STUDENT HANDOUT

AIR TRAFFIC CONTROL

5/69 - 3817 - 7(U)

NOVEMBER 1968

UNITED STATES ARMY AVIATION SCHOOL
FORT RUCKER, ALABAMA

DEPARTMENT OF ROTARY WING TRAINING
UNITED STATES ARMY AVIATION SCHOOL
FORT RUCKER, ALABAMA

File No. 3817-7(U)

PERFORMANCE OBJECTIVES

AIR TRAFFIC CONTROL

1. KNOWLEDGES: With the aid of his notes and a set of Flight Information Publications, the student will be able to write:

(Period one of seven periods)

a. The definitions of Air Traffic and Air Traffic Control (ATC).

b. Two of the services provided by Air Traffic Control.

c. The names of at least two of the agencies of Air Traffic Control and the authority of these agencies to approve or issue IFR and VFR flight clearances.

d. Two of the services provided by Flight Service Stations (FSS).

(Period two of seven periods)

e. Responsibility of the pilot while operating VFR in Control Zones, Airport Traffic Areas, Airport Advisory Areas, Restricted Areas, Joint Use Restricted Areas, and Climb Corridors.

f. The three requirements for operating under a Special VFR clearance in a Control Zone.

g. The content and sequence of IFR/VFR position reports and change of ETA at destination by more than 30 minutes reports.

h. The procedure to be followed by the pilot when flying IFR in a radar environment.

i. The 11 reports that shall be made to ATC on an IFR flight.

(Period three of seven periods)

j. Initial contact and report procedures when told to "report" or "contact".

k. The content of a malfunction report and the conditions under which report is made.

l. The responsibility of ATC to IFR traffic while VFR or VFR-on-top outside and within controlled airspace.

m. The separation standards used by ATC for IFR traffic in controlled airspace.

n. The three types of ATC IFR clearances and the Army rule governing copying, reading back, and accepting a clearance.

(Period four of seven periods)

o. The definitions of Minimum Enroute Altitude (MEA), Minimum Obstruction Clearance Altitude (MOCA, within and beyond 22 nm of the navaid).

p. The IFR cruising altitude rule and the responsibility of the pilot in selecting and ATC in assigning altitudes.

q. The standard and nonstandard holding patterns and the five items contained in a holding clearance.

r. The method used to establish Approach Control and the authority of Approach Control to originate IFR flight clearances.

s. Three types of instrument approaches and the procedure to follow when cleared for a specific approach, an approach, or a straight-in approach.

t. The meaning of a "Cruise" clearance and the responsibility of the pilot to ATC when executing a missed approach.

(Period five of seven periods)

u. Procedures to follow when communications failure is experienced under the following conditions:

(1) Enroute VFR.

(2) Enroute and terminal IFR.

v. Emergency procedures to be followed in the event of loss of all communications and navigation equipment (with and without a receiver).

(Period six and seven of seven periods)

w. The correct answers to all of the questions in a practical exercise composed of questions taken from material covered in the first five periods within a time limit of 80 minutes.

2. SKILLS: None.

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STUDENT OUTLINE

AIR TRAFFIC CONTROL

1. Organization and function of the Air Traffic Control (ATC) system.

   a. Definition of Air Traffic - AIRCRAFT OPERATING IN THE AIR OR ON AN AIRPORT SURFACE, EXCLUSIVE OF LOADING RAMPS AND PARKING AREAS.

   b. Definition of Air Traffic Control - AN AGENCY THAT PROVIDES SERVICES TO PROMOTE THE SAFE AND EXPEDITIOUS FLOW OF AIR THAFFIC.

   c. Services provided by ATC. prevent collision
   expedite flow of traffic
   provide flight information
   and in search and rescue.

   d. Air Traffic Control agencies.
      (1) Control tower. gives landing clearance
      (2) Approach Control. clears IFR
      (3) Air Route Traffic Control Center. close IFR
      (4) Flight Service Stations (FSS). not an angency but provides assist (Services provided)
         (a) Preflight briefing.
         (b) Filing - Closing of flight plans. VFR
         (c) Weather advisories.
         (d) NOTAMS.
         (e) Weather observations. schedule weather at 15 and 45
         (f) Scheduled weather broadcasts. move 15
         (g) Position reports.
         (h) Airport advisories. once every hour
         255.4 UHF call and ask about the station

   e. Training Film.

2. VFR traffic procedures.

a. Responsibility of the pilot. provide separation, file and close the flight plan, VFR control zone - Basic cloud clearance, 3 mi, above 1,000', 5 mi vis clear of clouds

b. Operations in Control Zones.

c. Operations in Airport Traffic Areas. ground up to 2000' you need permission to enter. 2 way radio.

d. Operations in Airport Advisory Areas. (no tower) no call in needed.

e. Restricted Areas. (climb corridors) - you need permission from the using or controlling agency.

f. Special VFR in Control Zones. A.T.C. clearance required, call tower and they will get it for you. He will provide clearance no visibility stay out of clouds

3. Direct communications - controller/pilot.

a. Monitoring frequencies. VFR stay on the F.S.S. freq. R 5574
IFR stay on the assigned freq. and tell them if you change freq.

4. Position reports - contents and sequence.

a. IFR position report. made over solid ▲ or any point specified by ATC

1. identification
2. Position
3. TIME
4. altitude
5. type of flight plan. (VFR on top, ect.)
6. next point for reporting and ETA
7. and the name of the following reporting station
8 remarks.

Fort Worth R12031
Crestview at 10 5000'
EST. Hartford at 40
Cruise, over.

b. VFR position report. necessary over any thing or 1200 ft

1. identification
2. position
3 time
4. altitude
5. type of flight plan
6. Destination.

c. Change of ~~flight plan at~~ ETA TO destination by more than 30 minutes (IFR/VFR).
1. aircraft identification
2. position and time
3. type of flight plan.
4. NEW ETA and hours of fuel left.
IFR - call center
VFR - flight Service

5. Flying in a Radar Environment.

a. In radar contact. do not have to make IFR position reports. the radar man will give you altimeter settings at each previous required position reporting point.

b. Radar service terminated. you start giving normal IFR position reports

6. In-flight reports to Air Traffic Control.

a. The time and altitude passing each designated reporting point or points designated by Air Traffic Control (ATC).

b. Any unforecast weather conditions.

c. Other information relating to flight safety.

d. The time and altitude/Flight Level reaching holding fix or point to which cleared.

e. When vacating a previously assigned altitude/Flight Level for a newly assigned altitude/Flight Level.

f. When leaving any assigned holding fix or point.

g. When leaving final approach fix inbound on final approach.

h. When an approach has been missed (pilot must request specific action, i.e., another approach, clearance to alternate, etc.).

i. Corrected time when previously submitted ETA is in error in excess of 3 minutes. (between reporting points. IFR)

j. That an altitude change will be made if operating on a clearance specifying "VFR conditions on-top." (VFR, you pick your alt. even or odd +500' and tell them your alt.

k. When changing True Airspeed by more than 10 knots.

7. Air Traffic Control transfer of control procedures.

a. When told to "REPORT". any time you are told to report you tell your idnt. and position followed by a complete report.

7a1. intial contact - no report following or at a time, give ID and estimate to next IFR reporting point and altitude.

b. When told to "CONTACT". identification and position then who he replies give full IFR position report.

8. Malfunction reports.

a. When to give a report. (1) loss of ADF or VOR, (2) complete or partial loss of ILS. (3) any loss of radio comm.

b. Content of report. 1. identification
2. name equipment effect.
3. full results of the fault on the flight
4. nature and extent of assistance

9. Responsibility of Air Traffic Control to air traffic.

a. When on an IFR clearance but flying in VFR conditions or when cleared "VFR Conditions On-top."

anytime in VFR conditions (even when on an IFR flight plan) you (the pilot) must keep aircraft separation.

write down and read the clearance, you do not have to accept any clearance.

b. When IFR flight conducted in IFR conditions outside of controlled airspace.
not responsible to ATC for separation

c. When IFR flight conducted in controlled airspace under IFR conditions.
separation from all known traffic.

separation by A.T.C. { different holding location, different route, different take off time } { above 290 radar recds there is 2000' vertical separation; below 290 less than 10 minut separation there is 1000' vertical separation }

10. Air Traffic Control flight clearances.

a. Types. 3 types long or regular (short clearance)
3. amended clearance (change to intial
2. short
1. initial clearance

b. Content of INITIAL CLEARANCE

1. heading
2. clearance limit
3. route
4. altitude maintain 6000' stay there (cruise 6,000 = 0' to 6,000' no report needed to change alt.
5. remarks, special instr.

11. Altitude requirements and assignment.

a. Minimum Enroute Altitude (MEA). osbrical clearance and radio ~~clearance~~ reception alt. within 22 nat miles use candle use the NOCA altitude

HOLDING PATTERN ENTRY

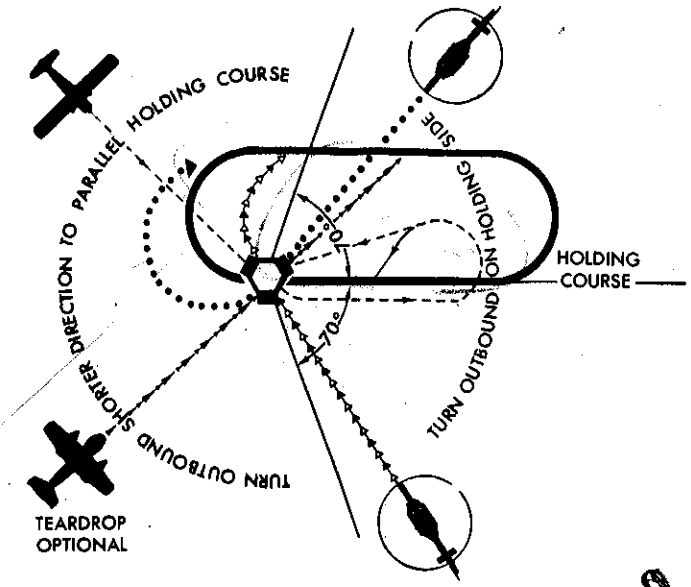
The aircraft is considered to be in the holding pattern at the time of initial passage of the holding fix. Turns during entry and while in the holding pattern will be made at the rate of 3° per second

a. Entry Turns — The aircraft heading at initial holding fix passage determines the direction of turn to enter the holding pattern.

(1) If the aircraft heading is within 70° of the inbound holding course, turn outbound in the same direction as the holding pattern to parallel the holding course (e.g., right-hand pattern, turn right to enter).

(2) If the aircraft heading is not within 70° of the inbound holding course, turn outbound in the shorter direction to parallel the holding course. If this places the aircraft on the nonholding side at completion of the outbound leg, turn toward the holding side.

(3) The teardrop entry may be used at the pilot's discretion when entering the holding pattern on a heading conveniently aligned with the teardrop course. The teardrop course is 30° or less outbound from the holding course and on the holding side.



b. Minimum Obstruction Clearance Altitude (MOCA).

MCA min. crossing alt.
MRA min section area
MAA max aircraft alt.

c. Direction of flight - altitude requirements.

0-179° use odd thousand
180-359 use even thousand

d. Altitude changes. get cleared from ATC, change as quickly as possible on heading but last 1000' is made at 500' rate of descent.

12. Holding procedures.

a. Holding clearance. Tells you to hold, gives you a circle and a location

b. Holding pattern entry(refer to page 8).

THE FOLLOWING EXAMPLES OF APPROACH CLEARANCES HAVE BEEN TAKEN FROM THE AIR CONTROLLERS MANUAL.

a. When only one approach is available of any type (i.e., VOR) controller will give following clearance:

"CLEARED FOR VOR APPROACH"

b. If more than one VOR approach is available Approach Control will designate the specific approach for which the pilot is cleared:

"CLEARED FOR VOR RUNWAY THREE SIX APPROACH"

c. When straight-in approach is authorized by Approach Control the controller will clear the pilot as follows:

"CLEARED FOR STRAIGHT-IN VOR RUNWAY THREE SIX APPROACH"

d. When being radar vectored by Approach Control the controller will give the following clearance:

"VECTOR TO CAIRNS VOR THREE FIVE ZERO RADIAL FOR A STRAIGHT-IN APPROACH"

e. When cleared for an approach of the pilot's choice or when only one approach is available the controller will give the following clearance:

"CLEARED FOR APPROACH"

NOTE: There are many variations to the above clearances. These clearances have been reproduced to acquaint the student with the fact that the controller will always give the pilot specific approach instructions. The pilot must be able to understand and interpret these instructions.

13. Approach Control. (Refer to Letter of Agreement - Page 35 of this handout)

a. Jurisdiction.

b. Approach clearances. (See examples of approach clearances on Page 10)

c. Weather advisories. and 3 mi visibl when ceiling is < 1000'

d. Runway Visual Range (RVR).

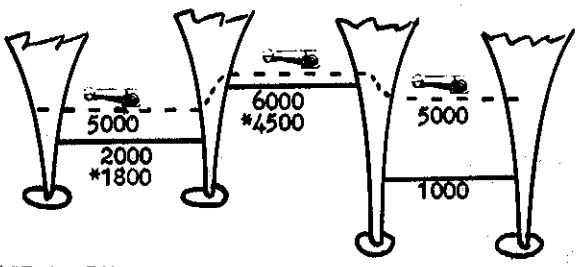
e. Missed approach.

14. Two-way radio communications failure.

a. VFR conditions. land as soon as practical.

b. IFR conditions - route to fly. continue to destination by your flight plan and do not hold

c. IFR conditions - altitude to fly.

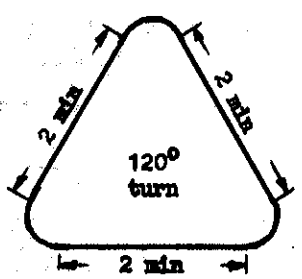


MAINTAIN LAST ASSIGNED ALTITUDE OR MEA - WHICHEVER IS HIGHER

d. IFR conditions - climb.

e. IFR conditions - terminal area.

15. Emergency procedure - loss of communications and navigation equipment.



RADIO RECEIVER INOPERATIVE - LEFT TURNS

RADIO RECEIVER OPERATING ONLY - RIGHT TURNS

16. Practical Exercise.

(NOTES)

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PERFORMANCE CHECK

AIR TRAFFIC CONTROL

(Period one of seven periods)

1. Write the definition of Air Traffic. aircraft operating in the air and on the runways.

2. Write the definition of Air Traffic Control. the agency that helps set up a fast and safe flow of air traffic.

3. List two of the services provided by Air Traffic Control (ATC).
   a. spacing and operation (flight information)
   b. search and rescue (collision)

4. Name two of the agencies of Air Traffic Control.
   a. tower F.S.S.
   b. approach control, aircraft traffic control center

5. List two of the services provided by Flight Service Stations (FSS).
   a. files flight plans for your preflight briefing
   b. notams, weather reports at 15, closes flight plan

(Period two of seven periods)

1. While flying in VFR flight conditions on an IFR flight plan in controlled airspace, who is responsible for traffic separation? the pilot

2. List the three requirements for Special VFR flights in a Control Zone.
   a. ATC clearance
   b. stay out of clouds
   c. helicopter, no min. visibl (fixed wing - 1 mi.)

3. When is the pilot required to monitor an enroute control communications frequency on a VFR cross country flight? at all times

4. List the contents of a complete IFR position report, in the proper sequence.

a. identification.
b. position.
c. time.
d. altitude.
e. ETA of next station.
f. name of following point.
g. remarks.

5. When flying on an IFR flight in a radar environment and the controller reports to the pilot that "radar service is terminated", what action is required by the pilot?

position reports at the following mandatory reporting points

6. List eleven in-flight reports that shall be made to Air Traffic Control.

a. _____.
b. _____.
c. _____.
d. _____.
e. _____.
f. _____.
g. _____.
h. _____.
i. _____.
j. _____.
k. _____.

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(Period three of seven periods)

1. What procedures should be used on an IFR flight, when told by the controller, to "contact" the Air Route Traffic Control Center (ARTCC) over a noncompulsory reporting point?

_____.
_____.
_____.

2. What would the initial call-up consist of if told to "report" over a non-compulsory reporting point? _____

_____.

3. List two of the three instances when a malfunction report should be made to Air Traffic Control.

a. _____.

b. _____.

4. Who is responsible for traffic separation while flying in IFR conditions on an IFR flight plan in noncontrolled airspace? _____

_____.

5. Under what circumstances might an IFR clearance assign an altitude of "VFR on-top" rather than a specific altitude? _____

_____.

6. What is the vertical separation used by Air Traffic Control for IFR traffic in controlled airspace, below Flight Level 290? _____feet.

7. Name the three types of Air Traffic Control clearances.

a. _____.

b. _____.

c. _____.

8. Must a pilot accept an IFR clearance once he has written it down and read it back to the controller? _____. (Yes/No)

(Period four of seven periods)

1. The Minimum Enroute Altitude (MEA) indicated on FLIP Low Altitude Enroute Charts guarantees the pilot obstruction clearance and _____.

2. When may the Minimum Obstruction Clearance Altitude (MOCA) be used as the Minimum Enroute Altitude (MEA)? _____.

3. The aviator must select his IFR altitude in accordance with the Minimum Enroute Altitudes, weather, and _____.

4. When changing altitude the aviator flying IFR should climb or descend at what rate until within 1000 feet of his new altitude? _____ _____. After arriving within 1000 feet of his new altitude the aviator should climb or descend at what rate?

_____.

5. The standard holding pattern consists of a racetrack pattern with _____ (right/left) hand turns and timing of the inbound leg, below 14,000 feet, is _____ minute(s).

6. The five items contained in a holding clearance are:

   a. _____.

   b. _____.

   c. _____.

   d. _____.

   e. _____.

7. Approach Control areas are established by a_____.

8. Name three instrument approach procedures.

   a. _____.

   b. _____.

   c. _____.

9. The agency of Air Traffic Control which would normally control enroute IFR traffic would be_____.

10. When cleared for "an approach" by Approach Control the aviator should_____

    _____.

11. When cleared for a straight-in approach by Approach Control must the aviator fly over the navaid, or may he proceed direct to the end of the active runway? _____.

12. What does it mean when you receive an IFR clearance from the controller to "cruise 5000"? _____

    _____

    _____.

13. Weather advisories must be given by Approach Control to the aviator flying IFR when the weather at the destination airfield reaches what minimums?

    _____.

14. What report shall the pilot make to Approach Control when conducting a missed approach?_____

    _____.

(Period five of seven periods)

1. What procedures should the aviator follow if communications failure is experienced enroute on an IFR flight, in instrument flight conditions, without holding instructions?_____

   _____

   _____.

2. If holding at the destination airport, at an outer fix, with an Expected Approach Clearance (EAC) time of 05, and communications failure is experienced prior to 05, when would you depart the fix?_____

_____.

3. You have experienced communications failure enroute and arrive at the destination radio facility five minutes prior to your ETA. Where should you hold and how would you determine the direction of turn in the holding pattern? _____

_____.

4. If, during an instrument approach for which you have been cleared by Approach Control, you experience communications failure what action should be taken? _____

_____.

5. You are on a radar vector on an IFR departure and are being vectored off your desired course by Departure Control when you experience communications failure; what action should you take?_____

_____.

6. You lose communications while on final approach and are forced to conduct a missed approach. What should you do? _____

_____

_____.

7. While flying an IFR flight, under instrument flight conditions, you experience complete loss of all communications and navigation radio equipment. What should you do? _____

_____

_____.

(NOTES)

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PRACTICAL EXERCISE

AIR TRAFFIC CONTROL

ANSWER THE FOLLOWING QUESTIONS AS INDICATED. ALL QUESTIONS PERTAIN TO IFR FLIGHT RULES UNLESS SPECIFIED OTHERWISE. CONSULT DOD FLIP AS NECESSARY.

1. Air Traffic Control (ATC) is a service which is concerned exclusively with the separation of air traffic on airways and issuing flight information to other air traffic on request. (True/False)

2. Select the agencies which have the authority to ORIGINATE IFR air traffic flight clearances from the following:

   a. Air Route Traffic Control Center (ARTCC)

   b. Approach Control

   c. Flight Service Station (FSS)

   d. Control Tower

3. In giving a Special VFR clearance to an aircraft, the control tower operator must guarantee that IFR separation standards will be used unless the aircraft can be visually separated from other aircraft by the control tower operator, or the pilot can maintain his own separation through visual contact with other aircraft. (True/False)

4. In a "VFR-on-top" position report, the altitude need not be stated. (True/False)

5. What sequence should be used in a complete IFR position report?

   a. Position, time, altitude, remarks.

   b. Position, time, altitude, IFR flight plan, ETA next reporting point, destination.

   c. Identification, position, time, altitude, ETA next reporting point, name only next reporting point, remarks.

   d. Identification, position, time, altitude, ETA next reporting point, destination, remarks.

6. The minimum vertical IFR separation between aircraft traveling on the same airway (below FL 290) is

   a. 1000 feet.

   b. 1200 feet.

   c. 1500 feet.

   d. 2000 feet.

7. IFR separation standards for aircraft flying IFR in controlled airspace while under radar control are less than those required for the same aircraft if operating IFR and not under radar control. (True/False)

8. If the aviator receives an IFR altitude assignment to "cruise 5000" from Air Traffic Control he knows that he is cleared to do which of the following?

   a. He may climb to and descend from 5000 feet at his discretion.

   b. He must maintain 5000 feet but will receive further clearance immediately.

   c. He must maintain 5000 feet but may increase or decrease his TAS by more than 10 knots at his discretion.

   d. He must maintain 5000 feet or above until reaching his destination.

9. In accordance with the Cruising Altitude Rule for IFR flight, Air Traffic Control is required to assign an EVEN cardinal altitude to all IFR air traffic cleared to fly in a westerly direction. (True/False)

10. In direct IFR flights off airways over mountainous terrain, it is the responsibility of the pilot to select a MEA sufficiently high to provide which of the following clearances?

    a. 1000 feet above the highest obstacle within 4 NM of the track.

    b. 1000 feet above the highest obstacle within 22 NM of the track.

    c. 2000 feet above the highest obstacle within 4 NM of the track.

    d. 2000 feet above the highest obstacle within 22 NM of the track.

11. It is possible to substitute the Minimum Obstruction Clearance Altitude for the Minimum Enroute Altitude when within 22 NM of the navigation facility.

12. If Air Traffic Control designates a fix, which is short of the destination, as the clearance limit, holding instructions must be included in the clearance. (True/False)

13. Which of the following is not a part of a holding clearance?

    a. Direction of holding from the fix.

    b. Expect further clearance or expect approach clearance time.

    c. Radial, course, bearing or airway on which to hold.

    d. Maximum Indicated Airspeed for holding.

14. If you arrive at a clearance limit without further clearance instructions (NO RADIO FAILURE INVOLVED) you should hold in a standard holding pattern, right hand turns, on the enroute course. (True/False)

15. You arrive at your destination, which is also your clearance limit, on an IFR flight. Because of the volume of communications going on, you are unable to get further clearance for an instrument approach from the controller. What action are you required to take in accordance with standard ATC procedures?

a. start an instrument approach immediately if you arrive after your filed ETA.

(b) do not make an approach but hold on the airway or radial on which you are approaching the destination navaid and attempt to contact the controller.

c. start an instrument approach if you can determine from transmissions made by the controller that there are no aircraft executing approaches when you arrive.

d. hold on any convenient radial and attempt to contact the controller.

16. What action should the aviator take when the controller informs him, "in radar contact", while flying IFR in a radar environment?

a. question the clearance since this is not a standard procedure.

(b) cease making position reports over compulsory reporting points.

c. continue making normal position reports and the controller will tell the aviator when he is within 3 nm of another aircraft.

d. make position reports only if ETA over compulsory reporting points is in error by more than 3 minutes.

17. Approach Control is a service established to control IFR flights arriving at, or departing from an airport by means of direct and instantaneous communications between Approach Control personnel and all aircraft operating under their direct control. (True/False)

18. Approach Control operates under the jurisdiction of an Air Route Traffic Control Center (ARTCC). It has jurisdiction over both civil and military aircraft and is established by which of the following methods?

a. executive order of the President of the United States.

b. the administrator, Federal Aviation Administration, Washington, D. C.

(c) a letter of agreement between the Approach Control and the Air Route Traffic Control Center.

d. Executive order of the governor of the state in which the Approach Control area of responsibility is located.

19. In situations where the Approach Control services are provided by the Air Route Traffic Control Center (ARTCC), the approach clearance may be relayed to the aviator through a Control Tower or Flight Service Station (FSS). (True/False)

20. When cleared for an approach while in a holding pattern on the approach course, you are permitted to intercept the final approach course inbound from the holding pattern without making the published procedure turn. (True/False)

21. Approach Control is required to issue weather information at any time the existing weather is below VFR minimums. (True/False)

22. You are required to report over the approach fix inbound on final approach. Where should this report be given when making an ILS approach?

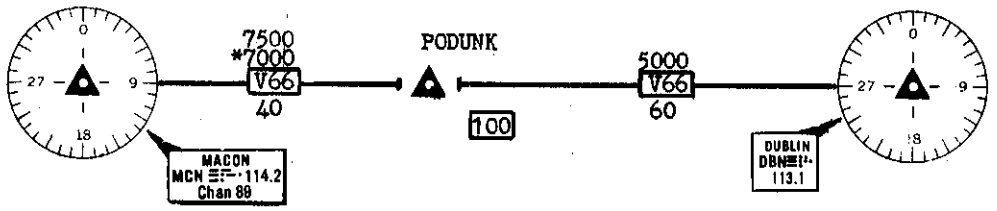
a. over the middle marker

(b.) over the outer marker

c. over the middle compass locator

d. out of procedure turn

23. During a westbound flight on V66, with an assigned altitude of 6000 feet, communications are lost. Using the figure below determine the altitude to which you should climb upon reaching Podunk Intersection. 7500 feet.



24. State the general rule to be followed in event of two-way radio communications failure.

use last assigned alt. or MEA. (the highest) follow the holding instructions given, use last cleared point and flight plan.

25. How many minutes (maximum) is an aviator allowed to be late in arriving at a compulsory reporting point <u>without</u> advising Air Traffic Control (ATC) of a revised ETA?

(a.) 3

b. 4

c. 5

d. 10

26. If you are on an IFR flight clearance flying VFR-on-top on a magnetic course of 110° and the cloud tops are 3800 feet MSL, what minimum altitude should you maintain? 4800 5500

a. 5000

(b.) 5500

c. 6000

d. 6500

27. When cleared for an approach from an outer fix, you are expected to proceed to the approach fix and turn outbound for a procedure turn, unless you receive a radar vector to final approach or are cleared for a straight-in by the controller. (True/False)

28. If an initial Air Traffic Control clearance gave an enroute fix as the clearance limit without holding instructions, and communications failure occurs prior to reaching this fix, upon reaching the clearance limit, you should continue on to airport and make approach at ETA or ATA which ever is later.

29. During a climb to 7000 feet on an IFR clearance, what rate of climb should be used upon reaching 6000 feet?

c. 500 feet per minute

b. 600 feet per minute

c. 800 feet per minute

d. as fast as practicable

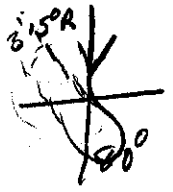
30. You have been cleared to hold on the 315° radial of a VOR (NON-standard pattern). You are approaching the VOR on a heading of 180° (no wind). Upon arrival at the VOR you should make which of the following turns?

a. right to heading 315°

b. right to heading 135°

c. left to heading 315°

d. left to heading 135°



31. While under radar approach control (after departing an outer fix) communications failure occurs, you should continue, then approach.

32. If communications failure occurs just prior to missed approach, upon conducting the missed approach, you should

a. return to the approach fix and commence another approach.

b. proceed directly to the alternate and stay outside of controlled airspace since you will not have an ATC clearance.

c. proceed to your alternate via the most direct airway route and fly at the Minimum Enroute Altitude (MEA).

d. return to the approach fix and hold for 30 minutes, then commence another approach.

33. A holding clearance should include "Expect Further Clearance at (time)" or "Expect Approach Clearance at (time)." (True/False)

34. While flying at an enroute altitude of 5000 feet you are directed by the ARTCC controller to change radio frequency over X-ray intersection and "contact" the center. If X-ray intersection is shown as a noncompulsory reporting point on the enroute chart your initial callup should be: "Jacksonville Center this is Army 12345,

a. X-ray, over."

b. X-ray at 15, 5000, over."

c. X-ray at 15, 5000, estimating Romeo at 45, Tango, over."

(d) estimating Romeo at 45, 5000, over."

35. A report must be made if the ETA at the destination changes by more than 30 minutes.

36. Communications are lost during an IFR flight. With no holding instructions included in the initial clearance, the pilot would continue to his destination and do which of the following?

a. Fly an emergency pattern for radar pickup over the VOR.

b. Hold at the VOR until 30 minutes after his ETA to his destination.

c. Hold on the airway radial coming into the VOR until his ETA, or execute the approach at the ATA, whichever is later.

(d) Hold on the approach radial for the VOR approach, until his ETA, or execute the approach at the ATA, whichever is later.

37. In order to file an IFR flight plan while airborne on a VFR flight an Army aviator should use which of the following procedures?

a. Contact the appropriate ARTCC as listed on the enroute chart.

b. Contact the appropriate ARTCC on frequency 344.6 MHz.

c. Request permission to contact the ARTCC through the nearest FSS.

(d.) Contact the nearest FSS and file his IFR flight plan.

38. You are instructed to "report" over Bravo intersection to Atlanta Air Route Traffic Control Center. Your initial call should be: "Atlanta Center this is Army 34257,

a. over."

b. Bravo, over."

c. IFR flight plan, Bravo, over."

(d.) Bravo 46, 7000, Instrument Flight Plan, Charlie 07, Delta, over."

39. List in the proper sequence the information contained in a VFR position report. identification, position, time, altitude, VFR flight plans, destination.

40. An IFR flight operating on a controlled VOR airway should always be flown:

a. Along the center line of the airway.

b. To the right of the center line of the airway.

c. Along the center line of the airway unless otherwise authorized by Air Traffic Control.

d. To the right of the center line of the airway unless otherwise authorized by Air Traffic Control.

41. The pilot of a UH-1 will make a VFR flight from Alfa direct to Zulu. The magnetic course from Alfa to Zulu is 005°, and the magnetic variation is 10° east. A solid overcast with bases at 5700 feet MSL is reported to exist along the entire route. Based on this information, the highest altitude at which the pilot may fly is:

a. 5500 feet.

b. 4500 feet.

c. 4000 feet.

d. 3500 feet.

42. Where the Administrator has not established a minimum IFR altitude over non-mountainous terrain, the minimum safe altitude for IFR flights is:

a. 700 feet above the surface, if operating outside control zones and control areas.

b. 1000 feet above the surface, if operating outside control zones and control areas.

c. 1000 feet above the highest obstacle within a horizontal radius of 2000 feet from the aircraft.

d. 1000 feet above the highest obstacle within a horizontal distance of 4 nm from the center line of the course to be flown.

43. The forecast weather for U.S. Army aerodromes A, B, C, and D, below, all having nonprecision approaches available, is as follows:

AERODROME	CEILING	VISIBILITY
A	600 feet	2 miles
B	800 feet	2 miles
C	900 feet	1 mile
D	900 feet	¼ mile

Which of the above listed aerodromes may an Army helicopter pilot, with a standard instrument rating, select for an alternate on an IFR flight?

a. A or B.
b. B or C.
c. B, C, or D.
d. A, B, or C.

Use the Enroute Low Altitude Chart on page 29 and the Chart Legend on page 30 to answer the following questions. Questions are based on an IFR flight from De Kalb-Peachtree Airport (located southwest of Norcross VOR) to Morris AAF (located west of Rex VOR) via the following route: Direct to Norcross VOR, V20N-97E to Bobby Jones Intersection, Direct to Morris AAF. Maintain 5000 feet MSL.

44. Checking over your route of flight you would expect to make how many position reports? 2. Name the check points over which you would expect to report:
Norcross VOR Bobby Jones intersection

45. Your ATC clearance reads in part: "Contact Atlanta Center on 360.6 over Tucker Intersection". Is the following callup correct?

"ATLANTA CENTER ARMY 12345, ESTIMATING BOBBY JONES AT 05, 5000, OVER." (Yes/No)

46. Which VOR stations should be used to fix Tucker Intersection? REX VOR, Atlanta VOR.

Approaching Bobby Jones Intersection on V20N-97E you receive the following amended clearance from ATC: "ATC clears Army 12345 to hold west of Bobby Jones Intersection on Victor 18, expect further clearance at 20."

47. From the holding clearance above you know that the holding pattern will be ____. (Standard/Nonstandard)

48. Using standard entry procedures for holding you should turn to a heading of 237 degrees upon passing Bobby Jones Intersection. Your inbound heading when inbound in the holding pattern will be 87 degrees.

49. If you should experience communications failure while in the holding pattern you would depart the holding fix at what time? 20 past the hour.

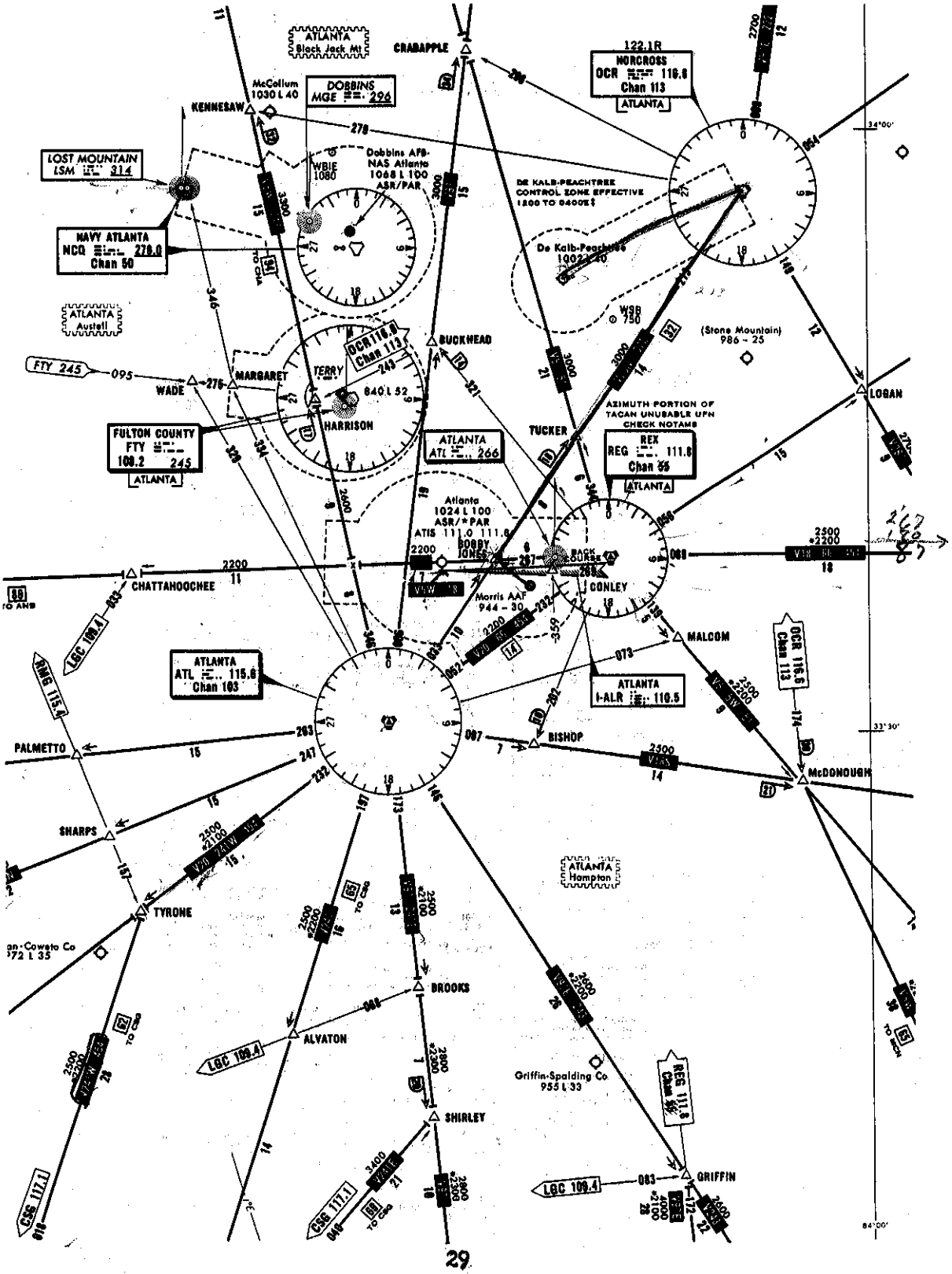
50. Morris AAF is printed in Brown indicating no instrument approach procedure. Assume you had planned on a VFR approach to Morris AAF but while holding at Bobby Jones, while flying in instrument flight conditions, you experience communications failure. You must now proceed to your alternate airport, which is Dobbins AFB (located north of Atlanta VOR)

What route should you fly from Bobby Jones to Dobbins? V5 V-18 and V97.

What altitude or altitudes should you use? 2200 and 3300.

What time should you depart the holding fix? 20 past the hour.

What is the identification and frequency of the NDB located about 5 NM northwest of Dobbins? MCE 396 kHz.


ATLANTA
Black Jack Mt
CRABAPPLE
122.1R
NORCROSS
OCR 116.8
Chan 113
ATLANTA
McCollum
1030 L 40
DOBBINS
MGE 294
KENNESAW
278
LOST MOUNTAIN
LSM 314
WBIE
1080
Dobbins AFB-
NAS Atlanta
1068 L 100
ASR/PAR
DE KALB-PEACHTREE
CONTROL ZONE EFFECTIVE
1200 TO 0400Z‡
De Kalb-Peachtree
1002 L 40
NAVY ATLANTA
NCQ 278.0
Chan 50
WBB
750
(Stone Mountain)
986 – 25
ATLANTA
Austell
FTY 245
095
WADE
276
MARGARET
TERRY
640 L 52
OCR 116.8
Chan 113
BUCKHEAD
HARRISON
FULTON COUNTY
FTY
108.2 245
ATLANTA
ATLANTA
ATL 266
TUCKER
AZIMUTH PORTION OF
TACAN UNUSABLE UPN
CHECK NOTAMS
REX
REG 111.8
Chan 55
ATLANTA
LOGAN
Atlanta
1024 L 100
ASR/*PAR
ATIS 111.0 111.8
2200
BOBBY
JONES
BACK
CORSE
CHATTAHOOCHEE
Morris AAF
944 – 30
CONLEY
MALCOM
ATLANTA
ATL 115.6
Chan 103
LGC 109.4
RMG 115.2
ATLANTA
I-ALR 110.5
OCR 116.8
Chan 113
PALMETTO
BISHOP
McDONOUGH
SHARPS
TYRONE
ATLANTA
Hampton
BROOKS
ALVATON
LGC 109.4
SHIRLEY
Griffin-Spalding Co
955 L 33
REG 111.8
Chan 55
GRIFFIN
LGC 109.4
CSG 117.1
CSG 117.1
34°00'
33°30'
84°00'

RADIO AIDS TO NAVIGATION AND COMMUNICATION BOXES

RADIO AIDS TO NAVIGATION

VHF/UHF Aids are depicted in BLUE
LF/MF Aids are depicted in BROWN

COMPASS ROSE Oriented to Magnetic North

VOR TACAN VORTAC

LF/MF Range with simultaneous Voice Signal Capability (Solid tip in "H" Quadrant)

LF/MF Range without simultaneous Voice Signal Capability

LF/MF Range Course Feathered side indicates "A" Quadrant

LF/MF Non-directional Radiobeacon or Marine Radiobeacon

UHF Non-directional Radiobeacon

Compass Locator Beacon

Consolan Station

Marker Beacon
Fan (FM) Bone (BM)

ILS Localizer Course with ATC Function. Feathered side indicates Blue Sector

RADIO AIDS TO NAVIGATION DATA BOXES

Abnormal Status Underprint for Affected Data, e.g., TO BE CMSN, SHUT DOWN, MAY BE CMSN, etc.

DME SHUT DOWN
DME Chan 88
NAME
NAM 000.0 (T)
MN 000
VOR with TACAN compatible DME

Combined VHF/UHF and LF/MF data

(T) Frequency protection
Usable range at 12,000'-25 NM

* Operates less than continuous or On-Request
NAME
NAM *000

Underline indicates No Voice Transmitted on this frequency

TACAN channels are without voice but are not underlined

Norfolk Weather Radio — U.S. Weather Station with Voice Communication

IDENT 000 — Commercial Broadcast Station

AIR/GROUND COMMUNICATION BOXES

Shadow box indicates Standard FSS A/G Voice Communications freqs 122.2T, 122.1R, 122.7, 123.6 and 200.4 are available at all altitudes without terrain interference.

Plain box, with freq/s, indicates all Standard FSS freqs are not available, or are not available at all altitudes, due to terrain interference.

126.7 — This is the best freq to use in the immediate vicinity of this site insuring reception at low altitudes. Other freqs are available from the Controlling FSS named, however, altitude may determine their reception.
WASHINGTON
Controlling FSS name

~~126.7~~ 379T — All Standard FSS freqs except the crossed out 126.7 are available at this location. 379T is other FSS frequency available.

Plain box, without frequencies, indicates no Standard FSS frequencies available.

Flight Service Station (FSS)
Remote Communications Outlet (RCO)
Limited Remote Communications Outlet (LRCO)

THE U.S. FEDERAL GOVERNMENT DISCLAIMS RESPONSIBILITY FOR NON-FEDERAL NAVIGATIONAL FACILITIES

AIR TRAFFIC SERVICES AND AIRSPACE INFORMATION

AIRWAY AND ROUTE DATA

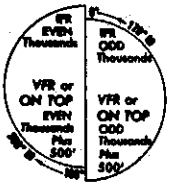
VHF/UHF Data is depicted in BLUE; LF/MF depicted in BROWN

V8 — VOR Airway and Identification
G3 — LF/MF Airway and Identification
R53 — Uncontrolled LF/MF Airway
55-67V — VHF/UHF Oceanic Route Identification
ALFA ROUTE — LF/MF Oceanic Route Identification
Oceanic Route (Controlled)
Oceanic Route (Uncontrolled)
Military Route
Military Advisory Route
Substitute Route Structure (see NOTAMs for facility outages)
Unusable or Closed Segment

NME 060.0
Facility Locator used with Radial Line in the formation of a Reporting Point

AME 000
Facility Locator used with Bearing Line in the formation of a Reporting Point

CRUISING ALTITUDES - U. S.



IFR-Outside controlled airspace
IFR-Within controlled airspace
(May be modified by ATC)
VFR at or above 3000' AGL

—036— Radial Outbound from a UHF/VHF Radio Aid
—036— Bearing Inbound to a LF/MF Radio Aid
123 / (123) Total Mileage between Compulsory Reporting Points and/or Radio Aids
23 / 23 Mileage between other Reporting Points, Radio Aids, and/or Mileage Breakdown
42 / 26 VOR Changeover Point Giving mileage to Radio Aids (Not shown at mid-point locations)
x x Mileage Breakdown (All mileages are Nautical to the nearest full mile)
Denotes DME fix (Distance same as route mileage)
16 Denotes DME fix (Encircled mileage shown when not otherwise-obvious)
MAA-15500 MAA (Maximum Authorized Altitude)
3500 / 3500 MEA (Minimum Enroute Altitude)
*3000 / *3000 MOCA (Minimum Obstruction Clearance Altitude)
EVEN Direction of Flight Indicator
MEA, MAA and/or MOCA Change at other than Radio Aids to Navigation
MRA (Minimum Reception Altitude)
MCA (Minimum Crossing Altitude)

ALL MILEAGES ARE NAUTICAL EXCEPT AS NOTED
ALL RADIALS AND BEARINGS ARE MAGNETIC
ALL ALTITUDES ARE MSL EXCEPT AS NOTED
ALL TIME IS GREENWICH MEAN (STANDARD) TIME (GMT)
ALL STATES ON DAYLIGHT SAVING TIME EXCEPT KENTUCKY
‡ DURING PERIODS OF DAYLIGHT SAVING TIME (DST), EFFECTIVE HOURS WILL BE ONE HOUR EARLIER THAN SHOWN

REPORTING POINTS

Compulsory Reporting Point
Non-Compulsory Reporting Point
Offset Arrows Indicate Facility Forming a Reporting Point. Toward LF/MF, Away from VHF/UHF

BOUNDARIES

Altimeter Setting Change
Altimeter Setting Change when not otherwise defined
Air Route Traffic Control Center (ARTCC)
NAME Name ARTCC Remoted Sites
Flight Information Region (FIR)
Air Defense Identification Zone (ADIZ)
Combined FIR and ADIZ
Oceanic Control Area (CTA)
Control Zone
Intnl Boundary (Omitted when coincident with ARTCC or FIR)
Area of Enlargement (Contains only data for through flights). See Area Charts for complete data
Official Time Zone

MISCELLANEOUS

7°E Isogonic Line and Value

Within the U.S., non-federal owned/operated radio aids to navigation are annotated to indicate whether operated by State, City, County, Private, etc.

DEPARTMENT OF ROTARY WING TRAINING
UNITED STATES ARMY AVIATION SCHOOL
FORT RUCKER, ALABAMA

File No. 3817-7(U)

PERFORMANCE CHECK KEY

AIR TRAFFIC CONTROL

(Period one of seven periods)

1. Aircraft operating in the air or on an airport surface, exclusive of loading ramps and parking areas.

2. An agency that provides services to promote the safe and expeditious flow of air traffic.

3. Any two of the following: a. Prevent collisions, b. Expedite flow of traffic, c. Provide flight information, d. Aid in search and rescue.

4. Any two of the following: a. Control tower, b. Approach control, c. Air Route Traffic Control Center, d. Flight Service Station.

5. Any two of the following: a. Preflight briefing, b. Filing/Closing flight plans, c. Weather advisories, d. NOTAMS, e. Weather observations, f. Scheduled weather broadcasts, g. Position reports, h. Airport advisories.

(Period two of seven periods)

1. The pilot in command.

2. a. ATC clearance, b. Clear of clouds, c. No minimum visibility helicopters and 1 mile visibility fixed wing.

3. At all times.

4. a. Identification, b. Position, c. Time, d. Altitude, e. ETA next reporting point, f. Name only next reporting point, g. Remarks.

5. The pilot will resume normal IFR flight and resume position reporting.

6. a. Designated reporting points, b. Unforecast weather conditions encountered, c. Other information relating to flight safety, d. The time and altitude/FL reaching holding fix or point to which cleared, e. When vacating any assigned altitude/FL for a newly assigned altitude/ FL, f. When leaving an assigned holding fix or point, g. When leaving final approach fix on final approach, h. When an approach has been missed (with intentions), i. When ETA previously submitted is in error in excess of 3 minutes, j. That an altitude change will be made if operating on a clearance specifying "VFR conditions-on-top", k. When changing TAS by more than 10 knots.

(Period three of seven periods)

1. Only one transmittion required giving identification, ETA next reporting point and altitude.

2. Identification and position only. After acknowledgement by ATC then give complete IFR position report.

3. Any two of the following: a. Loss of VOR or ADF, b. Complete or partial loss of ILS capability, c. Impairment of air to ground communications capability.

4. The pilot in command. ATC guarantees separation between known traffic operating IFR in controlled airspace only.

5. When requested by the pilot.

6. 1000 feet.

7. a. Initial, b. Short, c. Amended.

8. No. He can refuse the clearance any time before be becomes airborne.

(Period four of seven periods)

1. Radio (navigation) reception.

2. When within 22 NM of the navigation facility.

3. IFR cruising altitude rule.

4. As fast as practicable; 500 feet per minute.

5. Right; 1 minute.

6. a. Direction of holding from fix, b. Name of fix, c. Course, bearing, radial or airway on which to hold, d. EFC or EAC time, e. Direction of turn if nonstandard.

7. Letter of agreement between the ARTCC and the Approach Control.

8. Any three of the following: a. ILS, b. Radar, c. VOR, d. NDB, e. TACAN, f. LOC, g. LDA, h. VORTAC, i. VOR/DME.

9. an Air Route Traffic Control Center.

10. Execute any published approach.

11. He must go to the navaid for the instrument approach.

12. Climb to or descent from the assigned altitude may be made at the pilots discretion.

13. ~~Circling approach minimums or below.~~ if the ceiling < 1000 or visb < 3 mi

14. Time of the missed approach and his intentions.

(Period five of seven periods)

1. Proceed to destination and execute an instrument approach at ETA or ATA whichever is later.

2. Depart the fix so that the approach can be started at 05.

3. Hold on the approach course and holding turns will be on the same side as the published procedure turn.

4. Continue the approach.

5. Continue to the fix, route, or airway specified in the vector clearance.

6. Proceed to alternate via most direct airway route flying at MEA.
7. Fly a left-hand triangular pattern, 2 minute legs.

DEPARTMENT OF FIXED WING/ROTARY WING TRAINING
UNITED STATES ARMY AVIATION SCHOOL
FORT RUCKER, ALABAMA

File No. 3817-7(U)

PRACTICAL EXERCISE KEY

AIR TRAFFIC CONTROL

(Periods six and seven of seven periods)

1. False. Air Traffic Control provides services to both IFR and VFR traffic through the ARTCC, Approach Control, Control tower, or Flight Service Station.
2. Both a and b.
3. True.
4. False. Position reports always start out with position, time, and altitude.
5. c.
6. a.
7. True.
8. a.
9. False. ATC assigns altitudes as necessary to keep traffic moving.
10. d.
11. 22.
12. False.
13. d.
14. True.
15. b.
16. b. Controller will give altimeter setting over each reporting point.
17. True.
18. c.
19. True.
20. True.
21. ~~False~~ True
22. b.
23. 7500 feet.

24. If flying in VFR flight conditions, land as soon as practicable. If flying in IFR flight conditions proceed via the last acknowledged flight route or flight plan route. If holding depart fix at EFC time, or if holding with EAC time leave fix so that approach will be started at EAC time. Start instrument approach at destination at ETA or ATA whichever is later.

25. a.

26. b. When VFR conditions-on-top use VFR cruising altitude rule.

27. True.

28. Proceed to destination and commence approach at ETA or ATA whichever is later.

29. a.

30. c.

31. Continue the approach.

32. c. Notice that you should fly the most direct AIRWAY ROUTE.

33. True.

34. d.

35. 30.

36. d.

37. d.

38. b.

39. Identification, position, time, altitude, VFR flight plan, destination.

40. c. ATC can authorize an aviator to fly on an airway off the center line.

41. d. Cruising altitude rule is based on magnetic course.

42. d.

43. b.

44. 2; Norcross VOR and Bobby Jones Intersection.

45. Yes.

46. Atlanta VOR and Rex VOR. Small arrows indicate radials to be used for fix.

47. Standard. If nonstandard controller will say nonstandard, left turns.

48. 237 degrees; 087 degrees. Teardrop entry most practical for this entry.

49. 20 past the hour. This is the EFC time given by the controller.

50. Route - V5W-18 and V97.
Altitudes - 2200 feet Bobby Jones to intersection V97 and then 3000 feet to Dobbins.
Depart the fix at 20 past the hour.
NDB identification - MGE; Frequency - 296 kHz.

DEPARTMENT OF ROTARY WING TRAINING
UNITED STATES ARMY AVIATION SCHOOL
FORT RUCKER, ALABAMA

File No. 3717-7(U)

STUDENT HANDOUT NO. 1

AIR TRAFFIC CONTROL

THE FOLLOWING EXERPTS ARE TAKEN FROM THE JACKSONVILLE CENTER/UNITED STATES ARMY AVIATION CENTER LETTER OF AGREEMENT DATED JULY 7, 1964.

JACKSONVILLE CENTER AND UNITED STATES ARMY AVIATION CENTER, FORT RUCKER ALABAMA LETTER OF AGREEMENT

SUBJECT: Approach Control

EFFECTIVE: July 7, 1964

1. PURPOSE

The following agreement between the Jacksonville Center and the United States Army Aviation Center, Fort Rucker, Alabama covers approach control service (and tower en route control service) for Dothan Municipal Airport, Napier Field, Cairns AAF, Hanchey AHP, Lowe AAF and Shell AAF. This agreement is supplementary to the procedures contained in Handbook AT P 7110.1A.

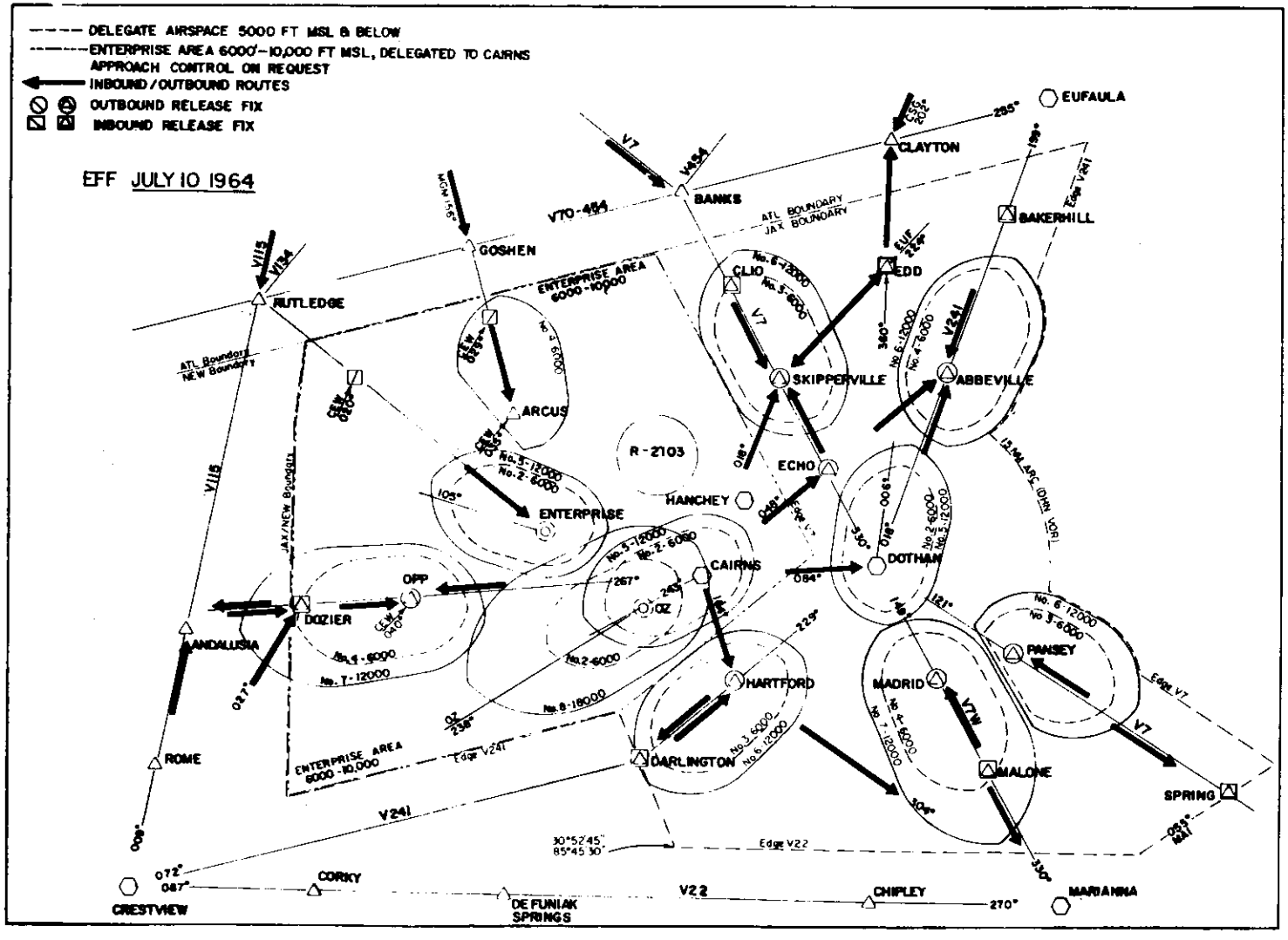
This agreement cancels and supersedes the Jacksonville Center/United States Army Aviation Center, Fort Rucker, Alabama Letter of Agreement dated January 10, 1962, and all amendments thereto.

2. AIRSPACE UNDER APPROACH CONTROL JURISDICTION

a. Cairns Approach Control shall have jurisdiction of all controlled airspace at 5000 feet MSL and below within the area depicted in Annex 1. (Page 37 of this Student Handout)

b. ENTERPRISE AREA

That airspace above 5000 feet MSL up to and including 10,000 feet MSL, within the boundaries as depicted on Annex 1, which is designated as "Enterprise Area", may be released to Cairns Approach Control when terminal traffic conditions require its use. The Cairns Approach Control Watch Supervisor shall coordinate all requests for use of the "Enterprise Area" with Jacksonville Center prior to proposed usage. Cairns Approach Control shall return control of the "Enterprise Area" to the Jacksonville Center when its use is no longer required. This may be on a shift-to-shift basis or for shorter periods as required.


DELEGATE AIRSPACE 5000 FT MSL & BELOW
ENTERPRISE AREA 6000'-10,000 FT MSL, DELEGATED TO CAIRNS APPROACH CONTROL ON REQUEST
INBOUND/OUTBOUND ROUTES
OUTBOUND RELEASE FIX
INBOUND RELEASE FIX
EFF JULY 10 1964
EUFAULA
CLAYTON
BANKS
V7
V454
V10-484
ATL BOUNDARY
JAX BOUNDARY
BAKERHILL
GOSHEN
V115
V134
RUTLEDGE
ENTERPRISE AREA 6000-10000
CLIO
EDD
SKIPPERVILLE
ABBEVILLE
V241
ATL Boundary NEW Boundary
ARCUS
R-2103
ECHO
HANCHEY
ENTERPRISE
JAX/NEW Boundary
DOTHAN
CAIRNS
OPP
DOZIER
ANDALUSIA
PANSEY
MADRID
HARTFORD
DARLINGTON
MALONE
SPRING
ROME
Edge V241
Edge V7
V244
V22
CRESTVIEW
CORRY
DE FUNIAK SPRINGS
CHIPLEY
MARIANNA

all above 19000' 5 miles cloud clear 1000 above 1000 below 1 mile.