NAVAL AIR TRAINING COMMAND

NAS CORPUS CHRISTI, TEXAS **CNATRAINST 1542.169**
CIN Q-2A-0169, Q-2D-0169, Q-2D-1169 **27 Jan 2016**

CHIEF OF NAVAL AIR TRAINING

T-45C NATOPS INSTRUCTOR UNDER TRAINING (IUT) CURRICULUM

2016

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

CNATRAINST 1542.169
N715
27 JAN 16

CNATRA INSTRUCTION 1542.169

Subj: T-45C NATOPS INSTRUCTOR UNDER TRAINING (IUT) CURRICULUM

1. Purpose. To publish the curriculum for training Instructor NFOs and Pilots in the NATOPS phase of Naval Air Training Command (NATRACOM) flight training.

2. Cancellation. CNATRAINST 1542.160 and CNATRAINST 1542.174 (NATOPS stage) will be cancelled when the last enrolled IUT completes the curriculum.

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

4. Forms. The CNATRA forms required by this instruction are automated in the Training Integration Management System (TIMS) computer program. Additional CNATRA forms are available on the CNATRA website https://www.cnatra.navy.mil/pubs/forms.htm.

D. M. EDGECOMB
Chief of Staff

Distribution:
CNATRA Website
CNATRA SharePoint

BLANK PAGE

LIST OF EFFECTIVE PAGES

Original

Total number of pages is 136 consisting of the following:

Page Number	Issue
Letter – 2	
3/(4 blank)	
i – ii	
iii/(iv blank)	
v/(vi blank)	
vii – x	
xi/(xii blank)	
xiii - xvi	
xvii/(xviii blank)	
I-1/(I-2 blank)	
I-3/(I-4 blank)	
I-5 – I-12	
II-1 – II-14	
II-15/(I-16 blank)	
III-1 – III-40	
III-41/(III-42 blank)	
IV-1/(IV-2 blank)	
V-1/(V-2 blank)	
VI-1/(VI-2 blank)	
VII-1/(VII-2 blank)	
VIII-1/(VIII-2 blank)	
IX-1 – IX-30	
IX-31/(IX-32 blank)	
X-1/(X-2 blank)	

BLANK PAGE

TABLE OF CONTENTS

PAGE

SUMMARY OF CHANGES.....v
COURSE DATA.....vii
ABBREVIATIONS.....xiii
GLOSSARY.....xv

CHAPTER I. GENERAL INSTRUCTIONS

SYLLABUS MANAGEMENT I-1
TRAINING MANAGEMENT I-1
T-45C PILOT NATOPS IUT COURSE FLOW I-3
T-45C NFO NATOPS IUT COURSE FLOW I-5
GROUND TRAINING AND BRIEFING REQUIREMENTS, MISSION PREPARATION, BRIEFINGS, AND DEBRIEFINGS I-6
MISSION GRADING PROCEDURES AND EVALUATION POLICIES ...I-7
SPECIAL INSTRUCTIONS AND RESTRICTIONS I-11

CHAPTER II. GROUND TRAINING

GROUND TRAINING PHILOSOPHY II-1
FLIGHT SUPPORT TRAINING PHILOSOPHY II-1
ADMINISTRATION/GROUND TRAINING (G01) II-2
NATOPS REFRESHER GROUND TRAINING (G02) II-4
ENGINEERING (ENG01) II-5
COCKPIT ORIENTATION (CO11) II-7
EMERGENCY PROCEDURES (EP11) II-8
AERODYNAMICS (AER01) II-9
INSTRUMENT NAVIGATION (NAV01) II-10
FAMILIARIZATION FLIGHT PROCEDURES (FAM11) II-11
NIGHT FAMILIARIZATION FLIGHT PROCEDURES (NFM11) II-12
OUT OF CONTROL FLIGHT PROCEDURES (OCF11) II-13
NATOPS EXAMINATIONS (NA11) II-14
SECTION FORMATION FLIGHT PROCEDURES (FRM11) II-15

CHAPTER III. NATOPS TRAINING

REFRESHER FLIGHT TRAINING PHILOSOPHY III-1
MATRICES III-1
NATOPS STAGE MIF III-1
COCKPIT ORIENTATION/FAMILIARIZATION/EMERGENCY PROCEDURES (NA31) III-9

NATOPS INSTRUMENT (NA32) III-13
OUT-OF-CONTROL FLIGHT (OCF) (NA33) III-16
NATOPS SECTION FORMATION (NA34) III-19
NATOPS EP/SIMULATOR TRAINING CHECK (NA35) III-21
NATOPS INSTRUMENT (NA41) III-23
NATOPS FAMILIARIZATION (NA42) III-26
NATOPS SECTION FORMATION (NA43) III-29
NATOPS NIGHT FAMILIARIZATION (NA44) III-31
NATOPS OUT-OF-CONTROL FLIGHT (OCF)TRAINING (NA45) .III-33
NATOPS CHECK FLIGHT (NA46) III-35
NATOPS INSTRUMENT CHECK IN SIMULATOR (NA36) III-38
NATOPS INSTRUMENT CHECK FLIGHT (NA47) III-40

CHAPTER IV. CONTACT TRAINING

DOES NOT APPLY IV-1

CHAPTER V. INSTRUMENT TRAINING

DOES NOT APPLY V-1

CHAPTER VI. NAVIGATION TRAINING

DOES NOT APPLY VI-1

CHAPTER VII. FORMATION TRAINING

DOES NOT APPLY VII-1

CHAPTER VIII. TACTICAL TRAINING

DOES NOT APPLY VIII-1

CHAPTER IX. COURSE TRAINING STANDARDS

PURPOSE IX-1
IUT DUTIES AND RESPONSIBILITIES IX-1
GENERAL STANDARDS IX-1
EXECUTION IX-1
JOB TASKS IX-2
COURSE TRAINING STANDARDS IX-2

CHAPTER X. MASTER MATERIALS LIST

INDIVIDUALLY ISSUED MATERIALS X-1

BLANK PAGE

SUMMARY OF CHANGES

CHANGE NUMBER	DATE OF CHANGE	CHANGE DESCRIPTION	PAGES AFFECTED/ INITIALS

BLANK PAGE

COURSE DATA

1. Course Title. T-45C NATOPS Instructor Under Training (IUT) Curriculum.

2. Course ID Number (CIN)

T-45C NATOPS IUT (TW1,TW2) - Pilot:	Q-2A-0169
T-45C NATOPS IUT (TW6) - Pilot:	Q-2D-0169
T-45C NATOPS IUT (TW6) – NFO:	Q-2D-1169

3. Location. Naval Air Station Kingsville, TX; Naval Air Station Meridian, MS; Naval Air Station Pensacola, FL.

4. Course Status. Active.

5. Course Mission. The T-45C NATOPS IUT Curriculum is designed to provide Pilots and NFOs with an initial NATOPS qualification or re-qualification and familiarization of the T-45C aircraft. This syllabus does not result in a Flight Instructor qualification. Successful completion of this curriculum is a prerequisite for follow on training and designation as a T-45C Instructor Pilot or Instructor NFO in either Strike Pilot or Advanced NFO training phases. This course will require:

a. Flight training to teach normal and emergency NATOPS procedures and aircraft familiarization.

b. Ground training to supplement and reinforce flight training.

6. Prerequisite Training

a. Designated U.S. Navy, Marine, Coast Guard, Air Force, and foreign military aviators (Pilot or Naval Flight Officer).

b. Swim/Physiology Class I, if required per 3710.7U guidance (prior to flight in the aircraft).

7. Security Clearance Required. None.

8. Follow-on Training. As required to maintain annual NATOPS currency IAW OPNAVINST 3710.7U.

9. Course Length. Overall time-to-train calculated in accordance with CNATRAINST 1550.6E. Training days account for factors including weather, personnel and equipment availability, briefing and preparation time, and historical delays. Calendar weeks further account for weekends, holidays, safety stand-downs, and other expected nonworking days.

	Training Days	Calendar Weeks
a. TW-1 Pilot NATOPS Initial Qualification	28.1	6.2
b. TW-2 Pilot NATOPS Initial Qualification	27.6	6.1
c. TW-6 Pilot NATOPS Initial Qualification	33.3	7.4
d. TW-6 NFO NATOPS Initial Qualification	25.9	5.7

10. Class Capacity. Variable.

11. Instructor Requirements. As determined by Chief of Naval Operations (CNO) planning factors.

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

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

14. Quota Control. Chief of Naval Operations.

15. Course Training Subjects

a. Ground Training

ADMINISTRATION (PILOT and NFO)		
Stage	**Symbol**	**Hours**
Administration/Check-in	G0101	4.0
Administration/Check-out	G0106	2.0
Total		6.0

GROUND TRAINING (PILOT and NFO)		
Stage	**Symbol**	**Hours**
Administration/Ground Training	G0102-5	4.0
NATOPS Refresher Ground Training*	G0201-3	4.5
Crew Resource Management	G0204	2.0
Operational Risk Management*	G0205	2.0
Engineering	ENG0101-28	33.2
Aerodynamics	AER0101-6	2.5
Instrument Navigation	NAV0101-8	2.25
Total		**50.45***

*Optional events accomplished if required by NATOPS.

b. Flight Support

FLIGHT SUPPORT (PILOT and NFO)		
Stage	**Symbol**	**Hours**
Emergency Procedures	EP1101-11	7.9
Cockpit Orientation	CO1101-5	2.0
Familiarization Flight Procedures	FAM1101-2	2.0
Familiarization Flight Procedures Exam	FAM1103	1.0
Night Fam Flight Procedures	NFM1101-2	1.0
Night Fam Procedures Exam*	NFM1103	1.0
OCF Procedures	OCF1101-2	2.0
NATOPS Examinations	NA1101-2	4.0
Section Formation Flight Procedures	FRM1101-5	2.0
Formation Exam I*	FRM1106	1.0
Pilot Total		**23.9**
NFO Total		**21.9**

* Exams NFM1103 and FRM1106 apply to Pilots only.

c. Flight/Simulator Training Summary. The programmed times for each phase, stage, and media are:

PILOT NATOPS IUT FLIGHT TRAINING				
Flight/Events	**OFT**		**T-45C Dual**	
	Flts	**Hrs**	**Flts**	**Hrs**
NA	9*	13.2	11**	13.5
Totals	9*	13.2	11**	13.5

* Includes optional NA3690 NATOPS Instrument Check not required for NATOPS qualification.

** Includes optional NA4790 NATOPS Instrument Check Flight not required for NATOPS qualification.

NFO NATOPS IUT FLIGHT TRAINING				
Flight/Events	**OFT**		**T-45C Dual**	
	Flts	**Hrs**	**Flts**	**Hrs**
NA	7	10.5	7	8.5
Totals	7	10.5	7	8.5

16. Training Preparation Time. In addition to the hours formally planned for classes, simulators, and flights, significant additional time to prepare and study should be expected outside of scheduled training hours. This range will vary depending on the complexity of the material and individual student needs, and may be up to several hours per event. For simulator and flight events, specific brief and taxi times will be programmed into TIMS and accounted for on the flight schedule, per the following table:

ADDITIONAL FORMAL TRAINING TIME PER CURRICULUM HOUR/EVENT			
Training Area	**Brief/Preflight/ Taxi**	**Taxi/ Debrief**	**Total**
Simulator (CSI)	0.50	0.50	1.00
Flight (IP)	1.5	1.00	2.5

17. Physical Requirements. As specified in Chapter 15 of the Manual of the Medical Department (NAVMED P-117) and all applicable anthropometric standards.

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

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

20. Preceding Curriculum Data. This curriculum replaces the NATOPS Stages of CNATRAINST 1542.160 and 1542.174.

21. Student Performance Measurement/Application of Standards. The standards outlined in Chapter IX, Course Training Standards, are used to evaluate student performance for all items on all events. Final judgment regarding the satisfactory performance of any flight maneuver rests with the NATOPS Instructor (NI). Refer to CNATRAINST 1500.4H, Chapter VII, for further guidance.

22. Summary of Lead Overhead. The Summary of the Instructor Lead planning factor hours for the T-45C NATOPS IUT is tabulated below. The tables are a compilation of events requiring Instructor Lead that can be found in Chapter III of this publication.

NATOPS IUT				
Flight/Event	**# Events**	**Lead Hrs/Event**	**# IUT per Lead**	**Total Lead Hrs/IUT (# events x hrs/event)**
NA43	1	1.4	1	1.4
Totals	**1**	**1.4**	**1**	**1.4**

23. Additional CSI Resource Requirements. None.

BLANK PAGE

ABBREVIATIONS

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

ASR - Airport Surveillance Radar
ATF - Aviation Training Form
ATS - Aviation Training Summary
BAR - Basic Airwork Recognition
BAW - Basic Airwork
CAI - Computer-Assisted Instruction
CNATRA - Chief of Naval Air Training
CRM - Crew Resource Management
CTS - Course Training Standards
EOB - End of Block
EP - Emergency Procedure
FAM - Familiarization
FFP - Familiarization Flight Procedures
FLIP - Flight Information Publication
FPC - Final Progress Check
FTI - Flight Training Instruction
GCA - Ground-Controlled Approach
IAW - In Accordance With
IFR - Instrument Flight Rules
IGS - Instrument Ground School
INAV - Instrument Navigation
IP - Instructor Pilot
IPC - Initial Progress Check
ITF - Instructor Training Form
IUT - Instructor Under Training
MCG - Master Curriculum Guide

MIF	-	Maneuver Item File
MIL	-	Mediated Interactive Lecture
MOA	-	Military Operations Area
NATOPS	-	Naval Air Training and Operating Procedures Standardization
NFO	-	Naval Flight Officer
NOTAMS	-	Notices to Airmen
OCF	-	Out-of-Control Flight
OCFFP	-	Out-of-Control Flight, Flight Procedures
OFT	-	Operational Flight Trainer
OPNAV	-	Office of the Chief of Naval Operations
PAR	-	Precision Approach Radar
SERGRAD	-	Selectively Retained Graduate
SI	-	Standardization Instructor
SOP	-	Standard Operating Procedure
SSR	-	Special Syllabus Requirement
TACAN	-	Tactical Air Navigation
UHF	-	Ultra High Frequency
UNSAT	-	Unsatisfactory
VFR	-	Visual Flight Rules
VHF	-	Very High Frequency
VMC	-	Visual Meteorological Conditions

GLOSSARY

1. Advancing X. Completed event within the normal syllabus flow. Excludes events with last characters in the range 84-89.

2. Aviation Training Summary. A tabular sheet listing the MIF and maneuver grades within a training stage.

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

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

5. Contact. The chapter of training that combines flight familiarization and visual navigation procedures.

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

7. Course Training Standard (CTS). A description of required behaviors and standards of performance for a specific maneuver. These standards are in Chapter IX.

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

9. 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.

10. Emergency Procedure. Any degradation of aircraft systems or flight conditions requiring crew action or intervention.

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

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

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

14. Instructor Training Form. A grade sheet documenting IUT performance for all categories of training regardless of media, phase, or stage.

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

Char	Meaning	Remarks
1st	Stage	AER—Aerodynamics CO—Cockpit Orientation ENG—Engineering EP-Emergency Procedures FAM-Familiarization FRM-Formation G—Ground NA—NATOPS NAV—Instrument Navigation NFM-Night Familiarization OCF-Out-of-Control Flight
2nd	Media	0—Ground Training 1—Academics/ Flt Support 2—Not Used 3—OFT Trainer 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: 84—Adaptation Flight 85—Practice Sim 86—Warmup 87—Extra Training 88—Initial Progress Check 89—Final Progress Check 90—Check Ride/Exam

Note: In a seven-character lesson designator, the alphanumeric characters represent the Stage and the four digits after the Stage identifier are in the same format as the 2nd-5th characters in a five-character lesson designator.

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

17. Master Syllabus. Chapters I-VIII list all training syllabus activities, prerequisites, and desired training flow for T-45C NATOPS IUT.

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

19. Stage of Training. All training of a particular type (Ground, NATOPS, etc.) within a phase. The alphanumeric letter(s) in the lesson designator identifies the stage of each lesson (For example: NA4101 is in the NATOPS Stage).

20. Standardization Instructor. The Squadron Commander will designate NATOPS/Standardization Instructors (SIs) for each stage. Qualified Instructors in this syllabus are herein referred to as "Instructor". Refer to local FIST instruction for NATOPS/Standardization Instructor qualification and designation requirements.

21. Training Media. The media for this syllabus include aircraft, T-45C OFT, MIL, Lecture, and CAI. The first numerical character in the lesson identifier designates the training media. (Example: CO1101 and EP1101 are academic events).

22. Training Review Board. A fact-finding board appointed to conduct an administrative review of circumstances and procedures relative to an FPC recommendation for an IUT's elimination.

BLANK PAGE

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 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 IAW CNATRAINST 1550.6E.

e. Syllabus Description. The syllabus is divided into stages; the stages are grouped by like-flight training regimes, such as Engineering, OCF, and NATOPS. Each stage is subdivided into training blocks. The training blocks consist of a specified number of events. Course Training Standards are modified by the MIFs to identify the acceptable level of performance that must be achieved at the completion of each training block.

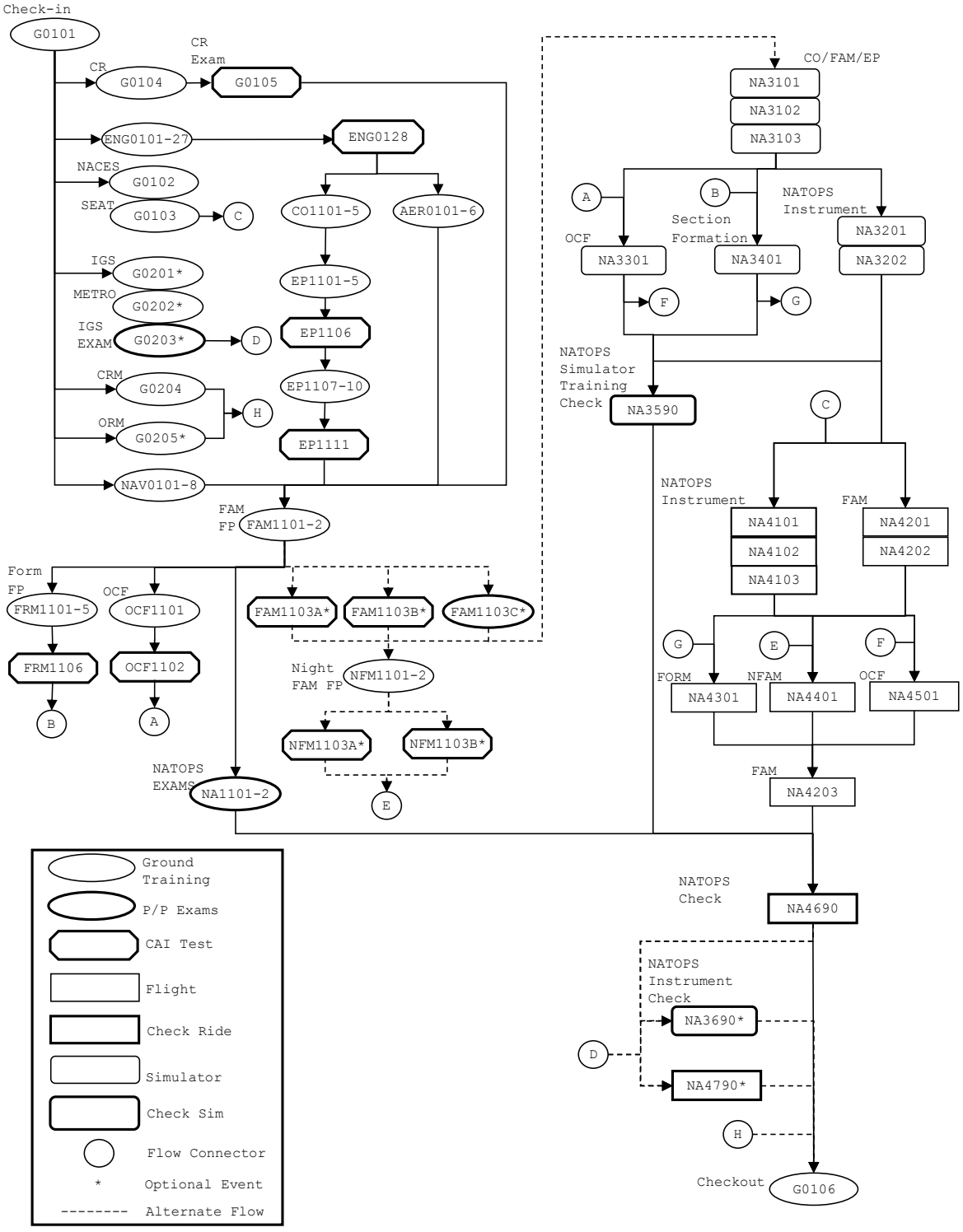
2. Training Management

a. Syllabus Progression. Fly events within each stage sequentially, except as noted. Do not start a block without all prerequisites. The flowcharts on pages I-3 through I-5 delineate the sequence of flying events and their ground training prerequisites. System training management is designed to facilitate two graded events (flight, simulator, or exam) per IUT per day.

b. Maneuver Continuity. IUTs must accomplish previously introduced maneuvers frequently enough to ensure maintaining required proficiency.

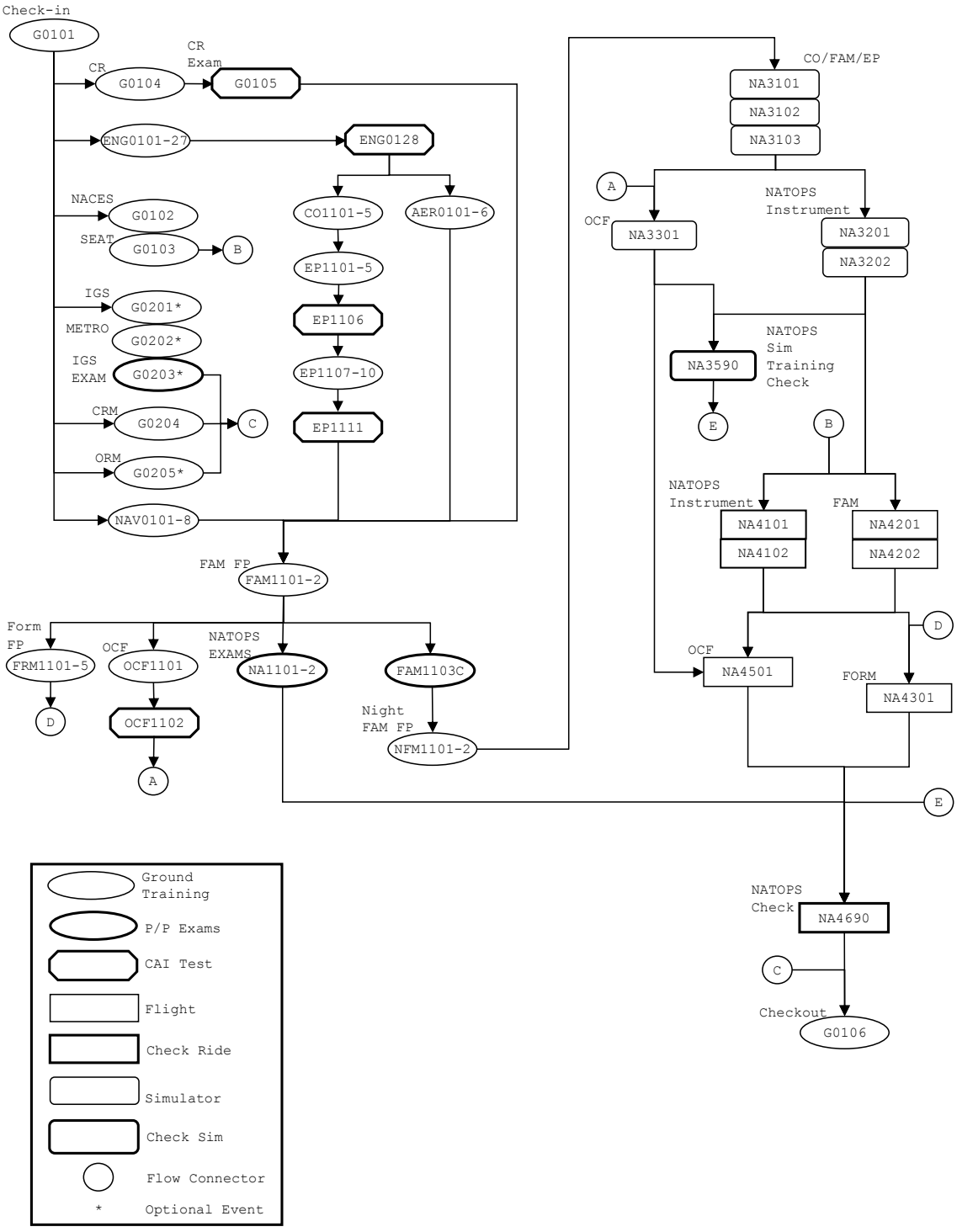
BLANK PAGE

T-45C PILOT NATOPS IUT COURSE FLOW



BLANK PAGE

T-45C NFO NATOPS IUT COURSE FLOW



c. H/X. Instructors 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.

3. Ground Training and Briefing Requirements, Mission Preparation, Briefings, and Debriefings

a. EOB Events. The instructor shall carefully review the ATS in planning the EOB event to ensure the profile includes opportunities to reach MIF on all critical and optional items attempted in the block.

b. Preparation. The IUT shall arrive for each flight with:

(1) Thorough knowledge of:

(a) Discuss items, as listed in Chapter III.

(b) Procedural knowledge of the critical and optional items for the event's training block.

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

(3) The latest ATS for the stage.

c. Briefing. Thoroughly cover the mission's:

(1) Discuss items, as listed in Chapter III.

(2) Specific objectives.

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

(4) NATOPS briefing requirements, planned profile, contingencies, and ORM considerations.

d. Debriefing

(1) After each event, the instructor shall critique the IUT's performance using cause/effect analysis, particularly with respect to the CTS.

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

(3) The instructor shall provide a copy of the event's ITF.

4. Mission Grading Procedures and Evaluation Policies

a. General Grading and Evaluation Policy. Course Training Standards listed in this instruction and the MIFs are minimum stage/phase completion standards per maneuver. CTS/MIFs are designed to allow for minimum performance in a specific area with the understanding that performance above the minimum CTS/MIF will offset the weak area.

b. Grading Procedures (Aircraft and Training Devices)

(1) Overall Grading

(a) The overall grade for all flight and device events, with the exception of the NATOPS Check Ride, will be pass/fail.

(b) The overall grade for the NATOPS Check Ride (NA4690) 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 Mission Commander.

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

(2) NATOPS Maneuver Grading. During the NATOPS phase of training, grading will be IAW NATOPS standards.

Judge the IUT's or student's proficiency only against the item's CTS or NATOPS grading criteria. The grading scale will be per the NATOPS as listed below:

5 = Not applicable to NATOPS Block Training
4 = Q
3 = CQ
2 = UQ
1 = Demonstrate

(3) Absolute Maneuver Grading. Use the following grading scale to document the IUT's characteristic performance on maneuvers attempted during each event. This is an absolute grading scale. Judge the IUT's proficiency ***only*** against the item's course training standard. Maneuver grades shall be consistent with ATF comments.

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

1. When the instructor demonstrates the maneuver and the IUT does not subsequently perform it during the event.

2. To indicate accomplishing SSRs. Specify the completed SSRs in the ITF's SSR comments section.

(b) Unqualified (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) Conditionally (C/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) Qualified (Q/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). Not applicable to NATOPS training.

(4) Progression Rule. Performance must meet MIF by the EOB. IUT shall maintain or exceed MIF performance from one block, stage, or media to the next.

(5) Maneuver Requirements. For each block:

(a) Critical Items. Items with a number and a plus (+) are mandatory and 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 IUT meets EOB MIF.

(b) Optional Items. Items with a number, but without a plus (+), are optional; however, if flown, they must meet the required EOB proficiency the last time the maneuver is graded in the block.

(6) Incomplete Events. If an IUT has had ample opportunity to learn a task and subsequently flies a short mission, do not incomplete the mission solely to provide unwarranted extra training. Assess the event complete if:

(a) Seventy-five percent of the event's H/X were 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.

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

(8) Trainer Event Completion. Assess a trainer event complete if the IUT has received a full 1.5-hour training period.

c. 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) The entire event should be devoted to assessing the IUT's ability to safely fly the aircraft. All maneuvers indicated with a plus (+) are check ride critical and must be accomplished to MIF.

(c) The IUT should be able to demonstrate required levels of proficiency without instructor assistance; however, instruction is allowed on check rides and IUTs may reattempt maneuvers at the instructor's discretion.

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

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

(b) The instructor was unable to sample sufficient examples of a given maneuver to assess the IUT'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 UNSAT if:

1. Any critical item is below MIF, or

2. Any maneuver is U/2.

5. Special Instructions and Restrictions

a. Schedule Limitations. Schedule limitations for IUTs will be left to the discretion of the Instructor Training Unit (ITU) or cognizant squadron, but consistent with the provisions of OPNAVINST 3710.7U.

b. Deviations from Standard Maneuvers. All IUT flights will be conducted in accordance with the current T-45C NATOPS/Technical Orders, FTIs, and local SOPs. No deviations from standard maneuvers are authorized except in cases of emergency.

c. Minimum IUT Turn-Times. Minimum turn times are at the discretion of the instructor and IUT, and IAW local SOP.

d. Crew Day. Crew day and flight hour limitations are established by OPNAVINST 3710.7U and applicable NATOPS.

e. Crew Rest. Crew rest limitations are established by OPNAVINST 3710.7U and applicable NATOPS.

f. NATOPS Qualification Requirements. Completion of the NATOPS Check Ride as described in this instruction meets the NATOPS qualification requirements for the T-45C aircraft.

g. Previous Experience or Demonstrated Ability. This syllabus is designed to provide the IUT with at least the minimum flight time required for NATOPS qualification. Refer to T-45C NATOPS manual for qualification and currency requirements. For initial NATOPS qualification, no portion of the syllabus may be waived with exception for SER Graduates (see below).

h. SERGRAD. A shortened syllabus is provided for SER Graduates due to recent flight experience in the T-45C. Minimum events required for SER Graduate NATOPS qualification are:

(1) G0102-5 (NACES, Ejection Seat, CR, CR Exam).
(2) ENG0127-28 (Engineering Review and Exam).
(3) G0201-5 (IGS, METRO, IGS Exam, CRM, ORM).
(4) EP1101-11 (Emergency Procedures).
(5) OCF1101-2 (OCF Procedures).
(6) NA4201 (Familiarization Flight).
(7) NA3301 (OCF Simulator).

(8) NA4501 (OCF Flight).
(9) NA4101 (Instrument Flight).
(10) NA3590 (NATOPS Simulator Check).
(11) NA1101-2 (NATOPS Exams).
(12) NA4690 (NATOPS Check Flight).

Chapter II

Ground Training

1. Ground Training Philosophy. Newly reporting IUTs must regain NATOPS-mandated currencies and become knowledgeable of their respective systems and flight preparation procedures.

2. Flight Support Training Philosophy. IUTs learn fundamentals and procedures of T-45C normal and emergency procedures and become knowledgeable of current standardization. The two primary methods of instruction are CAI and MIL. A CAI is a self-paced, computer-based instructional module. A MIL is a traditional lecture format, where an instructor teaches with the aid of electronic media.

Blk #	Media	Title	Events	Hrs	Blk Name
G01	Class	Administration/ Ground Training	6	10.0	See Below

1. Prerequisites

a. G0101 prior to G0102 and G0104.

b. G0102 prior to G0103.

c. G0104 prior to G0105A, G0105B, G0105C, and G0105D.

d. NA4690 prior to G0106.

e. If required: G0204, G0205, NA3690 and NA4790 prior to G0106 (Pilot).

f. If required: G0203-5 prior to G0106 (NFO).

2. Events

G0101	Admin	Administration/Check-In. IUTs will check in with the Wing/Squadron, Ground Training, Medical (Admin up-chit), and Flight Gear Support. This event includes Publications Issue, Curriculum Introduction, Safety, NATOPS and TIMS support.	4.0	ADMIN
G0102	Offline MIL	NACES Flight Physiology	1.0	SEAT
G0103	Offline MIL	Ejection Seat Lecture/NACES Preflight	1.0	SEAT
G0104	Offline MIL	Course Rules	1.0	CR

2. Events Cont

G0105A	CAI Test	CTW-2 Course Rules Exam	1.0	CR
G0105B	CAI Test	VT-7 Course Rules Exam	1.0	CR
G0105C	CAI Test	VT-9 Course Rules Exam	1.0	CR
G0105D	P/P Exam	CTW-6 Course Rules Exam	1.0	CR
G0106	Sqdn	Administration/Checkout. IUTs will check out with the Wing/Squadron (if required), NATOPS, Ground Training, Flight Gear Support, and TIMS Support).	2.0	ADMIN

3. Syllabus Notes. G0106 is required if follow on IUT training is accomplished at a different TRAWING. If follow on training is to continue at same location, G0106 may also be used to complete required NATOPS paperwork and move IUT into follow on syllabus in TIMS. Refer to local procedures for G0106 completion requirements.

4. Discuss Items. None.

Blk #	Media	Title	Events	Hrs	Blk Name
G02	Class	NATOPS Refresher Ground Training	5	8.5	See Below

1. Prerequisites

   a. G0101 prior to G0201-3 (in order).

   b. G0101 prior to G0204-5 (any order).

2. Events

G0201	Offline MIL	Instrument Ground School	3.0	IGS
G0202	MIL	Meteorology Review	0.5	IGS
G0203	P/P Exam	IGS Open-Book Exam	1.0	IGS
G0204	Offline MIL	Crew Resource Management	2.0	CRM
G0205	Offline MIL	Operational Risk Management	2.0	ORM

3. Syllabus Note. Complete G0201-5 as required for NATOPS currency.

4. Discuss Items. None.

Blk #	Media	Title	Events	Hrs	Blk Name
ENG01	MIL/CAI	Engineering	28	33.2	ENG

1. Prerequisite. G0101.

2. Events

ENG0101	MIL	Introduction to T-45C Configuration	1.3
ENG0102	MIL	Electrical System	1.3
ENG0103	CAI	Electrical System Malfunctions	0.7
ENG0104	MIL	Engine and Related Systems	2.0
ENG0105	CAI	Engine and Related Systems Malfunctions	1.4
ENG0106	CAI	Engine System Malfunctions	0.7
ENG0107	MIL	Aircraft Fuel System	0.9
ENG0108	CAI	Fuel System Malfunctions	0.5
ENG0109	MIL	Hydraulic System	1.5
ENG0110	CAI	Hydraulic System Malfunctions	1.0
ENG0111	MIL	Hydraulic Subsystems	1.8
ENG0112	CAI	Hydraulic Subsystem Malfunctions	1.0
ENG0113	MIL	Flight Control System	1.3
ENG0114	CAI	Flight Control System Malfunctions	0.7
ENG0115	MIL	Egress System	1.0
ENG0116	CAI	Egress System Malfunctions	0.5
ENG0117	MIL	ECS/Pressurization and OBOGS	0.9
ENG0118	CAI	ECS/Pressurization and OBOGS Malfunctions	0.5

2. Events (Cont)

ENG0119	MIL	Flight Instruments	1.7
ENG0120	CAI	Flight Instrument Malfunctions	0.8
ENG0121	MIL	CNI System	1.7
ENG0122	CAI	CNI System Malfunctions	1.0
ENG0123	MIL	Other T-45C Systems	1.0
ENG0124	MIL	INS/GPS Operation and Concepts	1.0
ENG0125	CAI	Display System and Malfunctions	1.5
ENG0126	MIL	Engine Start Procedures	1.0
ENG0127	MIL	Engineering Review	2.5
ENG0128	CAI Test	Engineering Block Exam	2.0

3. Syllabus Notes. None.

4. Discuss Items. None.

Blk #	Media	Title	Events	Hrs	Blk Name
CO11	CAI/MIL	Cockpit Orientation	5	2.0	CO

1. Prerequisite. ENG0128.

2. Events

CO1101	CAI	Engine Start and Poststart	0.4
CO1102	CAI	Multifunction Display and Navigation System Operation	0.4
CO1103	CAI	Display System (HUD)	0.4
CO1104	CAI	Waypoint Navigation Procedures	0.4
CO1105	MIL	Velocity Vector	0.4

3. Syllabus Notes. None.

4. Discuss Items. None.

Blk #	Media	Title	Events	Hrs	Blk Name
EP11	MIL/CAI	Emergency Procedures	11	7.9	EP

1. Prerequisite. CO1105.

2. Events

EP1101	MIL	Start, Ground, and Takeoff Emergency Procedures I	0.7
EP1102	MIL	Start, Ground, and Takeoff Emergency Procedures II	0.7
EP1103	MIL	Operational and Ejection Emergency Procedures	0.5
EP1104	MIL	Engine and Hydraulic Emergency Procedures I	0.7
EP1105	MIL	Engine and Hydraulic Emergency Procedures II	0.7
EP1106	CAI Test	Emergency Flight Procedures Exam I	1.0
EP1107	MIL	Canopy and Flight Control Emergency Procedures	0.5
EP1108	MIL	Electrical and Indicator Emergency Procedures I	0.7
EP1109	MIL	Electrical and Indicator Emergency Procedures II	0.7
EP1110	MIL	Operational and Landing Emergency Procedures	0.7
EP1111	CAI Test	Emergency Flight Procedures Exam II	1.0

3. Syllabus Notes. None.

4. Discuss Items. None.

Blk #	Media	Title	Events	Hrs	Blk Name
AER01	CAI/MIL	Aerodynamics	6	2.5	Aero

1. Prerequisite. ENG0128.

2. Events

AER0101	CAI	General Aeronautics Review	0.5
AER0102	MIL	High Speed Flight	0.25
AER0103	MIL	Slow Speed Flight, Stall and Spin, and AOA System	0.25
AER0104	MIL	Stability	0.25
AER0105	CAI	Engine Thrust and Thrust Curve Review	0.25
AER0106	MIL	NATOPS Performance Charts	1.0

3. Syllabus Notes. None.

4. Discuss Items. None.

Blk #	Media	Title	Events	Hrs	Blk Name
NAV01	Lab/MIL/ CAI	Instrument Navigation	8	2.25	INAV

1. Prerequisite. G0101.

2. Events

NAV0101	LAB	Review of FLIP and FAA Publications	0.25
NAV0102	MIL	Introduction to INAV and Voice Procedures	0.25
NAV0103	MIL	Departure and Terminal Procedures	0.25
NAV0104	CAI	Interpretation of High Altitude Instrument Approach Plates	0.25
NAV0105	LAB	Fuel, Weather, and Alternate Airfield Planning Lab	0.25
NAV0106	LAB	Flight Planning - Departure	0.25
NAV0107	LAB	Flight Planning - Enroute	0.25
NAV0108	LAB	Practical Problems	0.5

3. Syllabus Notes. None.

4. Discuss Items. None.

Blk #	Media	Title	Events	Hrs	Blk Name
FAM11	MIL/CAI	Familiarization Flight Procedures	3	3.0	FAMFP

1. Prerequisites

   a. EP1111.

   b. AER0106.

   c. NAV0108.

   d. G0105A-D (applicable CR Exam).

2. Events

FAM1101	MIL	Familiarization Flight Procedures I	1.0
FAM1102	MIL	Familiarization Flight Procedures II	1.0
FAM1103A	CAI Test	TW-2/Kingsville Familiarization Flight Procedures Exam	1.0
FAM1103B	CAI Test	TW-1/Meridian Familiarization Flight Procedures Exam	1.0
FAM1103C	P/P Exam	TW-6/Pensacola Familiarization Flight Procedures Exam	1.0

3. Syllabus Notes. Exam content is different for each location. IUTs shall complete applicable exam. TW-6/Pensacola IUT's enrolled at TW-1/2 shall complete the exam for that location. NFO IUTs complete TW-6 FFP Exam regardless of training location.

4. Discuss Items. None.

Blk #	Media	Title	Events	Hrs	Blk Name
NFM11	MIL/CAI	Night Familiarization Flight Procedures	3	2.0	NFMFP

1. Prerequisite. FAM1103A, FAM1103B, or FAM1103C (applicable FFP Exam).

2. Events

NFM1101	MIL	Night FAM Flight Procedures	0.5
NFM1102	MIL	Night Emergency Procedures	0.5
NFM1103A	CAI Test	Kingsville Night FAM Procedures Exam	1.0
NFM1103B	CAI Test	Meridian Night FAM Procedures Exam	1.0

3. Syllabus Notes. Exam content is different for each location. IUTs shall complete applicable exam. TW-6/Pensacola IUT's enrolled at TW-1/2 shall complete the exam for that location. Non-Strike IUT's (TW-6/TPS) are not required to complete NFM1103X.

4. Discuss Items. None.

Blk #	Media	Title	Events	Hrs	Blk Name
OCF11	MIL/CAI	OCF Procedures	2	2.0	OCFP

1. Prerequisite. FAM1102.

2. Events

OCF1101	MIL	Out-of-Control Flight	1.0
OCF1102	CAI Test	OCF Exam	1.0

3. Syllabus Notes. None.

4. Discuss Items. None.

Blk #	Media	Title	Events	Hrs	Blk Name
NA11	Exam	NATOPS Examinations	2	4.0	NATOPS

1. Prerequisite. FAM1102.

2. Events

NA1101	P/P Exam	NATOPS Open-Book Exam	2.0
NA1102	P/P Exam	NATOPS Closed-Book and SOP Exam	2.0

3. Syllabus Notes. None.

4. Discuss Items. None.

Blk #	Media	Title	Events	Hrs	Blk Name
FRM11	MIL/CAI	Section Formation Flight Procedures	6	3.0	FRMFP

1. Prerequisite. FAM1102.

2. Events

FRM1101	MIL	Formation Marshal, Takeoff, Rendezvous, Departure/ Climbout	0.5
FRM1102	MIL	Section Parade Formation	0.5
FRM1103	MIL	Section Formation Recovery, Approaches, Landing Configuration	0.25
FRM1104	MIL	Formation Section Cruise	0.25
FRM1105	MIL	Formation Emergencies	0.5
FRM1106	CAI Test	Formation Exam I	1.0

3. Syllabus Notes. Non-Strike IUT's (TW-6/TPS) are not required to complete FRM1106.

4. Discuss Items. None.

BLANK PAGE

Chapter III

NATOPS Training

1. Refresher Flight Training Philosophy. Allow IUT a chance to gain experience in the T-45C. Comply with T-45C NATOPS check-ride requirements.

2. Matrices. The following matrix is an overview of the entire NATOPS Stage. The purpose of this matrix is to provide the IUT and instructor the easiest way to track progress, regression, and overall status in relation to the MIF. In addition, there is a single matrix following each block description throughout this chapter.

3. NATOPS Stage MIF

Simulator Event
Check Event

NATOPS STAGE MANEUVER ITEM FILE														
CTS REF	**MANEUVER**	**NA3103**	**NA3202**	**NA3301**	**NA3401****	**NA3590**	**NA4103***	**NA4203***	**NA4301**	**NA4401****	**NA4501**	**NA4690**	**NA3690****	**NA4790****
1	General Knowledge/ Procedures	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+
2	Emergency Procedures	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+
3	Headwork/ Situational Awareness	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+
4	Basic Airwork	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+
4	Partial Panel Airwork		4+				4+						4+	4+

MIF continued on next page.

NATOPS STAGE MANEUVER ITEM FILE														
CTS REF	**MANEUVER**	**NA3103**	**NA3202**	**NA3301**	**NA3401****	**NA3590**	**NA4103***	**NA4203***	**NA4301**	**NA4401****	**NA4501**	**NA4690**	**NA3690****	**NA4790****
5	Mission Planning/ Briefing/ Debriefing	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+
6	Communications	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+
7	Ground Operations	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+
8	Flight Admin	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+
8	Course Rules							4+			4+			
2	Start Malfunctions	4+				4+								
2	Ground Emergencies	4+	4+			4+								
2	Aborted Takeoff	4+				4+								
2	Takeoff EPs	4+			4+	4+								
2	Engine EPs	4+		4+		4+								
2	Flight Control EPs	4+		4+										
2	Gear EPs	4+		4+	4+									
2	Electrical EPs	4+	4+			4+								
2	Hydraulic EPs	4+				4+								
2	ECS EPs	4+	4+											
2	Fuel System EPs	4+	4+											
2	Ejection	4+												

MIF continued on next page.

NATOPS STAGE MANEUVER ITEM FILE														
CTS REF	**MANEUVER**	**NA3103**	**NA3202**	**NA3301**	**NA3401****	**NA3590**	**NA4103***	**NA4203***	**NA4301**	**NA4401****	**NA4501**	**NA4690**	**NA3690****	**NA4790****
2	Swerve/Blown Tire on Landing	4+				4+								
2	Short-field Arrestment	4+				4+								
2	Rejected Landing/ Go-Around	4+				4+								
2	Lost Communications		4+											
2	Stuck Throttle Approach			4+										
9	Takeoff	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+
10	Departure/ Rendezvous	4+	4+	4+		4+	4+	4+		4+	4+	4+	4+	4+
11	Enroute Navigation	4+	4+				4+			4+			4+	4+
11	Nonsystem Point-to-Point Navigation		4+				4+						4+	4+
11	System Point-to-Point Navigation		4+				4+			4+			4+	4+
11	Intercept/ Maintain Course		4+				4+			4+			4+	4+
12	Descent/Field Entry	4+	4+			4+	4+	4+		4+		4+		
13	Holding		4+				4+						4+	4+

MIF continued on next page.

NATOPS STAGE MANEUVER ITEM FILE														
CTS REF	**MANEUVER**	**NA3103**	**NA3202**	**NA3301**	**NA3401****	**NA3590**	**NA4103***	**NA4203***	**NA4301**	**NA4401****	**NA4501**	**NA4690**	**NA3690****	**NA4790****
14	High Altitude Penetration						4+							
15	Precision Approach		4+				4+			4+			4+	4+
15	No-Gyro GCA		4+				4+						4+	4+
15 16 4	Partial Panel Approach		4+				4+						4+	4+
16	Non-Precision Approach		4+				4+			4+			4+	4+
17	Circling Approach		4+										4	4
17	Instrument-to-Visual Scan		4+							4+			4+	4+
18	Missed Approach		4+				4+						4+	4+
19	Emergency Instrument Approach												4+	4+
19	Low Oil Approach		4+				4+							
19	Min/Emergency Fuel Approach		4+				4+							
19	Precautionary Approach(es)	4+		4+	4+			4+	4		4+	4+		
19	Bird Strike/ Dirty PA	4+						4+				4		
19 21	PA to Full Stop							4+				4		

MIF continued on next page.

NATOPS STAGE MANEUVER ITEM FILE														
CTS REF	**MANEUVER**	**NA3103**	**NA3202**	**NA3301**	**NA3401****	**NA3590**	**NA4103***	**NA4203***	**NA4301**	**NA4401****	**NA4501**	**NA4690**	**NA3690****	**NA4790****
20	Straight-in Approach									4+				
20	VFR Landing Pattern	4+		4+	4+	4+		4+	4	4+	4+	4+		
20 4	Partial Panel Missed Approach		4+				4+						4+	4+
21	Landing/Touch-and-Go		4+		4+		4+	4+	4+	4+	4+	4+	4+	4+
21	Field Carrier Landing			4+						4+		4+		
21	NF Touch-and-Go	4+		4+				4+		4+		4+		
21	FF Roll-and-Go	4+				4+		4+				4+		
21	Half-Flap Roll-and-Go							4+						
21	NF Roll-and-Go					4+		4+				4+		
21	Crosswind Landings	4+										4		
21	No-HUD Landings	4+		4+				4+			4+	4+		
21	Full-Stop Landing	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+		
21	Full Stop with Blown Tire Non-arrested	4+												
21	No Flap Landings	4+												

MIF continued on next page.

NATOPS STAGE MANEUVER ITEM FILE														
CTS REF	**MANEUVER**	**NA3103**	**NA3202**	**NA3301**	**NA3401****	**NA3590**	**NA4103***	**NA4203***	**NA4301**	**NA4401****	**NA4501**	**NA4690**	**NA3690****	**NA4790****
21	Long Field Arrestment	4+												
22	Waveoff	4+		4+				4+		4+		4+		
23	S-3 Pattern		4+				4+							
24	Vertical Recovery	4+		4+		4+		4+			4+	4+		
24	Min Radius Turn							4+				4+		
25	Aileron Roll							4+						
25	Wingover							4+						
25	Barrel Roll							4+						
25	Aerobatics					4+		4+				4+		
25	Squirrel Cage							4+						
26	Unusual Attitude Recovery	4+	4+			4+		4+				4+		
27	Accelerated Stall							4+						
27	Break Turn Stall							4+						
27	Power Off Stall							4+						
27	Landing Attitude Maneuver							4+						
27	Landing Attitude Stall							4+						

MIF continued on next page.

NATOPS STAGE MANEUVER ITEM FILE														
CTS REF	**MANEUVER**	**NA3103**	**NA3202**	**NA3301**	**NA3401****	**NA3590**	**NA4103***	**NA4203***	**NA4301**	**NA4401****	**NA4501**	**NA4690**	**NA3690****	**NA4790****
27	Approach Turn Stall							4+						
27	Stall Series	4+						4+			4+	4+		
27	Pattern Stall and Recovery			4+										
27	High AOA/ Deep Stall Investigation/ Rudder-induced Departure			4+							4+			
27	70-Degree Nose-High Departure			4+							4+			
27	90-Degree Nose-High Departure			4+										
27	110-Degree Nose-High Departure			4+							4+			
27	Lateral Stick Adverse Yaw Departure			4+							4+			
27	Spin/Spin Recovery			4+										
28 9	Individual/ Interval Takeoff								4					
28	Section Takeoff				4+				4					

MIF continued on next page.

NATOPS STAGE MANEUVER ITEM FILE														
CTS REF	**MANEUVER**	**NA3103**	**NA3202**	**NA3301**	**NA3401****	**NA3590**	**NA4103***	**NA4203***	**NA4301**	**NA4401****	**NA4501**	**NA4690**	**NA3690****	**NA4790****
30	Parade				4+				4+					
30	Turns				4+				4+					
30	Crossunder				4+				4+					
30	TACAN Rendezvous				4+				4+					
30	Breakup and Rendezvous				4+				4+					
30	Underrun				4+				4+					
30	Running Rendezvous				4+				4					
30	Cruise				4+				4					
30	Section Break				4+				4					
31	Section Approach/ Missed Approach as Wing				4+				4+					
31	Section Approach: Touch-and-Go/ Rejoin as Wing				4+				4+					
32	Tail Chase								4					

*NFO IUTs complete NA4101-2 and NA4201-2; Pilot IUTs complete NA4101-3 and NA4201-3.

**Only Pilot IUTs complete NA3401, NA4401, NA3690 (if applicable), and NA4790.

Blk #	Media	Title	Events	Hrs	H/X
NA31	OFT	Cockpit Orientation/Familiarization /Emergency Procedures	3	4.5	1.5

1. Prerequisites

a. FAM1103A, FAM1103B, or FAM1103C (applicable FFP Exam)(Pilot).

b. NFM1102 (Night Emergency Procedures)(NFO).

2. Syllabus Notes

a. Pilot and NFO IUTs shall complete all events in this block.

b. NFO IUTs should attempt to fly these events to the maximum extent practicable.

c. Pilot IUTs shall execute all checklists and procedures IAW "single seat" mindset.

d. NFO IUTs shall execute NFO crew coordination checklists and procedures.

e. The IUT will perform the following procedures IAW FTI, NATOPS, and SOP on the indicated event:

NA3101
Canopy/ejection seat preflight, strap-in procedures, cockpit preflight checklist, prestart checklist, aircraft start, post-start checklist, cockpit display management, pre-taxi checklist, ground communications, taxi checklist, aircraft taxi, flight instrument checks, takeoff clearance, takeoff checklist, engine checks, takeoff, departure communications, 10,000-feet checks/15-minute report, enroute communications, descent/penetration checklist, approach control communications, VFR approach to pattern initial, landing checklist, VFR Landing Pattern, tower communications, FF Touch-and-Go, FF Roll-and-Go, Full-Stop Landing, after landing checklist, shutdown checklist, normal egress procedures.

Malfunctions/EPs: Abort, Engine Failure (seizure), NF Touch-and-Go, NF Roll-and-Go, Precautionary Approaches, Controlled Ejection, swerve after touchdown, landing rollout with blown tire.

NA3102
All normal checklists, full system utilization, VFR Landing Pattern, Precautionary Approaches (Straight-In/Abeam), Full-Stop Landing.

Malfunctions/EPs: Start malfunctions (no READY light, low oil pressure on start, bleed valve failure), Abnormal Start (wet start, hot start, hung start), ground emergency communications, Clear Engine Procedure, Emergency Shutdown/Egress, Tailpipe Fire After Shutdown, Engine Failure (takeoff, flameout), Assisted Airstart, Successful Airstart, EGT/RPM WARNING (engine overspeed), FIRE WARNING (engine fire on start, engine fire no secondary indications, engine fire with secondary indications), ACCEL Caution, TP HOT Caution, Precautionary Approach (Straight-In/Abeam).

NA3103
All normal checklists, area/MOA entry/exit, vertical recovery, aerobatic maneuvers, stall maneuvers, Unusual Attitude Recovery (VMC), VFR Landing Pattern, Crosswind Landings, Waveoff, No-HUD Landings, No Flap Landings, Precautionary Approach (Overhead Parallel/Perpendicular), Full-Stop Landing.

Malfunctions/EPs: Compressor Stall (High and Low Altitude), Failure to Relight, Incorrect or Uncommanded Engine Response, Vibrations, GTS FIRE WARNING, Hydraulic system malfunctions (HYD FAIL WARNING, HYD 1 EDP failure, HYD 2 EDP failure, HYD 1 and 2 failure RAT OK, total HYD failure, accumulator failure), gear emergency extend failure, OIL PRESS WARNING, ECA 2 Caution, RAT Caution (uncommanded RAT extension), Precautionary Approach (Overhead Parallel/Perpendicular), Half Flap Fly-In Arrestment, Half Flap Roll-In Arrestment.

3. Special Syllabus Requirements. None.

4. Discuss Items

NA3101
QOD, ground signals, READY Advisory, normal checklists.

NA3102
QOD, Start malfunctions, abnormal start indications.

NA3103
QOD, Stall Series, Overhead PA profiles.

5. Block MIF

CTS REF	MANEUVER	NA3103
1	General Knowledge/Procedures	4+
2	Emergency Procedures	4+
3	Headwork/Situational Awareness	4+
4	Basic Airwork	4+
5	Mission Planning/Briefing/ Debriefing	4+
6	Communications	4+
7	Ground Operations	4+
8	Flight Admin	4+
2	Start Malfunctions	4+
2	Ground Emergencies	4+
2	Aborted Takeoff	4+
2	Takeoff EPs	4+
2	Engine EPs	4+
2	Flight Control EPs	4+
2	Gear EPs	4+
2	Electrical EPs	4+
2	Hydraulic EPs	4+
2	ECS EPs	4+
2	Fuel System EPs	4+

MIF continued on next page.

CTS REF	MANEUVER	NA3103
2	Ejection	4+
2	Swerve/Blown Tire on Landing	4+
2	Short-field Arrestment	4+
2	Rejected Landing/Go-Around	4+
9	Takeoff	4+
10	Departure/Rendezvous	4+
11	Enroute Navigation	4+
12	Descent/Field Entry	4+
19	Precautionary Approach(es)	4+
19	Bird Strike/Dirty PA	4+
20	VFR Landing Pattern	4+
21	NF Touch-and-Go	4+
21	FF Roll-and-Go	4+
21	Crosswind Landings	4+
21	No-HUD Landings	4+
21	Full-Stop Landing	4+
21	Full Stop with Blown Tire Non-arrested	4+
21	No Flap Landings	4+
21	Long Field Arrestment	4+
22	Waveoff	4+
24	Vertical Recovery	4+
26	Unusual Attitude Recovery	4+
27	Stall Series	4+

Blk #	Media	Title	Events	Hrs	H/X
NA32	OFT	NATOPS Instrument	2	3.0	1.5

1. Prerequisite. NA3103.

2. Syllabus Notes

a. Pilot and NFO IUTs shall complete all events in this block.

b. NFO IUTs should attempt to fly these events to the maximum extent practicable.

c. Pilot IUTs shall execute all checklists and procedures IAW "single seat" mindset.

d. NFO IUTs shall execute NFO crew coordination checklists and procedures.

e. During this block, IUTs must fly at least the approaches listed below (approaches may be combined, e.g., a Low Oil PAR may be logged as a PAR and a Low Oil Approach):

TACAN/VOR DME	1 full panel
	1 partial panel
ILS	1 full panel
	1 partial panel
PAR	1 partial panel
No-Gyro GCA	1
Low Oil Approach	1
Min/Emergency Fuel Appr.	1

f. The IUT will perform the following procedures IAW FTI, NATOPS, and SOP on the indicated event:

NA3201 (Basic Instrument maneuvers)
All normal checklists, instrument takeoff, S-3 pattern, Unusual Attitude Recovery (IMC), instrument approaches, LOW OIL approach.

Malfunctions/EPs: SAHRS/GINA failure or erroneous data, DEU Degrade, DEU Failure, GINA Failure, SADS Degrade/Failure, MFD failure, Pitot Static Malfunction, Total Electrical Failure, Electrical Fire, Elimination of Smoke or Fumes from

Cockpit, GENERATOR WARNING, OXYGEN WARNING, AC INV Caution, engine fire on shutdown.

NA3202 (Instrument Navigation)
All normal checklists, instrument takeoff, point-to-point, non-system point-to-point, TACAN/VOR tracking, Unusual Attitude Recovery (IMC), instrument approaches, min/emergency fuel approach.

Malfunctions/EPs: ECS failure, AV HOT Caution, Excessive Fuel Flow/Suspected Fuel Leak, FUEL Caution, F PRES Caution, LP PUMP Caution, LP fuel pump failure, boost pump failure, initial shot failure, BINGO profile.

3. Special Syllabus Requirements. None.

4. Discuss Items

NA3201
QOD, DEU Overheat, CANOPY Caution, M FUEL Caution, ILS/LOCALIZER/POSITION/SIM MODE Advisories.

NA3202
QOD, Fogging of Windscreen/Fog in Crew Station, Cabin Temperature Failure, Hypoxia/OBOGS Contamination, Loss of Canopy, CABIN ALT WARNING.

5. Block MIF

CTS REF	MANEUVER	NA3202
1	General Knowledge/Procedures	4+
2	Emergency Procedures	4+
3	Headwork/Situational Awareness	4+
4	Basic Airwork	4+
4	Partial Panel Airwork	4+
5	Mission Planning/Briefing/ Debriefing	4+
6	Communications	4+
7	Ground Operations	4+

MIF continued on next page.

CTS REF	MANEUVER	NA3202
8	Flight Admin	4+
2	Ground Emergencies	4+
2	Electrical EPs	4+
2	ECS EPs	4+
2	Fuel System EPs	4+
2	Lost Communications	4+
9	Takeoff	4+
10	Departure/Rendezvous	4+
11	Enroute Navigation	4+
11	Nonsystem Point-to-Point Navigation	4+
11	System Point-to-Point Navigation	4+
11	Intercept/Maintain Course	4+
12	Descent/Field Entry	4+
13	Holding	4+
15	Precision Approach	4+
15	No-Gyro GCA	4+
15 16 4	Partial Panel Approach	4+
16	Non-Precision Approach	4+
17	Circling Approach	4+
17	Instrument-to-Visual Scan	4+
18	Missed Approach	4+
19	Low Oil Approach	4+
19	Min/Emergency Fuel Approach	4+
20 4	Partial Panel Missed Approach	4+
21	Landing/Touch-and-Go	4+
21	Full-Stop Landing	4+
23	S-3 Pattern	4+
26	Unusual Attitude Recovery	4+

Blk #	Media	Title	Events	Hrs	H/X
NA33	OFT	Out-of-Control Flight (OCF)	1	1.5	1.5

1. Prerequisites

a. NA3103.

b. OCF1102 (OCF Exam).

2. Syllabus Notes

a. NFO IUTs shall operate flight controls for this event to the maximum extent practicable.

b. Pilot IUTs shall execute all checklists and procedures IAW "single seat" mindset.

c. NFO IUTs shall execute NFO crew coordination checklists and procedures.

d. The IUT will perform the following procedures IAW FTI, NATOPS, and SOP on this event: all normal checklists, VFR Landing Pattern, NF Touch-and-Go, Vertical Recovery, departure maneuvers, PA to Full Stop. Two stuck throttle approaches are required (high and low).

Malfunctions/EPs: Engine stalls, Engine Vibration, Engine Seizure, Engine Flameout, Straight-In Stuck Throttle, Stuck Throttle Approach, Overhead Stuck Throttle, brake failure after touchdown, brake accumulator failure, Long Field Arrestment, Short Field Arrestment, Trim malfunctions (Trim Failure, Trim Runaway rudder/elevator/stabilator, Rudder Trim Hardover), Uncommanded Roll/Yaw, CONTR AUG failure, Jammed or Binding Flight Controls, Departure/Spin Procedure, Flaps/Slats Failure, speedbrake fails to retract, Controllability Check, landing with no NWS, Minimum speed rotation on roll-and-go, minimum rollout landing, Ground ejection scenario.

3. Special Syllabus Requirements. None.

4. Discuss Items. QOD, locked-in compressor stall, spin and spin recovery characteristics and indications, SLATS Caution, MISCOMPARE Advisory.

5. Block MIF

CTS REF	MANEUVER	NA3301
1	General Knowledge/Procedures	4+
2	Emergency Procedures	4+
3	Headwork/Situational Awareness	4+
4	Basic Airwork	4+
5	Mission Planning/Briefing/ Debriefing	4+
6	Communications	4+
7	Ground Operations	4+
8	Flight Admin	4+
2	Engine EPs	4+
2	Flight Control EPs	4+
2	Gear EPs	4+
2	Stuck Throttle Approach	4+
9	Takeoff	4+
10	Departure/Rendezvous	4+
19	Precautionary Approach(es)	4+
20	VFR Landing Pattern	4+
21	Field Carrier Landing	4+
21	NF Touch-and-Go	4+
21	No-HUD Landings	4+
21	Full-Stop Landing	4+
22	Waveoff	4+
24	Vertical Recovery	4+
27	Pattern Stall and Recovery	4+
27	High AOA/Deep Stall Investigation/Rudder-induced Departure	4+
27	70-Degree Nose-High Departure	4+
27	90-Degree Nose-High Departure	4+

MIF continued on next page.

CTS REF	MANEUVER	NA3301
27	110-Degree Nose-High Departure	4+
27	Lateral Stick Adverse Yaw Departure	4+
27	Spin/Spin Recovery	4+

Blk #	Media	Title	Events	Hrs	H/X
NA34	OFT	NATOPS Section Formation	1	1.5	1.5

1. Prerequisites

a. NA3103.

b. FRM1106 (Formation Exam).

2. Syllabus Notes

a. NFO IUTs do not complete this block.

b. Pilot IUTs shall execute all checklists and procedures IAW "single seat" mindset.

c. The IUT will perform the following procedures IAW FTI, NATOPS, and SOP on this event: all normal checklists, Individual/Interval Takeoff, Section Takeoff, formation maneuvers, Section Approach/Missed Approach as Wing, Section Approach: Touch-and-Go/ Rejoin as Wing, VFR Landing Pattern, Full-Stop Landing.

Malfunctions/EPs: Landing Gear Unsafe/Fail to Extend, Landing Gear Unsafe/Fail to Retract, Landing with NWS AUG Failure, Loss of Directional Control (blown tire during takeoff, NWS Caution), Landing with Blown Tire(s), LBAR WARNING, LDG GEAR (Handle) WARNING, WHEELS WARNING, DOOR Caution, SKID Caution.

3. Special Syllabus Requirements. None.

4. Discuss Items. QOD, formation check points, lost sight procedures, and underrun, NORDO procedures.

5. Block MIF

CTS REF	MANEUVER	NA3401
1	General Knowledge/Procedures	4+
2	Emergency Procedures	4+
3	Headwork/Situational Awareness	4+
4	Basic Airwork	4+
5	Mission Planning/Briefing/ Debriefing	4+
6	Communications	4+
7	Ground Operations	4+
8	Flight Admin	4+
2	Takeoff EPs	4+
2	Gear EPs	4+
9	Takeoff	4+
19	Precautionary Approach(es)	4+
20	VFR Landing Pattern	4+
21	Landing/Touch-and-Go	4+
21	Full-Stop Landing	4+
28	Section Takeoff	4+
30	Parade	4+
30	Turns	4+
30	Crossunder	4+
30	TACAN Rendezvous	4+
30	Breakup and Rendezvous	4+
30	Underrun	4+
30	Running Rendezvous	4+
30	Cruise	4+
30	Section Break	4+
31	Section Approach/Missed Approach as Wing	4+
31	Section Approach: Touch-and-Go/ Rejoin as Wing	4+

Blk #	Media	Title	Events	Hrs	H/X
NA35	OFT	NATOPS EP/Simulator Training Check	1	1.5	1.5

1. Prerequisites

a. NA3202, NA3301, and NA3401 (Pilot).

b. NA3202 and NA3301 (NFO).

2. Syllabus Notes

a. If practicable, this event should be completed just prior to the NATOPS Check Flight.

b. NFO IUTs should attempt to fly this event to the maximum extent practicable.

c. Pilot IUTs shall execute all checklists and procedures IAW "single seat" mindset.

d. NFO IUTs shall execute NFO crew coordination checklists and procedures.

e. The IUT will perform the following procedures IAW FTI, NATOPS, and SOP on this event: all normal checklists, area/MOA entry/exit, vertical recovery, aerobatic maneuvers, stall maneuvers, Unusual Attitude Recovery (VMC), VFR Landing Pattern, NF Touch-and-Go, FF Roll-and-Go, NF Roll-and-Go, Precautionary Approach(es), miscellaneous ground and airborne emergency procedures.

Malfunctions/EPs (minimum): Abnormal start (hot, hung or wet), birdstrike, compressor stall, stuck throttle (90-94%), OIL PRESS WARNING (no seizure), blown tire on takeoff roll, HYD 1 and 2 failure with operable RAT, generator failure with no reset, FIRE WARNING, Ejection.

3. Special Syllabus Requirements. None.

4. Discuss Items. Any major aircraft system, any T-45 limitations, and any immediate action emergency procedures, Ejection criteria, Abort criteria, Egress procedures, unresponsive engine/stuck throttle.

5. Block MIF

CTS REF	MANEUVER	NA3590
1	General Knowledge/Procedures	4+
2	Emergency Procedures	4+
3	Headwork/Situational Awareness	4+
4	Basic Airwork	4+
5	Mission Planning/Briefing/ Debriefing	4+
6	Communications	4+
7	Ground Operations	4+
8	Flight Admin	4+
2	Start Malfunctions	4+
2	Ground Emergencies	4+
2	Aborted Takeoff	4+
2	Takeoff EPs	4+
2	Engine EPs	4+
2	Electrical EPs	4+
2	Hydraulic EPs	4+
2	Swerve/Blown Tire on Landing	4+
2	Short-field Arrestment	4+
2	Rejected Landing/Go-Around	4+
9	Takeoff	4+
10	Departure/Rendezvous	4+
12	Descent/Field Entry	4+
20	VFR Landing Pattern	4+
21	FF Roll-and-Go	4+
21	NF Roll-and-Go	4+
21	Full-Stop Landing	4+
24	Vertical Recovery	4+
25	Aerobatics	4+
26	Unusual Attitude Recovery	4+

Blk #	Media	Title	Events	Hrs	H/X
NA41	T-45C	NATOPS Instrument	3	4.2	1.4

1. Prerequisites

a. NA3202.

b. G0102-3 (NACES, Ejection Seat).

2. Syllabus Notes

a. Pilot IUTs shall occupy the front cockpit and execute all checklists and procedures IAW "single seat" mindset.

b. NFO IUTs shall occupy the rear cockpit on all events and execute NFO crew coordination checklists and procedures.

c. NFO IUTs complete NA4101-02 only. NA4102 may be flown at night.

d. During this block, IUTs must fly at least the approaches listed below (approaches may be combined, e.g., a Low Oil PAR may be logged as a PAR and a Low Oil Approach):

High Altitude Penetration	1
TACAN/VOR DME	1 full panel
	1 partial panel
VOR	1
ASR	1
ILS	1 full panel
	1 partial panel
PAR	1 partial panel
No-Gyro GCA	1
Low Oil Approach	1
Min/Emergency Fuel Appr.	1

e. The IUT will perform the following procedures IAW FTI, NATOPS, and SOP on this event:

NA4101
UA's (IMC), S-3 pattern, TAC/VOR Holding.

NA4102
Point to point navigation (system and non-system).

3. Special Syllabus Requirements. None.

4. Discuss Items

NA4101
QOD, ground signals, local area procedures.

NA4102
QOD, emergency instrument approaches.

NA4103
QOD, Circling approach procedures.

5. Block MIF

CTS REF	MANEUVER	NA4103
1	General Knowledge/Procedures	4+
2	Emergency Procedures	4+
3	Headwork/Situational Awareness	4+
4	Basic Airwork	4+
4	Partial Panel Airwork	4+
5	Mission Planning/Briefing/ Debriefing	4+
6	Communications	4+
7	Ground Operations	4+
8	Flight Admin	4+
9	Takeoff	4+
10	Departure/Rendezvous	4+
11	Enroute Navigation	4+
11	Nonsystem Point-to-Point Navigation	4+
11	System Point-to-Point Navigation	4+

MIF continued on next page.

CTS REF	MANEUVER	NA4103
11	Intercept/Maintain Course	4+
12	Descent/Field Entry	4+
13	Holding	4+
14	High Altitude Penetration	4+
15	Precision Approach	4+
15	No-Gyro GCA	4+
15 16 4	Partial Panel Approach	4+
16	Non-Precision Approach	4+
18	Missed Approach	4+
19	Low Oil Approach	4+
19	Min/Emergency Fuel Approach	4+
20 4	Partial Panel Missed Approach	4+
21	Landing/Touch-and-Go	4+
21	Full-Stop Landing	4+
23	S-3 Pattern	4+

Blk #	Media	Title	Events	Hrs	H/X
NA42	T-45C	NATOPS Familiarization	3	3.6	1.2

1. Prerequisites

a. NA3202.

b. G0102-3 (NACES, Ejection Seat).

c. NA4301, NA4401, and NA4501 prior to NA4203 (Pilot).

2. Syllabus Notes

a. Pilot IUTs shall occupy the front cockpit and execute all checklists and procedures IAW "single seat" mindset.

b. NFO IUTs shall occupy the rear cockpit on all events and execute NFO crew coordination checklists and procedures.

c. NFO IUTs complete NA4201-02 only.

d. Perform the following maneuvers on each flight in this block: LAS, ATS, Unusual Attitudes (VMC), Precautionary Approach.

e. During this block, Pilot IUTs must fly at least the approaches listed below:

Overhead PA	1 parallel 1 perpendicular
Straight-in PA	2
Pattern PA	1 low key 2 modified low key

3. Special Syllabus Requirements. None.

4. Discuss Items

NA4201
QOD, engine surge/compressor stall, crosswind landing technique, and inadvertent engine shutdown (finger lifts).

NA4202
QOD, PA profiles and configuration management.

NA4203
QOD and short-field arrestment procedures.

5. Block MIF

CTS REF	MANEUVER	NA4203
1	General Knowledge/Procedures	4+
2	Emergency Procedures	4+
3	Headwork/Situational Awareness	4+
4	Basic Airwork	4+
5	Mission Planning/Briefing/ Debriefing	4+
6	Communications	4+
7	Ground Operations	4+
8	Flight Admin	4+
8	Course Rules	4+
9	Takeoff	4+
10	Departure/Rendezvous	4+
12	Descent/Field Entry	4+
19	Precautionary Approach(es)	4+
19	Bird Strike/Dirty PA	4+
19 21	PA to Full Stop	4+
20	VFR Landing Pattern	4+
21	Landing/Touch-and-Go	4+
21	NF Touch-and-Go	4+
21	FF Roll-and-Go	4+
21	Half-Flap Roll-and-Go	4+

MIF continued on next page.

CTS REF	MANEUVER	NA4203
21	NF Roll-and-Go	4+
21	No-HUD Landings	4+
21	Full-Stop Landing	4+
22	Waveoff	4+
24	Vertical Recovery	4+
24	Min Radius Turn	4+
25	Aileron Roll	4+
25	Wingover	4+
25	Barrel Roll	4+
25	Aerobatics	4+
25	Squirrel Cage	4+
26	Unusual Attitude Recovery	4+
27	Accelerated Stall	4+
27	Break Turn Stall	4+
27	Power Off Stall	4+
27	Landing Attitude Maneuver	4+
27	Landing Attitude Stall	4+
27	Approach Turn Stall	4+
27	Stall Series	4+

Blk #	Media	Title	Events	Hrs	H/X
NA43	T-45C	NATOPS Section Formation	1	1.2	1.2

1. Prerequisites

a. NA3401, NA4103, and NA4202 (Pilot).

b. FRM1105 (Formation Emergencies), NA4102 and NA4202 (NFO).

2. Syllabus Notes

a. Pilot IUTs shall occupy the front cockpit and execute all checklists and procedures IAW "single seat" mindset.

b. NFO IUTs shall occupy the rear cockpit and execute NFO crew coordination checklists and procedures.

c. This event will be accomplished in two-plane formation. If Pilot and NFO IUT combined in section, Pilot IUT will be wingman and NFO IUT will occupy rear cockpit of lead aircraft.

3. Special Syllabus Requirements. None.

4. Discuss Item. QOD and section approach weather requirements.

5. Block MIF

CTS REF	MANEUVER	NA4301
1	General Knowledge/Procedures	4+
2	Emergency Procedures	4+
3	Headwork/Situational Awareness	4+
4	Basic Airwork	4+
5	Mission Planning/Briefing/ Debriefing	4+
6	Communications	4+
7	Ground Operations	4+
8	Flight Admin	4+
9	Takeoff	4+
19	Precautionary Approach(es)	4
20	VFR Landing Pattern	4
21	Landing/Touch-and-Go	4+
21	Full-Stop Landing	4+
28 9	Individual/ Interval Takeoff	4
28	Section Takeoff	4
30	Parade	4+
30	Turns	4+
30	Crossunder	4+
30	TACAN Rendezvous	4+
30	Breakup and Rendezvous	4+
30	Underrun	4+
30	Running Rendezvous	4
30	Cruise	4
30	Section Break	4
31	Section Approach/Missed Approach as Wing	4+
31	Section Approach: Touch-and-Go/ Rejoin as Wing	4+
32	Tail Chase	4

Blk #	Media	Title	Events	Hrs	H/X
NA44	T-45C	NATOPS Night Familiarization	1	1.2	1.2

1. Prerequisites

a. NA4103.

b. NA4202.

c. NFM1103A or NFM1103B (applicable Night FAM Procedures Exam).

2. Syllabus Notes

a. Pilot IUTs shall occupy the front cockpit and execute all checklists and procedures IAW "single seat" mindset.

b. NFO IUTs do not complete this block.

c. Flight shall takeoff no earlier than 30 minutes after sunset.

d. The IUT shall perform the following procedures IAW FTI, NATOPS, and SOP on this event: instrument approach to touch and go (not at home field), overhead recovery, NO FLAP straight in, NO FLAP touch and go, VFR landing pattern.

3. Special Syllabus Requirements. None.

4. Discuss Items. Electrical and lighting systems and limitations, airport lighting, and ALDIS lamp signals.

5. Block MIF

CTS REF	MANEUVER	NA4401
1	General Knowledge/Procedures	4+
2	Emergency Procedures	4+
3	Headwork/Situational Awareness	4+
4	Basic Airwork	4+
5	Mission Planning/Briefing/ Debriefing	4+
6	Communications	4+
7	Ground Operations	4+
8	Flight Admin	4+
9	Takeoff	4+
10	Departure/Rendezvous	4+
11	Enroute Navigation	4+
11	System Point-to-Point Navigation	4+
11	Intercept/Maintain Course	4+
12	Descent/Field Entry	4+
15	Precision Approach	4+
16	Non-Precision Approach	4+
17	Instrument-to-Visual Scan	4+
20	Straight-in Approach	4+
20	VFR Landing Pattern	4+
21	Landing/Touch-and-Go	4+
21	Field Carrier Landing	4+
21	NF Touch-and-Go	4+
21	Full-Stop Landing	4+
22	Waveoff	4+

Blk #	Media	Title	Events	Hrs	H/X
NA45	T-45C	NATOPS Out-of-Control Flight (OCF) Training	1	0.9	0.9

1. Prerequisites

a. NA3301.

b. NA4103 (Pilot).

c. NA4202.

d. NA4102 (NFO).

2. Syllabus Notes

a. Pilot IUTs shall occupy the front cockpit and execute all checklists and procedures IAW "single seat" mindset.

b. NFO IUTs shall occupy the rear cockpit and execute NFO crew coordination checklists and procedures.

3. Special Syllabus Requirements. None.

4. Discuss Items. QOD, engine limitations, airstart procedures.

5. Block MIF

CTS REF	MANEUVER	NA4501
1	General Knowledge/Procedures	4+
2	Emergency Procedures	4+
3	Headwork/Situational Awareness	4+
4	Basic Airwork	4+
5	Mission Planning/Briefing/ Debriefing	4+
6	Communications	4+
7	Ground Operations	4+
8	Flight Admin	4+
8	Course Rules	4+
9	Takeoff	4+
10	Departure/Rendezvous	4+
19	Precautionary Approach(es)	4+
20	VFR Landing Pattern	4+
21	Landing/Touch-and-Go	4+
21	No-HUD Landings	4+
21	Full-Stop Landing	4+
24	Vertical Recovery	4+
27	Stall Series	4+
27	High AOA/Deep Stall Investigation/Rudder-induced Departure	4+
27	70-Degree Nose-High Departure	4+
27	110-Degree Nose-High Departure	4+
27	Lateral Stick Adverse Yaw Departure	4+

Blk #	Media	Title	Events	Hrs	H/X
NA46	T-45C	NATOPS Check Flight	1	1.2	1.2

1. Prerequisites

a. NA4203 (Pilot).

b. NA4301 and NA4501 (NFO).

c. NA1101-2 (NATOPS Exams).

d. NA3590.

2. Syllabus Notes

a. Pilot IUTs shall execute all checklists and procedures IAW "single seat" mindset.

b. NFO IUTs shall occupy the rear cockpit and execute NFO crew coordination checklists and procedures.

c. NATOPS open- and closed-book exams, immediate-action emergency procedures and limitations exam, and course rules exam shall be completed prior to execution of this event.

d. If annual CRM flight evaluation is conducted in conjunction with the NATOPS Check Flight, it shall be noted in the remarks section of the OPNAVINST 3710/7 NATOPS Rating Request Form.

e. The IUT shall perform the following procedures IAW FTI, NATOPS, and SOP to complete this event: LAS, ATS, UA (VMC), 2 PAs (1 modified, 1 High-Key or Low-Key or Straight-In), NO NWS Roll-and-Go.

f. Weather minimums of 3000/3 required to complete.

3. Special Syllabus Requirements. None.

4. Discuss Items. Any aircraft system, any emergency procedure or limitation, takeoff and landing data calculation check, and publication review.

5. Block MIF

CTS REF	MANEUVER	NA4690
1	General Knowledge/Procedures	4+
2	Emergency Procedures	4+
3	Headwork/Situational Awareness	4+
4	Basic Airwork	4+
5	Mission Planning/Briefing/ Debriefing	4+
6	Communications	4+
7	Ground Operations	4+
8	Flight Admin	4+
9	Takeoff	4+
10	Departure/Rendezvous	4+
12	Descent/Field Entry	4+
19	Precautionary Approach(es)	4+
19	Bird Strike/Dirty PA	4
19 21	PA to Full Stop	4
20	VFR Landing Pattern	4+
21	Landing/Touch-and-Go	4+
21	Field Carrier Landing	4+
21	NF Touch-and-Go	4+
21	FF Roll-and-Go	4+
21	NF Roll-and-Go	4+
21	Crosswind Landings	4
21	No-HUD Landings	4+
21	Full-Stop Landing	4+
22	Waveoff	4+
24	Vertical Recovery	4+
24	Min Radius Turn	4+

MIF continued on next page.

CTS REF	MANEUVER	NA4690
25	Aerobatics	4+
26	Unusual Attitude Recovery	4+
27	Stall Series	4+

Blk #	Media	Title	Events	Hrs	H/X
NA36	OFT	NATOPS Instrument Check in Simulator	1	1.2	1.2

1. Prerequisites

a. NA4690.

b. G0201-3 (IGS, METRO Review, IGS Exam) are required for initial qualification.

2. Syllabus Notes

a. Pilot IUTs shall occupy the front cockpit and execute all checklists and procedures IAW "single seat" mindset.

b. If annual CRM flight evaluation is conducted in conjunction with the NATOPS Instrument Ratings Check Flight, it shall be noted in the remarks section of the OPNAVINST 3710/2 NATOPS Instrument Rating Request Form.

c. NFO IUTs do not complete this block.

3. Special Syllabus Requirements. None.

4. Discuss Items. 3710.7U instrument planning requirements and restrictions, and local IFR NORDO approach procedures.

5. Block MIF

CTS REF	MANEUVER	NA3690
1	General Knowledge/Procedures	4+
2	Emergency Procedures	4+
3	Headwork/Situational Awareness	4+
4	Basic Airwork	4+
4	Partial Panel Airwork	4+
5	Mission Planning/Briefing/ Debriefing	4+
6	Communications	4+
7	Ground Operations	4+
8	Flight Admin	4+
9	Takeoff	4+
10	Departure/Rendezvous	4+
11	Enroute Navigation	4+
11	Nonsystem Point-to-Point Navigation	4+
11	System Point-to-Point Navigation	4+
11	Intercept/Maintain Course	4+
13	Holding	4+
15	Precision Approach	4+
15	No-Gyro GCA	4+
15 16 4	Partial Panel Approach	4+
16	Non-Precision Approach	4+
17	Circling Approach	4
17	Instrument-to-Visual Scan	4+
18	Missed Approach	4+
19	Emergency Instrument Approach	4+
20 4	Partial Panel Missed Approach	4+
21	Landing/Touch-and-Go	4+

Blk #	Media	Title	Events	Hrs	H/X
NA47	T-45C	NATOPS Instrument Check Flight	1	1.2	1.2

1. Prerequisites

a. NA4690.

b. G0201-3 (IGS, METRO Review, IGS Exam).

2. Syllabus Notes

a. For Strike IUTs (TW-1/2), initial NATOPS Instrument Check will be accomplished in follow on IUT training.

b. NFO IUTs do not complete this block.

c. Pilot IUTs shall occupy the front cockpit and execute all checklists and procedures IAW "single seat" mindset.

d. If annual CRM flight evaluation is conducted in conjunction with the NATOPS Instrument Ratings Check Flight, it shall be noted in the remarks section of the OPNAVINST 3710/2 NATOPS Instrument Rating Request Form.

3. Special Syllabus Requirements. None.

4. Discuss Items. 3710.7U instrument planning requirements and restrictions, and local IFR NORDO approach procedures.

5. Block MIF

CTS REF	MANEUVER	NA4790
1	General Knowledge/Procedures	4+
2	Emergency Procedures	4+
3	Headwork/Situational Awareness	4+
4	Basic Airwork	4+
4	Partial Panel Airwork	4+
5	Mission Planning/Briefing/ Debriefing	4+
6	Communications	4+
7	Ground Operations	4+
8	Flight Admin	4+
9	Takeoff	4+
10	Departure/Rendezvous	4+
11	Enroute Navigation	4+
11	Nonsystem Point-to-Point Navigation	4+
11	System Point-to-Point Navigation	4+
11	Intercept/Maintain Course	4+
13	Holding	4+
15	Precision Approach	4+
15	No-Gyro GCA	4+
15 16 4	Partial Panel Approach	4+
16	Non-Precision Approach	4+
17	Circling Approach	4
17	Instrument-to-Visual Scan	4+
18	Missed Approach	4+
19	Emergency Instrument Approach	4+
20 4	Partial Panel Missed Approach	4+
21	Landing/Touch-and-Go	4+

BLANK PAGE

Chapter IV

Contact Training

This chapter does not apply to the T-45C NATOPS IUT curriculum.

BLANK PAGE

Chapter V

Instrument Training

This chapter does not apply to the T-45C NATOPS IUT curriculum.

BLANK PAGE

Chapter VI

Navigation Training

This chapter does not apply to the T-45C NATOPS IUT curriculum.

BLANK PAGE

Chapter VII

Formation Training

This chapter does not apply to the T-45C NATOPS IUT curriculum.

BLANK PAGE

Chapter VIII

Tactical Training

This chapter does not apply to the T-45C NATOPS IUT curriculum.

BLANK PAGE

Chapter IX

Course Training Standards (CTS)

1. Purpose. These standards outline the tasks and proficiency required of IUTs in T-45C NATOPS IUT.

2. IUT Duties and Responsibilities

a. Plan or manage the overall mission as appropriate.

b. Ensure proper aircraft preflight inspection is completed and aircraft is properly equipped for the assigned mission.

c. Operate the aircraft or aircraft systems, as applicable, to accomplish the mission using sound judgment and airmanship.

3. General Standards

a. Achieve training standards to be NATOPS qualified in T-45C aircraft.

b. Unless otherwise specified, use ***Basic Airwork/Basic Airwork Recognition (BAW/BAR)*** standards for all items with altitude, airspeed, or heading parameters.

c. "Standard" equates to ***Qualified*** (Q)/**Good** (G/4).

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

e. 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 IUT progression to meet required standards prior to phase completion. SIs shall evaluate IUT performance against 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 Instructor Under Training…"

6. Course Training Standards

BEHAVIOR STATEMENT	STANDARDS
1. General Knowledge/Procedures	
• Demonstrate knowledge of aircraft systems, procedures, and associated directives and instructions.	• Demonstrates a thorough understanding of aircraft systems capabilities, aircraft directives, and local procedures. • Knowledgeable of local working area WRT boundaries, altitudes, and significant landmarks without reference to in-flight guide or charts. • Demonstrates ability to apply procedures from all applicable source guidance.
2. Emergency Procedures	
• Recognize system malfunction and/or emergency situation.	• Expeditiously analyzes situation and systems and recognizes malfunction or emergency situation. • Maintains control of aircraft while responding appropriately to malfunction/emergency. • Maneuvers aircraft smartly to prevent degradation of situation with respect to external factors such as weather, traffic, etc.

BEHAVIOR STATEMENT	STANDARDS
2. Emergency Procedures (continued)	
• Perform NATOPS immediate action emergency procedures.	• Verbally states emergency NATOPS immediate action items in sequence, from memory, without error. • Performs proper steps of emergency NATOPS immediate action items in sequence, from memory, without error.
• Perform NATOPS noncritical action emergency procedures to include: ▶ Analysis of hypothetical aircraft malfunctions. ▶ Simulated precautionary approaches and actual no-flap landings performed in the aircraft. ▶ Life support training, survival, and physiological training IAW NATOPS.	• Performs proper steps to a satisfactory conclusion, effectively using NATOPS PCL to troubleshoot or complete NATOPS procedures. • Incorporates effective CRM to secure additional assistance where applicable. • Maintains situational awareness WRT local area and airfields while troubleshooting systems/ responding appropriately to situation. • Successfully recovers aircraft to suitable airfield or recognizes extremis situation and initiates ejection within safe parameters.
• Lost communications	• Performs proper steps to a satisfactory conclusion, effectively using FIH to troubleshoot or complete lost communication procedures.

BEHAVIOR STATEMENT	STANDARDS
3. Headwork/Situational Awareness	
• Assess self and aircraft in relation to the dynamic environment of flight, threats, and mission forecast; then execute tasks based on this assessment.	• Understands instructions, demonstrations, and explanations. • Remains alert and spatially oriented. • Correctly interprets in-flight events and applies strategies to proactively address them. • Recognizes and avoids channelized attention.
• Utilize CRM.	• Effectively utilizes seven key skills of CRM throughout all portions of flight training.
4. Basic Airwork	
• Perform general aircraft control and composite/instrument cross-check as appropriate.	• Maintains smooth positive aircraft control at all times. • Ensures momentary deviations, ±5 seconds, do not exceed: ▶ Airspeed: ±5 percent. ▶ Altitude: ±100 feet. ▶ Heading: ±5 degrees. ▶ Course: ±1 dot/½ scale. ▶ AOA: ±1 unit. • Avoids hazards (ground obstructions, terrain, other aircraft, and severe weather).
• Perform general aircraft control and composite/instrument cross-check in a partial panel situation.	• Smoothly transitions to/from partial panel instrument scan as situation dictates. • Maintains course, altitude, and glideslope with minor deviations and appropriate error corrections for entirety of approach. • Deviations do not jeopardize safety of flight.

BEHAVIOR STATEMENT	STANDARDS
4. Basic Airwork (continued)	
► Partial Panel Airwork	● Maintains positive control of the aircraft at all times with a smooth transition from full panel to partial panel scan. ● Ensures momentary deviations ±5 seconds, do not exceed: ► Airspeed: ±15 knots. ► Altitude: ±150 feet. ► Heading: ±10 degrees. ► Course: ±2 NM. ► AOA: ±1 unit. ● Deviations do not jeopardize safety of flight.
5. Mission Planning/Briefing/Debriefing	
● Perform appropriate mission planning to include route selection, weather, NOTAMS, fuel optimization, computing takeoff, climb, enroute, descent, approach, and landing data: planning mission profile and alternate course of action where appropriate.	● Plans mission in a timely manner to meet training objectives, complete all applicable Navy and command forms correctly, and complies with all directives. ● Applies OPNAVINST 3710.7U filing and approach criterion to planning and execution of flight. ● Aware of alternatives available, if flight cannot be completed as planned.
● Attend/conduct pre- and post-mission briefing/ debriefing for simulator or aircraft event.	● Briefs IAW NATOPS and command directives. ● Asks questions, if necessary, to fully understand the mission overview and mission objectives, including ORM. ● Clearly presents all information requested during briefing/ debriefing. ● Understands all CRM objectives and expectations for the mission.

BEHAVIOR STATEMENT	STANDARDS
5. Mission Planning/Briefing/Debriefing (continued)	
	● Understands contingencies and plans to contend with them. ● Effectively compares mission results with briefed objectives. ● Displays professional attitude and ability to accept instruction.
6. Communications	
● Verbal	● Makes concise, timely transmissions and responses, using proper radio discipline with standard terminology. ● Makes required radio calls IAW FLIP requirements. ● Understands and prioritizes transmissions in a multiple communications (UHF/VHF/ICS) environment. ● Asks for and provides clarification when necessary. ● Maintains effective 2-way communication with other crew members.
● Visual	● Ensures visual signals are clearly visible to lead/wingman and IAW NATOPS, FTI, or flight briefing.

BEHAVIOR STATEMENT	STANDARDS
7. Ground Operations	
• Inspect and wear appropriate flight equipment.	• Complies with NATOPS and command directives.
• Perform exterior inspection, prestart and pretaxi checks to adhere to takeoff times within published tolerances.	• Determines aircraft status and accepts or rejects aircraft based on NATOPS/command directives. • Completes required checks correctly. • Complies with NATOPS procedures and standardization tolerances. • Ensures clearance of line personnel, ground equipment, and other aircraft using appropriate signals prior to activation of aircraft systems.
• Coordinate checks with other aircrew for formation flight.	• Performs all checks, to include formation flight procedures IAW applicable directives.
• Perform taxi to/from runway.	• Taxies at speeds commensurate with traffic and surface conditions, following prescribed route and giving way to other aircraft as appropriate. • Avoids hazards and ground obstructions.
• Complete "Instrument," "Before Takeoff," and "After Landing" checklists.	• Completes IAW NATOPS procedures.
• Perform the engine shutdown checklist.	• Completes IAW NATOPS procedures.
• Perform postflight inspection and administrative duties.	• Completes all postflight checks and administrative duties IAW NATOPS and applicable directives. • Thoroughly debriefs Maintenance Control on any aircraft discrepancies and ensures appropriate MAF filed.

BEHAVIOR STATEMENT	STANDARDS
8. Flight Admin	
• Perform in-flight planning and administrative functions, to include:	
► General.	• Adjusts mission profile to comply with time/fuel limitations, as well as weather and area limits.
► Local course rules.	• Complies with established routes, altitudes, and procedures for operating in local airspace environment.
► Area management.	• Uses assigned airspace in an efficient manner with minimum delay between maneuvers. • Remains within area boundaries with or without ground references.
► Task management.	• Prioritizes and accomplishes tasks in order of importance as it pertains to flight and mission accomplishment. • Properly utilizes mission cross-check time based on terrain/task load/personal performance.
► Fuel management.	• Actively monitors fuel state throughout the mission. • Complies with all established fuel requirements. • Recognizes Joker or Bingo fuel within ±100 pounds of briefed quantity and makes timely call to IP/lead. • Regulates flight profile, throttle, and configuration to optimize fuel consumption as appropriate for the mission profile and training objectives.

BEHAVIOR STATEMENT	STANDARDS
8. Flight Admin (continued)	
▶ Weather planning.	• Recognizes and applies OPNAV/FLIP weather minima required for selected type of approach to field.
▶ In-flight checks.	• Completes all checklist items correctly and at proper point in mission, to include checking over other aircraft in the flight, IAW applicable directives.
▶ Route/destination change.	• Properly coordinates flight plan change through appropriate FSS or ATC facility using a DRAFT report or the IFR Supplement Change of Flight Plan formatting. • If necessary, obtains new weather report along route of flight and at destination field. • Calculates new fuel requirements along with time of flight.
9. Takeoff	
• Perform individual takeoff to include: ▶ Runup check. ▶ Linespeed check. ▶ Retracting gear/ flaps. ▶ Accelerating to climb airspeed.	• Maintains position during engine runup for static takeoff. • Maintains runway centerline ±5 feet during takeoff. • Rotates within -0 to +10 knots of computed rotation speed and maintains desired pitch attitude ±2 degrees. • Establishes and maintains proper takeoff attitude at appropriate airspeed for existing conditions. • Initiates gear and flap retraction when safely airborne and ensures fully retracted prior to exceeding 200 KIAS.
• Transition to instruments as required.	• Properly transitions to flight instruments as required for actual or simulated weather conditions.

BEHAVIOR STATEMENT	STANDARDS
10. Departure/Rendezvous	
• Safely maneuver aircraft out of airfield environment. ► IFR. ► VFR.	• Performs departure as published or directed. • Complies with all restrictions. • Achieves and maintains target climb schedule airspeeds ±10 KIAS or 0.02 Mach at target altitudes ±1,000 feet. • Initiates level-off at desired altitude using the 10-percent rule. • Promptly establishes cruise airspeed.
• Interval departure/ rendezvous.	• Accomplishes using proper procedures and techniques per Formation FTI.
11. Enroute Navigation	
• Perform enroute navigation to include: ► Climbs/Descents	• Complies with basic airwork standards. • Compensates for known wind drift as required. • Maintains target airspeed ±10 knots. • Levels off at desired altitude ±100 feet using 10-percent rule. • Complies with all restrictions.
► Intercept/maintain course - perform VOR or TACAN course intercepts inbound, outbound, or immediately after station passage, and maintain VOR or TACAN course.	• Establishes a valid intercept. • Maintains course ±5 degrees/ 1 dot/½ scale.

BEHAVIOR STATEMENT	STANDARDS
11. Enroute Navigation (continued)	
► Arcing - Perform VOR/DME and TACAN radial-to-arc intercepts and maintain arcs.	• Establishes valid arc intercept, utilizing appropriate lead turn as needed. • Maintains arc ±0.2 mile. • Establishes valid arc-to-radial intercept.
► Nonsystem Point-to-Point.	• Complies with basic airwork standards. • Compensates for known wind drift as required. • Maintains target airspeed ±10 knots. • Makes initial turn in the proper direction. • Performs steps to TACAN or VOR/DME point-to-point IAW Instrument NATOPS. • Corrects initial turn and maintains heading +10 degrees to arrive at the desired point ±0.5 NM.
► System Point-to-Point.	• Complies with basic airwork standards. • Compensates for known wind drift as required. • Maintains target airspeed ±10 knots. • Makes initial turn in the proper direction. • Enters proper fix and all required navigational information into GINA and proceeds direct using RNAV/TACAN waypoint offset procedures. • Arrives at the desired point ±0.2 NM.

BEHAVIOR STATEMENT	STANDARDS
11. Enroute Navigation (continued)	
▶ STAR - Perform standard arrival (STAR) procedure IAW FLIP publication.	● Establishes valid course intercepts and maintains courses 1 dot/½ scale/±5 degrees. ● Establishes valid arc/radial intercepts and maintains arcs ±0.5 mile. ● Meets all altitude/airspeed restrictions.
12. Descent/Field Entry	
● Perform a descent and traffic entry, to include: ▶ Climbs/descents enroute descent. ▶ Climbs/descents max range descent. ▶ Climbs/descents field break.	● Executes as published or directed. ● Complies with all restrictions and directives. ● Analyzes internal and external factors to select most effective method of descent (enroute or max range). ● Utilizes RADALT effectively to observe platform and subsequent altitude restrictions. ● Observes "minute to live" rule (unless scenario or circumstances specifically dictate otherwise). ● Establishes proper interval for pattern entry. ● Maintains break altitude ±100 feet until established on downwind. ● Configures in adequate time to perform landing and AOA/airspeed checks prior to approach turn 90-degree position.

BEHAVIOR STATEMENT	STANDARDS
13. Holding	
• Perform high- and low-altitude VOR/TACAN holding as described by controller or IAW FLIP document.	• Performs published/standard entry procedures and maintains designated pattern IAW Instrument NATOPS and FTI. • Complies with holding pattern limits: ► Uses proper voice procedures. ► Maintains holding airspeed ±5 KIAS.
14. High Altitude Penetration	
• Perform a VOR, VOR/DME, or TACAN penetration (arc/radial intercept) from IAF to FAF, as published in FLIP document or local procedures.	• Complies with published penetration course, arc, and altitudes. • Complies with basic airwork standards. • Establishes valid intercepts. • Maintains course ±5 degrees/ 1 dot/½ scale. • Establishes valid arc/radial intercepts. • Maintains arcs ±0.5 NM.
15. Precision Approach	
• Perform precision approaches as published in FLIP document or local procedures, to include: ► ILS approach. ► PAR approach. ▪ Normal PAR. ▪ No-Gyro PAR. ▪ Partial panel.	• Complies with published approach and NATOPS procedures. • Maintains target AOA or final approach airspeed ±1 unit AOA or ±5 KIAS during final descent. • Arrives at DA in position to maintain a normal visual glidepath to the runway and land safely. • Maintains CDI and GSI within 1 dot/½ scale deflection. • Maintains ±3 degrees of assigned heading (except gyro out) and does not achieve multiple "well above" or "well below" glidepath calls.

BEHAVIOR STATEMENT	STANDARDS
15. Precision Approach (continued)	
► Transition from one-half flap approach setting to full flaps for landing.	● Prior to DA, configures to full flaps and reviews landing checks complete to confirm the configuration change. ● Recalculates and slows to the new full-flap target AOA or airspeed ±1 unit AOA or ±5 KIAS while maintaining appropriate glideslope to touchdown.
16. Non-Precision Approach	
● Perform non-precision, full panel, partial panel, or no-gyro approaches as published in FLIP document or local procedures, to include:	● Complies with published approach and NATOPS procedures. ● Arrives at and maintains MDA -0/+100 feet at or prior to VDP. ● Arrives in position to maintain a normal visual glidepath to the runway and land safely.
► Localizer approach or BC localizer.	● Begins timing within 5 seconds, if appropriate. ● Maintains target AOA or final approach airspeed ±1 unit AOA or ±5 KIAS after FAF. ● Maintains CDI within 1 dot/ ½ scale deflection.
► TACAN or VOR/DME approach.	● Maintains target AOA or final approach airspeed ±1 unit AOA or ±5 KIAS after FAF. ● Maintains final approach course ±1 dot/½ scale/5 degrees.

BEHAVIOR STATEMENT	STANDARDS
16. Non-Precision Approach (continued)	
► ASR approach.	● Maintains target AOA or final approach airspeed ±1 unit AOA or ±5 KIAS during and after descent to MDA. ● Maintains ±3 degrees of assigned heading (except No-Gyro). ● Does not exceed 1 call of "well left/right of course" and complies with controller's instructions in a timely manner. ● Observes "minute to live" rule during descent to MDA.
► Transition from one-half flap approach setting to full flaps for landing.	● Prior to VDP or arriving in position to maintain a normal visual glide path to the runway, configures to full flaps and reviews landing checks complete to confirm the configuration change. ● Recalculates and slows to the new full-flap target AOA or airspeed ±1 unit AOA or ±5 KIAS and then maintains appropriate glideslope to touchdown.

BEHAVIOR STATEMENT	STANDARDS
17. Circling Approach/Maneuver	
• Perform a circling approach and maneuver as published in FLIP document or local procedures.	• Accomplishes IAW Instrument FTI and Instrument NATOPS. • Prior to circling maneuver, maintains course and altitude IAW non-precision approach standards. • During maneuver, maintains circling MDA –0 feet, and maintains visual reference to the airport until acquiring visual glidepath. • Positions aircraft for a safe landing. • Once visual reference with the runway environment is acquired, appropriately transitions from an instrument scan to a visual scan while beginning the circling maneuver as published, as instructed by ATC, or in an appropriate manner to safely and efficiently execute the maneuver. • Remains within the clear zone for the approach category. • If required, executes appropriate missed approach instructions for the approach flown. • Executes circling maneuver on the appropriate side of the airfield.
18. Missed Approach	
• Perform a missed approach and partial panel missed approach. • Perform climbout for additional approaches.	• Complies with FLIP document and ATC instructions for missed approach or climbout instructions. • Completes IAW Instrument FTI and Instrument NATOPS.

BEHAVIOR STATEMENT	STANDARDS
19. Precautionary Approach	
• Perform precautionary approach IAW NATOPS, FTI and local SOP/ course rules, to include: ▶ Overhead. ▶ Abeam. ▶ Straight-In.	• Properly coordinates maneuver with ATC. • Effectively manages airspace for entry, including appropriate voice reports. • Effectively manages energy state via configuration and maintains profile without manipulation of throttle. • Utilizes target airspeed and altitude checkpoints (±15 knots, +300/-200 feet) to effectively maintain profile. • Manages flare adequately to touch down in first third of runway or prior to A-gear if required. • Safely achieves flight with flying airspeed, mil power, and speedbrakes retracted during touch-and-go.
• Performs precautionary instrument approach IAW NATOPS, FTI and local SOP/course rules, to include: ▶ Low oil approach. ▶ Min/emer fuel approach.	• Properly coordinates maneuver with ATC. • Effectively manages energy state via configuration to maintain adequate approach profile.

BEHAVIOR STATEMENT	STANDARDS
20. VFR Landing Pattern	
● Perform entry into visual landing pattern (pattern entry to the start) to include:	● Configures in adequate time to perform landing and AOA/airspeed checks prior to glideslope acquisition and/or final descent.
► Visual straight-in.	● Makes timely corrections for glideslope, AOA, and lineup deviations. ● Applies crosswind corrections adequately to maintain centerline both on final and during/after touchdown.
► Downwind entry.	● Configures in adequate time to perform landing and AOA/airspeed checks prior to 180 position. ● Makes timely corrections for glideslope, AOA, and lineup deviations. ● Applies crosswind corrections adequately to maintain centerline both on final and during/after touchdown.
► Overhead pattern (left-hand FCLP type).	● Maintains pattern altitude ±50 feet on downwind. ● Makes appropriate crosswind corrections on downwind to arrive at proper abeam distance. ● Initiates approach turn with appropriate extension off of abeam to achieve proper groove length (15-18 seconds). ● Manages energy state and AOB while making timely corrections to deviations throughout approach turn to arrive at the start within ±5 degrees of centerline, on-speed, with appropriate VSI, and with the ball centered to mid-high (3-4 balls) on the lens.

BEHAVIOR STATEMENT	STANDARDS
21. Landing/Touch-and-Go	
● (Start to touchdown) Perform touch-and-go or full-stop landing to include the following: ► Touch-and-go. ▪ Full-flap. ▪ Half-flap. ▪ No-flap. ▪ Crosswind.	● References optical landing system, if available, to achieve safe approach glideslope. ● Touches down at proper pitch attitude, maintains proper ground track, uses crosswind controls as required. ● Touches down in prescribed landing zone IAW NATOPS and local procedures. ● Touches down with no greater than -600 fpm rate of descent for flap configurations other than full.
► FCLP-type landing (FLOLS/IFLOLS).	● Performs graded touch-and-go or full-stop landing utilizing FLOLS/IFLOLS lens. ● Adequately manages energy state during wings-level transition to maintain reasonable VSI, AOA, and lineup control. ● Makes timely and appropriate corrections to maintain or correct back to optimum glideslope, AOA, and lineup. ● Applies crosswind corrections adequately to maintain centerline both on final and during/after touchdown. ● Consistently touches down with a stable, centered-to-high ball, on-speed, and on centerline.
► Roll-and-go. ▪ Full-flap. ▪ Half-flap (simulated short-field arrestment). ▪ No-flap.	● Maintains runway alignment using aileron, rudder, and nosewheel steering to track down runway. ● Recognizes groundspeed checkpoints and executes go-around at target airspeed ±5 KIAS/±200 feet of target runway remaining.

BEHAVIOR STATEMENT	STANDARDS
21. Landing/Touch-and-Go (continued)	
► Night landing at field without a lens.	● If required, performs instrument-to-visual scan while maintaining glideslope and centerline. ● Applies crosswind corrections adequately to maintain centerline both on final and during/after touchdown. ● Adequately manages energy state during approach to landing with proper AOA and VSI control. ● Touches down in prescribed landing zone IAW NATOPS and local procedures.
► Full-stop.	● Applies appropriate crosswind corrections and maintains runway alignment using aileron, rudder, and nosewheel steering. ● Applies braking smoothly and effectively to meet deceleration schedule. ● Adjusts braking to achieve appropriate line speeds.
22. Waveoff	
● Perform waveoff procedures.	● Immediately executes waveoff procedures when required or directed, maintaining landing attitude/AOA until safe climb established. ● Maintains safe lateral separation from interval aircraft in VFR pattern.

BEHAVIOR STATEMENT	STANDARDS
23. Basic Instrument Maneuvers	
● Perform instrument training maneuvers as described in Instrument FTI or as directed, full or partial panel, to include:	
► Climbs/descents.	● Effectively utilizes power to maintain airspeed ±10 knots. ● Maintains target VSI ±200 fpm. ● Levels off at desired altitude ±100 feet using 10-percent rule.
► Level speed changes.	● Maintains altitude ±100 feet. ● Achieves and maintains target airspeed ±5 knots.
► Timed turns.	● Maintains standard or one-half standard turn rate to achieve desired heading change in appropriate time period, ±5 seconds. ● Uses indicated airspeed to appropriately determine AOB. ● Monitors turn needle and adjusts AOB as required to maintain standard or one-half standard turn rate.
► Turn pattern.	● Effectively utilizes power to maintain airspeed ±5 knots. ● Maintains altitude ±100 feet. ● Performs turn reversals at target heading ±5 degrees.
► Vertical S maneuvers: ▪ S-1 pattern. ▪ S-3 pattern.	● Maintains VSI ±200 fpm. ● Maintains ±5 KIAS of desired airspeed. ● Maintains AOB ±5 degrees. ● Reverses direction or level off ±100 feet of desired altitude. ● Maintains timing ±5 seconds. ● Makes timely and appropriate corrections for deviations.

BEHAVIOR STATEMENT	STANDARDS
23. Basic Instrument Maneuvers (continued)	
► Slow flight maneuver.	● Reconfigures aircraft at appropriate airspeed, maintaining ±100 feet of target altitude. ● Maintains target airspeed ±5 knots or on-speed AOA ±2 units once established. ● Establishes target ROD ±200 fpm.
24. Familiarization Maneuvers	
● Perform familiarization maneuvers as described in the FTI or as directed, to include: ► Vertical recovery.	● Executes IAW FAM FTI descriptions, to include: ► Attains stabilized target entry airspeed ±5 knots. ► Smoothly applies back stick to achieve 17 units without entering pitch-buck. ► Elevates nose to and maintains attitude at 60 degrees (±3 degrees) until recovery. ► Initiates recovery at target airspeed ±5 knots. ► Begins maneuver with sufficient altitude excess to complete maneuver.

BEHAVIOR STATEMENT	STANDARDS
24. Familiarization Maneuvers (continued)	
▶ Minimum radius turn.	● Executes IAW FAM FTI descriptions, to include: ▶ Attains stabilized target entry airspeed ±5 knots. ▶ Smoothly applies back stick to achieve 17 ±1 unit. ▶ Maintains ±5 knots throughout maneuver. ▶ Prevents excessive nose "ballooning" during reversals (100-feet maximum). ▶ Completes reversal and final rollout ±5 degrees of target heading. ▶ Begins maneuver with sufficient altitude excess to complete maneuver.
25. Aerobatics	
● Perform instrument aerobatic maneuvers IAW Instrument FTI, to include: ▶ Aileron roll. ▶ Wingover. ▶ Barrel roll. ▶ Loop. ▶ One-half Cuban eight. ▶ Immelmann. ▶ Split-S. ● Perform maneuvers listed above in visual environment IAW Familiarization FTI. In addition, perform squirrel cage.	● Verbalizes and attains target entry parameters (±5 knots, ±100 feet) prior to beginning the maneuver. ● Flies in a smooth, positive, and coordinated manner. ● Achieves and maintains target g load ±1 g and AOA ±2 units during overhead maneuvers. ● Executes rolling maneuvers at target attitude ±5 degrees. ● Exits maneuver at original entry parameters ±200 feet, ±10 knots, ±10 degrees. ● Plans maneuver entries to remain within area boundaries. ● Ensures primary emphasis during aerobatic maneuvers is on use of outside references. ● Efficiently links series of maneuvers.

BEHAVIOR STATEMENT	STANDARDS
26. Unusual Attitude Recoveries	
• Perform recoveries IAW appropriate FTI for: ▶ Nose-high recovery. ▶ Nose-low recovery.	• Uses correct instrument flight references throughout recoveries. • Recovers to level flight expeditiously without stalling or exceeding aircraft limitations. • Recovers to level flight without excessive altitude loss, stall, or exceeding aircraft limitations. • Recovery is complete when the descent is stopped.
27. Stall/OCF Recognition and Recovery	
• Perform approaches to stall, full stalls, and recoveries IAW FTI, to include the following: ▶ Power-off stall. ▶ Break turn stall. ▶ Landing attitude maneuver. ▶ Landing attitude stall. ▶ Approach turn stall. ▶ Accelerated stall.	• Effectively trims aircraft for level flight/on-speed prior to commencing maneuver. • Maintains altitude ±100 feet and VSI 0±200 fpm prior to stall. • Recognizes approach-to-stall indications and recovers IAW NATOPS and FTI procedures, with no loss of altitude (recovery complete when two positive rates of climb established). • Recognizes full-stall indications and recovers IAW NATOPS and FTI procedures with minimum loss of altitude ≤500 feet (recovery complete when two positive rates of climb established). • Prevents entry into secondary stall; recognizes secondary stall, if entered, and recovers properly. • Does not exceed gear/flap limitation airspeeds.

BEHAVIOR STATEMENT	STANDARDS
27. Stall/OCF Recognition and Recovery (continued)	
• Performs OCF maneuvers IAW FTI, to include: ▶ High AOA/deep stall investigation. ▶ 70-/90-/110-degree departures. ▶ Lateral stick adverse yaw departure.	• Demonstrates in-depth knowledge of NATOPS OCF procedures and prohibited maneuvers. • Correctly enters prescribed syllabus maneuvers per OCF FTI. • Correctly applies recovery control inputs and procedures per OCF FTI.
28. Formation Takeoff	
• Perform two- and four-ship takeoffs as Wing IAW Formation FTI, to include:	• Positions aircraft in appropriate lane of runway ±3 feet, on appropriate bearing line or "banana echelon." • Achieves target interval ±1 second for brake release. • Maintains appropriate lane of runway ±5 feet during takeoff roll.
▶ Section takeoff.	• Lifts off no earlier than lead and maintains ±15 degrees of parade bearing. • Configures on lead's signal, making smooth, positive control inputs; signals clean at appropriate time.
▶ Interval takeoff.	• Smoothly and expeditiously accelerates to appropriate rendezvous speed. • Initiates cross to inside of expected turn within 5 seconds of aircraft clean, but not before interval. • Upon reaching target airspeed, expeditiously puts lead/interval on the horizon. • Accomplishes timely rendezvous maintaining lead on horizon, IAW CV or running rendezvous standards.

BEHAVIOR STATEMENT	STANDARDS
29. Formation Lead	
● Perform two-ship formation as Lead IAW Formation FTI, to include:	● Complies with Formation FTI and course rules, considering airspace and weather to plan maneuvers. ● Completes profile in a smooth manner without exceeding wingman's capabilities and without degrading flight safety. ● Maintains a smooth, stable platform, avoiding abrupt power changes and maintaining >80 percent rpm while monitoring -2. ● Utilizes proper communications and signals as lead. ● Maintains visual awareness of wingman.
► Departure.	● Monitors wingman during initial joinup. ● Communicates with ATC to effect joinup as necessary.
► Parade.	● Accomplishes parade maneuvering up to 2 Gs and 45 degrees of bank.
► Lead change.	● Passes lead utilizing appropriate visual/voice/light signals. ● Positively maneuvers aircraft to establish wingtip separation -0/+10 feet and step-down ±5 feet, and no further aft than cruise bearing line IAW FTI.
► Breakup and rendezvous.	● Provides stable platform within BAW tolerances.

BEHAVIOR STATEMENT	STANDARDS
30. Formation Wing	
• Perform two- and four-ship formation as the Wingman IAW Formation FTI, to include:	• Complies with Formation FTI. • Effectively passes signals to successive wingmen while smoothly maintaining position.
► Parade/fingertip.	• Maintains parade position IAW FTI: wingtip separation -0/+5 feet, step-down ±5 feet, and bearing line ±10 degrees, using smooth, positive control inputs. • Smoothly and positively corrects back to position within 5 seconds without prompting from IP. • Stacks level with lead ±5 feet and maintains fore/aft references during roll-in, rollout, and VFR turn-away position.
► Turns.	• Stacks level with lead/interval ±5 feet. • Maintains fore/aft references during roll-in, turn, and rollout.
► Crossunder/division shuffle.	• Crosses below lead/interval's jet wash (+0 to –20 feet) with constant track crossing rate, achieving target nose/tail clearance no farther aft than one aircraft length.
► Cruise.	• Initially establishes the aircraft on the lead's 45-degree bearing line with appropriate nose-to-tail separation and step down as per FTI. • Rotates around lead's axis prior to crossing inside lead's turn. • Safely and expeditiously stabilizes inside of lead's turn while maintaining situational awareness to all aircraft in flight.

BEHAVIOR STATEMENT	STANDARDS
30. Formation Wing (continued)	
► Cruise over-the-top.	• Maintains appropriate lane during reversals. • Smoothly and positively corrects back to position within 5 seconds without prompting from IP. • Smoothly enters over-the-top maneuver from a standard cruise position and maintains a relatively steady position throughout. • Makes appropriate corrections with throttle, AOB, and pitch attitude as required.
► Breakup for rendezvous.	• Maintains target airspeed ±5 knots during breakup turn and while in trail. • Rolls out 1,000 ±200 feet in trail of lead/interval.
► CV rendezvous.	• Maintains visual situational awareness to all aircraft ahead, with safe separation from interval. • Expeditiously maneuvers to bearing line. • Maintains a stable plane-of-motion, co-altitude with lead/interval. • Recognizes and makes corrections without prompting to deviations in bearing line, fuselage alignment, and airspeed control while maintaining positive closure. • Controls closure at the in-close position to effect smooth crossunder to echelon.

BEHAVIOR STATEMENT	STANDARDS
30. Formation Wing (continued)	
► Running rendezvous.	• Maintains situational awareness to all aircraft ahead with safe separation and closure to lead/interval.
► TACAN rendezvous.	• Maintains proper step-down ±150 feet below lead's altitude until on bearing line. • Properly utilizes communication to control lead's lighting at night.
► Division rendezvous.	• Expeditiously establishes aircraft on lead's altitude. • Positively corrects to bearing line and maintains a consistent controlled rate of closure throughout. • During breakup and rendezvous, does not exceed maximum AOB for position per the FTI. • Executes crossunder per the FTI at a speed that the aircraft could safely join into an open slot between two aircraft.
► Section break.	• Establishes aircraft in FTI parade position prior to the numbers or as briefed. • Sets the briefed interval. • Keeps lead on horizon. • Arrives in trail of lead while configuring aircraft for landing.
► Division break.	• Established in FTI parade prior to the numbers or as briefed. • Dash 2 sets the briefed interval. • Dash 3 and 4 match break interval. • Keeps lead on the horizon throughout break.

BEHAVIOR STATEMENT	STANDARDS
30. Formation Wing (continued)	
	• Arrives in trail of preceding aircraft while configuring aircraft for landing.
► Underrun.	• Recognizes unsafe or excessive parameters and expeditiously initiates maneuver. • Immediately responds to underrun command given by lead or IP. • Day: Expeditiously arrives at perch position as defined in FTI ±50 feet. • Night: Arrives outside lead's turn at 500 feet (±100 feet) below lead's altitude.
► Lead change.	• Refuses or assumes lead within two seconds of initiation, using appropriate visual/voice/light signals. • Maintains target altitude ±100 feet and airspeed ±5 knots while acting as lead. • Passes lead utilizing appropriate visual/voice/light signals. • Positively maneuvers aircraft to establish wingtip separation -0/+10 feet and step-down ±5 feet, and no further aft than cruise bearing line IAW FTI.

BEHAVIOR STATEMENT	STANDARDS
31. Formation Approach/Missed Approach/Touch-and-Go Rejoin	
● Perform two-ship approach procedures while at altitude or under controlling agency as:	
▶ Section lead.	● Complies with approach procedures and standards being flown. ● Lands in center of appropriate side of the runway. ● Maintains runway alignment after landing. ● Detaches wingman at appropriate time in a safe position for landing.
▶ Section wing.	● Performs landing checklist prior to signaling lead, and signals lead at appropriate time. ● Properly manages configuration and energy state to effect safe landing when detached. ● Rejoins safely and expeditiously within two miles during touch-and-go/rejoin. ● Maintains parade position parameters IAW Formation FTI during missed approach, matching lead's configuration changes via hand or radio signals.
32. Tail Chase Exercise	
● Perform tail chase exercise per FTI.	● Utilizes proper lead, pure, and lag pursuit to maintain 2,000-4,000 feet in trail of lead. ● Maintains a 500-foot bubble from lead at all times.

BLANK PAGE

Chapter X

Master Materials List

1. Individually Issued Materials

	TITLE	IDENTIFICATION	QTY PER STUDENT
a.	T-45C NATOPS IUT Curriculum	CNATRAINST 1542.169	1
b.	Flight Training Instructions (FTI)	CNATRA PAT PUB P-1204 through P-1289 as applicable	9
c.	DOD FLIP Publications		
	(1) Enroute IFR Supplement U.S.		3
	(2) Enroute High Altitude Chart		6
	(3) Terminal High Altitude Instrument Approach Procedures		6
d.	TRAWING In-Flight Guide	Locally produced/issued	1
e.	Aviation Training Jacket	CNATRA-GEN 1542/10A	1
f.	Pilot Training Summary	CNATRA 1542/95	1
g.	Jacket Review	CNATRA-GEN 1542/66	1

BLANK PAGE