



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

Canc frp: Mar 14

CNATRANOTE 1542  
N7X

20 Mar 13

CNATRA NOTICE 1542

Subj: T-6B INSTRUMENT TRAINING OPTIMIZATION PILOT PROGRAM FOR  
THE STRIKE PIPELINE

Ref: (a) CNATRAINST 1542.166A w/CH-1  
(b) CNATRAINST 1542.167 W/CH-2  
(c) CNATRAINST 1500.4G W/CH-3

Encl: (1) Optimization Training Track Diagrams  
(2) T-6B Instrument Training Optimization Syllabus  
(3) Aviation Training Jacket (ATJ) Supplemental Form  
(4) T-6B Instrument FTI Addendum

1. Background. The T-6B brings a new level of instrument training capability to primary flight training. The T-6B has a completely integrated avionics suite with a digital glass cockpit, a 25 degree Total Field of View (TFOV) Head-up Display, three (3) high fidelity 5x7" Multi-Function Displays (MFDs), Up-Front Control Panel (UFCP), GPS navigation system, and a fully-integrated and certified dual FMS. The T-6B can fly speed and altitude profiles similar to the T-45C and costs much less to train per flight hour. This capability presents an opportunity to download training from Intermediate Jet (I-Jet) to T-6B primary training, reducing costs with potentially improved, or minimally, no degradation in training quality.

2. Purpose. This CNATRANOTE directs evaluation of an operational T-6B Instrument Training Optimization Pilot Program for the Strike pipeline.

3. Applicability. This pilot program shall be conducted with 50 percent of U.S. Navy and U.S. Marine Corps Student Naval Aviators (SNA) selected for Intermediate Jet from Training Air Wing (TRAWING) FIVE where T-6B training is currently conducted. This evaluation will continue for approximately one year pending a decision to fully implement the change, implement with modifications, or terminate the program. This CNATRANOTE does not apply to TRAWING FOUR.

4. Training Syllabi Design. Upon completion of T-6B JPPT at TRAWING FIVE, students selected for T-6B Instrument Training Optimization will receive additional blocks of training as part of a separate training track within the currently waived T-6B USN/USMC STRIKE TOP-OFF portion of the syllabus in reference (a). **Waivers for the STRIKE TOP-OFF syllabus as outlined in reference (a) are still in effect as directed by separate CNATRANOTE.** This optimization training track consists of one (1) procedures lecture, two (2) OFT simulator events, and four (4) additional instrument flight events in the T-6B at their respective squadrons. During Intermediate Jet training, optimization students will follow an accelerated syllabus track with four (4) less instrument training flights from various blocks. Optimization training tracks will be inserted in TIMS under the current syllabi provided in references (a) and (b) as modified by this CNATRANOTE. The course flow tracks are provided in enclosure (1).

a. T-6B Instrument Training Optimization. The optimization training track provides for the following blocks of additional training:

(1) IN14 Block

(a) Prerequisites

1. T-6B JPPT Complete
2. Selection for Intermediate Jet

(b) Events. IN1401 - Offline MIL (Procedure Lecture)

(2) I34 Block

(a) Prerequisite. IN1401 prior to I3401

(b) Events

1. I3401 - OFT (Simulator)
2. I3402 - OFT (Simulator)

(3) I46 Block

(a) Prerequisites

1. I3401 prior to I4601
2. I3402 prior to I4603

(b) Events

1. I4601 - T-6B (Aircraft)
2. I4602 - T-6B (Aircraft)
3. I4603 - T-6B (Aircraft)
4. I4604 - T-6B (Aircraft)

(4) Course Data. Time to Train for each student increases by a projected 5.8 training days. With a 50 percent selection rate of Intermediate Jet selectees for the optimization training track from TRAWING FIVE only, the average T-6B JPPT Total Time to Train (TTT) increases for NAPP planning factors and CeTARS by the following amounts:

- (a) Training Days: +2.9
- (b) Calendar Days: +4.5
- (c) Calendar Week: +0.7

(5) All other course information is contained in enclosure (2).

b. Intermediate Jet Instrument Training Optimization Track. Student pilots selected for instrument training optimization will be assigned to the optimization training track incorporated in TIMS. This optimization training track provides for accelerated instrument training with syllabus modifications as follows:

(1) RI41 block

(a) The following events are waived and removed:

1. RI4102

2. RI4103

(b) Syllabus notes. During this block, students must fly the minimum approaches listed below:

High-altitude Penetration	2
TACAN/VOR DME	1 F/P
	2 P/P
ASR	1 P/P
ILS	1 F/P
	2 P/P
PAR	1 F/P
	1 P/P
Low Oil App	2
Min Fuel/Emer Fuel App	1
No-Gyro GCA	1

(c) All other syllabus items of reference (b) still apply except as modified above.

(2) AN41 Block

(a) AN4102 waived and removed.

(b) Syllabus notes. During this block, students must fly the minimum approaches listed below:

Precision App	3 F/P
	2 P/P
Non-Precision	2 F/P
	2 P/P
Low Oil App	1
Min Fuel/Emer Fuel App	1
No-Gyro GCA	1

(c) All other syllabus items of reference (b) still apply except as modified here.

(3) IR41 Block

(a) IR4101 waived and removed.

(b) Syllabus notes. During this block, students must fly the minimum approaches listed below:

Precision approach	1 F/P
Precision approach	1 P/P
Non-Precision approach	1

(c) All other syllabus items of reference (b) still apply except as modified here.

(4) Course Data. Time to Train for each student decreases by a projected 4.8 training days. With a 50 percent selection rate for the optimization training track for Intermediate Jet selectees from TRAWING FIVE, the weighted-average Intermediate Jet Total Time to Train (TTT) at both TRAWING ONE and TRAWING TWO decreases for NAPP planning factors and CeTARS by the following amounts:

(a) Training Days: -1.2

(b) Calendar Days: -1.9

(c) Calendar Week: -0.3

5. Optimization Training Support. Enclosure (3) provides an example of the TIMS-generated Aviation Training Jacket (ATJ) Supplemental Form and instructions for incorporating this form in the ATJ of students selected for T-6B Instrument Training Optimization.

a. JPPT TRARONS. Ensure the supplemental form referenced in enclosure (3) is incorporated into the student's ATJ along with a copy of this CNATRANOTE (without enclosures). Upon successful completion of the T-6B Instrument Training Optimization track, annotate flight event waivers for Intermediate Jet, and enter score data on both the hard copy and in the student's electronic training jacket. Detailed instructions are contained in the supplemental form.

b. Strike TRARONs. Ensure this CNATRANOTE and the supplemental ATF form are correctly entered in the ATJ with proper annotations. Verify student is assigned to the Intermediate Jet Instrument Training Optimization track. Update local event trackers to reflect events waived and removed.

c. If optimization training is discontinued at anytime for any reason, contact CNATRA N7P at DSN 861-1680 for further instructions.

#### 6. Training Support Materials

a. The T-6B Instrument FTI addendum is provided as enclosure (4). This addendum provides procedures required for instrument optimization training.

b. The Offline MIL (IN1401) for the supporting lecture will be provided via the T-6B Instrument Stage Manager.

#### 7. Instructor Training Qualifications

a. Instructor Training. The JPATS Primary PTO in coordination with T-6B Instrument Stage Manager will be responsible for training Instrument Standardization instructors and designated simulator instructors. At a minimum, this training will include:

- (1) Offline MIL (IN1401)
- (2) One OFT Simulator

b. Instructor Qualifications. Once training is received, Instrument Stage "S" instructors are required to instruct instrument optimization track events. This requirement will be incorporated in TIMS. TRAWING FIVE will conduct all future training as part of standardization checks for instrument "S" qualification. Training and qualifications will be managed according to TRAWING FIVE policies.

#### 8. Student Selection Process

a. Selection Methodology. Immediately following selection for intermediate jet, each student will be rank-ordered by NSS and systematically designated for optimization by alternation.

In the first selection week for optimization, all TRAWING FIVE Intermediate Jet Selectees will be ordered from highest NSS to lowest. Every other student will be selected for the optimization track starting with the highest NSS (1, 3, 5, etc.). In the second week of selection, every other student will be selected for the instrument training optimization track starting with the second highest NSS (2, 4, 6, etc.). Subsequent weeks will continue to alternate selection in this manner to provide systematic randomization and stratification by NSS. This random selection process will provide a continuous 50 percent selection rate and a sound basis for evaluation.

b. Selection Considerations. Selections for optimization will not be based on demographics; however, the systematic selection process will be monitored to ensure that characteristics such as race, gender, baseline aptitude as measured by the Aviation Selection Test Battery, and commissioning sources are not inadvertently over-assigned to one training track over the other.

c. Selection Process. Selections will be conducted by CNATRA N35 in close coordination with TRAWING FIVE and CNATRA N7P.

d. Selection Tracking. An example of the Instrument Training Optimization Track ATJ Supplemental Form is provided in enclosure (3) along with instructions. This form shall be incorporated in the student's ATJ prior to checking out of their respective primary flight training squadron.

## 9. Performance Evaluation

a. Performance Evaluation Metrics. Metrics for consideration in Primary (T-6B) and Intermediate Jet training will include, but is not limited to:

(1) Required overhead (additional flight events and hours):

(a) Initial Progress Checks (SXX88)

(b) Final Progress Checks (SXX89)

(c) Additional Progress Checks (SXX89)

(d) Unsatisfactory Performance (UNSATs)

(e) Extra Training (XX87)

(f) Warm-ups (SXX86)

(2) Grade measurements:

(a) Block Raw Score

(b) NSS

(3) Critical Skill Areas:

(a) Regression. Failing to meet or exceed previous block performance in critical items per reference (a) and (b).

(b) Tendencies. CNATRA N7 will evaluate unexpected performance differences that may arise from additional T-6B training. Engrained habit patterns from the T-6B may potentially impact application of T-45C procedures, instrument scan, headwork, situational awareness, systems management, energy management, and airwork. For example, the T-6B does not land with speed brakes extended and automatically retracts speed brakes when flaps are extended or throttle moves to full power. The T-45C, on the other hand, lands with speed brakes extended, and does not have auto-retract logic.

(4) Pipeline Designation (E2/C2 or Strike)

(5) Days in Student Monitoring Status (SMS)

b. Designated Evaluation Points. N7P will evaluate and compare group performance using accepted statistical methods at the following points in training:

(1) End of Block I46 (T-6B)

(2) End of Block BI41

(3) End of Block RI41

(4) End of Block AN41



- (5) End of Block IR41
- (6) IR4290 Check Flight
- (7) Tracking beyond IR4290 evaluate attrition.

c. Training Optimization Evaluation Reports. This report will be compiled and disseminated monthly via N7 to N00, and TRAWINGS ONE, TWO, and FIVE until a decision is made to fully implement, implement with changes, or terminate the program. This report should include:

- (1) Statistical Assessment
- (2) Risk Analysis
- (3) Recommendations

10. Risk Monitoring and Controls. The current Multi-Service Pilot Training System (MPTS) is a skills-based performance system that provides adequate risk monitoring and controls through curriculum course training standards (CTS) and requisite maneuver proficiency levels provided by the Maneuver Item File (MIF). Commands shall notify CNATRA N7 and use Student Monitoring Status (SMS) as provided for in references (a), (b), and (c) to focus supervisory attention on students who may be struggling as a result of training optimization. Monthly reports required in paragraph 7c will provide risk analysis and recommendations for mitigation, modification, or program termination.

11. Criteria for Program Success. A minimum of 60 instrument optimization student pilots shall complete training through to completion of advanced strike. N7 will review program results for statistically significant deviations from training quality standards. Training quality will be assessed according to those variables outlined in Paragraph 8. If there is no statistically significant degradation in training quality, the program will be fully implemented. If training quality is degraded, then the program will be modified as appropriate, or terminated.

12. Contingencies

a. Poor performance prior to completion of the T-6B Instrument Training Optimization track. After completion of T-6B JPPT and assignment to the T-6B Instrument Training Optimization track, normal MPTS rules apply except that prior performance during T-6B JPPT does not apply toward progress check procedures for the I34 and I46 blocks. If a student fails an IPC prior to completing T-6B Instrument Training Optimization, the student shall be dropped from the syllabus, directed to proceed to the next command, and assigned to the normal Intermediate Jet syllabus track. CNATRA N7P shall be promptly notified.

b. Poor performance during Intermediate Jet prior to IR4290 NATOPS Instrument Check. If an instrument optimization student fails an FPC during intermediate jet training prior to the IR4290 instrument check, the student will proceed to a training review board (TRB) per normal procedures. The Strike PTO shall be a required additional non-voting member of the board to assist in determining if optimization training may have been a factor in performance deficiencies. If the board believes deficiencies were related to instrument training optimization, consideration should be given to retain the student and provide extra training to address the deficiencies. If the student is then able to meet block MIF, the student shall continue training per the normal intermediate jet syllabus. CNATRA N7P shall be promptly notified.

c. Poor performance post IR4290 NATOPS Instrument Check. Performance issues beyond IR4290 will be handled in accordance with normal procedures.

d. Program Termination. If the student has successfully completed IR4290, previous events not flown shall remain waived. Optimization students prior to IR4290 will be assigned to normal syllabus flow from their current point in training. Previously waived events will remain waived. Additional instrument training events may be flown as Extra Training (XX87) to address poor performance as required.

13. Naval Air Warfare Center, Training Systems Division (NAWCTSD) Support. NAWCTSD will determine if Institutional Review Board (IRB) oversight is required and facilitate the process. Support is also requested for performance evaluation processes.

14. Action. CNATRA N7 will brief participating Training Air Wings prior to operational execution. This CNATRANOTE will be executed when directed by CNATRA.

15. Points of Contact:

a. LCDR Peter Walker, CNATRA N7P, DSN 861-1680, (361) 961-1680, or email at peter.b.walker@navy.mil.

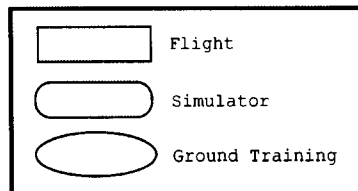
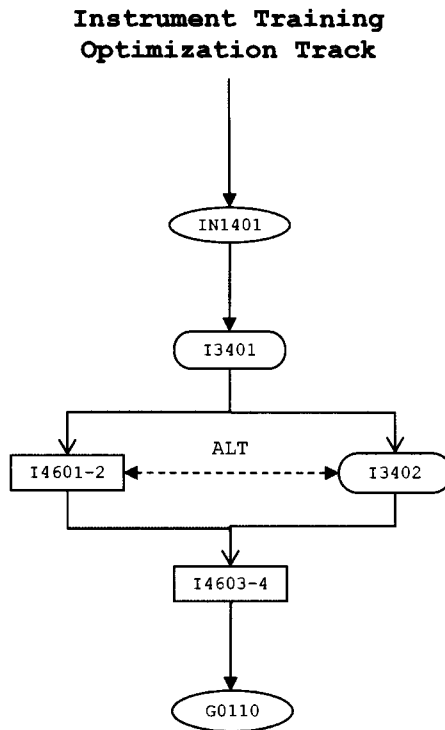
b. Shawn B. Inman, CNATRA N7 Optimization Program (Ctr), DSN 861-2145, (361) 961-2145, or email at shawn.inman.ctr@navy.mil.

16. Cancellation. This notice shall remain in effect until cancelled or superseded by a CNATRANOTE with the same subject within a year.

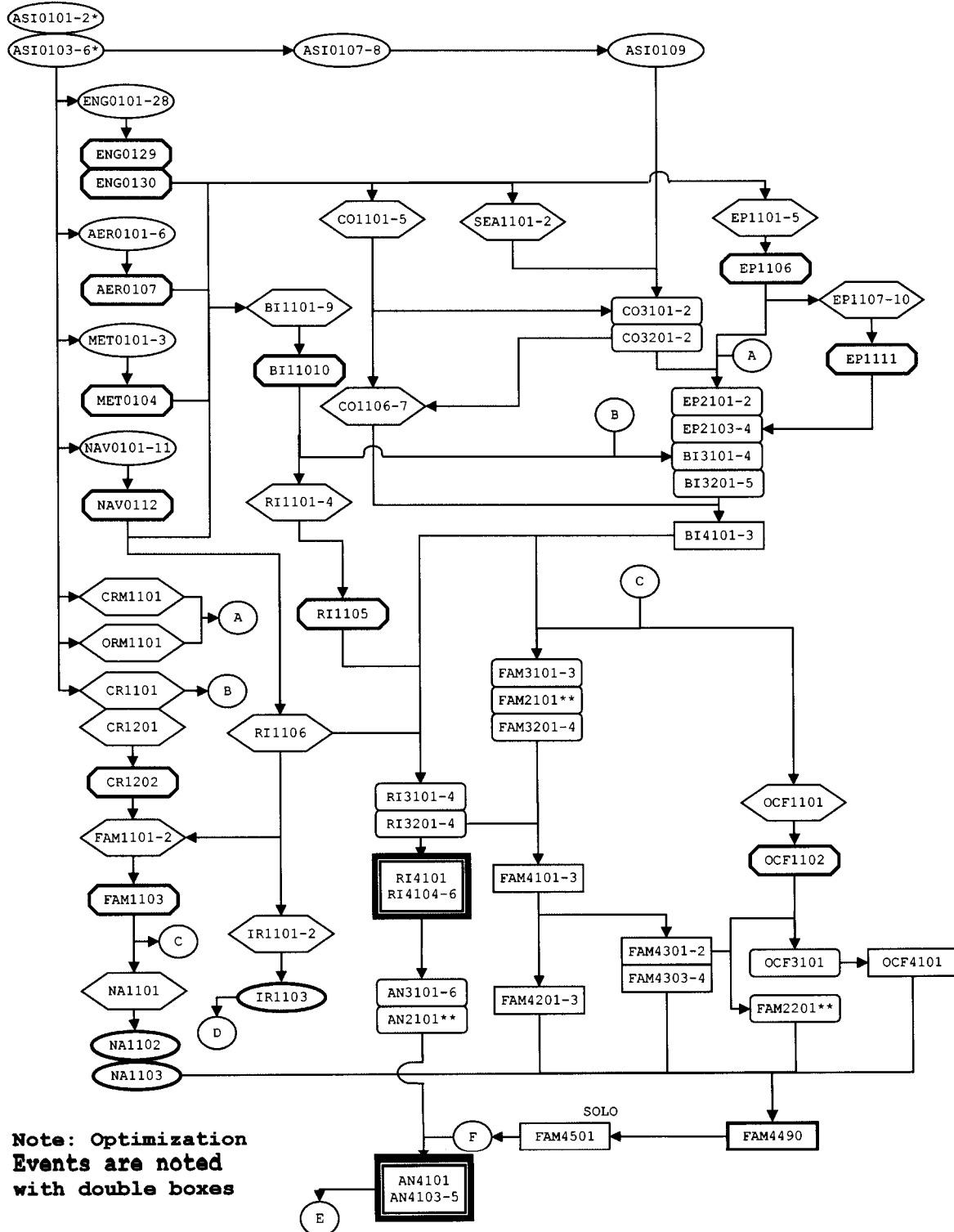
C. HOLLINGSWORTH  
Chief of Staff

Distribution:  
CNATRA Website

**T-6B INSTRUMENT TRAINING OPTIMIZATION COURSE FLOW**  
**(SEPARATE TRACK WITHIN T-6B USN/USMC STRIKE TOP-OFF SYLLABUS)**

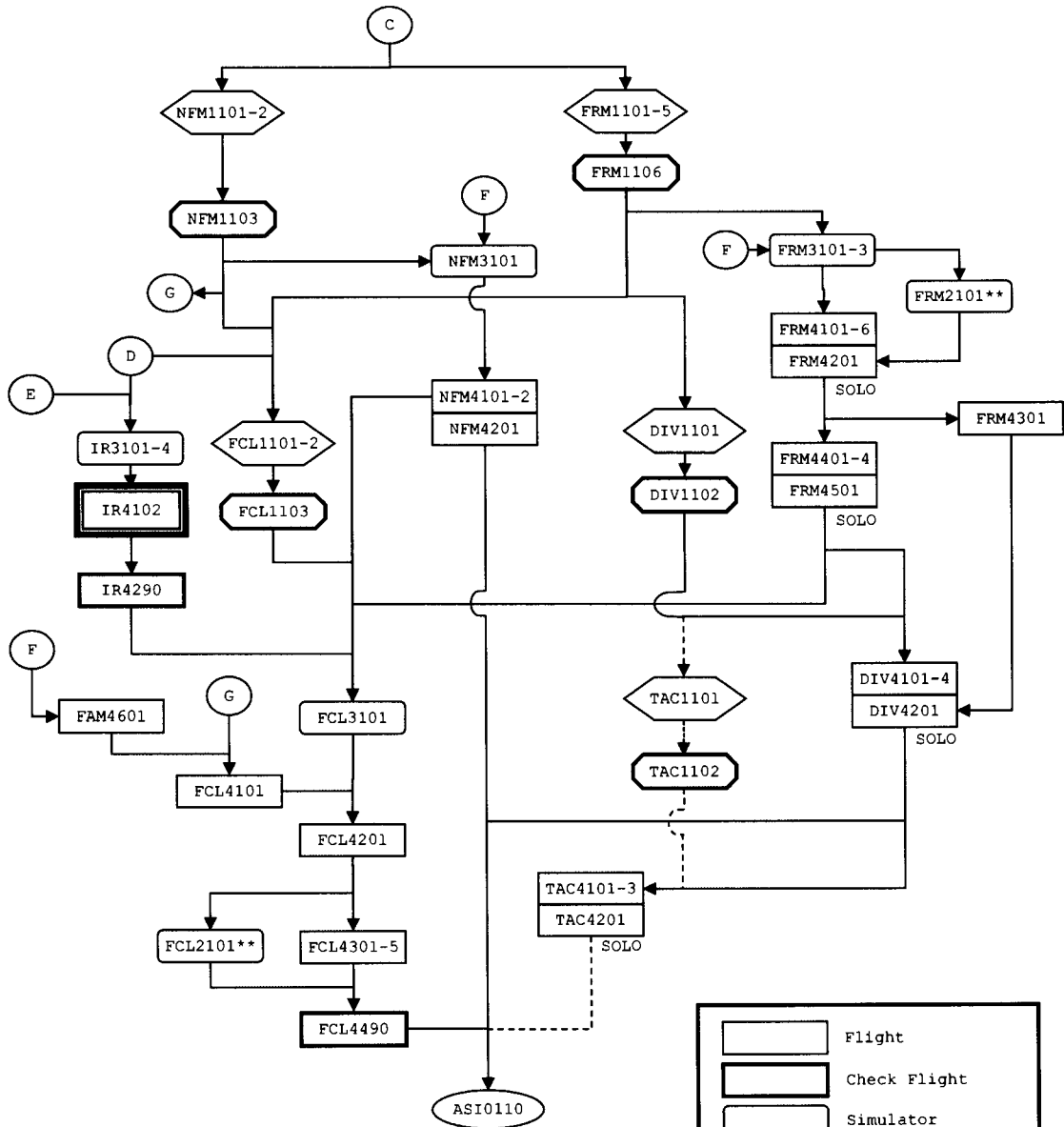


**INSTRUMENT TRAINING OPTIMIZATION COMPLETE COURSE FLOW (PART 1)  
(INTERMEDIATE JET)**



Enclosure (1)

**INSTRUMENT TRAINING OPTIMIZATION COMPLETE COURSE FLOW (PART 2)  
(INTERMEDIATE JET)**



NOTE: First event in stage must be completed within two weeks of the associated flight support lecture.

NOTE: Students selected for Intermediate E-2/C-2 will not complete TAC1101, TAC1102, TAC4101-3, or TAC4201.

NOTE: Optimization blocks are noted with double boxes.

	Flight
	Check Flight
	Simulator
	Ground Training
	CAI Test
	Flt Support
	P/P Exam
**	Any order
***	EP Event
---	Adv Strike Selectees only

Enclosure (1)

**T-6B Instrument Training Optimization (Strike Pipeline)**

<b>Block</b>	<b>Media</b>	<b>Title</b>	<b>Events</b>	<b>Hours</b>	<b>H/X</b>
IN14	Offline MIL	Instrument Optimization	1	1.0	NA

1. Prerequisite. JPPT Complete. Selected for Intermediate Jet.
2. Syllabus Notes
  - a. USN/USMC Intermediate Jet Instrument Training Optimization selected students only.
  - b. Students will train and practice single-seat procedures.
3. Special Syllabus Requirements

None
4. Discuss Items

None

<b>Block</b>	<b>Media</b>	<b>Title</b>	<b>Events</b>	<b>Hours</b>	<b>H/X</b>
I34	OFT	Instrument Optimization	2	2.6	1.3

1. Prerequisite. IN1401 for I3401.

2. Syllabus Notes

a. USN/USMC Intermediate Jet Instrument Training Optimization selected students only.

b. Students will train and practice single-seat procedures.

c. Event shall be flown in the high-altitude structure.

d. T-6B HUD is required for training.

3. Special Syllabus Requirements

I3401

HUD introduction (instrument approaches).

4. Discuss Items

I3401

Instrument approaches flown at higher speeds, single seat procedures, HUD, and high-altitude structure.

I3402

Backup Flight Instrument missed approach and IMC emergencies.

5. Block MIF

<b>CTS REF</b>	<b>MANEUVER</b>	<b>I3402</b>
1	General Knowledge/Procedures	4+
2	Emergency Procedures	4+
3	Headwork/Situational Awareness	4+
4	Basic Airwork	4+

Enclosure (2)



5	In-flight Checks/Fuel Management	4+
6	In-flight Planning/Area Orientation	4+
7	Task Management	4+
8	Communication	4+
9	Mission Planning/Briefing/Debriefing	4+
10	Ground Operations	4+
11	Takeoff	4+
12	Departure	4+
44	Radial Intercepts	4
45	Point-to-Point	4
49	Holding	4
50	Enroute Procedures	4+
109*	RADALT Procedures	3+
51	Enroute Descent	4+
52	High-Altitude Approach/Penetration	4+
53	Teardrop Approach	4
54	Arcing Approach	4
55	HILO Approach	4
56	Procedure Turn Approach	4
57	RVFAC Approach	4
58	GPS Approach	4
59	PAR Approach	4+
60	ASR Approach	4+
61	VOR Final	4
62	ILS Final	4+
63	LOC Final	4
64	GPS Final	4
65	Backup Flight Instrument Approach	4+
66	Circling Approach	4
67	Missed Approach	4+
67	Backup Flight Instrument Missed Approach	3+
68	Transition to Landing/Landing	4+

Special Syllabus Requirements 1

<u>Block</u>	<u>Media</u>	<u>Title</u>	<u>Events</u>	<u>Hours</u>	<u>H/X</u>
I46	T-6B	Instrument Optimization	4	6.0	1.5

1. Prerequisite. I3401 for I4601. I3402 for I4603.

2. Syllabus Notes

a. USN/USMC Intermediate Jet Instrument Training Optimization selected students only.

b. Events shall be flown from the front cockpit.

c. Students will train and practice single-seat procedures.

d. Event should be flown in the high-altitude structure. If available, high-altitude approaches should be used.

e. Events should be flown as an out and in or cross country.

f. A minimum of two instrument approaches should be flown on each event.

g. A minimum of one GCA approach shall be flown.

h. Flight planning for all events in this block shall include a completed jet log, DD-175, DD-175-1 weather brief, NOTAMS, and BASH conditions.

i. T-6B HUD should be available for training to the maximum extent possible. HUD utilization shall be documented on the ATF.

3. Special Syllabus Requirements

I4601

HUD introduction (instrument approaches).

4. Discuss Items

I4601

Instrument approaches flown at higher speeds, single seat procedures, HUD, and high-altitude structure.

Enclosure (2)

I4602

Any previously discussed procedures and any emergency procedure.

I4603

Backup flight instrument missed approach and IMC emergencies.

I4604

Any previously discussed procedures and any emergency procedure.

5. Block MIF

<b>CTS REF</b>	<b>MANEUVER</b>	<b>I4604</b>
1	General Knowledge/Procedures	4+
2	Emergency Procedures	4+
3	Headwork/Situational Awareness	4+
4	Basic Airwork	4+
5	In-flight Checks/Fuel Management	4+
6	In-flight Planning/Area Orientation	4+
7	Task Management	4+
8	Communication	4+
9	Mission Planning/Briefing/Debriefing	4+
10	Ground Operations	4+
11	Takeoff	4+
12	Departure	4+
44	Radial Intercepts	4
45	Point-to-Point	4
49	Holding	4
50	Enroute Procedures	4+
109*	RADALT Procedures	3+
51	Enroute Descent	4+
52	High-Altitude Approach/Penetration	4+
53	Teardrop Approach	4
54	Arcing Approach	4
55	HILO Approach	4

56	Procedure Turn Approach	4
57	RVFAC Approach	4
58	GPS Approach	4
59	PAR Approach	4
60	ASR Approach	4
61	VOR Final	4
62	ILS Final	4+
63	LOC Final	4
64	GPS Final	4
65	Backup Flight Instrument Approach	4+
66	Circling Approach	4
67	Missed Approach	4+
67	Backup Flight Instrument Missed Approach	3+
68	Transition to Landing/Landing	4+

Special Syllabus Requirements 1

Additional Course Training Standards (CTS):

BEHAVIOR STATEMENT	STANDARDS
109. RADALT Procedures	
<ul style="list-style-type: none"> <li>Performs RADALT procedures IAW T-6B Instrument Training Optimization (Strike Pipeline) FTI Addendum.</li> </ul>	<ul style="list-style-type: none"> <li>Utilizes RADALT effectively for safety of flight according to procedures.</li> </ul>

Supplemental ATJ Form Example and Instructions

CNATRA-GEN 1542/16 (REV. 3-74) - S/N 0197-CFO-4221

INSTRUCTOR: NA  
TRARON: <TRaining SquadRON>  
DATE: <DD/MMM/YYYY>  
STUDENT'S NAME: <Last, First, Middle Initial>

INSTRUCTOR COMMENTS: NA

**SUPPLEMENTARY JACKET FORM (ATJ)**

<RANK> <NAME> IS PARTICIPATING IN T-6B INSTRUMENT TRAINING OPTIMIZATION PILOT PROGRAM PER CNATRANOTE 1542 [date TBD]

DATE ENROLLED T-6B INSTRUMENT TRAINING OPTIMIZATION: <DD/MMM/YYYY>  
DATE COMPLETED: <DD/MMM/YYYY>  
PHASE/FLIGHT RAW SCORE: <RAW SCORE>

UPON COMPLETION OF T-6B INSTRUMENT OPTIMIZATION "TOP-OFF", THE FOLLOWING I-JET STRIKE SYLLABUS EVENTS ARE WAIVED AND REMOVED FROM THE INTERMEDIATE JET TRAINING TRACK:

RI4102, RI4103, AN4102, IR4101

NOTES:

1. **JPPT TRARON STUCON:**

a. SHALL FILE A COPY OF THIS SUPPLEMENTARY ATJ FORM (CNATRA 1542/16) DIRECTLY BELOW THE ATJ SUMMARY CARD FORM (CNATRA 1542/95) UPON ASSIGNMENT TO THE OPTIMIZATION TRACK.

b. SHALL FILE A COPY OF CNATRANOTE 1542 [date TBD], NOT INCLUDING ENCLOSURES, IN THE WAIVER SECTION OF THE STUDENT'S ATJ

c. UPON COMPLETION OF T-6B INST TRNG OPT SYLLABUS, SHALL MAKE ANNOTATIONS FOR WAIVED EVENTS IN I-JET AND UPDATE SUPPLEMENTAL FORM WITH SCORES (BOTH ELECTRONIC ATJ AS WELL AS THE HARD COPY).

2. **STRIKE TRARON STUCON** SHALL ENSURE STUDENT IS ASSIGNED TO THE OPTIMIZATION TRACK IN THE INTERMEDIATE JET SYLLABUS AND THAT ALL REQUIREMENTS IN NOTE 1 HAVE BEEN MET.

3. FOLLOW THE CONTINGENCY GUIDANCE PROVIDED IN CNATRANOTE 1542 [date TBD] FOR ALL PERFORMANCE ISSUES OR DISCONTINUATION OF TRAINING. CONTACT CNATRA N7P (DSN 861-1680) IF YOU HAVE QUESTIONS.

SIGNED \_\_\_\_\_

STUDENT CONTROL

Instructions for Supplemental ATJ form:

1. Verify the student is assigned and active in the optimization syllabus track.
2. Open *TIMS*.
3. Click the *Results* tab.
4. Click the *Gradebook* link.
5. Find the appropriate student's Gradebook.
6. Use the *Event dropdown* navigate to *IN1401*.
7. Once opened, on the right side, select the *Docs* tab.
8. On the *Write-up* band, select *add*.
9. Create a new write-up for the student(s).
10. Select "About Student."
11. Input subject, "T-6B Instrument Training Optimization Supplemental ATJ Form"
12. Click *Load Template*.
13. Load "T-6B Instrument Optimization".
14. Make necessary annotations.
15. *Save and Print*.

**T-6B Instrument Training Optimization (Strike Pipeline)**  
**FTI Addendum**

**1200. INSTRUMENT TRAINING OPTIMIZATION FOR STRIKE PIPELINE**

Congratulations on completing T-6B JPPT and selecting Strike! In preparing you for training in the T-45C, some of the ideas presented here will be new to you, but you will be familiar with much of it. You will be performing essentially the same procedures at faster airspeeds; consequently, events will happen more quickly than you have experienced, so your margins for error will be reduced. You will be flying these Strike “top off” events with a single-seat perspective and the need to manage all available aircraft resources, including the HUD and system capabilities to fullest extent.

Also, having the aircraft properly trimmed at all times is paramount. The extra effort to quickly and effectively trim the aircraft allocates more time to stay ahead of the aircraft. You should trim out the stick pressure (very light feel) allowing more attention to be focused on the required tasks and maneuvers. The idea is for you to fly the aircraft, not for the aircraft to fly you.

**1201. SINGLE-PILOT RESOURCE MANAGEMENT**

Single-Pilot Resource Management (SRM) is defined by the FAA as the art and science of managing all the resources (both on-board the aircraft and from outside sources) available to a single-pilot (prior and during flight) to ensure that the successful outcome of the flight is never in doubt. Human resources available to the single pilot include groups routinely working with the pilot who are involved in decisions that are required to operate a flight safely. Dispatchers, weather briefers, maintenance personnel, and air traffic controllers are examples of human resources. SRM is a set of skill competencies that must be evident in all tasks as applied to single-pilot operation. In this training, the student will perform all tasks and maneuvers as a single pilot with the Instructor acting primarily as a safety observer.

**1202. GENERAL GUIDANCE**

1. Events shall be flown from the front cockpit.
2. Students shall train and practice single pilot procedures.
3. Events should be flown within the high-altitude structure. If available, high-altitude approaches should be used.
4. All instrument approaches shall be flown at fast cruise and normal cruise as directed by the procedure contained herein. Begin transition 5-7 nm prior to FAF and configure to BAC within 3-5 nm of FAF with power and speedbrake as required.

5. Missed approach procedures will be conducted in accordance with the T-6B Primary Instrument Navigation Flight Training Instruction (FTI) and NATOPS. For partial panel missed approach, students shall reference the Backup Flight Instrument for attitude, rate of climb, rate of turn, heading, airspeed, and altitude.
6. Fuel planning and awareness shall be stressed including use of max endurance, max range, bingo profiles, and fuel-limited scenario-based training.

### **1203. HEAD UP DISPLAY (HUD)**

The HUD provides display of aircraft flight, navigation, and tactical data. The HUD basic flight data displays are comprised of a combination of aircraft control and performance data symbols. The aircraft control data symbology includes the waterline pitch reference, flight path marker, climb dive marker, and climb dive ladder. The aircraft performance data symbology includes the airspeed scale, altitude scale, vertical velocity indicator, heading scale, bank scale, bank indicator, and sideslip indicator. A course deviation indicator (CDI) is displayed in the NAV master mode when the NAV source is either FMS or VOR with a course selected. A glideslope deviation bar and a localizer deviation bar are displayed when in the NAV master mode when the NAV submode is selected and the navigation source is LOC. Please refer to the T-6B NATOPS for a detailed description on the HUD.

While you will learn to incorporate the HUD into your scan during an instrument approach, you must continue to scan all other applicable instruments. During visual maneuver, HUD attitude, navigation, and performance instrument information can be used to assist in the transition from a head-down instrument scan to a visual scan. The HUD information is a reference, your primary flight reference is the Attitude Indicator.

#### **Note**

The Head Up Display is not certified as a primary source of information under instrument flight rules.

### **1204. RADAR ALTIMETER (RADALT) / LOW ALTITUDE WARNING (LAW)**

The RADALT/LAW is essential to safe operation of tactical aircraft and its primary purpose is safety of flight (SOF). You will learn to use it according to the procedures the Strike community has consistently used for several decades. Nearly every Strike pilot can remember a time when proper use of the LAW prevented a dangerous situation. As such, these procedures will be critical to your success in training and in the fleet.

The T-6B LAW has operating limitations (T-6B operates up to 2500' AGL, +/- 30 deg AOB, +/- 15 deg pitch) that require slight modification to standard procedures used in the T-45C (T-45C operates up to 5000' AGL) however, the concepts are the same.

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## **RADALT/LAW Procedures**

1. The RADALT/LAW tone shall be acknowledged by both crewmembers. RADALT/LAW settings shall be verbally acknowledged and verified. SNAs shall notify the IP when a change in RADALT/LAW setting is required and/or made.
2. **Takeoff** - Set RADALT/LAW at 200 feet for low altitude awareness during initial climb and gear/flap transition.
3. **Climbout** - When above 2,500' the RADALT warning setting (tone) shall be set at 2,400' AGL (does not operate when set to 2500') and remain there until descending below 2,400' AGL. If an intermediate level off below 2,500' is required, enroute LAW settings (described below) apply until you resume your climbout.
4. **Enroute** - The LAW shall remain at 2,400 ft (maximum setting) until descending through 2,400' AGL. If assigned altitude below 2,400' AGL, the RADALT/LAW shall be set 10% below the assigned altitude.
5. **Descent/penetration** –
  - a. When descending through 5,000' AGL (platform), the pilot at the controls will simultaneously call, "Platform, RADALT is set at 2,400'," check/confirm speed brake in, shallow the descent, and apply the "minute to live" rule (rate of descent less than current AGL altitude).

### **Note**

Without a functioning RADALT at 5,000' AGL, you will reference the baro-altimeter (adjusted for height above sea level in higher elevation areas) for your "Platform" call. Areas with significantly higher terrain will require adjustment of your penetration descent profile prior to 5,000' MSL.

- b. The RADALT/LAW warning tone will sound when descending through 2,400' AGL. The pilot at the controls shall verbally acknowledge LAW tone and inform the other occupant of the new RADALT/LAW setting:
  - (1) "Good RADALT, resetting to \_\_\_\_\_."
  - (2) This procedure verifies the RADALT/LAW is operating properly and is the only time you should hear the LAW tone with the exception of a precision approach at Decision Height (DH).

c. From this point, the RADALT/LAW shall be set at 10% below the next expected level off altitude (assigned arcing altitude, FAF, etc.) and other intermediate approach altitudes as the situation allows (referred to as “stepping it down”).

## 6. Approaches –

a. Use of the RADALT/LAW during instrument approaches shall be as a backup to the barometric altimeter for cueing at minimum descent altitude or decision height.

b. The RADALT/LAW shall be set to Minimum Descent Altitude (MDA) adjusted for AGL (HAA), less 10% for non-precision approaches, and at Decision Height (DH) adjusted for AGL (HAT) for precision approaches. If the LAW goes off prior to DA/DH, you shall execute missed approach.

c. Failure to adjust for higher elevations will cause a warning tone well above the desired altitude. Also, terrain features may cause a momentary LAW warning requiring acknowledgement and cross-check for continuation. Your preflight planning will help you know what to expect.

d. The RADALT/LAW shall be reset in between approaches.

## 1205. INSTRUMENT FLIGHT PROCEDURES

This section discusses strike optimization instrument flight procedures in sequence by phase of flight. All other procedures remain the same in accordance with the T-6B Primary Instrument Navigation Flight Training Instruction (FTI) and T-6B NATOPS.

### DEPARTURE PHASE

Departure procedures will be conducted IAW the T-6B Primary Instrument Navigation Flight Training Instruction (FTI) and T-6B NATOPS.

### ENROUTE PHASE

The enroute phase will be flown at 240 KIAS (fast cruise). Since you will be flying at faster speeds, use these additional methods below in addition to the procedures outlined in the T-6B Primary Instrument Navigation FTI, remember the FAA recommends a maximum of 30 degrees angle of bank.

The calculations below, like many other calculations required during preflight planning, provide for smooth execution of your flight plan. However, a war-fighter must be flexible and adaptable. You should also be able to perform these calculations mentally by memorizing common ratios/relationships which will improve your “cockpit math” skills. “Cockpit math” is about utilizing the least amount of mental resources necessary to determine appropriate order of

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magnitude answers to real-time flight/mission decisions. Various ratios, relationships, and short-cuts derived from diligent practice of common flight calculations will enhance single-pilot safety and mission success.

### Intercepting an Arc from a Radial

The key to intercepting an arc precisely at the desired DME lies in performing an accurate lead point calculation (LPC) to determine the correct lead point DME to initiate the interception turn. For radial to arc intercepts, you will determine the lead point in miles (DME) instead of radials. The turn to intercept an arc from a radial will normally be at approximately 90 degrees (Figure 1). When intercepting an arc, you have to calculate the lead point at which you initiate the turn in order to intercept it at the correct distance.

A method to determine the lead point is use 1 percent of your groundspeed. For example, whether flying inbound or outbound at a groundspeed of 250 kts, your lead point will be 2.5 DME prior to the desired arc. When inbound to the arc, **add** the 1 percent to the arc DME and when outbound, **subtract** 1 percent from the arc DME when calculating the lead point.

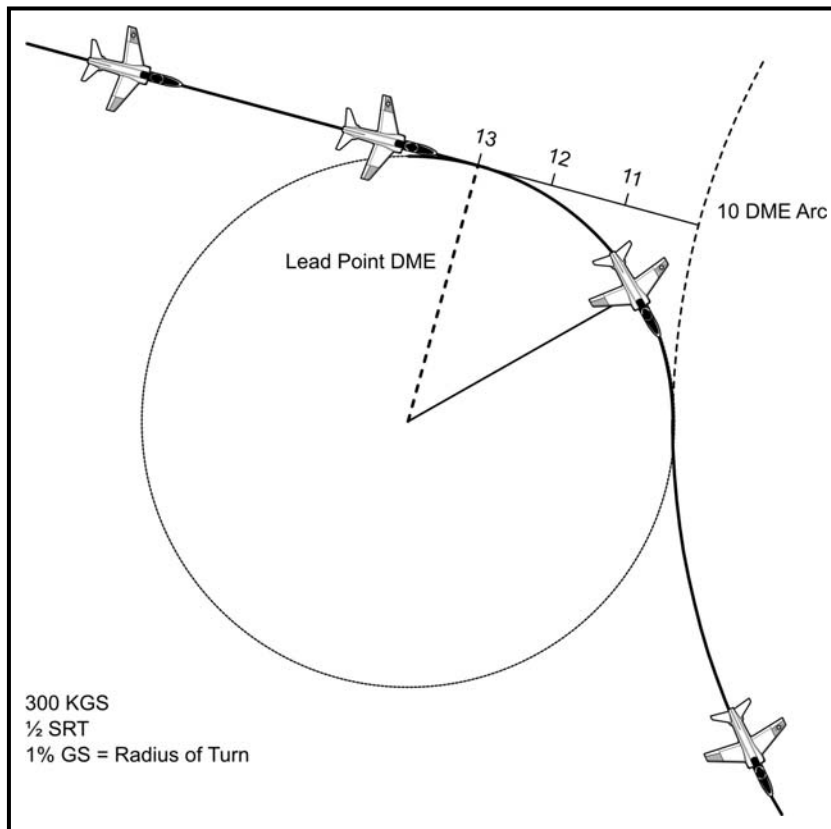


Figure 1. Radial-To-Arc Intercept

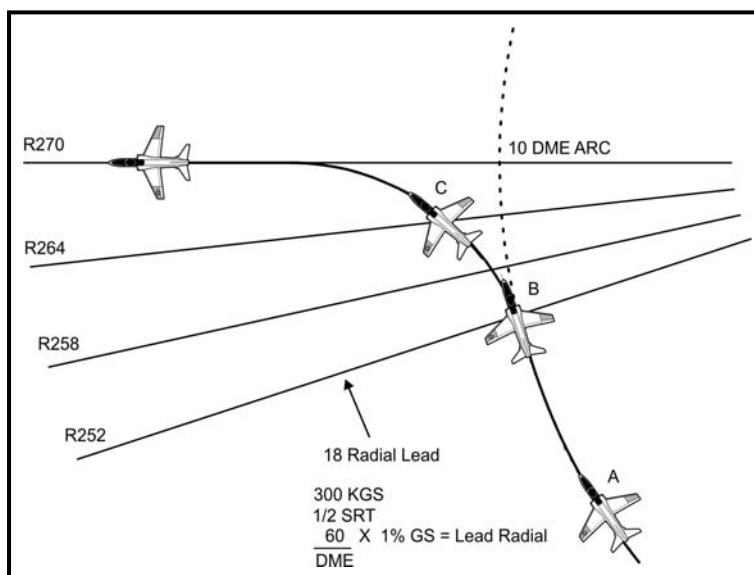
When you reach the lead point, initiate a 1/2 SRT turn in the proper direction and maintain it until the bearing pointer nears the 90-degree benchmark on the HSI display. You may have to modify your turn rate/AOB somewhat in order to arrive on the arc at the proper DME.

When intercepting an arc from a radial that is significantly more or less than a 90-degree turn, adjust the lead point by applying the following:

1. For turns of approximately 45 degrees, use 1/3 of the distance calculated for a 90-degree turn.
2. For turns of approximately 60 degrees, use 2/3 of the distance calculated for a 90-degree turn.
3. Turns of 30 degrees or less require very little lead.

### Intercepting a Radial from an Arc

When intercepting a radial from an arc, you must determine which way you have to turn to intercept and fly the radial in the correct direction (Figure 2). Since you will most often be performing an arc as part of an approach or departure procedure, you can obtain this information from the appropriate approach plate or SID. To turn from an arc to a radial, your main consideration is to determine the proper lead in radials. Radials diverge as you get further from a station and are 1 nm apart at 60 DME. Take this divergence into account when calculating your lead point for the turn.



**Figure 2. Arc-To-Radial Intercept**

To calculate the lead point for intercepting a radial from an arc, first you must calculate or estimate the groundspeed. Then apply the following formula:

Divide 60 by the arc DME, and then multiply the quotient by 1 percent of the groundspeed.

Example:

If you are on a 15 DME arc at 250 kts groundspeed, your lead point will be 10 radials (60 divided by 15 equals 4, 1 percent of 250 is 2.5, and 2.5 multiplied by 4 equals 10).

To intercept a radial from an arc, first set the desired course on the HSI display. Next, determine your lead, and then turn using a 1/2 SRT when you reach the lead point. Finally, vary your AOB in the turn with the movement of the course deviation indicator so that it is centered when the turn is complete. Do not exceed 30 degrees AOB.

For radial intercepts from arcs **less** than 10 DME, a correction factor must be applied to the arc-to-radial formula to account for the turn to the radial being more or less than 90 degrees. In the case of a turn inbound, the turn will actually be more than 90 degrees, and the correction factor will be **added** to the standard 90-degree arc-to-radial formula. In the case of an outbound turn, the turn will actually be less than 90 degrees, and the correction factor will be **subtracted** from the standard 90-degree arc-to-radial formula.

The correction factor is calculated as follows:

**Inbound turn** correction factor =  $([90 + \text{Lead (radials)}] / 90) \times (\text{Turn Radius})$

**Outbound turn** correction factor =  $([90 - \text{Lead (radials)}] / 90) \times (\text{Turn Radius})$

Example:

An inbound turn of more than 90 degrees on a 10 DME arc at 250 GS:

Correction Factor =  $([90 + 15] / 90) \times 2.5 = 2.9$

Therefore, the correct lead for an inbound turn at 10 DME =

$15$  (lead for 90 degree turn on 10 DME arc) + 2.9 = 17.9, or approximately 18 radials

An outbound turn of less than 90 degrees on a 10 DME arc at 250 GS:

Correction Factor =  $([90 - 15] / 90) \times 2.5 = 2.08$

Therefore, the correct lead for an outbound turn at 10 DME =

$15$  (lead for 90-degree turn on 10 DME arc) - 2.1 = 12.9, or approximately 13 radials

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## **Enroute and Terminal Descents**

In preparation for enroute or terminal descent, complete **WARP** checks:

- W** – Weather
- A** – Altimeter
- R** – Runway
- P** – Descent (Penetration) Checklist

**WARP** checks are the minimum information and procedures required to safely execute the approach.

When descending through 5,000 ft AGL, adhere to RADALT/LAW procedures and comply with the "minute-to-live" rule. Proper energy management requires the speed brake to be used only as necessary from this point forward with the exception of transitioning to landing configuration when required.

The NATOPS recommended enroute descent procedure is power and configuration as required (200-250 KIAS) and descent rate of ~4000 fpm. Descent rates will increase significantly (to 8000-11,000 fpm) with idle power and speed brake extended.

## **1206. TERMINAL PROCEDURES**

Terminal procedures will be performed as outlined in this FTI addendum.

### **APPROACH PHASE**

#### **High Altitude Approach**

Students should use the following procedures in addition to the T-6B Primary Instrument Navigation Flight Training Instruction (FTI) Chapter 8, paragraph 819. Figure 3 shows a graphical depiction of a high altitude penetration approach.

#### **Procedures**

1. Inbound to the IAF, complete the descent (penetration) Checklist.
2. At the IAF, lower the nose, extend speed brakes, establish 240 kts, PCL as required.
3. Manage energy to comply with all course, altitude, and DME restrictions. Lead the level-off from penetration by 1000'. Level segments of the penetration should be flown at fast cruise. Adhere to RADALT/LAW procedures.

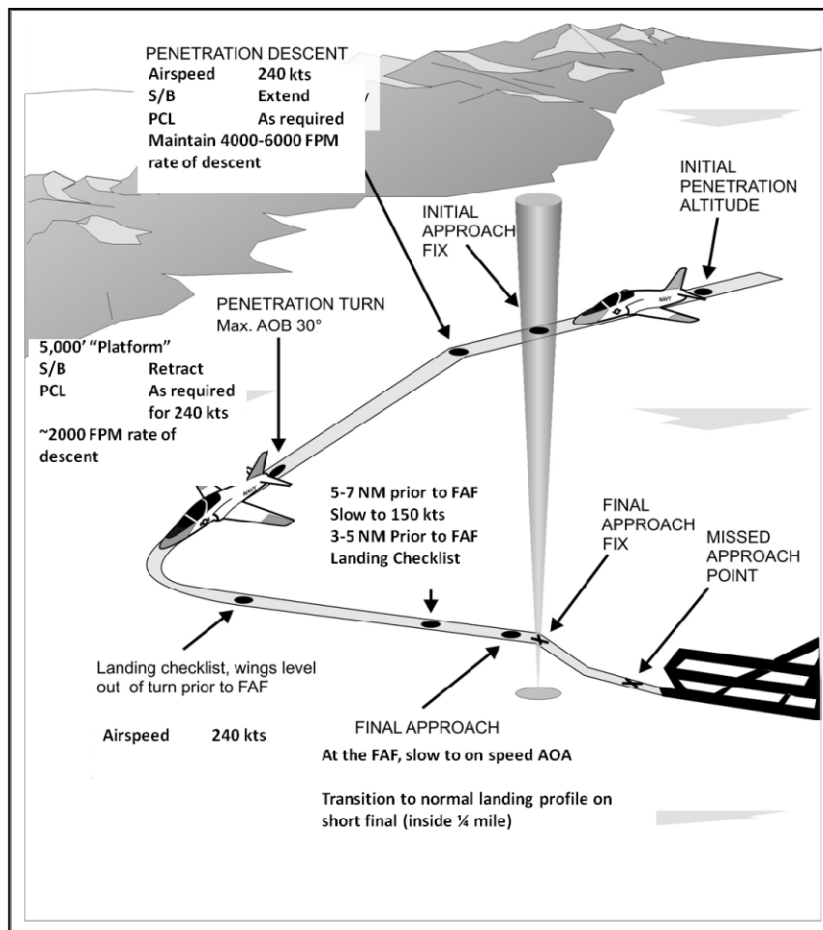


Figure 3

a. **Teardrop Penetration:** At one-half your initial altitude or reaching the published penetration turn, fly the penetration turn in the published direction. A 30° AOB turn is normally used during the penetration. During the last half of the turn, note the position of the head of the needle:

- If the head of the needle is not within 5° of the inbound course, stop the turn with a 45° intercept.
- If the head of the needle is within 5° of the inbound course, continue the turn and roll out with a double-the-angle intercept.

b. **Penetration including an Arcing Maneuver:** When turning 90° onto an arc from a radial, use methods outlined in paragraph 1206 and the T-6B Primary Instrument Navigation FTI. Do not exceed 30° AOB or SRT, whichever occurs first.

**NOTE**

Some high altitude approach plates have penetration instructions printed in the profile view of the approach plate. Review and comply with all printed instructions.

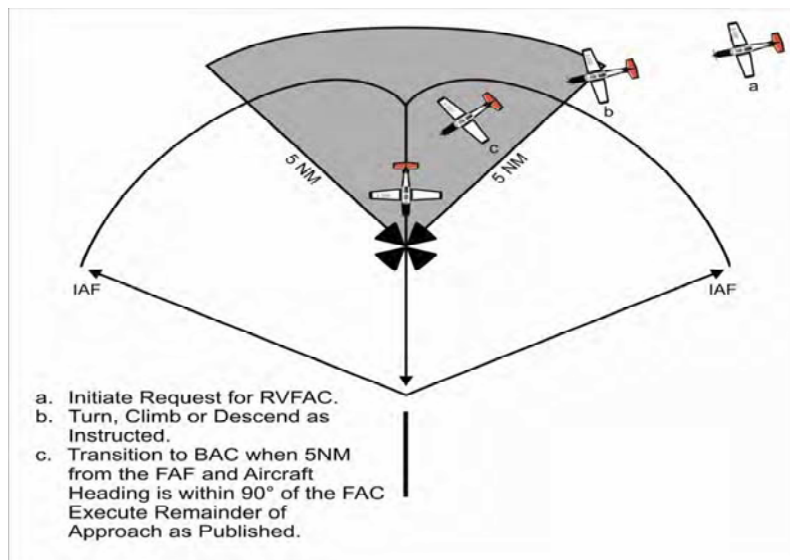
4. Once established inbound and within 5-7 NM of the FAF, slow to 150 knots.
5. 3-5 NM from the FAF, transition to BAC and slow to on speed AOA.
6. At the FAF, lower the nose, reduce power, and begin descent. Report to ATC as required.
7. Transition to normal landing profile on short final.

**NOTE**

High altitude approach plates do not contain landing minimums for category B aircraft. If category B minimums are not provided, T-6Bs should use category C minimums which are more conservative.

**Radar Vectors to Final Approach Course**

Students should use the following procedures in addition to the T-6B Primary Instrument Navigation Flight Training Instruction (FTI) Chapter 8, paragraph 818. Slow to 200 KIAS if vectored to downwind or base leg. Maintain a high level of situational awareness and know where the aircraft is in relation to the final approach fix (Figure 4).



**Figure 4**



## **Procedure**

1. Set up NAVAIDS for the approach.
2. Follow radar vectors given by approach control.
3. When cleared for the approach, maintain the last assigned altitude and heading given by ATC until established on the approach. As the CDI begins to center, and you are cleared for the approach, you are expected to turn onto the final approach course and track it inbound. Be alert for quick CDI movement since you are traveling at a faster airspeed and lead the turn sufficiently to roll out on course.
4. Once established inbound and within 5-7 NM of the FAF, slow to 150 knots.
5. 3-5 NM from the FAF, transition to BAC, and slow to on speed AOA.
6. At the FAF, lower the nose, reduce power, and begin descent. Report to ATC as required.
7. Transition to normal landing profile on short final.

## **ILS/Localizer Approach**

### **Procedure**

1. Set NAVAIDS up for the ILS/Localizer.
2. For low altitude approaches, maintain 200 KIAS.
3. Within 5-7 NM of the FAF, slow to 150 kts.

### **On final:**

4. As the CDI comes alive, turn onto final in order to capture the inbound course.
5. When established on final and within 3-5 NM of the FAF, transition to BAC and slow to on speed AOA.

Methods for determining when within 5 NM of the FAF:

- a. DME (not all ILS/LOC approaches provide DME)
- b. GPS waypoint

- c. Established at the published glide slope (ILS) intercept altitude and the glide slope indication is “alive” (green diamond starts to move down from the top of the glide slope case).
  - d. Controller radar identification
6. At glide slope intercept, lower the nose, reduce power, and begin descent. Report to ATC as required.

**NOTE**

In the case of a strong headwind/tailwind, more/less power may be required.

7. Corrections for glide slope (ILS) should be made with power; corrections for airspeed should be made with pitch attitude.
8. If the runway environment is in sight and a safe landing can be made, transition to normal landing profile on short final. If not, execute a Missed Approach. If the RALT warning is activated, execute a missed approach.

**GCA Approaches**

Students shall use the following procedures in addition to the T-6B Primary Instrument Navigation Flight Training Instruction (FTI) Chapter 9, paragraph 905. (Figure 5)

During the initial pattern of an ASR or PAR approach, you will be guided by surveillance radar. This segment includes all maneuvering up to the point at which your aircraft is inbound on the final approach course and at approximately 8 nm from touchdown. During the transition to final, the GCA controller will direct your headings and altitudes. All controller instructions to initiate turns and descents should be complied with immediately. In the pattern, maintain standard rate turns not to exceed 30 degrees AOB. On final, your AOB should approximate the number of degrees to be turned not to exceed half standard rate (approximately 10 degrees AOB). A good technique is 30 degrees AOB in pattern, 20 degrees AOB turning base to final. Once on final, do not exceed 10 degrees AOB for heading corrections to course.

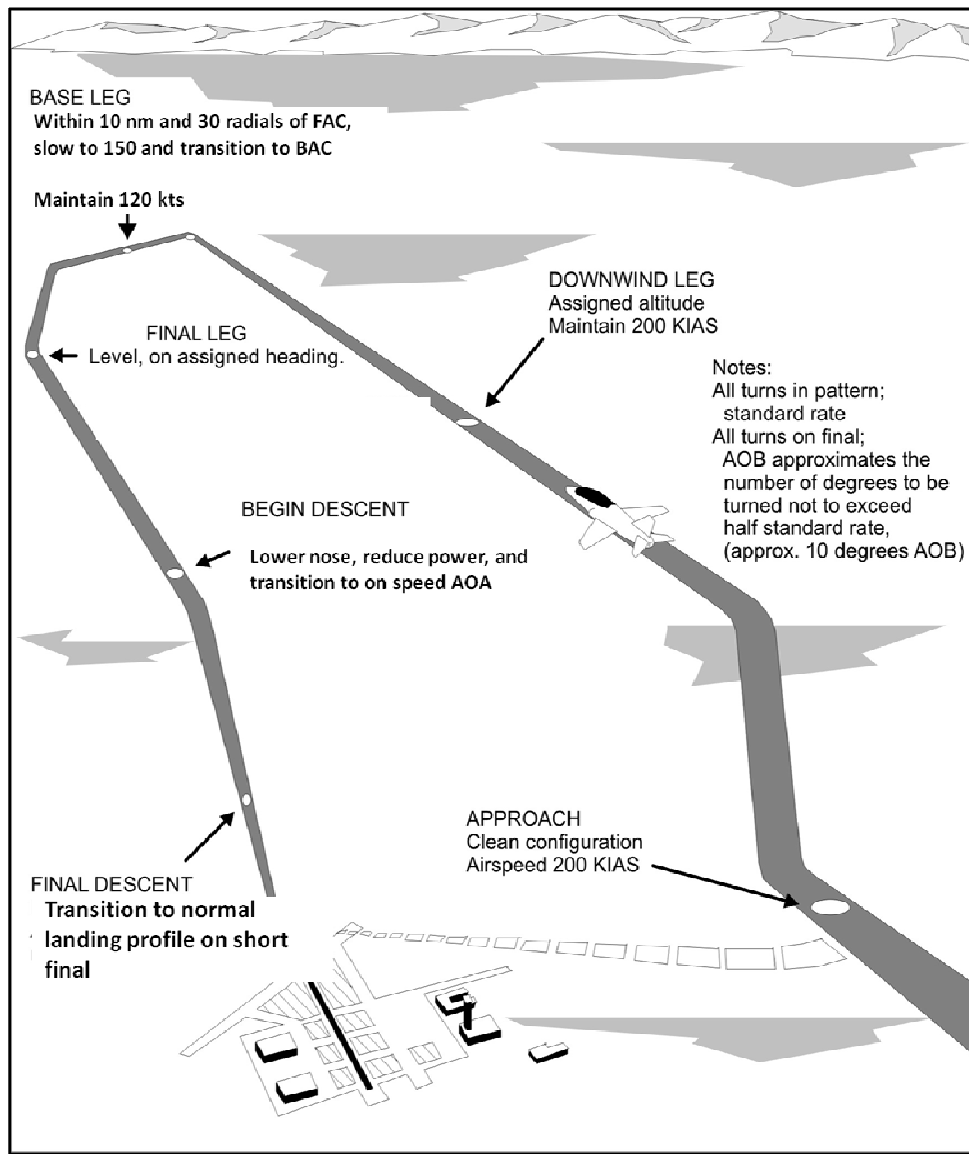


Figure 5

### Procedures

1. Comply with vectors provided by approach control and the final approach controller. Maintain situational awareness at all times.
2. When established on downwind, slow and maintain 200 KIAS.
3. Configure to BAC within 10 nm of the airfield and 30 radials of FINAL APPROACH COURSE (FAC) and slow to on speed AOA.

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4. Expect a frequency change to the final controller on final or dog-leg to final.
5. Begin descent when the final controller advises that you are "on glide path," Reduce power 24%, allow the nose to fall, trim to maintain on speed AOA, adjust power as required to maintain glide path and on speed AOA.
6. ASR: 100' prior to MDA, initiate level-off by adding power and raising the nose.
7. If the runway environment is in sight and a safe landing can be made, transition to normal landing profile on short final. If not, execute a Missed Approach.

## GENERAL INSTRUMENT PROCEDURES

**Visual Maneuvers.** Visual maneuvers, IFR procedures executed in VMC conditions, are included here because once you reach the MAP or are cleared by ATC for a visual approach; you will complete your approach and landing VFR. It is important that you adjust your rate of descent to arrive at the MDA well ahead of reaching the MAP so that you have time to visually acquire the field. Non-precision approaches that have a visual descent point (VDP) require you to remain at the MDA until the visual descent point is passed. During low visibility, avoid the tendency to "duck under" or go low during the final approach to touchdown.

**Visual Approach.** In a visual approach, an aircraft on an IFR flight plan, operating in VMC conditions and having received an Air Traffic Control authorization, may deviate from the prescribed instrument approach procedures and proceed to the airport of destination by maintaining VFR conditions. ATC may initiate a visual approach, **but** you are never required to accept it.

Certain conditions must be met before you can fly a visual approach: 1) the field or a preceding aircraft must be in sight, 2) the ceiling must be at least 1,000 ft AGL, and 3) there must be at least 3 sm visibility.

**Circling Approach.** The circling approach is used to align aircraft with the proper runway at the end of an instrument approach. The runway is often not the same one to which the instrument approach was flown. The minimums for a circling approach differ from the others published for a given runway. Circling minimums are higher than other instrument minimums and require you to remain VMC underneath while maneuvering to land.

Once you have elected to conduct a circling approach and have obtained clearance, descend to the circling minimums and visually acquire the runway.

Once you descend to the MDA, determine if visibility is sufficient to safely complete the landing. If it is, choose the landing pattern best suited to your situation, or the one directed by the

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controller. Stay at the MDA until you are in a position to execute a normal landing—ideally, the point at which you would intercept the normal glide slope to the runway. If weather permits, fly the circling maneuver at the normal VFR pattern altitude. Be sure to check the approach plate for any obstacles in the vicinity of the airport.

If you cannot safely complete the landing, execute your missed approach instructions.

## **1207. EMERGENCY APPROACH PROCEDURES**

**Simulated Minimum Fuel GCA.** When a minimum fuel GCA is requested, ATC will give normal GCA box pattern vectors (intercept glide path at approximately six miles from the end of the runway) and expect 200 KIAS until final. You can request a 30-second glide slope warning. The call "*Perform landing checks*" is a required USN/ USMC advisory call on base leg and does not mean to dirty up or reduce airspeed.

### **Procedure**

1. Request a 30 second glide slope warning.
2. At 30 second glide slope warning transition to BAC by reducing power to idle, lowering the landing gear at 150 KIAS, and slow to on speed AOA.
3. "On glide path," lower the nose slightly, trim to maintain on speed AOA, adjust power as required to maintain glide path.

**Simulated Minimum Fuel ILS.** Request vectors to ILS final and advise ATC that you will maintain 200 KIAS until glide path intercept. The glide slope needle starting to move down serves as a "30-second glide path warning."

### **Procedure**

1. When the glide slope needle begins to move, transition to BAC by reducing power to idle, lowering the landing gear at 150 KIAS, and slow to on speed AOA.
2. On glide slope, lower the nose slightly, trim to maintain on speed AOA, adjust power as required to maintain glide slope.