NAVAL AIR TRAINING COMMAND

NAS CORPUS CHRISTI, TEXAS
CIN Q-2C-0017, Q-2C-0118, Q-2C-0218

CNATRAINST 1542.41F

CHIEF OF NAVAL AIR TRAINING

HELICOPTER TRANSITION MPTS CURRICULUM

2009

DEPARTMENT OF THE NAVY
CHIEF OF NAVAL AIR TRAINING
CNATRA
250 LEXINGTON BLVD SUITE 102
CORPUS CHRISTI TX 78419-5041

CNATRAINST 1542.41F
N714
15 JUN 09

CNATRA INSTRUCTION 1542.41F

Subj: HELICOPTER TRANSITION PILOT TRAINING, MULTI-SERVICE PILOT TRAINING SYSTEM

1. Purpose. To issue the curriculum for training a naval aviator in rotary-wing aircraft, qualifying a naval aviator in the TH-57, or familiarizing a naval aviator with the TH-57 and helicopter flight and missions.

2. Cancellation. CNATRAINST 1542.41E will cancel when the last student finishes the curriculum.

3. Action. This curriculum is effective on receipt. No changes will be made without written authorization by the Chief of Naval Air Training (CNATRA).

4. Forms

a. The Aviation Training Forms required by this directive are computer generated in the Training Integration Management System (TIMS) at Training Air Wing (TRAWING) FIVE. This system has been assigned a system form number of CNATRA 1542/2020. CNATRA point of contact is the current Pipeline Training Officer, CNATRA (N714), DSN 861-3894. An update of these forms shall be accomplished no later than the issuance of this curriculum.

b. There are CNATRA-GEN forms available with printing instructions on CNATRA's web site: https://www.cnatra.navy.mil.

JAMES A. CRABBE
Chief of Staff

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LIST OF EFFECTIVE PAGES

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Total number of pages is 180 consisting of the following:

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CHAPTER VIII. COURSE TRAINING STANDARDS

CHAPTER IX. MASTER MATERIALS LIST

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SUMMARY OF CHANGES

CHANGE NUMBER	DATE OF CHANGE	CHANGE DESCRIPTION	PAGES AFFECTED/ INITIALS

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COURSE DATA

1. Course Title. Helicopter Transition Pilot Training, Multi-Service Pilot Training System (MPTS).

2. Course ID Number (CIN). Helicopter Transition, Q-2C-0017, NATOPS Only, Q-2C-0118, Helicopter Exposure, Q-2C-0218.

3. Location. Naval Air Station, Whiting Field, Milton, Florida 32570.

4. Course Status. Active.

5. Course Mission. The mission of the Helicopter Transition (HT) portion of this training is to teach the skills necessary for flying rotary-wing aircraft and to qualify naval aviators for rotary-wing designations. The mission of the Additional Training Track (ATT) portions of this training is to augment the helicopter transition course with specialized training relevant to follow-on assignments and training. The mission of the NATOPS Only (NO) portion of this training is to qualify naval aviators, previously designated as helicopter pilots, in the TH-57. The mission of the Helicopter Exposure (HE) portion of this training is to give naval aviators an opportunity to gain familiarity with the TH-57 and helicopter flight and missions.

6. Prerequisite Training. Designated naval aviator/military pilot.

7. Security Clearance Requirements. None.

8. Follow-on Training. As required to maintain currency.

9. Course Length. Overall time-to-train calculated in accordance with CNATRAINST 1550.6E.

Course Name	Calendar Weeks	Calendar Days	Training Days
Helicopter Transition	9.7	68.1	44.2
Tactics 'B' ATT (Optional/as Assigned)	0.3	2.1	1.4
Formation ATT (Optional/as Assigned)	0.6	4.3	2.8
Low-Level Nav ATT (Optional/as Assigned)	0.6	4.2	2.7
Tactics 'C' ATT(Optional/as Assigned)	1.0	7.1	4.6
NVG ATT(Optional/as Assigned)	1.8	12.4	8.1
Instrument Check ATT(Optional/as Assigned)	0.7	5.0	3.3
NATOPS Only	3.0	20.8	13.5
Helicopter Exposure	2.0	14.3	9.3

10. Class Capacity. Variable.

11. Instructor Requirements. As established by Chief of Naval Air Training planning factors.

12. Course Curriculum Model Manager. Commander, Training Air Wing FIVE (COMTRAWING FIVE).

13. Quota Management Authority. Chief of Naval Air Training.

14. Quota Control. Chief of Naval Operations.

15. Course Training Subjects

a. Initial Ground Training

HELICOPTER TRANSITION (HT) GROUND TRAINING		
Stage	**Symbol**	**Hours**
Indoctrination	G01	2.5
Helicopter Aircrew Breathing Device	G02	4.0
Safety	G03	1.0
Global Positioning System	G04	1.0
Checkout	G05	1.0
Total		**9.5**

NATOPS ONLY (NO) AND HELICOPTER EXPOSURE (HE) GROUND TRAINING		
Stage	**Symbol**	**Hours**
Indoctrination	G01	2.5
Helicopter Aircrew Breathing Device	G02	4.0
Checkout	G05	1.0
Total		**7.5**

b. Initial Flight Support

HELICOPTER TRANSITION (HT) FLIGHT SUPPORT		
Stage	**Symbol**	**Hours**
Systems 'B'	C01	9.5
Helicopter Aerodynamics	C02	25.0
Preflight Procedures 'B'	C03	2.0
Crew Resource Management – Contact	C04	1.0
Course Rules Flight Procedures	C05	3.0
NATOPS Examinations	C06	6.0
Systems 'C'	C07	3.0
Basic Instrument Flight Procedures	I01	1.5
Emergency Procedures	C08	1.5
Contact 'B' Flight Preparation Brief	C09	3.0
Crew Resource Management – Instrument	I02	2.0
Radio Instruments	I04	6.0
Mission Planning System	N01	2.0
Visual Flight Rules Navigation	N02	2.5
Total		**68.0**

NATOPS ONLY (NO) FLIGHT SUPPORT		
Stage	**Symbol**	**Hours**
Systems 'B'	C01	9.5
NATOPS Examinations	C06	6.0
Emergency Procedures	C08	1.5
Total		**17.0**

c. Initial Flight Training. Below are the programmed times for each stage and media.

HELICOPTER TRANSITION (HT) FLIGHT TRAINING								
Flight/Events	CPT		SIM		Dual		Solo	
	Flts	Hrs	Flts	Hrs	Flts	Hrs	Flts	Hrs
Cockpit Procedures Trainer	3	3.9						
Contact 'B'					10	20.0	1	1.7
Contact 'B' Safe-for-Solo Check Ride/NATOPS Check					1	2.0		
Contact 'C' Model Transition			1	1.3	1	1.5		
Night Contact 'C'					1	1.5		
Basic Instruments			2	2.6	2	3.4		
Emergency Procedures			1	1.3				
Radio Instruments			2	2.6	2	4.0	1	2.0
Visual Navigation					1	1.7	1	1.7
Totals	**3**	**3.9**	**6**	**7.8**	**18**	**34.1**	**3**	**5.4**

NATOPS ONLY (NO) FLIGHT TRAINING						
Flight/Events	CPT		SIM		Dual	
	Flts	Hrs	Flts	Hrs	Flts	Hrs
Cockpit Procedures Trainer	1	1.3				
Contact 'B'					3	6.0
NATOPS Check Ride					1	2.0
Contact 'C' Model Transition					1	1.5
Emergency Procedures			1	1.3		
Radio Instruments					2	4.0
Totals	**1**	**1.3**	**1**	**1.3**	**7**	**13.5**

HELICOPTER EXPOSURE (HE) FLIGHT TRAINING						
Flight/Events	CPT Flts	CPT Hrs	SIM Flts	SIM Hrs	Dual Flts	Dual Hrs
Contact 'B'					2	4.0
Scheduled Events			1	1.3	5	10.0
Totals			**1**	**1.3**	**7**	**14.0**

d. Additional Training Track (ATT) Flight Support

TACTICS 'B' ATT FLIGHT SUPPORT		
Stage	**Symbol**	**Hours**
Tactics Flight Procedures	T01	1.5
Total		**1.5**

FORMATION ATT FLIGHT SUPPORT		
Stage	**Symbol**	**Hours**
Formation Procedures	F01	3.5
Total		**3.5**

LOW-LEVEL NAV ATT FLIGHT SUPPORT		
Stage	**Symbol**	**Hours**
Low-Level Navigation	N03	2.5
Total		**2.5**

TACTICS 'C' ATT FLIGHT SUPPORT		
Stage	**Symbol**	**Hours**
Shipboard Operations/Search and Rescue	S01	1.0
Total		**1.0**

NVG ATT FLIGHT SUPPORT		
Stage	**Symbol**	**Hours**
NVD Training	V01	8.5
Total		**8.5**

INSTRUMENT CHECK ATT FLIGHT SUPPORT		
Stage	**Symbol**	**Hours**
Instrument Ground School	I05	7.0
Total		**7.0**

e. Additional Training Track (ATT) Flight Training. Below are the programmed times for each stage and media.

TACTICS 'B' ATT FLIGHT TRAINING						
	CPT		**SIM**		**Dual**	
Flight/Events	**Flts**	**Hrs**	**Flts**	**Hrs**	**Flts**	**Hrs**
Tactics					1	2.0
Totals					**1**	**2.0**

FORMATION ATT FLIGHT TRAINING						
	CPT		**SIM**		**Dual**	
Flight/Events	**Flts**	**Hrs**	**Flts**	**Hrs**	**Flts**	**Hrs**
Formation					2	3.4
Totals					**2**	**3.4**

LOW-LEVEL NAV ATT FLIGHT TRAINING						
	CPT		**SIM**		**Dual**	
Flight/Events	**Flts**	**Hrs**	**Flts**	**Hrs**	**Flts**	**Hrs**
Low-Level Nav					2	3.0
Totals					**2**	**3.0**

TACTICS 'C' ATT FLIGHT TRAINING						
	CPT		**SIM**		**Dual**	
Flight/Events	**Flts**	**Hrs**	**Flts**	**Hrs**	**Flts**	**Hrs**
Deck Landing Practice					2	1.0
Shipboard Operations			2	2.6		
Totals			**2**	**2.6**	**2**	**1.0**

NVG ATT FLIGHT TRAINING						
Flight/Events	CPT		SIM		Dual	
	Flts	Hrs	Flts	Hrs	Flts	Hrs
Night Tactical Flight			1	1.3	5	8.5
Totals			**1**	**1.3**	**5**	**8.5**

INSTRUMENT CHECK ATT FLIGHT TRAINING						
Flight/Events	CPT		SIM		Dual	
	Flts	Hrs	Flts	Hrs	Flts	Hrs
Radio Instruments					1	2.0
Instrument Check Ride					1	2.0
Totals					**2**	**4.0**

16. Training Time Analysis

ADDITIONAL TRAINING TIME PER CURRICULUM HOUR/EVENT				
Training Area	Brief/Preflight/ Taxi	Prep Study	Taxi/ Debrief	Total
Flight	2.0	2.0	0.5	4.5
Simulator/CPT	0.5	2.0	0.5	3.0

17. Physical Requirements. As specified in the Manual of the Medical Department, Chapter 15, and all applicable anthropometrical standards.

18. Obligated Service. Refer to MILPERSMAN for Naval personnel.

19. Primary Instructional Methods. Lecture, computer-assisted instruction (CAI), self- and group-paced study, and in-flight instruction.

20. Preceding Curriculum Data. This curriculum replaces CNATRAINST 1542.41E.

21. Transition Pilot(TP). The generic term used for any naval aviator going through any syllabus of this curriculum.

22. Transition Pilot Performance Measurement/Application of Standards. The standards outlined in Chapter VIII, Course Training Standards, are used to evaluate TP performance of individual items and maneuvers. Final judgment regarding the satisfactory performance of any flight maneuver rests with the Instructor Pilot (IP), who must assess the environmental and systems factors affecting the conditions under which the performance is measured and the TP's experience within the stage.

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ABBREVIATIONS

The following is a list of abbreviations used in the curriculum:

a. ADF - Automatic Direction Finder

b. AERO - Aerodynamics

c. AFCS - Automatic Flight Control System

d. AGL - Above Ground Level

e. AIM - Aeronautical Information Manual

f. AIRMET - Airman's Meteorological Information

g. AOB - Angle of Bank

h. APU - Auxiliary Power Unit

i. ASI - Aviation Student Indoctrination

j. ASR - Airport Surveillance Radar

k. ATC - Air Traffic Control

l. ATF - Aviation Training Form

m. ATIS - Automatic Terminal Information Service

n. ATJ - Aviation Training Jacket

o. ATS - Aviation Training Summary

p. ATT - Additional Training Track

q. BAW - Basic Air Work

r. BI - Basic Instrument

s. BIFP - Basic Instrument Flight Procedures

t. CAI - Computer-Assisted Instruction

u. CAWW - CNATRA Advisory Weather Warning

v. CDI - Course Deviation Indicator

w. CDO - Command Duty Officer

x. CPT - Cockpit Procedures Trainer

y. CR - Course Rules

z. CRM - Crew Resource Management

aa. CTS - Course Training Standard

ab. DCONFP - Day Contact Flight Procedures

ac. DH - Decision Height

ad. DME - Distance Measuring Equipment

ae. DP - Departure Procedures

af. EMFP - Emergency Flight Procedures

ag. EOB - End of Block

ah. EP - Emergency Procedures

ai. FAA - Federal Aviation Administration

aj. FAC - Final Approach Course

ak. FAF - Final Approach Fix

al. FAR - Federal Aviation Regulation

am. FDC - Flight Data Center

an. FIH - Flight Information Handbook

ao. FLIP - Flight Information Publication

ap. FORMFP - Formation Flight Procedures

aq. FP - Full Panel

ar. FSS - Flight Service Station

as. FTI - Flight Training Instruction

at. GCA - Ground-Controlled Approach

au. GPS - Global Positioning System

av. GPSFP - Global Positioning System Flight Procedures

aw. HABD - Helicopter Aircrew Breathing Device

ax. HE - Helicopter Exposure

ay. HLT - Helicopter Landing Trainer

az. HOSTAC - Helicopter Operations from Ships Other Than Aircraft Carriers

ba. HSI - Horizontal Situation Indicator

bb. HT - Helicopter Transition

bc. H/X - Hours per X

bd. IAF - Initial Approach Fix

be. IAW - In Accordance With

bf. ICAO - International Civil Aviation Organization

bg. IFM - Instrument Flight Manual

bh. IFR - Instrument Flight Rules

bi. ILS - Instrument Landing System

bj. IMC - Instrument Meteorological Conditions

bk. INAV - Instrument Navigation

bl. IP - Instructor Pilot

bm. ITO - Instrument Takeoff

bn. JOG - Joint Operations Graphic (Chart)

bo. KNDZ - NAS South Whiting Field

bp. LAHSO - Land and Hold Short Operations

bq. LHD/CV - Amphibious Assault Ship (General Purpose)/Multi-Purpose Aircraft Carrier

br. LOA - Letter of Agreement

bs. LOC - Localizer

bt. LSE - Landing Signalman Enlisted

bu. MAP - Missed Approach Point

bv. MCA - Minimum Crossing Altitude

bw. MDA - Minimum Descent Altitude

bx. MIF - Maneuver Item File

by. MIL - Mediated Interactive Lecture

bz. MOCA - Minimum Obstruction Clearance Altitude

ca. MPS - Mission Planning System

cb. MRA - Minimum Reception Altitude

cc. NATOPS - Naval Air Training and Operating Procedures Standardization

cd. NAVAID - Navigational Aid

ce. NDB - Non-Directional Beacon

cf. NDZ - South Whiting Field

cg. NG - No Grade

ch. NI - NATOPS Instructor

ci. NO - NATOPS Only

cj. NOTAMS - Notices to Airmen

ck. NVD - Night Vision Device

cl. NVG - Night Vision Goggles

cm. OBS - Omni-Bearing Selector

cn. OLF - Outlying Field

co. OPNAV - Office of the Chief of Naval Operations

cp. ORM - Operational Risk Management

cq. OSC - On-Scene Commander

cr. PAC - Pilot at Controls

cs. PAPI - Precision Approach Path Indicator

ct. PAR - Precision Approach Radar

cu. PMSV - Pilot Meteorological Information Service

cv. PNAC - Pilot Not at the Controls

cw. PP - Partial Panel

cx. PQM - Pilot Qualified in Model

cy. PT - Procedure Turn

cz. RI - Radio Instruments

da. RIFP - Radio Instruments Flight Procedures

db. RNAV - Area Navigation System

dc. RON - Remain Overnight

dd. RPM - Revolutions Per Minute

de. RV - Radar Vectors

df. RWOP - Rotary Wing Operating Procedures

dg. SAR - Search and Rescue

dh. SI - Standardization Instructor

di. SIGMET - Significant Meteorological Information

dj. SLAP - Solar/Lunar Almanac Prediction (software)

dk. SOP - Standard Operating Procedure

dl. SRT - Standard Rate Turn

dm. SS - Self-Study

dn. SSR - Special Syllabus Requirement

do. STARS - Standard Terminal Arrivals

dp. SYS - Systems

dq. TACAID - Tactical Airborne Information Document

dr. TACAN - Tactical Air Navigation

ds. TERF - Terrain Flight

dt. TFP - Tactics Flight Procedures

du. TOT - Turbine Outlet Temperature

dv. TP - Transition Pilot

dw. VASI - Visual Approach Slope Indicator

dx. VFR - Visual Flight Rules

dy. VFRNAV - Visual Flight Rules Navigation

dz. VMC - Visual Meteorological Conditions

ea. VNAVFP - Visual Navigation Flight Procedures

eb. VOR - Very High Frequency (VHF) Omnidirectional Range

ec. VSI - Vertical Speed Indicator

ed. WW - Weather Warning

GLOSSARY

1. Advancing X. Completed event within the normal syllabus flow. Excludes events with last characters in the range 85-89.

2. Aviation Training Form. A grade sheet documenting TP performance for all categories of training regardless of media, phase, or stage.

3. Aviation Training Jacket. The ATJ is the TP's training record. It contains ATFs, calendar card, grade reports, and all other associated training information. It is filed in the squadron and follows the TP through all phases of training.

4. Aviation Training Summary. A tabular sheet listing the Maneuver Item File (MIF) and maneuver grades within a training stage.

5. Block of Training. A sequential series of lessons within a training stage sharing an identical MIF. The third character in the lesson designator identifies a block.

6. Check Ride (SXX90). A flight check in any stage of training.

7. Contact. The stage of training that combines both day and night familiarization.

8. Course of Training. The entire program of preflight, flight, simulation, academics, and officer development conducted in all media during the programmed training days.

9. Course Training Standard. A description of required behaviors and standards of performance for a specific maneuver. These standards are in Chapter VIII.

10. Courseware. The technical data, FTIs, audio, video, film, CAI, instructor guides, student study guides, and other training material developed to support and implement the syllabus of instruction.

11. Critical Item. Any maneuver coded with a plus sign (+). This symbol indicates the maneuver is required and must be accomplished to the specified standard in that block of training.

12. End of Block. Last event in block. In order to progress past EOB, the TP must meet or exceed MIF on all critical items, and all optional items attempted, in the block.

13. Flight Training Instruction. A CNATRA-approved manual describing flight procedures and techniques for each training stage.

14. Hours per X. The average length for each event in a block, rounded to the nearest tenth of an hour.

15. Lesson Designator. All syllabus events have a five-character lesson designator in the following format:

Char	Meaning	Remarks		
1st	Stage	G—Ground C—Contact	I—Instrument N—Navigation	F—Formation T—Tactical
2nd	Media	0 or 1—Ground Training	2—CPT 3—Simulator	4—Aircraft
3rd	Block	Sequential, indicating block within stage.		
4th & 5th	Event/Check Identifier	Sequential, indicating event within block, or other event types as shown below:		
		85—Practice Simulator 86—Warmup 87—Extra Training	88—Initial Progress Check 89—Final Progress Check 90—Check Ride/Exam	

16. Maneuver Item File. A listing of required maneuvers and associated proficiency levels for each block of training.

17. Master Syllabus. Chapters I-VII list all training syllabus activities, prerequisites, and desired training flow for MPTS.

18. Special Syllabus Requirement. One-time, ungraded demonstration items.

19. Stage of Training. All training of a particular type (Ground, Contact, Instrument, Navigation, Formation, Tactical) within a phase. The first letter in the lesson designator identifies the stage of each lesson (Example: F4001 is in the Formation stage).

20. Standardization Instructor. The squadron commander will designate SIs for each stage.

21. Training Media. MPTS media include aircraft, simulator, CPTs, ground training, and CAI. The second character in the lesson identifier designates the training media.

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Chapter I

General Instructions

1. Syllabus Management

a. Distribution. Participating squadron personnel.

b. Interpretation. The syllabus is directive. Should circumstances create situations not covered within the scope of this syllabus, or specific course of action appears to conflict with other directives, consult CNATRA (N71).

c. Deviations. Document all deviations on the event's ATF.

d. Changes. Recommended changes shall be submitted in accordance with CNATRAINST 1550.6E.

e. Execution. Transition Pilots attempting to qualify as helicopter pilots shall complete all curriculum events in the Helicopter Transition syllabus as well as all events in any assigned Additional Training Tracks. TPs who are prior helicopter pilots attempting to gain NATOPS designation in the TH-57 shall complete all curriculum events in the NATOPS Only curriculum. TPs who desire exposure to helicopter flight and missions shall complete all assigned events in the Helicopter Exposure curriculum.

f. Syllabus Description. The Helicopter Transition MPTS phase of flight training is designed to teach the fundamental skills of flying rotary-wing aircraft. All training is flown in either the TH-57B or the TH-57C aircraft. This syllabus is divided into stages. Stages are grouped by like flight training regimes: Contact, Instrument, Navigation, Tactical, and Formation. Each stage is subdivided into training blocks. The training blocks consist of a specified number of flights. Maneuver item files identify the acceptable level of performance that must be achieved at the completion of each training block.

2. Training Management

a. Syllabus Progression. Fly syllabus events within each stage sequentially, except as noted. Do not start a block without all prerequisites. TPs may be in different stages or blocks simultaneously. Where applicable, TPs will be eligible for, and shall be prepared for, more than one syllabus event.

TPs must complete all events. The flowcharts on page I-6, I-7, I-9, and I-11 delineate the sequence of flying/device events and their ground training prerequisites. Any block of training may be interrupted to facilitate continued progress during inclement weather or to facilitate cross-country training. System training management is designed to facilitate two graded events (flight, simulator, or exam) per TP per day.

b. Accelerated Progression. Under exceptional circumstances, a TP's previous flight experience or demonstrated proficiency may warrant accelerated progression. Refer to CNATRAINST 3710.13F for additional information.

c. Maneuver Continuity. TPs must accomplish previously introduced maneuvers frequently enough to ensure maintaining required proficiency.

d. Hours/X. IPs shall plan and execute missions to meet H/X as closely as practical. If actual event length varies from H/X by more than 0.3 hours, annotate reason(s) in ATF's general comments section.

e. Special Syllabus Requirements. SSRs are allocated to flights. Unless noted otherwise, IPs may accomplish SSRs on any flight within the block. SSRs shall be completed in the specified block. Annotate completed SSRs in the ATF's SSR comments section. Assign NG/1 as the SSR maneuver grade.

f. Helicopter Transition Syllabus Minimum Requirements. The HT course flow on page I-5 is designed to give naval aviators (not previously designated as helicopter pilots) the curriculum necessary to fulfill OPNAV 3710.7T Helicopter Transition Pilot requirements. These requirements are 25 hours of dual instruction, 5 hours of solo instruction, and the CNATRA-approved helicopter aerodynamics exam. Any event in the HT syllabus that is required for these minimums is marked as

"NOT WAIVERABLE." TPs shall track their dual and solo hours to ensure the minimums are met prior to syllabus completion.

g. Additional Training Tracks. There are six additional training tracks depicted on page I-7 available to helicopter transition pilots. These are designed to allow the helicopter transition pilot to receive training that is relevant to follow-on training and assignments. TPs may be assigned any number of ATTs from zero to all six. Each track has specific prerequisites in the HT flow. The six tracks are:

(1) Tactics 'B' ATT. This ATT provides training in Confined Area Landings (CALs), Pinnacle Operations, and External Load Operations. Tactical maneuvering is also introduced.

(2) Formation ATT. This ATT provides training in two-ship Formation, focusing on formation maneuvers and landing pattern work.

(3) Low-Level Nav ATT. This ATT provides training in helicopter low level navigation techniques.

(4) Tactics 'C' ATT. This ATT provides training in helicopter shipboard operations and search and rescue as well as shipboard landing flights leading to deck landing qualification per TH-57 NATOPS.

(5) NVG ATT. This ATT provides training in NVD flight techniques. Pattern work and navigation are emphasized.

(6) Instrument Check ATT. This ATT provides the TP an opportunity to fulfill instrument check requirements if they are due to expire during training. This meets the OPNAV 3710.7T requirement for delaying the expiration of an instrument check until syllabus completion. This track is also available to TPs in the NATOPS-only curriculum, if necessary.

h. NATOPS Only Requirements. These flights are designed to give a prior helicopter pilot the experience and familiarity with the aircraft necessary to achieve the PQM designation per TH-57 NATOPS. The flights should adhere to the curriculum description, but can be tailored to address intended areas of focus. For example, if on an I4101 (RI) flight, part of the flight can be devoted to pattern work at the IP's discretion.

i. Helicopter Exposure (HE) Requirements. The helicopter exposure curriculum is designed to give a naval aviator exposure to the TH-57 as well as helicopter flight and missions. Two contact 'B' flights are provided initially to get the TP familiar with basic helicopter flight. After this flight, up to five flights and one simulator event are available for the TP to experience different aspects of helicopters. Because all flights in the syllabus are available to the TP, all prerequisites are waived for flights in the HE syllabus. Flights should be chosen in the areas the TP would like to focus on. Although discussion items serve as a useful tool for guiding discussion, the HE TP is not expected to have the same level of preparation and knowledge of discussion items as the NO and HT TPs. This syllabus can be completed by all naval aviators regardless of whether they have been designated a helicopter pilot. For example, a non-helicopter pilot could complete this course in anticipation of taking command of a wing unit that incorporated helicopters. Another example would be a helicopter pilot completing this course in anticipation of flying the TH-57 in another command.

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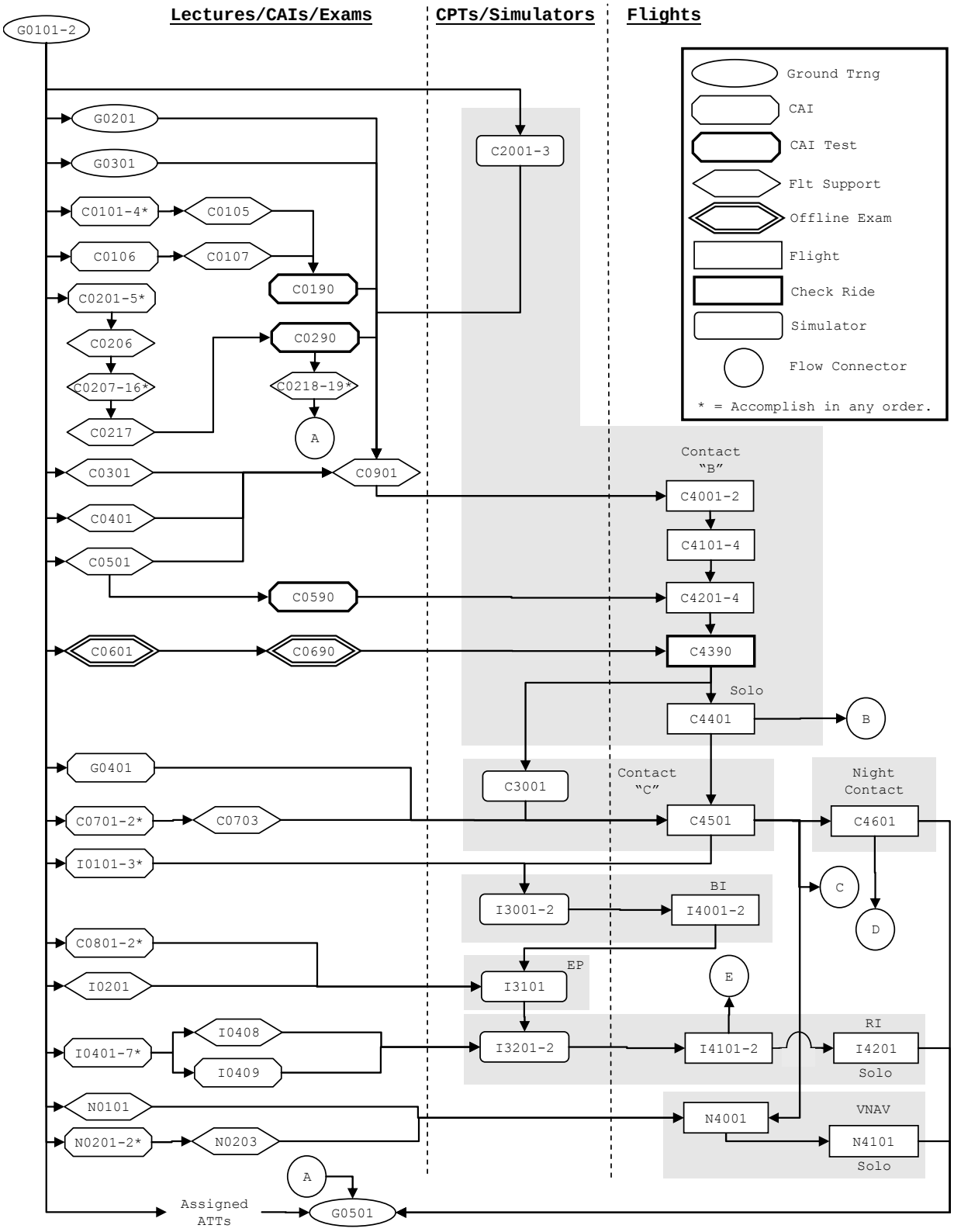
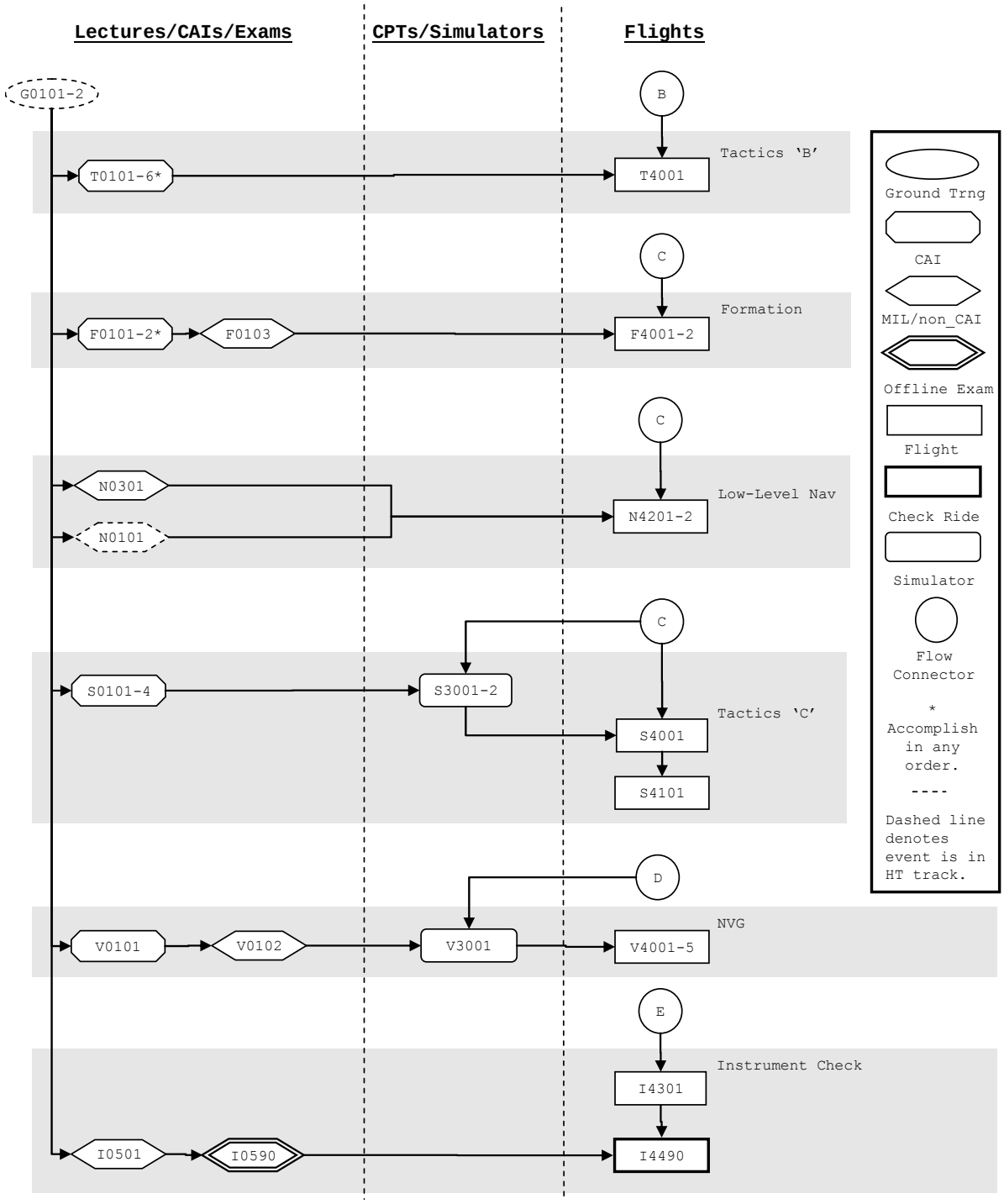
HELICOPTER TRANSITION (HT) COURSE FLOW



HELICOPTER TRANSITION ADDITIONAL TRAINING TRACKS (ATT)



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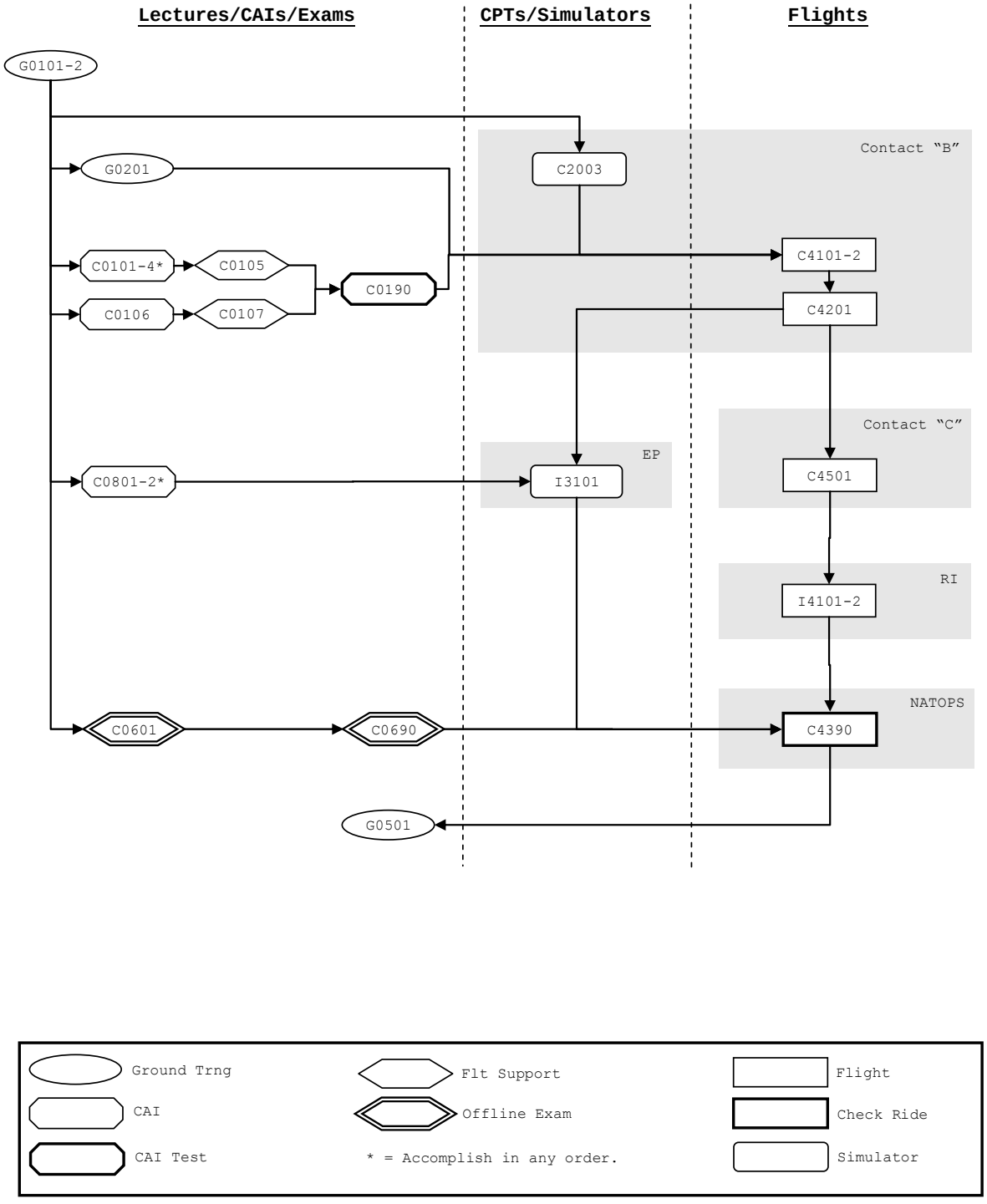
NATOPS ONLY (NO) SYLLABUS



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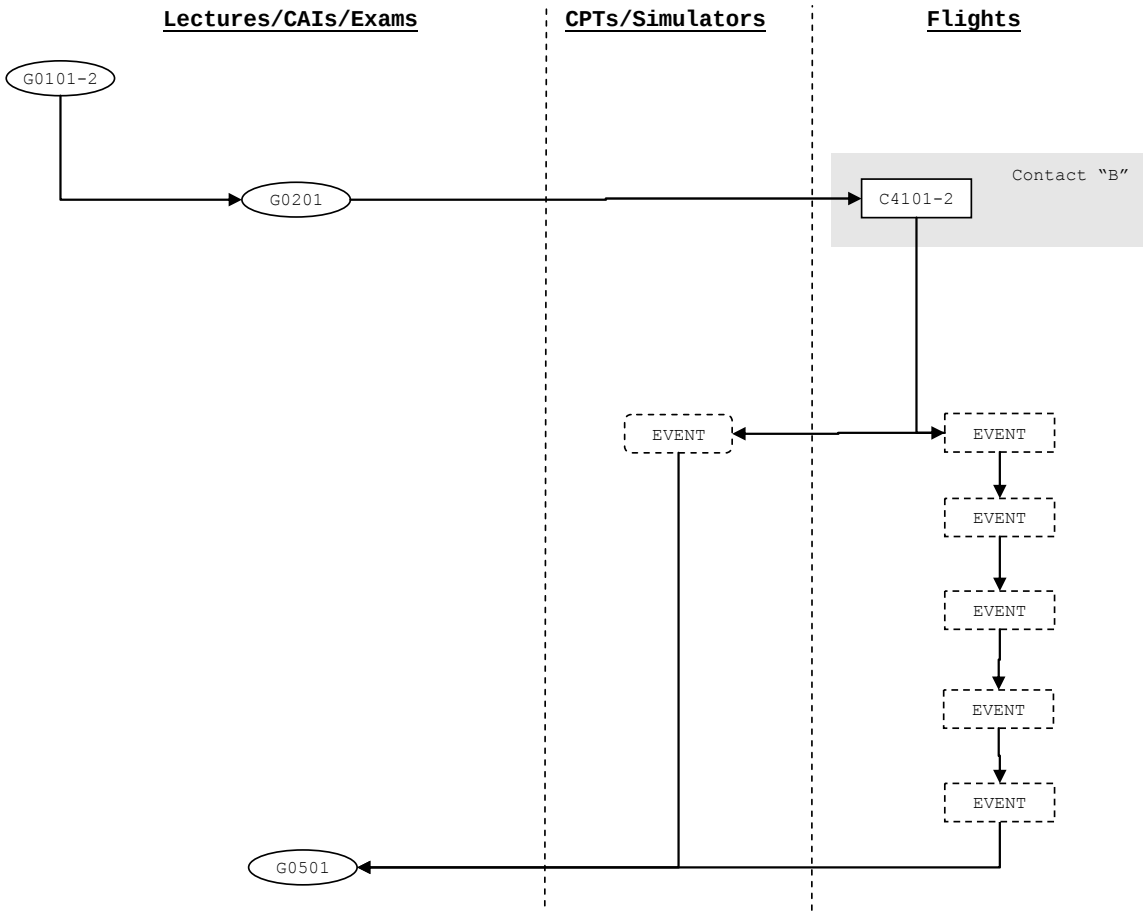
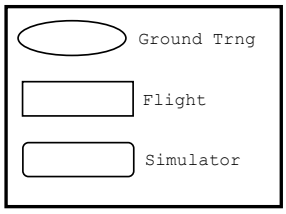
HELICOPTER EXPOSURE (HE) SYLLABUS



NOTE: Any event in the syllabus can be completed after C4102. All event prerequisites are waived. All assigned events must be completed before G0501.



3. Break in Training Warmup Events (SXX86). Generally, warmup events will not be scheduled for TPs.

a. If the number of days since the TP's last flight or simulator is 14 or more days, then the TP is in the "optional warmup" window. The next syllabus event shall be flown normally. If at the end of the event, the IP and TP agree that the break in training was excessively detrimental to TP progress, the flight shall be marked "incomplete" and flown again the next day.

b. For TPs in the HT course flow, the TP cannot complete an event marked as "SOLO" unless the TP has flown a syllabus event in the last seven days. If the TP exceeds this seven-day window, another non-solo syllabus event or a (SXX86) warmup event may be flown to regain currency.

4. Ground Training and Briefing Requirements

a. Mission Preparation, Briefings, and Debriefings

(1) EOB Events. The IP shall carefully review the Aviation Training Summary in planning the EOB event to ensure the profile includes opportunities to reach MIF on all critical items and optional items attempted in the block.

(2) Preparation. TPs shall arrive for each flight with:

(a) Thorough knowledge of:

1. The flight's discuss items, as listed in Chapters III-VII.

2. Procedural knowledge of the critical items for the event's training block.

(b) A flight profile tailored to training requirements, weak areas, and continuity.

(c) The latest ATS for the stage.

b. Briefing. Thoroughly cover the mission's:

(1) Event discuss items, as listed in Chapters III-VII.

(2) Specific objectives.

(3) Techniques and required procedures for accomplishing those objectives.

(4) Planned profile and contingencies.

c. Debriefing

(1) After each event, the IP shall critique the TP's performance using cause/effect analysis, particularly with respect to the Course Training Standards.

(2) The mission's complexity and TP's progress will govern the time required for the debrief.

(3) The IP shall provide the TP with a new ATS, and may provide a copy of the event's ATF.

5. Mission Grading Procedures and Evaluation Policies

a. General Grading and Evaluation Policy. Maneuver Item Files listed in the MPTS are minimum stage/phase completion standards per maneuver.

b. Grading Procedures (Aircraft and Training Devices)

(1) Overall Grading

(a) The overall grade for all flights and devices, with the exception of the NATOPS Check Ride (C4390), will be pass/fail.

(b) The overall grade for the NATOPS Check Ride will be UQ, CQ, or Q as described below:

1. Unqualified (UQ Level) – Fails to meet minimum acceptable criteria and needs supervised instruction.

2. Conditionally Qualified (CQ Level) – Meets minimum acceptable criteria and is safe to fly as the pilot in command.

3. Qualified (Q Level) – Displays good knowledge of operational procedures and a thorough understanding of the aicraft.

(2) Standard Maneuver Grading. Use the following grading scale to document the TP's characteristic performance on maneuvers attempted during each dual event. This is an absolute grading scale. Judge the TP's proficiency **only** against the item's course training standard.

(a) Demonstrated (NG/1 Level). Enter "No Grade (NG)":

1. When the IP demonstrates the maneuver and the TP does not subsequently perform it during the event.

2. To indicate accomplishing SSRs for that event. Specify completed SSRs in the ATF's comments section.

(b) Unable (U/2 Level). Performance is unsafe or lacks sufficient knowledge, skill, or ability. Deviations greatly exceed CTS, significantly disrupting performance. Corrections significantly lag deviations or aggravate the deviation.

(c) Fair (F/3 Level). Performance is safe, but with limited proficiency. Deviations exceed CTS, detracting from performance. Corrections noticeably lag deviations, and may not be appropriate.

(d) Good (G/4 Level). Characteristic performance is within CTS. Deviations outside CTS are allowed, provided they are brief, minor, and do not affect safety of flight. Corrections must be appropriate and timely.

(e) Excellent (E/5 Level). Greatly surpasses CTS. Performance is correct, efficient, and skillful. Deviations are very minor. Corrections, if required, are initiated by the TP and are appropriate, smooth, and rapid.

(3) Solo Events

(a) Assign NG/1 for performed maneuvers.

(b) Any IP may grade maneuvers to be either unsafe or exceptional on the solo ATF.

c. Progression Rule. Performance must meet MIF by EOB. TP shall maintain or exceed MIF performance from one block, stage, or media to the next. In all cases of unsatisfactory performance, TP training shall be suspended until corrective action has been taken and the Squadron commander/officer in charge (OIC) has released TP for further training.

d. Maneuver Requirements. For each block:

(1) Mandatory Items. Items with a number and a plus (+) are mandatory and the TP must meet the required proficiency by EOB. When a maneuver is performed multiple times in a block of training, the last grade assigned for the maneuver will determine if the TP meets EOB MIF.

(2) Optional Items. Items with a number, but without a plus (+), are optional. However, if flown, the TP must meet the required proficiency by EOB.

e. Incomplete Events. In general, TPs should consider an event complete if able to accomplish the requirements in paragraph (1) below. This is particularly true when weather precludes accomplishing certain maneuver items, but the IP is able to emphasize training on other maneuver items. Subsequent events in the block, when available, can reverse this emphasis, hence achieving overall training balance. If a TP has had ample opportunity to learn a task and subsequently flies a short event, do not incomplete the event solely to provide unwarranted extra training.

(1) Assessment. Assess the event complete if:

(a) Seventy-five percent of the event's H/X was used for training, and

(b) Sufficient events remain in the block to redress the imbalance, and

(c) Individual maneuvers can still be accomplished within the block.

(d) Otherwise, assess the event incomplete.

(2) Completion Events. An event may both complete a previous event and count as an advancing X.

(3) Simulator Event Completion. Assess a simulator event complete if the TP has received a full training period.

f. Policies for Evaluation Flights and Ground Evaluations

(1) Check Rides (SXX90). Check rides amount to single event training blocks. Therefore, all rules regarding progressing out of a block apply, except as noted below:

(a) Should fly a representative cross section of optional maneuvers.

(b) Up to two optional maneuvers may be graded F/3 where G/4 is required without requiring an overall unsatisfactory.

(c) The entire event should be devoted to assessing the TP's ability and readiness to progress to the next stage of training. All maneuvers indicated with a plus (+) are check ride critical and must be accomplished to MIF.

(d) The TP should be able to demonstrate required levels of proficiency without instructor assistance. However, instruction is allowed on check rides, and TPs may reattempt maneuvers at the SI's discretion.

(2) Incomplete Check Ride. The check ride shall be incomplete when:

(a) Any critical (+) item was not flown, or

(b) The SI was unable to sample sufficient examples of a given maneuver to assess the TP's overall performance.

NOTE: The subsequent flight need only include maneuvers required to complete the check.

(c) EXCEPTIONS. The check is complete and the overall grade is unsatisfactory if:

1. Any critical item is below MIF, or

2. More than two noncritical items were graded F/3 where G/4 is required, or

3. Any maneuver is U/2.

6. Special Instructions and Restrictions

a. Flight Hour/Event Requirements and Restrictions

(1) Programmed Hours and Events. Syllabus-programmed flight hours are listed on pages x – xiii. Event lengths, SXX86, 87, 88, and 89 events will cause variation. Accomplish all syllabus events.

(2) Minimum Solo Hours. 5.0 hours required for HT TPs.

(3) Maximum Daily TP Activities (Aircraft, Simulator, or Academic). TPs shall not exceed two graded activities during one duty day. An exception is made for TPs completing cross-country navigation flights. For airways and day/night navigation events, TPs may complete three graded activities as long as they do not exceed 6.5 flight hours. These events may be completed in a round robin cross-country event that originates and terminates after three legs at the same field.

(4) Minimum TP Turn-Times. There is no minimum TP turn time between events. This is to ensure maximum flexibility for scheduling TPs. However, the IP will ensure that sufficient time is allocated towards debriefing TPs on all events completed on the event.

(5) Crew Day. The period from the beginning of the TP's first event or official duty of the day until the completion of the last event of the day, including associated debrief and paperwork. Crew day shall not exceed 12 hours. Maximum TP crew day for cross-country flights is 12 hours provided total flight time for IPs does not exceed 8 hours and TP flight time does not exceed 6.5 hours.

(6) Crew Rest. The period from the end of one crew day until the start of the next shall be no less than 12 hours for TPs. After six consecutive scheduled days, TPs shall receive one day off.

(7) Pre-Maneuver Requirements. The TP shall not perform a maneuver for the first time until the IP discusses, briefs, or demonstrates the maneuver, unless previous training adequately fulfills this role.

(8) TP Flights. All TP flights will be conducted in accordance with the current TH-57 NATOPS, FTI, and local SOP. No deviations from standard maneuvers are authorized except in cases of emergency.

(a) Completion of C4390 meets the NATOPS qualification requirements for the TH-57 aircraft. Since HT TPs are not yet helicopter pilots, the PQM designation is not awarded until after syllabus completion.

(b) Completion of I4490 meets the OPNAV 3710.7T Instrument Rating requirements.

b. Solo Restrictions

(1) Documentation. The ATF for the event preceding the C4401 solo event must include "Safe for Solo" or "Unsafe for Solo" in the general comments section. Once the TP has been cleared "Safe for Solo," the TP is considered cleared for all future solo flights. The I4201 and N4101 solo events do not require a "Safe for Solo" comment on preceding flights.

(2) Solo Not Permitted. The TP may not fly the C4401 solo unless the preceding ATF states "Safe for Solo."

(3) Brief. The Flight/Operations Duty Officer shall brief the solo TP. The flight briefing must cover mission profile, objectives, and contingencies.

(4) Prohibited Maneuvers. For the C4401 contact solo, the following maneuvers are prohibited: sliding landings, full autorotation, simulated engine failures, boost-off flight, simulated tail-rotor malfunctions, no-hover landings, simulated emergency procedures, max load takeoffs, low Nr recoveries, and simulated engine failures on takeoff.

c. Aircraft/Simulator Interchangeability. Simulator events may be substituted in the aircraft when the simulator is unavailable for extended periods of time.

d. Boost-Off Approaches. Boost-off approaches will not be flown to a running/no-hover landing unless a paved surface (runway) is available.

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Chapter II

Ground Training

NOTE: Block numbering of Ground Training events matches the student syllabus or the IUT syllabus except where noted. The listing is not numerically sequential, in order to preserve numerical commonality with the student syllabus while presenting the training events in the order they are typically completed.

Block	Media	Title	Events	Hrs	Stage
G01	Sqdn/ Issue	Indoctrination	2	2.5	ASI

1. Events

G0101	Sqdn	Check-In	2.0
G0102	Issue	Training Publications Issue	0.5

2. Syllabus Notes. Complete G0101 prior to G0102.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
G02	Lecture/ Pool	Helicopter Aircrew Breathing Device	1	4.0	ASI

1. Events

G0201	Lect/ Pool	HABD Training	4.0

2. Syllabus Notes

a. G0201 completed as applicable per directive (OPNAVINST 3710.7T).

b. Complete G0102 prior to this event.

c. This event is waived if TP is already current.

d. Conduct during Aviation Water Survival at NAS Pensacola.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
G03	MIL	Safety	1	1.0	ASI

1. Events

G0301	MIL	Aviation Safety	1.0

2. Syllabus Notes

   a. HT flow only.

   b. Complete G0102 prior to this event.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
C01	CAI/MIL/ Test	Systems 'B'	8	9.5	SYS

1. Events

C0101	CAI	Power Plant	0.5
C0102	CAI	Fuel Supply System	0.5
C0103	CAI	Transmission and Drive Train	0.5
C0104	CAI	Rotor and Flight Control Systems	0.5
C0105	MIL	Allison 250 Turboshaft Engine Fuel Supply System Power Train System	3.0
C0106	CAI	Hydraulic System	0.5
C0107	MIL	Rotor System Hydraulic System 'B' Electrical System	3.0
C0190	CAI Test	Systems Exam	1.0

2. Syllabus Notes

a. HT and NO flows.

b. Complete G0102 prior to this block.

c. Complete C0101-4 in any order prior to C0105.

d. Complete C0106 prior to C0107.

e. Complete C0105 and C0107 prior to C0190.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
C02	CAI/MIL/ Test	Helicopter Aerodynamics	20	25.0	AERO

1. Events

C0201	CAI	The Atmosphere	1.0
C0202	CAI	Rotor Blade Aerodynamics	1.0
C0203	CAI	Powered Flight Analysis	1.0
C0204	CAI	Autorotation	1.0
C0205	CAI	Flight Phenomena	1.0
C0206	MIL	Atmospherics/Overview	1.5
C0207	MIL	Aerodynamic Theories	1.0
C0208	MIL	Rotor System Dynamics	1.0
C0209	MIL	Rotor System Design	0.5
C0210	MIL	Tail Rotor Design and Performance	1.0
C0211	MIL	Stability and Control	1.5
C0212	MIL	Power and Perfomance	1.5
C0213	MIL	Hovering Flight	1.0
C0214	MIL	Forward and Climbing Flight	1.5
C0215	MIL	Descending Flight and Autorotations	1.5
C0216	MIL	Hazards	2.0
C0217	MIL	Aerodynamics Review	2.0
C0290	CAI Test	Aerodynamics Exam	1.0
C0218	MIL	Special Mission Considerations I	2.0
C0219	MIL	Special Mission Considerations II	1.0

2. Syllabus Notes

a. HT flow only.

b. Complete G0102 prior to block.

c. Complete C0201-5 in any order prior to C0206.

d. Complete C0206 prior to C0207-16; C0207-16 can be done in any order prior to C0217.

e. Complete C0217 prior to C0290.

f. Complete C0290 prior to C0218-19; C0218-19 can be done in any order.

g. Complete the Aerodynamics block in accordance with the current syllabus. This includes readings and homework from the Aero textbook.

h. C0290 is not waiverable for helicopter transition pilots. It is required per OPNAVINST 3710.7T Transition Pilot Syllabus minimum requirements.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
C03	MIL	Preflight Procedures 'B'	1	2.0	DCONFP

1. Events

C0301	MIL	Preflight and Cockpit Procedures 'B'	2.0

2. Syllabus Notes

a. HT flow only.

b. Complete G0102 prior to this block.

3. Discuss Items

C0301
Weight and balance computation, aircraft issue, maintenance action forms (MAFs), aircraft interior/exterior inspection and emergency egress procedures, FTI/NATOPS manual use (verify changes posted), local operations, flight schedule, safety/standardization programs, fuel requirements, performance charts, go/no-go criteria, training time out policy, personal and emergency equipment, egress procedures, carbon lock/frozen turbine, NOTAMs, weather briefing.

Block	Media	Title	Events	Hrs	Stage
C04	MIL	Crew Resource Management – Contact	1	1.0	CRM

1. Events

C0401	MIL	Crew Resource Management	1.0

2. Syllabus Notes

a. HT flow only.

b. Complete G0102 prior to this block.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
C05	MIL/ Test	Course Rules Flight Procedures	2	3.0	CR

1. Events

C0501	MIL	Course Rules Flight Procedures	2.0
C0590	CAI Test	Course Rules Exam	1.0

2. Syllabus Notes

a. HT flow only.

b. Complete G0102 prior to C0501.

c. Complete C0501 prior to C0590.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
C06	Exam	NATOPS Examinations	2	6.0	NATOPS

1. Events

C0601	P/P Exam	NATOPS Open Book Exam	3.0
C0690	P/P Exam	NATOPS Closed Book Exam	3.0

2. Syllabus Notes

a. HT and NO flows only.

b. Complete G0102 prior to this block.

c. Obtain C0601 from squadron NATOPS office and complete in five working days prior to C0690.

d. Take C0690 in squadron spaces.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
G04	CAI	Global Positioning System	1	1.0	GPSFP

1. Events

G0401	CAI	Global Positioning System	1.0

2. Syllabus Notes

   a. HT flow only.

   b. Complete G0102 prior to event.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
C07	CAI/MIL	Systems 'C'	3	3.0	SYS

1. Events

C0701	CAI	TH-57C Electrical System	0.5
C0702	CAI	TH-57C Ministab System	0.5
C0703	MIL	TH-57C Helicopter Systems TH—57C Electrical System TH-57C Ministab System TH-57C Avionics	2.0

2. Syllabus Notes

   a. HT flow only.

   b. Complete G0102 prior to C0701-02.

   c. Complete C0701-2 in any order prior to C0703.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
I01	CAI	Basic Instrument Flight Procedures	3	1.5	BIFP

1. Events

I0101	CAI	Departure and Arrival Procedures	0.5
I0102	CAI	Basic Instrument Flight Procedures	0.5
I0103	CAI	Advanced Instrument Flight Procedures	0.5

2. Syllabus Notes

   a. HT flow only.

   b. Complete G0102 prior to this block.

   c. Complete I0101-3 in any order.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
C08	CAI	Emergency Procedures	2	1.5	EMFP

1. Events

C0801	CAI	In-Flight Emergencies	0.75
C0802	CAI	Tail Rotor Emergencies	0.75

2. Syllabus Notes

   a. HT and NO flows only.

   b. Complete G0102 prior to this block.

   c. Complete C0801-2 in any order.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
C09	Sqdn	Contact 'B' Flight Preparation Brief	1	3.0	DCONFP

1. Events

C0901	Sqdn	Contact 'B' Flight Preparation Brief	3.0

2. Syllabus Notes

a. HT flow only.

b. Complete G0201, G0301, C0190, C0290, C0301, C0401, C0501, and C2003 prior to C0901.

c. TP shall complete a weight and balance form during the event and perform a full preflight.

3. Discuss Items

C0901
ORM Checklist, NATOPS brief, weight and balance computation, preflight procedures, emergency egress procedures, helicopter hover height trainer, local training area, flight line operations, hot refueling and maintenance troubleshooting, entering and exiting the rotor arc, VFR integrated scan, trim techniques, height-velocity diagram, OPNAVINST 3710.7(series), NATOPS, TW-5 SOP (RWOP), squadron SOP, aircraft discrepancy book, and TP briefing preparation and standards.

Block	Media	Title	Events	Hrs	Stage
I02	MIL	Crew Resource Management – Instrument	1	2.0	CRM

1. Events

I0201	MIL	Crew Resource Management	2.0

2. Syllabus Notes

   a. HT flow only.

   b. Complete G0102 prior to this event.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
I04	CAI/MIL	Radio Instruments	9	6.0	RIFP

1. Events

I0401	CAI	Introduction to NAVAIDs and RI Flight Procedures	0.4
I0402	CAI	Fundamentals of RI Flight Procedures	0.5
I0403	CAI	TACAN and VOR Approaches	0.4
I0404	CAI	ADF Approaches	0.4
I0405	CAI	VOR/TACAN with Failed Directional Gyro	0.4
I0406	CAI	ADF Procedures with a Failed Directional Gyro	0.4
I0407	CAI	Radar and ILS Approaches	0.5
I0408	MIL	Radio Instrument Flight Procedures	2.0
I0409	CAI	Helicopter Radio Instrument Review	1.0

2. Syllabus Notes

a. HT flow only.

b. Complete G0102 prior to this block.

c. Complete I0401-07 in any order.

d. Complete I0401-07 prior to I0408.

e. Complete I0401-07 prior to I0409.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
N01	Lecture/ Lab	Mission Planning System	2	2.0	VNAVFP

1. Events

N0101	Lect/ Lab	MPS Overview/Lab	2.0

2. Syllabus Notes

   a. HT flow only.

   b. Complete G0102 prior to N0101.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
N02	CAI/MIL	Visual Flight Rules Navigation	3	2.5	VNAVFP

1. Events

N0201	CAI	Day Navigation Flight Procedures	1.0
N0202	CAI	Night Flight Procedures	0.5
N0203	MIL	VFR Navigation Review	1.0

2. Syllabus Notes

   a. HT flow only.

   b. Complete G0102 prior to this block.

   c. Complete N0201-2 in any order prior to N0203.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
T01	CAI	Tactics Flight Procedures	6	1.5	See Below

1. Events

T0101	CAI	Site 8 Course Rules	0.25	CR
T0102	CAI	Santa Rosa Course Rules	0.25	CR
T0103	CAI	Harold Course Rules	0.25	CR
T0104	CAI	Duke Night Course Rules	0.25	CR
T0105	CAI	Confined Area Landing (CAL) and External Load Operations	0.25	TFP
T0106	CAI	Tactical Maneuvers	0.25	TFP

2. Syllabus Notes

   a. Tactics 'B' ATT Only.

   b. Complete G0102 prior to block.

   c. Complete T0101-6 in any order.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
F01	CAI	Formation Procedures	3	3.5	FORMFP

1. Events

F0101	CAI	Formation Flying	0.5
F0102	CAI	NATOPS and Mission Brief	0.5
F0103	MIL	Formation Lecture	2.5

2. Syllabus Notes

   a. Formation ATT only.

   b. Complete G0102 prior to this block.

   c. Complete F0101-2 in any order prior to F0103.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
N03	MIL	Low-Level Navigation	1	2.5	VNAVFP

1. Events

N0301	MIL	Map Interpretation	2.5

2. Syllabus Note.

   a. Low-Level Nav ATT only.

   b. Complete G0102 prior to this event.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
S01	CAI/ Lecture	Shipboard Operations/ Search and Rescue	4	1.0	TFP

1. Events

S0101	CAI	General Shipboard Operations	0.25
S0102	CAI	Shipboard Qualification Procedures	0.25
S0103	CAI	SAR Organization and Planning	0.25
S0104	CAI	SAR Flight Procedures	0.25

2. Syllabus Notes

   a. Tactics 'C' ATT only.

   b. Complete G0102 prior to this block.

   c. Complete S0101-4 in any order.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
V01	CAI/Lab	Night Vision Device Training	2	8.5	NVD

1. Events

V0101	CAI	NVD Training	0.5
V0102	Lab	NVD Lab	8.0

2. Syllabus Notes

a. NVG ATT only.

b. Complete G0102 prior to this block.

c. Complete V0101 prior to V0102.

d. TPs shall bring their NVG modified helmet, one set of NVGs, and their NATOPS jacket to the NVD lab.

e. NVGs will be checked out from the paraloft.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
I05	Lecture/ Exam	Instrument Ground School	2	7.0	IFR

1. Events

I0501	Lect	Instrument Ground School Lecture	5.0
I0590	P/P Exam	Instrument Ground School Exam	2.0

2. Syllabus Notes

a. Instrument Check ATT only.

b. Complete G0102 prior to I0501.

c. Complete I0501 prior to I0590 AND within 60 days of I4490.

d. Complete I0590 prior to AND within 60 days of I4490.

3. Discuss Items. None.

Block	Media	Title	Events	Hrs	Stage
G05	Sqdn	Checkout	1	1.0	ASI

1. Events

G0501	Sqdn	Checkout	1.0

2. Syllabus Notes

a. For HT flow, complete I4201, N4101, C4601, C0218-19, and all assigned ATTs prior to G0501.

b. For NO flow, complete C4390 prior to G0501.

c. For HE flow, complete all assigned events prior to G0501.

3. Discuss Items. None.

Chapter III

Contact Training

1. Matrices. The following matrix is an overview of the entire Contact stage. The purpose of this matrix is to provide the TP and the IP the easiest way to track progress, regression, and overall status in relation to MIF. In addition, there is a single matrix following each block description throughout this chapter.

2. Stage MIF

Simulator Event
Check Ride Event

CONTACT STAGE MANEUVER ITEM FILE										
CTS REF	**MANEUVER**	**C2003**	**C4002**	**C4104**	**C4204**	**C4390**	**C4401**	**C3001**	**C4501**	**C4601**
1	General Knowledge/ Procedures	3+	4+	4+	4+	4+	4	4+	4+	4+
2	Emergency Procedures/ System Failures	3+	3+	4+	4+	4+	4	4+	4+	4+
2	Contact Stage Checklists	3+								
2	RPM Beep Control	3+								
2	Normal Start Procedures	3+								
2	Abnormal Starts	3+								
2	Anti-Ice Operation	3+								
2	Postshutdown Fire/Internal	3+								
2	Emergency Engine Shutdown	3+								
2	Engine Oil System	3+								
2	Transmission Oil System	3+								

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CONTACT STAGE MANEUVER ITEM FILE										
CTS REF	**MANEUVER**	**C2003**	**C4002**	**C4104**	**C4204**	**C4390**	**C4401**	**C3001**	**C4501**	**C4601**
2	Tac/Gen Malfunction	3+								
2	TOT Malfunction	3+								
2	Overtorque/Overtemp/ Overspeed	3+								
2	Torque Malfunction	3+								
2	Smoke and Fume Elimination	3+								
2	Suspected Fuel Leakage	3+								
2	Generator/Electrical	3+								
2	Hydraulic System	3+								
2	Chip Lights	3+								
2	Fuel System Malfunctions	3+								
2	Normal Shutdown Procedures	3+								
2	Engine Overspeed	3+								
2	Engine Underspeed	3+								
2	Compressor Stall	3+								
2	Engine Failure	3+								
2	Engine Restart	3+								
2	Electrical Fire	3+								
2	Main Drive Shaft Failure	3+								

MIF continued on next page.

CONTACT STAGE MANEUVER ITEM FILE										
CTS REF	**MANEUVER**	**C2003**	**C4002**	**C4104**	**C4204**	**C4390**	**C4401**	**C3001**	**C4501**	**C4601**
3	Headwork/Situational Awareness	3+	3+	4+	4+	4+	4	4+	4+	4+
4	Basic Air Work		3+	4+	4+	4+	4		4+	4+
5	Flight Planning		3+	4+	4+	4+	4		4+	4+
7	Ground Operations		3+	4+	4+	4+	4		4+	4+
8	CRM	3+	3+	4+	4+	4+	4	4+	4+	4+
9	Cockpit Management	3+	3+	4+	4+	4+	4		4+	4+
9	COMM/NAV Checklist							3+	4+	
10	Blindfold Cockpit Check	3+						3+		
11	Radio Procedures	3+	3+	4+	4+	4+	4	4+	4+	4+
13	Vertical Takeoff		3+							
14	Simulated Engine Failure on Takeoff				3+	3+				
16	No-Hover Takeoff			3+	4+	4			4+	
18	Transition to Forward Flight		3+	4+	4+	4+	4		4+	4+
20	Course Rules		3+	4+	4+	4+	4		4+	4+
22	Hover		3+							
23	Simulated Loss of Tail Rotor Thrust in Hover				3+	3+				
24	Simulated Fixed Pitch Tail Rotor Malfunction in Hover				3+	3+				
25	Simulated Fixed Pitch Tail Rotor Malfunction in Flight				3+	3+				
26	Turn on the Spot/Clearing Turn		3+							
27	Low Work			4+	4+	4+	4		4+	4+
29	Hover Taxi		3+							

MIF continued on next page.

CONTACT STAGE MANEUVER ITEM FILE										
CTS REF	**MANEUVER**	**C2003**	**C4002**	**C4104**	**C4204**	**C4390**	**C4401**	**C3001**	**C4501**	**C4601**
30	Max Load Takeoff			3+	4+	4			4+	
33	Normal Approach		3+	4+	4+	4+	4		4+	4+
33 39	Normal Approach, Stab-Off Flight								3+	
34	Steep Approach			3+	4+	4+	4		4+	3+
35	Hydraulic Boost-Off Approach			3+	4+	4+			4+	
37	Sliding Landing			3+	4+	4+			4+	
38	No-Hover Landing			3+	4+	4			4+	3+
40	Waveoff (Power On)		4	4+	4+	4+	4		4	4
41	Waveoff (Power Off)		4	4+	4+	4+	4		4	4
42	Power Recovery Autorotations		3+	4+	4+	4+	4		4+	3+
43	Full Autorotation			3+	4+	4+				
44	Low RPM Recovery				3+	3+				
46	Square Patterns		3+							
47	Simulated Engine Failure at Altitude		3+	4+	4+	4+			4+	
48	Simulated Engine Failure in a Hover		3+	4+	4+	4+			4+	
49	Simulated Engine Failure in a Hover Taxi		3+	4+	4+	4+			4+	
50	Quick Stop From a Hover			3+	4+	4				
90	Vertical Landing		3+							
	Special Syllabus Requirements	1	1	1						

Block	Media	Title	Events	Hrs	H/X
C20	2C67	Cockpit Procedures Trainer	3	3.9	1.3

1. Prerequisite. G0102 (Training Publications Issue).

2. Syllabus Notes

a. HT and NO flows only.

a. HT flow complete C2001-C2003.

b. NO flow complete C2003 only.

3. The TP shall perform the following procedures on the indicated event.

C2001
Blindfold cockpit check, cockpit management, radio procedures, ground operations, emergency procedures, Contact Stage checklists and voice reports, RPM beep control, normal start/shutdown procedures, abnormal starts (including engine fire on start), anti-ice operation, postshutdown fire (internal), and emergency engine shutdown.

C2002
Cockpit management, radio procedures, ground operations, emergency procedures, Contact stage checklists and voice reports, normal start procedures, abnormal starts, emergency engine shutdown, engine oil system malfunctions, transmission oil system malfunctions, tach/gen malfunctions, TOT malfunctions, overtorque/overtemp/overspeed, torque malfunctions, generator failure/electrical malfunctions, hydraulic system malfunctions, chip lights, fuel system malfunctions, and postshutdown fire (internal).

C2003
Cockpit management, radio procedures, ground operations, emergency procedures, Contact stage checklists and voice reports, normal start procedures, abnormal starts, overspeed/high N_r, underspeed/low N_r, compressor stall, engine failure, electrical fire, smoke and fume elimination, suspected fuel leakage, main drive shaft failure, engine restart in flight, and normal shutdown procedures.

4. Special Syllabus Requirements

C2001 (HT flow only)
Demonstrate CPT console operation.

5. Discuss Items

C2001
TP responsibilities for block C20; curriculum introduction and general information; cockpit management; radio procedures; use of checklists/voice reports; limitations; cold weather limitations; APU start; location, function, power source, and operation of cockpit gauges, radios, switches, and engine/rotor controls; RPM beep control; use of lights; abnormal starts; postshutdown fire (internal); and CRM (aircraft start and shutdown, flight control check/dual concurrence, ground emergencies).

C2002
Ditching, engine restart in flight, mast bumping, dynamic rollover, vibration identification, rotor blade stall, vortex ring state, and power required exceeds power available.

C2003
In-flight malfunctions, abnormal starts, single instrument indications, caution system, PAN/MAYDAY reports, hydraulic system, sprag clutch malfunctions, main drive shaft failure, autorotation into the trees, and CRM (in-flight emergencies).

6. Block MIF

CTS REF	MANEUVER	C2003
1	General Knowledge/Procedures	3+
2	Emergency Procedures/System Failures	3+
2	Contact Stage Checklists	3+
2	RPM Beep Control	3+
2	Normal Start Procedures	3+
2	Abnormal Starts	3+

MIF continued on next page.

CTS REF	MANEUVER	C2003
2	Anti-Ice Operation	3+
2	Postshutdown Fire/Internal	3+
2	Emergency Engine Shutdown	3+
2	Engine Oil System	3+
2	Transmission Oil System	3+
2	Tac/Gen Malfunction	3+
2	TOT Malfunction	3+
2	Overtorque/Overtemp/Overspeed	3+
2	Torque Malfunction	3+
2	Smoke and Fume Elimination	3+
2	Suspected Fuel Leakage	3+
2	Generator/Electrical	3+
2	Hydraulic System	3+
2	Chip Lights	3+
2	Fuel System Malfunctions	3+
2	Normal Shutdown Procedures	3+
2	Engine Overspeed	3+
2	Engine Underspeed	3+
2	Compressor Stall	3+
2	Engine Failure	3+
2	Engine Restart	3+
2	Electrical Fire	3+
2	Main Drive Shaft Failure	3+
3	Headwork/Situational Awareness	3+
8	CRM	3+
9	Cockpit Management	3+
10	Blindfold Cockpit Check	3+
11	Radio Procedures	3+
	Special Syllabus Requirements	1

Block	Media	Title	Events	Hrs	H/X
C40	TH-57B	Contact 'B'	2	4.0	2.0

1. Prerequisite. C0901 (Contact 'B' Flight Preparation Brief)

2. Syllabus Notes

a. HT flow only.

b. This block should concentrate on BAW, low work maneuvers, landing patterns, and checklist management.

3. Special Syllabus Requirements

C4001
Conduct Emergency Egress Drill.

4. Discuss Items

C4001
Course rules (local training area), abort start, abnormal starts (hot start, hung start, engine fire on start), emergency shutdown, postshutdown fire (internal), takeoff, landing, hover, and hover taxi.

C4002
Flight control system, jammed flight controls, engine fire (external), dynamic rollover, blowback, CRM (in-flight emergencies, simulated emergencies, decision making), and special VFR course rules.

5. Block MIF

CTS REF	MANEUVER	C4002
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	3+
3	Headwork/Situational Awareness	3+
4	Basic Air Work	3+
5	Flight Planning	3+
7	Ground Operations	3+
8	CRM	3+
9	Cockpit Management	3+
11	Radio Procedures	3+
13	Vertical Takeoff	3+
18	Transition to Forward Flight	3+
20	Course Rules	3+
22	Hover	3+
26	Turn on the Spot/Clearing Turn	3+
29	Hover Taxi	3+
33	Normal Approach	3+
40	Waveoff (Power On)	4
41	Waveoff (Power Off)	4
42	Power Recovery Autorotations	3+
46	Square Patterns	3+
47	Simulated Engine Failure at Altitude	3+
48	Simulated Engine Failure in a Hover	3+
49	Simulated Engine Failure in a Hover Taxi	3+
90	Vertical Landing	3+
	Special Syllabus Requirements	1

Block	Media	Title	Events	Hrs	H/X
C41	TH-57B	Contact 'B'	4	8.0	2.0

1. Prerequisites

   a. HT flow prerequisite: C4002.

   b. NO flow prerequisites:

      (1) G0201 (Helicopter Aircrew Breathing Device).

      (2) C0190 (Systems Exam).

      (3) C2003.

   c. HE flow prerequisite: G0201.

2. Syllabus Notes

   a. HT flow complete C4101-C4104.

   b. NO and HE flows complete C4101 and C4102 only.

   c. The purpose of this block is to practice basic pattern maneuvers, emergencies, and autorotations. 90- and 180-degree autorotations should be emphasized.

3. Special Syllabus Requirements

   C4101 (NO and HE flows only)
   Conduct emergency egress drill.

   C4103 (HT flow only)
   Maximum glide autorotation demonstration.

4. Discuss Items

   C4101 (HT flow)
   Electrical system, generator failure, DC load meter and voltmeter, overheated battery, electrical fire, smoke and fume elimination, fuselage fire, and CRM (assertiveness).

C4101 (NO and HE flows)
ORM checklist, NATOPS brief, preflight procedures, emergency egress procedures, local training area, course rules, flight line operations, entering and exiting the rotor arc, trim techniques, flight maneuvers, and CRM, NO or HE course preparation and standards.

C4102 (All flows)
Landing criteria for emergencies, definitions, aircraft limitations (NATOPS chapter 4), caution system and associated responses, single instrument indications, autorotation into the trees, blade element diagram, and autorotative aerodynamics.

C4103
Engine system, engine failures (NATOPS, FTI), engine restart in flight, engine chip clearing procedures, compressor stall, rotor droop, and CRM (communications and mission analysis).

C4104
Hydraulic system, hydraulic system malfunction, hydraulic power cylinder malfunction, mast bumping, and CRM (situational awareness).

5. Block MIF

CTS REF	MANEUVER	C4104
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
5	Flight Planning	4+
7	Ground Operations	4+
8	CRM	4+
9	Cockpit Management	4+
11	Radio Procedures	4+
16	No-Hover Takeoff	3+
18	Transition to Forward Flight	4+
20	Course Rules	4+
27	Low Work	4+
30	Max Load Takeoff	3+
33	Normal Approach	4+
34	Steep Approach	3+
35	Hydraulic Boost-off Approach	3+
37	Sliding Landing	3+
38	No-Hover Landing	3+
40	Waveoff (Power On)	4+
41	Waveoff (Power Off)	4+
42	Power Recovery Autorotations	4+
43	Full Autorotation	3+
47	Simulated Engine Failure at Altitude	4+
48	Simulated Engine Failure in a Hover	4+
49	Simulated Engine Failure in a Hover Taxi	4+
50	Quick Stop From a Hover	3+
	Special Syllabus Requirements	1

Block	Media	Title	Events	Hrs	H/X
C42	TH-57B	Contact 'B'	4	8.0	2.0

1. Prerequisites

    a. HT flow prerequisites:

        (1) C0590 (Course Rules Exam).

        (2) C4104.

    b. NO flow prerequisite: C4102.

2. Syllabus Notes

    a. HT and NO flows only.

    b. HT flow complete C4201-4204.

    c. NO flow complete C4201 only.

    d. The purpose of this block is to continue developing basic pattern work, autorotation skills, and emergency procedures while introducing advanced contact maneuvers.

    e. Flights shall be flown with a Contact Standardization Instructor.

3. Special Syllabus Requirements. None.

4. Discuss Items

    C4201
    Tail rotor malfunctions and failures, loss of tail rotor effectiveness, low RPM (N_r) recovery, simulated engine failure on takeoff.

    C4202
    Transmission system, sprag clutch slippage, sprag clutch seizure, main drive shaft failure, imminent transmission failure, overtorque, icing, ground vortex, simulated engine failure on takeoff, and CRM (adaptability/flexibility).

C4203
Fuel system, fuel boost pump failure, airframe fuel filter, fuel contamination, fuel control failure, suspected fuel leakage, engine fire in flight, engine overspeed (N_f), rotor RPM (N_r), underspeeding N_f/N_r, CRM (leadership).

C4204
Vortex ring state, control feedback, any previously briefed emergency procedure or aircraft limitation, solo guidelines, RWOP/SOP.

5. Block MIF

CTS REF	MANEUVER	C4204
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
5	Flight Planning	4+
7	Ground Operations	4+
8	CRM	4+
9	Cockpit Management	4+
11	Radio Procedures	4+
14	Simulated Engine Failure on Takeoff	3+
16	No-Hover Takeoff	4+
18	Transition to Forward Flight	4+
20	Course Rules	4+
23	Simulated Loss of Tail Rotor Thrust in Hover	3+
24	Simulated Fixed Pitch Tail Rotor Malfunction in Hover	3+
25	Simulated Fixed Pitch Tail Rotor Malfunction in Flight	3+
27	Low Work	4+
30	Max Load Takeoff	4+

MIF continued on next page.

CTS REF	MANEUVER	C4204
33	Normal Approach	4+
34	Steep Approach	4+
35	Hydraulic Boost-off Approach	4+
37	Sliding Landing	4+
38	No-Hover Landing	4+
40	Waveoff (Power On)	4+
41	Waveoff (Power Off)	4+
42	Power Recovery Autorotations	4+
43	Full Autorotation	4+
44	Low RPM Recovery	3+
47	Simulated Engine Failure at Altitude	4+
48	Simulated Engine Failure in a Hover	4+
49	Simulated Engine Failure in a Hover Taxi	4+
50	Quick Stop From a Hover	4+

Block	Media	Title	Events	Hrs	H/X
C43	TH-57B	NATOPS Check Ride	1	2.0	2.0

1. Prerequisites

a. HT flow prerequisites:

(1) C0690 (NATOPS closed book exam).

(2) C4204.

b. NO flow prerequisites:

(1) C0690.

(2) I3101.

(2) I4102.

2. Syllabus Notes

a. HT and NO flows only.

b. C4390 shall be flown with a qualified NATOPS instructor (NI or ANI).

c. For the HT flow, this flight also serves as a safe-for-solo check ride. Emphasize the maneuvers that the TP will fly on the solo flight.

3. Special Syllabus Requirements. None.

4. Discuss Items

C4390
Any previously briefed emergency procedure or aircraft limitation, and aircraft system, and course rules.

5. Block MIF

CTS REF	MANEUVER	C4390
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
5	Flight Planning	4+
7	Ground Operations	4+
8	CRM	4+
9	Cockpit Management	4+
11	Radio Procedures	4+
14	Simulated Engine Failure on Takeoff	3+
16	No-Hover Takeoff	4
18	Transition to Forward Flight	4+
20	Course Rules	4+
23	Simulated Loss of Tail Rotor Thrust in Hover	3+
24	Simulated Fixed Pitch Tail Rotor Malfunction in Hover	3+
25	Simulated Fixed Pitch Tail Rotor Malfunction in Flight	3+
27	Low Work	4+
30	Max Load Takeoff	4
33	Normal Approach	4+
34	Steep Approach	4+
35	Hydraulic Boost-off Approach	4+
37	Sliding Landing	4+
38	No-Hover Landing	4
40	Waveoff (Power On)	4+
41	Waveoff (Power Off)	4+
42	Power Recovery Autorotations	4+

MIF continued on next page.

CTS REF	MANEUVER	C4390
43	Full Autorotation	4+
44	Low RPM Recovery	3+
47	Simulated Engine Failure at Altitude	4+
48	Simulated Engine Failure in a Hover	4+
49	Simulated Engine Failure in a Hover Taxi	4+
50	Quick Stop From a Hover	4

Block	Media	Title	Events	Hrs	H/X
C44	TH-57B	Contact 'B' Solo	1	1.7	1.7

1. Prerequisite. C4390.

2. Syllabus Notes

a. HT flow only.

b. C4401 is not waiverable for helicopter transition pilots. It is required per OPNAVINST 3710.7T Transition Pilot Syllabus minimum solo hour requirements.

c. TPs shall make every attempt to fly C4401 to meet H/X flight time.

d. Flight shall be flown with an observer. The observer may be a C4390-complete TP, an IUT, or a PQM.

3. Special Syllabus Requirements. None.

4. Discuss Items

C4401
CRM, maneuver procedures and techniques, conduct of flight, and specific crew duties.

5. Block MIF

CTS REF	MANEUVER	C4401
1	General Knowledge/Procedures	4
2	Emergency Procedures/System Failures	4
3	Headwork/Situational Awareness	4
4	Basic Air Work	4
5	Flight Planning	4
7	Ground Operations	4
8	CRM	4
9	Cockpit Management	4
11	Radio Procedures	4
18	Transition to Forward Flight	4
20	Course Rules	4
27	Low Work	4
33	Normal Approach	4
34	Steep Approach	4
40	Waveoff (Power On)	4
41	Waveoff (Power Off)	4
42	Power Recovery Autorotations	4

Block	Media	Title	Events	Hrs	H/X
C30	2B42	Contact Simulator 'C' Model Transition	1	1.3	1.3

1. Prerequisite. C4390.

2. Syllabus Notes

a. HT flow only.

b. The purpose of this block is to introduce the TP to the 'C' model aircraft and the differences in cockpit configuration.

c. All TH-57C ground checklists and voice reports will be accomplished with special emphasis on the COMM/NAV checklist. TP shall execute a blind cockpit check.

3. Special Syllabus Requirements. None.

4. Discuss Items

C3001
Checklists (prestart, start, instrument takeoff (ITO), shutdown, hot refuel, hot seat), COMM/NAV checklist, and cockpit crew coordination brief.

5. Block MIF

CTS REF	MANEUVER	C3001
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
8	CRM	4+
9	COMM/NAV Checklist	3+
10	Blindfold Cockpit Check	3+
11	Radio Procedures	4+

Block	Media	Title	Events	Hrs	H/X
C45	TH-57C	Contact 'C' Model Transition	1	1.5	1.5

1. Prerequisites

    a. HT flow prerequisites:

        (1) G0401 (Global Positioning System).

        (2) C0703 (Systems 'C' MIL).

        (3) C3001.

        (4) C4401.

    b. NO flow prerequisite: C4201.

2. Syllabus Notes

    a. HT and NO flows only.

    b. Emphasize checklists and new requirements during preflight, start, operation, emergencies, and shutdown.

    c. Accomplish all TH-57 ground checklists and voice reports with special emphasis on the COMM/NAV checklist.

    d. Emphasize 90-/180-degree autorotations.

3. Special Syllabus Requirements. None.

4. Discuss Items

    C4501
    Cockpit management (COMM/NAV checklist), ministab flight control system 'C', TH-57C electrical system/malfunctions, flight maneuvers in the TH-57C, and preflight differences between 'C' and 'B' model aircraft.

5. Block MIF

CTS REF	MANEUVER	C4501
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
5	Flight Planning	4+
7	Ground Operations	4+
8	CRM	4+
9	Cockpit Management	4+
9	COMM/NAV Checklist	4+
11	Radio Procedures	4+
16	No-Hover Takeoff	4+
18	Transition to Forward Flight	4+
20	Course Rules	4+
27	Low Work	4+
30	Max Load Takeoff	4+
33	Normal Approach	4+
33 39	Normal Approach, Stab-off Flight	3+
34	Steep Approach	4+
35	Hydraulic Boost-off Approach	4+
37	Sliding Landing	4+
38	No-Hover Landing	4+
40	Waveoff (Power On)	4
41	Waveoff (Power Off)	4
42	Power Recovery Autorotations	4+
47	Simulated Engine Failure at Altitude	4+
48	Simulated Engine Failure in a Hover	4+
49	Simulated Engine Failure in a Hover Taxi	4+

Block	Media	Title	Events	Hrs	H/X
C46	TH-57C	Night Contact 'C'	1	1.5	1.5

1. Prerequisite. C4501.

2. Syllabus Notes

a. HT flow only.

b. The purpose of this block is to develop air work skills during basic maneuvers and autorotation in the TH-57C model aircraft at night.

c. Perform only 90-degree or straight-in power recovery autorotations in this block.

3. Special Syllabus Requirements. None.

4. Discuss Items

C4601
Dark adaptation, landing site evaluation at night, night hover scan, vertigo, night course rules, emergency procedures at night, engine failures at night, and landing zone lighting.

5. Block MIF

CTS REF	MANEUVER	C4601
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
5	Flight Planning	4+
7	Ground Operations	4+
8	CRM	4+
9	Cockpit Management	4+
11	Radio Procedures	4+
18	Transition to Forward Flight	4+
20	Course Rules	4+
27	Low Work	4+
33	Normal Approach	4+
34	Steep Approach	3+
38	No-Hover Landing	3+
40	Waveoff (Power On)	4
41	Waveoff (Power Off)	4
42	Power Recovery Autorotations	3+

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Chapter IV

Instrument Training

1. Matrices. The following matrix is an overview of the entire Instrument stage. The purpose of this matrix is to provide the TP and the IP the easiest way to track progress, regression, and overall status in relation to MIF. In addition, there is a single matrix following each block description throughout this chapter.

2. Stage MIF

Simulator Event
Check Ride Event

INSTRUMENT STAGE MANEUVER ITEM FILE									
CTS REF	**MANEUVER**	**I3002**	**I4002**	**I3101**	**I3202**	**I4102**	**I4201**	**I4301**	**I4490**
1	General Knowledge/ Procedures	4+	4+	4+	4+	4+	4	4+	4+
2	Emergency Procedures/ System Failures	4+	4+	3+	4+	4+	4	4+	4+
2	Abnormal Starts			3+					
2	Engine Overspeed			3+					
2	Engine Underspeed			3+					
2	Sprag Clutch Slippage			3+					
2	Main Driveshaft Failure			3+					
2	Hydraulic System Failure			3+					
2	Hydraulic Power Cylinder Malfunction			3+					
2	Engine Failure			3+					
2	Engine Restart			3+					
2	Compressor Stall			3+					

MIF continued on next page.

INSTRUMENT STAGE MANEUVER ITEM FILE									
CTS REF	**MANEUVER**	**I3002**	**I4002**	**I3101**	**I3202**	**I4102**	**I4201**	**I4301**	**I4490**
2	Torquemeter Malfunction			3+					
2	Loss of Tail Rotor Thrust			3+					
2	Vibration Analysis			3+					
2	Tac/Gen Failure			3+					
3	Headwork/Situational Awareness	4+	4+	4+	4+	4+	4	4+	4+
4	Basic Air Work	3+	4+	3+	4+	4+	4	4+	4+
4	Straight and Level	3+	4+						
4	Level Standard Rate Turns	3+	4+						
4	Standard Rate Climbs and Descents	3+							
5	Flight Planning		4+			4+	4	4+	4+
7	Ground Operations					4+	4		
7	Preflight/Postflight					4+	4		
7 21	Filing/Closing Flight Plans					4+	4		
8	CRM	4+	4+	4+	4+	4+	4	4+	4+
8	Copilot Duties					4+			
9	Cockpit Management	3+	3+	4+	4+	4+	4	4+	4+
9	Instrument Checklist	4+	4+			4+	4	4+	4+
9	Level-Off Checklist	4+	4+			4+	4	4+	4+
11	Radio Procedures	4	4+	3+	4+	4+	4	4+	4+
15	Instrument Takeoff	3+	4+						
18	Transition to Forward Flight					4+		4+	4+
19	Departure Procedures	4	4+			4+	4	4+	4+
21	Groundspeed/Fuel Checks					4+	4	4+	4+
21	Use of Flight Watch/Metro/ FSS					4+	4		
21	Enroute Procedures					4+	4	4+	4+

MIF continued on next page.

INSTRUMENT STAGE MANEUVER ITEM FILE									
CTS REF	**MANEUVER**	**I3002**	**I4002**	**I3101**	**I3202**	**I4102**	**I4201**	**I4301**	**I4490**
21	Enroute Nav/Fuel Consumption Checks					4+	4	4+	4+
21	Tracking				4+				
39	Stab-Off Flight		4+						
39	Stab-Off Flight (Partial Panel)		4+						
51	LSC	3+	4+						
52	Vertical S-1 Pattern	3+	4+						
53	Turn Pattern	3+	4+						
54	Oscar Pattern	3+	4+						
56	Unusual Attitude Recovery (Full Panel)	3+	4+						
56 59	Unusual Attitude Recovery (Partial Panel)		4+						
57	Instrument Autorotation	3+	3+	3+					
58	Magnetic Compass Turns	3+	4+						
59	Partial Panel Air Work	3+	4+						
60	TACAN Point-to-Point Navigation		4		4+	4	4	4	4
61	Terminal Procedures		4			4+	4	4+	4+
61	Option Approach					4	4	4	4
62	TACAN/VOR/NDB Approach	3+	4+		4+	4+	4	4	4
62	Localizer Approach				4+	4	4	4	4
62	ASR Approach				4+	4	4	4	4
62	RNAV/GPS Approach				4+	4+	4	4	4
63	PAR Approach				4+	4+	4	4	4
63	ILS Approach				4+	4+	4	4	4
64	Holding				4+	4+	4	4	4
65	Missed Approach				4+	4	4	4	4
	Special Syllabus Requirements		1						

Block	Media	Title	Events	Hrs	H/X
I30	2B42	Basic Instruments	2	2.6	1.3

1. Prerequisites

a. C4501.

b. I0101-3 (Basic Instrument Flight Procedures).

2. Syllabus Notes

a. HT flow only.

b. TPs shall fly a minimum of two instrument takeoffs, two departures, and one approach.

c. Practice COMM/NAV checklist items.

3. Special Syllabus Requirements. None.

4. Discuss Items

I3001
Attitude instrument flight/trim/scan, approximate power settings, AFCS/force trim, CRM, ITO checklist, and level-off checklist.

I3002
VOR receiver checks (airborne, ground, dual NAV), magnetic compass turns, electrical fire during IMC flight, engine fire during IMC flight, fuselage fire during IMC flight, and pitot-static instruments/failure.

5. Block MIF

CTS REF	MANEUVER	I3002
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	3+
4	Straight and Level	3+
4	Level Standard Rate Turns	3+
4	Standard-Rate Climbs and Descents	3+
8	CRM	4+
9	Cockpit Management	3+
9	Instrument Checklist	4+
9	Level-Off Checklist	4+
11	Radio Procedures	4
15	Instrument Takeoff	3+
19	Departure Procedures	4
51	LSC	3+
52	Vertical S-1 Pattern	3+
53	Turn Pattern	3+
54	Oscar Pattern	3+
56	Unusual Attitude Recovery (Full Panel)	3+
57	Instrument Autorotation	3+
58	Magnetic Compass Turns	3+
59	Partial Panel Air Work	3+
62	TACAN/VOR/NDB Approach	3+

Block	Media	Title	Events	Hrs	H/X
I40	TH-57C	Basic Instruments	2	3.4	1.7

1. Prerequisite. I3002.

2. Syllabus Notes

a. HT flow only.

b. TPs shall fly a minimum of three ITOs on I4001.

c. The TP should perform BI maneuvers while wearing a vision-restricting device.

3. Special Syllabus Requirements

I4001
IP will demonstrate a TACAN/VOR-DME approach as well as proper use of crew coordination.

4. Discuss Items

I4001
Attitude instrument flight/trim/scan, approach brief, CRM (instrument approach responsibilities PNAC), publications carried on instrument flights), ministab operation, Weather requirements for BI flights, NDZ "on top" weather briefing, vertigo parameters, and preparing for an instrument approach.

I4002
Required equipment for IMC flight, lost communications – NDZ on top, airspeed limits, standby generator minimum airspeed, altimeter error, attitude gyro malfunction (IMC), standby battery, turbulence penetration, and backup NAVAIDs.

5. Block MIF

CTS REF	MANEUVER	I4002
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
5	Straight and Level	4+
5	Level Standard-Rate-Turns	4+
5	Flight Planning	4+
8	CRM	4+
9	Cockpit Management	3+
9	Instrument Checklist	4+
9	Level-Off Checklist	4+
11	Radio Procedures	4+
15	Instrument Takeoff	4+
19	Departure Procedures	4+
39	Stab-Off Flight	4+
39	Stab-Off Flight (Partial Panel)	4+
51	LSC	4+
52	Vertical S-1 Pattern	4+
53	Turn Pattern	4+
54	Oscar Pattern	4+
56	Unusual Attitude Recovery (Full Panel)	4+
56 59	Unusual Attitude Recovery (Partial Panel)	4+
57	Instrument Autorotation	3+
58	Magnetic Compass Turns	4+
59	Partial Panel Air Work	4+
60	TACAN Point-to-Point Navigation	4
61	Terminal Procedures	4
62	TACAN/VOR/NDB Approach	4+
	Special Syllabus Requirements	1

Block	Media	Title	Events	Hrs	H/X
I31	2B42/ 2B42A	Emergency Procedures	1	1.3	1.3

1. Prerequisites

a. HT flow requirements:

(1) C0801 (In-Flight Emergencies).

(2) C0802 (Tail Rotor Emergencies).

(3) I0201 (Instrument CRM).

(1) I4002.

b. NO flow requirements:

(1) C0801.

(2) C0802.

(3) C4201.

2. Syllabus Notes

a. HT and NO flows only.

b. Execute the following emergency procedures: abnormal starts, engine overspeed (N_f) rotor RPM (N_r), underspeeding N_f or N_g (low N_r), sprag clutch slippage, main drive shaft failure, hydraulic system failure, hydraulic power cylinder malfunction, engine failure, engine restart in flight, compressor stall, torquemeter malfunction, loss of tail rotor thrust in flight, vibration analysis, and tachometer generator failures.

3. Special Syllabus Requirements. None.

4. Discuss Items

I3101
Land as soon as possible, land as soon as practicable, emergency reports, single instrument indications, in-flight malfunctions when IMC, crew coordination during emergencies, and the Radio Instrument stage.

5. Block MIF

CTS REF	MANEUVER	I3101
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	3+
2	Abnormal Starts	3+
2	Engine Overspeed	3+
2	Engine Underspeed	3+
2	Sprag Clutch Slippage	3+
2	Main Driveshaft Failure	3+
2	Hydraulic System Failure	3+
2	Hydraulic Power Cylinder Malfunction	3+
2	Engine Failure	3+
2	Engine Restart	3+
2	Compressor Stall	3+
2	Torquemeter Malfunction	3+
2	Loss of Tail Rotor Thrust	3+
2	Vibration Analysis	3+
2	Tac/Gen Failure	3+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	3+
8	CRM	4+
9	Cockpit Management	4+
11	Radio Procedures	3+
57	Instrument Autorotation	3+

Block	Media	Title	Events	Hrs	H/X
I32	2B42/ 2B42A	Radio Instruments	2	2.6	1.3

1. Prerequisites

a. I3101.

b. I0408 (Radio Instrument Flight Procedures).

c. I0409 (Helicopter Radio Instrument Review).

2. Syllabus Notes

a. HT flow only.

b. The purpose of this block is to build familiarity with conducting instrument approaches in a helicopter.

3. Special Syllabus Requirements. None.

4. Discuss Items

I3201
TACAN procedures, VOR procedures, ADF procedures, use of CDI and HSI, cockpit setup, cockpit/COMM/NAV organization, required voice reports, instrument autorotation to touchdown, and computing timing from FAF to MAP.

I3202
Localizer procedures, back course localizer procedures, ILS procedures, GCA procedures, GPS procedures, reverse sensing (CDI and HSI), GPS flight plans, GPS approach (OBS/leg, arm/active), overlay approach, and GPS missed approach.

5. Block MIF

CTS REF	MANEUVER	I3202
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
8	CRM	4+
9	Cockpit Management	4+
11	Radio Procedures	4+
21	Tracking	4+
60	TACAN Point-to-Point Navigation	4+
62	TACAN/VOR/NDB Approach	4+
62	Localizer Approach	4+
62	ASR Approach	4+
62	RNAV/GPS Approach	4+
63	PAR Approach	4+
63	ILS Approach	4+
64	Holding	4+
65	Missed Approach	4+

Block	Media	Title	Events	Hrs	H/X
I41	TH-57C	Radio Instruments	2	4.0	2.0

1. Prerequisites

a. HT flow prerequisite: I3202.

b. NO flow prerequisite: C4501.

2. Syllabus Notes

a. HT and NO flows only.

b. Each flight in this block should consist of a minimum of three approaches and holding.

c. For HT flow only, the TP shall call the IP prior to I4102 for route of flight details.

d. For HT flow only, I4102 is intended to leave the local area. It should originate or terminate at an airfield other than South Whiting to the maximum extent possible.

e. For HT flow only, I4102 should be flown in conjunction with N4001 to emphasize cross-country procedures.

f. TPs should not wear a vision-restricting device during RI flights.

3. Special Syllabus Requirements. None.

4. Discuss Items

I4101
TACAN procedures, VOR procedures, NDB procedures, cockpit management - COMM/NAV organization and use of navigation equipment (DME/ADF/HSI/CDI), publications carried on RI flights, NDZ stereotype flight plans, weather requirements for RI flights (RWOP, 3710.7T), approach brief, and required equipment for instrument flight (NATOPS, 3710.7T).

I4102
ILS/localizer procedures, GPS procedures, point-in-space approach, weather sources, weather briefs (DD 175-1), weather briefing system, equipment lost with essential No. 2 bus failure, and emergency operation procedures for audio control panel.

5. Block MIF

CTS REF	MANEUVER	I4102
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
5	Flight Planning	4+
7	Ground Operations	4+
7	Preflight/Postflight	4+
7 21	Filing/Closing Flight Plans	4+
8	CRM	4+
8	Copilot Duties	4+
9	Cockpit Management	4+
9	Instrument Checklist	4+
9	Level-Off Checklist	4+
11	Radio Procedures	4+
18	Transition to Forward Flight	4+
19	Departure Procedures	4+
21	Groundspeed/Fuel Checks	4+
21	Use of Flight Watch/Metro/FSS	4+
21	Enroute Procedures	4+
21	Enroute Nav/Fuel Consumption Checks	4+
60	TACAN Point-to-Point Navigation	4
61	Terminal Procedures	4+

MIF continued on next page.

CTS REF	MANEUVER	I4102
61	Option Approach	4
62	TACAN/VOR/NDB Approach	4+
62	Localizer Approach	4
62	ASR Approach	4
62	RNAV/GPS Approach	4+
63	PAR Approach	4+
63	ILS Approach	4+
64	Holding	4+
65	Missed Approach	4

Block	Media	Title	Events	Hrs	H/X
I42	TH-57C	Instrument Navigation Solo	1	2.0	2.0

1. Prerequisite. I4102.

2. Syllabus Notes

a. HT flow only.

b. This flight should be flown in conjunction with N4101 to the maximum extent possible.

c. Flight shall be flown to a destination greater than 50 NM straight-line distance. Aircraft shall be shut down.

d. I4201 is not waiverable for helicopter transition pilots. It is required per OPNAVINST 3710.7T Transition Pilot Syllabus minimum solo hour requirements.

e. TPs shall make every attempt to fly I4201 to meet H/X flight time.

f. Flight shall be flown with an observer. The observer may be a C4390-complete TP, an IUT, a current syllabus-complete SNA (completer), a current recently winged Naval Aviator (winger), or a PQM.

g. Brief the Instrument Navigation solo with the Operations Duty Officer.

3. Special Syllabus Requirements. None.

4. Discuss Items. None.

5. Block MIF

CTS REF	MANEUVER	I4201
1	General Knowledge/Procedures	4
2	Emergency Procedures/System Failures	4
3	Headwork/Situational Awareness	4
4	Basic Air Work	4
5	Flight Planning	4
7	Ground Operations	4
7	Preflight/Postflight	4
7	Filing/Closing Flight Plans	4
8	CRM	4
9	Cockpit Management	4
9	Instrument Checklist	4
9	Level-Off Checklist	4
11	Radio Procedures	4
19	Departure Procedures	4
21	Groundspeed/Fuel Checks	4
21	Use of Flight Watch/Metro/FSS	4
21	Enroute Procedures	4
21	Enroute Nav/Fuel Consumption Checks	4
60	TACAN Point-to-Point Navigation	4
61	Terminal Procedures	4
61	Option Approach	4
62	TACAN/VOR/NDB Approach	4
62	Localizer Approach	4
62	ASR Approach	4
62	RNAV/GPS Approach	4
63	PAR Approach	4
63	ILS Approach	4
64	Holding	4
65	Missed Approach	4

Block	Media	Title	Events	Hrs	H/X
I43	TH-57C	Radio Instruments	1	2.0	2.0

1. Prerequisite. I4102.

2. Syllabus Notes

a. Instrument Check ATT only.

b. The purpose of this flight is to give the TP the opportunity to complete enough instrument approaches to satisfy OPNAV 3710.7T instrument check minimums.

3. Special Syllabus Requirements. None.

4. Discuss Items

I4301
Altitude restrictions when cleared for the approach, takeoff/approach/landing minimums (RWOP/3710.7T), precision minima, HAA/HAT/HAL, criteria for continuing an instrument approach to landing, lost communication procedures on an IFR flight plan, and sidestep maneuver.

5. Block MIF

CTS REF	MANEUVER	I4301
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
5	Flight Planning	4+
8	CRM	4+
9	Cockpit Management	4+
9	Instrument Checklist	4+
9	Level-Off Checklist	4+
11	Radio Procedures	4+
18	Transition to Forward Flight	4+
19	Departure Procedures	4+
21	Groundspeed/Fuel Checks	4+
21	Enroute Procedures	4+
21	Enroute Nav/Fuel Consumption Checks	4+
60	TACAN Point-to-Point Navigation	4
61	Terminal Procedures	4+
61	Option Approach	4
62	TACAN/VOR/NDB Approach	4
62	Localizer Approach	4
62	ASR Approach	4
62	RNAV/GPS Approach	4
63	PAR Approach	4
63	ILS Approach	4
64	Holding	4
65	Missed Approach	4

Block	Media	Title	Events	Hrs	H/X
I44	TH-57C	Instrument Check Ride	1	2.0	2.0

1. Prerequisites

a. I0590 (Instrument Ground School Exam).

b. I4301.

2. Syllabus Notes

a. Instrument Check ATT only.

b. This event will be an evaluation of IFR procedural execution and abilities involving a representative cross section of maneuvers previously presented and/or discussed in the instrument syllabus.

c. Event shall consist of a minimum of two non-precision approaches and one precision approach.

d. The Instrument Ground School Exam (I0590) must be completed no more than sixty (60) days **PRIOR** to flight.

3. Special Syllabus Requirements. None.

4. Discuss Items

I4490
Any previously briefed item in the Instrument stage with a heavy emphasis on FAR/AIM/OPNAVINST 3710.7T knowledge and emergency procedures.

5. Block MIF

CTS REF	MANEUVER	I4490
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
5	Flight Planning	4+
8	CRM	4+
9	Cockpit Management	4+
9	Instrument Checklist	4+
9	Level-Off Checklist	4+
11	Radio Procedures	4+
18	Transition to Forward Flight	4+
19	Departure Procedures	4+
21	Groundspeed/Fuel Checks	4+
21	Enroute Procedures	4+
21	Enroute Nav/Fuel Consumption Checks	4+
60	TACAN Point-to-Point Navigation	4
61	Terminal Procedures	4+
61	Option Approach	4
62	TACAN/VOR/NDB Approach	4
62	Localizer Approach	4
62	ASR Approach	4
62	RNAV/GPS Approach	4
63	PAR Approach	4
63	ILS Approach	4
64	Holding	4
65	Missed Approach	4

Chapter V

Navigation Training

1. Matrices. The following matrix is an overview of the entire Navigation stage. The purpose of this matrix is to provide the TP and the IP the easiest way to track progress, regression, and overall status in relation to MIF. In addition, there is a single matrix following each block description throughout this chapter.

2. Stage MIF

NAVIGATION STAGE MANEUVER ITEM FILE				
CTS REF	**MANEUVER**	**N4001**	**N4101**	**N4202**
1	General Knowledge/Procedures	4+	4	4+
2	Emergency Procedures/System Failures	4+	4	4+
3	Headwork/Situational Awareness	4+	4	4+
4	Basic Air Work	4+	4	4+
5	Flight Planning	4+	4	4+
7	Ground Operations	4+	4	4+
7	Preflight/Postflight	4+	4	
7 21	Filing/Closing Flight Plans	4+	4	
8	CRM	4+	4	4+
9	Cockpit Management	4+	4	4+
11	Radio Procedures	4+	4	4+
13	Vertical Takeoff		4	4+
18	Transition to Forward Flight	4+	4	4+
19	Departure Procedures	4+	4	
21	Enroute Procedures	4+	4	
21 2	Lost Aircraft Procedures	4+		

MIF continued on next page.

NAVIGATION STAGE MANEUVER ITEM FILE				
CTS REF	**MANEUVER**	**N4001**	**N4101**	**N4202**
21	Groundspeed/Fuel Checks	4+	4	4+
21	Use of Flight Watch/Metro/FSS	4+	4	
33	Normal Approach	4+	4	4+
61	Terminal Procedures	4+	4	
74	VFR Navigation	4+	4	
74 1	Flight Rules and Regulations	4+		
74 1	Sectional Symbology	4+		
75	Low-Level Navigation			4+
76	Timing			3+
90	Vertical Landing		4	4+
	Special Syllabus Requirements			1

Block	Media	Title	Events	Hrs	H/X
N40	TH-57C	Day Navigation	1	1.7	1.7

1. Prerequisites

a. C4501.

b. N0203 (VFR Navigation Review).

c. N0101 (MPS Overview/Lab).

2. Syllabus Notes

a. HT flow only.

b. Fly N4001 in conjunction with I4102 to emphasize cross-country procedures.

c. TP shall call the IP before the flight to obtain route for planning purposes.

3. Special Syllabus Requirements. None.

4. Discuss Items

N4001
VFR filing and flight procedures, course rules, CRM, airspace (A,B,C,D,E,G, controlled/uncontrolled, special use, etc.), fuel planning/computation, use of GPS, wake turbulence, air/hover taxi, and airport operations with and without a control tower.

5. Block MIF

CTS REF	MANEUVER	N4001
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
5	Flight Planning	4+
7	Ground Operations	4+
7	Preflight/Postflight	4+
7 21	Filing/Closing Flight Plans	4+
8	CRM	4+
9	Cockpit Management	4+
11	Radio Procedures	4+
18	Transition to Forward Flight	4+
19	Departure Procedures	4+
21	Enroute Procedures	4+
21 2	Lost Aircraft Procedures	4+
21	Groundspeed/Fuel Checks	4+
21	Use of Flight Watch/Metro/FSS	4+
33	Normal Approach	4+
61	Terminal Procedures	4+
74	VFR Navigation	4+
74 1	Flight Rules and Regulations	4+
74 1	Sectional Symbology	4+

Block	Media	Title	Events	Hrs	H/X
N41	TH-57C	Visual Navigation Solo	1	1.7	1.7

1. Prerequisite. N4001.

2. Syllabus Notes

a. HT flow only.

b. This flight should be flown in conjunction with I4201 to the maximum extent possible.

c. Flight shall be flown to a destination greater than 50 NM straight-line distance. Aircraft shall be shut down.

d. N4101 is not waiverable for helicopter transition pilots. It is required per OPNAVINST 3710.7T Transition Pilot Syllabus minimum solo hour requirements.

e. TPs shall make every attempt to fly N4101 to meet H/X flight time.

f. Flight shall be flown with an observer. The observer may be a C4390-complete TP, an IUT, a current syllabus-complete SNA (completer), a current recently winged Naval Aviator (winger), or a PQM.

g. Brief the Visual Navigation solo with the Operations Duty Officer.

3. Special Syllabus Requirements. None.

4. Discuss Items. None.

5. Block MIF

CTS REF	MANEUVER	N4101
1	General Knowledge/Procedures	4
2	Emergency Procedures/System Failures	4
3	Headwork/Situational Awareness	4
4	Basic Air Work	4
5	Flight Planning	4
7	Ground Operations	4
7	Preflight/Postflight	4
7 21	Filing/Closing Flight Plans	4
8	CRM	4
9	Cockpit Management	4
11	Radio Procedures	4
13	Vertical Takeoff	4
18	Transition to Forward Flight	4
19	Departure Procedures	4
21	Enroute Procedures	4
21	Groundspeed/Fuel Checks	4
21	Use of Flight Watch/Metro/FSS	4
33	Normal Approach	4
61	Terminal Procedures	4
74	VFR Navigation	4
90	Vertical Landing	4

Block	Media	Title	Events	Hrs	H/X
N42	TH-57C	Low-Level Navigation	2	3.0	1.5

1. Prerequisites

a. C4501.

b. N0301 (Map Interpretation).

c. N0101 (MPS Overview/Lab).

2. Syllabus Notes

a. Low-Level Nav ATT only.

b. Routes shall be flown using 1:250,000 and 1:50,000 charts.

c. Routes shall be planned using 90 knots groundspeed.

d. N4201 shall be flown no lower than 500 feet AGL. N4202 shall be flown no lower than 500 feet AGL on the orange route and no lower than 200 feet AGL on the purple route.

3. Special Syllabus Requirements

N4201
IP shall navigate the first four checkpoints.

4. Discuss Items

N4201 GREEN ROUTE, 1:250,000
CRM for low-level navigation, visual scanning, TERF profiles, pilotage, dead reckoning, timing, use of GPS, checkpoints, hazards, map preparation, map changeover points, route selection, use of barriers, and effects of wind during navigation.

N4202 ORANGE ROUTE, 1:50,000 and PURPLE ROUTE, 1:50,000
Precision navigation using the GPS, crew comfort levels, emergency at low altitude, disorientation procedures, and bingo fuel.

5. Block MIF

CTS REF	MANEUVER	N4202
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
5	Flight Planning	4+
7	Ground Operations	4+
8	CRM	4+
9	Cockpit Management	4+
11	Radio Procedures	4+
13	Vertical Takeoff	4+
18	Transition to Forward Flight	4+
21	Groundspeed/Fuel Checks	4+
33	Normal Approach	4+
75	Low-Level Navigation	4+
76	Timing	3+
90	Vertical Landing	4+
	Special Syllabus Requirements	1

Chapter VI

Formation Training

1. Matrices. The following matrix is an overview of the entire Formation stage. The purpose of this matrix is to provide the TP and the IP the easiest way to track progress, regression, and overall status in relation to MIF. In addition, there is a single matrix following each block description throughout this chapter.

2. Stage MIF

FORMATION STAGE MANEUVER ITEM FILE		
CTS REF	**MANEUVER**	**F4002**
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
6	Formation NATOPS/Mission Brief	4+
8	CRM	4+
9	Cockpit Management	4+
17	Section Takeoffs	3+
66	Crossover	4+
67	Cruise Turns	3+
68	Cruise Climbs and Descents	4+
69	Breakup and Rendezvous	4+
70	Overrun	3+
71	Lead Change	4+
72	Section Cruise	4+
73	Section Landings	3+
82	Section High-Speed Approaches	3+
86	Section Waveoff	3+
	Special Syllabus Requirements	1

Block	Media	Title	Events	Hrs	H/X
F40	TH-57C	Formation	2	3.4	1.7

1. Prerequisites

   a. C4501.

   b. F0103 (Formation Lecture).

2. Syllabus Notes

   a. Formation ATT only.

   b. Emphasize CRM during all flights.

   c. Complete section waveoffs on F4002.

3. Special Syllabus Requirements

   F4001
   Demonstrate section parade and home-field break.

   F4002
   Demonstrate inadvertent IMC and lost communication items.

4. Discuss Items

   F4001
   CRM and inter-aircraft communication, relative motion and radius of turn relationships, Lead and Wing aircraft responsibilities and considerations, cruise position/cruise maneuvers/brevity codes, overtorque, and formation course rules.

   F4002
   Wing awareness/lookout doctrine, down plane procedures.

5. Block MIF

CTS REF	MANEUVER	F4002
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
6	Formation NATOPS/Mission Brief	4+
8	CRM	4+
9	Cockpit Management	4+
17	Section Takeoffs	3+
66	Crossover	4+
67	Cruise Turns	3+
68	Cruise Climbs and Descents	4+
69	Breakup and Rendezvous	4+
70	Overrun	3+
71	Lead Change	4+
72	Section Cruise	4+
73	Section Landings	3+
82	Section High-Speed Approaches	3+
86	Section Waveoff	3+
	Special Syllabus Requirements	1

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Chapter VII

Tactical Training

1. Matrices. The following matrix is an overview of the entire Tactics stage. The purpose of this matrix is to provide the TP and the IP the easiest way to track progress, regression, and overall status in relation to MIF. In addition, there is a single matrix following each block description throughout this chapter.

2. Tactics Stage MIF

TACTICAL STAGE MANEUVER ITEM FILE		
CTS REF	**MANEUVER**	**T4001**
1	General Knowledge/Procedures	4+
2	Emergency Procedures/ System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
8	CRM	4+
9	Cockpit Management	4+
16	No-Hover Takeoff	3+
28	Power Checks	3+
31	Confined Area Operations	3+
32	Pinnacle Operations	3+
33	Normal Approach	4+
34	Steep Approach	4+
36	High-Speed Approach	3+
38	No-Hover Landing	4+
45	External Load Operations	3+
55	Quick Stop	3+
	Special Syllabus Requirements	1

3. Shipboard/SAR Stage MIF

Simulator Event

SHIPBOARD/SAR STAGE MANEUVER ITEM FILE				
CTS REF	**MANEUVER**	**S3002**	**S4001**	**s4101**
1	General Knowledge/Procedures	4+	4+	4+
2	Emergency Procedures/ System Failures	4+	4+	4+
3	Headwork/Situational Awareness	3+	4+	4+
4	Basic Air Work	4+	4+	4+
8	CRM	4+	4+	4+
9	Cockpit Management	4+	4+	4+
12	Shipboard Radio Procedures		3+	3+
77 78 79	LLBI	3+		
80	SAR Patterns/Scenarios	3+		
81	Windline Rescue Pattern	3+		
83	ELVA	3+		
84	Shipboard TACAN/NDB Approach	3+		
85	Field Deck Landing Practice (TO/LDG)		3+	
87	Field Deck Landing Practice Waveoff		3+	
88	Response to LSE		3+	3+
89	Ship Deck Landing Qualification (TO/LDG)			3+

4. Night Vision Device Stage MIF

Simulator Event

NIGHT VISION DEVICE STAGE MANEUVER ITEM FILE			
CTS REF	**MANEUVER**	**V3001**	**V4005**
1	General Knowledge/Procedures	4+	4+
2	Emergency Procedures/ System Failures	4+	4+
3	Headwork/Situational Awareness	4+	4+
4	Basic Air Work	3+	4+
5	Flight Planning	3+	4+
7	Ground Operations	3+	4+
8	CRM	4+	4+
9	Cockpit Management	4+	4+
11	Radio Procedures	3+	4+
13	Vertical Takeoff		4+
16	No-Hover Takeoff		4+
18	Transition to Forward Flight	3+	4+
19	Departure Procedures	3+	4+
22	Hover		4+
26	Turn on the Spot/Clearing Turn		4+
29	Hover Taxi		4+
33	Normal Approach	3+	4+
34	Steep Approach		3+
38	No-Hover Landing		3+
40	Waveoff (Power On)	3	4
61	Terminal Procedures		4+
74	VFR Navigation		4+
90	Vertical Landing		4+
91	NVD Knowledge	3+	4+
92	Goggle/De-goggle Procedures	3+	4+
93	NVD Emergency Procedures	3+	4+
	Special Syllabus Requirements		1

Block	Media	Title	Events	Hrs	H/X
T40	TH-57B	Tactics	1	2.0	2.0

1. Prerequisites

   a. C4401.

   b. T0101-6 (Tactics Flight Procedures).

2. Syllabus Notes

   a. Tactics 'B' ATT only.

   b. Emphasize CRM during flight.

   c. Fly T4001 in TH-57B model aircraft.

3. Special Syllabus Requirements

   T4001
   Demonstrate the high-speed, low-level autorotation.

4. Discuss Items

   T4001
   Dynamic rollover, mast bumping, use of radar altimeter, low-level lookout doctrine, engine failure at high-speed and low-level, power checks, HIGE/HOGE, vortex ring state, waveoffs during CALs/externals, aircrew brief, power required exceeds power available, engine failure with external load, weight and balance, and course rules (Harold).

5. Block MIF

CTS REF	MANEUVER	T4001
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
8	CRM	4+
9	Cockpit Management	4+
16	No-Hover Takeoff	3+
28	Power Checks	3+
31	Confined Area Operations	3+
32	Pinnacle Operations	3+
33	Normal Approach	4+
34	Steep Approach	4+
36	High-Speed Approach	3+
38	No-Hover Landing	4+
45	External Load Operations	3+
55	Quick Stop	3+
	Special Syllabus Requirements	1

Block	Media	Title	Events	Hrs	H/X
S30	2B42A	Shipboard Operations	2	2.6	1.3

1. Prerequisites

a. C4501.

b. S0101-4 (Shipboard Operations/Search and Rescue).

2. Syllabus Notes

a. Tactics 'C' ATT only.

b. TPs should fly the Expanding Square, Creeping Line, Sector Search, and the Windline Rescue pattern on S3001.

c. TPs should fly the TACAN LHA/CV, Air Capable Ship, ELVA, and a SAR pattern with the Windline Rescue on S3002.

d. S30 block events require a visual simulator.

e. These events require a copilot, but the copilot is not graded.

3. Special Syllabus Requirements. None.

4. Discuss Items

S3001
Instrument takeoff, shipboard terminology, SAR patterns, Windline Rescue pattern, low-level scan using radar altimeter, vertigo, and use of GPS during SAR.

S3002
Ship NAVAIDs, Shipboard Aviation Facilities Resume, base recovery course (BRC)/wind direction and speed, radio discipline, and shipboard instrument approaches.

5. Block MIF

CTS REF	MANEUVER	S3002
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	3+
4	Basic Air Work	4+
8	CRM	4+
9	Cockpit Management	4+
77 78 79	LLBI	3+
80	SAR Patterns/Scenarios	3+
81	Windline Rescue Pattern	3+
83	ELVA	3+
84	Shipboard TACAN/NDB Approach	3+

Block	Media	Title	Events	Hrs	H/X
S40	TH-57C	Field Deck Landing Practice	1	0.5	0.5

1. Prerequisites

   a. C4501.

   b. S3002.

2. Syllabus Notes

   a. Tactics 'C' ATT only.

   b. Schedule S4001 with S4101.

   c. Complete FDLP requirements IAW TH-57 NATOPS.

3. Special Syllabus Requirements. None.

4. Discuss Items

   S4001
   Field deck landing practice (FDLP) pattern and airspeeds, LSE signals, shipboard terminology/signals, lost communication procedures, Naval Warfare Publication (NWP) 3-04.1, course rules-Santa Rosa/Spencer.

5. Block MIF

CTS REF	MANEUVER	S4001
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
8	CRM	4+
9	Cockpit Management	4+
12	Shipboard Radio Procedures	3+
85	Field Deck Landing Practice (TO/LDG)	3+
87	Field Deck Landing Practice Waveoff	3+
88	Response to LSE	3+

Block	Media	Title	Events	Hrs	H/X
S41	TH-57C	Ship Deck Landing Practice	1	0.5	0.5

1. Prerequisite. S4001.

2. Syllabus Notes

   a. Tactics 'C' ATT only.

   b. Schedule S4101 with S4001.

3. Special Syllabus Requirements. None.

4. Discuss Items

   S4101
   Ship's communication, NAVAID frequencies and identification, HOSTAC, Shipboard Aviation Facilities Resume, CHARLIE and DELTA patterns, overhead time, deck spotting, ship's heading (Foxtrot Corpen) and base recovery course (BRC), wind direction and speed, and radio discipline.

5. Block MIF

CTS REF	MANEUVER	S4101
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
8	CRM	4+
9	Cockpit Management	4+
12	Shipboard Radio Procedures	3+
88	Response to LSE	3+
89	Ship Deck Landing Qualification (TO/LDG)	3+

Block	Media	Title	Events	Hrs	H/X
V30	2B42/ 2B42A	Night Vision Device Simulator	1	1.3	1.3

1. Prerequisites

a. C4601.

b. V0102 (Night Vision Device Lab).

2. Syllabus Note

a. NVG ATT only.

b. Focus should be on goggle/de-goggle procedures and familiarization with basic scan and BAW while on night vision devices.

c. Due to lack of visual cues in the simulator, low work will not be graded.

d. TP shall check out a pair of NVGs from the paraloft and bring them to the brief, along with an NVG-configured helmet.

3. Special Syllabus Requirements. None.

4. Discuss Items

V3001
NVG preflight, NVG adjustment and assessment procedures, goggle/de-goggle procedures, NVG failures, and NVG scan pattern.

5. Block MIF

CTS REF	MANEUVER	V3001
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	3+
5	Flight Planning	3+
7	Ground Operations	3+
8	CRM	4+
9	Cockpit Management	4+
11	Radio Procedures	3+
18	Transition to Forward Flight	3+
19	Departure Procedures	3+
33	Normal Approach	3+
40	Waveoff (Power On)	3
91	NVD Knowledge	3+
92	Goggle/De-goggle Procedures	3+
93	NVD Emergency Procedures	3+

Block	Media	Title	Events	Hrs	H/X
V40	TH-57C	Night Vision Device Flight	5	8.5	1.7

1. Prerequisite. V3001.

2. Syllabus Note

a. NVG ATT only.

b. This block is broken down into two phases. The first two flights should concentrate on basic familiarization maneuvers using NVGs. The last three flights should concentrate on navigation routes and procedures while using NVGs.

c. TP shall check out a pair of NVGs from the paraloft and bring them to the brief along with an NVG-configured helmet.

d. TP shall contact instructor prior to V4003-5 flights for navigation route.

3. Special Syllabus Requirements

V4001
Power recovery autorotations shall be demonstrated by the instructor during this block.

4. Discuss Items

V4001
NVG preflight, NVG adjustment and assessment procedures, ANV-20/20 (Hoffman Box), goggle/de-goggle procedures, NVG failures, NVG maneuvers, NVG scan patterns, NVG crew coordination, RWOP NVG procedures, SLAP, and NVG brief.

V4002
Night vision goggles and accessories, NVG performance factors, aircraft NVG compatibility, emergency and safety considerations, and engine failure at night.

V4003
NVG scene interpretation/descriptions, terrain assessment, atmospheric impact on NVG performance, low light level

considerations, NVG navigation, route/checkpoint selection, and NVG map preparation.

V4004
NVG human factors, visual performance, fatigue, complacency/overconfidence, and Flight Operations with NVDs (OPNAV).

V4005
Any previously discussed item and tactical application of NVDs.

5. Block MIF

CTS REF	MANEUVER	V4005
1	General Knowledge/Procedures	4+
2	Emergency Procedures/System Failures	4+
3	Headwork/Situational Awareness	4+
4	Basic Air Work	4+
5	Flight Planning	4+
7	Ground Operations	4+
8	CRM	4+
9	Cockpit Management	4+
11	Radio Procedures	4+
13	Vertical Takeoff	4+
16	No-Hover Takeoff	4+
18	Transition to Forward Flight	4+
19	Departure Procedures	4+
22	Hover	4+
26	Turn on the Spot/Clearing Turn	4+
29	Hover Taxi	4+
33	Normal Approach	4+
34	Steep Approach	3+

MIF continued on next page.

CTS REF	MANEUVER	V4005
38	No-Hover Landing	3+
40	Waveoff (Power On)	4
61	Terminal Procedures	4+
74	VFR Navigation	4+
90	Vertical Landing	4+
91	NVD Knowledge	4+
92	Goggle/De-goggle Procedures	4+
93	NVD Emergency Procedures	4+
	Special Syllabus Requirements	1

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Chapter VIII

Course Training Standards

1. Purpose. These standards outline the tasks and proficiency required of TPs during transition training.

2. TP Duties and Responsibilities

a. Plan the mission.

b. Ensure the aircraft is preflighted, inspected, and equipped for the assigned mission.

c. Operate the aircraft to accomplish the mission using sound judgment and airmanship.

3. General Standards

a. Achieve training standards for visual meteorological condition (VMC) maneuvers in conjunction with visual clearing.

b. Unless otherwise specified, use **Basic Air Work (BAW)** standards for all items with altitude, airspeed, or heading parameters.

c. "Standard" equates to **good** (G/4).

d. Aircraft control must be smooth and positive. Performance may be within CTS and still not warrant a grade of ***good*** if control inputs are delayed, erratic, imprecise, or inappropriate. Slight deviations in establishing or maintaining the proper or desired aircraft attitude or position may occur during the maneuver being performed.

e. Momentary deviations outside CTS that do not compromise flight safety are acceptable if subsequent corrections are timely.

f. Procedural knowledge and application must comply with applicable directives and allow efficient mission accomplishment. If individual tasks require pre-mission planning, the standards from **Mission Planning** apply.

4. Execution. The MIF regulates TP progression to meet required standards prior to phase completion. Instructors shall evaluate TP performance against these standards.

5. Job Tasks. Specific performance and standards required are described as follows:

BEHAVIOR STATEMENT	STANDARDS
GRADED ITEM	
• A brief description of the behavior, required action, and/or conditions.	• The specific standards for the action. May be read as "The TP…"

6. Graded Items. The MIF for specific graded items varies for each stage. Several items are graded on all complete syllabus events. The standards for these universally graded items are listed first.

7. Course Training Standards

BEHAVIOR STATEMENT	STANDARDS
1. General Knowledge/Procedures	
• Maintain working knowledge of all appropriate flight training instructions and directives.	• Recites, discusses, and/or performs all applicable items essential to the operation of the aircraft.

BEHAVIOR STATEMENT	STANDARDS
2. Emergency Procedures/System Failures	
• Maintain in-depth knowledge of NATOPS and appropriate directives. • Begin with the introduction of the emergency by the IP. • End when IP announces simulation complete.	• Maintains positive control of the aircraft. • Properly identifies the simulated emergency or system failure, and calls for the appropriate procedure. • Executes/directs MEMORY items in proper order and in a timely manner. • Calls for appropriate checklist following execution of MEMORY items or when no MEMORY items apply. • Applies appropriate landing criteria for simulation.
3. Headwork/Situational Awareness	
• Comply with the FTI and NATOPS while maintaining situational awareness sufficient for flight safety.	• Understands instructions, demonstrations, and explanations. • Foresees and avoids possible difficulties. • Remains alert and spatially oriented.
4. Basic Air Work	
• Establish and maintain desired altitude, airspeed, and heading during flight.	• Maintains aircraft in balanced flight and within 100 feet, 10 KIAS, 10° of heading. • Appropriately uses power, attitude, and trim. • Levels off within 100 feet of desired altitude. • Accomplishes within ±10 seconds of correct time as applicable.

BEHAVIOR STATEMENT	STANDARDS
5. Flight Planning	
• Completes appropriate items required for specific flight prior to scheduled brief time.	• Plans the flight in a timely manner utilizing real time weather and all appropriate FLIP publications to meet all FTI/flight requirements. • Acquires a current weather brief for route of flight. • Plans and prepares a DD 175 IAW current GP publication. • Ensures that flight plan meets all IFR OPNAV requirements. • Screens all NOTAMS for the route of flight. • Completes Weight and Balance and verifies within limits.
6. Formation NATOPS/Mission Brief	
• Present modified NATOPS/mission brief concerning multiplane operations.	• Executes procedures IAW current FTI with minimal errors.

BEHAVIOR STATEMENT	STANDARDS
7. Ground Operations	
• Begin when departing flight planning room or base operations for the aircraft. • End when transitioning to forward flight. • Begin again when aircraft clears the runway and continue until transitioning to forward flight for a subsequent takeoff or when the aircrew is clear of the aircraft and postflight duties are complete.	• Complies with OPNAVINST 3710.7T, NATOPS, FTI, RWOP, squadron SOP, and training directives. • Determines aircraft status. • Properly preflights and starts the aircraft. • Properly operates aircraft systems on ground. • Ensures clearance of line personnel, ground equipment, and other aircraft using appropriate signals. • Taxies aircraft at speeds commensurate with safety based on location, weather conditions, and pilot skills. • Maintains taxiway boundaries (including hold short) and gives way to other aircraft as appropriate. • Properly shuts down the aircraft, postflights and secures the aircraft.

BEHAVIOR STATEMENT	STANDARDS
8. Crew Resource Management	
• Decision Making. • Assertiveness. • Mission Analysis. • Communications. • Leadership. • Adaptability. • Situational Awareness.	• Gathers available data before arriving at final decision; clearly states decisions to the crew; and provides rationale for decisions. • Displays assertive behavior when necessary and accepts assertive behavior from other crewmembers. • Assesses requirements, risks, and makes decisions; identifies probable contingencies and alternatives. • Ensures effective communication. • Recognizes and eliminates hazardous attitudes in self and other crewmembers; resolves conflict in a positive manner. • Provides positive leadership to the crew; encourages crew participation in the decision making process. • Adapts to meet new situational demands. • Demonstrates the ability to maintain awareness of what is happening on the ground, in the air, and with other crewmembers; copes with any subsequent mission impact as a result of these happenings. • As a copilot, performs duties IAW NATOPS, FTI, and checklist. • Performs all duties in a timely manner.

BEHAVIOR STATEMENT	STANDARDS
9. Cockpit Management	
• Prioritizes and manages crew tasks during mission profile. • Ensures complete checklist discipline and the following of all standard operating procedures.	• Correctly prioritizes multiple tasks; uses all available resources to manage workload. • Accomplishes all required normal and emergency checklists for each phase of flight; completes checklists in a timely manner with all items addressed.
10. Blindfold Cockpit Check	
• Conducted in CPTs and the simulator as a cockpit orientation drill.	• Without aid of visual cues, TP is expected to positively identify all items in the cockpit requested by the IP.
11. Radio Procedures	
• Performs verbal communications during mission profile.	• Uses precise, properly formatted radio calls with standard terminology. • Acknowledges all communications. • Understands and prioritizes transmissions in a multiple communications environment. • Asks for and provides clarification when necessary.
12. Shipboard Radio Procedures	
• Perform normal shipboard communication procedures.	• Executes procedures IAW current FTI.
13. Vertical Takeoff	
• Begins when adding power for takeoff. • Ends when aircraft is safely established in a hover.	• Executes maneuver IAW NATOPS and FTI. • Ascends at a rate commensurate with conditions and skill.

BEHAVIOR STATEMENT	STANDARDS
14. Simulated Engine Failure on Takeoff	
• Begin during a normal transition to forward flight when aircraft is at minimum 50 feet AGL and in position for a safe landing on the runway or otherwise suitable landing site. • End with either a full or power recovery autorotation.	• Clears intended point of landing, checks windspeed and direction, and ensures crew is set for maneuver. • Executes maneuver IAW FTI.
15. Instrument Takeoff	
• Begins when increasing power for takeoff. • Ends when aircraft is safely airborne, and climb power and airspeed are established.	• Checks aircraft performance and executes procedures IAW NATOPS and FTI. • Maintains takeoff torque ±5 percent. • Smoothly accelerates to appropriate climb speed. • Climbs at 70 KIAS ±5 knots.
16. No-Hover Takeoff	
• Transitions to forward flight while avoiding environmental hazards.	• Executes procedures IAW FTI.
17. Section Takeoffs	
• Begin from takeoff. • End on arrival at initial cruising altitude or commencement of next maneuver.	• Executes procedures IAW current FTI. • Wing maintains step-up +10/-5 feet through initial climb. • Lead maintains normal takeoff parameters.

BEHAVIOR STATEMENT	STANDARDS
18. Transition to Forward Flight	
• Begins with forward cyclic input. • Ends when established on desired altitude and airspeed.	• Checks aircraft performance prior to commencing transition. • Clears aircraft prior to commencing transition. • Considers wind direction and speed prior to transition. • Executes maneuver IAW NATOPS and FTI.
19. Departure Procedures (DP)	
• Begin when climb is established. • End when established on desired altitude with desired heading and airspeed or instrument departure is complete.	• Complies with ATC/DP/flight plan clearance or VFR course rules, as appropriate.
20. Course Rules	
• Begin from takeoff. • End when flight event is complete.	• Executes procedures IAW RWOP.
21. Enroute/Fuel Procedures	
• Begin when established at assigned altitude. • End with initial power reduction for descent into terminal environment or entering holding.	• Updates/validates planned time and fuel computations as required to safely and efficiently accomplish the mission IAW FAR, NATOPS, and OPNAVINST 3710.7T. • Effectively uses ATC, FSS, PMSV, and ATIS as required. • Maintains course orientation and alignment with minor deviations (if VFR). • Maintains course centerline between all NAVAIDs and fixes with minor deviations (if IFR). • Effectively plans for next phase, i.e., terminal environment.

BEHAVIOR STATEMENT	STANDARDS
22. Hover	
• Begins when established over desired spot.	• Checks power required IAW NATOPS. • Maintains 5 feet ±1 foot of skid height. • Maintains heading ±10°. • Maintains aircraft position directly over desired location. • Maintains situational awareness.
23. Simulated Loss of Tail Rotor Thrust in a Hover	
• Begin with pedal application. • End when aircraft has landed and collective is full down.	• Executes maneuver IAW NATOPS and FTI.
24. Simulated Fixed Pitch Tail Rotor Malfunction in Hover	
• Begin with pedal application. • End when aircraft has landed and collective is full down.	• Executes maneuver IAW NATOPS and FTI.
25. Simulated Fixed Pitch Tail Rotor Malfunction in Flight	
• Begin while in the crosswind/downwind. • End in a hover taxi or when aircraft is landed and collective is full down.	• Executes maneuver IAW NATOPS and FTI.
26. Turn on the Spot/Clearing Turn	
• Begins with pedal application to affect rate of turn. • Ends when stabilized on desired heading.	• Considers wind direction and speed prior to commencing turn. • Executes maneuver IAW NATOPS and FTI. • Maintains constant rate of turn. • Maintains skid height ±2 feet.

BEHAVIOR STATEMENT	STANDARDS
27. Low Work	
• Governs the handling of the aircraft under conditions in close proximity to the ground when not specifically covered by another CTS.	• Operates the aircraft IAW OPNAVINST 3710.7T, NATOPS, RWOP, squadron SOP, FTI, FLIP, and NOTAMS. • Aircraft control is smooth and positive. • Hover and hover taxi at altitude of 5 feet ±2 feet, heading ±10°, alignment ±3 feet of aircraft centerline and speed commensurate with safety and skills. • Vertical takeoff and landing: Ascends and descends at rate commensurate with safety and skills. • Turns/clearing turns/turns on the spot: Rates of turn are consistent and commensurate with safety, skills, and ambient conditions.
28. Power Checks	
• Begin in a hover. • End in a hover or in transition-to-forward flight.	• Calculates expected power requirements prior to flight. • Rechecks power expectation for current observed ambient conditions and load. • Checks actual power requirement. • Utilizes aircrew for greater situational awareness.

BEHAVIOR STATEMENT	STANDARDS
29. Hover Taxi	
• Begins from a hover with cyclic displacement • Ends when established in a hover or transition to forward flight.	• Considers wind direction and speed prior to commencing taxi. • Executes maneuver IAW NATOPS and FTI. • Maintains skid height ±2 feet, heading ±10°, alignment ±3 feet of aircraft centerline and safe speed. • Smoothly stops in a hover over desired spot or accelerates into a transition-to-forward flight.
30. Maximum Load Takeoff	
• Begins in a hover when checking N_g for simulated maximum allowable power. • Ends when established in transition to forward flight after obtaining 40 KIAS at or below 20 feet.	• Clears area before takeoff. • Considers wind direction and speed prior to transition. • Executes maneuver IAW NATOPS and FTI. • After completion of FTI procedures, intercepts normal transition-to-forward-flight profile and parameters.
31. Confined Area Operations	
• Takeoff begins from a hover in the confined area. • Takeoff ends when established in a normal climb. • Landing begins when aircraft is in position for a safe landing in the landing area. • Landing ends when established in a hover.	• Executes maneuver IAW NATOPS and FTI. • Utilizes aircrew for greater situational awareness.

BEHAVIOR STATEMENT	STANDARDS
32. Pinnacle Operations	
• Takeoff begins from a hover on the pinnacle area. • Takeoff ends when established in a normal climb. • Approach begins when aircraft is in position for a safe landing in the landing area. • Approach ends transitioning to a hover or no hover landing.	• Executes maneuver IAW NATOPS and FTI. • Utilizes aircrew for greater situational awareness.
33. Normal Approach	
• Begins with initial power reduction at 500 feet AGL at 70 KIAS. • Ends when stable in a hover or transitioning to affect a no hover or sliding landing.	• Executes maneuver IAW NATOPS and FTI. • Maintains desired profile ±50 feet, ±10 KIAS, and 10-20° glideslope. • Executes profile with minimal corrections to power and near constant angle of bank.
34. Steep Approach	
• Begins with initial power reduction at 500 feet AGL at 70 KIAS. • Ends when stable in a hover or transitioning to affect a landing.	• Executes maneuver IAW NATOPS and FTI. • Maintains desired profile ±50 feet, ±10 KIAS, and 25-45° glideslope. • Executes profile with minimal corrections to power and near constant angle of bank in turns and glideslope on final.

BEHAVIOR STATEMENT	STANDARDS
35. Hydraulic Boost-off Approach	
• Begin when hydraulic system is secured. • End when the aircraft is safely landed and collective is full down or SNA profile option.	• Executes maneuver IAW NATOPS and FTI to effect an approach with a shallow approach angle. • Lands the aircraft on an improved surface with positive control. ▶ Sliding landing is recommended but not required. ▶ (SNA profile option) Identifies safe landing speed and stabilizes in a hover taxi.
36. High-Speed Approach	
• Begins when accelerating from normal pattern downwind to 100 KIAS. • Ends in a hover or no-hover landing.	• Executes maneuver IAW NATOPS and FTI.
37. Sliding Landing	
• Begins when on final approach. • Ends when stopped and collective is fully down.	• Executes maneuver IAW NATOPS and FTI. • Lands with groundspeed commensurate with power available, landing surface, and atmospheric conditions. • Touches down with skids in a level attitude, aligned with direction of travel.
38. No-Hover Landing	
• Begins when on final approach. • Ends when stopped and collective is fully down.	• Executes maneuver IAW NATOPS and FTI. • Lands aircraft with little to no forward movement and not vertically from a hover. • Touches down with skids in a level attitude.

BEHAVIOR STATEMENT	STANDARDS
39. Stab-Off Flight	
• Begins when automatic flight control system (AFCS) is secured. • Ends at landing or when AFCS is engaged.	• Complies with NATOPS and FTI procedures. • Maintains ±15° from assigned heading while partial panel in simulated instrument conditions. • Can terminate in either a vertical landing or a no-hover landing.
40. Waveoff (Power On)	
• Begins when called for by tower or IP, or announced by PAC. • Ends when stable at desired altitude, heading, and airspeed.	• Executes maneuver IAW NATOPS, RWOP, and FTI. • Adds power smoothly without exceeding continuous operation limitations.
41. Waveoff (Power Off)	
• Begins when called for by tower or IP, or announced by PAC. • Ends when stable at desired altitude, heading, and airspeed.	• Executes maneuver IAW NATOPS, RWOP, and FTI. • Adds power smoothly without exceeding continuous operation limitations.
42. Power Recovery Autorotations	
• Begin at 600 feet AGL and in position for a safe landing on the runway or otherwise suitable landing site. • End in a hover taxi.	• Clears intended point of landing, checks wind speed and direction, and ensures crew is set prior to initiating maneuver. • Executes maneuver IAW NATOPS and FTI.

BEHAVIOR STATEMENT	STANDARDS
43. Full Autorotation	
• Begins at 600 feet AGL and in position for a safe landing on the runway or otherwise suitable landing site. • Ends when aircraft is stopped and collective is full down.	• Clears intended point of landing, checks wind speed and direction, and ensures crew is set prior to initiating maneuver. • Executes maneuver IAW NATOPS and FTI.
44. Low RPM Recovery	
• Begin at bottom of autorotation between 15-20 feet. • End in either a 5-foot, 5-10 knots hover taxi or when aircraft has landed and collective is full down.	• Executes maneuver IAW NATOPS and FTI.
45. External Load Operations	
• Begin with the attachment of an external load. • End when load is placed and released on intended point of delivery.	• Executes maneuver IAW NATOPS and FTI. • Utilizes aircrew for greater situational awareness.
46. Square Patterns	
• Begin with aircraft in a hover at the starting point. • End after one full transition around the square.	• Considers wind direction and speed prior to commencing. • Executes maneuver IAW FTI. • Maintains skid height ±2 feet, heading ±10°, and alignment ±3 feet of centerline of the aircraft.

BEHAVIOR STATEMENT	STANDARDS
47. Simulated Engine Failure at Altitude	
• Begins with the introduction of the engine failure by the IP. • Ends when IP calls for waveoff or with a power recovery autorotation (at the site).	• Maintains positive control of the aircraft. • Executes maneuver IAW NATOPS and FTI.
48. Simulated Engine Failure in a Hover (Hover Cut Gun)	
• Begins when the IP rotates the twist grip to flight idle. • Ends when the aircraft is safely on deck and collective is full down.	• IP ensures aircraft is in a stable 5-foot hover into the wind and over suitable landing surface. • Executes maneuver IAW NATOPS and FTI. • Lands with no drift and skids level.
49. Simulated Engine Failure in a Hover Taxi (Taxi Cut Gun)	
• Begins when IP rotates the twist grip to flight idle. • Ends when the aircraft is safely on deck and collective is full down.	• IP ensures aircraft is in a stable 5-foot/5-knot forward hover taxi into the wind and over a suitable landing surface. • Executes maneuver IAW NATOPS and FTI. • Lands with no lateral drift and skids aligned with direction of travel.
50. Quick Stop From a Hover	
• Begins when transitioning from a hover. • Ends when reestablished on normal climb parameters.	• Executes maneuver IAW NATOPS and FTI. • Maintains altitude –10/+15 feet. • Maintains desired ground track.

BEHAVIOR STATEMENT	STANDARDS
51. Level Speed Change (LSC)	
• Begins with initial power change or turn. • Ends when aircraft is stabilized in straight-and-level flight in position for the next maneuver.	• Executes all maneuvers IAW NATOPS and FTI. • Maintains ±75 feet. • Maintains ±5°.
52. Vertical S-1 Pattern	
• Begins with initial power change or turn. • Ends when aircraft is stabilized in straight-and-level flight in position for the next maneuver.	• Executes all maneuvers IAW NATOPS and FTI. • Maintains VSI at 500 FPM, ±200 FPM. • Completes maneuver ±5 KIAS, ±75 feet and ±5°.
53. Turn Pattern	
• Begins with initial power change or turn. • Ends when aircraft is stabilized in straight-and-level flight in position for the next maneuver.	• Executes all maneuvers IAW NATOPS and FTI. • Maintains ±5° angle of bank, ±75 feet, and rolls out ±5° from desired heading.
54. Oscar Pattern	
• Begins with initial power change or turn. • Ends when aircraft is stabilized in straight-and-level flight in position for the next maneuver.	• Executes all maneuvers IAW NATOPS and FTI. • Maintains VSI at 500 FPM, ±200 FPM. • Makes smooth inputs and timely corrections in relation to standard-rate turns. • Completes maneuver ±10 KIAS, ±75 feet, and ±15° heading.

BEHAVIOR STATEMENT	STANDARDS
55. Quick Stop	
• Begins when accelerating from normal pattern downwind to 100 KIAS. • Ends when established in a normal climb.	• Executes maneuver IAW NATOPS and FTI.
56. Unusual Attitude Recovery	
• Begins when unusual attitude is recognized. • Ends when aircraft is stable on recovery airspeed, altitude, and heading.	• Recovers aircraft IAW FTI. • Recognizes deviations from normal parameters. • Maintains smooth and positive aircraft control.
57. Instrument Autorotation	
• Begins when twist grip is reduced to flight idle. • Ends when at recovery altitude at maneuvering airspeed.	• Completes maneuver IAW FTI and NATOPS. • Maintains airspeed IAW FTI ±10 knots. • Recovers at ±50 feet of FTI requirements.
58. Magnetic Compass Turns	
• Apply during all failed directional gyro scenarios.	• Executes procedures IAW current FTI. • Constantly updates headings and air work.
59. Partial Panel Air Work	
• Governs the handling of the aircraft under partial panel conditions.	• Operates the aircraft IAW NATOPS Manual and FTI. • Maintains: ▶ Smooth and positive aircraft control. ▶ ±15° of assigned heading. ▶ ±150 feet of assigned altitude. ▶ ±15 knots of assigned/briefed airspeed. • Does not exceed standard rate turns.

BEHAVIOR STATEMENT	STANDARDS
60. TACAN Point-to-Point Navigation	
• Navigation from one TACAN fix to another TACAN fix.	• Has a general understanding of TACAN capabilities and procedures. • Demonstrates the ability to navigate IAW the FTI to an assigned TACAN/VORTAC fix within ±5 radials and ±0.5 DME concurrently.
61. Terminal Procedures	
• IFR: Begin when departing the MDA or DH on a visual glidepath to the landing environment. • End with commencement of ground operations. • VFR: Begin at termination of VFR Navigation. • End with commencement of ground operations.	• Establishes proper communication and complies with appropriate ATC in a timely manner. • Once VMC, maintains a safe visual glidepath to the landing environment, allowing for safe visual maneuvering to a landing. • Follows visual approach guidance as appropriate, i.e., VASI, PAPI, etc. • If VASI/PAPI does not apply, then helicopter maintains a safe profile to either the runway threshold or short final for an appropriate helipad.

BEHAVIOR STATEMENT	STANDARDS
62. Non-Precision Approach	
• Begins when established on a published portion of approach or cleared for the approach, or on radar vectors to final. • Ends at transition to landing environment or applying power to execute a missed approach/climbout.	• Performs IAW the FTI/INAV procedures and the applicable FAR/AIM. • FAF to MAP: Begins timing within ±5 seconds if appropriate, ±5 KIAS of approach airspeed, final approach course (FAC) ±5° and/or ±¾ deflection (±3 dot width). • Arrives at the MDA prior to MAP in a safe position to make a normal visual descent to land. • Maintains MDA +50/-0 feet. • Executes the missed approach procedure when applicable for the intended runway. • NDB final approach: Maintains ±10° bearing. • ASR approach: Does not exceed "well left/right of course" and complies with the controller's instructions in a timely manner. • GPS approach: Executes IAW current FTI.
63. Precision Approach	
• Begins when established on a published portion of approach or cleared for the approach, or on radar vectors to final. • Ends at transition to landing environment or applying power to execute a missed approach/climbout.	• Performs IAW the FTI/INAV procedures and the applicable FAR/AIM. • ILS final: Maintains within ¾ deflection (±3 dot width) of localizer and glideslope; maintains airspeed ±10 KIAS. • PAR approach: Does not exceed "well above/below glidepath" or "well left/right of course" and complies with the controller's instructions in a timely manner. • Immediately initiates the missed approach procedure at DH, if applicable.

BEHAVIOR STATEMENT	STANDARDS
64. Holding	
• Begins when crossing the holding fix. • Ends when departing the holding pattern for a subsequent fix or the approach.	• Enters and maintains holding IAW the FTI/INAV procedures and the applicable FAR/AIM. • While in holding, plans ahead for follow-on navigation.
65. Missed Approach	
• Execute procedures when aircraft arrives at the DH or the MAP, and power is added to execute either published missed approach instructions or to comply with ATC instructions.	• Accomplishes IAW FTI and NATOPS. • Complies with FLIP missed approach procedures or climbout instructions, as appropriate. • Requests, if appropriate, ATC clearance to an alternate airport or a new clearance limit.
66. Crossover	
• Begins when Wing moves from the normal cruise position on one side of Lead to the normal cruise position on the other side.	• Executes procedures IAW current FTI and NATOPS. • Lead maintains stable platform. • Wing maintains step-up +10/-5 feet.
67. Cruise Turns	
• Begin when Wing maneuvers about Lead using radius of turn to maintain cruise position in a turn without adjusting power.	• Executes procedures IAW current FTI. • Lead maintains AOB ±5°. • Wing: 3-6 rotor diameters, +10 feet step-up and ±10° of bearing.
68. Cruise Climbs and Descents	
• Begin when flight climbs and descends in cruise formation.	• Executes procedures IAW current FTI. • Lead maintains 500 FPM climb/ descent ±100 FPM and ±5 KIAS. • Wing maintains step-up +10 feet and ±10° of bearing.

BEHAVIOR STATEMENT	STANDARDS
69. Breakup and Rendezvous	
• Begins when flight separates. • Ends when flight returns to section cruise formation.	• Executes procedures IAW current FTI. • Maintains ±5° AOB. • Wing maintains step-up and avoids ±10° of bearing.
70. Overrun	
• Begins when Wing maneuvers to discontinue join-up due to excessive closure rate. • Ends with Wing stabilized in section cruise.	• Wing recognizes requirement for overrun in time to safely execute procedures IAW the current FTI.
71. Lead Change	
• Transfers control of the formation from Lead to Wing.	• Executes procedures IAW current FTI and NATOPS.
72. Section Cruise	
• Allows aircraft to fly in close proximity to one another safely.	• Executes procedures IAW current FTI. • Lead maintains altitude ±50 feet. • Wing maintains ±10° of bearing.
73. Section Landings	
• Perform landing in close formation.	• Executes procedures IAW current FTI. • Lead maintains normal approach profile IAW CTS. • Wing maintains ±10° of bearing.

BEHAVIOR STATEMENT	STANDARDS
74. VFR Navigation	
• Begins at start of visual navigation route. • Ends with terminal procedures.	• Accomplishes mission IAW FTI and FAR/AIM. • Arrives at brief with a neat and properly prepared sectional and all required documents per FTI and VNAV binders. • Demonstrates a working knowledge of chart depictions and airspace limitations and rules. • Executes proper entry into uncontrolled tower pattern IAW FAR/AIM (if applicable). • Makes appropriate course corrections to maneuver the aircraft to checkpoints and recovery airfield. • Proactive in navigation and leg timing.
75. Low-Level Navigation	
• Navigate at low level with appropriate charts.	• Executes procedures IAW current FTI. • Positively identifies chart information in conjunction with terrain.
76. Timing	
• Begin at first checkpoint on route. • End at last checkpoint on route.	• Executes procedures IAW current FTI.
77. Low-Level Basic Instruments (LLBI)	
• Execute basic instrument procedures while at low level.	• Executes procedures IAW current FTI. • Maintains altitude ±50 feet.
78. Stab-Off LLBI	
• Execute basic instrument procedures under diminished stabilization.	• Executes procedures IAW current FTI. • Maintains altitude ±50 feet.

BEHAVIOR STATEMENT	STANDARDS
79. Partial Panel LLBI	
• Execute basic instrument procedures with partial instrumentation.	• Executes procedures IAW current FTI. • Maintains altitude ±50 feet.
80. Search and Rescue Patterns/Scenarios	
• Begin with IP-driven scenario and TP demonstrates general knowledge and techniques regarding search and rescue pattern selection.	• Accomplishes mission IAW current FTI. • Demonstrates knowledge of SAR terminology, responsibilities of OSC, search-planning variables, and a general knowledge of the SAR TACAID. • Determines correct search plan for given scenario. • Demonstrates CRM leadership in crew utilization during scenario. • Adheres to SAR pattern FTI guidelines.
81. Windline Rescue Pattern	
• Begins with the completion of a selected SAR pattern or locating survivor, and TP selects entry for rescue based on last known winds.	• Executes procedures IAW current FTI. • Calculates timing correction based on last known wind for outbound leg. • Determines required turn prior to pattern entry.
82. Section High-Speed Approach	
• Allows flight to execute a high-speed approach in formation.	• Executes procedures IAW current FTI. • Lead maintains 50 feet until intercepting steep approach glideslope. • Wing maintains step-up +10 feet and ±10° of bearing.
83. Emergency Low Visibility Approach (ELVA)	
• Approach required for emergency weather conditions.	• Executes procedures IAW current FTI.

BEHAVIOR STATEMENT	STANDARDS
84. Shipboard TACAN/NDB Approach	
• Execute radio instrument procedures in a shipboard environment.	• Executes procedures IAW current FTI. • Maintains altitude ±50 feet. • Computes BRC-corrected headings and wind-corrected timing for approach in an expeditious manner.
85. Field Deck Landing Practice (Takeoff/Landing)	
• Preparation pattern designed to demonstrate shipboard landing pattern.	• Executes procedures IAW current FTI. • Maintains altitude ±50 feet, airspeed ±5 KIAS, and FAC ±10°.
86. Section Waveoff	
• Begins with either aircraft, individually or collectively, discontinuing an approach.	• Executes procedures IAW current FTI. • Lead/Wing makes appropriate waveoff transmission(s).
87. Field Deck Landing Practice Waveoff	
• Begins when approach terminates which is deemed unsafe or uncomfortable.	• Executes procedures IAW current FTI.
88. Response to LSE	
• Operate aircraft under LSE direction.	• Recognizes information given by LSE and follows direction properly.
89. Ship Deck Landing Qualification (Takeoff/Landing)	
• Conduct normal shipboard environment operations.	• Executes procedures IAW current FTI and NATOPS. • Maintains altitude ±50 feet, airspeed ±5 KIAS, and FAC ±10°.

BEHAVIOR STATEMENT	STANDARDS
90. Vertical Landing	
• Begins when established over desired landing spot. • Ends when aircraft is safely on deck and collective is full down.	• Executes maneuver IAW NATOPS and FTI. • Continues descent without intermediate stops.
91. NVD Knowledge	
• The specific knowledge required for safe, efficient flight operations and mission effectiveness as it relates to the use of night vision devices.	• Conducts proper NVG preflight. • Demonstrates full knowledge of NVG light effects and phenomenon. • Demonstrates proper use of aircraft interior and exterior lighting. • Understands proper NVG scan pattern. • Understands capabilities and limitations of NVGs. • Demonstrates knowledge of the use of sun/moon charts in mission planning.
92. Goggle/De-goggle Procedures	
• Begin when the need to goggle or de-goggle arises in the aircraft, whether in-flight or on the deck.	• Demonstrates full knowledge of goggle/de-goggle procedures. • Able to goggle/de-goggle in a timely fashion, with regard to safety for phase of flight. • Sets proper aircraft lighting regime, both interior and exterior.

BEHAVIOR STATEMENT	STANDARDS
93. NVD Emergency Procedures	
• The specific application of NATOPS procedures to resolve an aircraft emergency whether airborne or on the ground as it relates to night vision devices.	• Handles the emergency IAW NATOPS and FTI. • Demonstrates sound judgment when no specific guidance exists. • Resolves the emergency and carries to a logical conclusion. • Maneuvers the aircraft in a safe manner, descending no lower than specified in local procedures and no slower than 40 KIAS. • Demonstrates thorough knowledge of NVG battery failure, and NVG tube failure, including recognition of each condition and the subsequent emergency procedures.

Chapter IX

Master Materials List

Individually Issued Materials

NOMENCLATURE	IDENTIFICATION	QTY PER PILOT
1. Flight Training Instructions		
a. Contact FTI	CNATRA P-457	1
b. Instrument/Navigation FTI	CNATRA P-458	1
c. Tactical/Formation/NVD FTI	CNATRA P-459	1
2. Ground Training Publications		
a. Aerodynamics Workbook	CNATRA P-401	1
b. Systems Workbook	CNATRA P-402	1
c. IFR Workbook	CNATRA P-403	1
d. Flight Planning Workbook	CNATRA P-404	1

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