BASICS FOR AIR TRAFFIC CONTROL – STRIPMARKING (EN ROUTE)

MODULE OVERVIEW

Purpose: The purpose of this module is to identify the basic outline for stripmarking and the associated symbols for en route options.

MODULE OUTLINE

Lesson: Flight Progress Strips

Purpose: The purpose of this lesson is to describe the function of flight progress strips.

Objective:

- Identify the purpose and legal requirements of flight progress strips

Topics:

- Flight Progress Strips
  - Strips
  - Equipment Suffixes
- Knowledge Check
- Review/Summary

Lesson: En Route Strips

Purpose: The purpose of this lesson is to describe the types of information that are recorded on en route flight progress strips.

Objective:

- Identify content requirements of en route strips

Topics:

- En Route Strips
- Posted Strips En Route
- Block Information
- Knowledge Check
- Review/Summary

Study Aid – En Route Stripmarking

Lesson: Characters and Symbols

Purpose: The purpose of this lesson is to describe the different abbreviations and symbols that are recorded on flight progress strips.

Objective:

- Identify abbreviations and symbols used in flight progress strips

Topics:

- Hand-Printed Characters
- Control Symbology
  - Clearance Abbreviations
  - Miscellaneous Abbreviations
  - Control Symbols
- Corrected or Updated Information
- Knowledge Check
- Review/Summary

Study Aid – Aircraft Equipment Suffixes

Exercise – Abbreviations and Symbols Worksheet

Activity – Stripmarking Abbreviations and Symbology Drill

Exercise – En Route Strips

Game – Making Progress

Question and Answer Session – *Parking Lot*

End-of-Module (EOM) Test

Note: *Trivia Review Activity follows En Route* End-of-Module (EOM) Test.

INTRODUCTION

LESSONS	■ Flight Progress Strips ■ En Route Strips ■ Characters and Symbols
TOTAL ESTIMATED RUN TIME	4 hrs. 17 mins.
MODULE CONTENT	■ Module Overview ■ Lesson: Flight Progress Strips ■ Lesson: En Route Strips ■ Study Aid – En Route Stripmarking ■ Lesson: Characters and Symbols ■ Study Aid – Aircraft Equipment Suffixes ■ Exercise – Abbreviations and Symbols Worksheet ■ Activity – Stripmarking Abbreviations and Symbology Drill ■ Exercise – En Route Strips ■ Game – Making Progress ■ Q&A Session – Parking Lot ■ End-of-Module Test

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ Instruct students to select ***Stripmarking*** module link within Blackboard ■ Instruct students to read the module introduction and then wait quietly for additional instructions	Blackboard
	EST. RUN TIME
	2 mins.

In Air Traffic Control (ATC), digital recorders are used to record voice communications, computer software is used to record radar tracking information, and strips are used to record written information. Therefore, knowledge of stripmarking is an integral part of your job. In some situations, the absence of strips can seriously disrupt the normal flow of operations.

The purpose of this module is to identify basic stripmarking and the associated symbols for en route facilities.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ **ENABLE *Flight Progress Strips*** and ***En Route Strips*** lessons in Blackboard ■ Instruct students to navigate to the ***Flight Progress Strips*** lesson in Blackboard ■ Instruct students to work individually through the lesson content ■ Upon completion of ***Flight Progress Strips*** instruct students to navigate to the ***En Route Strips*** lesson in Blackboard ■ Instruct students to work individually through the lesson content ■ Upon completion of the lesson, students should review previously introduced content or wait quietly until other students have completed=	Blackboard **EST. RUN TIME** 10 mins.

FLIGHT PROGRESS STRIPS

Purpose: The purpose of this lesson is to describe the function of flight progress strips.

Objective:

- Identify the purpose and legal requirements of flight progress strips

References for this lesson are as follows:

- FAA Order JO 7110.65, Air Traffic Control

Flight Progress Strips

Unless otherwise authorized by a facility directive, use flight progress strips to:

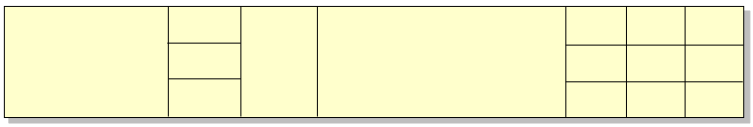
- Post current data on air traffic
- Post clearances required for ATC control
- Record any other air traffic services

Strips are considered legal documents.

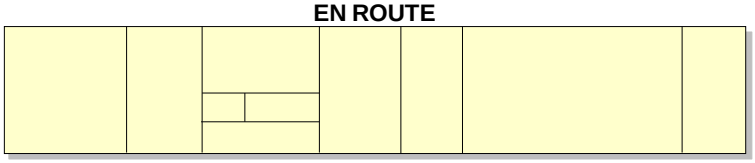
Strips are sized and formatted differently for each air traffic option.

- Terminal
- En route

TERMINAL



EN ROUTE



Strips

In any option, strips are either printed out with special printers or hand-printed.

- Printers are normally located in the operation area close to the control positions
- Hand-printed strips must conform to the format of machine-generated strips and must be modified to meet any changes in the machine-generated format

Equipment Suffixes

Special aircraft equipment is identified by "/" and a suffix following the aircraft identification.

Commonly Used Equipment Suffixes

Equipment	No Transponder	Transponder – No Mode C	Transponder With Mode C
No distance measuring equipment (DME)	**X**	**T**	**U**
DME	**D**	**B**	**A**
Tactical air navigation (TACAN) Only	**M**	**N**	**P**
Area navigation (RNAV)	**Y**	**C**	**I**

Note: *Equipment suffix determines type of clearance/routing aircraft can accept. For example, a /X cannot accept a clearance with a DME crossing restriction, and in a radar environment, a /X cannot ident for radar identification. See study aid for a complete list of equipment suffixes.*

Knowledge Check A

REVIEW what you have learned so far about flight progress strips. ANSWER the questions listed below.

1. Flight progress strips: *(Select all correct answers that apply.)*
   - ❑ **Contain current data on air traffic**
   - ❑ **Are used to post clearances**
   - ❑ Report local weather
   - ❑ **Are legal documents**

2. Identify the suffix that shows which type of special equipment an aircraft has on board *(Write the correct answers in the blanks,)*

Equipment	No Transponder	Transponder – No Mode C	Transponder With Mode C
No DME	**X**	**T**	**U**
DME	**D**	**B**	**A**
TACAN Only	**M**	**N**	**P**
RNAV	**Y**	**C**	**I**

Flight Progress Strips Summary

Paper flight progress strips are a quick and convenient way to explain flight instructions and allow for easy transfer of this information to other controllers. These small slips of paper also serve as legal records and are a mandatory part of air traffic control.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ ***Note: En Route Strips*** lesson should have already been enabled in Blackboard, if not ensure it is enabled ■ Instruct students to navigate to the ***En Route Strips*** lesson in Blackboard ■ Instruct students to work individually through the lesson content ■ Upon completion of the lesson, students should review previously introduced content or wait quietly until other students have completed	Blackboard **EST. RUN TIME** 20 mins.

EN ROUTE STRIPS

Purpose: The purpose of this lesson is to describe the types of information that are recorded on en route flight progress strips.

Objective:

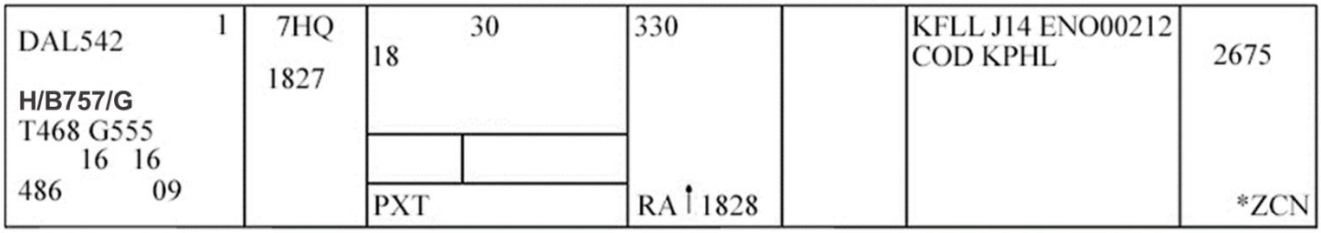
- Identify content requirements of en route strips

References for this lesson are as follows:

- FAA Order JO 7110.65, Air Traffic Control

En Route Strips

Paper en route flight progress strips are used to document en route flight information. The FAA Form designation for the en route strip is **7230-19**.



Posted Strips En Route

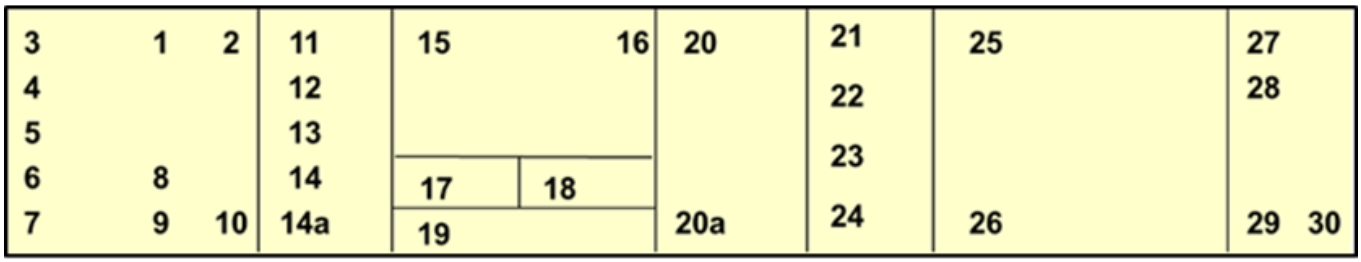
Requirements for posting en route strips are as follows:

- At least one strip shall print at each sector that an aircraft will enter, based on the flight's route and altitude
- The strip(s) will print automatically at a locally adapted time parameter prior to the aircraft's estimated time at the sector boundary
- The data printed will be current at the time the strip is printed

Block Information

Block information is as follows:

BLOCK NUMBERS



BLOCK	INFORMATION
3	Aircraft identification/call sign
4	Number of aircraft if more than one, heavy aircraft indicator “H/” if appropriate, type of aircraft, and aircraft equipment suffix
5	Filed true airspeed
11	Previous fix
12	Estimated time over previous fix
15	Center-estimated time over fix or clearance information for departing aircraft
17	Pilot-estimated time over fix
18	Actual time over fix, time leaving holding fix, arrival time at non-approach control airport, or symbol indicating cancellation of IFR flight plan for arriving aircraft, or departure time (actual or assumed)
19	Fix; for departing aircraft, add proposed departure time
20	Altitude information (in hundreds of feet)
21	Next fix/coordination fix
25	Point of origin, route as required for control and data relay and destination

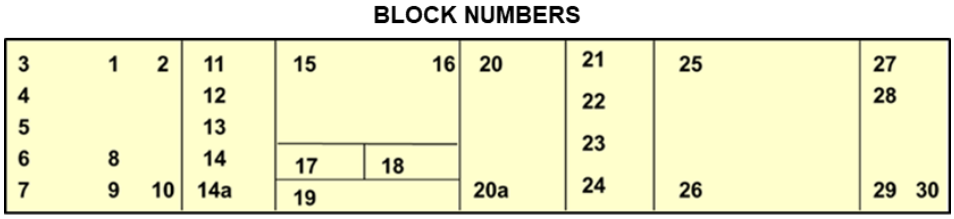
***Note**: Facility air traffic managers (ATMs) may authorize the optional use of spaces 13, 14, 14a, 22, 23, 24, and 28 for radar information*.

Knowledge Check B

REVIEW what you have learned so far about en route strips. ANSWER the questions listed below.

1. In which block does the aircraft call sign appear on an en route flight strip? *(Select the correct answer.)*

   - ❑ 5
   - ❑ 8
   - ❑ **3**



2. A strip will print at each sector an aircraft enters based on the flight's _____. *(Select all correct answers that apply.)*
   - ❑ **Route**
   - ❑ Aircraft type
   - ❑ **Altitude**
   - ❑ Direction

En Route Strips Summary

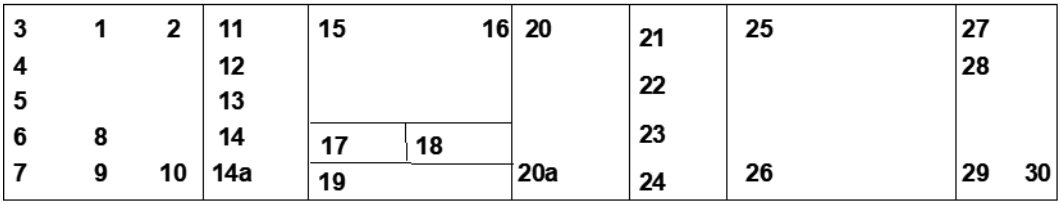
Keeping a close eye on the aircraft in your airspace is a critical part of your job. Quick recognition of the information on flight strips is very important to your success as an air traffic controller.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ This portion of training will be conducted by the facilitator ■ Instruct students to navigate to the study aid ***En Route Stripmarking*** in ***Student Guide*** ■ Facilitator will review content presented in the study aid and the ***Flight Progress Strips*** and ***En Route Strips*** lessons ■ Address questions and facilitate a brief discussion of the lesson content	Study Aid **EST. RUN TIME** 15 mins.

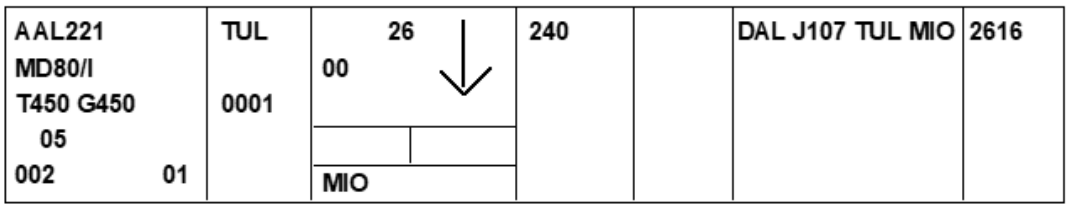
STUDY AID: EN ROUTE STRIPMARKING

EN ROUTE STRIP

BLOCK NUMBERS



Example



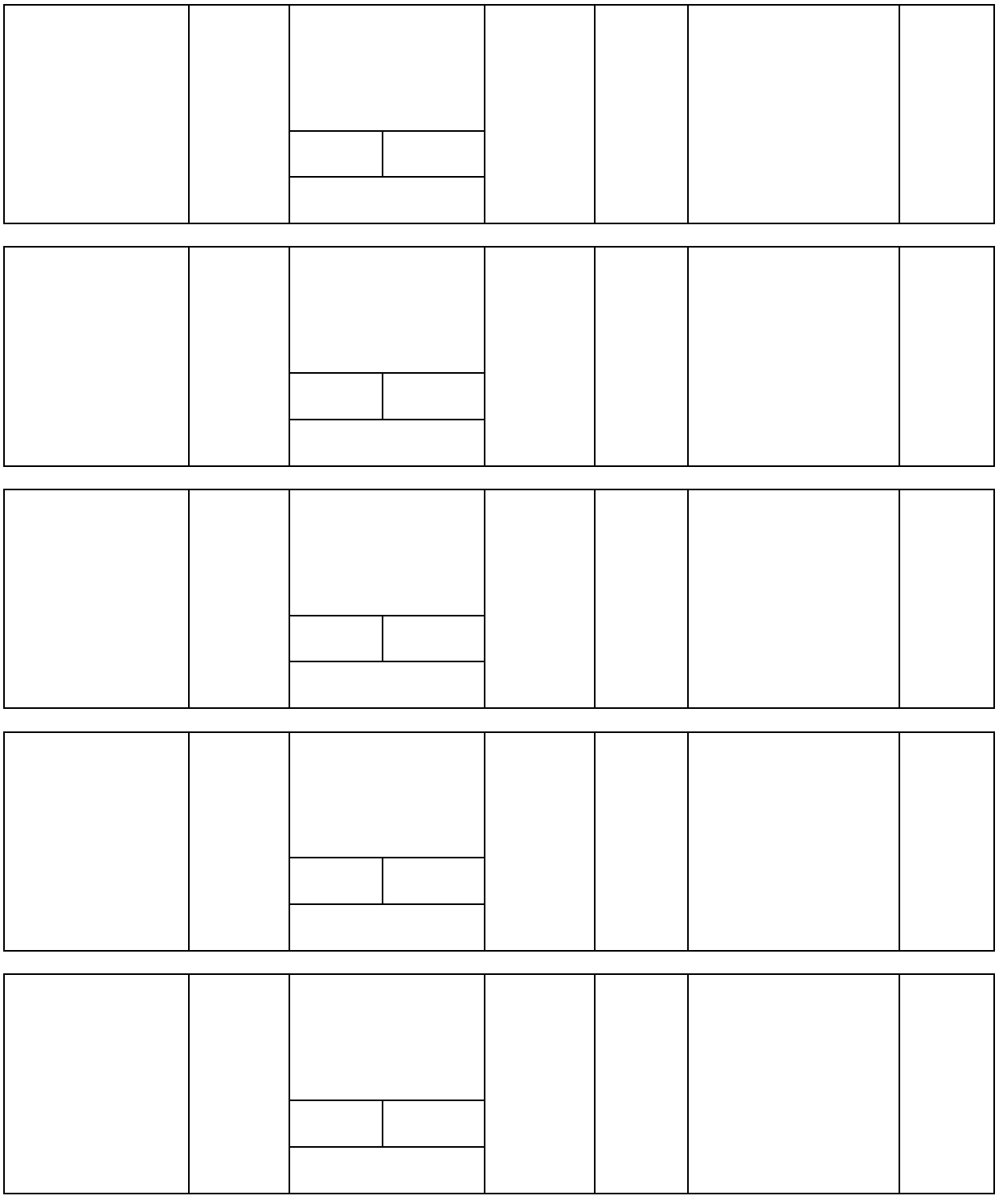
Note: *Altitude information may be written in thousands of feet, provided the procedure is authorized by the facility manager and is defined in a facility directive, i.e., FL 330 as 33; 5,000 feet as 5; and 2,800 as 2.8.*

BLOCK	INFORMATION
1	Verification symbol if required.
2	Revision number. DSR—Not used.
3	Aircraft identification.
4	Number of aircraft if more than one, heavy aircraft indicator “H/” if appropriate, type of aircraft, and aircraft equipment suffix.
5	Filed true airspeed.
6	Sector number.
7	Computer identification number if required.
8	Estimated ground speed.
9	Revised ground speed or strip request (SR) originator.
10	Strip number. DSR—Strip number/Revision number.
11	Previous fix.
12	Estimated time over previous fix.
13	Revised estimated time over previous fix.
14	Actual time over previous fix, or actual departure time entered on first fix posting after departure.

BLOCK	INFORMATION
14A	Plus time expressed in minutes from the previous fix to the posted fix.
15	Center-estimated time over fix (in hours and minutes), or clearance information for departing aircraft.
16	Arrows to indicate if aircraft is departing (↑) or arriving (↓).
17	Pilot-estimated time over fix.
18	Actual time over fix, time leaving holding fix, arrival time at non-approach control airport, or symbol indicating cancellation of IFR flight plan for arriving aircraft, or departure time (actual or assumed).
19	Fix. For departing aircraft, add proposed departure time.
20	Altitude information (in hundreds of feet) or as noted below.
20A	**OPTIONAL USE** when voice recorders are operational. **REQUIRED USE** when the voice recorders are not operating and strips are being used at the facility. This space is used to record reported RA events. The letters RA followed by a climb or descent arrow (if the climb or descent action is reported) and the time (hhmm) the event is reported.
21	Next posted fix or coordination fix.
22	Pilots estimated time over next fix.
23	Arrows to indicate north (↑), south (↓), east (→), or west (←) direction of flight, if required.
24	Requested altitude.
25	Point of origin, route as required for control and data relay, and destination.
26	Pertinent remarks, minimum fuel, point out/radar vector/speed adjustment information, or sector/position number (when applicable in accordance with par. 2-2-1, Recording Information), or NRP. High Altitude Redesign (HAR) or point-to-point (PTP) may be used at facilities actively using these programs.
27	Mode 3/A beacon code if applicable.
28	Miscellaneous control data (expect further clearance time, time cleared for approach, etc.).
29-30	Transfer of control data and coordination indicators.

En Route Strips

Blank progress strips are provided below for your practice.



FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ **ENABLE *Characters and Symbols*** lesson in Blackboard ■ Instruct students to navigate to the ***Characters and Symbols*** lesson in Blackboard ■ Instruct students to work individually through the lesson content ■ Upon completion of the lesson, students should review previously introduced content or wait quietly until other students have completed	Blackboard **EST. RUN TIME** 25 mins

CHARACTERS AND SYMBOLS

Purpose: The purpose of this lesson is to describe the different abbreviations and symbols that are recorded on flight progress strips.

Objective:

- Identify abbreviations and symbols used in flight progress strips

References for this lesson are as follows:

- FAA Order JO 7110.65, Air Traffic Control

Hand-Printed Characters

To prevent misinterpretation when data is hand-printed, use standard, hand-printed characters and write legibly. This graphic shows the phonetic alphabet and numbers, including the hand-printed examples.

Typed	Hand-Printed	Typed	Hand-Printed	Typed	Hand-Printed	Typed	Hand-Printed
A	A	K	K	U	U	1	1
B	B	L	L	V	V	2	2
C	C	M	M	W	W	3	3
D	D	N	N	X	X	4	4
E	E	O	O	Y	Y	5	5
F	F	P	P	Z	Z	6	6
G	G	Q	Q			7	7
H	H	R	R			8	8
I	I	S	S			9	9
J	J	T	T			0	Ø

***Note:** A slant line crossing through the number zero and underline of the letter "s" on hand-printed portions of flight progress strips are required only when there is reason to believe the lack of these markings could lead to misunderstanding. A slant line crossing the number zero is required on all weather data.*

Control Symbology

Use authorized symbols or abbreviations for recording:

- Clearances
- Reports
- Instructions

The following charts of symbols and abbreviations are common to all air traffic control (ATC) options:

- Terminal
- En route

Clearance Abbreviations

The following table shows selected clearance abbreviations.

Abbreviation	Meaning
A	Cleared to the airport (point of intended landing)
B	Center clearance delivered
C	ATC clears (when clearance relayed through non-ATC facility)
CAF	Cleared as filed
D	Cleared to depart from the fix
F	Cleared to the fix
H	Cleared to hold and instructions issued
L	Cleared to land
N	Clearance not delivered
O	Cleared to the outer marker
PD	Cleared to climb/descend at the pilot's discretion
Q	Cleared to fly specified sectors of a navigational aid (NAVAID) defined in terms of courses, bearings, radials or quadrants within a designated radius
T	Cleared through (for landing and takeoff through intermediate point)
V	Cleared over the fix
X	Cleared to cross (airway, route, radial) at (point)
Z	Tower jurisdiction

Miscellaneous Abbreviations

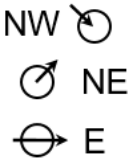
The following table shows the phonetic letters needed to describe miscellaneous abbreviations.

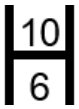
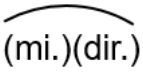
Abbreviation	Meaning
BC	Back course approach
CT	Contact approach
FA	Final approach
FMS	Flight Management System approach
GPS	Global positioning system (GPS) approach
I	Initial approach
ILS	Instrument landing system (ILS) approach
MA	Missed approach
MLS	Microwave landing system (MLS) approach
NDB	Nondirectional radio beacon approach
OTP	Visual flight rules (VFR) conditions-on-top
PA	Precision approach
PT	Procedure turn
RA	Resolution Advisory (pilot-reported Traffic Alert and Collision Avoidance System [TCAS] event)
RH	Runway heading
RL	Report leaving
RP	Report passing
RR	Report reaching
RX	Report crossing
SA	Surveillance approach
SI	Straight-in approach
TL	Turn left
TR	Turn right
VA	Visual approach
VR	Very high frequency omnidirectional range (VOR) approach

Control Symbols

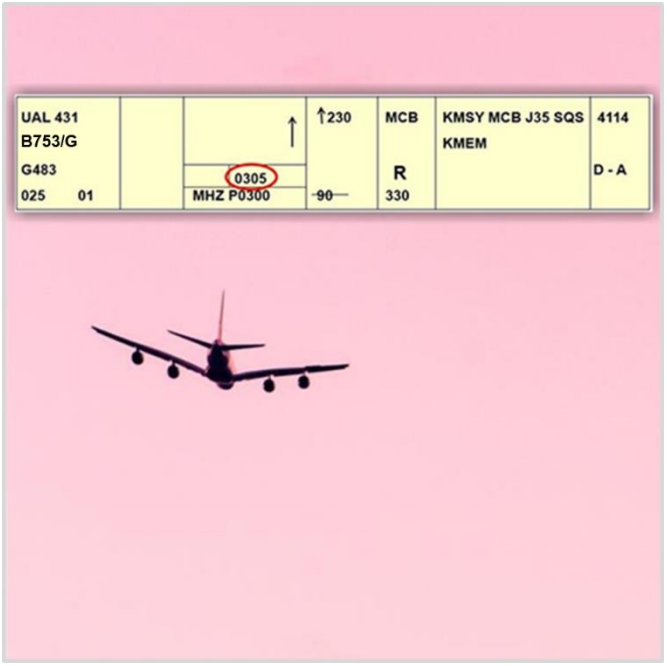
All the symbols listed below are used to identify an ATC instruction.

***Note**: The absence of an airway route number between two fixes in the route of flight indicates "direct"; no symbol or abbreviation is required.*

Symbols	Meaning
T→( )	Depart (direction, if specified)
	Climb and maintain
	Descend and maintain
	Cruise
@	At
X	Cross
	Maintain
	Join or intercept airway/jet route/track or course
	While in controlled airspace
	While in control area
	Enter control area
	Out of control area
 NW NE E	Cleared to enter, depart, or through surface area. Indicated direction of flight by arrow and appropriate compass letter. Maintain Special VFR (SVFR) conditions (altitude if appropriate) while in surface area.
250K	Aircraft requested to adjust speed to 250 knots.
-20K	Aircraft requested to reduce speed 20 knots.
+30K	Aircraft requested to increase speed 30 knots.
	Local SVFR operations in the vicinity of (name) aircraft are authorized until (time). Maintain Special VFR conditions (altitude if appropriate).
>	Before
<	After or past
170 (red)	Inappropriate altitude/flight level for direction of flight. (Underline assigned altitude/flight level in red).
/	Until
( )	Alternate instructions
Restriction	Restriction
	At or below

Symbols	Meaning
	At or above
— (Dash)	From-to (route, time, etc.)
(Alt)B(Alt)	Indicates a block altitude assignment. Altitudes are inclusive, and the first altitude shall be lower than the second. **Example:** 310B370
V <	Clearance void if aircraft not off ground by (time)
	Pilot canceled flight plan
	EN ROUTE: Aircraft has reported assigned altitude. **Example:** 80 
	TERMINAL/FLIGHT SERVICE STATION (FSS): Information forwarded (indicated information forwarded as required)
 (red)	EN ROUTE: Information or revised information forwarded. Circle, in red, inappropriate altitude/flight level for direction of flight or other control information when coordinated. Also circle, in red, the time (minutes and altitude) when a flight plan or estimate is forwarded. Use this method in both inter-center and intra-center coordination.
	Other than assigned altitude reported (circle reported altitude)
	DME holding (use with mileages). Upper figure indicates distance from station to DME fix, lower figure indicates length of holding pattern. In this example, the DME fix is 10 miles out with a 6 mile pattern indicated.
	Distance measuring equipment (DME) arc of very high frequency omnidirectional range tactical aircraft control (VORTAC), tactical air navigation (TACAN), or MLS.
	Contact (facility) or (frequency), (time, fix, or altitude if appropriate). Insert frequency only when it is other than standard.
R	Radar contact
R	EN ROUTE: Requested altitude (preceding altitude information)
	Radar service terminated
	Radar contact lost
RV	Radar vector
	Pilot resumed own navigation
	Radar handoff (circle symbol when handoff completed)
E (red)	EMERGENCY
W (red)	WARNING
P	Point out initiated. Indicate the appropriate facility, sector, or position. **Example:** PZFW
FUEL	Minimum fuel

Corrected or Updated Information



Do not overwrite or erase any item.

Use an “X” to delete:

- A “climb and maintain” (↑) or a “descend and maintain” (↓) arrow
- An “at or above” (↥) symbol or an “at or below” (↧) symbol
- A “cruise” (→) symbol
- Any unwanted or unused altitude information

For other unwanted or unused symbols:

- Draw one horizontal line through the symbol
- Write the new item immediately adjacent to the lined-through symbol and within the same space

Do not draw a horizontal line through an altitude being vacated until after the aircraft has reported or is observed leaving the altitude.

Example

Initial	UAL 431 B753/G T438 025 01		↑ 0305 KJAN P0300	↑230	MCB R 330	KJAN MCB RYTHM3 KMSY	4114 D - A
Updated	UAL 431 B753/G T438 025 01		↑ 0305 KJAN P0300	↑230 ~~90~~	MCB R 330	KJAN MCB RYTHM3 KMSY	4114 D - A

Knowledge Check C

REVIEW what you have learned so far about the characters and symbols. ANSWER the questions listed below.

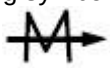
1. You should use authorized symbols or abbreviations for recording what three items? *(Select all correct answers that apply.)*
   - ❑ Warnings
   - ❑ **Clearances**
   - ❑ Searches
   - ❑ Notices
   - ❑ **Reports**
   - ❑ **Instructions**

2. Which hand-printed character is correct? *(Select the correct answer.)*
   - ❑ 
   - ❑ 
   - ❑  ***(correct)***

3. Referring to clearance abbreviations, what is the meaning of "Z"? *(Select the correct answer.)*
   - ❑ **Tower jurisdiction**
   - ❑ Cleared to cross
   - ❑ ATC clears

4. Referring to miscellaneous abbreviations, what is the abbreviation "RX" stand for? *(Select the correct answer.)*
   - ❑ Runway heading
   - ❑ Report leaving
   - ❑ **Report crossing**

5. Referring to the control symbol chart, the following symbol stands for _____. *(Select the correct answer.)*



   - ❑ **Maintain**
   - ❑ Moving eastbound
   - ❑ Maximum forward speed

6. To delete any unused or unwanted symbols or items, which symbols should be used? *(Select the correct answer.)*
   - ❑ /
   - ❑ **X *(correct)***
   - ❑ **- *(correct)***
   - ❑ O

Characters and Symbols Summary

The ability to interpret and update flight progress strips is an important job task. Therefore, you must become well practiced at recognizing and writing flight strip symbology and abbreviations in order to do your job effectively.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ This portion of training will be conducted by the facilitator ■ Instruct students to navigate to the study aid ***Aircraft Equipment Suffixes*** in ***Student Guide*** ■ Facilitator will review content presented in the study aid and ***Characters and Symbols*** lesson ■ Address questions and facilitate a brief discussion of the content	Study Aid **EST. RUN TIME** 15 mins.

STUDY AID: AIRCRAFT EQUIPMENT SUFFIXES

Separation Standard	Navigation Capability	Transponder Capability	Suffix
RVSM	Any	Failed transponder	/H
	Any	Failed Mode C	/O
	No RNAV, No GNSS	Transponder with Mode C	/W
	RNAV, No GNSS	Transponder with Mode C	/Z
	GNSS	Transponder with Mode C	/L
Non–RVSM	No DME	No transponder	/X
		Transponder, no Mode C	/T
		Transponder with Mode C	/U
	DME	No transponder	/D
		Transponder, no Mode C	/B
		Transponder with Mode C	/A
	TACAN	No transponder	/M
		Transponder, no Mode C	/N
		Transponder with Mode C	/P
	RNAV, No GNSS	No transponder	/Y
		Transponder, no Mode C	/C
		Transponder with Mode C	/I
	GNSS	No transponder	/V
		Transponder, no Mode C	/S
		Transponder with Mode C	/G

Acronym List:

DME – Distance measuring equipment

GNSS – Global navigation satellite system

RNAV – Area navigation

RVSM – Reduced vertical separation minima

TACAN – Tactical air navigation

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ Instruct students to locate student exercise ***Abbreviations and Symbols Worksheet*** in the printed ***Student Guide*** ■ The exercise will be performed individually ■ Instruct students to answer each question ■ At the end of the exercise, the exercise will be evaluated during discussion	Exercise **EST. RUN TIME** 30 mins.

EXERCISE: ABBREVIATIONS AND SYMBOLS WORKSHEET

Directions

Write the correct abbreviation or symbol in the blank space provided in front of each definition. If needed, use your stripmarking lesson to assist you.

Detailed Facilitator Instructions: *Give students some time to complete this exercise. Then, display correct answers and discuss as necessary.*

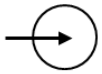
1.	PD	**Cleared to climb/descend at the pilot's discretion**
2.	X	**Cross**
3.		**Cruise**
4.		**Climb and maintain**
5.		**Enter control area**
6.	F	**Cleared to the fix**
7.	Q	**Cleared to fly specified sectors of a navigational aid (NAVAID) defined in terms of courses, bearings, radials or quadrants within a designated radius**
8.		**Cleared into the surface area from the west**
9.		**Cleared to conduct SVFR within the vicinity of the airport**
10.	V<	**Clearance void if aircraft not off the ground by (time)**
11.	@	**At**
12.	P	**Point out initiated**
13.	>	**Before**

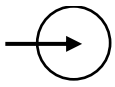
14.	V	**Cleared over the fix**
15.	↓	**Descend and maintain**
16.	TL	**Turn left**
17.	↥	**At or above**
18.	~~M~~→	**Maintain**
19.	/	**Until**
20.	H 20 10	**Cleared to hold and instructions have been issued**
21.	TR	**Turn right**
22.	RA	**Resolution Advisory (pilot-reported TCAS event)**
23.	———	**Restriction**
24.	℄	**Pilot canceled flight plan**
25.	<	**After**
26.	↧	**At or below**
27.	⩥	**Join or intercept airway/jet route/track or course**
28.	RX	**Report crossing**
29.	Z	**Tower jurisdiction**
30.	OTP	**VFR conditions on top**
31.	Ⓡ	**Radar handoff complete**
32.	═══	**While in controlled airspace**
33.	T→( )	**Depart (direction, if specified)**
34.	PT	**Procedure turn**
35.	RH	**Runway heading**

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ **ENABLE *Stripmarking Abbreviations and Symbology Drill*** in the ***Exercise and Activities*** folder ■ Instruct students to navigate to the ***Exercises and Activities*** folder in Blackboard ■ Instruct students to locate student activity ***Stripmarking Abbreviations and Symbology Drill*** ■ The activity may be performed individually ■ Instruct students to answer each question ■ At the end of the exercise, the activity will evaluate the students' performance ■ Suggest allowing opportunities to repeat the activity during periods of down time	Activity **EST. RUN TIME** 20 mins.

ACTIVITY: STRIPMARKING ABBREVIATIONS AND SYMBOLOGY DRILL (ANSWER KEY)

Distractors:

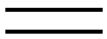
RX	→	TL	<	>
	TR	T→()		X

Question	Answer
1. Turn left	TL
2. Cleared to cruise	→
3. Enter control area	
4. Before	>
5. Turn right	TR
6. Cleared into the surface area	
7. Cross	X
8. Depart (direction if specified)	T→()
9. Report crossing	RX
10. After	<

Distractors:

R	R	RH	F	Q
V	W	R	V<	RA

Question	Answer
11. Cleared to the fix	F
12. Runway heading	RH
13. Cleared over the fix	V
14. Cleared to fly specified sectors of a navigational aid (NAVAID) defined in terms of courses, bearings, radials or quadrants within a designated radius	Q
15. Clearance void if not off by	V<
16. Radar contact lost	R
17. Local SVFR operations authorized	W
18. Resolution Advisory (pilot reported TCAS event)	RA
19. Radar service terminated	R
20. Radar handoff complete	R
21. At	@
22. Point out initiated	P
23. Descend and maintain	
24. Procedure turn	PT
25. At or below	
26. Pilot cancelled flight plan	

Question	Answer
27. Climb and maintain	
28. Maintain	
29. At or above	
30. Cleared to climb/descend at pilot's discretion	PD
31. Restriction	
32. Tower jurisdiction	Z
33. While in controlled airspace	
34. Terminal information (new or revised) forwarded	
35. Until	/
36. Join or intercept	
37. Cleared to hold and instructions have been issued	H
38. VFR conditions on top	OTP
39. En route information (new or revised) forwarded	 (red)
40. Other than assigned altitude reported	

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ Instruct students to locate student exercise ***En Route Strips*** in the printed ***Student Guide*** ■ The exercise will be performed in pairs ■ Instruct students to answer each question ■ At the end of the exercise, the exercise will be evaluated during discussion	Exercise **EST. RUN TIME** 30 mins.

EXERCISE: EN ROUTE STRIPS

Purpose

This exercise will provide a review of the items found on en route strips.

Directions

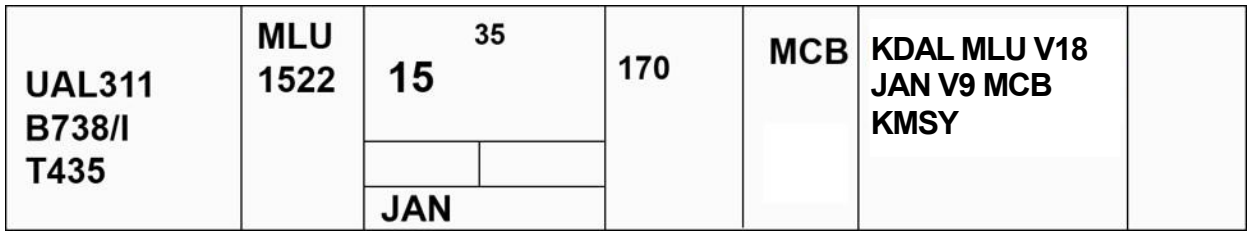
Based on the information provided in the table, fill out the en route flight strip below. Then, update the flight strip with the chronological information in the numbered list.

Detailed Facilitator Instructions: *Divide students into pairs. Have students refer to their student study aid to fill out the information on the en route flight strips. After giving students time to fill out the flight strips, engage them in a discussion about their answers. After some discussion, reveal the answers and provide corrective feedback to students, as necessary.*

En Route

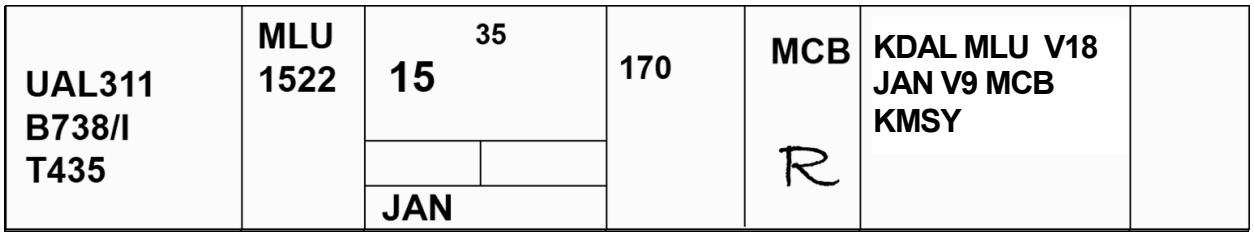
Detailed Facilitator Instructions: *Have students fill out the blank flight strip with the basic information listed in the table below. Go over the answers.*

BLOCK	INFORMATION
Aircraft identification	UAL311
Aircraft type	B738/I
True Airspeed	435 knots
Previous fix/next fix	MLU/MCB
Estimated time over previous fix	1522
Center-estimated time over fix	JAN 1535
Altitude	17,000 feet
Point of origin, route as required for control and data relay and destination	KDAL MLU V18 JAN V9 MCB KMSY

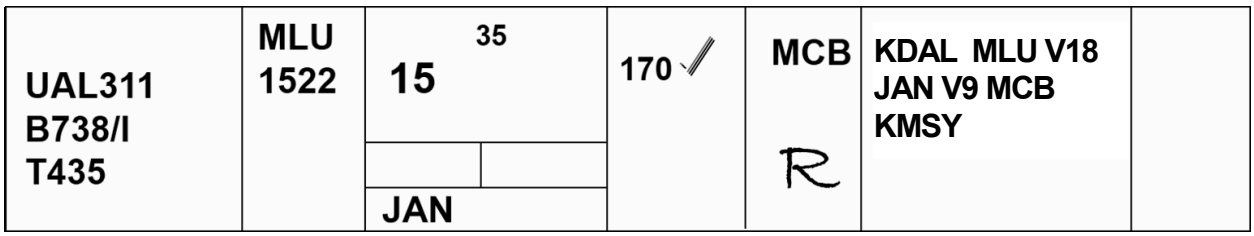


Detailed Facilitator Instructions: *After the students have completed the strip on UAL311, read the following scenario and have each student mark their strip accordingly. When you have finished the scenario, discuss the answers. Intent is to write the correct symbols, not necessarily in the correct block.*

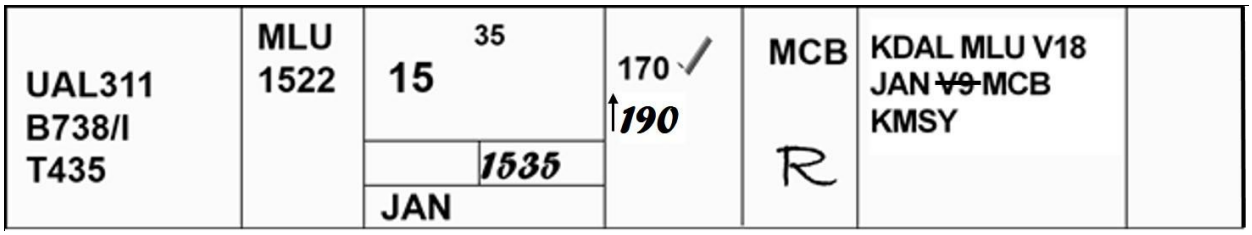
1. Accept a radar handoff (**Write "R" in block 24**)



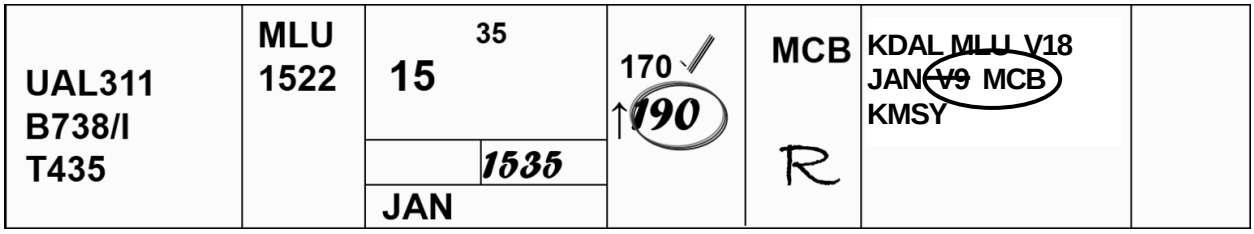
2. Pilot reports on frequency at 170 (**Place check mark by altitude**)



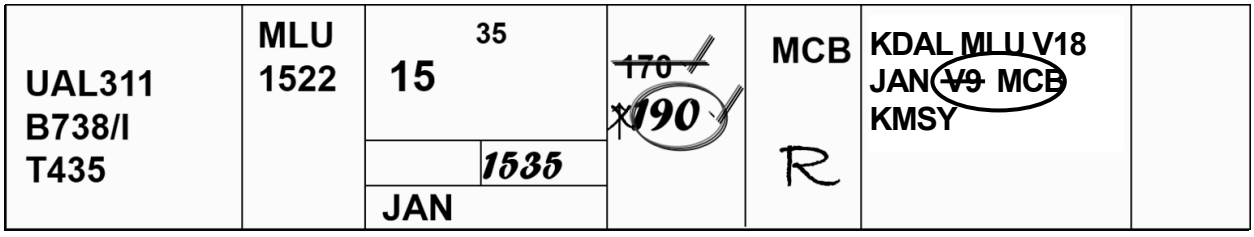
3. Pilot reports over JAN at 1535 and requests climb to FL 190, direct MCB. Radar controller immediately issues clearance direct MCB, climb and maintain FL 190 (**write 1535 in block 18, line out "V9" in the route to indicate direct, and (climb arrow) 190 in block 20**)



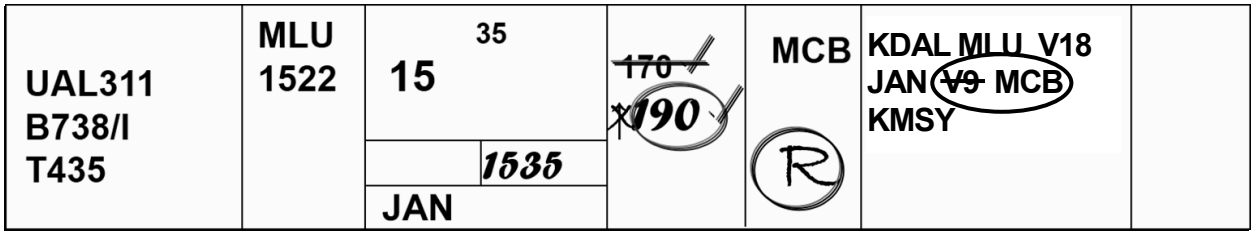
4. You coordinate revised route and altitude with the next sector (**Red circle "190" and the portion of the route that was revised**)



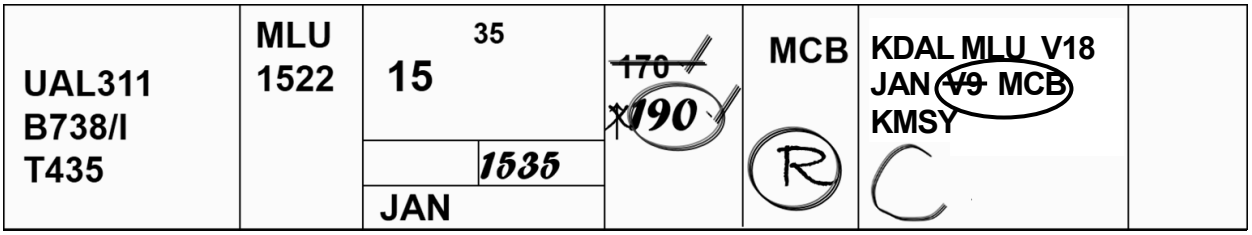
5. UAL311 is observed on radar at FL 190 (**Line out 170 and the checkmark, "X" out the climb arrow, place check mark next to 190**)



6. Handoff to next sector completed (**Circle the "R" in block 24**)



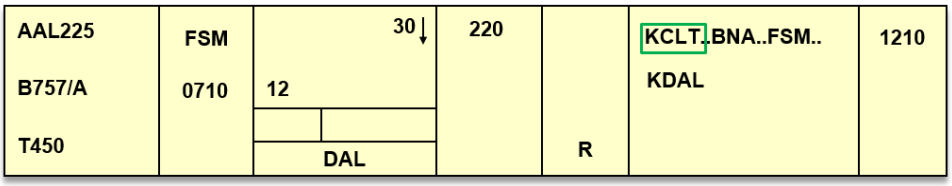
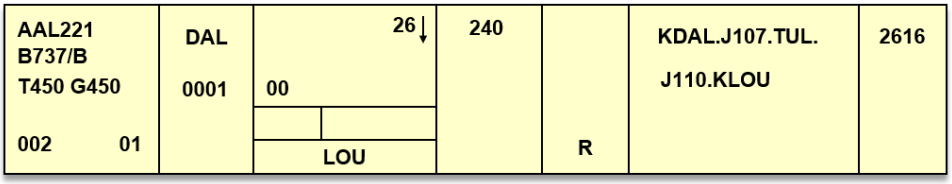
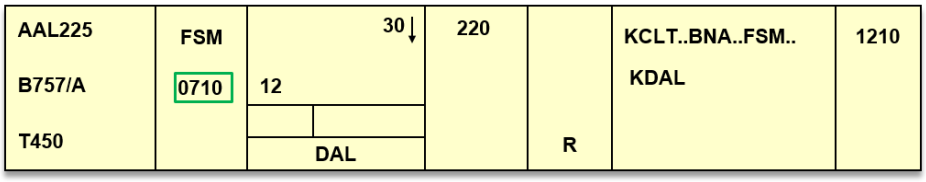
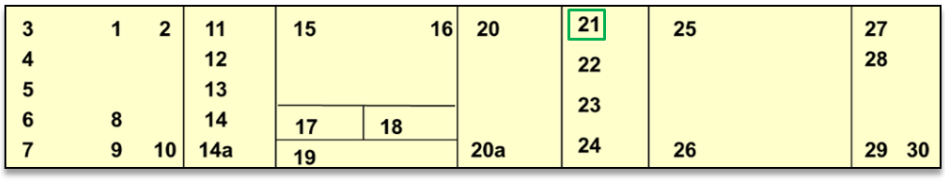
7. Standard communications instructions are issued (**Place a "C" in block 26; the strip would then be removed**)

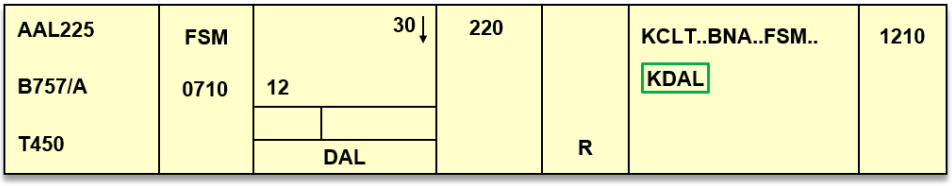
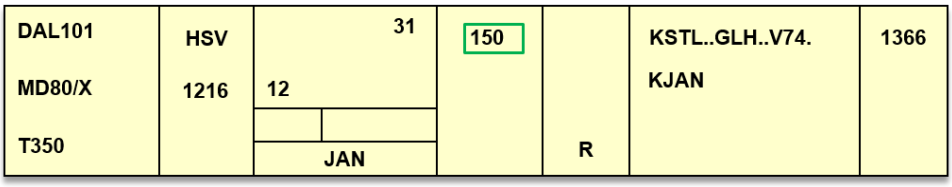
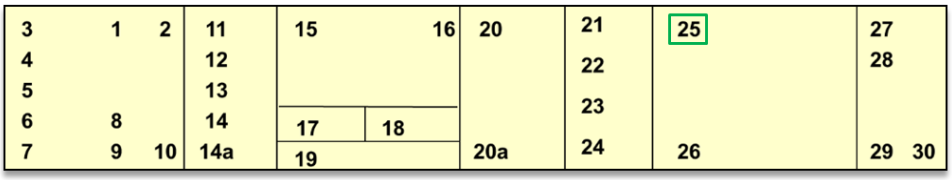
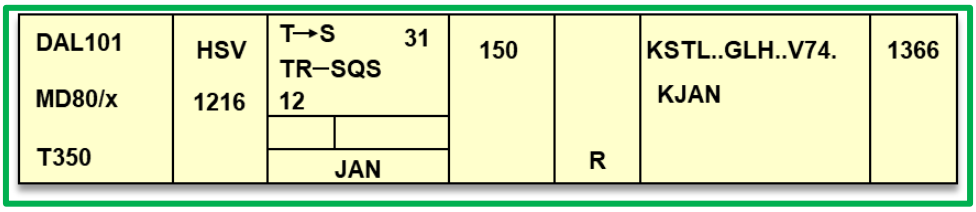
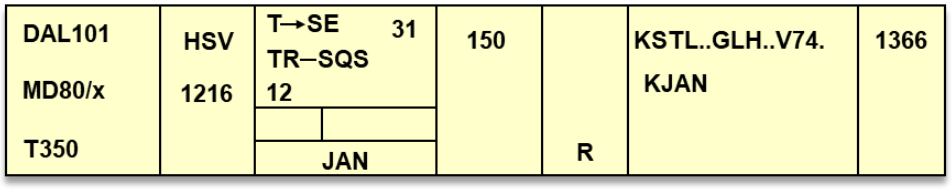
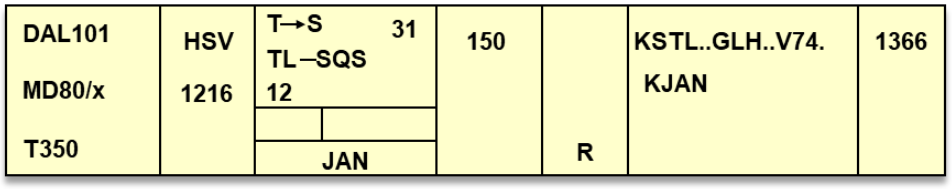
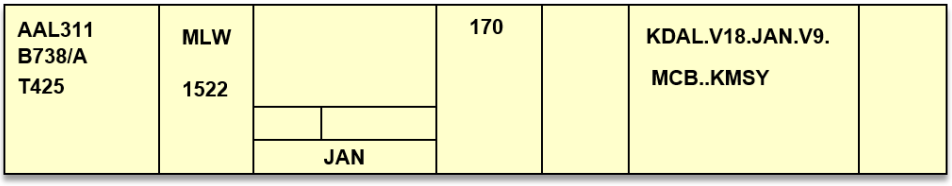
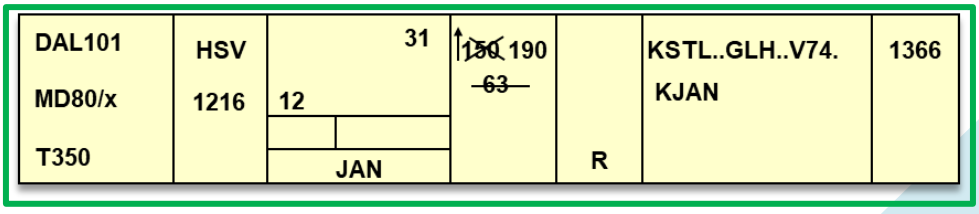


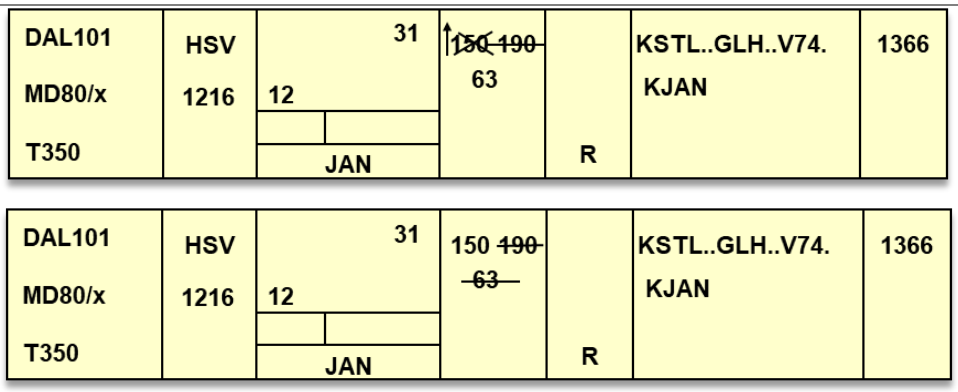
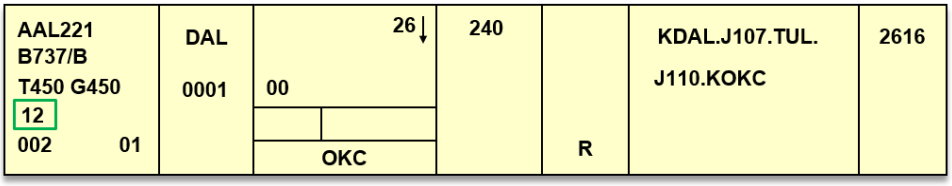
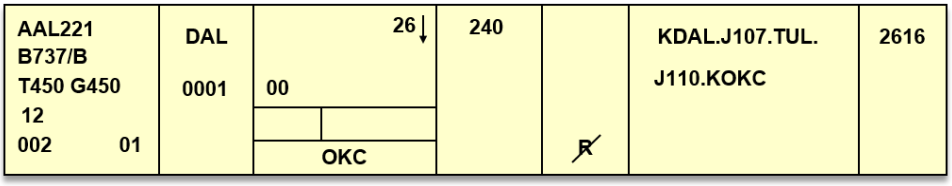
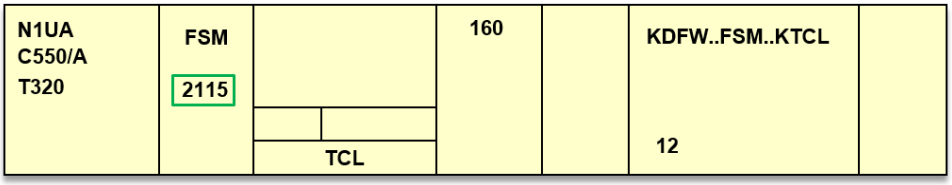
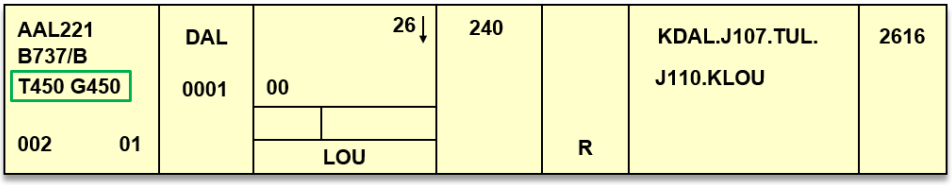
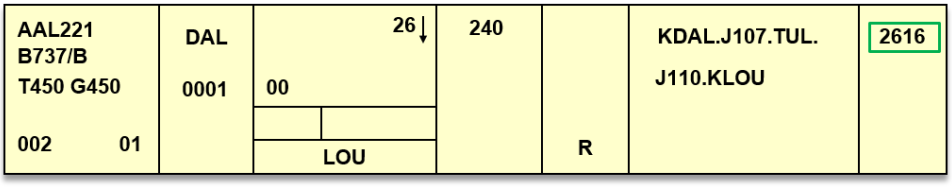
FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ **ENABLE *Making Progress*** in the ***Exercises and Activities*** folder ■ Instruct students to navigate to the ***Exercises and Activities*** folder in Blackboard ■ Instruct students to complete ***Making Progress***, the board game located in this folder ■ The game will be performed individually ■ Instruct students to answer each question ■ The game will evaluate the students' performance at the end ■ Suggest allowing opportunities to repeat the game during periods of down time	Game **EST. RUN TIME** 20 mins.

GAME: MAKING PROGRESS (ANSWER KEY)

Note: *The questions in the key and their distractors may appear in a different order than displayed here due to game question randomization.*

Question	Answer
1. From which airport did AAL225 depart?	
2. What does the arrow in block number 16 mean?	 **Arriving** Departing Maintain Descending
3. What time is AAL225 estimated over FSM?	
4. Where you would find the next fix/ coordination fix?	

5. Where is the AAL225 destination airport?	
6. What altitude is DAL101?	
7. Where is the route displayed?	
8. Which flight strip is telling us that DAL101 will depart south and turn right direct Sidon?	  
9. What equipment does AAL311 have?	 **DME and transponder with mode C** RNAV and transponder with no mode C No DME and transponder with mode C TACAN with no transponder
10. Which flight strip is telling us that the aircraft has vacated 6,300, was assigned 15,000, and has	

been re-cleared to FL 190?	
11. What sector number has control of AAL221?	
12. What does this en route strip indicate about the status of radar service?	 **Radar service terminated** Radar contact is lost AAL221 has been handed off Radar service terminated No Radar service provided
13. What time is N1UA estimated over FSM?	
14. Where would you find the TAS and GS?	
15. What beacon code is AAL221 assigned?	

SUMMARY

The purpose of this module was to identify the basic outline for stripmarking and the associated symbols for en route options.

In accordance with FAA Order JO 7110.65, Air Traffic Control; you should now be able to:

- Identify flight progress strips
- Identify content requirements of en route strips
- Identify abbreviations and symbols used in flight progress strips

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ Navigate to the ***Parking Lot*** link within Blackboard and review any student questions ■ Address ***Parking Lot*** questions and facilitate a brief discussion of the lesson content ■ Instruct students to prepare for the End-of-Module test by putting away their Student Guides	Facilitated Discussion **EST. RUN TIME** 15 mins.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ **ENABLE *Stripmarking (En Route) End-of-Module Test*** link in Blackboard ■ Instruct students: ○ Clear desks ○ Do not write anything during or after the test ○ Navigate to the ***Stripmarking (En Route) End-of-Module Test*** link in Blackboard ○ Once they are satisfied with their responses, click “Save and Submit;” do not click “OK” to review results until directed to do so ○ Choose “Cancel” if they receive a warning message that the test has unanswered questions; choosing OK will submit the test and not allow them to go back and answer the questions ○ Leave the room after submitting the test and return at the “Be Back” time ■ ***Note:*** *This test is scored but not graded* ■ During test, monitor students to ensure a secure testing environment ■ Identify the most commonly missed questions by reviewing student statistics in Blackboard ■ Instruct students to click “View Results” when ready to review commonly missed questions ■ Review commonly missed questions with students	Blackboard Assessment **EST. RUN TIME** 15 mins.

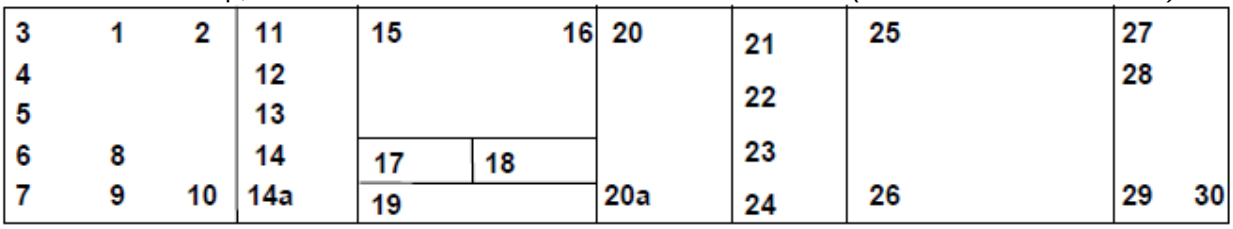
END OF MODULE TEST

Note: *Test questions in Blackboard are presented to the students in random order. Please be aware the test key question order will not match the student version.*

1. Which of the following is **NOT** a use of flight strips? *(Select the correct answer.)*
   - ❑ **Post current weather data**
   - ❑ Record any other air traffic services
   - ❑ Post current data on air traffic
   - ❑ Post clearances required for ATC control

   Reference(s): JO 7110.65, Chap. 2

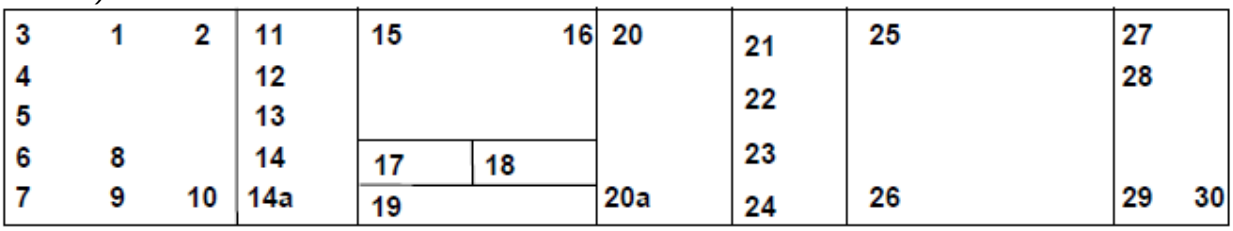
2. On an en route strip, in which block is the aircraft identification located? *(Select the correct answer.)*



   - ❑ **3**
   - ❑ 1
   - ❑ 4
   - ❑ 2

   Reference(s): JO 7110.65, Chap. 2

3. On an en route strip, which block contains the center-estimated time over the fix? *(Select the correct answer.)*



   - ❑ **15**
   - ❑ 11
   - ❑ 25
   - ❑ 19

   Reference(s): JO 7110.65, Chap. 2

4. Which control symbol indicates that an ARTCC facility has forwarded flight plan information? *(Select the correct answer.)*
   - ❑ **Red circle**
   - ❑ Black circle
   - ❑ Red check mark
   - ❑ Horizontal line

   Reference(s): JO 7110.65, Chap. 2

5. How is a strip marked to indicate that the aircraft has an emergency? *(Select the correct answer.)*
   - ❑ **Red "E"**
   - ❑ Black "E"
   - ❑ "EMRG"
   - ❑ Red check mark

   Reference(s): JO 7110.65, Chap. 2

6. What symbol indicates that an aircraft's clearance is void if **NOT** airborne by a specific time? *(Select the correct answer.)*
   - ❑ **V <**
   - ❑ V =
   - ❑ ~ V
   - ❑ V

   Reference(s): JO 7110.65, Chap. 2

7. What symbol should be used to delete any unwanted or unused altitude information? *(Select the correct answer.)*
   - ❑ **X**
   - ❑ —
   - ❑ +
   - ❑ /

   Reference(s): JO 7110.65, Chap. 2

8. What does the clearance abbreviation "PD" represent? *(Select the correct answer.)*
   - ❑ **Cleared to climb/descend at pilot's discretion**
   - ❑ Cleared to depart from the fix
   - ❑ Cleared to the airport
   - ❑ Cleared to execute a procedure turn

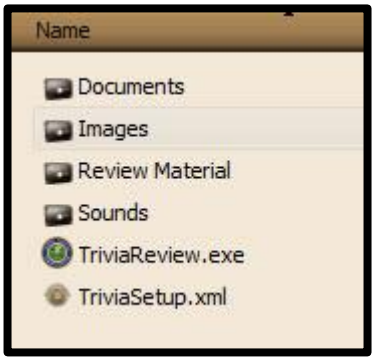
   Reference(s): JO 7110.65, Chap. 2

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ **ENABLE *End-of-Block 5 (En Route) Test*** in Blackboard ■ Instruct students: ○ Clear desks ○ Do not write anything during or after the test ○ Navigate to the ***End-of-Block 5 (En Route) Test*** link in Blackboard ○ Once they are satisfied with their responses, click “Save and Submit;” do not click “OK” to review results until directed to do so ○ Choose “Cancel” if they receive a warning message that the test has unanswered questions; choosing OK will submit the test and not allow them to go back and answer the questions ○ The test will auto-submit when the time limit is reached ○ Leave the room after submitting the test and return at the “Be Back” time ■ ***Note:*** *This test is scored but not graded* ■ During test, monitor students to ensure a secure testing environment ■ Instruct students to click “View Results” when ready to review results; do not review commonly missed questions	Blackboard Assessment **EST. RUN TIME** 60 mins.

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ ***Note:*** Copy the four folders and two separate files to a location on computer. Refer to the Trivia Review User Manual for detailed instructions ■ Review all procedures and rules with students ■ Inform students that exercise will be performed in four (4) teams ■ Randomly select students to represent teams ■ Instruct student teams to review all categories and bids before making selection ■ Instruct students to read displayed answer before framing an oral response in a question format ■ Encourage student (team) discussion before providing answers in a question format	Activity (Trivia Review) **EST. RUN TIME** 6 hrs.

TRIVIA REVIEW

Trivia review consists of four folders and two files under the root directory. All folders and files must be copied to either the desktop or a separate folder. If the files are copied to a specific folder, a shortcut for the executable file can be created and placed on the desktop for ease of access.



File Name	Description
Documents	Contains the Trivia Review User Manual, including both the word document and html version. Html version is called up when the Help button is clicked while the application is running.
Images	Contains all the images associated with the executable file
Review Material	Contains the five xml files containing all the questions and answers for the trivia game
Sounds	Contains all the audio files for the trivia game
TriviaReview.exe	This is the executable file used to activate the application
TriviaSetup.xml	This file is used to call in the opening jpg and all audio files

Start the Game

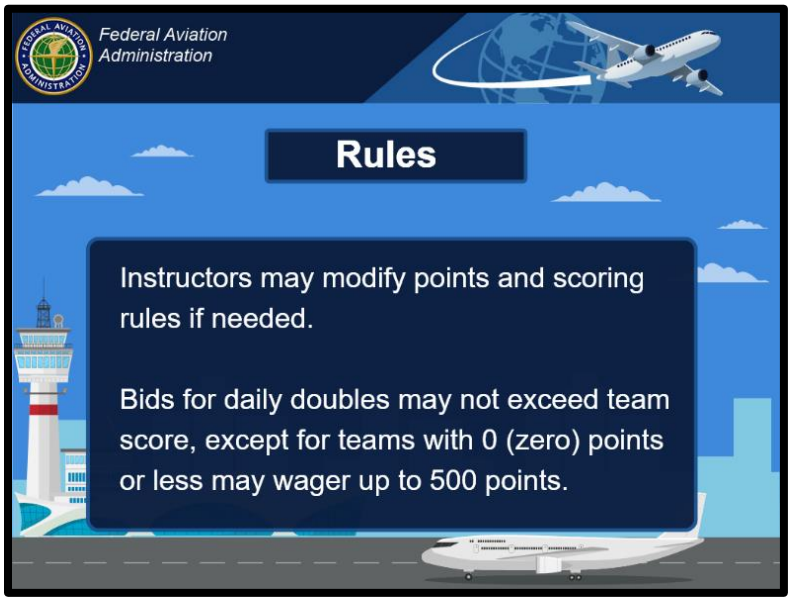
Once the Trivia Review application is installed on a Desktop along with all the applicable folders and files, click the desktop icon (FAA logo) to open the application. The application starts and displays the opening screen. When ready to begin, click the **Begin** button or press **Enter** on the keyboard.

Selecting a Block

Question/Answer review pools (question sets) are separated into five blocks. When the **Select Block** page is displayed, select the block review to be used for the applicable round. Each block contains different questions/answers referencing various modules in the course. All questions include a reference to the associated lesson material.

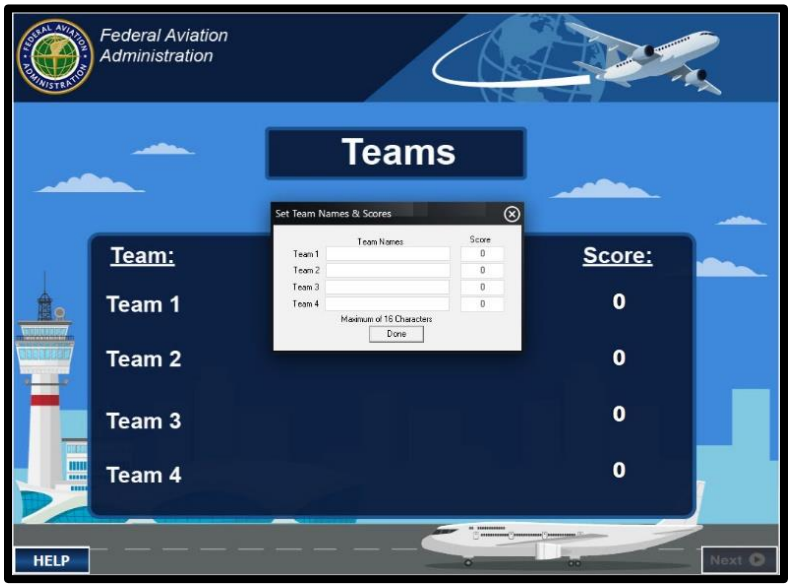
Rules

The Rules page appears. Review the rules with the players. Once all the rules are clearly understood, click **Next** or press **Enter** to proceed to the **Teams** page.



Team Names

The first time you access the **Teams** page, the **Set Team Names & Scores** sub-window is displayed. Input each team name in the applicable block. Click **Done** to exit the sub-window and save the team names.



Game Board

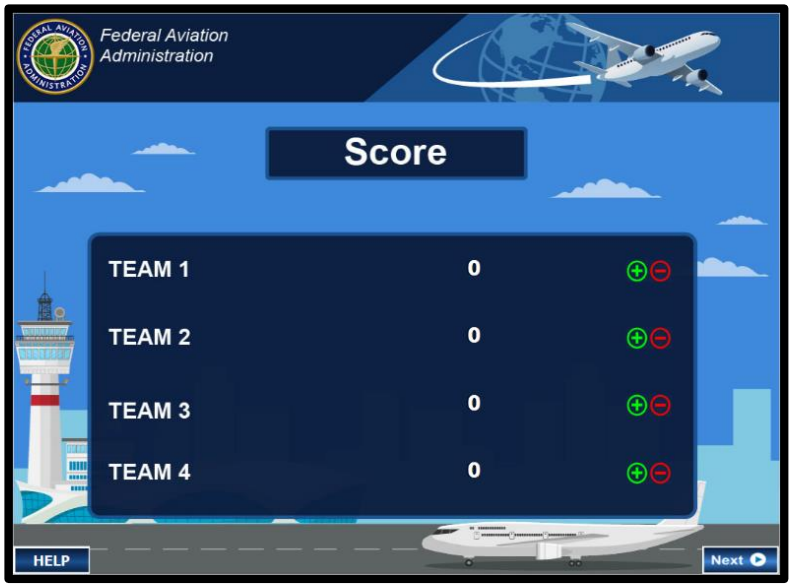
Teams take turns selecting the category and value. When the game board appears, a team advises the facilitator of the category and the value of the answer. The facilitator selects the desired category and value to display the answer on the next page.

The team in control needs to provide their answer as a question to the facilitator. When the facilitator is ready to display the correct question, press the **Enter** key or click on the **Next** button. The question and the answer are displayed. Press **Enter** or **Next** to advance to the **Score** page.

Score Page

At the start of each game all teams have a score of zero. Correct answers add points to a team's score. Incorrect answers subtract from the team's point.

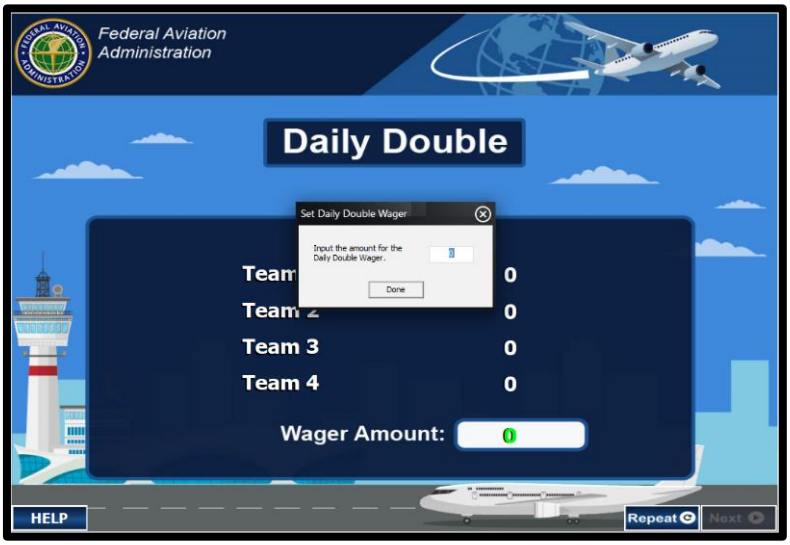
The facilitator clicks either the **Plus** or **Minus** sign for the applicable team, depending on whether their response is correct or incorrect. Once the facilitator has reviewed the correct/incorrect response(s), click **Next** to continue the game. (NOTE: The **Enter** button does not work on this page). The game board is brought back up and the game continues until all answers have been selected. Team with the highest score wins.



Daily Double

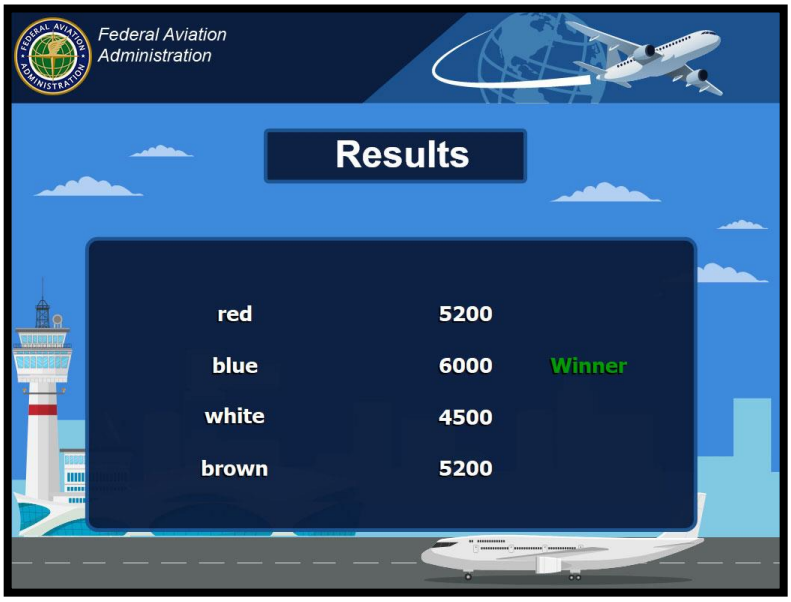
Daily doubles are selected at random in both the first and second rounds. There is one Daily Double in the first round and two in the second round. If the team selects a Daily Double, the following screen appears.

The facilitator will input the desired amount in the pop-up Wager Box. If the wrong amount is entered, the facilitator can click the **Repeat** button to change the value before clicking **Next** button to continue. The screen returns to the answer screen and the game continues.



End Game

Once the board is cleared of all point amounts, scores are tabulated and the team with the most points is displayed as the winner.



BLOCK 1 - ROUND 1

	The Bigger Picture	Lagniappe	Resting Spots	KEEP 'EM APART	The Latest News	Potpourri
Q1	To prevent a collision between aircraft by organizing the safe, orderly, and expeditious flow of air traffic.	The primary NAVAIDs for the nation's airways in the National Airspace System.	The runway markings that consist of groups of one, two, and three rectangular bars symmetrically arranged about the runway centerline.	Two thousand feet vertical separation is required for IFR flight above this altitude.	A NOTAM that requires wide dissemination that pertains to navigational aids and services.	The color of a taxiway centerline marking.
A1	What is the primary purpose of the ATC System? (M2F27)	What are VORs and VORTACs? (M2F45)	What are touchdown zone markings? (M3F12)	What is FL 410? (M4F9)	What is a NOTAM D? (M5F8)	What is yellow? (M3F6)
Q2	Air traffic facilities that provide pilot briefings, search & rescue, and other services to VFR and IFR pilots.	ATC service to aircraft is provided based on this operational priority.	A runway with a magnetic heading of 276 degrees.	Clear departing nonradar aircraft to fly specified headings that diverge by this many degrees.	These are the four NOTAM classifications.	Publication containing information on ATC procedures, flight safety, and accident reporting.
A2	What are Flight Service Stations (FSSs)? (M2F30)	What is "first come, first served"? (2F25)	What is Runway 28? (M3F7)	What is 45 degrees? (M4F13)	What are D, FDC, Pointer and FICON? (M5F1,8)	What is the Aeronautical Information Manual (AIM)? (M7F4)
Q3	The mission of the Traffic Management System.	These services are provided when the work situation permits.	The continuous runway markings that identify the full-length runway pavement area.	The minimum vertical separation required for aircraft from FL 290 to FL 410.	Authority responsible for ensuring NOTAM formats and monitoring the NOTAM system.	These documents supplement orders and directives and provide guidelines for intrafacility use.
A3	What is to balance air traffic demand with system capacity? (M2F40)	What are "additional services"? (M2F26)	What are runway side stripes? (M3F13)	What is 1,000 feet for RVSM aircraft and 2,000 feet for non-RVSM aircraft? (M4F9)	What is the United States NOTAM office (USNOF)? (M5F7)	What are Standard Operating Procedures? (M8F6)
Q4	To monitor and balance traffic flows within their area of responsibility.	Flight Data, Radar Coordinator, Radar Associate, and Radar Controller make up this.	The portion of the runway that is identified by large chevrons pointing in the direction of the threshold bar.	The minimum radar separation required for aircraft at or above FL 600.	Responsible for correct classification and NOTAM format and notifying affected facilities of new NOTAM.	This person is responsible for observing and reporting the conditions of the landing area of an airport.
A4	What is the mission of the Traffic Management Unit (TMU)? (M2F40)	What is the Radar/Sector Team? (M2F36)	What are blast pads, stop-ways, and EMSs? (M3F14)	What is 10 miles? (M4F20)	What is the certified source? (M5F5)	Who is the airport manager/operator? (M5F6)

Q5	This program assigns departure times to facilitate integration into the en route traffic stream.	Monitors and manages the flow of air traffic throughout the NAS.	The portion of the runway that is marked with white arrows which point in the direction of the displaced threshold.	The minimum radar separation a terminal facility provides between two aircraft 40 miles from the antenna.	Known or reported malfunctions of a NAVAID must be reported to this organization.	Q: These lights are emitted outward from the runway to indicate the landing threshold.
A5	What is the Sequencing Program? (M2F42)	What is the ATC System Command Center (ATCSCC)? (M2F41)	What is the non-landing portion of the runway? (M3(F13)	What is 5 miles? (M4F20)	Technical Operations or appropriate personnel? (M5F6)	A: What are green lights or threshold lights? (M3F27)

BLOCK 1 - ROUND 2

	EYE IN THE SKY	**ORDERS & MANUALS**	**PAPERWORK**	**NAS & ATC**	**AIRPORTS**	**POTPOURRI**
Q1	The radio detection device which provides information on range, azimuth, and/or elevation of objects.	The document that prescribes air traffic procedures and phraseology used by en route and terminal air traffic controllers.	Specifying an agreement or procedure between two positions within a facility requires this document.	The two tower positions that initiate control instructions.	This type of landing area is signified by a red "H" on a white cross.	ATC and NAS are the acronyms for these.
A1	What is radar? (M6F4)	What is FAA Order JO 7110.65? (M7F6)	What is Standard Operating Procedure? (M8F6)	What are the Local and Ground Control positions? (M2F34)	What is a hospital heliport? (M3F19)	What are Air Traffic Control and National Airspace System? (M2F2,10)
Q2	The system that uses both a ground-based interrogator and an aircraft-based transponder.	The word that means that the procedure is recommended.	This document supplements interfacility operational and procedural instructions.	The first duty priority of the Air Traffic Controller.	These lights emit a blue color.	Right turns and a 1-minute legs describe.
A2	What is secondary radar? (M6F10)	What is "should"? (M7F7)	What is a Letter of Agreement? (M8F3,4,6)	What are separating aircraft and issuing safety alerts? (M2F24)	What are taxiway edge lights? (M3F31)	What is a standard holding pattern below 14,000 feet MSL? (M4F32)
Q3	The radar system that relies solely on reflected radio signals.	A Notice issued by FAA Headquarters.	This document defines jurisdictional boundaries of each sector.	The ATC facility that provides air traffic control services to aircraft on IFR flight plans during the en route phase of flight.	This type of sign has a yellow background with a black inscription.	An area of control responsibility within an ARTCC or TRACON.

A3	What is primary radar? (M6F5)	What is a GENOT? (M7F5)	What is a Standard Operating Procedure? (M8F6)	What is the ARTCC? (M2F37)	What is a taxiway direction sign? (M3F18)	What is a “sector”? (M2F37)
Q4	The five components of the secondary radar system.	The three ways to revise a FAA Order.	This document minimizes manual coordination between air traffic facilities.	The En Route Sector team position which may not accept handoffs via landline communications.	This rotating beacon emits two quick white lights and a green light.	The order that provides direction and guidance for operating and managing air traffic facilities.
A4	What are interrogator, antenna, transponder, decoder, and display? (M6F10)	What are changes, notices and supplements? (M7F4)	What is a Letter of Agreement? (M8F3,4)	What is the Flight Data Position? (M2F37)	What is a rotating beacon at a military airport? (M3F25)	What is FAA Order JO 7210.3? (M7F6)
Q5	This system relies on an aircraft periodically broadcasting its GPS-derived position.	These indicate the location of substantive revisions to an Order.	The persons who may be delegated the authority to approve a Letter of Agreement.	The team(s) responsible for the safe and efficient operation of a facility sector.	These two types of signs have a black background with a yellow inscription and a yellow border.	The order that lists location identifiers authorized by the FAA.
A5	What is ADS-B? (M6F15)	What are bold vertical lines? (M7F5)	Who are ATREPs, Air Traffic Managers, and RADLO? (M8F4)	Who is the Sector Team or Radar Team? (M2F36,37)	What are taxiway and runway location signs? (M3F18)	What is FAA Order JO 7350.9? (M7F6)

BLOCK 1 - FINAL REVIEW

	Radar	Separation	NOTAMS	Radar Principles	Orders and Manuals	
Q	Three advantages of secondary radar	This radar separation is used by Terminal controllers when either aircraft is 40 miles or more from the antenna	This type of NOTAM consists of information that is regulatory in nature pertaining to flight	This type of surveillance system relies on information from ground stations, ADS-B transponders, and GPS satellites.	This document contains approved words and phrase contractions used by FAA personnel	
A	What are longer range, less vulnerable to blind spots and responses not degraded by weather? (M6F11)	What is 5 miles? (M4F20)	What is an FDC NOTAM? (M5F9)	What is ADS-B? (M6F16)	What is FAA Order JO 7340.2? (M7F6)	

BLOCK2 - ROUND 1

	Aircraft Recognition	Aircraft Characteristics	Title 14 CFR Part 91	Introduction to 14 CFR	Principles of Flight	Wake Turbulence
Q1	A P28A has this type of wing placement.	The weight classes of aircraft.	The class of airspace that has no VFR cloud clearance requirements.	The maximum airspeed in a VFR corridor in Class B airspace.	The direction of the airflow produced by an object moving through the air is called this.	This is another name for 'jet blast'.
A1	What is a low-wing? (M11F15)	What are Small, Large, Heavy and Super? (M11F7)	What is Class A? (M14F5)	What is 200 knots? (M13F16)	What is relative wind? (M9F7)	What is thrust stream turbulence? (M10F4)
Q2	The "V"-tail, Category I aircraft made by Beechcraft.	The three basic types of aircraft engines.	This is the range of magnetic courses that IFR aircraft fly if at even altitudes more than 3,000 feet AGL.	The definition of “flight plan.”	In flight, this force counteracts weight.	An aircraft first generates vortices at this time.
A2	What is a BE35 (Bonanza)? (M11F23)	What are reciprocating, turboprop, and turbojet? (M11F14)	What is 180-359 degrees? (M14F18)	What is specified information relating to the intended flight of an aircraft? (M13F8)	What is lift? (M9F11)	What is at the moment the aircraft generates lift or rotation? (M10F8)
Q3	The aircraft designator for a Dehavilland Dash-8.	The two basic types of landing gear.	If takeoff minimums are not prescribed, this is the minimum visibility required for an air taxi aircraft having two engines or less.	An authorization by air traffic control for the purpose of preventing collision between known aircraft, for an aircraft to proceed under specified traffic conditions within controlled airspace.	A rudder controls the movement of an aircraft around this axis.	This aircraft characteristic has the greatest impact on wake turbulence.
A3	What is a DH8A-D? (M11F27)	What are tricycle and conventional (Fixed or retractable also acceptable)? (M11F19)	What is 1 statute mile? (M14F17)	What is an air traffic clearance? (M13F5)	What is the vertical axis (yaw)? (M0F19)	What is weight? (M10F5)
Q4	Usually, the first character(s) in a civilian aircraft designator denotes this.	The aircraft designator for a Beechcraft, Super King Air.	These two conditions must be satisfied before an aircraft can operate IFR in controlled airspace.	This part of Title 14 CFR covers general operating and flight rules.	This defines camber.	The greatest amount of wake turbulence is generated when an aircraft is _____, _____, and _____.
A4	What is the manufacturer? (M11F11)	What is BE20? (M11F27)	What is an IFR flight plan must be filed and an appropriate ATC clearance must be received? (M14F16)	What is Part 91? (M13F11)	What is the curvature of the airfoil from the leading edge to the trailing edge? (M9F8)	What is heavy, clean, and slow? (M10F5)
Q5	A BE20 has this tail configuration and type of engines.	The weight class of an aircraft capable of a takeoff weight of 320,000 pounds, but operating at 290,000 pounds.	A minimum IFR altitude of 2,000 feet above and 4 NM horizontally, from the highest obstacle, is consistent with flight requirements over this type of terrain.	When Federal Aviation Regulations apply to foreign aircraft.	The collective controls this.	The speed at which vortices will travel laterally across the surface if there is no wind.
A5	What is a “T”-tail and twin turboprop engines? (M11F27)	What is heavy? (M11F7)	What is mountainous terrain? (M14F17)	What is when operating within the United States including airspace within 12 NM of the coast? (M13F4)	What is the pitch of a helicopter rotor blade? (M9F28)	What is 2 to 3 knots? (M10F9)

BLOCK 2 - ROUND 2

	ACFT RECOGNITION	ACFT CHARACTERISTICS	Title 14 CFR Part 91	AIRSPACE	PRINCIPLES OF FLIGHT	POTPOURRI
Q1	This commercial Boeing aircraft has four turbojet engines.	The three categories of aircraft.	An appropriate VFR altitude on a magnetic course of 250 degrees and more than 3,000 feet above the surface.	Class B airspace generally extends upward to this altitude.	The three principal airfoils that produce lift on an aircraft.	The four forces affecting aircraft in flight.
A1	What is a B747? (M11F32)	What are Category I, II, and III? (M11F5)	What is even thousands plus 500 feet? (M14F13)	What is 10,000 feet MSL? (M12F5)	What are the wing, propeller, and horizontal tail surface? (M9F8)	What are lift, weight, thrust, and drag? (M9F11)
Q2	This is the aircraft designator for a Bell 222 helicopter.	The three basic wing designs, or planforms.	When a pilot must file a DVFR flight plan.	The purpose of an Alert Area.	Internal pressure decreases at points where speed increases.	Category I aircraft generally operate within this speed range.
A2	What is B222? (M11F25)	What are straight, swept, and delta? M(11F16)	What is when the flight will enter a coastal or domestic ADIZ? (M14F8)	What is identify airspace in which a high volume of pilot training or other unusual aerial activities are taking place? (M12F12)	What is Bernoulli's Principle? (M9F5)	What is 100-160 KTS? (M11F8)
Q3	This is the designator for a Beechcraft Baron.	A twin-engine, turboprop aircraft weighing 14,500 pounds is in this aircraft category.	When approaching a clearance limit, the route a pilot will follow after a radio failure in IFR conditions if no route of flight has been assigned.	A 4096 code transponder with a functioning Mode C is required to enter these types of airspace.	The three factors that affect the density of the air.	An aircraft in this condition has the right-of-way over all other aircraft.
A3	What is BE58? (M11F26)	What is Category III? (M11F23)	What is the route of flight filed in the flight plan? (M14F22)	What are Class A, B, and C? (M12F6)	What are temperature, altitude, and humidity? (M9F13)	What is an aircraft in distress (emergency)? (M13F13)
Q4	A B06 belongs to this category.	The weight range of an aircraft in the small weight class.	The procedure a pilot will be expected to follow, on an IFR flight, after experiencing a two-way radio failure while in VFR conditions.	Type of airspace that is individually tailored and consists of an area of two or more layers.	The most hazardous aspect of structural icing.	Airspace of defined dimensions established beyond 3 NM from the coast of the United States.
A4	What is Category I? (M11F25)	What is 41,000 pounds or less? (M11F7)	What is proceed VFR and land as soon as practicable? (M14F21)	What is Class B? (M12F5)	What is distorts the shape of an airfoil reducing its lift capability? (M9F31)	What is a Warning Area? (M12F11)
Q5	The weight class that includes ANTONOV An-225 (A225).	The types of window shapes on aircraft.	Above this altitude, each occupant of an aircraft shall be provided with supplemental oxygen.	This type of Special Use Airspace is not charted, but may contain activity that could be hazardous to nonparticipating aircraft.	The angle between the chord line of the wing and the relative wind is known as this.	These two requirements must be met before two or more aircraft may fly in formation.
A5	What is Super? (M11F7)	What are oval, round, teardrop, square, and bubble canopy? (M11F18)	What is 15,000 feet MSL? (M14F25)	What is Controlled Firing Area? (M12F12)	What is angle of attack? (M9F9)	What are prior arrangements must be made between the pilots in command and there may not be any paying passengers on board? (M13F13)

BLOCK 2 - FINAL REVIEW

	AIRSPACE	CFRs	TITLE 14 CFR PART 91	PRINCIPLES OF FLIGHT	WAKE TURBULENCE	AIRCRAFT CHARACTERISTICS AND RECOGNITION
Q1	This type of airspace may overlie areas of natural disasters, specific hazards, etc.	These are the three types of domestic flight plans.	The fix, point, or location to which an aircraft is cleared when issued an ATC clearance is called this.	This maneuver is performed by a helicopter whenever the engine is no longer supplying power to the main rotor blades.	When a helicopter is in any type of hover, other pilots should avoid operating within this distance.	This is the designator for the Cessna Skyhawk.
A1	What are Temporary Flight Restrictions (TFR)? (M12F7)	What are VFR, IFR, and DVFR? (M14F6)	What is a clearance limit? (M14F23)	What is an autorotation? (M9F29)	What is 3 rotor diameters of the hovering helicopter? (M10F13)	What is C172? (M11F22)

BLOCK 3 - ROUND 1

	Basic Navigation	Radio and Satellite Navigation	VFR Charts & Publications	En Route IFR Charts	SIDs and STARs	Potpourri
Q1	These parallel the equator and circle the earth.	Number of usable magnetic radials radiated by a VOR.	Charts used for VFR navigation by slow to medium speed aircraft.	These two types of charts and the En Route IFR Area Charts use the same symbols.	Procedures to simplify clearance delivery, expedite departing traffic, and reduce controller workload.	The standard time used in aviation.
A1	What are parallels of latitude? (M5F15)	What is 360? (M16F8)	What are Sectional Aeronautical Charts? (M18F4)	What are the En Route Low and High Altitude Charts? (M19F4)	What are Standard Instrument Departures (SIDs)? (M20F6)	What is Coordinated Universal Time (UTC) or ZULU? (M15F14)
Q2	This line is located at zero degrees longitude.	Three classes of VORs.	This color indicates an airport with a control tower on the Sectional Aeronautical Chart.	What an asterisk (*) before an altitude on a low altitude airway indicates.	A procedure normally assigned by an En Route controller to an arriving aircraft.	Navigation by reference to visible landmarks.
A2	What is the prime meridian? (M15F6)	What is High, Low and Terminal? (M16F9)	What is blue? (M18F8)	What is the MOCA (Minimum Obstruction Clearance Altitude)? (M19F17)	What is a STAR? (M20F8)	What is pilotage? (M15F31)
Q3	The shortest route between two points on a sphere.	This NDB is used in conjunction with the Instrument Landing System (ILS).	Frequencies placed just above a communication box on a Sectional Aeronautical Chart are used to contact this type of facility.	A solid triangles indicates this on an En Route IFR Chart.	How a pilot may indicate that no coded departure procedure is desired.	The ILS approach is not authorized when this component is out of service.
A3	What is a great circle route? (M15F6)	What is a compass locator? (M16F7)	What is a FSS? (M18F9)	What is a compulsory reporting point? (M19F19)	What is by including “NO SID” in the remarks section of the flight plan? (M20F11)	What is the localizer? (M16F17)
Q4	The formula for determining time to a station.	The component of the ILS which provides vertical guidance during the approach.	The chart on which Class B Airspace operating rules are found.	When no altitude is depicted, the MEA on a Jet Route.	The graphic depictions of runways, routes, NAVAIDS, and radials are found in this section of a SID.	The frequency band that TACANs operate in.
A4	What is Time = Distance divided by Rate (Speed)? (M15F20)	What is the glideslope? (M17F15)	What is a Terminal Area Chart (on the reverse side)? M(18F19)	What is 18,000 feet MSL? (M19F38)	What is the planview? (M20F10)	What is UHF? (M16F11)

Q5	A line connecting points of zero magnetic variation.	Generally, the vertical dimensions of a VOR airway.	This indicates the highest terrain or obstruction in a quadrangle on a Sectional Aeronautical Chart.	How Class A airspace is depicted on an En Route Low Altitude Chart.	This procedure is recommended when no SID or radar vector is assigned and may be flown without an ATC clearance.	The ILS reverts to this type of approach procedure when the glideslope fails.
A5	What is an agonic line? (M15F28)	What is 1,200 AGL up to, but not including, 18,000 feet MSL? (M16F32)	What is the MEF or Maximum Elevation Figure? (M18F32)	What is Class A airspace is not depicted? (M19F36)	What is an ODP (Obstacle Departure Procedure)? (M20F6)	What is a nonprecision localizer approach? (M21F24)

BLOCK 3 - ROUND 2

	APPROACHES	PILOT'S ENVIRONMENT	BASIC NAVIGATION	RADIO AND SATELLITE NAVIGATION	SIDs AND STARs	POTPOURRI
Q1	The symbol used to indicate the final approach fix on a non-precision approach.	The instrument that would be affected if the pitot tube became clogged.	Established for every 15 degrees of longitude.	A predetermined geographical position used for route definition and/or progress reporting.	An arrival procedure that may serve either a single airport or more than one airport.	How the boundary of Class C airspace is depicted on a Sectional Aeronautical Chart.
A1	What is the Maltese Cross? (M21F23)	What is the airspeed indicator? (M17F6)	What are time zones? (M15F15)	What is a waypoint? (M16F28)	What is a STAR? (M20F17)	What is a solid magenta line? (M18F10)
Q2	An approach that does not provide vertical guidance.	Degrees of bank are obtained from this instrument.	Higher altitude will have this effect on Indicated airspeed.	The component of the ILS which gives course guidance to the runway centerline.	These are the three sections of a SID or STAR chart.	This is shown in each quadrangle on the Sectional Aeronautical Chart bounded by lines of latitude and longitude.
A2	What is a nonprecision approach? (M21F7)	What is the attitude indicator? (M17F17)	What is indicated airspeed will decrease? (M15F19)	What is the localizer? (M16F15)	What is the margin, planview and textual description? (M20F17)	What is Maximum Elevation Figure (MEF)? (M18F7)
Q3	The altitude at which a pilot, executing a precision approach, must either continue the approach or execute a missed approach.	A gyroscopic instrument that must be aligned to the magnetic compass.	The difference between true and magnetic north.	The vertical dimensions of the jet route system.	The locations of SIDs are listed in the U.S. Terminal Procedures Publications alphabetically in this order.	The omnibearing selector (OBS) is found on this instrument.
A3	What is the Decision Altitude (DA)? (M21F22)	What is a Heading Indicator or Directional Gyro (DG)? (M17F16,17)	What is magnetic variation? (M15F28)	What is 18,000 feet MSL up to and including FL 450? (M16F34)	What is by city then airport name? (M20F6)	What is the VOR? (M17F20)
Q4	This provides precision navigation guidance for exact alignment and descent of aircraft on approach and provides differential augmentation to the GNSS.	The only self-contained, direction-seeking instrument in the cockpit.	A line connecting points of equal difference between true and magnetic north.	Measures slant range in nautical miles.	These are the two types of SIDs.	The obstruction clearance an OROCA on an En Route Low Altitude Chart ensures.
A4	What is GLS? (M21F8)	What is the Magnetic Compass? (M17F11)	What is an isogonic line? (M15F28)	What is DME? (M16F11)	What are Pilot Navigational and Vector? (M20F7)	What is 1000' in non-mountainous areas and 2000' in mountainous areas? (M19F26)
Q5	The altitudes on an instrument approach procedure for emergency use only which do not ensure NAVAID reception.	This computer system allows routes to be preprogrammed by means of a data loader.	True course corrected for the effects of the wind.	The minimum number of GPS satellites required to provide altitude information.	These medium black lines provide navigation to the arrival fix.	The lowest altitude to which descent is authorized on a nonprecision approach.
A5	What are Minimum Safe Altitudes (MSAs)? (M21F17)	What is the Flight Management System (FMS)? (M17F33)	What is true heading? (M15F6)	What is four? (M16F25)	What are transition routes? (M20F19)	What is the Minimum Descent Altitude (MDA)? (M21F25)

BLOCK 3 - FINAL REVIEW

	CHARTS	BASIC NAVIGATION	RADIO & SATELLITE NAVIGATION	VFR CHARTS	IFR CHARTS	SIDs AND STARs
Q	Four of the five publications where ATIS frequencies can be found.	This can be described as 6,076.1 feet or 1.15 SM.	During an ILS approach, these assist the pilot in the transition from instrument flight to visual flight.	How obstruction altitudes are depicted on Sectional Aeronautical Charts.	An “X” inside a flag on an IFR Low Altitude Chart indicates this.	These are the two types of Instrument Departure Procedures (DPs).
A	What are Sectional Aeronautical Charts, VFR Terminal Area Charts, En Route Low Altitude Charts, Chart Supplements, and Terminal Procedures Publications?	What is 1 NM? (M15F13)	What are approach lights? (M16F15)	What is both AGL and MSL? (M18F10)	What is Minimum Crossing Altitude? (M19F19)	What are Obstacle Departure Procedures (ODPs) and Standard Instrument Departures (SIDs) (M20F5)

	APPROACHES	PILOT’S ENVIRONMENT				
Q	This depicts the Final Approach Fix on a precision approach.	The pitot static system provides the sources of air pressure for these instruments.				
A	What is a lightning bolt? (M21F21)	What are the altimeter, vertical speed indicator, and the airspeed indicator? (M17F31)				

BLOCK 4 - ROUND 1

	Weather Fundamentals	Bad Weather	Current Weather	Forecasts	Advisories	Potpourri
Q1	The standard sea level pressure.	The weather phenomenon which contains almost every aviation hazard to an aircraft in flight.	Six of the seven sky conditions.	Expected meteorological conditions for a specified time within 5 SM of an airport.	It's the maximum valid period of a SIGMET for SEV turbulence.	This is an instrumentally derived value that represents the horizontal distance a pilot may see down the runway.
A1	What is 29.92 inches of mercury? (M22F7)	What is a thunderstorm? (M23F28)	What are VV, FEW, SCT, BKN, OVC, SKC and CLR? (M24F36)	What is a Terminal Aerodrome Forecast? (M25F5)	What is 4 hours? (M25F17)	What is Runway Visual Range (RVR) (M24F24)
Q2	The layer of the atmosphere where most of the world's weather is found.	The weather phenomenon that is characterized by a change in wind speed and/or direction in a short distance.	A non-routine aviation weather report is called this.	The four times a day a TAF is issued.	Three types of in-flight weather advisories.	A sky cover of five-eighths is reported as this.
A2	What is the troposphere? (M22F6)	What is wind shear? (M23F18)	What is a SPECI (Special)? (M24F9)	What are 0000, 0600, 1200 and 1800Z? (M25F6)	What are SIGMETs, Convective SIGMETs, and AIRMETs? (M25F16)	What is BKN (broken)? (M24F36)
Q3	The phenomenon characterized by a rise in temperature as altitude is increased.	The type of turbulence that is caused by very warm surface temperatures and uneven heating of the Earth's surface.	This indicates precipitation of moderate intensity.	The altitude above which all temperatures are understood to be negative in a FB.	Three characteristics of a severe thunderstorm.	In a METAR or a TAF, wind direction is given in reference to this
A3	What is a temperature inversion? (M22F6)	What is convective turbulence? (M23F16)	What is the lack of an intensity qualifier? (M24F32)	What is FL 240? (M25F30)	What are winds of 50 knots or greater, hail 3/4 inch or greater in diameter, or tornadoes? (M25F18)	What is true north? (M24F18)
Q4	Relatively strong winds concentrated within a narrow, horizontal band in the upper troposphere.	The three ingredients necessary for thunderstorm formation.	How a partial obscuration is encoded in the body of a METAR.	PROB30 is used in a TAF when this is expected.	The alphabetic designator for an AIRMET for moderate icing.	TAFs are normally valid for this amount of time.
A4	What is the Jet Stream? (M22F6)	What are water vapor, unstable air, and lift? (M23F29)	What is FEW000, SCT000 or BKN000? (M24F37)	What is "when the likelihood of a thunderstorm or precipitation is 30 percent"? (M25F13)	What is ZULU? (M25F20)	What is 24 or 30 hours? (M25F34)
Q5	This is the change of ice directly to water vapor.	The description of severe icing.	Variable visibility is encoded in a METAR this way.	In a TAF, wind shear is forecast up to this altitude.	A plain language, non-technical description of weather used by TMU for planning purposes.	The measurement used in a PIREP to report cloud base heights.
A5	What is sublimation? (M22F10)	What is the rate of accumulation is such that deicing equipment fails to control the hazard, making immediate flight diversion necessary? (M23F25)	What is by showing the minimum and maximum visibility in remarks preceded by VIS and separated by "V"? (M24F54)	What is 2,000 feet AGL? (M25F10)	What is a Meteorological Impact Statement? (M25F26)	What is hundreds of feet MSL? (M26F15)

BLOCK 4 - ROUND 2

	POT LUCK	PIREPs	FORECASTS AND ADVISORIES	BAD WEATHER	METAR	DECODING
Q1	The prefix for three-letter station identifiers for all weather-reporting stations in the conterminous United States.	The purpose of a PIREP.	The identifier for this product is WST.	The four turbulence intensities.	This is an instrumentally derived value that represents the horizontal distance a pilot may see down the runway.	00000KT is spoken as this (decode).
A1	What is K? (M25F6)	What is to report meteorological conditions in flight? (M26F4)	What is Convective SIGMET? (M25F18)	What are light, moderate, severe, and extreme? (M23F19)	What is Runway Visual Range (RVR)? (M24F24)	What is WIND CALM? (M24F19)
Q2	While not particularly hazardous to en route aircraft, this weather phenomenon is very dangerous on approach.	Towers and TRACON's use PIREPs for this purpose.	This group supersedes all previously forecast weather in a TAF.	The four intensities of icing.	The unit of measurement for wind, visibility and altimeters in a U.S. METAR.	10SM is spoken as this (decode).
A2	What is wind shear, LLWS, or microburst? (M23F30,35)	What is to expedite the traffic flow in the vicinity of an airport or provide hazardous weather avoidance procedures? (M26F6)	What is a FM ("from") change indicator group? (M25F11)	What are trace, light, moderate, and severe? (M23F25)	What is knots, SM and inches of mercury? (M24F23,48)	What is VISIBILITY ONE ZERO? (M24F23)
Q3	It's the ratio of actual water vapor to the maximum amount of vapor a parcel of air could hold.	The lowest turbulence intensity level at which controllers must solicit PIREPs.	TEMPO is used in a TAF when this is expected to occur.	The size criteria for a microburst.	The unit of measurement used to describe cloud base heights in a METAR.	M1/4SM is spoken as this (decode).
A3	What is relative humidity? (M22F10)	What is moderate intensity? (M26F7)	What are temporary fluctuations to the forecast conditions? (M25F12)	What is up to 2.5 miles in diameter? (M23F30)	What are hundreds of feet AGL? (M24F37)	What is VISIBILITY LESS THAN ONE-QUARTER? (M24F23)
Q4	In the body of a METAR report, it is the type of visibility that is always reported, followed by "SM".	In a PIREP, the controller must include this, along with type aircraft, altitude, and aircraft position.	Three weather phenomena reported in the body of a METAR, but not forecast in a TAF.	The beginning of precipitation indicates this stage of the thunderstorm.	The difference between SKC and CLR.	32012G22KT 280V350 is spoken as this (decode).
A4	What is prevailing visibility? (M24F23)	What is the time? (M26F8)	What are RVR, temperature, dew point, and altimeter? (Variable wind direction and TCUs also acceptable) (M25F5)	What is the mature stage? (M23F29)	What is SKC is reported at manual stations when no layers are present and CLR is reported at automated stations when no layers are detected at or below 12,000 feet above the surface? (M24F39)	What is WIND THREE TWO ZERO AT ONE TWO, GUSTS TWO TWO, WIND VARIABLE BETWEEN TWO EIGHT ZERO AND THREE FIVE ZERO? (M24F19)
Q5	On a PIREP form, or in a PIREP, /TM, /TB, /FL, and /RM are all called this.	Four of the seven phenomenon requiring an Urgent PIREP (UUA) classification.	How 690948 in an FB would be spoken.	Wind shear produces the greatest hazard to aircraft during these phases of flight.	Three of the four METAR elements that are not announced as "missing" when absent from a report.	R17/M0600FT is spoken as this (decode).

A5	What are Text Element Indicators (TEIs)? (M26F9)	What are tornadoes, severe or extreme turb, severe icing, hail, LLWS, volcanic activity or any other weather conditions hazardous to flight? (M26F5)	What is WIND ONE NINER ZERO AT ONE ZERO NINER, TEMPERATURE MINUS FOUR EIGHT? (M25F8)	What are takeoff and landing? (M23F34)	What is Report Modifier, RVR, Present Weather group and Remarks? (M24F9)	What is RUNWAY ONE SEVEN RVR LESS THAN SIX HUNDRED? (M24F25)

BLOCK 4 - FINAL REVIEW

	WEATHER FUNDAMENTALS	**PIREPs**				
Q1	Temperatures and dew points below zero are prefixed in this way.	Five of the eight conditions (forecast or reported) which require solicitation of PIREPs.				
A1	What is with the letter "M"? (M24F46)	What are ceilings AOB 5,000, VIS AOB 5SM, TS, MOD+ turb., LGT+ icing, wind shear, VA, detection of sulfur gases, or braking advisories in effect? (M26F7)				

BLOCK 5 - ROUND 1

	Pass The Word	How Do You Say?	Say It "By The Numbers"	Clearance Clearance	Get Me Outta Here	Mark IT!
Q1	Transfer of radar identification with intent to transfer communications.	RNAV Route Q142.	An altitude of 14,700 feet is spoken as this.	Situation in which the pilot does not have to cancel IFR.	The step of Position Relief Briefing in which the relieving specialist indicates that the verbal briefing may begin.	"OTP"
A1	What is a handoff? (M29F46)	What is "Q One Forty-Two"? (M29F40)	What is "One four thousand, seven hundred"? (M29F16)	What is when landing at an airport with a functioning control tower? (M30F5)	What is preview the position? (M29F54)	What is "VFR conditions-on-top"? (M31F17 – M31aF15)
Q2	The transfer of communications should occur at this time.	IFR Military Training Route 17.	An MDA of 1,310 feet is spoken as this.	First item in a departure clearance.	The step in which the specialist being relieved summons assistance if needed.	"@"
A2	What is after the handoff has been accepted? (M29F51)	What is "I R Seventeen"? (M29F39)	What is "Minimum Descent Altitude one three one zero"? (M29F17)	What is the aircraft Identification? (M930F6)	What is review the position? (M29F55)	What is "at" (M31F18 – M31aF16)
Q3	A physical or automated action to transfer radar identification ONLY.	The call sign S21523.	An altimeter setting of 30.05 is spoken as this.	Authorization to execute an instrument approach.	The step in which the specialist being relieved briefs the traffic situation.	">"
A3	What is a point out? (M29F46)	What is "Sam Two One Five Two Three"? (M29F35)	What is "Altimeter three zero zero five"? (M29F21)	What is an approach clearance? (M30F11)	What is the verbal briefing? (M29F55)	What is 'before'? (M31F18 – M31aF16)
Q4	After completing a handoff this must be done before an aircraft enters the receiving controller's area of jurisdiction.	The call sign E47539.	A surface wind of 29010G24 is spoken as this.	Authorization for a pilot to depart the airport from a runway.	All items are completed by the relieving specialist in this step.	"/"
A4	What is transfer radio communications? (M29F51)	What is "Air Evac Four Seven Five Three Niner"? (M29F35)	What is "Wind two niner zero at one zero, gusts two four"? (M29F21)	What is a takeoff clearance? (M30F10)	What is preview the position? (M29F54)	What is "until'? (M31F18 – M31aF16)
Q5	The transfer of separation responsibility from one controller to another is known as this.	The call sign L31754.	How frequency 126.275 is spoken.	Authorizes the pilot to make intermediate stops while en route to a final destination.	The step in which the relieving specialist indicates that the position responsibility is assumed.	"W" with a circle around it.
A5	What is transfer of control? (M29F51)	What is "Logair Three One Seven Five Four"? (M29F35)	What is "One two six point two seven"? (M29F23)	What is a through clearance? (M30F12)	What is assumption of position responsibility? (M29F55)	What are 'Local Special VFR Operations'? (M31F18 – M31aF16)

BLOCK 5 - ROUND 2

	EMERGENCIES	SEARCH AND RESCUE	AIR/GROUND	LOST AND FOUND	SAY WHAT?	DÉJÀ VU
Q1	The person who has final responsibility for the course of action to be followed in an emergency.	An aircraft on an IFR flight plan, estimated over a specified reporting point at 0625, has failed to report. The aircraft is considered overdue at this time.	The conditions required for pilots to interrupt radio monitoring of ATC.	Transponder code 7600 indicates this.	Standardized phonetics from this organization are used for the pronunciation of numbers and letters.	This is how words and phrases frequently used in pilot/controller communications are printed in FAA Order JO 7110.65.
A1	What is the Pilot in Command? (M27F9)	What is 0655? (30 min) (M28F5)	What is pilot requested, ATC approved and for a defined period of time? (M29F8)	What is radio failure? (M27F15)	What is ICAO? (M29F10)	What is in bold italics? (M29F12)
Q2	121.5 VHF and 243.0 UHF are referred to as this.	The two organizations that are responsible for the physical search of the contiguous U.S. and the maritime region.	The correct way to say FL 304.	This facility initiates Search and Rescue procedures when no flight plan has been filed.	This prefix is used when a controller is establishing initial communications with U.S. registered civil aircraft.	Use these words to interrupt lower priority messages.
A2	What are the universal emergency frequencies? (M27F5)	What are the U.S. Coast Guard and U. S. Air Force? (M28F7)	What is "Flight level three zero four"? (M29F17)	What is the Flight Service Station (FSS). (M28F6)	What is NOVEMBER? (M29F33)	What are "Emergency" and "Control"? (M29F45)
Q3	An emergency may be declared by any one of these.	This organization is responsible for the communications search for missing aircraft under the National Search and Rescue Plan.	The correct phraseology to assign this beacon code: 4622.	An aircraft on a VFR flight plan is considered overdue at this time.	E = AIR EVAC, L = LOGAIR, and S = SAM are examples of this.	The preferred method for intrafacility coordination.
A3	What are the pilot, ATC facility personnel, or aircraft owner/officials responsible for operation of the aircraft? (M27F6)	What is the FAA? (M28F6)	What is "Squawk four six two two"? (M29F22)	What is ETA plus 30 minutes? (M28F9)	What are special military operations call signs? (M29F35)	What is "via interphone"? (M29F42)
Q4	The minimum required information for handling an emergency.	The interagency agreement that provides for the effective utilization of all facilities during search and rescue missions.	The correct phraseology to state a magnetic heading of 90 degrees.	An unexpected loss of radar contact and communication constitutes this.	This phraseology requires that good judgment must be exercised.	This piece of equipment emits a distinct audio tone on 121.5 MHz and 243.0 MHz.
A4	What are the aircraft identification and type, nature of emergency, and pilot's desires? (M27F8)	What is the National Search and Rescue Plan? (M28F4)	What is "heading zero niner zero"? (M29F22)	What is an emergency? (M27F6)	What is nonstandard phraseology? (M29F13)	What is an ELT? (M27F7)
Q5	The definition of a distress condition.	The notice issued after all responses to an INREQ are negative.	When controllers must identify their ATC unit.	An ALNOT search includes this geographic area.	These are to be monitored continuously.	The 4 items, in correct sequence, to complete a point-out.
A5	What is an aircraft that is threatened by serious and/or imminent danger which	What is an ALNOT? (M28F12)	What is "on initial contact"? (M29F30)	What is 50 miles on either side of the route of flight from the last reported position to the destination?	What are interphones and assigned radio frequencies? (M29F8)	What are "Point-out", target position, ACID and altitude? (M29F47)

	requires immediate assistance? (M27F5)			(M28F11)		

BLOCK 5 - FINAL REVIEW

	Phraseology					
Q1	It is the phraseology to complete this handoff; SWA35, FL190, OKC240050 .	.				
A1	What is "Handoff, five-zero miles southwest of Oklahoma City, Southwest thirty-five, flight level one niner zero"? (M29F47)					

FACILITATOR INSTRUCTIONS	DELIVERY METHOD
■ **ENABLE *End-of-Course Test*** link in Blackboard ■ Instruct students to navigate to the ***End-of-Course Test*** link in Blackboard ■ ***Note:*** This test is scored and students must receive a score of 70% or higher ■ ***Note:*** Students must receive a passing score to advance to next level of training ■ Instruct students the test consists of 182 multiple choice questions ■ Instruct students they will have 2.5 hours to complete the test ■ Inform students once the test begins, a timer displays in Blackboard showing the amount of time remaining and will end the test when time expires ■ ***Note:*** Instruct students to choose "Cancel" if they receive a warning message that the test has unanswered questions; choosing OK will submit the test and not allow them to go back and answer the questions ■ Instruct students to select Begin to start the test ■ During test, monitor students to ensure a secure testing environment ■ After test, discuss results with students individually ■ Inform students when they have completed the test they may quietly leave the classroom ■ Establish student return time and inform students	Blackboard Assessment **EST. RUN TIME** 2.5 hours