD	NATOPS EVAL	6030	X	X	X	X					1.5	(N)	A	1	365	6012		NI / ANI	6030	
	RQD	ANI EVAL	6031	X	X	X	X					1.5	(N)	A	1	365	6012	6030	NE / NI		
	RQD	NI EVAL	6032	X	X	X	X					1.5	(N)	A	1	365	6012	6030	NE		

MV-22B CREW CHIEF T&R MATRIX (2000-6000 Phase)																					
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	POI				ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	INSTRUCTOR	EVENT CONV
				BASIC	TRANSITION	REFRESHER	MAINTAIN	#	TIME	#	TIME	#	TIME								
NTPS SKILL TOTAL								3.0	5.0	0	5.0	3	4.5								
CREW RESOURCE MANAGEMENT (CRM)																					
CRM	ACAD	CRM REFRESHER	6070	X	X	X	X		1.0				(N)	G		365			CRM/I	6016	
	RQD	CRM EVAL	6080	X	X	X	X				1.5		(N)	S	1	365	6070		CRM/I	6031	
	ACAD	CRM F LECTURE	6090	X	X	X	X		0.0				(N)	G		365	-	6070	CRM/I		
	RQD	CRM F EVAL	6091	X	X	X	X				0.0		(N)	S	1	365	6090	6080	CRM/I		
	ACAD	CRM I COURSE	6092	X	X				0.0				(N)	G		*					
CRM SKILL TOTAL								3	1.0	2	1.5	0	0.0								
EMERGENCY PROCEDURES (EP)																					
EP	RQD	EP REVIEW	6033	X	X	X	X				1.0		(N)	S	1	90				6036	
EP SKILL TOTAL								0	0.0	1	1.0	0	0.0								
REDUCED VISIBILITY LANDINGS AND AUTOMATION TRACKING (RVL)																					
RVL	RVL	HIGH OBSCURATION RVL	6900	X	X	X	X					0.0	(NS)	A	1	180	2270,2271	2282			
RVL SKILL TOTAL								0	0.0	0	0.0	1.0	0.0								

3.14 MV-22B CREW CHIEF RANGE AND ORDNANCE MATRIX

MV-22B CREW CHIEF RANGE AND ORDNANCE MATRIX								
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ORDNANCE	ORDNANCE QUANTITY	ORDNANCE NOTES	RANGE	RANGE NOTES
2000 PHASE (CORE)								
CONFINED AREA LANDING (CAL)								
CAL	CAL	SINGLE CAL	2240					SUITABLE LZ AND AIRSPACE
	CAL	SECTION CAL	2242					SUITABLE LZ AND AIRSPACE
REDUCED VISIBILITY LANDINGS (RVL)								
RVL	RVL	RVL (ACTUAL COND)	2282					LZ WITH REDUCED VISIBILITY CONDITIONS
NIGHT SYSTEMS HIGH LIGHT LEVEL (NS HLL)								
HLL	NS HLL	HLL SGL CAL	2340					SUITABLE LZ AND AIRSPACE
	NS HLL	HLL SEC CAL	2341					SUITABLE LZ AND AIRSPACE
NIGHT SYSTEMS LOW LIGHT LEVEL (NS LLL)								
LLL	NS LLL	FAM/LLL SGL CAL	2380					SUITABLE LZ AND AIRSPACE
	NS LLL	LLL SGL CAL	2381					SUITABLE LZ AND AIRSPACE
	NS LLL	LLL SEC NAV/TACFORM	2382					SUITABLE LZ AND AIRSPACE
	NS LLL	LLL SEC CAL	2383					SUITABLE LZ AND AIRSPACE
TAIL GUNNERY (TG)								
TG	TG	SINGLE SHIP TAIL GUN EMPLOYMENT	2540	7.62 MM,M240D; 50 CAL,GAU-16; .50 CAL,GAU-21	600 ROUNDS	PER GUNNER	Appropriate TG range	
	TG	SECTION TAIL GUN EMPLOYMENT	2541	7.62 MM,M240D; 50 CAL,GAU-16; .50 CAL,GAU-21	600 ROUNDS	PER GUNNER	Appropriate TG range	
	TG	NS SINGLE-SHIP TAIL GUN EMPLOYMENT	2542	7.62 MM,M240D; 50 CAL,GAU-16; .50 CAL,GAU-21 APPROPRIATE WEAPON SYSTEM	600 ROUNDS	PER GUNNER	Appropriate TG and Laser approved range	
	TG	NS SECTION TAIL GUN EMPLOYMENT	2543	APPROPRIATE WEAPON SYSTEM	600 ROUNDS	PER GUNNER	Appropriate TG and Laser approved range	
	TG	M240D UNDER INSTRUCTION	2550	7.62 MM,M240D	600 ROUNDS	PER GUNNER	Appropriate TG and Laser approved range	LASER APPROVED-(NS)
	TG	M240D QUALIFIED	2551	7.62 MM,M240D	600 ROUNDS	PER GUNNER	Appropriate TG and Laser approved range	LASER APPROVED-(NS)
	TG	GAU-16/A UNDER INSTRUCTION	2552	.50 CAL,GAU-16	600 ROUNDS	PER GUNNER	Appropriate TG and Laser approved range	LASER APPROVED-(NS)
	TG	GAU-16/A QUALIFIED	2553	.50 CAL,GAU-16	600 ROUNDS	PER GUNNER	Appropriate TG and Laser approved range	LASER APPROVED-(NS)
	TG	GAU-21 UNDER INSTRUCTION	2554	.50 CAL,GAU-21	600 ROUNDS	PER GUNNER	Appropriate TG and Laser approved range	LASER APPROVED-(NS)
	TG	GAU-21 QUALIFIED	2555	.50 CAL,GAU-21	600 ROUNDS	PER GUNNER	Appropriate TG and Laser approved range	LASER APPROVED-(NS)
LOW ALTITUDE TACTICS (LAT)								
LAT	LAT	LAT MAN / RTE	2640					LAT
	LAT	SEC LAT	2641					LAT
	NS LAT	HLL SEC LAT	2642					LAT
	NS LAT	LLL SEC LAT	2643					LAT

MV-22B CREW CHIEF RANGE AND ORDNANCE MATRIX								
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ORDNANCE	ORDNANCE QUANTITY	ORDNANCE NOTES	RANGE	RANGE NOTES
DIVISION (DIV)								
DIV	FORM	DIV TACFORM/NAV	2780					
	CAL	DIV CAL	2781					SUITABLE LZ AND AIRSPACE
	CAL	HLL DIV CAL	2782					SUITABLE LZ AND AIRSPACE
	CAL	LLL DIV CAL	2783					SUITABLE LZ AND AIRSPACE
	CAL	DIV LAT	2784					SUITABLE LZ AND AIRSPACE
GROUND THREAT REACTION (GTR)								
GTR	GTR	SECTION TR	2840	CHAFF,FLARE	60,30		EW Range	CHAFF AND FLARE CAPABLE RANGE
CARRIER QUALIFICATION (CQ)								
CQ	CQ	DAY FCLP	2940					FCLP
	CQ	DAY CQ	2941					FCLP
	NSCQ	NIGHT FCLP	2942					SHIP
	NSCQ	NIGHT CQ	2943					SHIP
3000 PHASE (MISSION)								
TACTICAL RECOVERY OF AIRCRAFT AND PERSONNEL (TRAP)								
TRAP	TRAP	TRAP MISSION	3340	7.62 / .50, CHAFF, FLARES	600,40,50		YES	AERIAL GUNNERY AND EXPENDABLE CAPABLE RANGE
COMBAT ASSAULT TRANSPORT (CAT)								
CAT	CAT	LOW THRT SEC	3440					
	CAT	ESCORT SEC	3441	7.62 / .50, CHAFF, FLARES	600,40,50		YES	AERIAL GUNNERY AND EXPENDABLE CAPABLE RANGE
4000 PHASE (CORE PLUS)								
AERIAL DELIVERY (AD)								
AD	PARA	PARAOPS	4041				CERTIFIED DROP ZONE	
	AD	DOOR BUNDLE	4042				CERTIFIED DROP ZONE	
	AD	CDS	4043				CERTIFIED DROP ZONE	
	EXT	DAY SINGLE POINT EXTERNALS	4081				EXT	External Load
	EXT	DAY DUAL POINT EXTERNALS	4082				EXT	External Load
	EXT	NS SINGLE POINT EXTERNALS	4083				EXT	External Load
	EXT	NS DUAL POINT EXTERNALS	4084				EXT	External Load
ALTERNATE INSERTION/EXTRACTION TECHNIQUES (A/E)								
A/E	AIE	FASTROPE / RAPPEL	4140					SUITABLE AIRSPACE
	AIE	HOISTING	4141					SUITABLE AIRSPACE
	AIE	SPIE	4142					SUITABLE AIRSPACE
	AIE	HELO CAST	4143					SUITABLE AIRSPACE
MOUNTAIN AREA TRAINING (MAT)								
MAT	MAT	DAY MAT	4180					SUITABLE LZ AND AIRSPACE
	MAT	NS MAT	4181					SUITABLE LZ AND AIRSPACE
DEFENSIVE WEAPONS SYSTEM (DWS)								
DWSI	DWS	DAY W/NO ROUNDS	4240				AIR TO GROUND GUNNERY RANGE AND MOVING LAND TARGET (MLT) IF AVAILABLE	

MV-22B CREW CHIEF RANGE AND ORDNANCE MATRIX

SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ORDNANCE	ORDNANCE QUANTITY	ORDNANCE NOTES	RANGE	RANGE NOTES
	DWS	DAY DWS EMPLOYMENT	4241	7.62, GAU-17	2000	ROUNDS PER GUNNER	AIR TO GROUND GUNNERY RANGE AND MOVING LAND TARGET (MLT) IF AVAILABLE	
	DWS	DAY SECTION DWS EMPLOYMENT	4242	7.62, GAU-17	2000	ROUNDS PER GUNNER	AIR TO GROUND GUNNERY RANGE AND MOVING LAND TARGET (MLT) IF AVAILABLE	
	DWS	NIGHT W/NO ROUNDS	4243				AIR TO GROUND GUNNERY RANGE AND MOVING LAND TARGET (MLT) IF AVAILABLE	
	DWS	NIGHT DWS EMPLOYMENT	4244	7.62, GAU-17	2000	ROUNDS PER GUNNER	AIR TO GROUND GUNNERY RANGE AND MOVING LAND TARGET (MLT) IF AVAILABLE	
	DWS	NIGHT SECTION DWS EMPLOYMENT	4245	7.62, GAU-17	2000	ROUNDS PER GUNNER	AIR TO GROUND GUNNERY RANGE AND MOVING LAND TARGET (MLT) IF AVAILABLE	
	DEFENSIVE COMBAT MANEUVERING (DCM)							
DCM	DCM	DCM AGAINST FW AGGRESSOR	4340				ACM RANGE SPACE	
CARRIER QUALIFICATION (CQ)								
CQ	CQ	NIGHT UNAIDED FCLP	4480					FCLP
	CQ	NIGHT UNAIDED CQ	4481					SHIP
RAPID INSERTION / EXTRACTION								
R/E	R/E	RAPID INSERT/EXTRACT	4540					SUITABLE AIRSPACE
AVIATION DELIVERED GROUND REFUELING								
ADGR	ADGR	ADGR MISSION	4640					SUITABLE AIRSPACE
BATTLEFIELD ILLUMINATION (BI)								
BI	BI	BI ASSISTANT	4740	LUU-2A/B, LUU-19B	6		AIR TO GROUND RANGE	SUAS AUTHORIZED FOR USE OF APFS
	BI	BI LEAD	4741	LUU-2A/B, LUU-19B	6		AIR TO GROUND RANGE	SUAS AUTHORIZED FOR USE OF APFS
AIR DELIVERY (AD)								
AD	AD	AD MISSION	4840				RANGE REQUIREMENTS SPECIFIC TO EACH SPECIFIC AD SKILL.	
5000 PHASE (INSTRUCTOR TRAINING)								
TAIL GUNNERY INSTRUCTOR (TGI)								
TGI	TGI	TG IUT (M240D)	5430	7.62, M240D	600 ROUNDS	PER GUNNER	APPROPRIATE TG RANGE	
	TGI	TG IUT (M240D)	5431	7.62, M240D	600 ROUNDS	PER GUNNER	APPROPRIATE TG / LASER RANGE	LASER APPROVED-(NS)
	TGI	TGI CERTIFICATION (M240D)	5432	7.62, M240D	600 ROUNDS	PER GUNNER	APPROPRIATE TG / LASER RANGE	LASER APPROVED-(NS)
	TGI	TG IUT (GAU-16/A)	5433	.50 CAL, GAU-16	600 ROUNDS	PER GUNNER	APPROPRIATE TG RANGE	
	TGI	TGI CERTIFICATION (GAU-16/A)	5434	.50 CAL, GAU-16	600 ROUNDS	PER GUNNER	APPROPRIATE TG / LASER RANGE	LASER APPROVED-(NS)
	TGI	GAU-21 IUT	5435	.50 CAL, GAU-21	600 ROUNDS	PER GUNNER	APPROPRIATE TG RANGE	
	TGI	TGI CERTIFICATION (GAU-21)	5436	.50 CAL, GAU-21	600 ROUNDS	PER GUNNER	APPROPRIATE TG / LASER RANGE	LASER APPROVED-(NS)
DEFENSIVE WEAPON SYSTEM INSTRUCTOR (DWSI)								
DWSI	DWSI	DWSI CERTIFICATION	5533	7.62, GAU-17	2000	ROUNDS PER GUNNER	AIR TO GROUND GUNNERY RANGE AND MOVING LAND TARGET (MLT) IF AVAILABLE	
LOW ALTITUDE TACTICS INSTRUCTOR (LATI)								

MV-22B CREW CHIEF RANGE AND ORDNANCE MATRIX								
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ORDNANCE	ORDNANCE QUANTITY	ORDNANCE NOTES	RANGE	RANGE NOTES
LATI	LATI	LAT IUT	5630				LAT	
	LATI	LATI CERTIFICATION	5631				LAT	
DEFENSIVE COMBAT MANEUVERS INSTRUCTOR (DCMI)								
DCMI	DCMI	DCM IUT	5831	90 FLARES, RMWS	ZERO ROUNDS			
	DCMI	DCMI CERTIFICATION	5832	90 FLARES, RMWS	ZERO ROUNDS		ACM RANGE SPACE	
REDUCED VISIBILITY LANDINGS AND AUTOMATION TRACKING (RVL)								
RVL	RVL	HIGH OBSCURATION RVL	6900					SUITABLE LZ AND AIRSPACE

3.15 **MV-22B FRS CREW CHIEF T&R MATRIX (1000 & 5000 Phase)**

MV-22B FRS CREW CHIEF T&R MATRIX (1000 & 5000 Phase)																					
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	POI				ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	INSTRUCTOR	EVENT CONV
				BASIC	TRANSITION	REFRESHER	MAINTAIN	#	TIME	#	TIME	#	TIME								
1000 PHASE (CORE INTRODUCTION)																					
GROUND SCHOOL																					
GROUND SCHOOL	ACAD	GROUND SCHOOL INBRIEF	0100	X	X				1.0					(N)	G		*			FRSCCI	0100
	ACAD	ACAD BLK 1	0101	X	X				11.5					(N)	G		*	0100		FRSCCI	0101
	LAB	FIRE EXT LAB	0200	X	X				1.0					(N)	A	1	*	0100		FRSCCI	0200
	LAB	INGRESS, EGRESS	0201	X	X				1.0					(N)	C/A		*	0100		FRSCCI	0201
	LAB	INTRO TO APU, CMS STARTUP	0202	X	X						5.0			(N)	S	1	*	0100		FRSCCI	0202
	ACAD	ACAD BLK 2	0102	X	X				15.0					(N)	G		*	0101		FRSCCI	0102
	LAB	APU, CMS STARTUP	0203	X	X						5.0			(N)	S	1	*	0101		FRSCCI	0203
	ACAD	ACAD BLK 3	0103	X	X				13.5					(N)	G		*	0102		FRSCCI	0103
	LAB	CONTROLS AND DISPLAYS	0204	X	X						5.0			(N)	S	1	*	0102		FRSCCI	0204
	LAB	COMM AND NAV	0205	X	X						5.0			(N)	S	1	*	0102		FRSCCI	0205
	ACAD	ACAD BLK 4	0104	X	X				9.0					(N)	G		*	0103		FRSCCI	0104
	LAB	NAVIGATION AND IEWS	0206	X	X						4.0			(N)	S/A		*	0103		FRSCCI	0206
	ACAD	ACAD BLK 5	0105	X	X				16.0					(N)	G		*	0104		FRSCCI	0105
	LAB	ENGINE FAMILIARIZATION	0207	X	X				5.0					(N)	A	1	*	0104		FRSCCI	0207
	LAB	APU AND FIRE PROTECTION	0208	X	X				2.0					(N)	A	1	*	0104		FRSCCI	0208
	LAB	WEIGHT AND BALANCE	0209	X	X						4.0			(N)	S	1	*	0104		FRSCCI	0209
	LAB	CARGO LOADING	0210	X	X				3.0					(N)	G		*	0104		FRSCCI	0210
	ACAD	ACAD BLK 6	0106	X	X				12.0					(N)	G		*	0105		FRSCCI	0106
	LAB	PROPROTOR SYS	0211	X	X				3.0					(N)	A	1	*	0105		FRSCCI	0211
	LAB	HYD, ENG START, EAPS	0212	X	X						6.0			(N)	S	1	*	0105		FRSCCI	0212
	ACAD	ACAD BLK 7	0107	X	X				12.5					(N)	G		*	0106		FRSCCI	0107
	LAB	LANDING GEAR	0213	X	X				2.0					(N)	A	1	*	0106		FRSCCI	0213
	LAB	SERVICING	0214	X	X				2.0					(N)	A	1	*	0106		FRSCCI	0214
	LAB	INTRO TO BFWS	0215	X	X						11.0			(N)	S	1	*	0106		FRSCCI	0215
	LAB	BFWS	0216	X	X				6.0					(N)	A/S	1	*	0106		FRSCCI	0216
	ACAD	ACAD BLK 8	0108	X	X				22.0					(N)	G		*	0107		FRSCCI	0108
	LAB	INTRO PLANE CAPTAIN DUTIES	0217	X	X				40.0					(N)	A	1	*	0107		FRSCCI	0217
	ACAD	ACAC BLK 9	0109	X	X				17.0					(N)	G		*	0108		FRSCCI	0109
	LAB	STARTUP, TAXI, SHUTDOWN	0218	X	X				5.0					(N)	A		*	0108		FRSCCI	0218
	LAB	MOORING	0219	X	X				2.0					(N)	A	1	*	0108		FRSCCI	0219
	LAB	ALSS EQUIPMENT	0220	X	X				4.0					(N)	G		*	0108		FRSCCI	0220
	LAB	EMERGENCY PROCEDURES	0221	X	X				4.0					(N)	G		*	0108		FRSCCI	0221
	LAB	MISSION PREP/BRIEFING	0222	X	X				2.0					(N)	A	1	*	0108		FRSCCI	0222
	ACAD	CRM INITIAL	0110	X	X				4.0					(N)	G		*			CRMI	0110
	ACAD	NITE LAB	0111	X	X				8.0					(N)	G		*			AMSO/AMSC	0111

MV-22B FRS CREW CHIEF T&R MATRIX (1000 & 5000 Phase)																					
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	POI				ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	INSTRUCTOR	EVENT CONV
				BASIC	TRANSITION	REFRESHER	MAINTAIN	#	TIME	#	TIME	#	TIME								
	ACAD	MV-22 CRM	0114	X	X				2.0					(N)	G		*	100		FRSI	
GROUND SCHOOL TOTAL								28	225.5	8	45.0	0	0.0								
FAMILIARIZATION (FAM)																					
FAM	ACAD	FAM STAGE INBRIEF	1010	X	X				1.0					(N)	G		*	GRND SCHOOL COMP		FRSCCI	1010
	ESFAM	CMS CHECKLIST	1032	X	X						2.0			(N)	S/A	1	*	1010		FRSCCI	1032
	ESFAM	CC CALL OUTS, START UP	1033	X	X						2.0			D	S/A	1	*	1032		FRSCCI	1033
	FAM	ENG STRT, NAC DRILL, CONV PTRN	1080	X	X								1.5	D	A	1	*	1033		FRSCCI	1043
	FAM	CONV PTRN, STP APP, MGW	1081	X	X								1.5	D	A	1	*	1080		FRSCCI	1044
	FAM	CONV PTRN, TRNS/CONV, LSC	1082	X	X								1.5	D	A	1	*	1081		FRSCCI	1045
	FAM	APLN PTRN	1083	X									1.5	D	A	1	*	1082		FRSCCI	1046
	FAM	APLN PTRN, HIGH AOB, STALLS	1084	X	X								1.5	D	A	1	*	1083		FRSCCI	1047
	FAM	APLN PTRN, STALLS, ELP	1085	X									1.5	D	A	1	*	1084		FRSCCI	1048
FAM	FAM PROGRESS CHECK	1086	X	X								1.5	D	A	1	*	1085		FRSCCI	1049	
FAM TOTAL								1	1.0	2	4.0	7	10.5								
INSTRUMENT (INST)																					
INST	ACAD	INST STAGE INBRIEF	1210	X	X				1.0					(N)	G		*	1083		FRSCCI	1210
	INST	BASIC INSTRUMENT FLIGHT	1240	X	X							1.5		N*	A	1	*	1210		FRSCCI	1234
INST TOTAL								1	1.0	0	0.0	1	1.5								
CONFINED AREA LANDING (CAL)																					
CAL	ACAD	CAL STAGE INBRIEF	1310	X	X				1.0					(N)	G		*	1086		FRSCCI	1310
	CAL	CAL PTRN, TAC ST IN, RVL	1340	X	X							2.0		D	A	1	*	1310		FRSCCI	1332
	CAL	CAL, RVL	1341	X	X							1.5		D	A	1	*	1340		FRSCCI	
CAL TOTAL								1	1.0	0	0.0	2	3.5								
FORMATION (FORM)																					
FORM	ACAD	FORM STAGE INBRIEF	1410	X	X				1.0					(N)	G		*	1086		FRSCCI	1410
	FORM	FORM SEQ	1440	X	X							2.0		D	A	2	*	1340,1410		FRSCCI	1432
FORM TOTAL								1	1.0	0	0.0	1	2.0								
FIELD CARRIER LANDING PRACTICE (FCLP)																					
FCLP	ACAD	FCLP STAGE INBRIEF	1510	X	X				1.0					(N)	G		*	1086		FRSCCI	
	FCLP	DAY FCLP	1540	X	X							1.5		D	A	1	*	1510,1340		FRSCCI	
FCLP TOTAL								1	1.0	0	0.0	1	1.5								
NIGHT SYSTEMS (NS)																					
NS	ACAD	NS STAGE INBRIEF	1610	X	X				1.5					(N)	G		*	1086		NSFI / NSI	1610
	NS	NVD FAM, FLIR USE	1640	X								1.5		NS	A	1	*	1610,0111		NSFI / NSI	1631
	NS	NVD CAL, FLIR	1641	X	X							1.5		NS	A	1	*	1340,1640		NSFI / NSI	1633
	NS	NVD FORM	1642	X	X							2.0		NS	A	2	*	1440,1641		NSFI / NSI	1635
NS TOTAL								1	1.5	0	0.0	3	5.0								

MV-22B FRS CREW CHIEF T&R MATRIX (1000 & 5000 Phase)																					
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	POI				ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	INSTRUCTOR	EVENT CONV
				BASIC	TRANSITION	REFRESHER	MAINTAIN	#	TIME	#	TIME	#	TIME								
CARGO																					
CARGO	ACAD	CARGO OPS STAGE BRIEF	1710	X	X				2.0					(N)	G		*	1086		FRSCCI	1710
	ACAD	MISSION CONFIG CLASS	1711	X	X				2.0					(N)	G		*	1710		FRSCCI	1711
	LAB	INTERNAL CARGO LAB	1720	X	X				2.0					(N)	G		*	1710		FRSCCI	1720
	SCARGO	INTERNAL CARGO SIM	1730	X	X						1.5			D	S		*	1720		FRSCCI	1730
CARGO TOTAL								3	6.0	1	1.5	0	0.0								
REVIEW (REV)																					
REV	ACAD	OPEN BOOK NATOPS EXAM	6010	X	X	X	X		3.0					(N)			365			NE/NI/ANI	6010
	ACAD	CLOSED BOOK NATOPS EXAM	6011	X	X	X	X		1.0					(N)			365	6010		NE/NI/ANI	6011
	ESREV	EP REV	1830	X							1.0			(N)	A/S	1	*	CORE SKILL INTRO		NE/NI/ANI	1830
	ESREV	REV ALL MANEUVERS	1831	X								2.0		(N)	A/S	1	*	1830		FRSCCI	1831
	REV	REV ALL MANEUVERS	1840	X	X							1.5		D	A	1	*	1831		FRSCCI	1832
	ACAD	NATOPS ORAL EXAM	6012	X	X	X	X		3.0					(N)			365	6011		NE/NI/ANI	6012
	RQD	INITIAL NATOPS EVALUATION	1841	X	X	X	X						1.5	(N)	A	1	*	6012, 1840	6030	NE/NI/ANI	
REVIEW TOTAL								3	7.0	1	1.0	3	5.0								
1000 PHASE TOTAL								40	244.0	12	51.5	18	27.5								
5000 PHASE																					
NIGHT SYSTEM FAMILIARIZATION INSTRUCTOR (NSFI)																					
NSFI	ACAD	NSFI ACAD	5710	X	X	X			1.0					(N)	G		*	NSQ (HLL/LLL) , 5143		NSI	5710
	NSFI	NSF IUT	5731	X	X	X						2.0		NS	A	2	*	5710		NSI	5731
	NSFI	NSFI CERTIFICATION	5732	X	X	X						2.0		NS	A	2	*	5630		NSI	5732
NSFI SKILL TOTAL								0	1.0	0	0.0	0	4.0								
FRS CREW CHIEF INSTRUCTOR (FRSCCI)																					
FRSCCI	ACAD	BASIC INSTRUCTOR TRAINING COURSE	5010	X	X	X			8.0					(N)	G		*	NSQ, STAN BOARD			5110
	FIT	FAM IUT	5140	X	X	X						2.0		D	A	1	*	5010		STANI	5130
	FIT	CAL IUT	5141	X	X	X						1.5		D	A	1	*	5010		STANI	5131
	FIT	FORM IUT	5142	X	X	X						1.5		D	A	2	*	5010		STANI	5132
	FIT	FRSCCI CERTIFICATION	5143	X	X	X						2.0		D	A	1	*	5140, 5141, 5142		STANI	5133
FRSCCI SKILL TOTAL								0	8.0	0	0.0	0	7.0								

CHAPTER 4

AERIAL GUNNER/OBSERVER/6199

	PARAGRAPH	PAGE
AERIAL GUNNER/OBSERVER SYLLABUS T&R REQUIREMENTS.....	4.1	4-3
TRAINING PROGRESSION MODEL	4.2	4-3
PROGRAMS OF INSTRUCTION.....	4.3	4-3
PROFICIENCY & CURRENCY	4.4	4-4
REQUIREMENTS, CERTIFICATIONS, QUALIFICATIONS, AND DESIGNATION (RCQD) TABLES	4.5	4-5
SYLLABUS NOTES	4.6	4-5
CORE PHASE	4.7	4-9
MISSION PHASE	4.8	4-49
CORE PLUS PHASE.....	4.9	4-55
REQUIREMENTS, CERTIFICATIONS, QUALIFICATIONS, DESIGNATIONS (RCQD) PHASE.....	4.10	4-82
AERIAL OBSERVER T&R MATRIX (2000-6000 PHASE)	4.11	4-86
AERIAL OBSERVER RANGE AND ORDNANCE MATRIX.....	4.12	4-92

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CHAPTER 4 AERIAL GUNNER/OBSERVER/6199 INDIVIDUAL TRAINING AND READINESS REQUIREMENTS

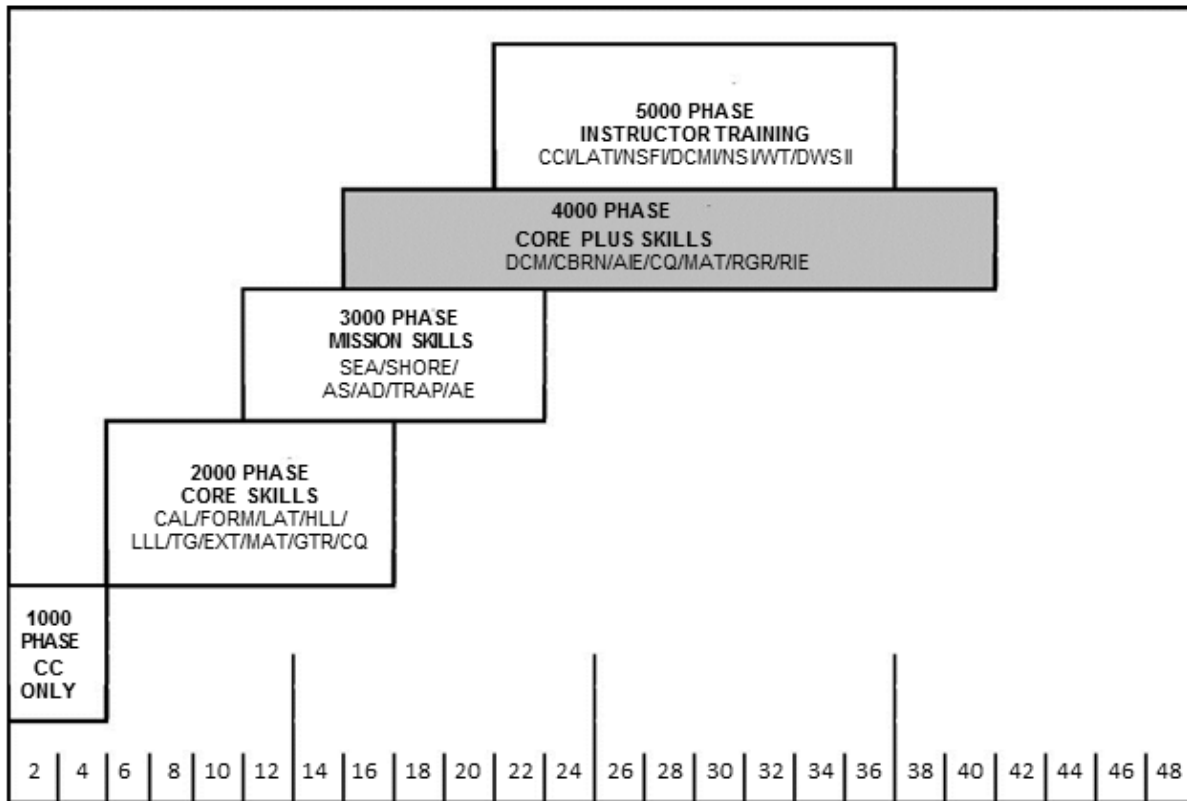
4.1 AERIAL GUNNER/OBSERVER SYLLABUS T&R REQUIREMENTS

This T&R Syllabus is based on specific goals and performance standards designed to ensure individual proficiency in Core and Mission skills. The goal of this chapter is to develop individual and unit warfighting capabilities.

4.2 TRAINING PROGRESSION MODEL

This model represents the recommended training progression for the average MV-22 aerial gunner/observer. Units should use the model as a point of departure to generate individual training plans.

Figure 4-1: Aerial Gunner/Observer Progression Model



4.3 PROGRAMS OF INSTRUCTION (POI)

A Program Of Instruction (POI) is a training track assigned to a Marine based on their proficiency in a skill. All Marines undergoing training are assigned to at least one POI. The following POIs represent the average time-to-train.

4.3.1 Basic (B)

The entire syllabus as listed in Table 4-1 shall be completed for personnel assigned to this category.

Table 4-1: Basic Aerial Gunner/Observer

Weeks	Course/Phase	Activity
1-11	Core Phase	Tactical Squadron
12-21	Mission Phase	Tactical Squadron

4.3.2 Transition (T)

Previously qualified aerial gunner/observers from rotary wing platforms shall be placed in the Transition POI and shall complete all events designated by a 'T' for the 2000-4000 phase. This is defined below in Table 4-2. This assumes that the transition aerial gunner/observer has had previous proficiency in that stage of training. If the transition aerial gunner/observer has no previous proficiency in a stage or particular event, then the transition aerial gunner/observer should fly the entire stage or all events not previously flown. Event proficiency updating for aircrew assigned to the Transition syllabus is per Chapter 2 of the Aviation T&R Program Manual. When all 'T' events in a stage are successfully completed, all remaining events in that stage are updated. Upon completion of the Transition POI, aircrew shall be assigned to the Refresher POI and follow Refresher POI proficiency updating procedures.

Table 4-2: Transition Aerial Gunner/Observer

Weeks	Course/Phase	Activity
1-11	Core Phase	Tactical Squadron
12-21	Mission Phase	Tactical Squadron

4.3.3 Refresher (R)

Previously designated MV-22 aerial gunner/observers who have been out of the MV-22 for more than 730 days shall be placed in the Refresher POI, to be completed at the tactical squadron. When all R-coded events in a stage are successfully completed, the remaining events in that stage that are delinquent are updated. NBA and Incomplete events are not updated and must be completed in addition to R-coded events. If the Refresher aerial gunner/observer has no previous proficiency in a stage or particular event, then the Refresher should fly the entire stage or all events not previously flown.

A Modified Refresher syllabus for personnel out of the aircraft for 486-730 days can be directed by the commanding officer of the tactical squadron. It will be based upon the Refresher syllabus but may be tailored to fit the experience of the aerial gunner/observer. Any modification to the Refresher syllabus by the unit commanding officer shall be documented in Section 3 of the aerial gunner/observer's APR prior to commencement of training. Table 4-3 below provides an example of this syllabus. The Refresher syllabus applies only up to the stage achieved during the prior tour. After that, the aerial gunner/observer will complete the entire remaining syllabus.

Table 4-3: Modified Refresher

Weeks	Course/Phase	Activity
1-2	MV-22 Familiarization	Training/Tactical Squadron
3-4	Ground Schools / OJT	Training/Tactical Squadron
5-7	Core Introduction Phase	Tactical Squadron
8-10	Core Phase	Tactical Squadron
11-12	Mission Phase	Tactical Squadron

4.4 PROFICIENCY AND CURRENCY

4.4.1 Event Proficiency

Event proficiency is defined as successful completion of the performance standard as determined by the instructor or evaluator. Event completion is predicated upon demonstrated proficiency. Once completed, it is logged in M-SHARP by entering the appropriate event code. M-SHARP automatically updates the event proficiency date to reflect the completion date.

4.4.2 Skill Proficiency

Proficiency is a measure of achievement of a specific skill. To attain Individual Skill proficiency, an individual must be simultaneously proficient in all events for that Skill. Individuals may be attaining proficiency in some skills while maintaining proficiency in others.

4.4.2.1 Maintaining Skill Proficiency

Once attained, skill proficiency is maintained by executing those events which have a Proficiency Period (Maintain events). Proficiency Periods establish the maximum time between Event demonstration. Should proficiency be lost in any maintain event, for a specific skill, that skill proficiency is temporarily lost. Skill proficiency can be re-attained by again demonstrating proficiency in the Event(s) that are not proficient. For flying communities, an individual shall complete delinquent events with a proficient instructor, crewman/flight lead as delineated by the T/M/S Syllabus Sponsor (see Chapter 3 of the Program Manual on specific instructor requirements for Low Altitude Flight, Night Systems, ACM, DM, DACM, DCM, FAC(A)).

Loss of Individual Skill Proficiency. Should an individual lose proficiency in all maintain events in a skill, the individual will be assigned to the Refresher POI for the skill. To regain skill proficiency, the individual must demonstrate proficiency in all R-coded events for the skill.

Loss of Unit Skill Proficiency. If an entire unit loses proficiency in an Event, unit instructors shall regain proficiency by completing the Event with an instructor from a like unit. If not feasible, the instructor shall regain proficiency by completing the Event with another instructor. For flying communities, if a unit has only one instructor and cannot complete the Event with an instructor from another unit, the instructor shall regain proficiency with another aircraft commander or as designated by the commanding officer.

Proficiency Status. Proficiency is a “Yes/No” status by skill assigned to an individual. When an individual attains and maintains Core Skill Proficiency (CSP), Mission Skill Proficiency (MSP), Core Plus Skill Proficiency (CPSP), or Mission Plus Skill Proficiency (MPSP), the individual may count towards CMMR or CMTS.

4.4.3 Skill Currency

Currency is a control measure used to provide an additional margin of safety based on exposure frequency to a particular skill and applies to all MOSs that must comply with NATOPS and OPNAV requirements. It is a measure of time since the last event demanding that specific skill. For example, currency determines minimum altitudes in rules of conduct based upon the most recent low altitude fly date. Specific currency requirements for aircrew individual type mission profiles can be found in Chapter 3 of the Program Manual.

Management of individual CSP/MSP/CPSP/CPMP serves as the foundation for developing proficiency requirements in DRRS.

4.5 REQUIREMENTS, CERTIFICATIONS, QUALIFICATIONS, AND DESIGNATION TABLES

Commanders may issue certification, qualification or designation letters when individual personnel complete applicable training requirements. A copy of these letters shall be included in Section 4 of Aircrew Performance Records per Chapter 2 of the Program Manual. Only after successfully completing certification, qualification or designation requirements and being issued a letter signed by the commanding officer will an individual be considered certified, qualified or designated. Do not confuse certifications with qualifications or designations as defined below

Table 4-4: Individual Qualification Requirements

Qualification	Event Requirements
NATOPS	6010R, 6011R, 6012R, 6030R
NSQ HLL	2310,2311,2340,2341
NSQ LLL	2380,2381,2382,2383
Day TGQ	2510,2511/2512/2513,2520/2521/2522,2540,2541
NS TGQ	2514,2515, 2542,2543
Day LATQ	2610,2611,2620,2640,2641
NS LATQ	2642,2643
GTR	2810,2811,2812,2813,2814,2815,2820,2831,2840
CQ	2930,2931,2940,2941,2942,2943
DWSQ	4210,4211,4220,4221,4222,4223,4240,4241,4242,4243,4244,4245
DCMQ	4310,4311,4312,4320,4331

Table 4-5: Individual Designation Requirements

Designation	Event Requirements
AERIAL GUNNER/OBSERVER	Day LATQ,NS LATQ,TGQ,6010R,6011R,6012R,6030R

4.6 SYLLABUS NOTES

4.6.1 Event Environmental Conditions

Table 4-6: Environmental Conditions

Code	Description (Environmental Condition)
D	SHALL BE CONDUCTED DURING DAY
N	SHALL BE CONDUCTED AT NIGHT, AIDED OR UNAIDED, AT LEAST 30 MINUTES AFTER OFFICIAL SUNSET.
(N)	MAY BE CONDUCTED DAY OR NIGHT. IF AT NIGHT, AIDED OR UNAIDED.
NS	SHALL BE CONDUCTED AT NIGHT AIDED UNDER HIGH LIGHT LEVEL OR LOW LIGHT LEVEL AT LEAST 30 MINUTES AFTER OFFICIAL SUNSET.
HLL	SHALL BE CONDUCTED AT NIGHT AIDED UNDER HIGH LIGHT LEVEL CONDITIONS.
LLL	SHALL BE CONDUCTED AT NIGHT AIDED UNDER LOW LIGHT LEVEL CONDITIONS.

(NS)	MAY BE CONDUCTED DAY OR NIGHT. IF AT NIGHT, SHALL BE AIDED UNDER HIGH LIGHT LEVEL OR LOW LIGHT LEVEL AT LEAST 30MINUTES AFTER OFFICIAL SUNSET.
(HLL)	MAY BE CONDUCTED DAY OR NIGHT. IF AT NIGHT, SHALL BE AIDED AND UNDER HIGH LIGHT LEVEL CONDITIONS.
(LLL)	MAY BE CONDUCTED DAY OR NIGHT. IF AT NIGHT, SHALL BE AIDED AND UNDER LOW LIGHT LEVEL CONDITIONS.
N*	SHALL BE CONDUCTED AT NIGHT UNAIDED, AT LEAST 30 MINUTES AFTER OFFICIAL SUNSET
(N*)	MAY BE CONDUCTED DAY OR NIGHT. IF AT NIGHT, SHALL BE UNAIDED.
D/N*	SHALL BE CONDUCTED IN THE SIMULATOR DURING DAY AND NIGHT AIDED.

4.6.2 Device Matrix

The nomenclature in the table below is used to differentiate aircraft, simulator, part task trainer, computer-based trainer, and classroom events. Particular device information is found on the far right of the header. The aircraft is used for those events designated with an A, a simulator or part task trainer is used for those events designated with an S, and ground/academic training, labs, self-paced learning, or the computer based trainer is used for those events designated with a G in the event header. To give commanding officers the maximum amount of flexibility for training, some events allow for the optional use of simulators or aircraft.

Table 4-7: Device Matrix

Symbol	Meaning
A	CONDUCTED IN AIRCRAFT
A/S	AIRCRAFT PREFERRED/SIMULATOR OPTIONAL
S	CONDUCTED IN SIMULATOR
S/A	SIMULATOR PREFERRED/AIRCRAFT OPTIONAL
G	GROUND/ACADEMIC TRAINING. MAY INCLUDE COMPUTER-BASED TRAINING, LECTURES, OR LABS.
NOTE – IF THE EVENT IS TO BE FLOWN IN THE SIMULATOR THE SIMULATOR INSTRUCTOR SHALL SET THE DESIRED ENVIRONMENTAL CONDITIONS FOR THE EVENT.	

4.6.3 Simulator Training

While it is recognized that the simulator does not specifically train to the aerial gunner/observer position, the Flight Training Device (FTD), Full Flight Simulator (FFS), Interactive Cockpit Learning Environment (ICLE) and Consolidated V-22 Enhanced Maintenance Trainer (CVEMT) have been incorporated into the Core Introduction and the Core phases of the syllabus to integrate the aerial gunner/observer into cockpit and cabin procedures prior to entering the aircraft. Any simulator event in the aerial gunner/observer syllabus can be conducted in conjunction with pilot training.

4.6.4 Event Terms

4.6.4.1 Discuss

The CCI shall discuss a system, procedure, or maneuver during the brief, in flight, or debrief.

The AG/OUI shall demonstrate an understanding of all discussed items listed in the event description.

Demonstrate/Introduce flight events shall be discussed during the brief.

Emergencies listed in the event description are treated as discussion items during the brief and may be simulated during the flight at the option of the CCI and in accordance with unit SOP. EPs for Simulator events will be treated as Demonstrate/Introduce items on the event in which they are listed and are subject to review during any subsequent event.

4.6.4.2 Demonstrate

CCI performs the maneuver or procedure with accompanying description. At CCI discretion, the AG/OUI may perform the maneuver or procedure, but is not graded. The AG/OUI observes the maneuver and is responsible for knowledge of the procedures during the brief.

4.6.4.3 Introduce

The CCI may perform the maneuver or procedure with an accompanying description followed by the AG/OUI performing the maneuver or procedure, the CCI may coach the AG/OUI through the maneuver or procedure without demonstration.

The AG/OUI shall perform the maneuver with coaching as necessary and is responsible for knowledge of the procedures prior to the flight. In general, the expectation is that the AG/OUI will not consistently recognize errors and will frequently be outside performance standards.

Safe but limited proficiency. Requires frequent input from the instructor.

4.6.4.4 Practice

The AG/OUI shall perform, with occasional coaching, a maneuver or procedure that has been previously introduced. The purpose is to continue to work towards attaining a specified level of performance.

Correct. Recognizes and corrects errors. Requires occasional input from the instructor.

4.6.4.5 Review

The CCI observes and grades the maneuver or procedure with only minimal coaching.

The AG/OUI is expected to perform the maneuver or procedure with minimal coaching and with only minor procedural errors. In general, the expectation is that the AG/OUI will consistently recognize errors; however occasionally, corrections will not be timely with some excursions outside performance standards.

Correct, efficient, skillful and without hesitation. Requires minimal input from the instructor.

4.6.4.6 Evaluate

The CCI observes and grades the maneuver or procedure without coaching the AG/OUI. An airborne critique of the AG/OUI's performance is at the option of the instructor.

The AG/OUI is expected to perform the maneuver or procedure without coaching, with minor or no procedural errors, and at a level acceptable to warrant progress in the syllabus. The expectation is that the AG/OUI will consistently apply timely corrections with very few and quickly corrected excursions outside performance standards.

Unusually high degree of ability. Requires no input from instructor.

4.6.4.7 Expose

The CCI shall expose the AG/OUI to the procedure or consideration during the brief, in flight or debrief. The AG/OUI is not responsible for the knowledge of the procedure or consideration prior to the flight.

4.6.5 Training Event Performance Requirements

4.6.5.1 Purpose

To familiarize the AG/OUI with general syllabus expectations, definitions, and the observation scale found on the Aircrew Training Forms (ATF).

4.6.5.2 General

AG/OUIs shall be familiar with, but not be required to memorize, numerical system limitations for those systems with indications displayed with a green, yellow or red scale on either the EICAS or MFDs.

All flights shall terminate with a comprehensive debrief with emphasis on aircrew performance and procedures or systems discussed. Instructors should use all available debriefing techniques. Culmination of the debrief shall be an ATF for initial events or those events listed with an X at the discretion of the Commanding Officer.

4.6.5.3 Levels of Learning

Table 3-8 describes how the MAWTS-1 grading scale correlates to the numerical observations for graded events. The MAWTS-1 scale comments are designed to evaluate a AG/OUI's performance.

Table 4-7: Observation Scale

Observation	Level of Learning	General	MAWTS Scale
5	CORRELATION (EVALUATE)	PROACTIVE. AHEAD OF THE SITUATION. REACTS CORRECTLY WITH CHANGING CONDITIONS. AND/OR CHANGING MISSION.	UNUSUALLY HIGH DEGREE OF ABILITY. REQUIRES NO INPUT FROM INSTRUCTOR.
4	APPLICATION (REVIEW)	SELF / CREW RECOGNITION OF ERRORS. CORRECT APPLICATION OF RESOURCES.	CORRECT, EFFICIENT, SKILLFUL, AND WITHOUT HESITATION. REQUIRES MINIMAL INPUTS FROM THE INSTRUCTOR.
3	UNDERSTANDING (PRACTICE)	MINOR ERRORS NOT DETECTED. CREW REDUNDANCY DIMINISHED.	CORRECT. RECOGNIZES AND CORRECTS ERRORS. REQUIRES OCCASIONAL INPUT FROM THE INSTRUCTOR.
2	ROTE (INTRODUCE)	TASK ACCOMPLISHED MECHANICALLY AND/OR WITH LIMITED SITUATIONAL AWARENESS. CREW REDUNDANCY LOST. RISK INCREASED.	SAFE BUT LIMITED PROFICIENCY. REQUIRES FREQUENT INPUT FROM THE INSTRUCTOR.
1	UNFAMILIAR	UNABLE	UNSAT – UNSAFE OR COMPLETE LACK OF ABILITY AND/OR KNOWLEDGE. REQUIRES SUBSTANTIAL INPUT FROM INSTRUCTOR FOR SAFE EXECUTION AND /OR MISSION ACCOMPLISHMENT.

4.6.5.4 Aircrew Training Forms (ATFs)

Also known as syllabus evaluation forms, ATFs are required for any initial event completed by crew members in one of the formal POIs, or as recommended by the Squadron Standardization Board, to include ACAD and LAB events. Events that were converted from a previous version of the T&R do not require a new ATF. However, events that did not previously exist will require an ATF.

If the commanding officer has waived or deferred a syllabus event, the squadron training officer shall place a waiver or deferral letter in Section 3 of the APR.

4.6.5.5 Aircrew Evaluation Flights

All aerial gunner/observers shall have an appropriate NATOPS evaluation form completed annually upon completion of the NATOPS Check (RQD-6030). A designated NATOPS Evaluator or NATOPS Instructor/Assistant NATOPS Instructor shall evaluate RQD-6030.

4.6.5.6 Instructor Requirements

An instructor requirement is noted for each event. If the case an event does not list an instructor requirement, then the minimum requirement is a Basic Instructor Crew Chief (BICC) proficient in the given event.

4.6.5.7 Crew Requirements/Position Designations

Crew requirements are listed for each stage of training. This Manual requires an aerial gunner/observer for all external cargo, NS, Ground Threat Reaction (GTR), and Defensive Combat Maneuvers (DCM) flights. However, the squadron commanding officer may, at his or her discretion, employ an aerial gunner/observer on any flight event. The requirement for an aerial gunner/observer is intended to provide a second crewmember in the aircraft cabin section. A designated crew chief or aerial gunner/observer may fill this requirement. On training flights an aerial gunner/observer under instruction (AG/OUI) may fill this requirement when flying with an appropriate syllabus instructor.

4.6.5.8 Event Completion

Event completion is predicated upon demonstrated proficiency. When an individual successfully accomplishes the requirements of an event per the performance standards, the individual should log completion of the event (enter the appropriate T&R code) in M-SHARP. When the event is entered into M-SHARP, the individual's proficiency date for that event is automatically updated to reflect the date the event was completed. When supervising individual events, unit instructors/leaders shall ensure that trainees demonstrate proficiency per T&R standards prior to logging successful event completion. Evaluating individual proficiency in an event normally requires both objective and subjective assessment. If, in the instructor's opinion, the AG/OUI does not adequately perform a required event, then all or parts of the sortie shall be repeated until adequate performance is demonstrated. If an individual fails to accomplish the requirements of an event per the performance standards, the individual should not log that event and the proficiency status for that event remains unchanged. Times indicated for each event are for planning purposes only.

4.6.5.9 Sequence

Training should be accomplished by flying events within a stage in sequence and stages in sequence when practical.

4.6.5.10 Crew Resource Management (CRM)

Aircrew shall brief techniques of CRM for all flights and/or events.

4.6.5.11 Operational Risk Management (ORM)

Aircrews shall brief those factors that affect risk mitigation decisions for every flight or mission.

4.7 CORE PHASE

Purpose. The Core Phase is designed to provide the fundamental skills that will allow the Aircrew to support the basic functions of the VMM.

General.

All references to ANTPP are directed to the ANTPP 3.22.3 MV-22 (unclassified) unless otherwise noted.

A BICC is the minimum requirement to instruct an initial event. Additional instructor requirements are identified on each specific event if needed.

Core Phase Overview. The following stages are included in the Core Phase of training.

Table 4-8: Core Phase

Stage Name
▪ Familiarization (FAM)
▪ Formation (FORM)
▪ Confined Area Landing (CAL)
▪ Reduced Visibility Landing (RVL)
▪ Night Systems High Light Level (NS HLL)
▪ Night Systems Low Light Level (NS LLL)
▪ Tail Gunnery (TG)
▪ Low Altitude Tactics (LAT)
▪ Division (DIV)
▪ Ground Threat Reaction (GTR)
▪ Carrier Qualification (CQ)

4.7.1 Familiarization (FAM)

Purpose. To prepare the AG/OUI for the Core Phase. Emphasis is placed on flight line safety equipment, aircraft emergency equipment, and flight line procedures.

Familiarization Stage Overview. The events included in the FAM stage of the Core Phase of training are depicted below.

Table 4-9: Familiarization Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-2010	4.0	*	B,T		G		CRM Initial
ACAD-2011	8.0	*	B,T		G		NITE Lab
ACAD-2012	1.0	*	B,T		G		Reference Publication

ACAD-2013	1.0	*	B,T		G		Air-to-air Refueling
LAB-2020	2.0	*	B,T		G	1	Mission Auxiliary Tank System
LAB-2021	1.0	*	B,T		G	1	Flightline Fire Extinguisher Lab
LAB-2022	1.0	*	B,T		G	1	Ingress/Egress Lab
LAB-2023	1.0	*	B,T		G	1	Start-up/taxi/shut-down Lab
LAB-2024	2.0	*	B,T		G	1	Mooring Lab
LAB-2025	2.0	*	B,T		G		ALSS Equipment Lab
LAB-2026	2.0	*	B,T		G	1	Emergency Procedures
LAB-2027	1.5	*	B,T		G	1	Cargo Loading
FAM-2040	1.0	*	B,T	D	A	1	Familiarization Flight

ACAD-2010 4.0 * B,T G

Crew Resource Management (CRM) Initial

Goal. The AOUI understands the Risk and Resource Management (RRM) model and how the icons, processes, and seven critical skills apply to Crew Resource Management.

Requirements

Discuss

Seven critical skills
RRM model
Icons and processes
Available resources
Decision model

Performance Standard. Student is provided initial CRM training IAW Naval Safety Center curriculum.

Instructor. CRMI or CRMF

ACAD-2011 8.0 * B,T G

Night Imaging and Threat Evaluation (NITE) Lab

Goal. The AOUI is introduced to the night environment, utilization of NVDs, and light discipline.

Requirement. Per NITE lab syllabus

Performance Standard. Per NITE lab syllabus

Instructor. AMSO/AMSC

ACAD-2012 1.0 * B,T G

Reference Publications

Goal. The CCUI has a familiarity with manuals that governing operations and procedures in the MV-22.

Requirements. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to reference publications.

Prerequisite. RQD-1841

Instructor. BICC

ACAD-2013 1.0 * B,T G

MV-22 Air-to-Air Refueling

Goal. The AG/OUI has a familiarity with air-to-air refueling procedures in the MV-22.

Requirements. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to aerial refueling procedures.

Instructor. BICC

Required Reading. NATOPS Ch 4, 12, MAWTS-1 NVD Manual Ch 18

LAB-2020 2.0 * B,T G 1 MV-22

Mission Auxiliary Tank System Lab

Goal. The AG/OUI has an introductory knowledge of the installation and set-up of the MV-22 MATS.

Requirement. IAW IETMS

Performance Standard. Student is introduced to installation procedures for Mission Auxiliary Tanks.

Instructor. BICC

Required Reading. ANTTP Ch 6, 9

LAB-2021 1.0 * B,T G 1 MV-22

Flightline Fire Extinguisher Lab

Goal. Familiarize AOUI with operation and inspection of flightline fire bottles.

Requirement.

- Discuss
 - Preflight procedures and operation
- Introduce
 - Hand and arm signals for aircraft fire
 - Preflight, positioning, and operation of levers and pins
 - Hazardous materials, i.e. HALON

Performance Standard. Demonstrate fire bottle preflight inspection and operating procedures.

Instructor. BICC

LAB-2022 1.0 * B,T A 1 MV-22

Ingress/Egress Lab

Goal. Familiarize AOUI with squadron procedures for flight. Complete required V-22 Egress.

Requirements

- Discuss
 - Flight equipment checkout.
- Introduce
 - V-22 Egress.

Performance Standard. Execute the V-22 egress procedures without reference or coaching.

Instructor. NI/ANI

LAB-2023 1.0 * B,T G 1 MV-22

Start-up/taxi/shut-down Lab

Goal. Familiarize AOUI with flightline procedures for aircraft start-up, shut-down, and taxi.

Requirement

Introduce
 CRM.
 Standard terminology
 Safety considerations
 Hand and arm signals

Performance Standard. Student is introduced to aircraft start-up, shut-down, and taxi.

Instructor. BICC

LAB-2024 2.0 * B,T G 1 MV-22

Mooring Lab

Goal. Familiarize AOUI with aircraft tiedown and securing procedures.

Requirements

Discuss
 Weather considerations
Introduce
 Aircraft mooring procedures
 Proper aircraft mooring

Performance Standard. Student is introduced to MV-22 tiedown and securing procedures.

Instructor. BICC

Required Reading. NATOPS Ch 3

LAB-2025 2.0 * B,T CLSRM

ALSS equipment Lab

Goal. Familiarize AOUI with ALSS equipment.

Requirements

Introduce
 ALSS Equipment
 ALSS Equipment Inspections
 Survival Vest Inspection
 LPU-34/P Inspection
 SRU-40/P Helicopter Aircrew Breathing Device (HABD) Pre-flight/post-flight
 HGU-84/8P flight helmet inspection procedures
 MBU-23 (V) 8/P oxygen mask
 CRU-103/P regulator

Performance Standard. Student is introduced to ALSS equipment and inspection criteria.

Instructor. BICC

LAB-2026 2.0 * B,T G 1 MV-22

Emergency Procedures Lab

Goal. Familiarize AOUI with aircraft emergency equipment and its use.

Requirements

Discuss

- Aviate, Navigate, Communicate
- Terminology and Emergency Procedures
- Landing criteria
- Memory items
- Aircrew emergency equipment

Introduce

- Ground Emergency Procedures
 - Aircraft Fire
 - Wheel Brake Overheat/Fire.
- In-flight Emergency Procedures
 - Fuselage Fire In-Flight
 - Smoke and Fume Elimination
- Landing Emergency Procedures
 - Emergency Landing

Performance Standard. Student is introduced to aircraft emergency equipment and emergency procedures.

Instructor. NI/ANI

Required Reading. NATOPS Ch 4, 12

LAB-2027 1.5 * B,T G 1 CVENT

Cargo Loading Lab

Goal. To prepare the AG/OUI for cargo and forklift operations.

Requirements.

Discuss

- Cargo Handling Manual
- Cabin set-up for different mission profiles
- Cargo winch and pulley systems
- Tie down fittings and restraints
- Aircrew communication with ground personnel during cargo operations
- Approach with load and fuselage clearance procedures
- Hand and arm signals and forklift operations
- Proper restraint procedures

Introduce

- Proper load planning
- Loading and unloading procedures
- Weight and balance computations

Performance Standards.

- Demonstrate knowledge of internal cargo procedures.
- Successfully load, restrain and unload an internal cargo load.

Instructor. BICC

Required Reading. A1-V22AB-CLG-000 Ch. 2, 4-6.

FAM-2040 1.0 * B,T A 1 MV-22

Familiarization Flight

Goal. Introduce crewmember responsibilities and calls during aircraft start-up and FAM maneuvers in a day environment.

Requirements

Discuss

- Firefighting equipment operation
- Hand and arm signals for Turn-up & Taxi, aircraft fires, and hot brakes
- Aircraft fires on the ground, abnormal starts, and emergency shutdown procedures
- Cabin configuration
- Standard traffic calls (clock code, high, level, low, factor or no-factor)

Demonstrate

- Proper pre-start, start, taxi, pre takeoff, after takeoff, landing, and shutdown procedures IAW NATOPS Pocket Check List (PCL)

Introduce

- Systems troubleshooting through the use of the Cockpit Management System (CMS)
- Aircraft start-up and shutdown
- Taxi procedures
- Lookout doctrine and areas of responsibility
- Hover work
- Air taxi
- Vertical landing from the hover
- Normal approach and landing pattern
- Standard traffic calls
- Squadron SOPs
- IMC/VMC/IFR/VFR

Emergencies

- Electrical system failure(s)
- Ground emergencies

Performance Standards.

Perform crew member duties and required calls during pre-start, start, taxi, pre takeoff, after takeoff, landing, and shutdown IAW applicable publications.
State indications, execute/recite memorized items and exercise proper crew coordination during simulated emergency procedures.

Instructor. BICC

Prerequisite. ACAD-2010, LAB-2021, LAB-2022, LAB-2023, LAB-2025, LAB-2026, LAB-2027

Required Reading. NATOPS Ch. 2,3,4,12

4.7.2 Formation (FORM)

Purpose. To introduce tactical formations and tactical formation maneuvering.

General. All maneuver descriptions are in the MV-22 ANTTP Manual.

Crew Requirements. P/P/CC/AO

Formation Stage Overview. The events included in the FORM stage of the Core Phase of training are depicted below.

Table 4-10: Formation Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-2110	1.0	*	B,T		G		EA TACFORM
FORM-2140	2.0	365	B,T,R,M	(NS)	A	2	TACFORM/NAV

ACAD-2110 1.0 * B,T G

TACFORM for Enlisted Aircrew

Goal. The AG/OUI is introduced to basic tactical formation maneuvers.

Requirement. Utilize MAWTS-1 courseware

Performance Standard. Student is introduced to MV-22 TACFORM maneuvers.

Prerequisite. FAM-2040

Instructor. BICC

Required Reading. NATOPS Ch 9.1-9.1.14, ANTTP Ch 4

FORM-2140 2.0 365 B,T,R,M (NS) A 2 MV-22

Goal. Introduce tactical formations, tactical formation maneuvering, navigation to a SYS TOT, and lost contact procedures.

Requirement.

Discuss

- CRM
- Standard terminology
- Lookout doctrine
- Crew comfort level
- Inter/intra-plane coordination
- Lead/wingman responsibilities
- Bullseye calls
- Inadvertent IMC

Introduce

- Combat spread and combat cruise
- Tactical formation maneuvers in the ANTTP
- Tactical lead changes
- Simulated lost contact with wingman with subsequent rejoin en route and at a point.
- Lost communications procedures

Practice

- Formation lookout doctrine

Review

- CMS power-up

Expose

- EMCON procedures.
- Types of escort operations.
- CMS tactical considerations (e.g. Threat Ring).
- Split section operations.

Performance Standards

- Demonstrate procedural knowledge of tactical formation maneuvers IAW MV-22 ANTTP manual.
- Recognize proper tactical formations IAW MV-22 ANTTP manual.
- Distance estimation calls to wingman are performed to a reasonable margin of error.

Prerequisites. ACAD-2110

Instructor. BICC

Required Reading. Review NATOPS Ch 9.1-9.1.14, ANTTP Ch 4

4.7.3 Confined Area Landings (CAL)

Purpose. To develop proficiency in single and section takeoffs and landings and tactical approaches to confined areas.

General. All maneuver descriptions are in the MV-22 ANTP Manual.

Crew Requirements. P/P/CC

Confined Area Landing Stage Overview. The events included in the CAL stage of the Core Phase of training are depicted below.

Table 4-11: Confined Area Landings Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
CAL-2240	1.5	*	B	D	A	1	Single-ship CAL
CAL-2242	2.0	365	B,T,R,M	D	A	2	Section CAL

CAL-2240 1.5 * B D A 1 MV-22

Single-ship Confined Area Landings

Goal. Introduce low- and medium-altitude tactical approaches, landings, and departures to a confined area.

Requirements.

Discuss

- CRM
- Standard terminology
- Aircrew responsibilities
- Obstacle clearance
- Crew comfort level
- Tactical approaches
- Initial terminal guidance (ITG)
- Glide slope
- Distance Estimation
- Wave-off procedures

Introduce

- Tactical approaches, landings and departures to a confined area (minimum 5 for initial sorties)

Practice

- Standard terminology
- Obstacle clearance
- Distance estimation
- Drift correction

Review

- Fuel burn considerations
- Proper restraint procedures
- Weight and balance computations
- CG limitations
- Procedures and safety precautions for transporting passengers, internal cargo, and/or tactical vehicles
- Major system EP

Expose

- LZ diagram
- Final Approach Course (FAC), or ingress heading
- L-Hour and Time on Target (TOT)
- METT-TC

Performance Standards

- Perform obstacle clearance calls during approach, landing, and takeoff.
- Evaluate suitability of LZ terrain and communicate information to pilots.
- Perform drift correction, accurate and timely distance estimation calls to the pilot prior to aircraft touchdown.

Instructor. BICC

Prerequisite. FAM-2040

Required Reading. ANTTP Ch.1, Ch.3

External Syllabus Support. Suitable airspace and landing site.

CAL-2242 2.0 365 B,T,R,M D A 2 MV-22

Section Confined Area Landings

Goal. Introduce section low- and medium-altitude tactical approaches, landings, and departures to a confined area.

Requirements.

Discuss

- CRM
- Standard terminology
- Aircrew responsibilities during section CALs
- Closure rates
- Air-to-air TACAN
- Crew comfort level
- Lookout doctrine
- Wingman considerations
- Wave-off procedures

Introduce

- Section tactical approaches, takeoffs and landings (minimum 3 as lead for initial sorties).

Review

- Standard terminology
- Obstacle clearance
- Distance estimation
- Drift correction

Expose

- Assault Support Serial Assignment Table (ASSAT)
- Assault Support Landing Table (ASLT)
- Objective area diagram
- Initial point (IP), Holding area (HA), and Battle position (BP)
- Rules of engagement
- Wind considerations with high gross weight
- Discuss Air-Defense Artillery (ADA)

Performance Standards.

- Provide pilots with accurate and timely information on the position of wingman.
- Distance estimation calls to wingman are performed to a reasonable margin of error in terms of DME.
- Provide obstacle clearance calls for the section during approach, landing, and takeoff.
- Inform pilots of wingman's position prior to landing to ensure both aircraft have adequate clearance to land.

Instructor. BICC

Prerequisite. FORM-2140,CAL-2240

Required Reading. ANTTP Ch.1, Ch. 5

External Syllabus Support. Suitable landing site.

4.7.4 Reduced Visibility Landing (RVL)

Purpose. To introduce RVL procedures and landings.

General. All maneuver descriptions are in the MV-22 ANTP Manual. All initial sorties shall be conducted during the day. Proficient aircrew may conduct subsequent sorties at night. If the level of obscuration causes all crew members to lose visual reference with the deck, RVL-6900 will be logged.

Crew Requirements. P/P/CC/AO

Reduced Visibility Landing Stage Overview. The events included in the RVL stage of the Core Phase of training are depicted below.

Table 4-22: Reduced Visibility Landing Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
SRVL-2270	1.0	*	B,T	(NS)	S	1	RVL Simulator
RVL-2282	2.0	365	B,T,R,M	(NS)	A	1	RVL Flight

SRVL-2270 1.0 * B,T (NS) S 1 FFS/FTD

Reduced Visibility Landing Procedures

Goal. Introduce single-ship RVL procedures, placing emphasis on CRM cadence.

Requirements.

Discuss

- NATOPS RVL limitations
- Landing zone evaluation and selection
 - Soil composition
 - Micro terrain, obstacles, and aircraft clearances
- Standard approach to RVLs
- Brown out considerations
- Crew resource management during RVLs
- Proper CRM cadence

Introduce

- Crew resource management during RVLs
- Proper CRM cadence

Performance Standards.

Demonstrate proper CRM when making calls during RVLs

Instructor. BICC

Prerequisite. CAL-2240

Required Reading. ANTP Ch 3.

RVL-2282 2.0 365 B,T,R,M (NS) A 1 MV-22

Reduced Visibility Landings

Goal. Introduce single-ship RVL procedures in actual RVL conditions.

Requirements.

Discuss

- Landing zone evaluation and selection
 - Soil composition

Elevation and density altitude/pressure altitude
Micro terrain, obstacles, and aircraft clearances
RVL scale
RVL procedures
Cabin set-up and CRM during RVLs
Wind effects
Wave-off procedures for RVLs
Takeoff procedures
Brown out/White out
Nacelle dust abatement
Aircraft signature during RVLs
Introduce
Cabin set-up and CRM during RVLs
RVLs with various levels of obscuration (minimum of 5 for initial sorties).
No-hover/Hover coupled landing.
Wave-off procedures for RVLs
Takeoffs with various levels of obscuration.
RVL Scale

Performance Standard.

Demonstrate the proper procedures for RVLs IAW the MV-22 ANTTP Manual.

Instructor. BICC

Prerequisite. SRVL-2270

Required Reading. NATOPS Ch 7.28.7, 7.29, ANTTP Ch 3 pg 20-39

4.7.5 Night Systems (NS) High Light Level (HLL)

Purpose. To develop proficiency while using night vision devices under light levels greater than or equal to .0022 lux as predicted by the SLAP application. Certify the crewmember Night Systems Qualified High Light Level (NSQ HLL).

General. An NSI is required for all unqualified aircrew. Upon completion of this stage and receipt of a qualification letter signed by the unit commanding officer the crewmember is NSQ HLL.

Crew Requirements. P/P/CC/AO

Night Systems High Light Level Stage Overview. The events included in the NS HLL stage of the Core Phase of training are depicted below.

Table 4-12: Night Systems High Light Level Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-2310	1.0	*	B,T,R		G		Night Vision Training
ACAD-2311	1.0	*	B,T,R		G		MV-22 FLIR
NS HLL-2340	2.0	365	B	HLL	A	1	Single-ship CAL
NS HLL-2341	2.0	365	B,T,R,M	HLL	A	2	Section CAL

ACAD-2310 1.0 * B,T,R G

Night Vision Training

Goal. The AG/OUI has an introductory knowledge of the Night Vision Goggles, Night Environment, Human factors, and NVG Weapons employment procedures.

Requirement. Utilize MAWTS-1 Courseware

Performance Standard. Student is introduced to night vision devices.

NAVMC 3500.11E
16 Apr 18

Instructor. NSI

Prerequisite. ACAD-2011, FAM-2040

Required Reading. MAWTS-1 NVD Manual

ACAD-2311 1.0 * B,T G

MV-22 FLIR for Enlisted Aircrew

Goal. The AG/OUI has an introductory knowledge of the MV-22 FLIR.

Requirement. Utilize MAWTS-1 courseware

Performance Standard. AG/OUI is introduced to the MV-22 FLIR.

Prerequisite. ACAD-2310

Instructor. NSI

Required Reading. MV-22 NATOPS Chapter 16.8, NVD Manual CH. 4

NSHLL-2340 2.0 365 B HLL A 1 MV-22

High Light Level Familiarization Maneuvers and Confined Area Landings

Goal. Introduce single ship familiarization maneuvers and tactical CALs.

Requirements.

Discuss

- NVD briefing guide
- CRM
- Automatic gain control system
- Aircraft lighting
- Lighting conditions
- Night illumination sources
- Aircrew duties during NS CALs
- Crew comfort level
- Human factors considerations
- Night environment considerations
- NVD and FLIR theory
- Scanning techniques
- Monocular cues
- Depth perception
- Distance estimation
- Obstacle clearance
- Drift correction
- NVG failure
- Brown out/white out
- FLIR utilization

Introduce

- NVD tactical approaches, landings, and departures to a confined area (minimum of 5 for initial sorties)

Practice

- NVG Set-up and focusing procedures
- Cabin configuration
- Distance estimation
- ITG

Expose

Light discipline

Performance Standards:

Execute proper procedures for NS CALs IAW the MV-22 ANTPP Manual and the MAWTS-1 NVD Manual.
Demonstrate proper NVG scanning techniques.
Provide timely and accurate information to the pilots with regard to terrain clearance, LZ topography, aircraft drift, and distance estimation calls prior to landing.

Instructor. NSI

Prerequisite. CAL-2242, ACAD-2311

Required Reading. NATOPS Ch 2.3.9, 2.12, NVD Manual Ch. 2,3,7,14, 3-22.5-ASTACSOP Page 21

External Syllabus Support. Suitable landing site and airspace.

NSHLL-2341 2.0 365 B,T,R,M HLL A 2 MV-22

High Light Level Section Confined Area Landings

Goal. Introduce section tactical CALs in HLL.

Requirements

Discuss

- CRM
- Aircraft lighting
- Loss of visual contact with wingman
- Closure rates
- FLIR functions
- Sensor integration

Introduce

- Formation flight
- Section CALs in HLL (minimum 3 as lead for initial sorties)
- Section tactical approaches, departures, takeoffs and landings in HLL

Practice

- NVG emergencies

Review

- NVG Set-up and focusing procedures
- Cabin configuration
- Distance estimation

Performance Standards

Maintain an aggressive NVG scan and provide the pilots with timely information on LZ topography and aircraft drift.
Maintain awareness of wingman's position and provide timely information to the pilots.
Distance estimation calls prior to landing are within a reasonable margin of error.

Instructor. NSI

Prerequisite. NSHLL-2340

External Syllabus Support. Suitable landing and airspace.

Required Reading. NVD Manual Ch. 5, 15.8

4.7.6 Night Systems (NS) Low Light Level (LLL)

Purpose. To develop proficiency while using night vision goggles under light levels less than 0.0022 lux as predicted by the SLAP application. Certify the AG/OUI Night Systems Qualified Low Light Level (NSQ LLL).

General. All maneuver descriptions are in the MV-22 ANTTP Manual.

An NSI is required for all unqualified aircrew. Upon completion of this stage and receipt of a qualification letter signed by the unit commanding officer the crewmember is NSQ LLL.

Crew Requirements. P/P/CC/AO

Night Systems Low Light Level Stage Overview. The events included in the NS HLL stage of the Core Phase of training are depicted below.

Table 4-13: Night Systems Low Light Level Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
NS LLL-2380	1.5	240	B	LLL	A	1	FAM and Single-ship CAL
NS LLL-2381	1.5	*	B	LLL	A	1	Single-ship CAL
NS LLL-2382	1.5	*	B,T	LLL	A	2	Section NAV/TACFORM
NS LLL-2383	2.0	240	B,T,R,M	LLL	A	2	Section CAL

NS LLL-2380 1.5 240 B LLL A 1 MV-22

Low Light Level Familiarization Maneuvers, Confined Area Landings, and Tactical Approaches

Goal. Introduce FAM maneuvers single aircraft CALs and tactical approaches in LLL.

Requirements.

Discuss

- CRM
- LLL CAL considerations
- Cultural lighting considerations
- NVG scan
- Shadowing, moon angle, azimuth

Introduce

- Tactical approaches, landings, and departures to a confined area in LLL (minimum 5 for initial sorties).

Practice

- Aircraft lighting
- NVG emergencies
- Distance estimation

Performance Standards

- Execute proper procedures for NS CALs IAW the MV-22 ANTTP Manual and the MAWTS-1 NVD Manual.
- Demonstrate proper NVG scanning techniques.
- Provide timely and accurate information to the pilots with regard to terrain clearance, LZ topography, aircraft drift, and distance estimation calls prior to landing.

Instructor. NSI

Prerequisites. NSQ HLL

Required Reading. NTRP Ch. 3, Review NVD Manual

External Syllabus Support. Suitable landing site and airspace.

NS LLL-2381 1.5 * B LLL A 1 MV-22

Low Light Level Confined Area Landings, and Tactical Approaches

Goal. Practice single -ship CALs and tactical approaches in LLL.

Requirements.

Discuss

- CRM
- LLL CAL considerations
- Cultural lighting considerations
- NVG scan
- Moon angle/azimuth and terrain shadowing

Practice

- Tactical approaches, landings, and departures to a confined area in LLL (minimum 5 for initial sorties).
- NVG emergencies
- Aircraft lighting
- Distance estimation

Performance Standards.

- Execute proper procedures for NS CALs IAW the MV-22 ANTPP Manual and the MAWTS-1 NVD Manual.
- Demonstrate proper NVG scanning techniques.
- Provide timely and accurate information to the pilots with regard to terrain clearance, LZ topography, aircraft drift, and distance estimation calls prior to landing.

Instructor. NSI

Prerequisites. NS LLL-2380

External Syllabus Support. Suitable landing site and airspace.

NS LLL-2382 1.5 * B,T LLL A 2 MV-22

Low Light Level Section Navigation and Tactical Formations

Goal. Introduce NS tactical formations, tactical formation maneuvering, navigation to a SYS TOT and lost contact procedures.

Requirements.

Discuss

- Crew duties during NS formation operations
- Aircraft lighting
- Sensor integration
- Night tactical formation maneuvering
- Moon angle/azimuth and terrain shadowing

Practice

- Tactical formation maneuvers in the ANTPP
- Tactical lead changes
- Simulated lost contact with wingman with subsequent rejoin en route and at a point.
- NVG Emergencies

Review

- Formation lookout doctrine
- Closure rates

Performance Standards.

Demonstrate procedural knowledge of tactical formation maneuvers IAW MV-22 ANTTTP manual.
Recognize proper tactical formations IAW MV-22 ANTTTP manual.
Distance estimation calls to wingman are performed to a reasonable margin of error.
Maintain proper lighting configuration.

Instructor. NSI

Prerequisite. NS LLL-2381

Required Reading. NTRP Ch. 4, Review NVD Manual Ch. 5

External Syllabus Support. Suitable landing site and airspace.

NS LLL-2383 2.0 240 B,T,R,M LLL A 2 MV-22

Low Light Level Section Confined Area Landings

Goal. Introduce division formations and division CALs using NVDs under LLL conditions.

Requirement.

Discuss

- CRM
- Crew comfort levels
- Moon angle/azimuth and terrain shadowing
- Inadvertent IMC
- Obstacle clearance
- Distance estimation and depth perception
- Wave-offs

Introduce

- Section tactical approaches, departures, takeoffs, and landings in LLL
- Section CALs in LLL (minimum of 3 as lead for initial sorties)

Review

- NVG set-up and focusing procedures
- Aircraft lighting
- NVG Emergencies

Performance Standards

- Provide feedback to pilots about the integrity of the flight.
- Maintain awareness of both wingmen and provide adequate landing area information to the pilots during CALs.
- Provide pilots with timely information with regard to LZ topography, aircraft drift, and distance estimation prior to landing.

Instructor. NSI

Prerequisites. NS LLL-2382

Required Reading. Review NVD Manual Ch. 8,9

External Syllabus Support. Suitable landing site and airspace.

4.7.7 Tail Gunnery (TG)

Purpose. To develop the ability to employ the MV-22 Ramp Mounted Weapon System (RMWS), deliver accurate air-to-ground fire, and provide defensive fire on targets of opportunity.

General. A TGI designated for the appropriate weapon system is required for all lectures and labs and initial training flights, or flights when aircrew have lost proficiency.

These sorties are ordnance driven. Ordnance expenditure requirements shall be adhered to in order for the AG/OUI to attain TG qualification, maintain, or regain proficiency. Flights should be scheduled to maximize range time so that ordnance expenditure requirements can be met.

Successful completion of TG-2541 and TG-2543 constitutes Day TGQ and NS TGQ; respectively. Initial TG qualification may be attained with any of the three weapon systems. After initial qualification requirements are met, qualification with subsequent weapon systems requires completion of TG-2540 and TG-2542 only in addition to the listed prerequisites. A qualification letter signed by the unit commanding officer stating the Aircrew is TGQ for the appropriate weapon system is to be placed in the crew member's NATOPS jacket prior to conducting any tail gunnery flight without a designated TGI.

Crew Requirements. P/P/CC/AO

Tail Gunnery Stage Overview. The events included in the NS HLL stage of the Core Phase of training are depicted below.

Table 4-14: Tail Gunnery Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-2510	1.0	*	B,T		G		Fundamentals of Aerial Gunnery
ACAD-2511	0.5	*	B,T		G		M240D Machine Gun
ACAD-2512	0.5	*	B,T		G		GAU-16/A Machine Gun
ACAD-2513	0.5	*	B,T		G		GAU-21 Machine Gun
ACAD-2514	0.5	*	B,T		G		Laser Aiming Devices
ACAD-2515	0.5	*	B,T		G		Laser Bore Sighting Procedures
LAB-2520	0.5	*	B,T,R		G		M240D Machine Gun
LAB-2521	0.5	*	B,T,R		G		GAU-16/A Machine Gun
LAB-2522	0.5	*	B,T,R		G		GAU-21 Machine Gun
TG-2540	1.5	*	B,T	D	A	1	Single-ship Tail Guns
TG-2541	1.5	365	B,T,R	D	A	2	Section Tail Guns
TG-2542	1.5	*	B,T	NS	A	1	NS Single-ship Tail Guns
TG-2543	1.5	365	B,T,R,M	NS	A	2	NS Section Tail Guns
TG-2550	1.5	*	B,T	(NS)	A	1	M240D Under Instruction
TG-2551	1.5		B,T,R,M	(NS)	A	1	M240D Qualified
TG-2552	1.5	*	B,T	(NS)	A	1	GAU-16/A Under Instruction
TG-2553	1.5		B,T,R,M	(NS)	A	1	GAU-16/A Qualified
TG-2554	1.5	*	B,T	(NS)	A	1	GAU-21 Under Instruction
TG-2555	1.5		B,T,R,M	(NS)	A	1	GAU-21 Qualified

ACAD-2510 1.0 * B,T G

Fundamentals of Aerial Gunnery

Goal. The AG/OUI has a familiarity with the basic fundamentals of aerial gunnery.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to the fundamentals for proper aerial gunnery.

Instructor. TGI

Required Reading. MV-22 ANTTP *Defensive Weaponry*

Prerequisites. FAM-2040

ACAD-2511 0.5 * B,T G

M240 Machine Gun

Goal. The AG/OUI has a familiarity with the components, characteristics, and operation of the M240 machine gun.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to the M240D machine gun.

Instructor. TGI

Required Reading. NAVAIR 11-95M240D1-1

Prerequisites. ACAD-2510

ACAD-2512	0.5	*	B,T	G
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GAU-16/A Machine Gun

Goal. The AG/OUI will be familiar with the components, characteristics, and operation of the GAU-16/A machine gun.

Requirement. Utilize MAWTS-1 courseware

Performance Standard. Student is introduced to the GAU-16/A machine gun.

Instructor. TGI

Required Reading. NAVAIR 11-95-13

Prerequisites. ACAD-2510

ACAD-2513	0.5	*	B,T	G
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GAU-21 Machine Gun

Goal. The AG/OUI will be familiar with the components, characteristics, and operation of the GAU-21 machine gun.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to the GAU-21 machine gun.

Instructor. TGI

Required Reading. NAVAIR 11-95GAU21-1

Prerequisites. ACAD-2510

ACAD-2514	0.5	*	B,T	G
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Laser Aiming Devices

Goal. The AG/OUI has a familiarity with laser aiming devices and their utilization.

Requirement. Utilize MAWTS-1 courseware

Performance Standard. Student is introduced to laser aiming devices and laser eye protection.

Instructor. TGI

Required Reading. MV-22 NTRP Chapter 2 and Appendix D, NAVAIR 11-95IZLID-1 WP 3,7

Prerequisites. ACAD-2510

ACAD-2515	0.5	*	B,T	G
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Laser Bore Sighting

Goal. The AG/OUI has a familiarity with laser bore sighting procedures.

Requirements.

- Discuss
 - Administrative Laser Safety Officers (ALSO)
 - Safety considerations
 - Laser Eye Protection (LEP)
 - Specular reflection
 - Diffuse reflection

Performance Standard. Student is introduced to laser bore sighting procedures and safety considerations.

Instructor. TGI

Required Reading. NAVAIR 11-95 IZLID-1

Prerequisites. ACAD-2514

LAB-2520 0.5 * B,T,R G

M240D Breakdown, Inspection, and Cleaning Procedures

Goal. The AG/OUI will be familiar with the breakdown, inspection, function check, and cleaning procedures of the M240D machine gun.

Requirements

- Discuss
 - Nomenclature
 - Inspection procedures
 - Weapon emergencies
 - Cleaning procedures
- Introduce
 - Cycle of operation
 - Weapons checklist
 - Immediate action procedures
 - RMWS inspection and mounting procedures

Performance Standards.

- Demonstrate knowledge of nomenclature, cycle of operation, and inspection procedures for the M240 machine gun.
- Demonstrate RMWS inspection procedures and operation.
- Demonstrate immediate action procedures.

Instructor. TGI

Required Reading. NAVAIR 11-95M240D1-1, NTRP 3-22.4-MV-22B Ch. 1

Prerequisite. ACAD-2511

LAB-2521 0.5 * B,T,R G

GAU-16/A Breakdown, Inspection, and Cleaning Procedures

Goal. The AG/OUI will be familiar with the breakdown, inspection, function check, and cleaning procedures of the GAU-16/A machine gun.

Requirements

- Discuss
 - Nomenclature
 - Inspection procedures

NAVMC 3500.11E
16 Apr 18

Weapon emergencies
Cleaning procedures
Introduce
Cycle of operation
Weapons checklist
Immediate action procedures
RMWS inspection and mounting procedures

Performance Standards

Demonstrate knowledge of nomenclature, cycle of operation, and inspection procedures for the GAU-16/A machine gun.
Demonstrate RMWS inspection procedures and operation.
Demonstrate immediate action procedures.

Instructor. TGI

Required Reading. NAVAIR 11-95-13, NTRP 3-22.4-MV-22B Ch. 1

Prerequisite. ACAD-2512

LAB-2522	0.5	*	B,T,R	G
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GAU-21 Breakdown and Cleaning Procedures

Goal. The AG/OUI will be familiar with the breakdown, inspection, function check, and cleaning procedures of the GAU-21 machine gun.

Requirements.

Discuss
Nomenclature
Inspection procedures
Weapon emergencies
Cleaning procedures
Introduce
Cycle of operation
Weapons checklist
Immediate action procedures
RMWS inspection and mounting procedures

Performance Standards

Demonstrate knowledge of nomenclature, cycle of operation, and inspection procedures for the GAU-21 machine gun.
Demonstrate RMWS inspection procedures and operation.
Demonstrate immediate action procedures.

Instructor. TGI

Required Reading. NAVAIR 11-95GAU21-1, NTRP 3-22.4-MV-22B Ch. 1

Prerequisite. ACAD-2513

TG-2540	1.5	*	B,T	D	A	1	MV-22
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Single-ship Tail Gun Employment

Goal. To introduce MV-22 ramp mounted weapon system employment during the day.

Requirements

Discuss

- CRM
- ICS procedures
- Safety
- Cabin configuration
- Crew-served weapons checklist
- Weapon preparation/nomenclature
- Weapons conditions
- Weapons commands
- Muzzle awareness
- Target identification
- Aiming techniques (Port/Starboard effect)
- Fields of fire/Sectors of fire
- Weapon malfunctions/stoppages/emergencies

Introduce

- Weapon parameters and limitations
- Preparation of weapon and ramp mount
- Ammunition preparation and reloading
- STAR
- Target acquisition
- Firing on pre-briefed targets with crew-served weapons

Performance Standards

- Demonstrate use of the crew-served weapons checklist.
- Demonstrate knowledge of the three weapons control procedures.
- Demonstrate proper utilization of all weapons commands.
- Demonstrate appropriate weapon emergency procedures.
- Demonstrate knowledge of weapon parameters.
- Maintain positive control and muzzle awareness at all times during live-fire evolution.
- Demonstrate the ability to conduct day, single-ship tail gunnery.

Instructor. TGI

Prerequisites. ACAD-2510

Required Reading. ANTP Ch 7 Classified ANTP Ch 3, NAVAIR 11-95M240D1-1, NTRP Ch 1

Ordnance. 600 rounds per gunner of appropriate ammunition.

External Syllabus Support. Appropriate TG range, moving land target (MLT) if available.

TG-2541 1.5 365 B,T,R D A 2 MV-22

Multi-aircraft Tail Gun Employment

Goal. To introduce MV-22 ramp mounted weapon system employment in a multi-aircraft environment during the day.

Requirements

Discuss

- CRM
- ICS procedures
- Safety
- Weapon preparation/nomenclature
- Muzzle awareness in a multi-aircraft environment

- Weapon effects on targets
- Weapon malfunctions/stoppages/emergencies
- Introduce
 - Surface danger zone (SDZ)
 - Fields of fire/Sectors of fire
 - Target acquisition
 - Firing techniques in a multi-aircraft environment
 - Target hand-off between aircraft
 - Multi-aircraft tail gunnery operations
- Practice
 - Weapon parameters and limitations
 - Preparation of weapon and ramp mount
 - Ammunition preparation and reloading
 - STAR
 - Target acquisition
 - Firing on pre-briefed targets with crew-served weapons

Performance Standards

- Maintain positive control and muzzle awareness at all times during live-fire evolutions.
- Demonstrate the ability to engage pre-briefed targets in a multi-aircraft environment.
- Demonstrate use of fire control procedures to suppress targets.
- Demonstrate proper utilization of all weapons commands.

Instructor. TGI

Prerequisites. TG-2540

Required Reading. NAVAIR 11-95-13, NAVAIR 11-95-M240D-1-1, NAVAIR 11-95GAU21-1 as applicable

Ordnance. 600 rounds per gunner of appropriate ammunition

External Syllabus Support. Appropriate TG range, moving land target (MLT) if available.

TG-2542	1.5	*	B,T	NS	A	1	MV-22
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Night Systems Single-ship Tail Gun Employment

Goal. To introduce MV-22 ramp mounted weapon system employment while using NVGs.

Requirements.

- Discuss
 - CRM
 - ICS procedures
 - Safety considerations
 - Weapon preparation/nomenclature
 - Laser aiming devices/procedures
 - Laser eye protection
 - Weapon effects on NVDs
 - Muzzle awareness
 - Weapon malfunctions/stoppages/emergencies
- Introduce
 - Laser utilization
 - Target acquisition utilizing NVGs
 - Firing techniques utilizing NVGs
 - Single aircraft aerial gunnery operations at night
- Review

Weapon parameters and limitations
Preparation of weapon and ramp mount
STAR

Performance Standards

Demonstrate proper utilization of weapons commands.
Demonstrate use of laser aiming device for target acquisition and engagement.
Demonstrate the ability to engage pre-briefed targets at night utilizing NVGs.
Demonstrate use of fire control procedures to suppress targets while utilizing NVGs.
Maintain positive control and muzzle awareness at all times during live-fire evolutions.

Instructor. TGI

Prerequisites. ACAD-2514, TG-2530, NS HLL-2334, NS LLL-2383~LLL

Required Reading. MAWTS-1 NVD Manual Ch 15.9, NAVAIR 11-95IZLID-1

Ordnance. 600 rounds per gunner of appropriate ammunition.

External Syllabus Support. Appropriate TG and laser approved range, moving land target (MLT) if available.

TG-2543 1.5 365 B,T,R,M NS A 2 MV-22

Night Systems Multi-aircraft Tail Gun Employment

Goal. To introduce MV-22 ramp mounted weapon system employment in a multi-aircraft flight while using NVGs.

Requirements.

Discuss
 CRM
 ICS procedures
 Safety considerations
 Weapons preparation/nomenclature
 Laser aiming devices/procedures
 Muzzle awareness in a multi-aircraft environment
 Weapon malfunctions/stoppages/emergencies
 Weapons effects on NVDs
Introduce
 Laser utilization in a multi-aircraft environment
 Multi-aircraft aerial gunnery operations at night
Practice
 Target acquisition utilizing NVGs
 Firing techniques utilizing NVGs
Review
 Weapon parameters and limitations
 Preparation of weapon and ramp mount
 STAR

Performance Standards

Demonstrate use of laser aiming device for target acquisition and engagement in a multi-aircraft environment.
Demonstrate the ability to engage pre-briefed targets in a multi-aircraft environment while utilizing NVGs.
Demonstrate use of fire control procedures to suppress targets while utilizing NVGs.
Maintain positive control and muzzle awareness at all times during multi-aircraft live-fire evolutions at night.

Instructor. TGI

Prerequisites. TG-2542

Ordnance. 600 rounds per gunner of appropriate ammunition.

External Syllabus Support. Appropriate TG and Laser approved range, moving land target (MLT) if available.

TG-2550 0.0 * B,T (NS) A 1 MV-22

M240D Under Instruction

Goal. Track use of the M240D machine gun prior to qualification. This code is intended to be logged in addition to TG-254X.

TG-2551 0.0 365 B,T,R,M (NS) A 1 MV-22

M240D Qualified

Goal. Track use of the M240D machine after qualification. This code is intended to be logged in addition to TG-254X.

TG-2552 0.0 * B,T (NS) A 1 MV-22

GAU-16/A Under Instruction

Goal. Track use of the GAU-16/A machine gun prior to qualification. This code is intended to be logged in addition to TG-254X.

TG-2553 0.0 365 B,T,R,M (NS) A 1 MV-22

GAU-16/A Qualified

Goal. Track use of the GAU-16/A machine gun after qualification. This code is intended to be logged in addition to TG-254X.

TG-2554 0.0 * B,T (NS) A 1 MV-22

GAU-21 Under Instruction

Goal. Track use of the GAU-21 machine gun prior to qualification. This code is intended to be logged in addition to TG-254X.

TG-2555 0.0 365 B,T,R,M (NS) A 1 MV-22

GAU-21 Qualified

Goal. Track use of the GAU-21 machine gun after qualification. This code is intended to be logged in addition to TG-254X.

4.7.8 Low Altitude Tactics (LAT)

Purpose. To develop proficiency in MV-22 Low Altitude Tactics.

General. All maneuver descriptions are in the MV-22 ANTTP Manual.

Non-proficient aircrew are required to fly with a LAT Instructor for day events and an NSI for night events.

The AG/OUI is Day LAT qualified upon completion of LAT 2641, and NS LAT qualified upon completion of LAT-2643.

LAT altitude restrictions and currency requirements are IAW the T&R Program Manual.

Events should be flown in areas with significant vertical relief.

Crew Requirements. P/P/CC/AO

Low Altitude Tactics Stage Overview. The events included in the LAT stage of the Core Phase of training are depicted below.

Table 4-15: Low Altitude Tactics Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-2610	0.5	*	B,T		G		LAT for EAC
ACAD-2611	0.5	*	B,T		G		Tactical Aircrew Considerations
LAB-2620	0.5	*	B,T		G		LAT Walk-through
LAT-2640	1.5	*	B,T	D	A	1	LAT Maneuvers and Route
LAT-2641	1.5	365	B,T,R,M	D	A	2	Section LAT
NS LAT-2642	1.5	240	B,T,R	HLL	A	2	HLL Section LAT
NS LAT-2643	1.5	180	B,T,R,M	LLL	A	2	LLL Section LAT

ACAD-2610 0.5 * B,T G

LAT for Enlisted Aircrew

Goal. The AG/OUI has introductory knowledge of LAT terms and definitions.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to MV-22 Low Altitude Tactics.

Instructor. LATI

Required Reading. MV-22 ANTPP Chapters 4&5, NAVMC 3500.14 Chapter 3

ACAD-2611 0.5 * B,T G

Tactical Aircrew Considerations and Responsibilities

Goal. The AG/OUI has a familiarity with responsibilities specific to a tactical environment.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to aircrew responsibilities in a tactical environment.

Instructor. LATI

Prerequisites. ACAD-2610

LAB-2620 0.5 * B,T G

LAT Maneuver Walk Through

Goal. The AG/OUI is able to walk through all LAT maneuvers prior to executing them in the aircraft.

Requirement. Conduct IAW ANTPP.

Performance Standard. Demonstrate all LAT maneuvers prior to executing.

Instructor. LATI

Prerequisites. ACAD-2611

LAT-2640 1.5 * B,T D A 1 MV-22

Low Altitude Tactics Maneuvers and Navigation Route

Goal. Introduce LAT maneuvers and navigation on a route in the contour profile.

Requirements.

Discuss

- Rules of Conduct (ROC)
- Squadron SOP for required equipment
- CRM
- ICS procedures
- Aircrew duties in the LAT environment
- Lookout doctrine
- Aircraft clearance
- Physiological considerations
- Crew comfort levels
- Climb to cope
- Dive Recovery rules
- MSA/ESA
- L-hour
- Cabin Situational Awareness Device (CSAD)
- Introduce
 - Route cards
 - Fire control, Emissions, Navigation, Communication, Expendables (FENCE) checks
 - LAT maneuvers
 - Vertical maneuvers
 - Low level and contour flight
 - Low altitude emergencies
 - Height Above Terrain (HAT)
- Expose
 - CSAD
 - Surface-to-Air missiles (SAMs)
 - Go/No Go criteria

Performance Standards.

- Maintain situational awareness during each maneuver with regard to aircraft orientation to the terrain.
- Provide timely feedback to the pilots for terrain avoidance and obstacle clearance.
- Execute all LAT maneuvers IAW the MV-22 ANTTP Manual.
- Demonstrate proper CRM principles in the LAT regime.
- Comply with ROC IAW T&R Program Manual and other governing directives.
- Assist pilot with navigational assistance, route card, and fuel burn considerations.

Instructor. LATI

Prerequisite. LAB-2620

Required Reading. Review ANTTP En Route Tactics

External Syllabus Support. Approved route/range space with vertical relief.

LAT-2641	1.5	365	B,T,R,M	D	A	2	MV-22
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Section Low Altitude Tactics

Goal. Introduce section LAT maneuvers and navigation on a route in the contour profile.

Requirements.

- Discuss
 - ROC
 - CRM
 - ICS procedures
 - Aircrew duties in the LAT environment
 - Lookout doctrine

- Fuel considerations
- Crew comfort levels
- Wingman considerations
- Combat cruise
- Combat spread
- Vertical maneuvers
- Introduce
 - Max performance turns
 - Section vertical maneuvers
- Practice
 - Route cards
 - Fire control, Emissions, Navigation, Communication, Expendables (FENCE) checks
 - Combat spread and combat cruise
 - LAT maneuvers
 - Tactical formation maneuvers in the ANTTTP
 - Tactical lead changes
 - Low level and contour flight
 - Low altitude emergencies
- Review
 - Climb to Cope
 - Dive recovery rules
 - MSA/ESA
- Expose
 - Man Portable Air Defense Systems (MANPADS).

Performance Standards

- Provide pilots with timely information concerning terrain clearance and obstacle avoidance for the section.
- Demonstrate awareness of and comply with all LAT ROC and SOPs.
- Maintain geographical orientation throughout the navigation route.
- Maintain situational and terrain awareness.
- Demonstrate proper CRM principles in the LAT regime.
- Demonstrate ability to utilize route card for navigational assistance.
- Provide pilots with timely information concerning wingman position during LAT maneuvers.

Instructor. LATI

Prerequisites. FORM-2140, LAT- 2640

Required Reading. Review ANTTTP Formation

External Syllabus Support. Approved route/range space with vertical relief.

LAT-2642	1.5	240	B,T,R	HLL	A	2	MV-22
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High Light Level Section Low Altitude Tactics

Goal. Introduce NVD section tactical formation maneuvers, LAT maneuvers and navigation under HLL conditions.

Requirements

- Discuss
 - Standard terminology
 - Aircrew duties in the NS LAT environment
 - Aircraft lighting
 - Altitude awareness
 - Spatial orientation
 - Crew comfort level

- Sensor integration
- Obstacle/hazard avoidance
- Combat cruise
- Combat spread
- Vertical maneuvers
- Route card and navigational assistance in a night environment
- Introduce
 - Tactical formation maneuvering in HLL
 - LAT maneuvers in HLL
- Practice
 - Route cards
 - Fire control, Emissions, Navigation, Communication, Expendables (FENCE) checks
 - Combat spread and combat cruise
 - Tactical lead changes
 - Low level and contour flight
 - Low altitude emergencies
- Review
 - ESA/MSA
 - Vertical maneuvers

Performance Standards

Provide pilots with timely information on wingman position, terrain clearance, and obstacle avoidance.
Maintain geographical awareness along the LAT route.

Instructor. NSI

Prerequisites. NSQ HLL, LAT-2641

Required Reading. NVD Manual Ch. 6,15.2

External Syllabus Support. Approved route/range space with vertical relief

LAT-2643	1.5	180	B,T,R,M	LLL	A	2	MV-22
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Low Light Level Section Low Altitude Tactics

Goal. Introduce NVD section tactical formation maneuvers, LAT maneuvers and navigation under LLL conditions.

Requirements.

- Discuss
 - Standard terminology
 - Aircrew duties in the NS LAT environment
 - Aircraft lighting
 - Altitude awareness
 - Spatial orientation
 - Crew comfort level
 - Obstacle/hazard avoidance
 - Speed rush baseline/optical flow
- Introduce
 - Tactical formation maneuvering in LLL
 - LAT maneuvers in LLL
- Review
 - Aircraft lighting
 - Route cards
 - Fire control, Emissions, Navigation, Communication, Expendables (FENCE) checks
 - Combat spread and combat cruise

Tactical lead changes
Low level and contour flight
Low altitude emergencies

Performance Standards

Provide pilots with timely information on wingman position, terrain clearance, and obstacle avoidance.
Maintain geographical awareness along the route.

Instructor. NSI

Prerequisites. NSQ LLL, LAT-2642

Required Reading. NTRP App. F, Review NVD Manual Ch. 6

External Syllabus Support. Approved route/range space with vertical relief.

4.7.9 Division

Purpose. To develop proficiency in MV-22 Division Tactics.

General.

All maneuver descriptions are in the MV-22 ANTP Manual.

Crew Requirements. P/P/CC/AO

Division Tactics Stage Overview. The events included in the DIV stage of the Core Phase of training are depicted below.

Table 4-16: Division Tactics Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
DIV-2780	1.5	*	B,T	(NS)	A	3	Division TACFORM/NAV
DIV-2781	1.5	*	B,T	D	A	3	Division CAL
DIV-2782	1.5	*	B,T	HLL	A	3	HLL Division CAL
DIV-2783	1.5	365	B,T,R,M	LLL	A	3	LLL Division CAL
DIV-2784	1.5	365	B,T,R,M	(NS)	A	3	Division LAT

DIV-2780 1.5 * B,T (NS) A 3 MV-22

Division Formation and Navigation

Goal. Introduce division formations.

Requirements.

Discuss
 CRM
 Crew comfort level
 Standard terminology
 Division formations
 Tactical formation maneuvering
Introduce
 Division formations in the ANTP
 Division formation maneuvers in the ANTP
 Loss of visual contact/rendezvous and holding
Expose
 Threat levels

Performance Standards

Maintain proper lookout doctrine during division formation maneuvers.
Distance estimation calls to wingman are performed to a reasonable margin of error in terms of DME.
Maintain situational awareness during division formation maneuvers.

Instructor. BICC

Prerequisite. FORM-2140, NS LLL-2382~LLL

Required Reading. Review ANTTP Formation

DIV-2781 1.5 * B,T D A 3 MV-22

Division Confined Area Landings

Goal. Introduce division low- and medium-altitude tactical approaches, landings, and departures to a confined area.

Requirements

Discuss

CRM
Standard terminology
Crew comfort level
Combat cruise with 3 or more aircraft

Introduce

Division tactical approaches, landings, and takeoffs from a confined area (minimum 3 as lead for initial sorties)
Division terminal area procedures

Expose

Sectors of fire
Mutual support
Contingency operations
Pickup zone (PZ) operations

Performance Standard.

Provide pilots with accurate and timely information on the position of wingmen.
Distance estimation calls to wingmen are performed to a reasonable margin of error in terms of DME.
Provide obstacle clearance calls for the division during approaches, landings, and takeoffs.
Inform pilots of wingmen's position prior to landing to ensure all aircraft have adequate clearance to land.
Evaluate suitability of LZ terrain and communicate information to pilots
Perform drift corrections, accurate and timely distance estimation calls to the pilot prior to aircraft touchdown

Instructor. BICC

Prerequisite. CAL-2133

External Syllabus Support. Suitable landing site.

Required Reading. ANTTP Ch. 8

DIV-2782 1.5 * B,T HLL A 3 MV-22

High Light Level Division Confined Area Landings

Goal. Introduce division CALs using NVDs under HLL conditions.

Requirements.

Discuss

CRM

- Crew comfort levels
- Moon illumination/shadow effects on terrain
- Division formation and landing considerations
- Obstacle clearance
- Inadvertent IMC
- Distance estimation and depth perception
- Wave-offs
- Introduce
 - Division tactical approaches, departures, takeoffs, and landings (minimum of 3 CALs as lead)
- Practice
 - Division formations in the ANTTP
 - Division formation maneuvers in the ANTTP

Performance Standards.

- Provide feedback to pilots about the integrity of the flight.
- Maintain awareness of wingmen and provide adequate landing area information to the pilots during NVD HLL CALs.
- Provide pilots with timely information with regard to aircraft drift and LZ topography.

Instructor. NSI

Prerequisites. NS HLL-2341, DIV-2781

Required Reading. NVD Manual Ch. 8,9

External Syllabus Support. Suitable landing site and airspace.

DIV-2783 1.5 365 B,T,R,M LLL A 3 MV-22

Low Light Level Division Formation and Confined Area Landings

Goal. Review division formations and introduce division CALs using NVDs under LLL conditions.

Requirements.

- Discuss
 - CRM
 - Crew comfort levels
 - Moon illumination/shadow effects on terrain
 - Division formation and landing considerations
 - Obstacle clearance
 - Inadvertent IMC
 - Distance estimation and depth perception
 - Wave-offs
- Practice
 - Division tactical approaches, departures, takeoffs, and landings (minimum of 3 CALs as lead)
- Review
 - Division formations in the ANTTP
 - Division formation maneuvers in the ANTTP

Performance Standards.

- Provide feedback to pilots about the integrity of the flight.
- Maintain awareness of wingmen and provide adequate landing area information to the pilots during NVD LLL CALs.
- Provide pilots with timely information with regard to aircraft drift and LZ topography.
- Demonstrate procedural knowledge of tactical formation maneuvers IAW MV-22 ANTTP manual.
- Recognize proper tactical formations IAW MV-22 ANTTP manual.

Distance estimation calls to wingman are performed to a reasonable margin of error.

Instructor. NSI

Prerequisites. NS LLL-2383, DIV-2782

Required Reading. NVD Manual Ch. 8,9

External Syllabus Support. Suitable landing site and airspace.

DIV-2784 1.5 365 B,T,R,M (NS) A 3 MV-22

Division Low Altitude Tactics and Navigation

Goal. Review division tactical formation maneuvers, LAT maneuvers and navigation.

Requirements.

Discuss

- CRM
- Aircrew duties in the LAT environment
- Crew comfort levels
- Division formations in the LAT environment
- Division LAT considerations
- Division considerations and wingman awareness
- Division tactical formation maneuvering

Introduce

- Division LAT maneuvers

Review

- Division formations in the ANTTTP
- Division formation maneuvers in the ANTTTP
- Route cards
- Fire control, Emissions, Navigation, Communication, Expendables (FENCE) checks
- Tactical lead changes
- Low level and contour flight

Performance Standards.

- Provide feedback to pilots about the integrity of the flight.
- Provide pilots with timely information with regard to aircraft drift and LZ topography.
- Demonstrate procedural knowledge of tactical formation maneuvers IAW MV-22 ANTTTP manual.
- Recognize proper tactical formations IAW MV-22 ANTTTP manual.
- Distance estimation calls to wingman are performed to a reasonable margin of error.
- Provide pilots with timely information concerning terrain clearance and obstacle avoidance for the section.
- Demonstrate awareness of and comply with all LAT ROC and SOPs.
- Maintain geographical orientation throughout the navigation route.
- Demonstrate proper CRM principles in the LAT regime.

Instructor. NSI

Prerequisites. LAT-2641~D, NSLAT-2642~HLL, NSLAT-2643~LLL, FORM-2780

Required Reading. Review ANTTTP *En Route Tactics and Formation*

4.7.10 Ground Threat Reaction (GTR)

Purpose. To develop proficiency in counter-tactics versus enemy surface-to-air threats.

General

All maneuver descriptions are in the Classified MV-22 ANTP Manual. RADAR principles are listed in the NTRP Appendix G.

A WTI is required for all initial sorties. Aircrew who have completed their initial GTR sorties and have lost proficiency may regain proficiency by flying with a LATI who is proficient in that sortie.

The flight lead shall be GTR-2832 proficient and specifically brief all applicable GTR training rules per the MV-22 ANTP Manual and T&R Program Manual.

GTR-2832 shall be conducted against a threat emitter; e.g. SA-6, ZSU-23-4, etc. and requires an electronic warfare range.

All initial sorties shall be conducted during the day following completion of LAT-2641. Proficient aircrew may conduct subsequent sorties at night if they are LAT-Q.

Once proficiency is attained in GTR-2832, proficiency may be maintained by completion of GTR-2831.

Crew Requirements. P/P/CC/AO

Ground Threat Reaction Stage Overview. The events included in the GTR stage of the Core Phase of training are depicted below.

Table 4-17: Ground Threat Reaction Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-2810	1.0	730	B,T,R		G		Aircraft Survivability Equipment
ACAD-2811	1.0	*	B,T		G		Basic Principles of EW
ACAD-2812	1.0	*	B,T		G		ADA Threat
ACAD-2813	1.0	*	B,T		G		IR SAM Threat
ACAD-2814	1.0	*	B,T		G		Radar SAM Threat
ACAD-2815	1.0	*	B,T		G		GTR
LAB-2820	0.5	*	B,T		G		GTR Walk-through
GTR-2831	2.0	365	B,T,R		S	1	Section GTR Simulator
GTR-2840	1.5	365	B,T,R,M	(NS)	A	2	Section GTR

ACAD-2810 1.0 730 B,T,R G

EA Aircraft Survivability Equipment

Goal. The AG/OUI has a familiarity with the Aircraft Survivability Equipment (ASE).

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to Aircraft Survivability Equipment and theory of operation.

Instructor. WTI

Required Reading. MV-22 NTRP Ch 5, App B, C, and G

Prerequisites. ACAD-2611

ACAD-2811 1.0 * B,T G

EA Basic Principles of Electronic Warfare

Goal. The AG/OUI has a familiarity with the basic principles of Electronic Warfare.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to the concepts associated with Electronic Warfare.

Instructor. WTI

Required Reading. MV-22 NTRP App F

Prerequisites. ACAD-2810

ACAD-2812 1.0 * B,T G

Air Defense Artillery Threat to Assault Support (S)

Goal. The AG/OUI has a familiarity with the various ADA threats to assault support aircraft.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to ADA threats to assault support.

Instructor. WTI

Required Reading. AFTTP 3-1

Prerequisites. ACAD-2811

ACAD-2813 1.0 * B,T G

IR Surface-to-air Missile Threat to Assault Support (S)

Goal. The AG/OUI has a familiarity with the threat of IR SAMS to assault support.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to SAM threats to assault support.

Instructor. WTI

Required Reading. AFTTP 3-1

Prerequisites. ACAD-2811

ACAD-2814 1.0 * B,T G

RADAR SAM Threat to Assault Support(S)

Goal. The AG/OUI has a familiarity with the threat of RADAR SAMS to assault support.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to RADAR threats to assault support.

Instructor. WTI

Required Reading. AFTTP 3-1

Prerequisites. ACAD-2811

ACAD-2815 1.0 * B,T G

MV-22 Ground Threat Reaction (S)

Goal. The AG/OUI has a familiarity with the reaction maneuvers executed by the MV-22 as a result of a ground threats.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to Ground Threat Reaction theory and maneuvers.

Instructor. WTI

Required Reading. NATOPS Ch 18, ANTTP Appendix A, Classified ANTTP Ch 2

Prerequisites. ACAD-2810, ACAD-2811, ACAD-2812, ACAD-2813, ACAD-2814

LAB-2820 0.5 * B,T G

MV-22 Ground Threat Reaction Walk Through

Goal. The AG/OUI has a solid understanding of all GTR maneuvers prior to in-flight execution.

Instructor. WTI

Required Reading. ANTPP GTR Program Guide Appendix A

Prerequisites. ACAD-2815

SGTR-2831 2.0 365 B,T,R (NS) S 2 FFS/FTD TEN

Ground Threat Reaction Simulator

Goal. Introduce operation of onboard ASE to include strengths and weaknesses of ASE. Introduce defensive tactics vs RADAR and non-RADAR ADA and IR SAMs.

Discuss

Operation of the ALE-47, APR-39, AAR-47
CRM as it applies to the use of onboard ASE and threat detection
Strengths and weaknesses of each ASE system vs ADA, RF and IR threat
Verbal and non-verbal cues for threat reaction (e.g. lead's flares)
Counter-tactics against ADA, RF and IR threats
All available expendables
Effective fires vs non-effective fires
SPOT reporting
ROC per T&R Program Manual
GTR training rules
Threat reaction and escort coordination in the objective area
Transient gearbox pressures while maneuvering

Introduce

Use of all onboard ASE
Counter-tactics against ADA, RF and IR threats
Threat indications and symbols

Performance Standards.

Properly operate ASE IAW the ANTPP.
Employ proper counter-tactics vs ADA, RF and IR threats.
Recognize and correctly identify displayed threat indications.

Instructor. WTI.

Prerequisites. LAB-2820

GTR-2840 1.5 365 B,T,R,M (NS) A 2 MV-22

Goal. Review operation of onboard ASE and practice procedures to counter non-RADAR and RADAR threats in a multi-aircraft flight.

Requirements.

Discuss

CRM
Operation of ASE
Lookout doctrine

- Threat reaction and post engagement reaction
- Defensive weapons considerations
- GTR line numbers
- GTR training rules
- Practice
 - Threat avoidance maneuvers and/or tactics to defeat threat systems
 - Use of expendables to defeat threat systems
- Review
 - Set-up of ASE to defend against a ground threat
 - Threat indications and symbols

Performance Standards.

- Demonstrate knowledge of IR and RADAR SAMs and countermeasures.
- Execute GTR vs a ground threat IAW the MV-22 ANTTP manual.
- Call for maneuvers in response to a threat IAW the MV-22 ANTTP Manual.
- Employ all ASE IAW the MV-22 ANTTP Manual and NTRP.
- Maintain situational awareness of wingman position and provide information to pilots in a timely manner.

Instructor. WTI

Prerequisites. FORM-2140, LAT-2641, SGTR-2831

Ordnance. 60 chaff and 30 flares (initial and refresher events). Subsequent events inside the proficiency interval may be conducted in training mode with no actual chaff or flare loadout.

External Syllabus Support. EW emitter, chaff and flare capable range, ground fire indication.

4.7.11 Carrier Qualification (CQ)

Purpose. To qualify the AG/OUI in flight operations from a carrier deck or ship platform under day and NVD conditions.

General

Refer to NAVAIR 00-80T-106 LHA/LHD NATOPS and NAVAIR 00-80T-105 CV NATOPS Manuals for carrier operations.
Refer to NAVAIR 00-80T-122 for air capable ship operations.

CQ-2943 shall be flown under HLL conditions for initial qualifications. An NSI is required for unqualified aircrew on NVD CQ flights.

IAW NATOPS and NAVMC 3500.14, a crew member is day CQ upon completion of CQ-2932 and is NVG CQ upon completion of CQ-2935. A qualification letter signed by the commanding officer stating the crew member is day CQ/NVG CQ shall be placed in the crewmember's NATOPS jacket upon completion of the appropriate flight.

Crew Requirement. P/P/CC (AO required for NVD CQ)

Carrier Qualification Stage Overview. The events included in the CQ stage of the Core Phase of training are depicted below.

Table 4-18: Carrier Qualification Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
CQ-2930	1.0	*	B,T	D	S	1	Day CQ Simulator
CQ-2931	1.0	*	B,T	NS	S	1	NS CQ Simulator
CQ-2940	1.5	365	B,T,R	D	A	1	Day FCLP
CQ-2941	1.5	365	B,T,R	D	A	1	Day CQ Flight
NSCQ-2942	1.5	365	B,T,R	NS	A	1	NS FCLP
NSCQ-2943	1.5	365	B,T,R,M	NS	A	1	NS CQ Flight

SCQ-2930 1.0 365 B,T D S 1 FFS/FTD

Day Carrier Qualification Simulator

Goal. Introduce day CQ pattern and procedures to various classes of ships.

Requirements.

Discuss

- CRM
- Crewmember duties during CQs
- Shipboard ICS procedures
- Flight deck status lights
- Flight deck crew
- Hand-and-arm signals for shipboard operations
- Flight deck operations
- Ship traffic patterns
- Wave offs
- Various patterns around the ship
- Pitch-up with side-slip characteristics
- Emergency procedures in the shipboard environment

Introduce

- Carrier operation
 - Airplane and conversion mode arrivals
 - Charlie pattern for LHA/LHD and LPD/LSD (minimum of 5 for initial events)
 - Communication procedures
 - Lights and light signals
 - LSE signals and procedures
 - Waveoff
 - Departure procedures
- Self-taxi procedures
- STOs
- NATOPS shipboard approaches
- High gross weight operations
- Checklists

Performance Standards

Demonstrate knowledge of flight deck crew.
 Demonstrate knowledge of day shipboard procedures IAW the CV/LHA/LHD NATOPS and Air Capable Ships NATOPS.
 Demonstrate proper clearance calls prior to landing.

Instructor. BICC

Prerequisite. CAL-2240

SCQ-2931 1.0 365 B,T NS S 1 FFS/FTD

NS Carrier Qualification Simulator

Goal. Introduce NVD CQ pattern and procedures to various classes of ships.

Requirements.

Discuss

- CRM
- Crewmember duties during CQs
- Shipboard ICS procedures

- Flight deck crew
- Shipboard lighting and light signals
- Aircraft lighting
- Hand-and-arm signals for shipboard operations
- Emergency procedures in the shipboard environment
- Introduce
 - Carrier operations using NVDs
 - Arrival
 - Night landing patterns (minimum of 5 for initials)
 - Communication procedures
 - Shipboard lighting and light signals
 - LSE signals and procedures
 - Waveoff
 - Departure
 - Self-taxi procedures
 - STOs
 - NATOPS shipboard approaches
 - High gross weight operations
 - Checklists

Performance Standards

Demonstrate knowledge of flight deck crew.
Demonstrate knowledge of NS shipboard procedures IAW the CV/LHA/LHD NATOPS and Air Capable Ships NATOPS.
Demonstrate proper clearance calls prior to landing.

Instructor. BICC

Prerequisite. SCQ-2930

CQ-2940 1.5 365 B,T,R D A 1 MV-22

Field Carrier Landing Practice

Goal. Introduce day CQ patterns and procedures in a Field Carrier Landing Practice (FCLP) scenario.

Requirements.

- Discuss
 - CRM
 - Crewmember duties during CQs
 - Shipboard ICS procedures
 - Hand-and-arm signals for shipboard operations
 - Flight deck status lights
 - Flight deck operations
 - Ship traffic patterns
 - Wave offs
- Practice
 - Carrier operation
 - Communication procedures
 - Airplane and conversion mode arrivals
 - Aircraft lighting
 - Charlie pattern for LHA/LHD and LPD/LSD (minimum 5 for initial sorties)
 - LSE signals and procedures
 - Departure procedures
 - Self-taxi procedures

STOs
Pitch-up with side-slip characteristics
Technique A and B approaches
Stern Approach

Performance Standards

Demonstrate knowledge of ship landing deck configuration.
Demonstrate proper clearance calls prior to landing.
Properly execute the CQ pattern IAW LHA/LHD NATOPS.
Correction calls over the spot are accurate, clear, and timely.

Instructor. BICC

Prerequisites. SCQ-2930

Required Reading. MV-22 NATOPS Ch 8, LHA/LHD NATOPS Ch 2, 3, 4, 5, 6, App A, ANTPP Ch. 13

External Syllabus Support. FCLP site

CQ-2941	1.5	365	B,T,R	D	A	1	MV-22
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Goal. Day qualification flight.

Requirements

Discuss

CRM
Crewmember duties during CQs
Shipboard ICS procedures
Hand-and-arm signals for shipboard operations
Flight deck operations
Nacelle modulation procedures
Waveoffs
Ditching

Review

Carrier operation
Communication procedures
Airplane and conversion mode arrivals
Aircraft lighting
Charlie pattern for LHA/LHD or LPD/LSD (minimum 5 for initial sorties)
LSE signals and procedures
Departure procedures
Self-taxi procedures
STOs
NATOPS shipboard approaches
Checklists

Performance Standards

Demonstrate knowledge of ship landing deck configuration.
Demonstrate proper clearance calls prior to landing.
Properly execute the CQ landing pattern IAW applicable NATOPS Manual (minimum 5 for initial sorties).
Correction calls over the spot are accurate, clear, and timely.

Instructor. BICC

Prerequisites. CQ-2940

External Syllabus Support. Landing platform afloat

CQ-2942	1.5	365	B,T,R	NS	A	1	MV-22
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Goal. Introduce night aided CQ patterns and procedures in an FCLP scenario.

Requirements.

Discuss

- CRM
- Aircraft lighting
- Crewmember duties during NVD CQs
- NVD CQ patterns
- Ditching

Practice

- Carrier operations using NVDs
 - Arrival
 - Night landing patterns (minimum of 5 for initials)
 - Communication procedures
 - Shipboard lighting and light signals
 - LSE signals and procedures
 - Waveoff
 - Departure
- Self-taxi procedures
- STOs
- NATOPS shipboard approaches
- High gross weight operations
- Checklists

Performance Standards

- Maintain an active NVG scan to acquire hazards and recognize improper landing profiles.
- Correction calls over the spot are accurate, clear, and timely.
- Perform standard CQ landing procedures utilizing NVDs (minimum 5 for initial sorties).

Instructor. NSI

Prerequisites. SCQ-2931, CQ-2940

Required Reading. MAWTS-1 NVD Manual Ch 15

External Syllabus Support. FCLP site

CQ-2943	1.5	365	B,T,R,M	NS	A	1	MV-22
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Goal. NVD qualification flight.

Requirements

Discuss

- CRM.
- Aircraft lighting
- Ship lighting
- NVD CQ patterns
- Crewmember duties during NVD CQs
- LSE signals at night
- Low contrast environment utilizing NVDs
- Ditching

Review

- Carrier operations using NVDs
 - Arrival
 - Night landing patterns (minimum of 5 initial sorties).
 - Communication procedures
 - Shipboard lighting and light signals
 - LSE signals and procedures
 - Waveoff
 - Departure
- Self-taxi procedures
- STOs
- NATOPS shipboard approaches
- High gross weight operations
- Checklists

Performance Standards

Perform standard CQ landing procedures while utilizing NVDs (minimum 5 for initial sorties).
Maintain an active NVG scan to acquire hazards and recognize improper landing profiles.
Correction calls over the spot are accurate, clear, and timely.

Instructor. NSI

Prerequisites. NSQ for appropriate light level, CQ-2942

External Syllabus Support. Landing platform afloat

4.8 MISSION PHASE

Purpose.

To establish training designed to enable Aircrews to achieve proficiency in mission skills. Mission Phase events are designed to fulfill the requirements of the VMM Mission Essential Task List (METL) as defined by the associated Marine Corps Task List (MCTL).

General.

Events in this stage of training should be based on tactical scenarios designed to focus on the specific items delineated in the different training codes and will be developed by the squadron WTI. To the greatest extent possible the scenarios should incorporate the employment of escort aircraft (fixed or rotary wing), ASE, and use of the weapon systems. On certain events integration with other ACE assets is required.

Discuss items for each event in this stage are designed to be the focus of scenario-based training for planning and execution, not necessarily for discussion during individual crew briefs. However, this does not preclude these items from being discussed during crew briefs and emphasized during flight.

ROC will be per the T&R Program Manual.

Aircrew shall complete all initial flight events in this phase of training in accordance with the requirements in the individual event header.

Aircrew do not meet minimum crew requirements for readiness reporting per Chapter 1 until GTR-2832 complete.

Mission Phase Overview. The following stages are included in the Mission Skill Phase of training.

Table 4-19: Mission Phase

Stage Name
Air Logistics Support (ALS)
Expeditionary Shore-Based Aviation Operations (EXP)

Expeditionary Sea-Based Aviation Operations (SEA)
Tactical Recovery Of Personnel And Aircraft (TRAP)
Combat Assault Transport (CAT)

4.8.1 Air Logistics Support (ALS)

Purpose. To introduce air logistics support planning, briefing and execution specific. This stage of training is designed to fulfill the requirement set in MCT XXXXXXXX.

Crew Requirement. P/P/CC/AO

Air Logistics Support Stage Overview. The events included in the ALS stage of the Mission Phase of training are depicted below.

Table 4-20: Aviation Logistics Support Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-3011	0.5		B,T		G		Six Functions of Marine Aviation
ALS-3040	2.0	365	B,T,R,M	(NS)	A		ALS Mission

ACAD-3011 0.5 B,T G

Six Functions of Marine Aviation

Goal. The AG/OUI has a familiarity with the functions of Marine aviation.

Requirement. Utilize MAWTS-1 Courseware.

Performance Standards. Aircrew are introduced to the functions of Marine aviation.

Instructor. WTI

Prerequisites. NSQ

ALS-3040	2.0	365	B,T,R,M	(NS)	A	2	MV-22
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Air Logistics Support Mission

Goal. Conduct air logistics support in a low-threat environment.

Requirement. Aircrew are able to demonstrate proficiency in general cargo handling and securing, cabin loading and unloading, forklift/vehicle directing, and passenger handling.

Performance Standard. Aircrew safely handle cargo, equipment, and personnel in accordance with appropriate publication.

Instructor. LATI

Required Reading. ANTTP *Mission planning, Cargo Operations, Air Delivery*; NATOPS Shore-based procedures.

Prerequisites. ACAD-3011

4.8.2 Expeditionary Shore-Based Aviation Operations (EXP)

Purpose. This stage of training is designed to fulfill the requirement set in MCT 1.3.3.3.2, Conduct Aviation Operations From Expeditionary Shore-Based Sites.

Crew Requirement. P/P/CC/AO.

Expeditionary Shore-Based Aviation Operations Stage Overview. The events included in the EXP stage of the Mission Phase of training are depicted below.

Table 4-21: Expeditionary Shore-Based Operations Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-3110	0.5	*	B,T		G		EA ACEOI
EXP-3140	2.0	365	B,T,R,M	(NS)	A	2	Shore-based General Support Mission

Prerequisites. CQ, GTR-2840, EXP-3140

4.8.4 Tactical Recovery of Aircraft and Personnel (TRAP)

Purpose. To introduce tactical mission planning, briefing, and execution specific to TRAP. This stage of training is designed to fulfill the requirement set in MCT 6.2.1.1 Conduct Aviation Support of Tactical Recovery of Aircraft and Personnel (TRAP).

Crew Requirement. P/P/CC/AO.

Tactical Recovery of Aircraft and Personnel Stage Overview. The events included in the TRAP stage of the Mission Phase of training are depicted below.

Table 4-30: TRAP Mission Skill Phase

EVENT	TIME	REFLY	POI	CONDITIONS	DEVICE	NUM	DESCRIPTION
ACAD-3310	1.0	*	B,T		G		Personnel Recovery
TRAP-3340	2.0	365	B,T,R,M	(NS)	A		TRAP Mission

ACAD-3310 1.0 * B,T G

Personnel Recovery

Goal. The AG/OUI has a familiarity with responsibilities associated with a TRAP mission.

Requirement. Complete JKO PR 102.

Performance Standard. Student is introduced to all responsibilities during a TRAP mission.

Instructor. JKO

Required Reading. ASTACSOP TRAP

Prerequisite. ACAD-3110

TRAP-3340 2.0 365 B,T,R,M (NS) A 2 MV-22

Tactical Recovery of Aircraft and Personnel Mission

Goal. Introduce a tactical recovery of aircraft or personnel mission.

Requirement.

Discuss

- CRM
- Enlisted aircrew responsibilities
- TRAP mission analysis
- Threat analysis
- Alert postures
- Assault Support Tac SOP
- Use of standardized TRAP template
- Use of Mission Kits (Medevac, Hoist, etc.)
- Use of ASE
- Quick reaction force
- Go/No-go criteria
- TRAP COAs

Introduce

- Execution of a TRAP mission
- TRAP Template
- ISOPREP data
- Types of TRAP
- Authentication

Performance Standards

Maintain situational awareness with respect to the friendly and enemy situation and mission progress.
Configure the cabin for TRAP mission.
Properly execute assigned mission utilizing appropriate COA.

Instructor. LATI

Prerequisites. EXP-3140, ACAD-3311

Ordinance. 600 rds appropriate ammunition, 40 chaff and 50 flares

External Syllabus Support. Aerial gunnery and expendable capable range, aircraft to perform RMC, RESCORT/RESCAP, approved LZ

4.8.5 Combat Assault Transport (CAT)

Purpose. To introduce day and night combat assault transport tactical mission planning, briefing, and execution. This stage of training is designed to fulfill the requirement set in MCT 1.3.4.1, Conduct Combat Assault Transport.

Crew Requirement. P/P/CC/AO

Stages. The following stages are included in the CAT Mission Skill Phase of training, depicted below

Table 4-22 Combat Assault Transport Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-3415	1.0	*	B,T		G		NEO Execution
ACAD-3416	1.0	*	B,T		G		CASEVAC
CAT-3440	2.0	365	B,T,R	NS	A	2	Low-threat Section
CAT-3441	2.0	365	B,T,R,M	(NS)	A	2	Escort Section

ACAD-3415 1.0 * B,T G

NEO Execution

Goal. The AG/OUI has a familiarity with responsibilities associated with a NEO mission.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to the execution and responsibilities during a NEO mission.

Instructor. WTI

Prerequisite. ACAD-3110

ACAD-3416 1.0 * B,T G

CASEVAC

Goal. The AG/OUI has a familiarity with responsibilities associated with a casualty evacuation mission.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to CASEVAC operations and responsibilities.

Instructor. WTI

Prerequisite. NSQ, 3011, 3110

Required Reading. MV-22 TPG litter provisions and 9-line, ASTACSOP CASEVAC

CAT-3440 2.0 365 B,T,R, (NS) A 2 MV-22

Low-threat Air Assault Mission

Goal. Introduce an urban long range Air Assault Raid mission in a low-threat environment utilizing a section.

Requirement.

Discuss

- Cabin configuration
- Use of SERE information
- ROE
- GCE Scheme of maneuver
- Threat considerations
- PZ and LZ operations
- Objective area planning
- Objective area actions
- Sectors of fire/Fields of fire
- Route considerations
- Execution Checklists
- Contingency plans
- Fire Support Coordination Measures
- ACEOI
- Aircraft Survivability Equipment

Introduce

- Execution of a low threat assault support mission using a section
- Execution checklists

Performance Standards

- Maintain situational awareness with respect to the friendly and enemy situation and mission progress.
- Properly employ all ASE IAW the MV-22 ANTTTP Manual.
- Execute proper weapons employment procedures IAW the MV-22 ANTTTP Manual.
- Demonstrate weapons employment procedures in a low threat tactical environment.

Instructor. LATI

Prerequisites. LATQ, EXP-3140, ACAD-3415, ACAD-3416

Ordnance. 600 rds appropriate ammunition, 40 chaff and 50 flares

External Syllabus Support. Aerial gunnery and expendable capable range, approved LZ.

CAT-3441 2.0 365 B,T,R,M (NS) A 2 MV-22

Air Assault Mission Utilizing Escorts

Goal. Introduce an Air Assault mission incorporating escorts, troops, and fire support agencies.

Requirements.

Discuss

- Cabin configuration
- Use of SERE information
- ROE
- GCE Scheme of maneuver
- Threat considerations
- PZ and LZ operations
- Objective area planning
- Objective area actions
- Sectors of fire/Fields of fire

Escort operations
Route considerations
Execution Checklists
Contingency plans
Fire Support Coordination Measures
ACEOI
Aircraft Survivability Equipment
Introduce
Escort operations
Integrated objective areas

Performance Standards

Maintain situational awareness with respect to the friendly and enemy situation and mission progress.
Properly employ all ASE IAW the MV-22 ANTTP Manual.
Execute proper weapons employment procedures IAW the MV-22 ANTTP Manual.
Demonstrate weapons employment procedures in a tactical environment.

Instructor. LATI

Required Reading. ANTTP *Assault Support*

Prerequisites. CAT-3440

Ordnance. 600 rds of appropriate ammunition, 40 chaff and 50 flares.

External Syllabus Support. Aerial gunnery and expendable capable range, EW emitter, approved LZ, and FW/RW escort.

4.9 CORE PLUS PHASE

Purpose. To establish training for Core Plus Skill events. (theater specific, low-probability of occurrence)

General.

ROC will be per T&R Program manual.

Aircrews may fly night flights using NVGs in this phase under HLL or LLL conditions provided they are NSQ for that light level.

Prior to training in this phase, Aircrew should be complete with Core Phase training.

Stages. The following stages are included in the Core Plus Phase of training.

Table 4-23: Core Plus Phase

Stage Name
Air Delivery (AD)
Alternate Insertion/Extraction Techniques (AI/E)
Mountainous Area Training (MAT)
Defensive Weapon System (DWS)
Defensive Combat Maneuvers (DCM)
Chemical, Biological, Radiological And Nuclear (CBRN)
Carrier Qualification (CQ)
Rapid Insertion/Extraction (RI/E)
Aviation Delivered Ground Refueling (ADGR)
Aviation-Delivered Battlefield Illumination (BI)
Air Delivery Mission (AD)
Airborne Command And Control (AC2)

4.9.1 Air Delivery (AD)

Purpose. To develop proficiency in personnel parachute operations (PARAOPS), air delivery of cargo, and day/NVD external load operations from confined areas.

General. All maneuver descriptions are in the ANTP.

An NSI is required for initial NVD external events.

Crew Requirements. P/P/CC/AO for aircraft events.

Air Delivery Stage Overview. The events included in the AD stage of the Core Plus Phase of training are depicted below.

Table 4-24: Air Delivery Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-4010	1.0	*	B,T		G		EA Air Delivery
PARA-4041	1.5	365	B,T,R	(NS)	A	1	PARAOPS
AD-4042	1.5	365	B,T	(NS)	A	1	CDS
AD-4043	1.5	365	B,T,R,M	(NS)	A	1	Door Bundle
EXT-4081	1.5	365	B,T,R	D	A	1	Day Single-point Externals
EXT-4082	1.5	365	B,T,R	D	A	1	Day Dual-point Externals
EXT-4083	1.5	365	B,T,R,M	NS	A	1	NS Single-point Externals
EXT-4084	1.5	365	B,T,R,M	NS	A	1	NS Dual-point Externals

ACAD-4010 1.0 * B,T G

EA MV-22 Air Delivery

Goal. The AG/OUI has an introductory knowledge of procedures to execute air delivery and PARAOPS from the MV-22.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to MV-22 air delivery procedures and appropriate checklists.

Instructor. BICC

Required Reading. ANTP *Air Delivery*, NATOPS Operating limitations

Prerequisite. ACAD-2610

PARA-4041 1.5 365 B,T,R (NS) A 1 MV-22

Personnel Parachute Operations

Goal. Introduce PARAOPS procedures.

Requirements.

Discuss

CRM during PARAOPS (aircrew/jumpmaster responsibilities)
Tactical considerations for air delivery of troops
MV-22 TPG air delivery briefing guide
Voice communication/standard terminology during PARAOPS
Cargo handling manual

Introduce

Inspection of anchor cable
Air delivery checklist

Performance Standards

Execute PARAOPS procedures IAW the MV-22 ANTP.
Demonstrate proper crew coordination during PARAOPS operations.

Prerequisites. LAT-2640~D, LAT-2642~HLL, LAT-2643~LLL, ACAD-4010

External Syllabus Support. Certified Drop Zone, Jumpmaster, qualified troops.

AD-4042 1.5 365 B,T (NS) A 1 MV-22

Air Delivery of Cargo via Door Bundle

Goal. Introduce air delivery of cargo via Door Bundle.

Requirements.

Discuss

- CRM
- Voice communication/standard terminology
- Tactical considerations for air delivery of cargo
- Rigging and preflight of equipment and cargo
- Air delivery checklist/briefing guide

Introduce:

- Cabin configuration for air delivery of cargo
- Door bundle rigging procedures
- Load inspection procedures
- Execution of the air delivery checklist

Performance Standards.

- Execute air delivery procedures IAW the MV-22 ANTP Manual.
- Demonstrate proper crew coordination during air delivery operations.
- Demonstrate proper cabin configuration for air delivery of cargo.
- Demonstrate proper loading and rigging procedures for Door Bundle.

Instructor. BICC

Prerequisites. LAT-2640~D, LAT-2642~HLL, LAT-2643~LLL, ACAD-4010

External Syllabus Support. Aerial Delivery Platoon, door bundles.

AD-4043 1.5 365 B,T,R,M (NS) A 1 MV-22

Air Delivery of Cargo via Container Delivery System

Goal. Introduce air delivery of cargo via Container Delivery System (CDS).

Requirements.

Discuss

- CRM
- Tactical considerations for air delivery of cargo
- Rigging and preflight of equipment and cargo
- Air delivery checklist/briefing guide
- Voice communication/standard terminology

Introduce

- Cabin configuration for air delivery of cargo
- Container Release System (CRS)
- Container Delivery System (CDS)
- Container rigging procedures
- Load inspection procedures
- Execution of the air delivery checklist

Performance Standards

- Execute air delivery procedures IAW the MV-22 ANTP Manual.
- Demonstrate proper crew coordination during air delivery operations.
- Demonstrate proper cabin configuration for air delivery of cargo.
- Demonstrate proper loading and rigging procedures for CDS.

NAVMC 3500.11E
16 Apr 18

Instructor. BICC

Prerequisites. LAT-2640~D, LAT-2642~HLL, LAT-2643~LLL, ACAD-4010

External Syllabus Support. Aerial Delivery Platoon, CDS bundles.

EXT-4081	1.5	365	B,T,R	D	A	1	MV-22
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Single-point External Cargo Operations

Goal. Introduce single-point external load hook-up and delivery to a confined area

Requirements

Discuss

- Aircraft hook system
- Pendant preflight
- HWOOG operation
- HST composition, functions, and signals
- HST safety brief
- Crew responsibilities and communications during external operations
- Standard terminology
- Cargo hook-up procedures
- Reduced visibility conditions
- Terrain/obstacle clearance
- Inadvertent IMC procedures
- Aircraft emergencies with single-point external load
- Tactical considerations during external lift operations
- Aerodynamic characteristics of external loads
- Light and heavy external load considerations
- Load jettison procedures

Introduce

- Pendant preflight
- Hook checks
- External load and rigging inspection.
- Single-point external load hook-up and delivery to a confined area (minimum of 5 for initial sorties)
- Wave-off with external load

Performance Standards

- Demonstrate Proper aircraft hook system and pendant preflight checks IAW Aircrew Pocket Checklist (NFM-800).
- Demonstrate proper ICS terminology during external operations.
- Place the load within 10 meters of desired location.
- Execute single-point external procedures IAW the MV-22 ANTTP Manual.

Instructor. BICC

Prerequisites. CAL-2240, ACAD-4010

Required Reading. ANTTP *Cargo Operations*, NATOPS Operating limitations

External Syllabus Support. External load, HST, approved LZ with 7nm of protected airspace to 1,000' AGL

EXT-4082	1.5	365	B,T,R	D	A	1	MV-22
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Dual-point External Cargo Operations

Goal. Introduce dual-point external load hook-up and delivery to a confined area.

Requirements

Discuss

- CRM
- Standard terminology
- HWOOG operation
- Dual-point cargo hook-up procedures
- Terrain/obstacle clearance
- Reduced visibility conditions
- Inadvertent IMC procedures
- Aircraft emergencies with dual-point external load
- Tactical considerations during external lift operations
- Aerodynamic characteristics of dual-point external loads
- Light and heavy external load considerations
- Auto-jettison functionality
- 70/30-30/70

Introduce

- Dual point external load hook-up and delivery to a confined area (minimum of 5 for initial sorties)
- Wave-off with external load

Performance Standards

- Demonstrate aircraft hook system and pendant preflight checks IAW Aircrew Pocket Checklist (NFM-800).
- Demonstrate proper ICS terminology during dual-point external operations.
- Place the load within 10 meters of desired location.
- Execute dual-point external procedures IAW the MV-22 ANTTP Manual.

Instructor. BICC

Prerequisites. AD-4081

External Syllabus Support. External load, HST, approved LZ with 7nm of protected airspace to 1,000' AGL

EXT-4083	1.5	365	B,T,R,M	NS	A	1	MV-22
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NS Single-point External Cargo Operations

Goal. Introduce single-point external cargo operations utilizing NVGs.

Requirements

Discuss

- All previously introduced EXT stage items
- NVD briefing guide
- Aircraft and landing zone lighting
- Aircraft emergencies with external load

Introduce

- Identifying the zone and load using NVDs
- Single-point external load hook-up and delivery to a confined area using NVGs (minimum of 5 for initial sorties)
- Use of aircraft lighting (search light, belly light)

Practice

- Pendant preflight
- Hook checks
- External load and rigging inspection

Performance Standards

- Demonstrate aircraft hook system and pendant preflight checks IAW Aircrew Pocket Checklist (NFM-800).
- Demonstrate proper ICS terminology during external operations.
- Place load within 10 meters of desired location.
- Execute proper NVD external procedures IAW the MV-22 ANTTP Manual.

Instructor. NSI

Required Reading. MAWTS-1 NVD Manual *Low Light Level External Operations Considerations*

Prerequisites. NS-2340~HLL, NS-2380~LLL, AD-4081

External Syllabus Support. External load, HST, approved LZ with 7nm of protected airspace to 1,000' AGL.

EXT-4084 1.5 365 B,T,R,M NS A 1 MV-22

NS Dual-point External Cargo Operations

Goal. Introduce dual-point external cargo operations utilizing NVGs.

Requirements.

- Discuss
 - All previously introduced EXT stage items
 - NVD briefing guide
 - Aircraft and landing zone lighting
 - Aircraft emergencies with external load
- Introduce
 - Dual-point external load hook-up and delivery to a confined area using NVGs (minimum of 5 for initial sorties)
- Practice
 - Identifying the zone and load using NVDs
 - Use of aircraft lighting (search light, belly light)
- Review
 - Pendant preflight
 - Hook checks
 - External load and rigging inspection

Performance Standards

- Demonstrate aircraft hook system and pendant preflight checks IAW Aircrew Pocket Checklist (NFM-800).
- Demonstrate proper ICS terminology during external operations.
- Place load within 10 meters of desired location.
- Execute proper NVD external procedures IAW the MV-22 ANTTP Manual.

Instructor. NSI

Prerequisites. NS-2340~HLL, NS-2380~LLL, AD-4082

External Syllabus Support. External load, HST, approved LZ with 7nm of protected airspace to 1,000' AGL.

4.9.2 Alternate Insertion/Extraction Techniques (AIE)

Purpose. To develop proficiency in tiltrotor alternate insertion and extraction techniques and procedures.

General. Initial AIE-4140 through AIE-4143 shall be conducted during the day. Subsequent execution of AIE-4130 through AIE-4132 may be conducted at night. Aircrews shall be NSQ for the appropriate light level if conducting AIE-4130 through AIE-4143 using NVGs

Crew Requirement. P/P/CC/AO

Alternate Insertion/Extraction Techniques Stage Overview. The events included in the AIE stage of the Core Plus Phase of training are depicted below.

Table 4-25: Alternate Insertion/Extraction Techniques Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-4111	0.5	*	B,T		G		Alternate Insertion/Extraction
ACAD-4112	0.5	*	B,T		G		Hoist Operations
AIE-4140	1.5	365	B,T,R,M	(NS)	A	1	Fastrope/Rappel
AIE-4141	1.5	365	B,T,R,M	(NS)	A	1	Hoisting

AIE-4142	1.5	365	B,T,R,M	(NS)	A	1	SPIE
AIE-4143	1.5	365	B,T,R,M	(NS)	A	1	HELOCAST

ACAD-4111 0.5 * B,T G

EA MV-22 Alternate Insertion/Extraction

Goal. The AG/OUI has an introductory knowledge of procedures to execute Fastrope, Rappel, SPIE, and Helocast operations from the MV-22.

Requirement. Utilize MAWTS-1 Courseware

Performance Standard. Student is introduced to procedures for AIE techniques.

Instructor. BICC

Required Reading. ANTTP *Alternate Insertion and Extraction*

Prerequisite. ACAD-2611

ACAD-4112 0.5 * B,T G

EA MV-22 Hoist Operations

Goal. The AG/OUI has an introductory knowledge of procedures to execute hoist operations from the MV-22.

Requirement. Utilize MAWTS-1 Courseware

Performance Standard. Student is introduced to Hoist procedures.

Instructor. BICC

Required Reading. ANTTP *Alternate Insertion and Extraction*

Prerequisite. ACAD-2611

AIE-4140 1.5 365 B,T,R,M (NS) A 1 MV-22

Alternate Insertion Procedures via Fastrope or Rappel

Goal. Introduce insertion procedures via fastrope or rappel.

Requirements.

Discuss

HIGE/HOGE power requirements
HRST brief
Voice communication/standard terminology
ICS failure/hand and arm signals
Obstacle clearance/wave-off
Emergency procedures

Introduce

Preflight of fast rope/rappel rigging
Troop insertion via fastrope/rappel

Performance Standards

Maintain proper lookout for hover operations when deploying troops.
Maintain obstacle clearance.
Execute proper AIE procedures IAW the MV-22 ANTTP Manual.

Instructor. BICC

NAVMC 3500.11E
16 Apr 18

Prerequisites. EXT-4081, EXT-4083~NS, ACAD-4111

External Syllabus Support. HRST Master, qualified troops.

AIE-4141 1.5 365 B,T,R,M (NS) A 1 MV-22

Alternate Insertion/Extraction Procedures via Hoisting

Goal. Introduce insertion/extraction procedures via hoisting.

Requirements.

Discuss

- HIGE/HOGE power requirements
- CRM
- Voice communication/standard terminology
- ICS failures/hand and arm signals
- Obstacle clearance
- Emergency procedures

Introduce

- Hoist cable inspection
- Troop insertion/extraction via hoisting

Performance Standards

- Maintain proper lookout for extended hover when inserting/extracting troops.
- Execute proper hoist procedures IAW the MV-22 ANTTP Manual.
- Maintain obstacle clearance.

Instructor. BICC

Prerequisites. EXT-4081, EXT-4083~NS, ACAD-4112

AIE-4142 1.5 365 B,T,R,M (NS) A 1 MV-22

Special Patrol Insertion/Extraction Operations

Goal. Introduce insertion/extraction procedures via Special Patrol Insertion/Extraction (SPIE) operations.

Requirements

Discuss

- HIGE/HOGE power requirements
- CRM
- Pilot, Aircrew, HRST Master and HRST Safety Observer brief
- Voice communication/standard terminology
- ICS failures/hand and arm signals
- Obstacle clearance
- Emergency procedures

Introduce

- SPIE rigging inspection
- Troop insertion/extraction via SPIE

Performance Standards.

- Maintain proper lookout for extended hover when extracting/inserting troops.
- Maintain obstacle clearance.
- Execute proper SPIE procedures IAW the MV-22 ANTTP Manual.

Instructor. BICC

Prerequisites. EXT-4081, EXT-4083~NS, ACAD-4111

External Syllabus Support. HRST master, qualified troops.

AIE-4143 1.5 365 B,T,R,M (NS) A 1 MV-22

Helocast and Soft Duck Operations

Goal. Introduce insertion procedures via helocast and/or soft duck (deflated rubber boat) and introduce SAR operations.

Requirements

Discuss

CRM while performing helocast or soft duck
Proper rigging and preflight of equipment to be inserted via helocast and soft duck
Low altitude aircraft emergencies over water
Ditching/water landing
Salt encrustation/compressor stall
Helocast/soft duck aerial delivery altitudes and airspeeds
Voice communications/standard terminology
Flight Director search patterns
Cargo handling manual

Introduce

Insertion of troops and equipment by helocast or soft duck
Preflight of aircraft, troops and equipment for helo cast or soft duck
SAR patterns and over-water hoisting operations

Performance Standards

Execute helo cast or soft duck procedures IAW the MV-22 ANTPP Manual.
Demonstrate proper crew coordination during helo cast or soft duck operations.

Instructor. BICC

Prerequisite. CAL-2240, ACAD-4111, EXT-4081, EXT-4083 ~NS

4.9.3 Mountain Area Training (MAT)

Purpose. To develop proficiency in day and NVD mountainous terrain operations. Aircraft landings shall be conducted at zones above 6000' DA and where mountainous terrain is a significant factor.

General. All maneuver descriptions are in the ANTPP.

Crew Requirements. P/P/CC/AO.

Mountain Area Training Stage Overview. The events included in the MAT stage of the Core Plus Phase of training are depicted below.

Table 4-26: Mountain Area Training Stage

Event	Time	Refty	POI	Conditions	Device	Num	Description
MAT-4180	1.5	365	B,T,R	D	A	1	Day MAT
MAT-4181	1.5	365	B,T,R,M	NS	A	1	NS MAT

MAT-4180 1.5 365 B,T,R D A 1 MV-22

Mountain Area Training

Goal. Introduce operations and landings in mountainous terrain.

Requirements.

Discuss

Mountainous area operations
Pinnacle landings

- Slope landings
- Landings and operations in valleys and canyons
- Crosswind landings
- Orographic turbulence
- Aircraft performance considerations
- Introduce
 - Landings at high altitude
 - Aircraft performance at high altitude
- Review
 - CAL-2240

Performance Standards

- Execute proper MAT procedures IAW the MV-22 ANTTP Manual.
- Execute up-slope/down-slope and cross-slope landings.
- Provide pilots with timely and accurate information about LZ topography, aircraft drift, and distance estimation prior to landing.

Instructor. BICC

Required Reading. NATOPS *Extreme weather operations*, ANTTP *Mountain and Rough Terrain Flying*

Prerequisites. CAL-2240

MAT-4181 1.5 365 B,T,R,M NS A 1 MV-22

Night Systems Mountain Area Training

Goal. Introduce operations and landings in mountainous terrain utilizing NVGs.

Requirements.

- Discuss
 - Previously discussed MAT items
- Introduce
 - NVD mountainous terrain operations
 - NVD landings at high altitude
- Review
 - NS-2341, MAT-4180

Performance Standards

- Execute proper NVD MAT procedures IAW the MV-22 ANTTP Manual.
- Execute up-slope/down-slope and cross-slope NVD landings.
- Provide pilots with timely and accurate information about LZ topography, aircraft drift, and distance estimation prior to landing.

Instructor. BICC

Prerequisites. CAL-2240, NS-2340~HLL, NS-2380~LLL, MAT-4180

4.9.4 Defensive Weapon System (DWS)

Purpose. To develop the ability to control the employment of the MV-22B Defensive Weapon System (DWS), deliver accurate air-to-ground fire employing crew-served weapons, and provide defensive fire on targets of opportunity.

General

The aircraft weapon system lectures must be conducted by a designated DWSI.

A DWSI is required for unqualified aircrew.

At the completion of this stage, the aircrew will demonstrate knowledge of the DWS and ordnance delivery with the system.

These sorties are ordnance driven. Ordnance expenditure requirements shall be adhered to in order for the crew member to attain DWS qualification, maintain, or regain proficiency. Flights should be scheduled to maximize range time so that ordnance expenditure requirements can be met.

Successful completion of this stage constitutes DWSQ. A qualification letter signed by the commanding officer stating the crew member is DWSQ is to be placed in the crewmember's NATOPS jacket prior to conducting any defensive weapon system flight without a designated DWSI.

Crew Requirements. P/P/CC/AO/AO.

Defensive Weapon System Stage Overview. The events included in the DWS stage of the Core Plus Phase of training are depicted below.

Table 4-27: Defensive Weapon System Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-4210	1.0	*	B,T		G		GAU-17/A
ACAD-4211	1.0	*	B,T		G		EA MV-22 DWS
LAB-4220	0.5	*	B,T		A		DWS Installation
LAB-4221	1.5	*	B,T		S/A		DWS Functionality
LAB-4222	1.0	180	B,T		S/A		DWS EPs
LAB-4223	1.0	*	B,T		G		GAU-17/A
DWS-4240	1.5	*	B,T,R	D	A	1	Day w/No Rounds
DWS-4241	1.5	*	B,T,R	D	A	1	Day DWS Employment
DWS-4242	1.5	365	B,T,R	D	A	2	Day Section DWS Employment
DWS-4243	2.0	*	B,T,R	NS	A	1	Night w/No Rounds
DWS-4244	1.5	365	B,T,R	NS	A	1	Night DWS Employment
DWS-4245	1.5	365	B,T,R,M	NS	A	2	Night Section DWS Employment

ACAD-4210 1.0 * B,T G

GAU-17/A

Goal. The AG/OUI has a familiarity with the GAU-17/A minigun and how to properly utilize it.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to the GAU-17/A minigun.

Instructor. DWSI

Required Reading. NAVAIR 11-95GAU-17-1

Prerequisites. ACAD-2510

ACAD-4211 1.0 * B,T G

EA MV-22 DWS

Goal. The AG/OUI has a familiarity with the components, characteristics, and operation of the Defensive Weapon System.

Requirement. Utilize MAWTS-1 courseware.

Instructor. DWSI

Required Reading. MV-22 ANTTP *Defensive Weaponry*

Prerequisites. ACAD-4210

LAB-4220 0.5 * B,T A

Weapon Installation and Ammo Can Loading Procedures

Goal. The AG/OUI has a familiarity with installing the GAU-17/A on the turret and with ammo can loading procedures.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. Student is introduced to DWS weapon installation and ammunition can loading, and understand how to manually retract the weapon system.

Instructor. DWSI

Required Reading. MV-22 ANTTP *Defensive Weaponry*

Prerequisites. ACAD-4211

External Syllabus Support. MV-22 configured with DWS system, aircraft placed on jacks, 1000 rounds 7.62mm ammunition.

LAB-4221 1.5 * B,T S/A

Defensive Weapon System Functionality

Goal. The AG/OUI has a familiarity with all functions and controls associated with the DWS.

Instructor. DWSI

Required Reading. ACS 16982 DWS technical and flight manual

Prerequisites. LAB-4220

External Syllabus Support. DWS simulator or MV-22 configured with DWS system and aircraft placed on jacks.

LAB-4222 1.0 180 B,T S/A

Defensive Weapon System Emergency Procedures

Goal. The AG/OUI has a familiarity with all emergency procedures associated with the DWS and the GAU-17/A.

Instructor. DWSI

Required Reading. ACS 16982 DWS technical and flight manual, A1-V22AB-NFM-800 Weapons checklist.

Prerequisites. LAB-4221

External Syllabus Support. DWS simulator if available.

LAB-4223 1.0 * B,T G

GAU-17/A Breakdown and Cleaning Procedures

Goal. The AG/OUI will be familiar with the breakdown, inspection, function check, and cleaning procedures of the GAU-17/A minigun.

Requirements

- Discuss
 - Nomenclature
 - Inspection procedures
 - Cleaning procedures
 - Weapon emergencies
- Introduce

Cycle of operation
Weapons checklist
Troubleshooting procedures
Practice
DWS inspection and weapon mounting procedures

Performance Standards

Demonstrate knowledge of nomenclature, cycle of operation, and inspection procedures for the GAU-17/A machine gun.
Demonstrate DWS inspection procedures and operation.
Demonstrate trouble shooting procedures.

Instructor. DWSI

Required Reading. NAVAIR 11-95GAU17-1

Prerequisite. ACAD-4210

DWS-4240 1.5 365 B,T,R D A 1 MV-22

Day Sensor Employment

Goal. Introduce DWS Charged Coupled Device (CCD) sensor employment.

Requirements

Discuss
CRM
ICS procedures
Safety considerations
Weapons conditions
Weapons commands
Weapon system malfunctions/stoppages/emergencies
Crew-served weapons checklist
Aiming techniques
Muzzle awareness
Weapon preparation/nomenclature
Target identification
Sensor utilization
Gunner station symbols
STAR
Shifting fires and target handoff procedures
Introduce
Preparation of weapon and aircraft configuration
Engagement of pre-briefed targets with DWS in training mode
Weapon parameters and limitations
Add waypoint and utilize the capture point function

Performance Standards

Demonstrate knowledge of the DWS operating procedures.
Demonstrate the ability to deploy the DWS to all positions.
Demonstrate proper execution of all weapons commands.
Demonstrate emergency weapons procedures.
Demonstrate knowledge of weapons parameters.
Demonstrate use of the crew-served weapons checklist.
Demonstrate the ability to operate the DWS controls to acquire and simulate engagement on multiple targets.

Instructor. DWSI

Required Reading. A1-V22AB-NFM-800 Weapons checklist.

Prerequisites. TGQ. Mission Phase complete, LAB-4222, LAB-4223

DWS-4241 1.5 * B,T,R D A 1 MV-22

Single-ship Defensive Weapon System Employment

Goal. Introduce DWS employment in a single-aircraft environment.

Requirements

- Discuss
 - CRM
 - ICS procedures
 - Safety
 - Weapons malfunctions/stoppages/emergencies
 - Muzzle awareness
 - Weapons preparation/nomenclature
 - Sensor utilization
 - Fields of fire/Sectors of fire
- Introduce
 - Defensive weapon system operations
 - Fields of fire
 - Sectors of fire
 - Simulated approach to landings while engaging targets
- Practice
 - Preparation of weapon and aircraft configuration
 - Engagement of pre-briefed targets with DWS
 - Weapon parameters and limitations
 - Add waypoint and utilize the capture point function

Performance Standards

- Demonstrate knowledge of the three weapons control procedures.
- Demonstrate use of crew-served weapons checklists.
- Demonstrate proper utilization of all fire control voice and hand signals.
- Demonstrate the ability to operate the defensive weapon system controls to acquire and engage multiple targets in a day single aircraft environment.
- Demonstrate the ability to perform weapon system troubleshooting and emergency procedures.
- Demonstrate knowledge of weapons parameters.
- Demonstrate knowledge of cabin configuration limitations while utilizing the DWS.

Instructor. DWSI

Prerequisites. TGQ, DWS-4240

Ordnance. 2000 rounds per gunner of appropriate ammunition

External Syllabus Support. Appropriate aerial gunnery range and moving land target (MLT) if available

DWS-4242 1.5 365 B,T,R D 2 MV-22

Section Defensive Weapon System Employment

Goal. To introduce DWS employment in a multi-aircraft environment.

Requirements

- Discuss
 - CRM
 - ICS procedures

- Safety
 - Weapons system malfunctions/stoppages/emergencies
 - Muzzle awareness in a multi-aircraft environment
 - Weapons preparation/nomenclature
 - Integrating sectors of fire
 - Surface danger zones
- Introduce
 - Firing techniques in a multi-aircraft environment
 - Target hand off to other aircraft
 - Muzzle awareness in a multi-aircraft environment
 - Formation flight patterns for weapons employment
- Practice
 - Preparation of weapon and aircraft configuration
 - Defensive weapon system operations
 - Simulated approach to landings while engaging targets
 - Engagement of pre-briefed targets with DWS
 - Weapon parameters and limitations
 - Add waypoint and utilize the capture point function

Performance Standards

- Demonstrate the ability to operate the defensive weapon system controls to acquire and engage multiple targets in a day multi-aircraft environment.
- Demonstrate use of fire control procedures to suppress targets.
- Demonstrate use of system sensors for target acquisition and engagement in a multi-aircraft environment.
- Maintain muzzle awareness at all times during multi-aircraft live fire evolution.
- Demonstrate the ability to perform weapon system troubleshooting and emergency procedures.
- Demonstrate the ability to successfully suppress targets while conducting target hand-off from the gunners station to another weapon system within the flight.

Instructor. DWSI

Prerequisites. DWS-4241

Ordnance. 2000 rounds per gunner of appropriate ammunition.

External Syllabus Support. Appropriate aerial gunnery range and moving land target (MLT) if available.

DWS-4243 2.0 365 B,T,R NS A 1 MV-22

Night Sensor Employment

Goal. Introduce DWS Forward Looking Infrared (FLIR) sensor employment

Requirements

- Discuss
 - CRM
 - ICS procedures
 - Safety considerations
 - Weapons conditions
 - Weapons commands
 - Weapon system malfunctions/stoppages/emergencies
 - Crew served weapons checklist
 - Aiming techniques at night
 - Muzzle awareness
 - Weapons preparation/nomenclature
 - Target identification at night
 - Sensor utilization

Training mode
Introduce
Preparation of weapons and aircraft
Acquiring pre-briefed targets with DWS at night
Weapon parameters

Performance Standards

Demonstrate knowledge of the defensive weapons system operating procedures.
Demonstrate understanding of all sensor modes of operation.
Demonstrate proper utilization of all fire control voice and hand signals at night.
Demonstrate appropriate emergency weapons procedures.
Verbally demonstrate knowledge of weapons parameters.
Demonstrate use of the crew served weapons checklist.
Demonstrate the ability to operate the defensive weapon system controls to acquire and simulate engagement on multiple targets in a night, single-aircraft environment.

Instructor. DWSI

Prerequisites. DWS-4240

DWS-4244 1.5 * B,T,R NS A 1 MV-22

Night Single-ship Defensive Weapon System Employment

Goal. Introduce DWS employment in a single-aircraft HLL or LLL environment.

Requirements

Discuss
CRM
ICS procedures
Safety
Weapons malfunctions/stoppages/emergencies
Muzzle awareness
Weapons preparation/nomenclature
Weapons effects on NVDs
Sensor utilization at night
Introduce
Firing techniques utilizing NVDs
Single aircraft defensive weapon system operations at night
Review
Preparation of weapon and aircraft configuration
Weapon parameters and limitations
Add waypoint and utilize the capture point function

Performance Standards

Demonstrate the ability to operate the defensive weapon system controls to acquire, sight on, and fire on multiple targets in a single aircraft environment at night utilizing NVDs.
Demonstrate use of fire control procedures to suppress targets at night.
Demonstrate use of system sensors for target acquisition and engagement in a single aircraft environment at night utilizing NVDs.
Demonstrate the ability to perform weapon system troubleshooting and emergency procedures at night.
Demonstrate knowledge of cabin configuration limitations while utilizing the DWS.

Instructor. DWSI

Prerequisites. DWS-4241, DWS-4243

Ordinance. 2000 rounds per gunner of appropriate ammunition.

External Syllabus Support. Appropriate aerial gunnery range and moving land target (if available).

DWS-4245 1.5 365 B,T,R,M NS A 2 MV-22

Night Section Defensive Weapon System Employment

Goal. Introduce DWS employment in a multi-aircraft HLL or LLL environment.

Requirements.

- Discuss
 - CRM
 - ICS procedures
 - Safety
 - Weapons malfunctions/stoppages/emergencies
 - Muzzle awareness in a multi-aircraft environment
 - Weapons preparation/nomenclature
 - Weapons effects on NVDs
- Introduce
 - Firing techniques in a multi-aircraft environment at night
 - Target acquisition at night in a multi-aircraft environment
 - Multi-aircraft defensive weapon system operations at night
- Practice
 - Firing techniques utilizing NVDs
- Review
 - Preparation of weapon and aircraft configuration
 - Defensive weapon system operations
 - Simulated approach to landings while engaging targets
 - Engagement of pre-briefed targets with DWS
 - Weapon parameters and limitations
 - Add waypoint and utilize the capture point function

Performance Standards

- Demonstrate the ability to operate the defensive weapon system controls to acquire and engage multiple targets in a multi-aircraft environment at night.
- Demonstrate use of fire control procedures to suppress targets at night.
- Maintain muzzle awareness at all times during multi-aircraft live fire evolutions.
- Demonstrate use of system sensors for target acquisition and engagement in a multi-aircraft environment at night.
- Demonstrate the ability to perform weapon system troubleshooting and emergency procedures at night.
- Demonstrate the ability to successfully suppress targets while conducting target hand-off from the gunners station to another weapon system within the flight.

Instructor. DWSI

Prerequisites. DWS-4242, DWS-4244

Ordnance. 2000 rounds per gunner of appropriate ammunition.

External Syllabus Support. Appropriate aerial gunnery and moving land target (MLT) if available.

4.9.5 Defensive Combat Maneuvers (DCM)

Purpose. To introduce and develop proficiency in tactics and aerial defensive measures used to evade enemy air-to-air threats.

General

AG/OUI in this stage must be LAT qualified and proficient and proficient in GTR.

A DCMI is required for all non-proficient aircrew.

The flight lead shall be a DCMI and specifically brief all applicable DCM training rules per the ANTTTP, the Aviation T&R Program Manual, and this Manual.

After completion of DCM-4340 the AG/OUI is DCM Qualified (DCMQ).

Sequences for all DCM flights shall be flown as outlined in the MV-22 ANTTTP Manual.

Crew Requirements. P/P/CC/AO

Defensive Combat Maneuvers Stage Overview. The events included in the DCM stage of the Core Plus Phase of training are depicted below.

Table 4-28: Defensive Combat Maneuvers Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-4310	1.0	*	B,T		G		Rotary-wing Threat to Assault Support
ACAD-4311	0.5	*	B,T		G		Fixed-wing Threat to Assault Support
ACAD-4312	1.0	*	B,T		G		DEFTAC
ACAD-4313	1.0	*	B,T		G		DCM
LAB-4320	0.5	*	B,T		G		DCM Walk-through
DCM-4340	1.0	365	B,T,R,M		A	2	DCM

ACAD-4310 1.0 * B,T G

Rotary-wing Threat to Assault Support (S)

Goal. The AG/OUI has an introductory knowledge specific attack helicopter threats to assault support aircraft.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. The student is introduced to specific attack helicopter threats to assault support.

Instructor. DCMI

Required Reading. Classified MV-22 ANTTTP *Defensive Combat Maneuvers Program*

Prerequisites. LATQ, GTR-2840

ACAD-4311 0.5 * B,T G

Fixed-wing Threat to Assault Support (S)

Goal. The AG/OUI has an introductory knowledge of the fixed wing threat to assault support.

Requirement. Utilize MAWTS-1 courseware.

Performance Standard. The student is introduced to the fixed wing threats to assault support.

Instructor. DCMI

Required Reading. Classified MV-22 ANTTTP *Defensive Combat Maneuvers Program*

Prerequisites. LATQ, GTR-2840

ACAD-4312 1.0 * B,T G

MV-22 Defensive Tactics

Goal. The AG/OUI has an introductory knowledge of MV-22 air-to-air defensive tactics.

Requirement. Utilize MAWTS-1 courseware

Performance Standard. Student is introduced to MV-22 air-to-air defensive tactics.

Instructor. DCMI

Prerequisite. ACAD-4310, ACAD-4311

ACAD-4313 1.0 * B,T G

Defensive Combat Maneuvers

Goal. The AG/OUI has an introductory knowledge of MV-22 defensive combat maneuvers.

Requirement. Utilize MAWTS-1 courseware

Performance Standard. Student is introduced to MV-22 defensive combat maneuvers.

Instructor. DCMI

Required Reading. Classified MV-22 ANTTTP *Defensive Combat Maneuvers Program*

Prerequisite. ACAD-4312

LAB-4320 0.5 * B,T G

Defensive Combat Maneuver Walk-through

Goal. The AG/OUI has a satisfactory knowledge of MV-22 defensive combat maneuvers prior to in-flight execution.

Requirement. DCMI

Performance Standard. Student completes a walk-through of all briefed DCM flight maneuvers and line numbers.

Required Reading. Classified MV-22 ANTTTP *Defensive Combat Maneuvers Program*

Prerequisite. ACAD-4313

DCM-4340 1.0 365 B,T,R,M D A 2 MV-22

Defensive Combat Maneuvers

Goal. Introduce section DCM against a fixed-wing aggressor.

Requirement

Discuss

Lookout doctrine

Situational awareness

Adversary aircraft parameters

Adversary weapons parameters, envelopes, and considerations

Mutual support

Introduce

Tiltrotor DCM versus a single FW aggressor per the MV-22 ANTTTP Manual

DCM line numbers in accordance with the MV-22 ANTTTP

Aggressor attacks at various altitudes

Performance Standards

Execute DCM vs. a FW threat IAW the MV-22 ANTTTP Manual.

Maintain DCM ROC IAW the Aviation T&R Program Manual.

Maintain proper lookout doctrine during DCM.

Instructor. DCMI

Prerequisites. LAB-4320

Ordnance. 60 flares, RMWS

External Syllabus Support. FW adversary, ACM range space.

4.9.6 Chemical, Biological, Radiological, and Nuclear (CBRN)

Purpose. To introduce the AR-5 CBRN protective mask and associated CBRN equipment.

General. For safe execution of all flights, 1 aircrewman shall remain unmasked during flights in the aircraft.

Crew Requirement. P/P/CC/AO

Chemical, Biological, Radiological, and Nuclear Stage Overview. The events included in the CBRN stage of the Core Plus Phase of training are depicted below.

Table 4-29: Chemical, Biological, Radiological, and Nuclear Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
LAB-4420	0.5	*	B,T		G		Equipment Fitting and Familiarization
SCBRN-4430	1.0	*	B,T		S	1	Day CBRN
SCBRN-4431	1.0	*	B,T	NS	S	1	Night CBRN

LAB-4420 0.5 * B,T G

CBRN Equipment Fitting and Familiarization

Goal. The AG/OUI is introduced to CBRN protective equipment and is fitted with the required gear for flight operations.

Performance Standard. Student is provided introductory training with the flight equipment utilized in a CBRN environment.

Instructor. BICC

Required Reading. NAVAIR 00-80T-121

Prerequisite. CAL-2240

SCBRN-4430 1.0 * B,T S 1 FFS/FTD

CBRN Operations

Goal. Demonstrate the ability to conduct flight in a CBRN environment with mask and gear donned during day conditions.

Requirements.

Discuss

- CRM while masked, to include emergency procedures and ground handling signals
- Mask limitations pertaining to vision and scan
- Physiological limitations and fatigue factors imposed by CBRN protective equipment
- Mask maintenance and factors that render the mask unserviceable

Demonstrate

- Proper mask use (donning and doffing)

Introduce

- CBRN defensive suit
- Start while masked
- Taxi while masked
- Takeoff and landings while masked
- Normal flight operations while masked

Performance Standards

- Properly don CBRN protective equipment and conduct flight maneuvers.

Demonstrate knowledge of CBRN operations IAW the MV-22 ANTP Manual.

Instructor. BICC

Prerequisites. LAB-4420

SCBRN-4431 1.0 730 B,T,R,M NS S 1 FFS/FTD

NS CBRN Operations

Goal. Demonstrate the ability to conduct flight in a CBRN environment with mask and gear donned during NS conditions.

Requirements

Discuss

NVD limitations pertaining to vision and scan
CRM while wearing the mask and NVGs

Introduce

CBRN defensive suit
Start while masked
Taxi while masked
Takeoff and landings while masked
Normal flight operations while masked

Performance Standards

Properly don CBRN protective equipment and conduct flight maneuvers with NVDs.
Demonstrate knowledge of CBRN operations IAW the MV-22 ANTP Manual.
Demonstrate proper mask donning procedures.

Instructor. BICC

Prerequisites. NSQ, SCBRN-4430

4.9.7 Carrier Qualification Unaided (CQ)

Purpose. Qualify the AG/OUI in flight operations from a carrier deck or ship platform under night unaided conditions.

General. Refer to NAVAIR 00-80T-106 LHA/LHD NATOPS and NAVAIR 00-80T-105 CV NATOPS Manuals for carrier operations. Refer to NAVAIR 00-80T-122 for air capable ship operations.

Crew Requirement. P/P/CC/AO

Carrier Qualification Unaided Stage Overview. The events included in the CQ stage of the Core Plus Phase of training are depicted below.

Table 4-30: Carrier Qualification Unaided Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
CQ-4480	1.0	365	B,T,R	N*	A	1	Unaided FCLPs
CQ-4481	1.5	365	B,T,R,M	N*	A	1	Unaided CQ

CQ-4480 1.0 365 B,T,R N* A 1 MV-22

Unaided Field Carrier Landing Practice

Goal. Introduce night unaided CQ patterns and procedures in an FCLP scenario.

Requirement

Discuss:

CRM
Crewmember duties during CQs
Shipboard ICS procedures

Hand-and-arm signals for shipboard operations
Flight deck status lights
Flight deck operations
Ship traffic patterns
Night landing and takeoff techniques
Wave offs

Introduce:

Unaided carrier operation
Night takeoff/landing patterns (minimum 5 for initial sorties)
Communication procedures
Lights and light signals specific to night operations
LSE signals and procedures
Carrier aided and unaided lighting configurations
Self-taxi procedures
STOs
Pitch-up and side slip characteristics

Performance Standards

Properly execute the night unaided CQ pattern IAW LHA/LHD/ NATOPS.
Provide accurate drift correction calls to the pilots in the landing environment.

Instructor. BICC

Required Reading. NATOPS Ch 8, LHA/LPH/LHD NATOPS Ch 2, 3, 4, 5, 6, 7.2, 7.3 App A,D

Prerequisites. CQ-2940

External Syllabus Support. FCLP site

CQ-4481	1.5	365	B,T,R,M	N*	A	1	MV-22
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Unaided Carrier Qualification

Goal. Night unaided carrier qualification flight.

Requirements

Discuss

Aircraft ditching.
Emergency egress procedures.

Introduce

Procedures for unaided landings and takeoffs.
Night unaided patterns.
Unaided approaches and landings (minimum 5 for initial sorties).
Aircraft lighting configuration.
Deck lighting configuration.
Unaided closure rates.

Review

CRM.
Emergency Egress Lighting System (EELS).
LSE signals.
Voice procedures.

Performance Standards

Properly execute the night unaided CQ pattern IAW LHA/LHD/ NATOPS.
Provide accurate drift correction calls to the pilots in the landing environment.

Instructor. BICC

Prerequisites. CQ-2941, CQ-4480

External Syllabus Support. Landing platform afloat.

4.9.8 Rapid Insertion/Extraction Mission (RI/E)

Purpose. To demonstrate proficiency in tiltrotor rapid insertion and extraction techniques and procedures. This stage of training is designed to fulfill the requirement set in MCT 1.3.4.1.1 Conduct Airborne Rapid Insertions / Extraction.

General. Initial RIE-4180 may be conducted day or night. Aircrew shall be complete in the appropriate AIE skill prior to conducting RIE-4180 and NSQ for the appropriate light level if conducting RIE-4180 using NVDs.

Crew Requirement. P/P/CC/AO

Rapid Insertion/Extraction Mission Stage Overview. The events included in the RI/E Mission stage of the Core Plus Phase of training are depicted below.

Table 4-31: Rapid Insertion/Extraction Mission Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
RIE-4540	2.5	365	B,T,R,M	(NS)	A	1	RIE Mission

RIE-4540 2.5 365 B,T,R,M (NS) A 1 MV-22

Rapid Insertion/Extraction Mission

Goal. Demonstrate the ability to execute rapid insertion / extraction operations in a tactical environment.

Requirements

Discuss:

CRM during AIE.

Tactical considerations for applicable AIE mission.

Review

Appropriate AIE skill.

Performance Standards

Execute AIE procedures IAW the MV-22 ANTP.

Demonstrate proper crew coordination during AIE operations.

Complete the assigned mission.

Instructor. LATI

Prerequisite. Appropriate AIE skill proficient

External Syllabus Support. Jumpmaster/Castmaster/HRST Master, qualified troops

4.9.9 Aviation Delivered Ground Refueling (ADGR)

Purpose. To introduce ADGR/FARP procedures.

General. Specific procedures on VARS will be developed and incorporated in future T&R change correspondence. Initial AAR-4631 shall be conducted during the day. All following AAR-4631 may be conducted at night.

Crew Requirement. P/P/CC/AO

Aviation Delivered Ground Refueling Stage Overview. The events included in the ADGR stage of the Core Plus Phase of training are depicted below.

Table 4-32: Aviation Delivered Ground Refuel Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-4610	1.0	*	B,T		G		MV-22 Aviation Delivered Ground Refueling
LAB-4620	2.0	*	B,T		G		ADGR Lab
ADGR-4640	0.5	365	B,T,R,M	(NS)	A	1	ADGR Mission

ACAD-4610 1.0 * B,T G

EA MV-22 Aviation Delivered Ground Refueling

Goal. The AG/OUI has an introductory knowledge of the MV-22 Aviation Delivered Ground Refueling equipment and FARP setup.

Requirement. Utilize MAWTS-1 courseware

Performance Standard. Student is introduced to ADGR equipment set-up and mission execution

Instructor. BICC

Required Reading. NATOPS Operating limitations, NTRP RGR and FARE kits, MV-22 ANTPP *Aviation Delivered Ground Refueling*

Prerequisites. CAL-2240

LAB-4620 2.0 * B,T A 1 MV-22

Aviation Delivered Ground Refueling Lab

Goal. The AG/OUI has an introductory knowledge of the setup of a FARP.

Requirement. Set up a FARP utilizing at least one MAT and a FARE kit.

Performance Standard. Student demonstrates practical knowledge of ADGR set-up procedures.

Instructor. BICC

Required Reading. MV-22 ANTPP *Aviation Delivered Ground Refueling*, ASTACSOP FARP operations

Prerequisite. ACAD-4610

ADGR-4640 0.5 365 B,T,R,M (NS) A 1 MV-22

Aviation Delivered Ground Refuel Mission

Goal. Introduce an ADGR mission.

Requirements

Discuss

- Fuel planning
- FARP site evaluation and selection
- FARP security considerations

Introduce

- Tactical planning, briefing, and execution of an RGR mission during day or night. The AG/OUI will assist in the set-up of the FARP.

Performance Standards

- Maintain situational awareness with respect to the friendly and enemy situation and mission progress.
- Demonstrate proper knowledge and set up of the ADGR mission kit.
- Safely conduct refueling operations in the ADGR site.
- Provide fuel and/or ordnance to receivers.
- Demonstrate proper knowledge of NVD tactical considerations IAW the MV-22 ANTPP Manual and MAWTS-1 NVD Manual as applicable for the mission.

Prerequisites. NS HLL-2340~HLL, NS LLL-2380~LLL, LAB-4620

External Syllabus Support. Approved site for refueling operations, receiver.

4.9.10 Aviation Delivered Battlefield Illumination (BI)

Purpose. To introduce, qualify, attain and/or maintain proficiency in Aircraft Parachute Flare (APF) delivery for Battlefield Illumination (BI).

General. Initial codes will be instructed by a BI proficient and qualified CC QASO.

A CC Quality Assurance Safety Officer (QASO) is required for all battlefield illumination flights.

At the completion of this stage, the aircrew shall be qualified to act as a BI team member/team leader.

Crew Requirements. P/P/CC/AO.

Aviation Delivered Battlefield Illumination Stage Overview. The events included in the BI stage of the Core Plus Phase of training are depicted below.

Table 4-33: BI Core Plus Skill Phase

Event	Time	Refly	POI	Conditions	Device	Num	Description
ACAD-4710	1.0	*	B,T		G		Battlefield Illumination
BI-4740	1.5	365	B,T	NS	A	1	Battlefield Illumination Assistant
BI-4741	1.5	365	B,T,R,M	NS	A	1	Battlefield Illumination Lead

ACAD-4710 1.0 * B,T G

EA Battlefield Illumination

Goal. The AG/OUI has a familiarity with battlefield illumination procedures.

Requirement. Utilize MAWTS-1 courseware

Performance Standards. Student is introduced to Battlefield Illumination equipment and mission execution.

Instructor. QASO

Required Reading. MV-22 ANTPP *Battlefield Illumination*, NTRP 3-22.4-MV-22B Aircraft Parachute Flares.

Prerequisites. ACAD-2310

BI-4740 1.5 365 B,T,R,M NS A 1 MV-22

Aviation Delivered Battlefield Illumination Assistant

Goal. Introduce, or maintain proficiency in battlefield illumination as a Battlefield Illumination Assistant.

Requirements

Discuss

- CRM
- ICS procedures
- APF characteristics
- APF malfunctions
- Cabin configuration
- Required equipment
- APF emergency procedures

Introduce

- Cabin configuration for BI
- APF preparation and loading
- Safety Procedures
- BI checklist
- APF delivery (minimum 6 LUU-2 or LUU-19 APFs)

Performance Standards

- Demonstrate the ability to prepare APFs.
- Demonstrate proper crew coordination procedures for BI.
- Demonstrate understanding of emergency procedures for APFs.
- Demonstrate proper procedures for delivering APFs.

Instructor. QASO

Prerequisite. ACAD-4710, NSQ for appropriate light level

Ordinance. (6) LUU-2 or LUU-19 Series APFs.

BI-4741 1.5 365 B,T,R,M NS E A 1 MV-22

Battlefield Illumination Lead

Goal. Introduce or maintain proficiency in Battlefield Illumination as a Battlefield Illumination Lead.

Requirements.

- Discuss
 - CRM
 - ICS procedures
 - APF inspection
 - APF malfunctions
 - Cabin configuration
 - APF emergency procedures
 - Safety precautions
 - BI Lead duties
- Introduce
 - APF inspection and acceptance
 - BI Lead communication responsibilities
- Practice
 - Cabin configuration for BI
 - APF preparation and loading
 - Safety Procedures
 - BI checklist
 - APF delivery (minimum 6 LUU-2 or LUU-19 APFs)

Performance Standards

- Demonstrate capability to brief emergency procedures during flight brief.
- Demonstrate inspection and acceptance procedures for APFs.
- Demonstrate proper crew coordination procedures for BI.
- Demonstrate understanding of emergency procedures for APFs.
- Demonstrate proper procedures for verification and setting of APF timers.
- Supervise delivery of a minimum of (6) LUU-2 or LUU-19 APFs.
- Perform the duties of BI Lead during the BI mission.

Instructor. WTI QASO

Prerequisites. BI-4740

Ordinance. Minimum 6 LUU-2 and/or LUU-19 Series APFs are required for initial event.

4.9.11 Air Delivery Mission

Purpose. To demonstrate proficiency in tiltrotor air delivery techniques and procedures. This stage of training is designed to fulfill the requirement set in MCT 4.3.4 Conduct Air Delivery.

General. Initial AD-4830 may be conducted day or night. Aircrew shall be complete in the appropriate AD skill prior to conducting AD-4840 and NSQ for the appropriate light level if conducting AD-4840 using NVGs.

Crew Requirements. P/P/CC/AO

Air Delivery Mission Stage Overview. The events included in the AD Mission stage of the Core Plus Phase of training are depicted below.

Table 3-42: Air Delivery Mission Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
AD-4840	2.5	365	B,T,R,M	(NS)	A	1	AD Mission

AD-4840 2.5 365 B,T,R,M (NS) A 1 MV-22

Air Delivery Mission

Goal. Demonstrate the ability to execute aerial delivery operations in a tactical environment.

Requirements

- Discuss
 - CRM during AD
 - Tactical considerations for applicable AD mission
- Review
 - Appropriate AD skill

Performance Standards

- Execute AD procedures IAW the MV-22 ANTP.
- Demonstrate proper crew coordination during AD operations.
- Complete the assigned mission.

Instructor. BICC

Prerequisite. Appropriate AD skill proficient

External Syllabus Support. Per specific AD skill

4.9.12 Airborne Command and Control (AC2)

Purpose. To develop the ability to provide an Airborne Command and Control vehicle, communications and situational awareness to command elements.

Airborne Command and Control Stage Overview. The events included in the AC2 stage of the Core Plus Phase of training are depicted below.

Table 4-34: Airborne Command and Control Stage

Event	Time	Refly	POI	Conditions	Device	Num	Description
LAB-4920	1.0	*	B,T		A	1	MV-22

LAB-4920 1.0 * B,T A 1 MV-22

Airborne Command and Control Lab

Goal. The AG/OUI will have an introductory knowledge of the cabin set-up of an MV-22 for AC2 missions.

Requirement. Prepare the aircraft cabin for MV-22 command and control missions, to include installation of radios and equipment used by the Command and Control personnel. A block C aircraft should be used for setup demonstration.

Performance Standard.

- Introduce the student to set-up, preparation, and understanding of MV-22 command and control procedures.

Instructor. BICC

Prerequisite. NSQ

4.10 REQUIREMENTS, QUALIFICATIONS, AND DESIGNATIONS (RQD) PHASE (6000)

Purpose. To establish training for specific requirements.

General. Squadrons will use this phase of training for check flights, qualifications and designations. The AG/OUI will demonstrate sound levels of aircraft/flight leadership and judgment required in a combat environment.

Requirement and qualification codes in the 6000 phase should be logged in conjunction with other 2000-4000 codes completed during the event. For example, RQD-6030 may be logged in conjunction with any flight in the training syllabus provided that all the requirements for that flight have been met. When the flight to attain the requirement/qualification/designation is complete, a letter from the squadron commanding officer awarding the qualification or designation shall be placed in the NATOPS and APR before that designation may be utilized.

After the commanding officer has designated the AG/OUI in writing as gaining a designation or qualification, Operations shall make the required qualification or designation entry into M-SHARP.

Purpose. To track requirements as outlined in CNAFINST 3710.7, the MV-22 NATOPS, and CNAFINST 1542.7.

General. This section allows squadrons to document and track annual NATOPS and Instrument check flights and CRM training.

Crew Requirements. All checks will be per applicable directives.

Stages. The following stages are included in the Requirements, Qualifications, and Designations Phase of training.

Stage Name
NATOPS
Crew Resource Management (CRM)
Reduced Visibility Landing (RVL)

4.10.1 NATOPS Requirements Tracking

Purpose. To track requirements as outlined in OPNAVINST 3710.7 and the V-22 NATOPS Manuals

ACAD-6010 3.0 365 B,T,R,M E G

Open-book NATOPS Examination

Goal. The Open-book Examination shall consist of, but not be limited to, questions from the V-22 NATOPS question bank. The purpose of the written examination is to evaluate the aircrewman's knowledge of the appropriate publications and the aircraft.

Performance Standard. Achieve a minimum grade of Qualified on the Open-book examination.

Instructor. NI/ANI

ACAD-6011 1.0 365 B,T,R,M E G

Closed-book NATOPS Examination

Goal. The Closed-book Examination shall be limited to the V-22 NATOPS question bank. The purpose of the closed book examination portion of the written examination is to evaluate the aircrewman's knowledge of normal/emergency procedures and aircraft limitations.

Performance Standard. Achieve a minimum grade of Qualified on the Closed-book Examination.

Instructor. NI/ANI

Prerequisite. ACAD-6010

ACAD-6012 1.0 365 B,T,R,M E G

Oral NATOPS Examination

Goal. The Oral Examination shall consist of, but not be limited to, the V-22 NATOPS question bank. The evaluator may draw upon personal experience to propose questions of a direct and positive manner and in no way be opinionated to evaluate the aircrewman's knowledge of normal/emergency procedures, aircraft limitations, and performance.

Performance Standard. Achieve a minimum grade of Qualified on the Oral Examination.

Instructor. NI/ANI

Prerequisite. ACAD-6011

RQD-6030 1.5 365 B,T,R,M (N) E A 1 MV-22

NATOPS Evaluation

Goal. Conduct an objective evaluation of the aircrewman's knowledge of briefing, normal operating procedures (flight and ground), crew resource management, aircraft systems, performance criteria, emergency procedures, and debriefing. The focus is on normal and emergency procedures, not tactical execution. Emphasis shall be placed on the aforementioned items with the addition of local course rules, local SOPs, and admin flight procedures. The NATOPS evaluation is intended to evaluate compliance with NATOPS procedures. The NATOPS evaluation is the means to measure the aircrewman's efficiency in the execution of normal operating procedures and reaction to emergencies and malfunctions. The NATOPS evaluation process should be as much a learning tool and/or experience as it is an evaluation.

Requirement. The Aircrew under evaluation shall bring a completed NATOPS evaluation card. The proficiency expected by the evaluator in this flight shall be commensurate with the experience level and highest qualification or designation of the Aircrew under evaluation.

Performance Standard. The Aircrew under evaluation must be prepared to safely demonstrate emergency procedures and knowledge of all maneuvers and procedures described within the NATOPS, OPNAV 3710.7 and in accordance with all SOPs. Upon successful completion of this event, the evaluator shall log the appropriate training code for tracking purposes.

Instructor. NI/ANI

Prerequisite. ACAD-6012

RQD-6031 1.5 365 B,T,R,M (N) E A 1 MV-22

NATOPS Instructor/Assistant NATOPS Instructor Evaluation

Goal. Tracking code for an NI/ANI evaluation. Log this code in place of RQD-6030.

Requirement. The Aircrew under evaluation shall bring a completed NATOPS evaluation card. The proficiency expected by the evaluator in this flight shall be commensurate with the experience level qualification of the Aircrew under evaluation.

Performance Standards. The Aircrew under evaluation must be prepared to safely demonstrate flight proficiency and knowledge of all maneuvers and procedures described within the NATOPS, OPNAV 3710.7 and in accordance with all SOPs.

Instructor. NE/NI.

Prerequisite. ACAD-6012

RQD-6033 1.0 90 B,T,R,M (N) E A/S 1 MV-22

Emergency Procedures Review

Goal. Emergency Procedures review.

Requirement. This flight will review MV-22 emergency procedures and fulfills the requirement of the 90 day EP review requirement.

Performance Standard. Comply with MV-22 NATOPS procedures while dealing with non-normal conditions.

4.10.2 Crew Resource Management Requirements Tracking

Purpose. To track requirements as outlined in CNAFINST 1542.7.

ACAD-6070	1.0	365	B,T,R,M	E	G
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Crew Resource Management Refresher Lecture

Goal. Review the 7 critical CRM skills during a mission scenario, as well as during emergencies and system failures.

Instructor. CRMI/F

Prerequisites. RQD-6030

RQD-6080	1.5	365	B,T,R,M	(N), E	A	1	MV-22
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Crew Resource Management Flight

Goal. Review CRM principles while executing a simulated mission scenario.

Requirement. Review the 7 critical CRM skills during a mission scenario as well as during emergencies and system failures.

Performance Standards. Aircrews shall demonstrate effective use of the 7 critical CRM skills in accordance with OPNAVINST 1542.7, MV-22 NATOPS, and applicable directives.

Instructor. CRMF/I.

Prerequisites. ACAD-6070

RQD-6090	0.0	365	B,T,R,M	E	G
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Crew Resource Management Facilitator Lecture

Goal. Tracking code for CRMF lecture.

Performance Standards. Successful completion of the CRMF lecture.

Instructor. CRMI.

RQD-6091	0.0	365	B,T,R,M	(N), E	A	1	MV-22
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Crew Resource Management Facilitator Evaluation

Goal. Tracking code for CRMF evaluation.

Requirement. Review the 7 critical CRM skills during a mission scenario as well as during emergencies and system failures.

Performance Standards. Aircrews shall demonstrate effective use of the 7 critical CRM skills in accordance with OPNAVINST 1542.7, MV-22 NATOPS, and applicable directives.

Instructor. CRMI.

Prerequisites. ACAD-6090

RQD-6092 0.0 * B,T,R,M E G

Crew Resource Management Instructor Course

Goal. Tracking code for CRMI course.

Performance Standards. Successful completion of the CRMI course.

4.10.3 Reduced Visibility Landing Tracking (RVL)

RVL-6900 0.0 180 B,T,R,M (NS) A 1 MV-22

Goal. Track landings in actual RVL conditions using any of the approach or landing types. This code is intended to be logged in addition to RVL-2234.

Requirement. Landing in reduced visibility conditions where all crew members lose visual reference to the ground and no crew member can visually provide drift or altitude corrections.

4.11 MV-22B AERIAL OBSERVER T&R MATRIX (2000-6000 Phase)

MV-22B AERIAL OBSERVER T&R MATRIX (2000-6000 Phase)																					
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	POI				ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	INSTRUCTOR	EVENT CONV
				BASIC	TRANSITION	REFRESHER	MAINTAIN	#	TIME	#	TIME	#	TIME								
2000 PHASE (CORE)																					
FAMILIARIZATION (FAM)																					
FAM	ACAD	CRM	2010	X	X				4.0						G		*			CRMI/CRMF	2010
	ACAD	NITE LAB	2011	X	X				8.0						G		*			AMSO/AMSC	2011
	ACAD	REFERENCE PUBLICATIONS	2012	X	X				1.0						G		*			BICC	2012
	ACAD	AIR-TO-AIR REFUELING	2013	X	X				1.0						G		*			BICC	2013
	LAB	MISSION AUXILIARY TANK SYSTEM	2020	X	X				2.0						A	1	*			BICC	2020
	LAB	FLIGHT LINE FIRE EXT LAB	2021	X	X				1.0						G		*			BICC	2021
	LAB	INGRESS/EGRESS	2022	X	X				1.0						G		*			NI/ANI	2022
	LAB	START-UP/SHUTDOWN/TAXI	2023	X	X				1.0						G		*			BICC	2023
	LAB	MOORING LAB	2024	X	X				2.0						G		*			BICC	2024
	LAB	ALSS EQUIPMENT	2025	X	X				2.0						G		*			BICC	2025
	LAB	EPs	2026	X	X				2.0						G		*			NI/ANI	2026
	LAB	CARGO LOADING	2027	X	X				1.5						A/S	1	*			BICC	2027
	FAM	FAM FLIGHT	2040	X	X								1.0		A	1	*	2010,2021,2022,2023,2025,2026,2027		BICC	2040
FAM TOTAL								12	26.5	0	0.0	1	1.0								
FORMATION (FORM)																					
FORM	ACAD	EA TACFORM	2110	X	X				1.0						G		*	2040		BICC	2160
	FORM	TAC FORM / NAV	2140	X	X	X	X					2.0	(NS)	A	2	365	2110		BICC	2182	
FORM TOTAL								1	1.0	0	0.0	1	2.0								
CONFINED AREA LANDING (CAL)																					
CAL	CAL	SINGLE CAL	2240	X								1.5	D	A	1	*	2040		BICC	2132	
	CAL	SECTION CAL	2242	X	X	X	X					2.0	D	A	2	365	2140, 2240	2240	BICC	2135	
CAL TOTAL								0	0.0	0	0.0	2	3.5								
REDUCED VISIBILITY LANDINGS (RVL)																					
RVL	SRVL	RVL PROCEDURES INTRODUCTION	2270	X	X					1.0			(NS)	S		*	2240		BICC	2110	
	RVL	RVL (ACTUAL COND)	2282	X	X	X	X					2.0	(NS)	A	1	365	2270	2240	BICC	2133	
RVL SKILL TOTAL								0	0.0	1	1.0	1	2.0								
NIGHT SYSTEMS HIGH LIGHT LEVEL (NS HLL)																					
HLL	ACAD	EA NIGHT VISION TRAINING	2310	X	X	X			1.0						G		*	2011,2040		NSI	2310
	ACAD	MV-22 FLIR FOR EAC	2311	X	X	X			1.0						G		*	2310		NSI	2311
	NS HLL	HLL SGL CAL	2340	X								2.0	HLL	A	1	365	2311, 2242	2240	NSI	2331	
	NS HLL	HLL SEC CAL	2341	X	X	X	X					2.0	HLL	A	2	365	2340	2242, 2340	NSI	2332	
NS HLL SKILL TOTAL								2	2.0	0	0.0	2	4.0								
NIGHT SYSTEMS LOW LIGHT LEVEL (NS LLL)																					
LLL	NS LLL	FAM/LLL SGL CAL	2380	X								1.5	LLL	A	1	240	NSQ HLL	2340	NSI	2381	
	NS LLL	LLL SGL CAL	2381	X								1.5	LLL	A	1	*	2380		NSI	2381	
	NS LLL	LLL SEC NAV/TACFORM	2382	X	X							1.5	LLL	A	2	*	2381	2140	NSI	2382	

MV-22B AERIAL OBSERVER T&R MATRIX (2000-6000 Phase)

SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	POI				ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	INSTRUCTOR	EVENT CONV
				BASIC	TRANSITION	REFRESHER	MAINTAIN	#	TIME	#	TIME	#	TIME								
	NS LLL	LLL SEC CAL	2383	X	X	X	X						2.0	LLL	A	2	240	2382	2341, 2380	NSI	2382
NS LLL SKILL TOTAL								0	0.0	0	0.0	4	6.5								
TAIL GUNNERY (TG)																					
TG	ACAD	FUNDAMENTALS OF AERIAL GUNNERY	2510	X	X				1.0					G		*	2040		TGI	2510	
	ACAD	M240D MACHINE GUN	2511	X	X				0.5					G		*	2510		TGI	2511	
	ACAD	GAU-16/A MACHINE GUN	2512	X	X				0.5					G		*	2510		TGI	2512	
	ACAD	GAU-21 MACHINE GUN	2513	X	X				0.5					G		*	2510		TGI		
	ACAD	LASER AIMING DEVICES	2514	X	X				0.5					G		*	2510		TGI	2513	
	ACAD	LASER BORESIGHTING PROCEDURES	2515	X	X				0.5					G		*	2514		TGI	2514	
	LAB	M240D MACHINE GUN	2520	X	X	X			0.5					G		*	2510		TGI	2520	
	LAB	GAU-16/A MACHINE GUN	2521	X	X	X			0.5					G		*	2512		TGI	2521	
	LAB	GAU-21 MACHINE GUN	2522	X	X	X			0.5					G		*	2513		TGI		
	TG	SINGLE SHIP TG EMPLOYMENT	2540	X	X								1.5	D	A	1	*	2510		TGI	2530, 2531
	TG	SECTION TAIL GUN EMPLOYMENT	2541	X	X	X							1.5	D	A	2	365	2540	2540	TGI	2532
	TG	NS SINGLE-SHIP TG EMPLOYMENT	2542	X	X								1.5	NS	A	1	*	2514,2530,2334~HLL,2383~LLL	2540	TGI	2533, 2534
	TG	NS SECTION TAIL GUN EMPLOYMENT	2543	X	X	X	X						1.5	NS	A	2	365	2542	2541, 2542	TGI	2535
	TG	M240D UNDER INSTRUCTION	2550	X	X								0.0	(NS)	A	1	*			M240D TGI	2530
	TG	M240D QUALIFIED	2551	X	X	X	X						0.0	(NS)	A	1	365			M240D TGI	
	TG	GAU-16/A UNDER INSTRUCTION	2552	X	X								0.0	(NS)	A	1	*			GAU-16 TGI	2531
TG	GAU-16/A QUALIFIED	2553	X	X	X	X						0.0	(NS)	A	1	365			GAU-16 TGI		
TG	GAU-21 UNDER INSTRUCTION	2554	X	X								0.0	(NS)	A	1	*			GAU-21 TGI		
TG	GAU-21 QUALIFIED	2555	X	X	X	X						0.0	(NS)	A	1	365			GAU-21 TGI		
TG SKILL TOTAL								9	5.0	0	0.0	10	6.0								
LOW ALTITUDE TACTICS (LAT)																					
LAT	ACAD	LAT FOR EAC	2610	X	X				0.5					G		*			LATI	2210	
	ACAD	TAC AIRCREW CONSIDERATIONS	2611	X	X				0.5					G		*	2610		LATI	2211	
	LAB	LAT WALK-THROUGH	2620	X	X				0.5					G		*	2611		LATI	2220	
	LAT	LAT MAN / RTE	2640	X	X								1.5	D	A	1	*	2620		LATI	2231
	LAT	SEC LAT	2641	X	X	X	X						1.5	D	A	2	365	2140,2640	2140, 2640	LATI	2233
	NS LAT	HLL SEC LAT	2642	X	X	X							1.5	HLL	A	2	240	NSQ HLL, 2641	2641	NSI	2335
	NS LAT	LLL SEC LAT	2643	X	X	X	X						1.5	LLL	A	2	180	NSQ LLL, 2642	2642, 2382	NSI	2384
LAT SKILL TOTAL								3	1.5	0	0.0	4	6.0								

MV-22B AERIAL OBSERVER T&R MATRIX (2000-6000 Phase)																					
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	POI				ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	INSTRUCTOR	EVENT CONV
				BASIC	TRANSITION	REFRESHER	MAINTAIN	#	TIME	#	TIME	#	TIME								
DIVISION (DIV)																					
DIV	FORM	DIV TACFORM/NAV	2780	X	X								1.5	(NS)	A	3	*	2140,2382~LLL	2140, 2382~LLL	BICC	2183
	CAL	DIV CAL	2781	X	X								1.5	D	A	3	*	2133	2242	BICC	2136
	CAL	HLL DIV CAL	2782	X	X								1.5	HLL	A	3	*	2341,2781	2341, 2781	NSI	2336
	CAL	LLL DIV CAL	2783	X	X	X	X						1.5	LLL	A	3	365	2383, 2782	2782	NSI	2385
	CAL	DIV LAT	2784	X	X	X	X						1.5	(NS)	A	3	365	2780, 2641~D, 2642~HLL, 2643~LLL	2642~HLL, 2643~LLL	LATI~D, NSI~NS	2183
DIV TOTAL								0	0.0	0	0.0	5	7.5								
GROUND THREAT REACTION (GTR)																					
GTR	ACAD	ASE	2810	X	X	X			1.0					G		730	2611		WTI	2810	
	ACAD	BASIC PRINCIPLES OF EW	2811	X	X				1.0					G		*	2810		WTI	2811	
	ACAD	AIR DEFENSE ARTILLERY THREAT	2812	X	X				1.0					G		*	2811		WTI	2812	
	ACAD	IR SURFACE-TO-AIR MISSILE THREAT	2813	X	X				1.0					G		*	2811		WTI	2813	
	ACAD	RADAR SURFACE-TO-AIR MISSILE	2814	X	X				1.0					G		*	2811		WTI	2814	
	ACAD	GTR	2815	X	X				1.0					G		*	2810,2811,2812,2813,2814		WTI	2815	
	LAB	GTR WALK-THROUGH	2820	X	X				0.5					G		*	2815		WTI	2820	
	SGTR	SECTION TR SIM	2831	X	X	X					2.0			(NS)	S	2	*	2820		WTI	
GTR	SECTION TR	2840	X	X	X	X						1.5	(NS)	A	2	365	2140,2641,2831	2641, 2642~HLL, 2643~LLL	WTI	2832	
GTR SKILL TOTAL								7	6.5	1	2.0	1	1.5								
CARRIER QUALIFICATION (CQ)																					
CQ	SCQ	DAY SIM	2930	X	X					1.0				D	S	1	*	2240		BICC	
	SNSCQ	NIGHT SIM	2931	X	X						1.0			NS	S	1	*	2930		BICC	
	CQ	DAY FCLP	2940	X	X	X							1.5	D	A	1	365	2930		BICC	2931
	CQ	DAY CQ	2941	X	X	X							1.5	D	A	1	365	2940	2940	BICC	2932
	NSCQ	NIGHT FCLP	2942	X	X	X							1.5	NS	A	1	365	2931, 2940	2940	NSI	2934
	NSCQ	NIGHT CQ	2943	X	X	X	X						1.5	NS	A	1	365	2341~HLL,2383~LLL,2942	2941, 2942	NSI	2935
CQ SKILL TOTAL								0	0.0	2	2.0	4	6.0								
BASIC CC 2000 PHASE TOTAL								34	42.5	4	5.0	38	44.0								
3000 PHASE (MISSION)																					
AIR LOGISTICS SUPPORT (ALS)																					
ALS	ACAD	SIX FUNCTIONS	3011	X	X				0.5					G		*	NSQ		WTI	3217	
	ALS	ALS MSN	3040	X	X	X	X						2.0	(NS)	A	2	365	3011			3030
ALS SKILL TOTAL								1	0.5	0	0.0	1	2.0								
EXPEDITIONARY SHORE BASED OPERATIONS (EXP)																					
EXP	ACAD	EA ACEOI	3110	X	X				0.5					G		*	3011		WTI	3012	
	EXP	GS MSN	3140	X	X	X	X						2.0	(NS)	A	2	365	TGQ,2840,3040,3110		LATI	3030
EXP SKILL TOTAL								1	0.5	0	0.0	1	2.0								

MV-22B AERIAL OBSERVER T&R MATRIX (2000-6000 Phase)																					
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	POI				ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	INSTRUCTOR	EVENT CONV
				BASIC	TRANSITION	REFRESHER	MAINTAIN	#	TIME	#	TIME	#	TIME								
EXPEDITIONARY SEA BASED OPERATIONS (SEA)																					
SEA	SEA	SHIP TO SHORE MSN	3240	X	X	X	X						2.0	(NS)	A	2	365	CQ,2840,3140		LATI	3130
SEA SKILL TOTAL								0	0.0	0	0.0	1	2.0								
TACTICAL RECOVERY OF AIRCRAFT AND PERSONNEL (TRAP)																					
TRAP	ACAD	PR 102 JKO	3310	X	X				1.0						G		*	3110		JKO	3410
	TRAP	TRAP MISSION	3340	X	X	X	X						2.0	(NS)	A	2	365	2840,3140,3311	3140,3040	LATI	3430
TRAP SKILL TOTAL								1	1.0	0	0.0	1	2.0								
COMBAT ASSAULT TRANSPORT (CAT)																					
CAT	ACAD	NEO EXECUTION	3415	X	X				1.0						G		*	3110		WTI	3311
	ACAD	CASEVAC	3416	X	X				1.0						G		*	NSQ,3011,3110		WTI	3310
	CAT	LOW THRT SEC	3440	X	X	X	X					1	2.0	NS	A	2	365	LATQ,3140,3415,3416	3140,3040	LATI	3230
	CAT	ESCORT SEC	3441	X	X	X	X					1	2.0	(NS)	A	2	365	3440	3140,3040	LATI	3233
CAT SKILL TOTAL								2	2.0	0	0.0	2	4.0								
3000 PHASE TOTAL								5	4.0	0	0.0	6	12.0								
4000 PHASE (CORE PLUS)																					
AERIAL DELIVERY (AD)																					
AD	ACAD	EA AIR DELIVERY	4010	X	X			1	1.0						G		*	2610		BICC	2610
	PARA	PARAOPS	4041	X	X	X						1.5	(NS)	A	1	365	2640~D,2642~HLL,2643~LLL,4010	2240	BICC	4030	
	AD	DOOR BUNDLE	4042	X	X							1.5	(NS)	A	1	365	2640~D,2642~HLL,2643~LLL,4010	2240	BICC	2631	
	AD	CDS	4043	X	X	X	X					1.5	(NS)	A	1	365	2640~D,2642~HLL,2643~LLL,4010	2240	BICC	2631	
	EXT	DAY SINGLE POINT EXTERNALS	4081	X	X	X						1.5	D	A	1	365	2240,4010	2240	BICC	4031	
	EXT	DAY DUAL POINT EXTERNALS	4082	X	X	X						1.5	D	A	1	365	4081	4081	BICC	4032	
	EXT	NS SINGLE POINT EXTERNALS	4083	X	X	X	X					1.5	NS	A	1	365	2340~HLL,2380~LLL,4081	4081	NSI	4033	
	EXT	NS DUAL POINT EXTERNALS	4084	X	X	X	X					1.5	NS	A	1	365	2340~HLL,2380~LLL,4082	4083,4082,4081	NSI	4034	
AD SKILL TOTAL								1	1.0	0	0.0	7	10.5								
ALTERNATE INSERTION/EXTRACTION TECHNIQUES (AI/E)																					
AI/E	ACAD	ALTERNATE INSERT/EXTRACT	4111	X	X				0.5						G		*	2611		BICC	4111
	ACAD	HOIST OPS	4112	X	X				0.5						G		*	2611		BICC	4112
	AIE	FASTROPE / RAPPEL	4140	X	X	X	X					1.5	(NS)	A	1	365	4081,4083~NS,4111	2240,4081,4083~NS	BICC	4130	
	AIE	HOISTING	4141	X	X	X	X					1.5	(NS)	A	1	365	4081,4083~NS,4112	2240	BICC	4131	
	AIE	SPIE	4142	X	X	X	X					1.5	(NS)	A	1	365	4081,4083~NS,4111	2240,4081,4083~NS	BICC	4132	
	AIE	HELO CAST	4143	X	X	X	X					1.5	(NS)	A	1	365	2240,4111,4081,4083~NS	2240	BICC	4133	
AI/E SKILL TOTAL								2	1.0	0	0.0	4	6.0								
MOUNTAIN AREA TRAINING (MAT)																					
MAT	MAT	DAY MAT	4180	X	X	X						1.5	D	A	1	365	2240	2240	BICC	2732	
	MAT	NS MAT	4181	X	X	X	X					1.5	NS	A	1	365	2240,2340~HLL,2380~LLL,4180	2240,2340~NS,2380~LLL,	NSI	2733	
MAT SKILL TOTAL								0	0.0	0	0.0	2	3.0								

MV-22B AERIAL OBSERVER T&R MATRIX (2000-6000 Phase)																					
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	POI				ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	INSTRUCTOR	EVENT CONV
				BASIC	TRANSITION	REFRESHER	MAINTAIN	#	TIME	#	TIME	#	TIME								
DEFENSIVE WEAPONS SYSTEM (DWS)																					
DWS	ACAD	GAU-17/A	4210	X	X				1.0						G		*	2510		DWSI	4510
	ACAD	EA MV-22 DWS	4211	X	X				1.0						G		*	4210		DWSI	4511
	LAB	DWS INSTALLATION	4220	X	X				0.5						A	1	*	4211		DWSI	4520
	LAB	DWS FUNCTIONALITY	4221	X	X				1.5						S/A	1	*	4220		DWSI	4521
	LAB	DWS EPs	4222	X	X				1.0						S/A	1	180	4221		DWSI	4522
	LAB	GAU-17/A	4223	X	X				1.0						C	1	*	4210		DWSI	4523
	DWS	DAY W/NO ROUNDS	4240	X	X	X							1.5	D	A	1	*	TGQ,3000 SKILL COMPLETE,4222,4223		DWSI	4531
	DWS	DAY DWS EMPLOYMENT	4241	X	X	X							1.5	D	A	1	*	TGQ,4240	4231	DWSI	4532
	DWS	DAY SECTION DWS EMPLOYMENT	4242	X	X	X							1.5	D	A	2	365	4241	4232	DWSI	4533
	DWS	NIGHT W/NO ROUNDS	4243	X	X	X							2.0	NS	A	1	*	4240	4231	DWSI	4534
	DWS	NIGHT DWS EMPLOYMENT	4244	X	X	X							1.5	NS	A	1	365	4241,4243	4232,4234	DWSI	4535
DWS	NIGHT SECTION DWS EMPLOYMENT	4245	X	X	X	X						1.5	NS	A	2	365	4242,4244	4235	DWSI	4536	
DWS SKILL								6	6.0	0	0.0	6	9.5								
DEFENSIVE COMBAT MANEUVERING (DCM)																					
DCM	ACAD	RW THREAT TO AS	4310	X	X				1.0						G		*	LATQ,2840		DCMI	4810
	ACAD	FW THREAT TO AS	4311	X	X				1.0						G		*	LATQ,2840		DCMI	4811
	ACAD	MV-22 DEFTAC	4312	X	X				1.0						G		*	4310,4311		DCMI	4812
	ACAD	DCM	4313	X	X				1.0						G		*	4312		DCMI	4812
	LAB	DCM WALKTHROUGH	4320	X	X				0.5						G		*	4313		DCMI	4820
	DCM	DCM AGAINST FW AGGRESSOR	4340	X	X	X	X						1.0	D	A	2	365	4320	2840	DCMI	4831
DCM SKILL TOTAL								5	4.5	0	0.0	1	1.0								
CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR (CBRN) / CARRIER QUALIFICATION (CQ) / COMBAT ASSAULT TRANSPORT (HTT)																					
CBRN	LAB	EQUIPMENT FIT & FAM	4420	X	X				0.5						G		*	2240		BICC	4620
	SCBRN	DAY CBRN	4430	X	X						1.0			D	S	1	*	4420		BICC	4630
	SCBRN	NIGHT CBRN	4431	X	X	X	X				1.0			NS	S	1	730	NSQ,4430	4430	BICC	4631
CBRN SKILL TOTAL								1	0.5	2	2.0	0	0.0								
CARRIER QUALIFICATION (CQ)																					
CQ	CQ	NIGHT UNAIDED FCLP	4480	X	X	X						1.0	N*	A	1	365	2940	4470	BICC	4781	
	CQ	NIGHT UNAIDED CQ	4481	X	X	X	X					1.5	N*	A	1	365	2941,4480	4481	BICC	4782	
CQ SKILL TOTAL								0	0.0	0	0.0	2	2.5								
RAPID INSERTION / EXTRACTION																					
RI/E	RI/E	RAPID INSERT/EXTRACT	4540	X	X	X	X					2.5	(NS)	A	1	365	APPROPRIATE AIE SKILL		LATI	4180	
RI/E SKILL TOTAL								0	0.0	0	0.0	1	2.5								
AVIATION DELIVERED GROUND REFUELING																					
ADGR	ACAD	ADGR	4610	X	X				1.0						G		*	2240		BICC	4210
	LAB	ADGR LAB	4620	X	X				2.0						A	1	365	4610	4640	BICC	4220
	ADGR	ADGR MISSION	4640	X	X	X	X					0.5	(NS)	A	1	365	2340~HLL,2380~LLL,4620	4620	BICC	4230	

MV-22B AERIAL OBSERVER T&R MATRIX (2000-6000 Phase)																					
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	POI				ACAD		SIM		FLIGHT		CONDITION	TYPE	# AIRCRAFT or SIM	PROFICIENCY INTERVAL	PREREQUISITE	CHAINING	INSTRUCTOR	EVENT CONV
				BASIC	TRANSITION	REFRESHER	MAINTAIN	#	TIME	#	TIME	#	TIME								
ADGR SKILL TOTAL								2	3.0	0	0.0	1	0.5								
BATTLEFIELD ILLUMINATION (BI)																					
BI	ACAD	EA BATTLEFIELD ILLUMINATION	4710	X	X				1.0					G		*	2310		BICC	4310	
	BI	BI ASSISTANT	4740	X	X	X	X					1.5	NS	A	1	365	NSQ FOR APPROPRIATE LIGHT LEVEL, 4710		QASO	4330	
	BI	BI LEAD	4741	X	X	X	X					1.5	NS	A	1	365	NSQ FOR APPROPRIATE LIGHT LEVEL, 4740		WTI QASO	6653	
BI SKILL TOTAL								1	1.0	0	0.0	2	3.0								
AIR DELIVERY (AD)																					
AD	AD	AD MISSION	4840	X	X	X	X					2.5	(NS)	A	1	365	APPROPRIATE AD SKILL		BICC	3530	
AD SKILL TOTAL								0	0.0	0	0.0	1	2.5								
AIRBORNE COMMAND AND CONTROL (AC2)																					
AC2	LAB	AIRBORNE C2 LAB	4920	X	X				1.0					A	1	*	NSQ		BICC	4420	
AC2 SKILL TOTAL								1	1.0	0	0.0	0	0.0								
6000 PHASE (REQUIREMENTS, CERTIFICATIONS, QUALIFICATIONS AND DESIGNATIONS (R,C,Q,D))																					
NATOPS (NTPS)																					
NTPS	ACAD	NATOPS OPEN BOOK	6010	X	X	X	X		3.0					G		365			NI / ANI	6010	
	ACAD	NATOPS CLOSED BOOK	6011	X	X	X	X		1.0					G		365	6010		NI / ANI	6011	
	ACAD	NATOPS ORAL EXAM	6012	X	X	X	X		1.0					G		365	6011		NI / ANI	6012	
	RQD	NATOPS EVAL	6030	X	X	X	X					1.5	(N)	A	1	365	6012		NI / ANI	6030	
NTPS SKILL TOTAL								3.0	5.0	0	5.0	3	4.5								
CREW RESOURCE MANAGEMENT (CRM)																					
CRM	ACAD	CRM REFRESHER	6070	X	X	X	X		1.0					G		365			CRMF/I	6016	
	RQD	CRM EVAL	6080	X	X	X	X				1.5		(N)	S	1	365	6070		CRMF/I	6031	
	ACAD	CRMF LECTURE	6090	X	X	X	X		0.0					G		365	-	6070	CRMF/I		
CRM SKILL TOTAL								3	1.0	2	1.5	0	0.0								
EMERGENCY PROCEDURES (EP)																					
EP	RQD	EP REVIEW	6033	X	X	X	X				1.0		(N)	S	1	90				6036	
EP SKILL TOTAL								0	0.0	1	1.0	0	0.0								
REDUCED VISIBILITY LANDINGS AND AUTOMATION TRACKING (RVL)																					
RVL	RVL	HIGH OBSCURATION RVL	6900	X	X	X	X					0.0	(NS)	A	1	180	2270,2271	2282			
RVL SKILL TOTAL								0	0.0	0	0.0	1.0	0.0								

4.12 MV-22B AERIAL OBSERVER RANGE AND ORDNANCE MATRIX

MV-22B AERIAL OBSERVER RANGE AND ORDNANCE MATRIX								
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ORDNANCE	ORDNANCE QUANTITY	ORDNANCE NOTES	RANGE	RANGE NOTES
2000 PHASE (CORE)								
CONFINED AREA LANDING (CAL)								
CAL	CAL	SINGLE CAL	2240					SUITABLE LZ AND AIRSPACE
	CAL	SECTION CAL	2242					SUITABLE LZ AND AIRSPACE
REDUCED VISIBILITY LANDINGS (RVL)								
RVL	RVL	RVL (ACTUAL COND)	2282					LZ WITH REDUCED VISIBILITY CONDITIONS
NIGHT SYSTEMS HIGH LIGHT LEVEL (NS HLL)								
HLL	NS HLL	HLL SGL CAL	2340					SUITABLE LZ AND AIRSPACE
	NS HLL	HLL SEC CAL	2341					SUITABLE LZ AND AIRSPACE
NIGHT SYSTEMS LOW LIGHT LEVEL (NS LLL)								
LLL	NS LLL	FAM/LLL SGL CAL	2380					SUITABLE LZ AND AIRSPACE
	NS LLL	LLL SGL CAL	2381					SUITABLE LZ AND AIRSPACE
	NS LLL	LLL SEC NAV/TACFORM	2382					SUITABLE LZ AND AIRSPACE
	NS LLL	LLL SEC CAL	2383					SUITABLE LZ AND AIRSPACE
TAIL GUNNERY (TG)								
TG	TG	SINGLE SHIP TAIL GUN EMPLOYMENT	2540	APPROPRIATE WEAPON SYSTEM	600 ROUNDS	PER GUNNER	Appropriate TG range	
	TG	SECTION TAIL GUN EMPLOYMENT	2541	APPROPRIATE WEAPON SYSTEM	600 ROUNDS	PER GUNNER	Appropriate TG range	
	TG	NS SINGLE-SHIP TAIL GUN EMPLOYMENT	2542	APPROPRIATE WEAPON SYSTEM	600 ROUNDS	PER GUNNER	Appropriate TG and Laser approved range	
	TG	NS SECTION TAIL GUN EMPLOYMENT	2543	APPROPRIATE WEAPON SYSTEM	600 ROUNDS	PER GUNNER	Appropriate TG and Laser approved range	
	TG	M240D UNDER INSTRUCTION	2550	7.62 MM,M240D	600 ROUNDS	PER GUNNER	Appropriate TG and Laser approved range	LASER APPROVED~(NS)
	TG	M240D QUALIFIED	2551	7.62 MM,M240D	600 ROUNDS	PER GUNNER	Appropriate TG and Laser approved range	LASER APPROVED~(NS)
	TG	GAU-16/A UNDER INSTRUCTION	2552	.50 CAL,GAU-16	600 ROUNDS	PER GUNNER	Appropriate TG and Laser approved range	LASER APPROVED~(NS)
	TG	GAU-16/A QUALIFIED	2553	.50 CAL,GAU-16	600 ROUNDS	PER GUNNER	Appropriate TG and Laser approved range	LASER APPROVED~(NS)
	TG	GAU-21 UNDER INSTRUCTION	2554	.50 CAL,GAU-21	600 ROUNDS	PER GUNNER	Appropriate TG and Laser approved range	LASER APPROVED~(NS)
	TG	GAU-21 QUALIFIED	2555	.50 CAL,GAU-21	600 ROUNDS	PER GUNNER	Appropriate TG and Laser approved range	LASER APPROVED~(NS)
LOW ALTITUDE TACTICS (LAT)								
LAT	LAT	LAT MAN / RTE	2640					LAT
	LAT	SEC LAT	2641					LAT
	NS LAT	HLL SEC LAT	2642					LAT
	NS LAT	LLL SEC LAT	2643					LAT
DIVISION (DIV)								
DIV	FORM	DIV TACFORM/NAV	2780					
	CAL	DIV CAL	2781					SUITABLE LZ AND AIRSPACE
	CAL	HLL DIV CAL	2782					SUITABLE LZ AND AIRSPACE

MV-22B AERIAL OBSERVER RANGE AND ORDNANCE MATRIX								
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ORDNANCE	ORDNANCE QUANTITY	ORDNANCE NOTES	RANGE	RANGE NOTES
	CAL	LLL DIV CAL	2783					SUITABLE LZ AND AIRSPACE
	CAL	DIV LAT	2784					SUITABLE LZ AND AIRSPACE
GROUND THREAT REACTION (GTR)								
GTR	GTR	SECTION TR	2840	CHAFF,FLARE	60,30			CHAFF AND FLARE CAPABLE RANGE
CARRIER QUALIFICATION (CQ)								
CQ	CQ	DAY FCLP	2940					FCLP
	CQ	DAY CQ	2941					FCLP
	NSCQ	NIGHT FCLP	2942					SHIP
	NSCQ	NIGHT CQ	2943					SHIP
3000 PHASE (MISSION)								
TACTICAL RECOVERY OF AIRCRAFT AND PERSONNEL (TRAP)								
TRAP	TRAP	TRAP MISSION	3340	7.62 / .50, CHAFF, FLARES	600,40,50		YES	AERIAL GUNNERY AND EXPENDABLE CAPABLE RANGE
COMBAT ASSAULT TRANSPORT (CAT)								
CAT	CAT	LOW THRT SEC	3440					
	CAT	ESCORT SEC	3441	7.62 / .50, CHAFF, FLARES	600,40,50		YES	AERIAL GUNNERY AND EXPENDABLE CAPABLE RANGE
4000 PHASE (CORE PLUS)								
AERIAL DELIVERY (AD)								
AD	PARA	PARAOPS	4041				CERTIFIED DROP ZONE	
	AD	DOOR BUNDLE	4042				CERTIFIED DROP ZONE	
	AD	CDS	4043				CERTIFIED DROP ZONE	
	EXT	DAY SINGLE POINT EXTERNALS	4081				EXT	External Load
	EXT	DAY DUAL POINT EXTERNALS	4082				EXT	External Load
	EXT	NS SINGLE POINT EXTERNALS	4083				EXT	External Load
	EXT	NS DUAL POINT EXTERNALS	4084				EXT	External Load
ALTERNATE INSERTION/EXTRACTION TECHNIQUES (AIE)								
AIE	AIE	FASTROPE / RAPPEL	4140					SUITABLE AIRSPACE
	AIE	HOISTING	4141					SUITABLE AIRSPACE
	AIE	SPIE	4142					SUITABLE AIRSPACE
	AIE	HELO CAST	4143					SUITABLE AIRSPACE
MOUNTAIN AREA TRAINING (MAT)								
MAT	MAT	DAY MAT	4180					SUITABLE LZ AND AIRSPACE
	MAT	NS MAT	4181					SUITABLE LZ AND AIRSPACE
DEFENSIVE WEAPONS SYSTEM (DWS)								
DWSI	DWS	DAY W/NO ROUNDS	4240				AIR TO GROUND GUNNERY RANGE AND MOVING LAND TARGET (MLT) IF AVAILABLE	
	DWS	DAY DWS EMPLOYMENT	4241	7.62, GAU-17	2000	ROUNDS PER GUNNER	AIR TO GROUND GUNNERY RANGE AND MOVING LAND TARGET (MLT) IF AVAILABLE	
	DWS	DAY SECTION DWS EMPLOYMENT	4242	7.62, GAU-17	2000	ROUNDS PER GUNNER	AIR TO GROUND GUNNERY RANGE AND MOVING LAND TARGET (MLT) IF AVAILABLE	
	DWS	NIGHT W/NO ROUNDS	4243				AIR TO GROUND GUNNERY RANGE AND MOVING LAND TARGET (MLT) IF AVAILABLE	

MV-22B AERIAL OBSERVER RANGE AND ORDNANCE MATRIX								
SKILL	PREFIX	T&R DESCRIPTION	EVENT NUMBER	ORDNANCE	ORDNANCE QUANTITY	ORDNANCE NOTES	RANGE	RANGE NOTES
	DWS	NIGHT DWS EMPLOYMENT	4244	7.62, GAU-17	2000	ROUNDS PER GUNNER	AIR TO GROUND GUNNERY RANGE AND MOVING LAND TARGET (MLT) IF AVAILABLE	
	DWS	NIGHT SECTION DWS EMPLOYMENT	4245	7.62, GAU-17	2000	ROUNDS PER GUNNER	AIR TO GROUND GUNNERY RANGE AND MOVING LAND TARGET (MLT) IF AVAILABLE	
DEFENSIVE COMBAT MANEUVERING (DCM)								
DCM	DCM	DCM AGAINST FW AGGRESSOR	4340				ACM RANGE SPACE	
CARRIER QUALIFICATION (CQ)								
CQ	CQ	NIGHT UNAIDED FCLP	4480					FCLP
	CQ	NIGHT UNAIDED CQ	4481					SHIP
RAPID INSERTION / EXTRACTION								
R/E	R/E	RAPID INSERT/EXTRACT	4540					SUITABLE AIRSPACE
AVIATION DELIVERED GROUND REFUELING								
ADGR	ADGR	ADGR MISSION	4640					SUITABLE AIRSPACE
BATTLEFIELD ILLUMINATION (BI)								
BI	BI	BI ASSISTANT	4740	LUU-2/LUU-19	6		AIR TO GROUND RANGE	SUAS AUTHORIZED FOR USE OF APFS
	BI	BI LEAD	4741	LUU-2/LUU-19	6		AIR TO GROUND RANGE	SUAS AUTHORIZED FOR USE OF APFS
AIR DELIVERY (AD)								
AD	AD	AD MISSION	4840				RANGE REQUIREMENTS SPECIFIC TO EACH SPECIFIC AD SKILL.	
REDUCED VISIBILITY LANDINGS AND AUTOMATION TRACKING (RVL)								
RVL	RVL	HIGH OBSCURATION RVL	6900					SUITABLE LZ AND AIRSPACE