WORKBOOK

ADVANCED INSTRUMENT FLIGHT PLANNING TH-57C

2021

DEPARTMENT OF THE NAVY
CHIEF OF NAVAL AIR TRAINING
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Subj: WORKBOOK, ADVANCED INSTRUMENT FLIGHT PLANNING, TH-57C

1. CNATRA P-427 (Rev. 12-21) PAT, "Workbook, Advanced Instrument Flight Planning, TH-57C" is issued for information, standardization of instruction, and guidance to all flight instructors and student military aviators within the Naval Air Training Command.

2. This publication is an explanatory aid to the Helicopter curriculum and shall be the authority for the execution of all flight procedures and maneuvers herein contained.

3. Recommendations for changes shall be submitted via the electronic Training Request Form (TCR) form located on the CNATRA Website.

3. CNATRA P-427 (New 11-20) PAT is hereby cancelled and superseded.

T. P. ATHERTON
By direction

Releasability and distribution:
This instruction is cleared for public release and is available electronically only via Chief of Naval Air Training Issuances Website, https://www.cnatra.navy.mil/pubs-pat-pubs.asp.

FLIGHT PLANNING WORKBOOK

FOR

ADVANCED INSTRUMENT

TH-57

Q-2C-3156

LIST OF EFFECTIVE PAGES

Dates of issue for original and changed pages are:
Original…0…03 Nov 20 (this will be the date issued)
Revision…1…13 Dec 21

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 77 CONSISTING OF THE FOLLOWING:

Page No.	**Change No.**	**Page No.**	**Change No.**
COVER	0		
LETTER	0		
iii – xxi	0		
xxii (blank)	0		
1 – 17	0		
18 (blank)	0		
19 – 25	0		
26 (blank)	0		
27 – 33	0		
34 (blank)	0		
35 – 45	0		
46 (blank)	0		
47 – 55	0		

INTERIM CHANGE SUMMARY

The following Changes have been previously incorporated in this manual:

CHANGE NUMBER	REMARKS/PURPOSE

The following interim Changes have been incorporated in this Change/Revision:

INTERIM CHANGE NUMBER	REMARKS/PURPOSE	ENTERED BY	DATE

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ADVANCED PHASE

DISCIPLINE: Navigation

COURSE TITLE: Advanced Instrument Flight Planning, TH-57C

UNIT: Flight Planning Workbook

PREREQUISITES: None

TERMINAL OBJECTIVE:

Upon completion of the Flight Planning Lecture and review of this workbook text, the student will understand the flight planning requirements set forth by CNAF M-3710.7 series for use during syllabus radio instrument (RI) and cross-country flights and on the flight planning portion of the final examination for this course in partial fulfillment of the requirements to obtain a standard instrument rating.

ENABLING OBJECTIVES:

1. Complete Single Engine Flight Logs and fuel plans for practice problems one through five.

    a. Given basic aircraft weight, crew weight, oil weight, and baggage weight calculate maximum allowable fuel on board based on NATOPS max gross weight of 3200 lbs.

    b. Given the route of flight, select the optimum planned flight altitude ("cruising altitude") consistent with the Instrument Flight Rules (IFR) semicircular cruising rules from a list containing four or more altitudes and their forecast winds.

    c. Given outside air temperatures and indicated airspeeds or calibrated airspeeds, determine True Airspeeds (TAS) at planned cruise altitude(s) and instrument approach altitude(s) using a CR-2 computer.

    d. Given forecast winds, TAS, and courses, determine ground speeds for each flight leg segment.

    e. Using calculated aircraft weight with crew, baggage, and fuel, and with the selected cruising altitude, OAT, and IAS, determine fuel flow at planned flight altitude utilizing NATOPS performance charts.

    f. With ground speed, route of flight, and fuel flow, compute the Estimated Elapsed Time (EET) and fuel required for each segment and for the planned flight overall.

    g. State CNAF M-3710.7 series, TH-57 NATOPS, and RWOP requirements for minimum planned fuel reserve.

h. Determine the total fuel required at take-off to complete the flight as planned. Determine the hours of fuel on board at takeoff for inclusion on the DD-1801.

2. Plan IFR Flights to include:

a. IFR flight to destination (no alternate required).

b. IFR flight to destination with an alternate required.

c. IFR flight to destination with an en route delay or terminal delay.

3. Complete the DD-1801 for IFR flights.

a. Complete the DD-1801 for IFR flight to destination.

b. Complete the DD-1801 for IFR flight to destination with an alternate airport.

c. Complete the DD-1801 for IFR flight to destination with an en route delay or terminal delay.

4. Demonstrate a working knowledge of the information contained in the DoD Flight Information Publications (FLIP) and the appropriate sections of CNAF M-3710.7.

a. List FAR/DoD/CNAF cloud clearances and visibility requirements to operate in controlled airspace and uncontrolled airspace, and special rules for helicopters (where applicable).

b. State the FAR/DoD/CNAF rules for operating helicopters in Class B, C, and D airspace, and special rules for helicopters where applicable).

c. Understand and apply CNAF "standard instrument rating" takeoff weather minimum requirements for non-precision approaches.

d. Understand and apply CNAF M-3710.7 approach minimum rules for single-piloted and multi-piloted aircraft and special rules for helicopters (where applicable).

e. State CNAF requirements for selection of alternate airports on IFR flight plans.

f. State takeoff minimums for "standard instrument rating" pilots using available precision approaches.

g. Understand and apply CNAF M-3710.7 rules with respect to instrument approach ceiling and visibility minimums for executing various approaches.

h. Interpret the information provided in the low altitude instrument approach plate pilot briefing and procedures section.

i. Interpret low altitude instrument approach plate plan view information.

j. Interpret low altitude instrument approach plate profile view information.

k. Interpret the information on low altitude instrument approach plate airport sketches and diagrams.

l. Select the correct procedure given in clearances issued by ATC/Approach control/Tower.

m. State the difference between closing out and canceling a flight plan.

n. Define an ATC approved "contact approach."

o. Describe the Low Altitude Airways system and list its limitations.

p. List the limitations of NAVAIDs established by the "Radio Class Codes" in the IFR Supplement.

q. Understand and apply CNAF M-3710.7 approach minima for a single-piloted aircraft executing an instrument approach.

r. Complete the DD-1801 for IFR flights IAW the GP.

s. Understand and apply CNAF M-3710.7 and approach plate minimums for executing various types of approaches.

t. Apply CNAF Instructions for selecting alternate airports in various situations.

u. Know how to use the Airport/Facility Directory Legend of the IFR Supplement.

v. Interpret airport information in the Airport/Facility Directory of the IFR Supplement.

w. Understand the information contained in the Pilot Procedures chapter of the FLIP GP publication.

x. Understand the information contained in the Flight Hazards section of the FLIP AP/1 publication.

y. Understand the information contained in the Explanation of Terms chapter of the FLIP GP publication.

z. Know how to obtain and use inflight weather advisories.

aa. Understand the information contained in the Emergency Procedures section of the FLIP FIH publication.

bb. Know how to use the Supplementary Enclosures of FLIP Low Altitude Approach Plates.

cc. Know how to read the information on a FLIP Low Altitude IFR Chart.

dd. Understand the information contained in the legends and flaps of a FLIP Low Altitude IFR Chart.

ee. Understand the information contained in the National and International Flight Data and Procedures section (Section B) of the FLIP FIH publication.

ff. Be able to correctly interpret METAR weather information.

gg. Understand the information contained in Flight Rules, chapter 5, of CNAF M-3710.7.

hh. Understand the information contained in the Glossary appendix of CNAF M-3710.7.

ii. Know how to use Pilot-to-Metro Services.

jj. Know how to use the Supplementary Airport Information section FLIP AP/1 publication.

kk. Understand the information contained in the Theater Flight Data/Procedures section of the FLIP IFR Supplement.

ll. Understand the CNAF requirements concerning weather for planning, briefing, and filing of a flight plan.

DIRECTIONS TO STUDENT

STEP 1 Attend the Helicopter Flight Planning Lecture. You will need this workbook (CNATRA Pub P-427), the Instrument Navigation Workbook (CNATRA Pub P-426), the 2016 Flight Information Publications (FLIPS), CNAF M-3710.7, and a flight computer (CR-2). These can be checked out from Book Issue at the beginning of class. (Note, there are different sizes of the flight computer (CR-2, CR-3, etc.), so this text will refer to it as CR-X). The lecture is a REVIEW only. It is your responsibility to read thoroughly all sections of the pubs/instructions listed on the "IFR/INAV REVIEW," as well as complete the practice problems in this workbook AND in the P-426 workbook, prior to taking the exam. (NOTE: The course instructors will refer to the IFR/INAV Review list as the "Required Reading List," as this is how you should consider it—required reading *and* understanding.)

STEP 2 After attending the Flight Planning Lecture:

- Incorporate errata information, if any was provided, into this workbook.
- Do a thorough study of the procedures in the front sections of this workbook, including those found in the "Lecture Problem" section.

STEP 3 Complete the five practice problems contained in this text.

- Check your flight logs, DD 1801, and answers carefully against the answer keys for each problem. There are ***amplifying remarks*** given for specific areas on some flight logs and for particular answers that require a bit more thorough explanation. If your answers do not match, figure out why! You will be required to demonstrate flight planning skills throughout the RI training syllabus. It is imperative that you fully understand these flight-planning skills.
- Once you have completed all five problems, refer to the ***"R.O.E. for The Test"*** at the back of the workbook.

At any time during this process, you are highly encouraged to ask one of the INAV instructors for clarification of any question or flight planning issue that may be unclear to you. A course instructor is available in Bldg. 2946, room 4 between 1215 and 1430 each day. If you are unable to meet with one of the course instructors, see Mr. Cockrum in room #4 (0730-1600) or ask one of your squadron instructors for help. For all problems, follow these procedures:

- Show all work on Flight Log.
- Fill out all blocks (frequencies, dates, etc.) on each flight log.

- For the associated practice questions that are included with each practice problem, it is recommended you include all references for your answers (include specific pub and page) for later study and review.

- Initially plan to spend between 2 and 3 hours per problem depending on the complexity. Goal is to be able to complete the planning process in approximately 1 to 1.5 hours for the test.

STEP 4 Remember, the flight planning portion of the test (jet log, fuel plan, DD-1801) is only 20% of the test. The other 80% will be computer-based, multiple-choice questions drawn from the "required reading" list included with your pubs issue (labeled "IFR/INAV Review). The test is "open book," but to succeed you must have a strong, working knowledge of the material to get through the 40 questions in a reasonable amount of time. This requires thorough review and study!

STEP 5 Keep track of your schedule. The completion of the practice problems is self-paced. You must complete the five problems and take the exam prior to EP3102 and you 2nd block of RI Sims.

FLIGHT PLANNING INFORMATION

Unless specifically stated otherwise in the problem, use the following information for all practice problems and exams. Procedures have been standardized for the academic learning process but may vary slightly for actual flight conditions and situations. (For example, when planning a flight in the aircraft, you may elect to flight plan for an optional (non-bold type) procedure turn, although it is not required to do so for this course. See #12, "Approach Planning" below for more details.) The level of detail required for actual flights depends on the situation and must be evaluated on a case-by-case basis by the pilot-in-command.

1. **Aircraft and Engine:** All practice and test problems will utilize the TH-57C with a 250-C20 engine.

2. **Gross Takeoff Weight:** Calculate given a basic aircraft weight, crew weight, baggage weight, oil weight, fuel weight (6.7 lbs/gal), and atmospheric conditions. Per NATOPS, the maximum gross weight allowed is 3200 lbs.

3. **Maximum Fuel Load:** Compute the maximum fuel load allowed in the aircraft based upon the gross weight calculations for each problem. This is important because you will need to decide whether the maximum fuel load is sufficient to complete the flight as planned.

4. **Start and Taxi Fuel:** For standardization of this course, ***three*** (3) gallons are allotted.

5. **Indicated Airspeeds:** will be provided for flights and problems. Cruise indicated airspeed will be 100 KIAS, Approach indicated airspeed will be 90 KIAS. ***All climbs*** will utilize ***ground speed of 70 kts.*** Do not compute TAS for the climb.

6. **Calibrated Airspeeds:** Unless the information is given, flights and problems will compute calibrated airspeed from NATOPS Figure 23-1 Airspeed Calibration Chart (pg. 23-3) using ***Method B.*** Remember, indicated airspeed KIAS must be converted to Calibrated Airspeed CAS **BEFORE** converting to True Airspeed TAS. As a reminder, Calibrated Airspeed is the speed at which the A/C is moving through the air, which is found by correcting Indicated Airspeed KIAS for instrument and position errors. (FAA-H-8083-15B Instrument Flying Handbook pg 5-9)

7. **True Airspeed (TAS):** Compute TAS for cruise altitude and the instrument approaches. Cruising altitude TAS is computed using cruising altitude and corresponding temperature. Approach TAS is computed using the ***average*** altitude of the descent (and corresponding temperature) to the nearest one-thousand-foot level (see page 4 for details on determining average descent altitude). As a reminder, True Airspeed (TAS) is Calibrated Airspeed (CAS) corrected for nonstandard pressure and temperature. TAS and CAS are the same in standard atmosphere at sea level. (Same reference as above for Calibrated Airspeed CAS)

Using the CR-X to determine TAS, begin with the small set of double windows near the center of the CR-X labeled "True Air Speed." Using the outboard window of the double windows, line up the given altitude and temperature (take care to use the correct side (+/-) of temperature). With the altitude and temperature lined up, convert your CAS to TAS, going from the inside grey ring (labeled "Calibrated Air Speed") to the outside white ring (labeled True Air Speed).

8. **<u>Planned Flight Altitude</u>:** Per CNAF M-3710.7, fuel consumption ***for all portions of the entire flight*** (climb, cruise, and approach) is calculated using the planned flight altitude (see "Fuel Flow, item #9 below for details). In addition, in order to file a flight plan, the FAA requires an initial planned flight altitude be listed on the DD-1801. For the INAV course, flight to the destination is planned at one altitude for the entire flight. This is done for simplification. The planned cruising altitude should be the first altitude at or above the highest minimum safe altitude for the flight consistent with the IFR semicircular cruising rules and considering the best winds (best ground speed), as discussed below. If an alternate airport is required, the planned flight altitude to the alternate will be calculated in the same manner as to the destination ***except best winds will be disregarded*** (more details to follow).

To begin, determine a base altitude—the highest altitude of the three phases of the flight: take-off, en route, and approach. (See below for details on selecting these altitudes). After the base altitude is selected, use the average course to apply the semicircular cruising altitudes (East is Odd, West is Even; see the bottom of any IFR Low Altitude Chart legend for details).

NOTE

> To find the average course, simply measure the straight-line course on the IFR low-level chart(s) connecting the takeoff airport direct to the destination airport.

Finally, choose from the remaining (odd or even) viable altitudes, based on which provides the best (highest) groundspeed. The highest groundspeed will be determined by examining the winds aloft. Utilize the CR-X to determine how the winds aloft affects your ground speed based on your average course. Remember, when utilizing winds aloft, you must consider magnetic variation. Winds aloft are expressed in **TRUE**. All courses measured on the IFR En route Low Altitude chart are expressed in **MAGNETIC**. As a result, when you apply winds aloft to the average course **don't forget to apply the MAGNETIC VARIATION** listed in the problem,

NOTE

> As a reminder, all written winds are expressed in **TRUE** and all spoken winds are expressed in **MAGNETIC**.

For direct legs, consider the following information for altitude selection: A direct leg is an off-airway segment of a flight-planned route. Examples include the initial segment from the airport to the first NAVAID or fix on the airway, en route between fixes and/or NAVAIDs not connected by airways, and the segment from the airway to an off-airway initial approach fix (IAF). (SIDs, DPs, and approach procedures are not considered direct legs. More details to follow.)

9. **<u>Takeoff Phase</u>:** To select the correct altitude from the airport to the first NAVAID or fix on the airway, consider the following sources for altitudes. The goal is to determine the ***lowest*** published safe altitude (free from obstacles) for that leg. Keep in mind that the relative size of the areas covered by each item listed below increase as the list descends. The larger the area covered, the more likely the altitude will be higher, so attempt to find an altitude by starting at the top of this list:

a. Obstacle departure procedure. If the departure airport has an obstacle departure procedure for the runway in use that includes specific routing to the airway and altitudes to be flown, that procedure should be used to get to the airway. Existence of these procedures is noted on the approach plates using the ▼T symbol. Refer to the tabulation in the front of the volume for more details.

b. Standard Instrument Departure procedures (SIDS). If the departure airport has a SID which includes specific routing to the fix or NAVAID specified on the departure instructions, use the altitudes stated in the procedure.

c. Missed approach procedure. If a missed approach procedure exists that will generally take you from the vicinity of the airport ***direct*** to the desired NAVAID or fix on the airway, use the altitude stated in the procedure.

d. Approach or feeder route segment. If an approach or feeder route exists from the desired NAVAID or fix ***direct to the airport***, use the altitude associated with it. Remember though that feeder routes feed you to the IAF and, as a result, will typically ***not*** go direct to the airfield.

e. Airway MEA. If the airport is within 4 NM of an airway (i.e., airport is located under/within the boundaries of an airway) that proceeds to the first NAVAID or fix along the route, the airway MEA may be used as the minimum altitude for the direct leg.

f. MSA. If the first NAVAID or fix on the route is within the range specified on the MSA circle on the approach plate (usually 25 NM), ***and your entire route*** to that first NAVAID/fix lies within that specified range, the associated MSA may be used as the minimum altitude.

g. ESA or OROCA. If none of the altitudes discussed above apply, use the ESA or OROCA, as appropriate, as the minimum altitude. Begin by checking the ESA because it will typically be lower than the OROCA.

Record the minimum altitude you selected on the space provided on the Flight Plan.

10. **<u>En Route Phase</u>:** After the takeoff phase, the remainder of the flight plan is considered the "en route phase" until reaching the IAF for the designated instrument approach given in the route of flight. To determine the en route altitude, start by finding the highest MEA along all Victor Airways utilized in the route of flight. If any segments are "off airway" (for example, SEMMES VORTAC direct to EATON VORTAC, or PLEBE Intersection direct to JABAK (IAF), consider the following altitudes and select the lowest available, ensuring that it covers that entire route of flight segment being considered:

a. Feeder route. A feeder route is often depicted to provide guidance from the airway to the IAF. If a feeder route exists that is consistent with the routing given in the flight-planning problem, use the altitude associated with it.

b. Airway MEA. If the direct leg to the IAF remains within the 4 NM of an airway, use the airway MEA as the minimum altitude for the segment.

c. MSA. If the MSA for the airport covers the entire portion of the direct leg to the IAF, use it as the minimum altitude.

d. ESA or OROCA. If the direct leg to the IAF is not completely covered by any other means, use the ESA or OROCA as the minimum altitude for the leg, as appropriate. Begin by checking the ESA because it will typically be lower than the OROCA.

NOTE

In no case shall the selected altitude be less than the IAF/procedure turn altitude given for the approach to be flown (determined in the next step).

Record the highest of the altitudes you observed from the list above, including MEAs along the route, on the space provided on the Flight Plan.

11. **Approach Phase:** To select the correct altitude for the "approach phase," simply identify the altitude at the IAF for the designated approach and record it on the space provided on the Flight Plan.

12. **Fuel Flow** (NATOPS, Chap 26)**:** ***For all phases of flight, use the cruise fuel flow.*** The climb will use slightly more fuel and the approach will use slightly less than the calculated fuel flow for cruise, but these will typically average out (except under extreme flight conditions). ***CNAF M-3710.7 requires that we compute our fuel consumption based upon operation at planned flight altitude.*** Unless the information is provided with the background information, you will need to determine cruise fuel flow from the NATOPS Cruise Charts for the Clean Configuration, using maximum gross weight and Indicated Airspeed (IAS). (NOTE: Pay attention to the vertical axis labels on these charts. ***DO NOT USE TAS located on the inside axes***. Always enter the chart using IAS on the ***outside axes***.) To find cruise fuel flow for odd thousand-foot altitudes, use next higher thousand. Example: 3000 feet cruise altitude, you would use 4000 feet fuel flow. Enter the chart with IAS (outside axis) and move horizontally to the appropriate gross weight line. At this point move vertically on the chart to the top axis to record Fuel Flow. To be conservative, ***always round fuel flow up*** to the next whole number (for example 25.1 GPH would round up to 26 GPH).

NOTE

Take care to apply any NATOPS airspeed limitations (annotated as shaded, hashed lines on the charts and typically found at higher/hotter conditions) if they exist.

13. **Rate of Climb/Descent:** Plan for 500 feet per minute for flights and problems. In flight, the climb rate may be slightly different based upon gross weight and TQ setting. Time to climb procedures can be found on page 4.

14. **<u>Groundspeeds for Climbs, Cruise, and Approaches</u>:** For the purpose of this course, climb groundspeed is planned to remain constant at 70 KGS since relatively little time is spent in the initial climb with a minimum amount of relative ground covered (this is an approximation and may not be suitable under all circumstances). This will be applied to ***all climb portions*** of the flight plan. Use the wind at cruise altitude to determine cruise ground speeds. For standardization for this INAV course, surface winds at the landing facility will be used ***from the Initial Approach Fix (IAF) inbound*** to simplify planning. (For actual flights in the aircraft, other winds (i.e. forecast winds at altitude) may be more practical to use. Use best judgement in those cases.)

15. **<u>Approach Planning</u>:** Full approaches (i.e., including any mandatory full procedure turns) are planned for time and fuel consumption (worst case). There are five basic approach procedure "patterns": ***45° procedure turn, teardrop, holding pattern, straight-in,*** and ***arcing*** approaches. It is important that you plan to the approach end of the runway and not just to the Missed Approach Point (MAP) if the MAP is short of the runway. If the Navigational Aid (NAVAID) is located on the airport use the entire Distance Measuring Equipment (DME) unless the actual distance to the approach end of the runway can be determined from the approach plate. In this case use the actual distance to the approach end for fuel planning.

NOTE

> When actually flying an approach in the aircraft that requires timing to identify the MAP, that timing is still calculated in the aircraft as usual (using groundspeed based on the currently reported winds at the airport).

16. **45° Procedure Turn and Teardrop:** Outbound and inbound from the IAF back to the IAF; a standard time of ***seven minutes*** is allowed. After the procedure turn portion, on the jet log, you will use Groundspeed (GS) and distance to the MAP, or the approach end of the runway, whichever is farther, to compute the additional EET from the Final Approach Fix (FAF).

17. **Mandatory Holding Pattern:** Depicted Holding Patterns, where no distance is published, are one-minute legs, and, therefore, require 4 minutes for one complete circuit from the IAF back to the IAF (1 minute for each straight leg and 1 minute for each 180 degree SRT). After the procedure turn portion, on the jet log, you will use GS and distance to compute the additional EET from the IAF to the MAP or the approach end of the runway, whichever is farther.

Holding patterns where the straight leg time differs from one minute will have the straight leg time published. If DME legs are specified, calculate the time to fly the total mileage for the inbound and outbound legs using ***calculated TAS for the approach*** and add a total of 2 minutes for the standard rate turns.

NOTE

> For INAV course standardization, disregard flight planning for any ***optional*** reversal procedure turn (i.e., not depicted in bold type) that may be needed for course reversal, ***even if it appears it may be necessary*** upon arrival at the IAF. For this INAV course, only plan for a procedure turn if it is mandatory (depicted in bold type).

18. **Straight-In Approaches:** Where the IAF is not located at the FAF, the entire EET depends upon the GS and distance from the IAF to the MAP or the approach end of the runway, whichever is farther. Again, for standardization of the INAV course, if the approach only shows an ***optional*** reversal procedure turn, ***do not*** flight plan for it. Therefore, for depicted Straight-In approaches, only flight plan the FAC, since no procedure turn is required.

19. **Arcing Approaches and Lead Radials:** The entire approach is planned as published. When solving the arcing leg, the ***average course of the arc*** is determined using point-to-point procedures in the following manner: On the CR-X "wind vector" side, plot a point on the beginning radial, and a point at the ending radial ***(at the same distance).*** Rotate to align the two points vertically using the underlying gridlines as needed. Make sure the starting radial of the arc is ***on the lower half of the computer***. The answer (average course) will be under the TC INDEX.

The ***distance of the arc*** is computed using the following formula:

$$\frac{\text{DME of the ARC}}{\text{60 (INDEX)}} = \frac{\text{(DISTANCE of the ARC)}}{\text{No. of RADIALS of the ARC}}$$

Determine course and distance for other segments of the approach (e.g., FAC) as described above.

Lead Radials are defined as a radial at which a turn from the DME arc to the inbound course is started. Lead radials define a point on an arc when you are two miles (along the arc) from the inbound course. It is simply a reference point two miles away. It is important to remember, distance rather than degrees of turn is a much more consistent mark than degrees of arc because the arc radius can vary greatly. Simply stated, Lead Radials always mark a point two miles from the inbound course and this distance does not vary with radius. There are two instances when Lead Radials are required:

a. A two NM Lead Radial (1 NM for Copter procedures) must be published with arc initial approaches when the DME is not collocated with the facility providing procedural course guidance. (FAA Order 8260.19G Flight Procedures and Airspace 8-2-5-h pg. 8-7)

b. The angle of intersection between two successive initial approach courses and the angle of intersection between an initial approach course and an intermediate course must not exceed 120 degrees. When the angle between an initial approach course and the intermediate course exceeds 90 degrees, a radial or bearing which provides at least 2nm of lead must be identified to assist in leading the turn onto the intermediate course. (FAA Order 8260.3G TERPS 2-4-3-a-1 pg. 2-17)

20. **Alternate Airport Flight Planning:** When an alternate airport is required, plan for the approach at the destination airport followed by a missed approach, and proceed to the alternate. (See NOTE on page 8 for details.) The cruising altitude to the alternate will be determined using the same procedures listed in paragraph 8 ***with two exceptions***.

Exception 1: ***Best winds will be disregarded.*** For this INAV course, you will choose the first altitude at or above the highest minimum safe attitude for the entire route consistent with the IFR semicircular cruising rules. For actual aircraft flights, the choice in altitude will be based on a combination of factors including distance to the alternate, time to climb, and potential ground speed gained by climbing higher.

Exception 2: ***The climb will begin at the Minimum Descent Altitude/Decision Height/Decision Altitude (MDA/DH/DA)*** over the center of the destination airport, ***not at the field elevation***. Airspeeds for climb, cruise, and descent to the alternate are computed in the same way as they were for the destination route. The time to climb will be determined from the MDA/DH to the new cruising altitude. Fuel flow to the alternate is not recomputed. Use the previously computed cruising fuel flow to the destination. (This is a conservative approach. This fuel flow will likely provide "worst case" numbers since the aircraft is lighter and unless the altitude difference is extreme, the actual fuel flow will typically be better than planned.)

21. **Missed Approach Instructions:** You must comply with the published missed approach instructions (including altitude regardless of cruising rules) for the planned instrument approach at your destination ***if those instructions match the planned route to the alternate*** (or portion thereof). If your flight plan requires an alternate, be sure to compare the published missed approach instructions with the planned route of flight to the alternate given to you in the problem. If no portion matches, you need not comply with the published missed approach instructions/restrictions when flight planning since you would normally request alternate routing as soon as practical after executing a missed approach.

22. **Rounding Procedures:** On the jet log, use standard rounding (round 0.5 up) to round miles and minutes off to the nearest whole number. As stated earlier, always be conservative with fuel and ***round fuel up***. Any fraction over a gallon, round up to the next gallon. Example: Compute 10.1 gallons to 11 gallons.

NOTE

An exception to the standard rounding rule would be section 2 of the **FUEL PLAN.** Always round **MAX FUEL** down and **NOT** up. This is more conservative approach to fuel planning.

23. **Time Conversions:** As with real flights, since your flight schedule usually lists takeoff times in local time, the takeoff times given in the practice problems and on the test are given in ***local standard time*** and must be converted to ZULU time.

NOTE

All times are provided in standard time. For the purposes of this INAV course, ***daylight savings time is never used for any practice or test problems***, regardless of the actual time of the year it might be when you are taking this course.

24. **<u>Types of Flight Problems</u>:** Potential types of flight problems that you may encounter in this course (practice problems and tests) are as follows:

a. Destination - no alternate required,

b. Destination - alternate required,

c. Destination with a planned en route or terminal area delay,

You will find an example of each type of these problems in this workbook.

25. **<u>Determine "RESERVE TIME"</u>:** When completing the fuel plan, RESERVE TIME must be calculated. To determine "RESERVE TIME" in section 5 of the fuel plan, use the following steps:

a. Combine the NATOPS minimum fuel amount (always 10 gallons) with the reserve fuel determined in Section #1 of the fuel plan and listed in Section#3. (This reserve fuel is usually 9 gallons, but is based on cruise fuel flow and can vary)

b. Using the CR-X convert this combined fuel value (usually 19 gallons) into minutes. For example, 19 gallons converts to 00+42 at a fuel flow of 27 gallons/hour.

STOP! ATTEND THE FLIGHT PLANNING LECTURE BEFORE PROCEEDING FURTHER IF YOU HAVE NOT DONE SO ALREADY.

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LECTURE PROBLEM DATA

DIRECTIONS:

1. Read all of the information given.
2. Complete a flight log, fuel plan, and DD-1801.
3. Answer the questions about this problem.

PROBLEM DATA:

ACFT/BUNO/Call sign/Equipment: TH-57/162042/1E078/VOR TACAN/GTN-650/ILS/ADF

Type flight plan: IFR

	Airport	**Weather ETA ± 1 hour**
Departure:	NAS New Orleans, LA (KNBG)	04010KT 2400 BKN004 SCT005 QNH2910INS
Destination:	Jackson-Medgar Wiley Evers INTL, MS (KJAN)	30004KT 2SM HZ SCT010 BKN025 QNH2910INS
Alternate:	Hawkins Field, MS (KHKS)	30007KT 2SM RA OVC010 QNH3004INS

Route of flight:

Destination: Plan a takeoff time of 0900 local standard time. Radar vectors to SNAKI V552 Picayune VOR/DME V555 McComb VORTAC V9 ROMAR direct to FAVIN (IAF) for the RNAV (GPS) RWY 34L approach into Jackson-Medgar Wiley Evers INTL.

Alternate: Direct to BRENZ (IAF) for an Instrument Landing System (ILS) RWY 16 Approach into Hawkins Field.

AIRSPEEDS:	**ALT**	**WINDS**	**TEMP**
Climb 70 Kts ground speed	1000	060/10	+15
Cruise 100 KIAS	2000	070/12	+15
Descent 90 KIAS	3000	080/14	+13
	4000	100/15	+10
	5000	070/15	+9
	6000	060/19	+6

Basic weight:	2115 lbs.
Crew forward:	315 lbs.
Crew aft:	150 lbs.
Baggage:	30 lbs.
Oil:	12 lbs.
Fuel load/flow:	as calculated
Climb rate:	500 feet per min.
Transponder:	4096 with Mode S
Instrument Rating:	Standard
Variation:	10° W ***(exaggerated for demonstration purposes)***

HELO INAV PRACTICE PROBLEM PROCEDURES (FLIGHT LOG)

Step 1: READ ALL THE INFORMATION PROVIDED IN THE FLIGHT PLANNING PROBLEM. Calculate maximum fuel load using block 2 (A/C W&B) on the fuel plan. Remember to round MAX FUEL down to the nearest gallon. This is a more conservative approach to flight planning.

Step 2: EXAMINE DEPARTURE WEATHER AND DETERMINE IF TAKEOFF MINIMUMS ARE MET (CNAF M-3710.7).

NOTE

Actual takeoff (T/O) minimums for flight will be determined using current reported weather conditions at takeoff time.

1. Select the lowest published minimums for an available approach and;

2. Compare against CNAF minimums (for a standard Instrument Rated Pilot):

- Precision – published minimums but not less than 200-1/2.
- Nonprecision – published minimums but not less than 300-1.

NOTE

An "available approach" is considered an approach that is compatible with your aircraft equipment, can be expected to be approved if requested, and can be completed safely (i.e., using straight-in minimums for a runway that will have a 20+ knot tailwind given the current reported winds would not be consistent with the intent of this requirement).

While looking up these minimums, copy the appropriate takeoff airport frequencies into the top line of your flight log.

Step 3: EXAMINE DESTINATION WEATHER AND DETERMINE IF AN ALTERNATE AIRFIELD IS REQUIRED (see CNAF M-3710.7, Figure 4-1). Additionally, read any special instructions that may be contained in the DOD FLIP (for example, check the remarks/notes section at the top of the approach plates).

While looking up these minimums, copy appropriate destination frequencies onto your Flight Log.

Step 4: SELECT AN ALTERNATE (IF REQUIRED) USING THE FOLLOWING CONSIDERATIONS:

1. Terminal Forecast

2. NAVAID Compatibility

3. Notice to Airmen (NOTAMS)

4. Approach plate remarks (e.g., ▲ NA symbol and ▲ symbology)

If an alternate is required, copy appropriate information for the alternate onto your Flight Log.

Step 5: COMPUTE AVERAGE COURSE.

– To find the average course, simply measure the straight-line course on the IFR low-level chart(s) connecting the takeoff airport direct to the destination airport.

Step 6: REVIEW ROUTE OF FLIGHT AND SELECT APPROPRIATE CRUISING ALTITUDE FOR DESTINATION USING THE GUIDANCE IN THE FRONT OF THE WORKBOOK.

– Don't forget to consider magnetic variation when analyzing winds aloft to consider the best cruise altitude. As a reminder, winds aloft are forecasted in TRUE and average course is measured in MAG.

Step 7: COMPUTE TIME TO CLIMB

a. Subtract starting altitude (takeoff airport elevation) from cruise altitude.

NOTE

Climb to alternate cruise altitude starts at the MDA/DH/DA, ***not*** at the alternate's field elevation.

b. Round to the nearest 100 feet and then divide by rate of climb.

c. Round time to nearest whole minute and record on the flight plan.

Step 8: COMPUTE CRUISE AND APPROACH CALIBRATED AIRSPEED USING METHOD B OF NATOPS CHART ON PG 23-3

Step 9: COMPUTE CRUISE AND APPROACH TRUE AIRSPEED (TAS) USING CR-X

a. Begin by computing the average altitude for the descent:

i. Destination elevation ***plus*** cruise altitude divided by two.

DEST FIELD ELEV + CRUISE/2

ii. Round to nearest 1000 feet and record on the flight plan.

b. Using provided information and procedures from the front of the workbook, spin Cruise and Approach TAS on CR-X, and record on the flight plan.

Step 10: IF AN ALTERNATE IS REQUIRED, REPEAT STEPS 5 THROUGH 8 FOR THE ALTERNATE.

Step 11: DETERMINE YOUR CRUISE FUEL FLOW USING THE FUEL FLOW CHARTS IN YOUR NATOPS MANUAL (Chapter 26). Use the cruise fuel flow for the cruise altitude to the destination for ***all segments*** of the flight. See "Fuel Flow" in the "Flight Planning Information" section on the front of this workbook for more details.

Step 12: REVIEW ROUTE OF FLIGHT, RECORD EACH LEG ON FLIGHT LOG, AND DETERMINE ASSOCIATED INFORMATION.

1. Rules for leg entries on the Flight Log:

a. NAVAID to NAVAID (whether on or off an airway)

b. Course changes of ***six degrees or more*** on Victor Airways

c. Both ends of a direct route (i.e., anytime aircraft is not on an airway)

d. Flight over a designated compulsory reporting point (see IFR En route Low Altitude FLIP Chart Legend) (See STEP 13 below for details)

2. Fill in the associated NAVAID, frequency, magnetic course, and distance for the segment of the jet log.

Magnetic course and distance from the departure airfield to the first fix (if a NAVAID) may potentially be found:

a. in the IFR En route Supplement in the NAVAIDS section of the departure airport

b. on the appropriate Approach Plates (for example, feeder routes)

In the absence of these two sources, measure the distances directly off the IFR Low Altitude Charts using the mileage scale and a nearby compass rose.

For the remaining segments, to determine magnetic course and distance on a direct leg:

a. Use approach plate or Victor Airway information (if available).

b. Measure courses and distances directly off the charts.

Skip one to two lines on the jet log to enter information for the approach. Flight plan the approach legs using the planning information in the front of this workbook (#12 under "Flight Planning Information.")

Step 13: DETERMINE COMPULSORY REPORTING POINTS (CRP) FOR NONRADAR ENVIRONMENT AND MARK ACCORDINGLY (Place black triangle in top right corner of the jet log box); FIXES ARE CONSIDERED COMPULSORY REPORTING POINTS UNDER THE FOLLOWING CIRCUMSTANCES (see FIH, PG B-5 for details):

1. Both ends of a direct route

2. Depicted (solid black-filled) intersection triangle or NAVAID (See IFR chart Legend)

NOTE

An exception to item #1 above is the takeoff leg. The takeoff leg will be a direct leg to your first point in the route of flight. We do not count the actual takeoff as a compulsory reporting point. Of course, ATC knows your exact position at that moment you are cleared for takeoff. Remember, the main point of CRPs is to report your position to ATC in a non-radar environment since they can't "see" you. The same logic applies for the missed approach climb out—that point is not counted as a CRP.

Step 14: COMPUTE GROUND SPEED (GS) FOR EACH LEG ON THE JET LOG USING THE WIND SIDE OF CR-2, 3, OR 5.

1. Plot the winds at cruise altitude (given in the background information) on "wind side" of CR-X and then spin to place desired course ***over the given variation*** in the problem. Remember, you control the "scale" on the CR-2, so use a factor that will keep your plotted points toward the outside of the CR-2 as much as practical to improve accuracy. (For example, if your winds are 10 kts, use the "5" ring and make your factor 2.) As a reminder, don't forget to account for magnetic variation when computing the groundspeed for each individual leg.

NOTE

Magnetic variation will be provided for each problem and for the purpose of this INAV course will be assumed to remain constant for the entire route of flight (including to the alternate, if needed). In actual flights in the aircraft, check for changes in magnetic variation on the IFR en route charts along the route of flight.

NOTE

Upon reaching the IAF, use the ***APPROACH TAS*** to determine groundspeeds from the IAF to the airport.

2. Determine any headwind or tailwind component and annotate that in the "notes" block of that respective leg of the jet log.

3. Apply this headwind/tailwind to the TAS to determine groundspeed and record this in the "GS" column on the jet log.

Step 15: COMPUTE EET FOR EACH LEG USING THE COMPUTATION SIDE OF THE CR-X.

1. Using 70 Kts ground speed for the climb and the time-to-climb you determined earlier, compute the distance traveled until reaching level off (at cruise altitude).

2. Three possibilities exist:

   a. Reaching cruise altitude prior to the first fix

   b. Reaching cruise altitude after crossing the first fix

   c. Reaching the first fix at the same time as reaching cruise altitude

3. The leg with the level-off (usually the first leg but can be a subsequent leg) is referred to as a split leg; part of this leg is climb and part is cruising.

4. For the split leg, split the EET block into the time-to-climb plus the time to finish the leg at cruise ground speed.

5. Also split the distance leg into the distance traveled during the climb plus the distance remaining of that leg.

6. Compute EET for the remaining legs.

Step 16: CALCULATE LEG FUEL FOR EACH LEG.

1. Use CR-X. Place index under fuel burn rate (e.g., 27 for 27 GPH).

2. Go to the EET of that leg (e.g., 16 for 16 minutes). Remember time is the inside ring (the same one used for CAS earlier in the "Flight Planning" section in the front of the book).

3. Read corresponding gallons burned on the outside ring (the white TAS ring). ***Remember to round up all values for fuel*** (e.g., 8 gal in this example, rounded up from 7.2 gal using 27 GPH at 6 minutes).

Step 17: TOTAL UP COLUMNS. COMPUTE TOTAL DISTANCE, EET, AND FUEL FOR THE DESTINATION ROUTE AND THE ALT ROUTE. RECORD ON THE JET LOG.

Step 18: COMPLETE TH-57 FUEL PLAN USING FLIGHT LOG INFORMATION.

NOTE

CNAF M-3710.7, section 4.8.5 defines minimum fuel requirements for two specific cases:

1. alternate not required
2. alternate required

If an alternate is required, 3710 does not require the destination approach to be included in calculating fuel reserves.
See CNAF 3710.7 para 4.8.5 Minimum Fuel Requirements for review.

Step 19: CALCULATE ESTIMATED FUEL REMAINING (EFR) FOR EACH LEG IN THE RESPECTIVE BLOCK ON THE JET LOG. REMEMBER THAT YOUR ESTIMATED TAKEOFF FUEL CAN BE FOUND IN SECTION #4 OF THE FUEL PLAN (DETERMINED BY SUBTRACTING THREE GALLONS (FOR STARTUP AND TAXI) FROM MAXIMUM FUEL (SECTION #2 OF FUEL PLAN)

Simply subtract the amount of gas burned on each leg from the previous leg's EFR starting with subtracting the first leg fuel consumption from the "Takeoff Fuel" determined in Section #4 of the fuel plan.

Step 20: COMPLETE "ALTERNATE/ROUTE/ALTITUDE/TIME/FUEL" LINE (DRAFT REPORT) OF THE ALTERNATE PORTION OF THE FLIGHT LOG.

"TIME" is the amount of time to get to the alternate IAF. "FUEL" is found by taking the EFR at the completion of the destination approach and converting it into hours/minutes using the CR-X. For example, if the EFR after the destination approach is 35 gallons and the fuel burn is 27 GPH, then the time would be 1+18.

Step 21: USING THE COMPLETED JET LOG AND FUEL PLAN, COMPLETE THE DD-1801 IN ACCORDANCE WITH GP CHAPTER FOUR.

Step 22: ANSWER THE QUESTIONS AT THE END OF THE PROBLEM.

LECTURE PROBLEM QUESTIONS

1. What is the CNAF 3710.7 fuel reserve requirements for this flight? _____

2. How many mandatory position reporting points are there to the destination? _____

3. How much fuel is remaining at Picayune? _____

4. Over Picayune Very High Frequency (VHF) Omnidirectional Radio and Tactical Air Navigation (VORTAC), whom would you contact to change your flight plan, and on what frequency(ies)? _____

5. Based on the given TAF, can you accept an approach clearance for the TACAN RWY 34L approach at the destination?

6. What is the minimum safe altitude on the route that you approach the destination? _____

7. Shooting the RNAV (GPS) RWY 16 R approach with the duty runway 34R at the destination, what is the Height Above Airport (HAA)? _____ AGL or MSL?

8. Is Automatic Terminal Information Service (ATIS) available at the destination? _____

9. The elevation of the destination's control tower is _____ Above Ground Level or Mean Sea Level (AGL/MSL).

10. What type of approach lights are available on the runway 34L at the destination?
_____

11. Is there a military organization at Jackson Evers Intl and, if so, whom? _____

12. Referring to question 11, what phone number would you use to contact them if needed?
_____

13. If you spent the night at the destination airport, with whom would you file your flight plan prior to departing the next day? _____

14. If your destination were NAS New Orleans, would you need permission to land there before beginning the flight? _____, if so, whom would you call? _____

LECTURE PROBLEM ANSWERS

1. 9 gals (on top of the 10 gal NATOPS fuel minimum)

2. 3

3. 69

4. Greenwood FSS 255.4 UHF, 122.2 VHF or VHF transmit on 122.1, listen on 112.2 (ask if you don't understand)

5. Yes

6. 3500 feet MSL

7. 534 feet AGL

8. Yes, on 121.05

9. 474 feet MSL

10. Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR). The system has sequenced flashing lights and is pilot controlled.

11. Air National Guard (IFR Supp)

12. DSN: 828-8372

13. Air National Guard Base Ops (CNAF 3710.7, 4.5.5)

14. Yes, DSN: 678-3602/3

PRACTICE PROBLEM #1 DATA

DIRECTIONS:

1. Read all the information given.

2. Complete a flight log, fuel plan, and DD-1801.

3. Answer the questions about this problem.

PROBLEM DATA:

ACFT/BUNO/Call sign/Equipment: TH-57/162042/1E078/VOR TACAN/GTN-650/ILS/ADF

Type flight plan: IFR

	Airport	**Weather ETA ± 1 hour**
Departure:	NAS Whiting Field South, FL (KNDZ)	32005KT 9999 SCT015 SCT100 QNH2910INS
Destination:	Maxwell AFB, AL (KMXF)	09012KT 9000 HZ SCT020 BKN120 OVC250 QNH2910INS
Alternate:	Dannelly Field, AL (KMGM)	08004KT 4SM HZ OVC200 QNH2910INS

Route of flight:

Destination: Plan a takeoff time of 1000 CST. Request radar departure direct Crestview VORTAC (CEW) V115 Montgomery VORTAC (MGM) direct Maxwell TACAN (MXF) direct to SEEME (IAF) for the TACAN RWY 15 Approach into Maxwell AFB (KMXF PPR #12-34).

Alternate (if required): Direct to IAF for an NDB RWY 10 approach into Dannelly Field.

AIRSPEEDS:	**ALT**	**WINDS**	**TEMP**
Climb 70 Kts ground speed	1000	080/04	+13
Cruise 100 KIAS	2000	080/05	+12
Descent 90 KIAS	3000	080/06	+11
	4000	080/08	+10
	5000	110/15	+9
	6000	090/20	+8

Basic weight:	2150 lbs.
Crew forward:	300 lbs.
Crew aft:	140 lbs.
Baggage:	40 lbs.
Oil:	12 lbs.
Fuel load/flow:	as calculated
Climb rate:	500 feet per min.
Transponder:	4096 with Mode S
Instrument Rating:	Standard
Variation:	3° W
KMXF PPR#:	12-34

PRACTICE PROBLEM #1 QUESTIONS

1. For the planned flight to Maxwell AFB, what is the CNAF 3710.7 fuel reserve requirements?

2. How many mandatory position reporting points, in a non-radar environment, should there be on this flight log (in accordance with the rules in the FIH, section B)? _____

3. How much fuel is remaining at PIGON intersection? _____

4. If instructed to hold South of REDDI Int on V115, what course would you set in the KDI-525A (HSI)? _____

5. Could you accept a visual approach clearance to the destination airport at night in Visual Flight Rules (VFR) conditions? _____

6. If you arrived at your destination at 1500Z on Wednesday, September 2 with weather CLR 7 SM, should you expect to receive a TACAN approach clearance? _____

7. What is the latest time you could arrive at the destination during operating hours on a Thursday? _____(Local)

8. What rate of descent must you maintain to remain on the glideslope of the Precision Approach Radar (PAR) 23 approach to NAS Whiting (South) (Assume 90 kts ground speed)? _____

9. If you were at the MDA for the TACAN approach at the destination, what should your radar altimeter read? _____

10. What are your lowest possible approach minimums to RWY 15 at your destination? _____

11. Canceling an IFR flight plan with Air Route Traffic Control Center (ARTCC) is the same as "closing out" a flight plan? _____(True/False)

12. A pilot is executing a TACAN RWY 15 approach to runway 15 at Maxwell AFB and is at 0.5 DME at 630 feet MSL (50 feet above MDA). If the pilot does not have the landing environment in sight, must he/she execute a missed approach now or can the pilot continue down to the MDA before executing missed approach? _____

13. If you used the 6000’ cruise chart, -5 to +15C range, any airspeed concerns?

14. During final approach, utilizing a descent glide slope of 3.01 degrees and 90 knots IAS what is your corresponding descent rate with no wind? What is your descent rate with a 15 knot head wind? What is your descent rate with a 15 knot tail wind?

FLIGHT LOG

DEP ELEV	CLNC DEL	GND CONT	TOWER
KNDZ 177'	355.6 (CH2)	317.65 (CH 3)	348.675 (CH 4)/121.4
ALT CORR	TIME OFF	TAS	LBS PH/MIN
		70GS /106/92	27 GPH

CLEARANCE

DEPARTURE

DEST ELEV KMXF 171'	APC CONT 121.2/269.05	TOWER 118.15/253.5	GND CONT 127.15/289.4

ROUTE TO	IDENT / CHAN	CUS	DIST	EET	ETA / ATA	LEG FUEL	EFR / AFR	GS	NOTES
D	CEW		12+7	10+4			73	70	
Crestview	115.9	060	19	14		7		97	-9 106x
V115	CEW						62		
PIGON	115.9	358	44	24		11		112	+6 106x
V115	MGM						51		
Montgomery	112.1	021	43	24		11		107	+1 58x
D	MXF						48		
MAXWELL	97X	344	10	5		3		116	+10 97x
D	MXF						46		
SEEME	97X	338	6	3		2		117	+11 97x
(TOTALS)			122	1+10		34			
TCN RWY	MXF			7+4			41		
15 APP	97X	158	6	11		5		87	-5

ALTERNATE	ROUTE	ALTITUDE	TIME	FUEL
ALT ELEV	APC CONT	TOWER	GND CONT	

Figure 1-1 Flight Log

Name & Rank: PRACTICE PROBLEM #1 (Jan 2021)
(Use with FLIPs issued for INAV course)

TH-57 FUEL PLAN

1. **RESERVE FUEL** (gallons) **greater** of:

10 % PLANNED FUEL REQ	4
20 MIN BURN AT CRUISE FF	9

(Per 3710.7)

2. **A/C W&B (Max Fuel)**

Max GW (lbs)		3200
A/C BW	-	2150
Crew Fwd weight	-	300
Oil weight	-	12
Crew Aft weight	-	140
Baggage	-	40
Max fuel available (lbs)	=	558
Max fuel (gal, divide by 6.7)	=	83

3. **REQUIRED FUEL** (gallons)

FUEL TO DEST IAF	34
FUEL FOR DEST APP*	5
FUEL TO ALTN IAF	NA
FUEL FOR ALTN APP	NA
NATOPS MIN FUEL	10
RESERVE FUEL	9
TOTAL FUEL REQ at T/O	58

4. **EXTRA FUEL\TIME AT CRUISE FF**

FUEL LOAD (gal) (**max 91**) (based on W&B from #2 above)	83
MINUS START/TAXI fuel	3
EST TAKEOFF FUEL	80
MINUS FUEL REQUIRED	58
EXTRA FUEL (gal)	22
EXTRA TIME (hrs+min)	0+49

5. **FUEL ON BOARD** (in time)

TIME TO DEST IAF	1+10
TIME FOR DEST APP	0+11
TIME TO ALTN IAF	NA
TIME FOR ALTN APP	NA
RESERVE TIME**	0+42
EXTRA TIME	0+49
TOTAL TIME (Fuel on Board)	2+52

Departure to Destination
Altitude Selection

T/O	2300 (MSA)
Enroute	3300 (off airway MEA)
Approach	3000 (IAF)
Average Course	015
Altitude	
Cruise	5000
Avg Descent	3000
Time to Climb	10 min
Speeds	
Climb	70 KGS
Cruise (**TAS**)	106
Approach (**TAS**)	92

Destination to Alternate
Altitude Selection

T/O	
Enroute	
Approach	
Altitude	
Cruise	
Avg Descent	
Time to Climb	
Speeds	
Climb	70 KGS
Cruise (**TAS**)	
Approach (**TAS**)	

*When an alternate is required, CNAF does NOT include the destination approach when determining fuel minimums. This workbook utilizes the worst case scenario.
** "RESERVE TIME" is determined by combining the NATOPS min fuel (10 gal) and the reserve fuel as defined by CNAF.

Figure 1-2 Fuel Plan

PRIORITY ≡FF → | ADDRESSEE(S)

FILING TIME | ORIGINATOR

SPECIFIC IDENTIFICATION OF ADDRESSEE(S) AND/OR ORIGINATOR

3. MESSAGE TYPE ≡ (FPL | 7. AIRCRAFT IDENTIFICATION — VV1E078 | 8. FLIGHT RULES — I | TYPE OF FLIGHT M

9. NUMBER — | TYPE OF AIRCRAFT B06 | WAKE TURBULENCE CAT. / L | 10. EQUIPMENT — BDFGLOTUV/SU2

13. DEPARTURE AERODROME — KNDZ | TIME 1600

15. CRUISING SPEED N0106 | LEVEL A050 | ROUTE → DCT CEW V115 MGM DCT MXF DCT SEEME DCT

16. DESTINATION AERODROME — KMXF | TOTAL EET HR/MIN 0110 | ALTN AERODROME → | 2ND ALTN AERODROME →

18. OTHER INFORMATION — NAV/SBAS SUR/282B DOF/YYMMDD RMK/KMXF PPR#12-34

NOT FOR TRANSMISSION

19. SUPPLEMENTARY INFORMATION

ENDURANCE — FUEL/ 0252 | PERSONS ON BOARD → POB/ 3 | EMERGENCY AND SURVIVAL EQUIPMENT → RDO/ 121.5 → 243 → 500 → 8364

TYPE OF EQUIPMENT — POLAR → DESERT → MARITIME → JUNGLE → GLOBAL | LIFE JACKETS → JACKETS → LIGHT → FLUORESCEIN → | RADIO FREQUENCY 282.8

DINGHIES | COLOR | NUMBER | TOTAL CAPACITY | OTHER EQUIPMENT

DINGHIES → | COVER → | RMK/

REMARKS: FLIMSY #

AIRCRAFT SERIAL NUMBERS AND TYPE OF AIRCRAFT IN FLIGHT: 162042

CREW LIST [ ] ATTACHED [X] LOCATED AT: KNDZ

PASSENGER MANIFEST [ ] ATTACHED [ ] LOCATED AT:

NAME OF PILOT IN COMMAND: PILOT, I. M. - Standard

SIGNATURE OF APPROVING AUTHORITY:

AIRCRAFT HOME STATION OR ORGANIZATION: HT-18 / KNDZ

DD Form 1801, MAY 87 — *Previous edition is obsolete.* — Reset — DOD INTERNATIONAL FLIGHT PLAN

Figure 1-3 Flight Plan

ANSWERS TO PRACTICE PROBLEM #1 QUESTIONS

1. 9 gals (on top of the 10-gal NATOPS fuel minimum).

2. 4

3. 62

4. 021

5. Yes – See definition of "Visual Approach" GP 2-50

6. No "No-NOTAM MP" IFR Supplement B-412. What is a NO, NOTAM MP? See IFR Supp, Section C

7. 2200, the field closes at 0400Z, IFR Supplement B-411

8. 480 Feet per Minute (FPM) (inside back cover of approach plates: 3.01 GS, 90 KGS)

9. 409 feet above the ***touchdown zone*** of the runway. App. Plates Vol 14, pg. 255

10. 200 – ¼. Per CNAF M-3710.7, Chapter 5, vis may be reduced by ½ published mins but no lower than ¼ mile.

11. False. See note, CNAF M-3710.7, Chapter 4

12. Execute missed approach now. You have already passed the MAP for the TACAN approach.

13. Yes, worst case, at 3200 lbs, 6000' and +15C and 100 KIAS, you would be over the Vne line. However, realistically you would be close but not over since you will be flying at 5000', the temperature is forecast to be less than 15 deg and you won't actually be at 3200lb after take- off. Just be aware that you may be near the airspeed limits at the higher altitudes.

14. 480 feet per minute, 400 fpm, 560 fpm. Approach Plate Inside back Cover – Instrument Takeoff or Approach Procedure Charts Rate of Climb/Descent Table

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PRACTICE PROBLEM #2 DATA

DIRECTIONS:

1. Read all the information given.

2. Complete a flight log, fuel plan, and DD-1801.

3. Answer the questions about this problem.

PROBLEM DATA:

ACFT/BUNO/Call sign/Equipment: TH-57/162043/1E076/VOR-TAC/GTN650/ILS/ADF

Type flight plan: IFR

	Airport	**Weather ETA ± 1 hour**
Departure:	McComb Pike County, MS (KMCB)	28012K 7SM SCT030 QNH3012INS
Destination:	Mobile Regional, AL (KMOB)	28012KT 1 1/4 SM RA OVC010 QNH3002INS
Alternate:	Gulfport-Biloxi Intl, MS (KGPT)	30007KT 2SM RA OVC010 QNH3004INS

Route of flight:

Destination: Plan a takeoff time of 0900 CST. Direct McComb VOR, V555 Picayune VOR, V552 to OBOES (IAF) for the ILS RWY 33 approach to Mobile.

Alternate: Direct Semmes, V20 Gulfport for the VOR RWY 32 at Gulfport-Biloxi Intl.

AIRSPEEDS:	**ALT**	**WINDS**	**TEMP**
Climb 70 Kts ground speed	1000	300/05	+08
Cruise 100 KIAS	2000	280/10	+06
Descent 90 KIAS	3000	300/12	+04
	4000	320/14	+02
	5000	340/15	+-0
	6000	350/20	-02

Basic weight:	2120 lbs.
Crew forward:	315 lbs.
Crew aft:	150 lbs.
Baggage:	26 lbs.
Oil:	12 lbs.
Fuel load/flow:	as calculated
Climb rate:	500 feet per min
Transponder:	4096 with Mode S
Instrument Rating:	Standard
Variation:	1° W

PRACTICE PROBLEM #2 QUESTIONS

1. What is your fuel remaining in time (down to 0 gal) at the destination IAF?
_____

2. What are your takeoff minimums from McComb Pike County (duty Runway 33)? _____

3. What is the TCH on the ILS 33 (on Glideslope) into Mobile Regional? _____

4. What type of approach lighting is on Rwy 33 at Mobile Regional? _____

5. Does Mobile Tower operate continuously? _____

6. There are _____helicopter alighting (landing) areas at Mobile Regional.

7. Does SJI have continuous HIWAS transmitted? _____

8. Passing the FAF while executing the ILS RWY 33 approach, the ILS glide slope fails. Can you complete the approach or must you execute the missed approach? Yes/No

   If you can complete the approach, how would you do it? _____

9. Timing from FAF to MAP, using your ground speed, at Mobile is _____

10. What approach control frequency(s) would you expect to be on if you went to Keesler AFB as your alternate? _____

11. Keesler Metro is full service continuous. _____(True/False)

12. What are the hours of operation for the Class D airspace at Gulfport-Biloxi INTL, Mississippi? _____

13. Over MINDO Intersection, who would you call to change your destination?
_____

14. A PPR (Prior Permission Required) number is required to RON at Mobile Regional Airport?
_____ (True/False)

FLIGHT LOG

DEP ELEV	CLNC DEL	GND CONT	TOWER
KMCB 413'		CTAF/123.05	UNICOM 123.05
ALT CORR	TIME OFF	TAS	LBS PH/MIN →
		70 GS↑ 101→ 89↓	26 gph

CLEARANCE CRUISE = 3000 AVG COURSE = 100
TTC = 5 min
AVG ↓ = 2000
See WkBk pg5 #1 IFR Supp (E.S.)
#2 App Plates
#3 Charts-measure

DEPARTURE

DEST ELEV KMOB 219 | APC CONT 118.5/269.3 | TOWER 118.3/239.0 | GND CONT 121.9/348.6

ROUTE TO	IDENT CHAN	CUS	DIST	EET	ETA ATA	LEG FUEL	EFR AFR	GS	NOTES
D	MCB		6+7	5+4			79	70	
MCCOMB	116.7	053	13	9		4		106	+5 114X
V-555	PCU	145					66		
PICAYUNE	112.2	144	52	28		13		112	+11 59X
V-552	SJI						53		
OBOES	115.3	077	54	29		13		110	+9 100X
			119	1+06		30			
		To lead radial							
									lead radial "LR" see App Legend Pg II
ARC TO	SJI		37+2				43		
FINAL	115.3	107	39	23		10		101	+12 100X
FINAL	I-ATE						39		
ILS 33	111.5	325	12	9		4		80	-9

Can't use ARC DME - VORTAC not at field
6.8 Decke to JABAK
5.1 JABAK to field

ALTERNATE	ROUTE	ALTITUDE	TIME	FUEL
KGPT (Gulfport-Biloxi)	D SJI V20 GPT	2000	0+31	1+30

ALT ELEV 28' (From IFR Enroute Sup) | APC CONT 127.5/254.25 | TOWER 123.7/339.8 | GND CONT 120.4/348.6

D	SJI		4+2	3+1			37	70	
SJI	115.3	284	6	4		2		90	-10 100X
V-20	GPT	238					25		
GULFPORT	109.0	241	42	27		12		93	-7 27X
			48	0+31		14			
VOR RWY32	GPT	final					21		
Gulfport	109.0	308	---	7		4		81	-7 27X
			(Procedure turn only)						

Figure 2-1 Flight Log

Name & Rank: PRACTICE PROBLEM #2
(Use with FLIPs issued for INAV course)

TH-57 FUEL PLAN

1. **RESERVE FUEL** (gallons) **greater** of:

10 % PLANNED FUEL REQ	5
20 MIN BURN AT CRUISE FF	9

(Per 3710.7)

2. **A/C W&B (Max Fuel)**

Max GW (lbs)		3200
A/C BW	-	2120
Crew Fwd weight	-	315
Oil weight	-	12
Crew Aft weight	-	150
Baggage	-	30
Max fuel available (lbs)	=	573
Max fuel (gal, divide by 6.7)	=	86

3. **REQUIRED FUEL** (gallons)

FUEL TO DEST IAF	30
FUEL FOR DEST APP*	14
FUEL TO ALTN IAF	14
FUEL FOR ALTN APP	4
NATOPS MIN FUEL	10
RESERVE FUEL	9
TOTAL FUEL REQ at T/O	81

4. **EXTRA FUEL\TIME AT CRUISE FF**

FUEL LOAD (gal) (**max 91**)	86
(based on W&B from #2 above)	
MINUS START/TAXI fuel	3
EST TAKEOFF FUEL	83
MINUS FUEL REQUIRED	81
EXTRA FUEL (gal)	2
EXTRA TIME (hrs+min)	0+ 05

5. **FUEL ON BOARD** (in time)

TIME TO DEST IAF	1 + 06
TIME FOR DEST APP	0 + 32
TIME TO ALTN IAF	0 + 31
TIME FOR ALTN APP	0 + 07
RESERVE TIME	0 + 21
EXTRA TIME	0 + 05
TOTAL TIME (Fuel on Board)	2 + 42

Departure to Destination
Altitude Selection

T/O	2000 (ILS Missed)
Enroute	2000 MEA
Approach	1900 IAF
Avg course	100

Altitude

Cruise	3000
Avg Descent	2000
Time to Climb	5 min

Speeds

Climb	**70 KGS**
Cruise (**TAS**)	101
Approach (**TAS**)	89

Destination to Alternate
Altitude Selection

T/O	2000 ILS Missed App
Enroute	2000 MEA
Approach	1900 PT
Avg course	245

Altitude

Cruise	2000
Avg Descent	1000
Time to Climb	3 min

Speeds

Climb	**70 KGS**
Cruise (**TAS**)	100
Approach (**TAS**)	88

*When an alternate is required, CNAF does NOT include the destination approach when determining fuel minimums. This workbook utilizes the worst case scenario.
** "RESERVE TIME" is determined by combining the NATOPS min fuel (10 gal) and the reserve fuel as defined by CNAF.

Figure 2-2 Fuel Plan

PRIORITY ≡FF → | ADDRESSEE(S)

FILING TIME | ORIGINATOR

SPECIFIC IDENTIFICATION OF ADDRESSEE(S) AND/OR ORIGINATOR

3. MESSAGE TYPE ≡ (FPL

7. AIRCRAFT IDENTIFICATION — VV1E076

8. FLIGHT RULES — I

TYPE OF FLIGHT M ≡

9. NUMBER —

TYPE OF AIRCRAFT B06

WAKE TURBULENCE CAT. L

10. EQUIPMENT — BDFGLOTUV/SU2 ≡

13. DEPARTURE AERODROME — KMCB

TIME 1500 ≡

15. CRUISING SPEED — N0101

LEVEL A030 →

ROUTE DCT MCB V555 PCU V552 OBOES DCT

16. DESTINATION AERODROME — KMOB

TOTAL EET HR/MIN 0106

ALTN AERODROME → KGPT

2ND ALTN AERODROME →

18. OTHER INFORMATION

— NAV/SBAS SUR/282B DOF/YYMMDD

) ≡

NOT FOR TRANSMISSION

19. SUPPLEMENTARY INFORMATION

ENDURANCE — FUEL/ 0305 → PERSONS ON BOARD → POB/ 3 → RDO/ EMERGENCY AND SURVIVAL EQUIPMENT 121.5 → 243 → 500 → 8364 ≡

TYPE OF EQUIPMENT: POLAR → DESERT → MARITIME → JUNGLE → GLOBAL → LIFE JACKETS: JACKETS → LIGHT → FLUORESCEIN → RADIO FREQUENCY: 282.8 ≡

DINGHIES | COLOR | NUMBER | TOTAL CAPACITY | OTHER EQUIPMENT

DINGHIES → COVER → RMK/) ≡

REMARKS
FLIMSY #

AIRCRAFT SERIAL NUMBERS AND TYPE OF AIRCRAFT IN FLIGHT
162043

CREW LIST [ ] ATTACHED [X] LOCATED AT: KNDZ

PASSENGER MANIFEST [ ] ATTACHED [ ] LOCATED AT:

NAME OF PILOT IN COMMAND
PILOT, I. M. - Standard

SIGNATURE OF APPROVING AUTHORITY

AIRCRAFT HOME STATION OR ORGANIZATION
HT-18 / KNDZ

DD Form 1801, MAY 87 *Previous edition is obsolete.* Reset DOD INTERNATIONAL FLIGHT PLAN

Figure 2-3 Flight Plan

ANSWERS TO PRACTICE PROBLEM #2 QUESTIONS

1. 2+02. If you gave your answer in Gallons, read the question carefully!

2. 500-1. Circle to land minimums off ILS/LOC plates since there is no approach to RWY33.

3. 57'. App plate profile view. Glideslope not coincident with VGSI.

4. MALSR: pilot controlled, sequenced flashing. App plate and FIH

5. No ★ on App plate in the tower frequency box. App plate General Information legend pg. I or IFR Supp B-445.

6. Look for "circled H" on the airport sketch.

7. No. Check low chart legend and NAVAID box on low chart L-22.

8. Yes. Use LOC minimums and timing (you did start the clock, right?) from JABAK to the MAP.

9. 80 Kts ground speed for 5.1 miles = 3 min 50 sec

10. 127.5/254.25. Sector frequencies on App plate. Inbound from north-east half.

11. False. FIH C-22

12. 1200-0500Z++ (M-F). IFR Supp B-278 Communications Section – TWR Opr Hours

13. Greenwood FSS. "Book (test) answer" – FSS is responsible for processing/making changes to flight plans. On a workload permitting basis, your ATC controller may do it for you (real world).

14. False. IFR Supp B-445 Remarks. PPR is only required for unscheduled aircraft over 65,000 lb.

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PRACTICE PROBLEM #3 DATA

DIRECTIONS:

1. Read all the information given.

2. Complete a flight log, fuel plan, and DD-1801.

3. Answer the questions about this problem.

PROBLEM DATA

ACFT/BUNO/Call sign/Equipment: TH-57/162042/1E078/VOR-TAC/GTN650/ILS/ADF

Type flight plan: IFR

	Airport	**Weather ETA ± 1 hour**
Departure:	Hattiesburg Bobby L. Chain Muni -, MS (KHBG)	02003KT P6SM SCT015 SCT100 QNH2910INS
Destination:	NAS Pensacola, FL (KNPA)	05006KT 4800 HZ BKN020 QNH2910INS
Alternate:	Pensacola Intl., FL (KPNS)	07004KT 3SM HZ SCT010 OVC040 QNH2910INS

Route of flight:

Destination: Plan a takeoff time of 1300 CST. Request radar departure direct WIGGO V114 MINDO V552 SEMMES VORTAC (SJI) direct SIDNY (IAF) for the RNAV (GPS) RWY 7L approach into NAS Pensacola (KNPA PPR#: 12-34).

NOTE

The reversal/procedure turn at SIDNY ***could*** be accomplished numerous ways (turn in holding, offset, intercept inbound, etc.). For course standardization, do ***not*** plan a reversal turn. Plan direct to SIDNY and then plan the approach from SIDNY inbound to BOLNE.

Alternate: Direct to Saufley VHF Omnidirectional Range (VOR), direct to BRENT (IAF) for an ILS RWY 17 approach into Pensacola International.

AIRSPEEDS:	**ALT**	**WIND**	**TEMP**
Climb 70 Kts ground speed	1000	160/03	+12
Cruise 100 KIAS	2000	180/05	+10
Descent 90 KIAS	3000	180/06	+8
	4000	200/10	+6
	5000	270/12	+5
	6000	290/14	+3
	7000	300/15	+1
	8000	310/11	+1
	9000	310/12	0

Maximum GW:	3000 lbs.*
Basic weight:	2150 lbs.
Crew forward:	300 lbs.
Crew aft:	(none)
Baggage:	35 lbs.
Oil:	12 lbs.
Fuel load/flow:	as calculated
Climb rate:	500 feet per min.
Transponder:	4096 with Mode S
Instrument Rating:	Standard
Variation:	2° W
KNPA PPR#:	12-34

NOTE

The planned maximum gross weight is limited due to atmospheric conditions (See NATOPS cruise power charts). This will affect the available fuel load and require a reduction in additional weight (i.e., not capable of carrying a passenger).

PRACTICE PROBLEM #3 QUESTIONS

1. How many mandatory position reporting points are there to the destination? _____

2. How much fuel is remaining at SIDNY if the flight goes as planned? _____

3. You have been cleared for your filed route of flight. During the flight, your instructor tells you to request holding at MINDO for 15 minutes. After finishing the 15 minutes of practice holding, you are cleared to continue with your filed route. En route to SEMMES, you experience lost comms. When would you be expected to commence your approach at the IAF?
_____

4. If you arrived at the alternate airfield after its published TWR hours in a VHF transceiver-equipped aircraft, what frequency would you utilize while landing at the airport? _____

5. Upon arriving at Semmes VORTAC, you receive the following: "Cleared for the RNAV (GPS) RWY 7L approach to NAS Pensacola." When could you leave your cruising altitude and how low could you descend? _____

6. If flying to NAS Meridian, at what range should you initiate contact with Meridian approach control? _____ VFR flight)

7. On what frequency would you contact Pensacola METRO? _____

8. If flight planning to NAS Pensacola from the east, what route of flight are you expected to file for? _____

9. What is your (TH-57C single-piloted) minimum weather required to commence the RNAV (GPS) RWY 17 approach at Pensacola International? _____

10. The reported weather at NAS Pensacola is 500 feet, ½ mile, and you have received clearance to execute NAS Pensacola's ***TACAN RWY 7R*** approach. Can you accept the approach clearance?
_____
Can you shoot a practice approach if no landing is intended? _____

11. On a precision approach, a missed approach is executed immediately upon reaching the _____unless the runway environment is in sight and a safe landing can be made.

12. To "close out" a flight plan, VFR or IFR, it is the pilot in command's responsibility to ensure the proper agency is notified of_____.

13. ***Must*** a suitable alternate always have a published instrument approach compatible with installed aircraft navigation equipment that can be flown without the use of two-way radio comms? _____

FLIGHT LOG

DEP ELEV	CLNC DEL	GND CONT	TOWER
KHBG 151'	N/A	N/A	122.8 (CTAF)
ALT CORR	TIME OFF	TAS	LBS PH/MIN
	1900Z	70GS/108/93	26GPH

CLEARANCE

DEPARTURE

DEST ELEV KNPA 28'	APC CONT 120.65/270.8	TOWER 120.7/340.2	GND CONT 121.7/336.4

ROUTE / TO	IDENT / CHAN	CUS	DIST	EET	ETA / ATA	LEG FUEL	EFR / AFR	GS	NOTES
D	LBY		16+12	14+6			63	70	
WIGGO	110.6	170	28	20		9		118	+10 43X
V114	GPT						60		
MINDO	109.0	162	10	5		3		119	+11 27X
V552	SJI						50		
SEMMES	115.3	077	42	21		10		118	+10 100X
D	SJI						37		
SIDNY	115.3	121	59	29		13		123	+15
(TOTALS)			139	1+15		35			
GPS 7L	NPA						34		
BOLNE	119X	334	9	6		3		92	-1
GPS 7L	I-NPA						30		
FINAL	109.3	069	11	8		4		87	-6
(TOTALS)			20	0+14		7			

ALTERNATE	ROUTE	ALTITUDE	TIME	FUEL
Penacola Intl (KPNS)	D NUN D BRENT	3000'	0+11	1+09
ALT ELEV	APC CONT	TOWER	GND CONT	
KPNS 121'	119.0 / 269.375	119.9/257.8	121.9/348.6	

D	NUN		6+1	5+1			27	70	
SAUFLEY	108.8	351	7	6		3		108	+6
D	NUN						24		
BRENT	108.8	049	8	5		3		106	+4
(TOTALS)			15	0+11		6			
ILS RWY	I-PNS			7+3			19		
17	111.1	169	5	10		5		90	+0 48X

Figure 3-1 Flight Log

Name & Rank: PRACTICE PROBLEM #3
(Use with FLIPs issued for INAV course)
TH-57 FUEL PLAN

1. **RESERVE FUEL** (gallons) **greater** of:
   - 10% PLANNED FUEL REQ ___5___
   - 20 MIN BURN AT CRUISE FF ___9___
   - **(Per 3710.7)**
2. **A/C W&B (Max Fuel)**

Max GW (lbs)		3000
A/C BW	-	2150
Crew Fwd weight	-	300
Oil weight	-	12
Crew Aft weight	-	0
Baggage	-	35
Max fuel available (lbs)	=	503
Max fuel (gal, divide by 6.7)	=	75

3. **REQUIRED FUEL** (gallons)

FUEL TO DEST IAF	35
FUEL FOR DEST APP*	7
FUEL TO ALTN IAF	6
FUEL FOR ALTN APP	5
NATOPS MIN FUEL	10
RESERVE FUEL	9
TOTAL FUEL REQ at T/O	72

4. **EXTRA FUEL\TIME AT CRUISE FF**

FUEL LOAD (gal) (**max 91**) (based on W&B from #2 above)	75
MINUS START/TAXI, fuel	3
EST TAKEOFF FUEL	72
MINUS FUEL REQUIRED	72
EXTRA FUEL (gal)	0
EXTRA TIME (hrs+min)	0

5. **FUEL ON BOARD** (in time)

TIME TO DEST IAF	1+15
TIME FOR DEST APP	0+14
TIME TO ALTN IAF	0+11
TIME FOR ALTN APP	0+10
RESERVE TIME**	0+44
EXTRA TIME	0+00
TOTAL TIME (Fuel on Board)	2+34

Departure to Destination
Altitude Selection

T/O	2900 (OROCA)
Enroute	6000 (MEA)
Approach	2200 (IAF)
Ave Course	115
Altitude	
Cruise	7000'
Avg Descent	4000'
Time to Climb	14
Speeds	
Climb	**70 KGS**
Cruise (**TAS**)	108 KTS
Approach (**TAS**)	93 KTS

Destination to Alternate
Altitude Selection

T/O	1800 (MSA)
Enroute	1800 (Feeder)
Approach	1800 (IAF)
Ave Course	040
Altitude	
Cruise	3000'
Avg Descent	2000'
Time to Climb	5
Speeds	
Climb	**70 KGS**
Cruise (**TAS**)	102 KTS
Approach (**TAS**)	90 KTS

*Dest app not required for 3710 fuel planning when an alternate is required, including destination approach provides worst-case scenario fuel requirement.
** "RESERVE TIME" is determined by combining NATOPS min fuel(10 gal) and the reserve fuel as defined by CNAF.

Figure 3-2 Fuel Plan

PRIORITY: FF
ADDRESSEE(S)
FILING TIME
ORIGINATOR
SPECIFIC IDENTIFICATION OF ADDRESSEE(S) AND/OR ORIGINATOR

3. MESSAGE TYPE: (FPL
7. AIRCRAFT IDENTIFICATION: VV1E078
8. FLIGHT RULES: I
TYPE OF FLIGHT: M
9. NUMBER:
TYPE OF AIRCRAFT: B06
WAKE TURBULENCE CAT.: L
10. EQUIPMENT: BDFGLOTUV /SU2
13. DEPARTURE AERODROME: KHBG
TIME: 1900
15. CRUISING SPEED: N0108
LEVEL: A0700
ROUTE: DCT WIGGO V114 MINDO V552 SJI DCT SIDNY DCT

16. DESTINATION AERODROME: KNPA
TOTAL EET HR/MIN: 0115
ALTN AERODROME: KPNS
2ND ALTN AERODROME:
18. OTHER INFORMATION: NAV/SBAS SUR/282B DOF/YYMMDD RMK/KNPA PPR#12-34

NOT FOR TRANSMISSION

19. SUPPLEMENTARY INFORMATION
ENDURANCE: FUEL/ 0234
PERSONS ON BOARD: POB/ 3
EMERGENCY AND SURVIVAL EQUIPMENT: RDO/ 121.5 243 500 8364
TYPE OF EQUIPMENT: POLAR DESERT MARITIME JUNGLE GLOBAL
LIFE JACKETS: JACKETS LIGHT FLUORESCEIN
RADIO FREQUENCY: 282.8
DINGHIES: COLOR NUMBER TOTAL CAPACITY
OTHER EQUIPMENT: DINGHIES COVER RMK/

REMARKS: FLIMSY #
AIRCRAFT SERIAL NUMBERS AND TYPE OF AIRCRAFT IN FLIGHT: 162042
CREW LIST: ☐ ATTACHED ☒ LOCATED AT: KNDZ
PASSENGER MANIFEST: ☐ ATTACHED ☐ LOCATED AT:
NAME OF PILOT IN COMMAND: PILOT, I. M. - Standard
SIGNATURE OF APPROVING AUTHORITY:
AIRCRAFT HOME STATION OR ORGANIZATION: HT-18 / KNDZ

DD Form 1801, MAY 87 — Previous edition is obsolete. — Reset — DOD INTERNATIONAL FLIGHT PLAN

Figure 3-3 Flight Plan

ANSWERS TO PRACTICE PROBLEM #3 QUESTIONS

1. 3

2. 37 gallons

3. The actual takeoff time (XXXX) plus the EET (1:15) plus the time spent in holding (0+15). COMMENCE APP TIME = XXXX + 1:15 + 0+15 FIH A-7

4. After TWR hours, make calls on CTAF (119.9). IFR Supp/approach plates

5. SEMMES, 2200'. Since you are on a feeder route and have been cleared for the approach (not typical) you can begin a descent at Semmes VORTAC down to the published MEA (2200') for the feeder route. The feeder route in this case is considered part of the approach clearance. AIM Para 5-4-6 Approach Clearance.

6. 25 NM if on a VFR flight. IFR Supp Remarks B-428.

7. 359.6 MHz IFR Supp B-517, FIH C-22

8. V198 - 241 PENSI Direct NPA. AP-1 Supplementary Airport Information, pg. 3-155.

9. LPV weather minimums: -200-1/2. So, after applying CNAF M-3710.7 visibility reduction, 200-1/4.

10. Yes/Yes. 3710 5.3.5.1 – reduce required visibility so you are within minimums. You can make practice approaches at your destination and alternate if the weather is at or above your minimums. 3710 5.3.5.7.

11. Decision height. 3710, 5.3.5.4 or GP chap 2.

12. Flight termination. 3710, 4.9

13. No, if the forecast ceiling and visibility at the alternate is 3000/3 or better $\pm$1 hour of your ETA and the destination has a published instrument approach compatible with the installed operable aircraft navigation equipment that can be flown without the use of two-way radio comms. (CNAF M-3710.7, 4.8.4.3)

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PRACTICE PROBLEM #4 DATA

DIRECTIONS:

1. Read all the information given.

2. Complete a flight log, fuel plan, and DD-1801.

3. Answer the questions about this problem.

PROBLEM DATA:

ACFT/BUNO/Call sign/Equipment: TH-57/162042/1E078/VOR-TAC/GTN650/ILS/ADF

Type flight plan: IFR (w/ en route holding delay)

	Airport	**Weather ETA ± 1 hour**
Departure:	Dothan, AL (KDHN)	30008KT 5SM HZ OVC008 QNH2992INS
Destination:	Tyndall AFB, FL (KPAM)	30009KT 9000 HZ BKN020 QNH2992INS
Alternate:	Northwest Florida Beaches International, FL (KECP)	36006KT 6SM HZ OVC018 QNH2992INS
	Eglin AFB, FL (KVPS)	35005KT 3200 RA SCT009 BKN040 QNH2992INS

Route of flight:

Destination: Plan a takeoff time of 2000 CST. Request radar departure to Wiregrass VORTAC (RRS), V521 to BRITS Intersection. Request 10-minute delay at BRITS for practice holding. Depart BRITS direct to GEENA (IAF) for a VOR/DME Z RWY 32R approach to Tyndall AFB (KPAM PPR#: 12-34).

Alternates: Northwest Florida Beaches International; Direct to Handle VORTAC (IAF) for a VOR/DME RWY 34 approach.

Eglin AFB; Direct to Handle VORTAC, Direct GINTY IAF for ILS Z RWY 30 approach.

NOTE

TAS and Fuel Flow is provided below for this problem. You ***do not*** have to determine these.

AIRSPEEDS:	**ALT**	**WINDS**	**TEMP**
Climb: 70 kts ground speed	1000	310/15	+30
Cruise: 107 kts **True**	2000	320/20	+28
Descent: 93 kts **True**	3000	330/18	+26
Alternate Cruise: 107 kts **True**	4000	340/18	+24
Alternate Descent: 93 kts **True**	5000	320/18	+20
	6000	310/18	+17
	7000	300/20	+15

Maximum weight*:	3200 lbs.
Basic weight:	2150 lbs.
Crew forward:	320 lbs.
Crew aft:	145 lbs.
Baggage:	30 lbs.
Oil:	12 lbs.
Fuel flow:	27 gph
Climb rate:	500 feet per min.
Transponder:	4096 with Mode S
Instrument Rating:	Standard
Variation:	4° W
KPAM PPR#:	12-34

PRACTICE PROBLEM #4 QUESTIONS

1. How many mandatory position reporting points are there on this flight log? _____

2. How much fuel is remaining at Marianna VORTAC? _____

3. What is the TOTAL FUEL REQ at T/O?

4. At Dothan Regional, you would receive your ATC clearance from

   a. Ground Control
   b. Departure Control
   c. Clearance Delivery
   d. Tower

5. At Dothan Regional, your lowest weather minimums for takeoff using RWY 32 are:

   NOTE: KDHN NOTAM: LOC RWY 32 O/S

   a 200 – ¾
   b. 300 - 1
   c. 300 – ¾
   d. 400 – ½

6. If an aircraft taking off RWY 18 at Dothan Regional at night, is 75 feet AGL, slightly right of centerline, approximately 2,000 feet beyond the departure end, it has a good chance of striking what?

   a cell tower
   b. airport control tower
   c. power lines
   d. trees

7. If you have an emergency after takeoff from Dothan Regional and need to return to the airport using the RNAV (LPV) RWY 32 approach, should you expect to see REIL for RWY 32?

8. En route to Marianna VORTAC (MAI), what frequency, (or frequencies) would you use to contact Jacksonville Center?

9. Upon arrival at BRITS what is your voice report? Provide corresponding reference from the FIH. _____

10. Upon departing BRITS what is your voice report? Provide corresponding reference from the FIH. _____

11. If you should lose communications inbound to Marianna, you would be expected to begin your approach to Tyndall at takeoff time plus

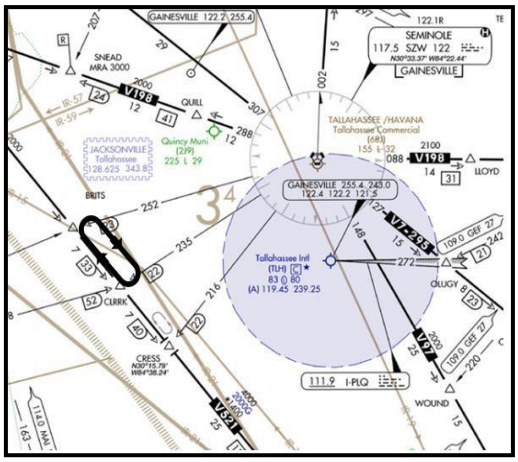
   a. 1 + 00
   b. 0 + 50
   c. 1 + 09
   d. 1 + 19

Outbound from Marianna, you receive the following clearance:

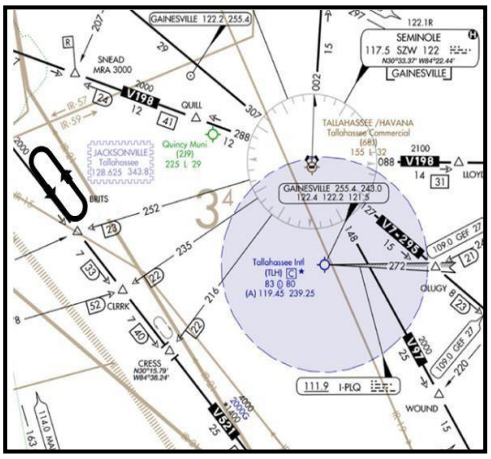
"Navy 1E078 Jacksonville Center, hold east of BRITS on the Seminole 252 radial, 2 - mile legs. Maintain (altitude) expect further clearance at XXXX (BRITS arrival time plus 15 minutes), over."

12. At BRITS, based on the above clearance, your holding pattern would be

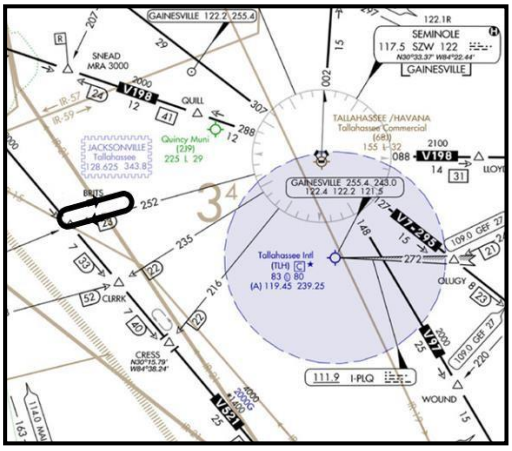
a.



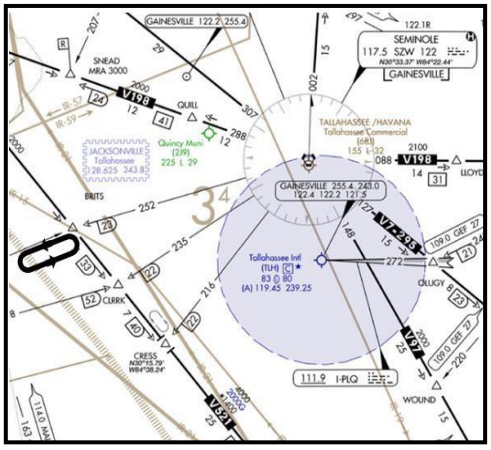
b.



c.



d.



13. To enter holding at BRITS ***as published on your actual chart***, you would turn_____ (right/left) to_____ heading.

a. left . . . 141
b. left . . . 321
c. right . . . 321
d. right . . . 141

14. At BRITS, what holding course would you set in the KI-525A Horizon Situation Indicator (HSI)? _____

15. You have just completed your 10 minutes of practice holding as requested. After departing BRITS, if you should lose communications with ATC, you would be expected to begin your approach at Tyndall at Cairns departure time plus _____.

a. 1 + 00
b. 0 + 50
c. 1 + 02
d. 1 + 19

16. If you arrived at Tyndall at 0030 CST, your approach controller would be

a. Panama City Approach Control
b. Tyndall Approach Control
c. Jacksonville Center
d. Tallahassee Radio

17. At Tyndall, you would expect your controller to

a. clear you for a TACAN RWY 14L approach.
b. radar vector you for a straight-in TACAN approach to RWY 14L.
c. clear you for a PAR approach (without request).

18. At Tyndall, your MDA is

a. 50
b. 460
c. 446
d. 500

19. The Tyndall TACAN is usable in all directions within 40 NM. _____ (TRUE/FALSE)

20. If your destination weather is greater than the required minimums but less than 3000-3, the ILS RWY 16 approach at Northwest Florida Beaches International airport can be used as an alternate anytime the weather there is forecast to be 400-1 or higher._____ (TRUE/FALSE)

21. At Northwest Florida Beaches International, if approach control provided you with the Destin altimeter setting while executing the VOR/DME RWY 34 approach to RWY 34 _____.

a. your MDA is 480.
b. your MDA is 580.
c. your MDA is 520.
d. the approach procedure is not authorized.

22. At Northwest Florida Beaches International, the Class D airspace effective times are from _____ to _____.

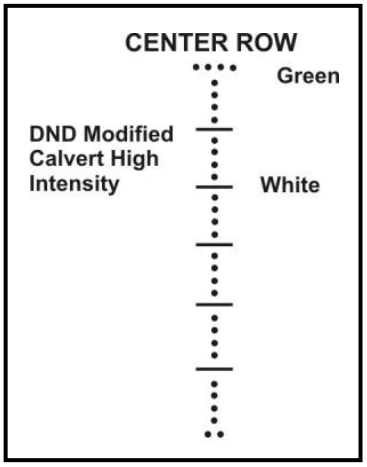
a. 1330Z . . . 0130Z
b. 1200Z . . . 0400Z
c. 1230Z . . . 0300Z
d. 1200Z . . . 0200Z

23. On the ILS Z RWY 30 approach at Eglin AFB, the DA to RWY 30 is_____ feet above the field elevation.

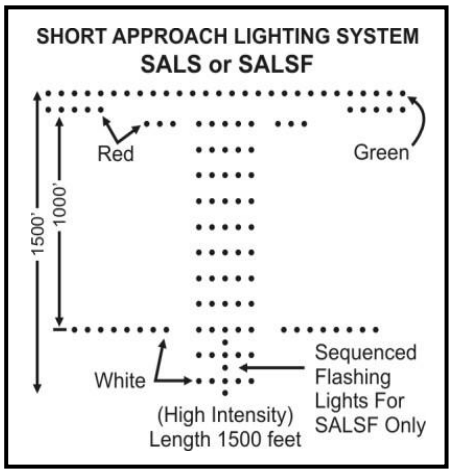
a. 165
b. 200
c. 249
d. 440

24. At Northwest Florida Beaches International, shooting the VOR/DME Rwy 34 approach, you would expect to see which approach lighting system?

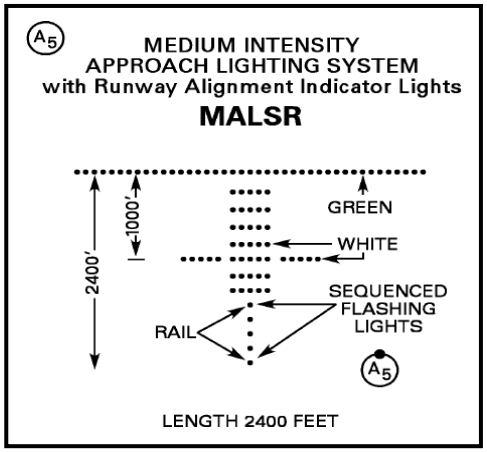
a.



c.



b.



d. None of these.

25. On the low-level chart (L-22), your flight path to the alternate goes through several blocks of restricted airspace (R-2914B/R-2919B). Is that a problem YES or NO? Why or why not?

FLIGHT LOG

DEP ELEV	CLNC DEL	GND CONT	TOWER
KDHN / 401'	N/A	121.7 / 348.6	118.4 / 257.6
ALT CORR	TIME OFF	TAS	LBS PH/MIN
	0200Z	70GS/107/93	27 GPH

CLEARANCE

DEPARTURE

DEST ELEV	KPAM / 17'	APC CONT	120.825/379.3	TOWER	133.95 / 263.15	GND CONT	121.9 / 259.3

ROUTE / TO	IDENT / CHAN	CUS	DIST	EET	ETA / ATA	LEG FUEL	EFR / AFR	GS	NOTES
D WIREGRASS	RRS / 111.6	155	2	2		1	67	70GS	53X
V521 MARIANNA	MAI / 114.0	150 / 152	6+28 / 34	5+14 / 19		9	58	70GS / 124	87X / +17
V521 BRITS	MAI / 114.0	141	26	13		6	52	123	87X / +16
HOLDING DELAY	MAI / 114.0	N/A	N/A	10		5	47	N/A	87X
D GEENA	HLL / 114.3	218	32	16		8	39	118	90X / +11
(TOTALS)			94	1+00		29			
VOR/DME Z 32R ARC	HLL / 114.3	203	9	6		3	36	95	90X / +2
FINAL	HLL / 114.3	304	19	13		6	30	85	90X / -8
(TOTALS)			28	0+19		9			

ALTERNATE	ROUTE	ALTITUDE	TIME	FUEL
KVPS	D HLL D GINTY	4000	0+26	1+07
ALT ELEV	APC CONT	TOWER	GND CONT	
84'	132.1 / 360.6	118.2 / 353.65	121.8 / 335.8	

D HANDLE	HLL / 114.3	302	7	6		3	27	70GS	90X
D GINTY	DWG / 2X	298	2+30 / 32	2+19 / 21		10	17	70GS / 94	2X / -13
(TOTALS)			39	0+27		13			
ILS Z RWY 30 FINAL	I-VPS / 109.1	300	17	0+11		5	12	90	-3

Figure 4-1 Flight Log

Name & Rank: PRACTICE PROBLEM #4
(Use with FLIPs issued for INAV course)
TH-57 FUEL PLAN

1. **RESERVE FUEL** (gallons) **greater of:**

10% PLANNED FUEL REQ	6
20 MIN BURN AT CRUISE FF	9
(Per 3710.7)	

2. **A/C W&B (Max Fuel)**

Max GW (lbs)		3200
A/C BW	-	2150
Crew Fwd weight	-	390
Oil weight	-	12
Crew Aft weight	-	145
Baggage	-	30
Max fuel available (lbs)	=	473
Max fuel (gal, divide by 6.7)	=	71

3. **REQUIRED FUEL** (gallons)

FUEL TO DEST IAF	29
FUEL FOR DEST APP*	9
FUEL TO ALTN IAF	13
FUEL FOR ALTN APP	5
NATOPS MIN FUEL	9
RESERVE FUEL	10
TOTAL FUEL REQ at T/O	75

4. **EXTRA FUEL\TIME AT CRUISE FF**

FUEL LOAD (gal) (**max 91**)	71
(based on W&B from #2 above)	
MINUS START/TAXI, fuel	3
EST TAKEOFF FUEL	68
MINUS FUEL REQUIRED	75
EXTRA FUEL (gal)	-7**
EXTRA TIME (hrs+min)	0+00

5. **FUEL ON BOARD** (in time)

TIME TO DEST IAF	1+00
TIME FOR DEST APP	0+19
TIME TO ALTN IAF	0+26
TIME FOR ALTN APP	0+11
RESERVE TIME	0+20
EXTRA TIME	-------
TOTAL TIME (Fuel on Board)	2+16

Departure to Destination
Altitude Selection

T/O:	1400 (KDHN VOR/TAC-A)
Enroute	3300 (KPAM ESA)
Approach:	3000 (KPAM IAF)
Ave Course	181
Altitude	
Cruise	4000
Avg Descent	2000
Time to Climb	7 MIN
Speeds	
Climb	**70 KGS**
Cruise (**TAS**)	107
Approach (**TAS**)	93

Destination to Alternate
Altitude Selection

T/O:	1600 (VOR/DME Z 14L)
Enroute	3200 (OROCA)
Approach	2500 (KVPS IAF)
Ave Course	298
Altitude	
Cruise	4000
Avg Descent	2000
Time to Climb	7 MIN
Speeds	
Climb	**70 KGS**
Cruise (**TAS**)	107
Approach (**TAS**)	93

*When an alternate is required, CNAF does NOT include the destination approach when determining fuel minimums. This workbook utilizes the worst case scenario.
** "RESERVE TIME" is determined by combining the NATOPS min fuel (10 gal) and the reserve fuel as defined by CNAF.

Figure 4-2 Fuel Plan

PRIORITY: FF
ADDRESSEE(S)
FILING TIME
ORIGINATOR
SPECIFIC IDENTIFICATION OF ADDRESSEE(S) AND/OR ORIGINATOR

3. MESSAGE TYPE: (FPL
7. AIRCRAFT IDENTIFICATION: VV1E078
8. FLIGHT RULES: I
TYPE OF FLIGHT: M
9. NUMBER:
TYPE OF AIRCRAFT: B06
WAKE TURBULENCE CAT.: L
10. EQUIPMENT: BDFGLOTUV/SU2
13. DEPARTURE AERODROME: KDHN
TIME: 0200
15. CRUISING SPEED: N0107
LEVEL: A0400
ROUTE: DCT RRS V521 BRITS/D00+10 DCT GEENA DCT

16. DESTINATION AERODROME: KPAM
TOTAL EET HR/MIN: 0100
ALTN AERODROME: KVPS
2ND ALTN AERODROME:
18. OTHER INFORMATION: NAV/SBAS SUR/282B DOF/YYMMDD RMK/KPAM PPR#12-34

NOT FOR TRANSMISSION

19. SUPPLEMENTARY INFORMATION
ENDURANCE — FUEL/ 0246
PERSONS ON BOARD — POB/ 3
EMERGENCY AND SURVIVAL EQUIPMENT — RDO/ 121.5 → 243 → 500 → 8364
TYPE OF EQUIPMENT — POLAR → DESERT → MARITIME → JUNGLE → GLOBAL
LIFE JACKETS — JACKETS → LIGHT → FLUORESCEIN
RADIO FREQUENCY — 282.8
DINGHIES — COLOR — NUMBER — TOTAL CAPACITY — OTHER EQUIPMENT
DINGHIES → COVER → RMK/

REMARKS
FLIMSY #
AIRCRAFT SERIAL NUMBERS AND TYPE OF AIRCRAFT IN FLIGHT
162042
CREW LIST [ ] ATTACHED [X] LOCATED AT: KNDZ
PASSENGER MANIFEST [ ] ATTACHED [ ] LOCATED AT:
NAME OF PILOT IN COMMAND: PILOT, I.M. - Standard
SIGNATURE OF APPROVING AUTHORITY
AIRCRAFT HOME STATION OR ORGANIZATION: HT-18 / KNDZ

DD Form 1801, MAY 87 — Previous edition is obsolete. — Reset — DOD INTERNATIONAL FLIGHT PLAN

Figure 4-3 Flight Plan

ANSWERS TO PRACTICE PROBLEM #4 QUESTIONS

1. 5

2. 58 gals. ± 1

3. 75 gals. ± 2

4. a. Approach Plates for Dothan Regional

5. b. App Plates, Vol 14, pg. 125, RNAV (GPS) RWY 32 approach. ILS is out of service (see NOTAM provided with question). LPV approaches are considered non-precision, so no less than 300-1 (CNAF 3710.7 non-precision mins) even though published minimums are 200-1/2.

6. d. trees (see Takeoff Minimums section of approach plates)

7. No, (Approach Plates for Dothan Regional)

8. 134.3 or 322.55 (L-22 IFR En route Chart)

9. "TYNDAL APPROACH, NAVY 1E078, BRITS, TIME THREE FOUR (+/- 2 mins), FOUR THOUSAND FEET. Basic voice reports (PTA) FIH pg. B-6 para 2.a. (6).(a).6 The time and altitude or flight level upon reaching a holding fix or point to which cleared.

10. "TYNDAL APPROACH, NAVY 1E078, DEPARTING BRITS, TIME FOUR FOUR (+/- 2 mins), FOUR THOUSAND FEET. Basic voice reports (PTA) FIH pg. B-6 para 2.a.(6).(a).7 When leaving any assigned holding fix or point.

11. b. FIH A-7. Assuming you have not received ATC clearance to hold (as requested at BRITS) yet, if you go lost comm., why would you still practice holding along the way?

12. c.

13. b. Left to 321 (outbound holding heading) direct entry for non-standard left hand holding.

14. 141

15. a. FIH A-7.

16. c. IFR Supp B-676 Comm section "OT CTC JAX CTR" Other times, contact JAX Center.

17. b. See A/P 1 Supplementary Airport Information.

18. b.

19. True. IFR Supp pg. B-674, NAVAIDS section lists Tyndall TACAN as a "HA" NAVAID. Supp Legend, pg. A-27 explains what that means.

20. False. Published minimums 200-1/2 plus CNAF M-3710.7 reqd 200-1/2 = 400/1. While this is sufficient WX to select field as an Alternate, see A at top of approach plate in pilot briefing section. Refer to "IFR Alternate Minimums" section, pg. LIX. Panama City-Bay County is "NA when local weather not available" and the ILS is also NA when tower closed." The question asked, "Can be used ***anytime***." Read the questions carefully!

21. b. Apply the note at the top which stated to "Increase all MDAs 100 feet" when using Destin altimeter setting.

22. b. IFR Supp B-490

23. a. 249 ft (MDA) – 84 ft (field elevation) = 165 ft. If you selected answer b, (200 ft (the HAT)), you did not read the question carefully.

24. d. IFR Supp or APP Plates for approach lighting codes.

25. No. According to the chart special use airspace panel (behind the Legend flap) R-2914B and 2919B effective altitudes are 8500 MSL and up. Flight planned altitude is 4000 ft.

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PRACTICE PROBLEM #5 DATA

DIRECTIONS:

1. Read all the information given.

2. Complete a flight log, fuel plan, and DD-1801.

3. Answer the questions about this problem.

PROBLEM DATA:

ACFT/BUNO/Call sign/Equipment: TH-57/162722/1E049/VOR-TAC/GTN650/ILS/ADF

Type flight plan: IFR

	Airport	**Weather ETA ± 1 hour**
Departure:	Winston-Salem/ Smith Reynolds, NC (KINT)	16010KT P6SM FEW 300 QNH3010INS
Destination:	Daniel Field, Augusta, GA (KDNL)	16003KT 3SM HZ BKN120 QNH3012INS
Alternate:	Columbia Metropolitan, SC (KECP)	14007KT 3SM HZ SCT100 QNH3011INS

Route of Flight:

Destination: Plan for a departure time of 0700 local standard time. Proceed via radar departure to BURCH Intersection, V222 to Sugarloaf Mountain VORTAC (SUG), V53 to CARTT (IAF) for the ILS or LOC RWY 22 approach into Greenville Spartanburg Intl (KGSP) for a terminal delay/practice approach. Use 88 **KTAS** and winds of 16010KTS for the practice approach. At the completion of the approach, proceed direct to PETON intersection, V185 to Colliers VORTAC (IRQ) (IAF) for the VOR/DME-B approach into Daniel Field, GA.

NOTAMS: (KDNL) NO 100LL
CONST N SIDE RWY 29
MIRL INOP ALL RWY

Alternate: As needed (route is your choice)

NOTE: TAS and Fuel Flow is provided below for this problem. You *do not* have to determine these.

AIRSPEEDS:	**ALT**	**WIND**	**TEMP**
Climb 70 Kts ground speed	2000	140/09	+02
Cruise 105 Kts **True**	3000	120/13	00
Descent 90 Kts **True**	4000	100/17	-02
	5000	080/20	-04
	6000	060/24	-06
	7000	050/18	-08
	8000	020/16	-10

Basic weight:	2150 lbs.
Crew forward:	298 lbs.
Crew aft:	140 lbs.
Baggage:	30 lbs.
Oil:	12 lbs.
Fuel flow:	26 gph
Climb rate:	500 feet per min.
Transponder:	4096 with Mode
Instrument Rating:	Standard
Variation:	7° W

PRACTICE PROBLEM #5 QUESTIONS

1. What is your total fuel required? _____

2. How many hours of fuel do you have on board? _____

3. What is your destination approach time? _____

4. How many hours and minutes of fuel do you have remaining at your destination IAF? ____

5. What is the height of the glide slope (in MSL) at the ILS FAF for the ILS or LOC RWY 35 approach at Augusta Regional at Bush Field, GA.? _____

6. What is the MSA at Sugar Loaf Mountain VORTAC (SUG)? _____

7. If you had departed from Ashville Regional, (KAVL), what altitude restrictions apply and why? _____

8. What minimum altitude must you be at when crossing GENOD intersection on V-222 just prior to SUG VORTAC? _____

9. What are the operating hours of the class "C" airspace at Greenville Spartanburg International?

10. What are your takeoff minimums for KINT? _____

11. Using the following information, determine your cruise fuel flow?

    Pressure altitude 4000
    Temperature +10 degrees C
    Acft weight 3000 lbs.
    Fuel flow = _____ GPH

12. Using the data provided, calculate the true airspeeds.

    - Cruise altitude and temperature 4000/+10 degrees C 100 KIAS = _____ KTAS
    - Average approach altitude and temperature 2000/+15 degrees C 90 KIAS = _____ KTAS

FLIGHT LOG

DEP ELEV	CLNC DEL	GND CONT	TOWER
KINT 969'	GND 128.25	128.25	123.75/257.8
ALT CORR	TIME OFF	TAS	LBS PH/MIN
	0700L/1200Z	70/105/90	26GPH

CLEARANCE

DEPARTURE

DEST ELEV KDNL 423'	APC CONT 126.8/270.3	TOWER 123.05 (CTAF)	GND CONT N/A

ROUTE / TO	IDENT / CHAN	CUS	DIST	EET	ETA / ATA	LEG FUEL	EFR / AFR	GS	NOTES
D	GSO		12+17	10+8			74	70	109X
BURCH	116.2	277	29	18		8		126	+21
V222	BZM						68		
BARRETTS MOUNTAIN	110.8	235	27	13		6		129	+24
V222	SUG	247					56		59X
SUGAR LOAF MOUNTAIN	112.2	243	57	27		12		129	+24
V53	SUG						50		59X
CARTT (IAF)	112.2	145	20	12		6		100	-5
TERM AREA DELAY	I-LMJ						44		
ILS 22	110.7	218	17	12		6		82	-6 (88 KTAS)
D	GRD		12+3	10+2			38	70	102X
PETON	115.5	176	15	12		6		113	+8
V185	GRD						32		102X
GREENWOOD	115.5	176	24	13		6		113	+8
V185	IRQ	182					24		86X
COLLIERS	113.9	185	33	17		8		115	+10
(TOTALS)			222	2+04		58			
KDNL	IRQ						19		86X
VOR/DME B	113.9	161	15	10		5		87	-3

ALTERNATE	ROUTE	ALTITUDE	TIME	FUEL
ALT ELEV	APC CONT	TOWER	GND CONT	

Figure 5-1 Flight Log

Name & Rank: **PRACTICE PROBLEM #5**
(Use with FLIPs issued for INAV course)
TH-57 FUEL PLAN

1. **RESERVE FUEL** (gallons) **greater** of:
   - 10% PLANNED FUEL REQ ____ 7
   - 20 MIN BURN AT CRUISE FF ____ 9
   - **(Per 3710.7)**
2. **A/C W&B (Max Fuel)**

Max GW (lbs)		3200
A/C BW	-	2150
Crew Fwd weight	-	298
Oil weight	-	12
Crew Aft weight	-	140
Baggage	-	30
Max fuel available (lbs)	=	570
Max fuel (gal, divide by 6.7)	=	85

3. **REQUIRED FUEL** (gallons)

FUEL(Avg) DEST IAF	58
FUEL FOR DEST APP*	5
FUEL TO ALTN IAF	- -
FUEL FOR ALTN APP	- -
NATOPS MIN FUEL	10
RESERVE FUEL	9
TOTAL FUEL REQ at T/O	82

4. **EXTRA FUEL\TIME AT CRUISE FF**

FUEL LOAD (gal) (**max 91**)	85
(based on W&B from #2 above)	
MINUS START/TAXI, fuel	3
EST TAKEOFF FUEL	82
MINUS FUEL REQUIRED	82
EXTRA FUEL (gal)	0
EXTRA TIME (hrs+min)	0+00

5. **FUEL ON BOARD** (in time)

TIME TO DEST IAF	2+05
TIME FOR DEST APP	0+10
TIME TO ALTN IAF	- -
TIME FOR ALTN APP	- -
RESERVE TIME	0+21
EXTRA TIME	0+00
TOTAL TIME (Fuel on Board)	2+36

Departure to Destination
Altitude Selection

T/O	3500 (V310 MEA)
Enroute	6000 (MEA)
Approach	2100 (IAF)
Ave Course	218
Altitude	
Cruise	6000'
Avg Descent	3000'
Time to Climb	10
Speeds	
Climb	**70 KGS**
Cruise (**TAS**)	105 KTS
Approach (**TAS**)	90 KTS

Destination to Alternate
Altitude Selection

T/O	N/A
Enroute	N/A
Approach	N/A
Avg course	N/A
Altitude	
Cruise	N/A
Avg Descent	N/A
Time to Climb	N/A
Speeds	
Climb	**70 KGS**
Cruise (**TAS**)	N/A
Approach (**TAS**	N/A

*When an alternate is required, CNAF does NOT include the destination approach when determining fuel minimums. This workbook utilizes the worst case scenario.
** "RESERVE TIME" is determined by combining the NATOPS min fuel (10 gal) and the reserve fuel as defined by CNAF.

Figure 5-2 Fuel Plan

PRIORITY: FF
ADDRESSEE(S)
FILING TIME
ORIGINATOR
SPECIFIC IDENTIFICATION OF ADDRESSEE(S) AND/OR ORIGINATOR

3. MESSAGE TYPE: (FPL
7. AIRCRAFT IDENTIFICATION: VV1E049
8. FLIGHT RULES: I
TYPE OF FLIGHT: M
9. NUMBER:
TYPE OF AIRCRAFT: B06
WAKE TURBULENCE CAT.: L
10. EQUIPMENT: BDFGLOTUV/SU2
13. DEPARTURE AERODROME: KINT
TIME: 1200
15. CRUISING SPEED: N0091
LEVEL: A080
ROUTE: DCT BURC V222 SUG V53 CARTT DCT KGSP/D00+12 DCT PETON V185
IRQ DCT

16. DESTINATION AERODROME: KDNL
TOTAL EET HR/MIN: 0204
ALTN AERODROME:
2ND ALTN AERODROME:
18. OTHER INFORMATION
NAV/SBAS SUR/282B DOF/YYMMDD

NOT FOR TRANSMISSION

19. SUPPLEMENTARY INFORMATION
ENDURANCE: FUEL/ 0258
PERSONS ON BOARD: POB/ 3
EMERGENCY AND SURVIVAL EQUIPMENT: RDO/ 121.5 243 500 8364
TYPE OF EQUIPMENT: POLAR DESERT MARITIME JUNGLE GLOBAL
LIFE JACKETS: JACKETS LIGHT FLUORESCEIN
RADIO FREQUENCY: 282.8
DINGHIES: DINGHIES
COLOR:
NUMBER:
TOTAL CAPACITY:
OTHER EQUIPMENT: COVER
RMK/

REMARKS
FLIMSY #

AIRCRAFT SERIAL NUMBERS AND TYPE OF AIRCRAFT IN FLIGHT
162722

CREW LIST: ☐ ATTACHED ☒ LOCATED AT: KNDZ
PASSENGER MANIFEST: ☐ ATTACHED ☐ LOCATED AT:

NAME OF PILOT IN COMMAND: PILOT, I. M. - Standard
SIGNATURE OF APPROVING AUTHORITY:
AIRCRAFT HOME STATION OR ORGANIZATION: HT-18 / KNDZ

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Figure 5-3 Flight Plan

ANSWERS TO PRACTICE PROBLEM #5 QUESTIONS

1. 82 gallons +/- 2 2.

2. 2+58 +/- 5 minutes

3. 0+10

4. 0+55. 24 gallons remaining at IAF @ 26 GPH (CR-2)

5. 1700' MSL. Question asked for height of glide slope at the ILS FAF, not the Localizer FAF. If you have read the legends for the approach plates, you know that the lightning bolt is the precision FAF.

6. 7700' Asheville Regional Approach plate (ILS RWY 35), MSA circle. Question did **not** ask for the lowest safe altitude.

7. on approach plate indicates go to "obstacle departure procedures" in front of plates. Depending on runway in use, the procedures call for a visual climb to various altitudes before proceeding on course. The "why" is because there is a "Trouble T." Although the real reason is not indicated, it is likely due to the mountainous terrain around Asheville.

8. 6000'. There is an MRA flag at GENOD intersection, but it doesn't apply in this case. Look up the definitions for MEA and "Minimum Reception Altitude." MRAs ***only*** apply when using cross radials/bearings to identify a fix. Remember that the MEA provides navaid reception along the ***entire*** route.

9. 1100-0445Z++ IFR Supp, Greenville Spartanburg International

10. 500-1. App plates. Best option based on winds is the RNAV RWY 15 at 500-1 which also meets CNAF 3710.7 requirements.

11. 26 GPH

12. 104 KTAS +/- 1 KT
    91 KTAS +/- 1 KT

R.O.E. FOR THE TEST

1. In addition to your reading list/study guide, make sure you review the flight planning "rules" outlined in the front of this workbook including the lecture problem. You cannot use your workbook during the exam.

2. Take your 2016 FLIP pubs and CNAF M-3710.7 with you into the test. (There is no requirement to bring a copy of the AIM, but you may bring your own copy if you wish. There are also copies available in the testing center. Note that all test questions can be answered without having to reference the FAR/AIM.) Feel free to highlight, underline, and tab the pubs if you desire; however, ***do not make notes of any kind in the pubs***. Also, you will not need your NATOPS manual or pocket checklist. The test package provided to you will include copies of NATOPS Fuel Flow Charts.

3. You may bring a basic calculator, plotter/straight edge, dividers, and pencils/erasers. You cannot use cell phones, PDAs, electronic flight planning calculators or similar electronic devices during the test. Scratch paper will be provided.

4. Squadrons' typically hard schedule SNAs for the test. Typical start time for the INAV exam is 1000, M-F, but can vary. Check with your squadron for details and specific scheduling times.

5. You are allotted 3 hours to take the test. The test consists of 40 multiple choice questions on the computer which counts as 80% of the exam. There are also 5 fill-in-the-blank questions on the Flight Log and 5 graded entries on the DD 1801 (20% of the exam). Flight Log questions are listed on the back of the problem data sheet and a space to write the answers is provided on the Flight Log itself. You may take the test in whatever order you prefer, but it is recommended that you do the flight planning first then do the multiple-choice questions. Also, it is recommended that you spend no more than 1+15 (try to target 1+00) on the flight log and spend the rest of the time on the multiple-choice questions.

6. If you give yourself at least 1.5 hours for the questions, that gives you about 2 minutes per question – more than enough time ***if you have studied the books***. If you don't find an answer in 2 minutes, start a list of questions you want to review later and move on! Once you have gone through the entire test, you should have some extra time at the end; use it to go back to your list and dig a little deeper for the answers you didn't find the first time and review the test. Also, you will not turn in the flight log until you complete the test, so you can always go back to it if you have extra time.

7. ***Be precise*** when doing your flight planning. *Reasonable* tolerances are provided for most jet log answers, but precision planning in accordance with this workbook is still expected and necessary.

8. ***Read the questions carefully.*** On the flight log, answer the question that is asked. If it asks for fuel in "hours and minutes" do not answer in "gallons," etc. If one of the 5 questions ask for the number of compulsory reporting points to the "Destination IAF," do not include compulsory points that may have been marked for routing to the alternate and vice versa.

9. Read the information in the applicable publication carefully before answering the question, e.g., lookup and verify all answers! Pay attention to Helicopter "exceptions to the rule." ***You are not allowed to ask questions during the test*** (International Students may ask for language clarification only). *After* the test you are encouraged to seek clarification of anything you didn't fully understand from an INAV instructor.

10. ***Use the reading list*** as a study guide. If we mention the glossary, legend, etc., then ensure that you actually read through that particular section. ***Do not merely tab its location!*** Go back and review the practice problems, especially the ones that require terminal area delays and holding delays. Review the answer keys for each of the practice problems. If you are not getting the correct answers and you cannot figure out why, speak with an INAV instructor.

"Careless" mistakes CAN KILL YOU when flying so there is no forgiveness for carelessness on the test either. Attention to detail!