CEFC Instructor Standardization Manual

Course: Instrument Rating
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Objective

The primary objective of this document is to define procedures that are specific to CEFC operations. Secondary objectives of this document are to expand on areas that, in the opinion of the Chief CFI and Staff are consistently weak on Instrument Rating progress checks and to define the level of understanding that is expected.

An effort has been made to repeat as little of what has already been published in the following documents:

- Instrument Rating Practical Test Standards
- Airplane Flying Handbook (FAA-H-8083-3A)
- Instrument Flying Handbook (FAA-H-8083-)
- Pilot’s Handbook of Aeronautical Knowledge (FAA-H-8083-25)
- CBI for Instrument Pilot’s
- Pilot’s Operating Handbook and AFM
- Cessna Single Engine Operations Manual (SEOM)

This Standardization Manual is to be used in conjunction with these resources. If an item is listed in the PTS as a completion standard, but is listed in this manual, it has been found to be common error. These errors will be denoted by a star (*).

If the area under a TASK is left blank, in the view of the Chief CFI and Staff, the published material covers the subject in sufficient scope and needs no further explanation.

Note: Information considered directive in nature is described in this manual in terms, such as “shall” and “must” indicating the actions are mandatory. Guidance information is described in terms, such as “should” and “may” indicating the actions are desirable but not mandatory.

Special Emphasis Areas

*The students shall have knowledge of the Special Emphasis Areas listed in the PTS.
I. AREA OF OPERATION: PREFLIGHT PREPARATION

A. TASK: WEATHER INFORMATION

Plain language weather is acceptable, as well as telephone briefings. However, at a minimum, students must demonstrate the ability to decipher the following undecoded weather sources:

- METAR
- TAF
- Winds and Temperature Aloft

*In addition, students shall know how to find and interpret graphic weather products.

Special emphasis will be placed by the check airman to determine the student’s understanding of AIRMETs and SIGMETs, as well as known icing conditions.

Beyond just knowing how to interpret weather information, students must follow a GO / NO GO decision-making process. It is recognized that one process cannot suffice for all sets of circumstances. However, having a baseline is important in setting a strong foundation for students to build upon. The following is a hierarchy of where students should begin their decision-making process:

- FAR’s / Aircraft Limitations
- SEOM
- Risk Assessment
- Personal Minimums
- Seek the guidance of a flight instructor

This same process can also be used in developing a strategy or plan of action for avoiding potential weather encounters.

B. TASK: CROSS COUNTRY FLIGHT PLANNING

*Students are expected to be familiar with EVERYTHING on all instrument related charts including those items located in the margins. *They must also have a thorough understanding as to what is contained in the AFD.

- A flight plan created on Duats is acceptable, however, the students must be able to create and file a flight plan using traditional means.
- *Students must have a thorough knowledge of GPS (to include OBS functionality) and RAIM capability and be able to explain what that means to them.
- Students should know how to create user waypoints that would enable them to comply with ATC clearances. In addition, they should know how to load a route including airways into the G1000’s flight plan feature. This can be easily performed by mimicking the airway using the waypoints that define it.
- *Students shall understand L, D, and FDC NOTAMs as well as the printed NOTAMs book (FDC NOTAMs), EFAS and FSS services.
II. AREA OF OPERATION: PREFLIGHT PROCEDURES

A. TASK: AIRCRAFT SYSTEMS RELATED TO IFR OPERATIONS

B. TASK: AIRCRAFT FLIGHT INSTRUMENTS AND NAVIGATION EQUIPMENT

- Students shall be able to explain the operating characteristics for all primary and standby flight instruments.
- In addition, students should understand how the failure of components affects other components/indications as a result of integration (both G1000 and autopilot).
- Students must be intimately familiar with the KOEL.

C. TASK: INSTRUMENT COCKPIT CHECK

- The following bullets outline the required G1000 setup for all CEFC operations:
  - MFD Data Bar Fields: GS, ETE, XTK, MSA
  - Moving Map Orientation: Track Up or Heading up
  - PFD Time and Temperature format: UTC, Celsius
  - Flight Plan inset window: DTK and CUM
  - PFD Inset Map Overlays: Traffic, Terrain
    - TOPO optional
  - MFD Overlays: Traffic
    - TOPO, NEXRAD, XM LTNG optional
    - No Terrain
  - Airspace Alerts: all OFF except Restricted Areas
- Students shall use the COM radios in the following manner:
  - Use COM # 2 for ATIS/AWOS/ASOS, Clearance, and Ground communication and COM # 1 for Tower, Departure/Approach, Center, and CTAF communication.
  - Pre-load next frequencies in standby position if known.
- *Students shall be familiar with all preflight cockpit checks with a special emphasis placed on the autopilot preflight check as well as the GPS # 2 check on the G1000 equipped aircraft.

III. AREA OF OPERATION: AIR TRAFFIC CONTROL CLEARANCES AND PROCEDURES

A. TASK: AIR TRAFFIC CONTROL CLEARANCES

- Students must know ALL ways to pick up an IFR clearance, including how to receive a pop up clearance. The ways are:
  - Clearance Delivery
  - Ground Control
  - Tower
B. TASK: COMPLIANCE WITH DEPARTURE, EN ROUTE, AND ARRIVAL PROCEDURES AND CLEARANCES

C. TASK: HOLDING PROCEDURES
   - Speed: 90 KIAS
   - When doing a published hold in conjunction with an approach loaded into the G1000’s flight plan, use the flight plan inset for timing or distance.
   - *Students must know how to hold without the use the MFD. In addition, they must know how to correct for wind on the inbound and outbound leg of the holding pattern.
   - *Students must know how to enter unpublished holds.
   - *Students must strive to achieve a 1 minute inbound leg.

IV. AREA OF OPERATION: FLIGHT BY REFERENCE TO INSTRUMENTS

A. TASK: BASIC INSTRUMENT FLIGHT MANEUVERS
   - Any maneuver is fair game for testing with the exception of commercial and ground reference maneuvers.
   - If the students are being tested in a G1000 equipped aircraft they will not be expected to perform timed turns to magnetic compass headings. It’s just not practical; the student should simply follow the course line drawn on the MFD.
   - There is still some relevance in understanding magnetic compass turns. While these also depend upon a coordinated, standard rate turn, the student should know compass errors and how to compensate for them. This will allow them to crosscheck their magnetic compass to ensure the GPS is indicating correctly in a failure situation.

B. TASK: RECOVERY FROM UNUSUAL FLIGHT ATTITUDES

Students should practice these with and without primary flight instrument indications.
V. AREA OF OPERATION: NAVIGATION SYSTEMS

TASK: INTERCEPTING AND TRACKING NAVIGATIONAL SYSTEMS AND DME ARCS

- Students should be able to decode waypoint names that the Jeppesen database uses to identify IAF and lead radials for DME Arcs.
- Students must know how to intercept and track a DME Arc without the aid of the G1000 GPS flight plan sequencing (in other words, an unpublished DME Arc).
- In addition, they should know how to use the bearing pointers on the G1000 PFD. Anytime students are performing a DME Arc, they must have the appropriate bearing pointer displayed on the HSI.

VI. AREA OF OPERATION: INSTRUMENT APPROACH PROCEDURES

- Students shall use 90 KIAS as their default airspeed to maintain during approaches. However, they must practice using faster speeds so they have the ability to blend with the ATC environment when requested, however, this will not preclude the student from making a decision and telling ATC that they are unable.
- Students shall know when the G1000 automatically switches navigation sources and what affect that has on autopilot operation. In addition, they should know when to manually switch the navigation source when executing an approach where the G1000 does not switch it for them.
- As a standard procedure, students shall place the altitude reference at the MDA or DA, rounded up to the nearest one hundred feet.
- Students must know how to use the autopilot for all approaches.
- Students shall perform an approach briefing which contains the following elements:
  - Airport and Approach Name
  - Primary NAVAID Frequency and Where the G1000 Loaded It
  - Approach Course
  - MDA or DA
  - MAP and Procedure

A. TASK: NONPRECISION APPROACH (NPA)

Students should be taught to calculate a predetermined decent point (some call it a VDP). This will help them see that if they are at MDA at the MAP, there is no way they can descend to the runway and land using normal maneuvers. This can be easily done by dividing the HAT by 300 (as in 300 feet per NM). This will give them a distance from the runway at which they should have the runway in sight in order to land using normal maneuvers. Example: 330 HAT / 300’ per NM = 1.1 nm. So, the runway should be in sight at least 1.1 nm out. Of course, some VDPs are published on approach charts.
B. TASK: PRECISION APPROACH (PA)

C. TASK: MISSED APPROACH

When flying a G1000 equipped aircraft, students should first change the CDI back to GPS mode (if it is not already there) and then press the SUSP key.

D. TASK: CIRCLING APPROACH

Students will be verbally tested on the procedure for executing a missed approach while circling (climb and turn towards the airport, then as published).

E. TASK: LANDING FROM A STRAIGHT IN OR CIRCLING APPROACH

VII. AREA OF OPERATION: EMERGENCY OPERATIONS

A. TASK: LOSS OF COMMUNICATIONS

Students shall be able to explain how to apply the rules to a scenario rather than just reciting the regulations.

B. TASK: NOT APPLICABLE

C. TASK: NOT APPLICABLE

D. TASK: APPROACH WITH LOSS OF PRIMARY FLIGHT INSTRUMENT INDICATORS

- Upon simulation of the failure, in addition to flying the airplane, the students shall:
  - Simulate informing ATC of the failure.
  - Reference the appropriate checklist.
  - Use the autopilot to reduce workload.

VIII. AREA OF OPERATION: POST FLIGHT PROCEDURES

TASK: CHECKING INSTRUMENTS AND EQUIPMENT
Appendices

APPENDIX 1: APPROACH PREPARATION

Before beginning ANY approach procedure the following pre-approach checklist must be accomplished:

(S) Select- the approach to be executed

(L) Load- the approach into the G1000 flight plan (activate if necessary)

(I) Identify-in which NAV radio the primary navaid is loaded (if applicable)

(M) Marker-beacons activated (if applicable)

(E) Entry-for the course reversal (either procedure turn or holding pattern in lieu of)

(E) Estimate-wind direction and how it will be corrected for

Perform approach briefing
APPENDIX 2: PRECISION APPROACH OPERATIONS

At Initial Approach Fix (IAF)

- Perform 4 T’s
  - (T) Time - G1000 starts time for the hold; be sure to have flight plan inset displayed on PFD
  - (T) Turn - to the appropriate heading or course
  - (T) Transition - reduce throttle to approximately 2100 RPM, slow to 90 KIAS, and descend if needed
  - (T) Talk - inform ATC if previously instructed or transmit over CTAF

- Perform Before Landing Checklist

At Procedure Turn Inbound

- Perform 4 T’s
  - (T) Time - G1000 starts time for the hold; be sure to have flight plan inset displayed on PFD
  - (T) Turn - to the appropriate heading or course
  - Verify the G1000 switched the NAV source and slewed the front course
    - Select APR mode on the autopilot if applicable
  - (T) Transition - descend is needed
  - (T) Talk - inform ATC if previously instructed or transmit over CTAF

At Final Approach Fix (FAF) Inbound

- Perform 4 T’s
  - (T) Time - there is no need to start a timer, just scan the clock on the PFD to note the time
  - (T) Turn - to the appropriate heading or course
  - (T) Transition - reduce throttle to approximately 1500 RPM (or as required) to maintain 90 KIAS during descent; 0 to 10° of flaps is acceptable for precision approaches
  - (T) Talk - inform ATC if previously instructed or transmit over CTAF

At the Missed Approach Point (MAP)

- Apply Full Power
- Retract Flaps (if extended)
- Pitch to establish 74 KIAS
- Fly the missed approach procedure
- Report the missed to ATC
APPENDIX 3: NON-PRECISION APPROACH OPERATIONS

At Initial Approach Fix (IAF)

- Perform 4 T’s
  - (T) Time - G1000 starts time for the hold; be sure to have flight plan inset displayed on PFD
  - (T) Turn - to the appropriate heading or course
  - (T) Transition - reduce throttle to approximately 2100 RPM, slow to 90 KIAS, and descend if needed
  - (T) Talk - inform ATC if previously instructed or transmit over CTAF
- Perform Before Landing Checklist

At Procedure Turn Inbound

- Perform 4 T’s
  - (T) Time - G1000 starts time for the hold; in the case of a TAA GPS approach, mileage will display rather than time; be sure to have flight plan inset displayed on PFD
  - (T) Turn - to the appropriate heading or course
    - For VOR approaches, switch the NAV source on the G1000 and select the proper course
      - Select APR mode on the autopilot if applicable
    - For LOC BC approaches, switch the NAV source on the G1000 and verify that the head the CDI is on front course
      - Select REV mode on the autopilot if applicable
    - For GPS approaches, if within 2 miles of the FAF, verify that the CDI displays APR, which indicates RAIM is available.
  - (T) Transition - descend is needed
  - (T) Talk - inform ATC if previously instructed or transmit over CTAF

At Final Approach Fix (FAF) Inbound

- Perform 4 T’s
  - (T) Time - there is no need to start a timer, just scan the clock on the PFD to note the time
  - (T) Turn - to the appropriate heading or course
  - (T) Transition - reduce throttle to approximately 1500 RPM (or as required) to maintain 90 KIAS during descent; flaps as necessary for non-precision approaches
    - Students shall use the “dive and drive” method for non-precision approaches; minimum of 700 fpm decent; maximum of 1000 fpm decent
  - (T) Talk - inform ATC if previously instructed or transmit over CTAF

At the Missed Approach Point (MAP)

- Apply Full Power
- Retract Flaps (if extended)
- Pitch to establish 74 KIAS
➤ Fly the missed approach procedure
➤ Report the missed to ATC
APPENDIX 4: VARIOUS ACRONYMS USED FOR INSTRUMENT FLYING

Required Documents on Aircraft
§91.9 and §91.203

A – Airworthiness  
R – Registration  
O – Operating Limitations  
W – Weight and Balance

Required Aircraft Inspections
§91.171; §91.207; §91.409; §91.411; §91.413; §91.417

A – Airworthiness Directives (AD’s)  
A – Annual Inspection (12 calendar Months)  
V – VOR Check (30 days, IFR only)  
I – 100 hour (if for training/hire)  
A – Altimeter (Pitot-Static, 24 calendar months)  
T – Transponder (24 calendar Months)  
E – ELT (inspected every 12 calendar months, ½ of battery, or 1 cumulative hour of use)

IFR Flight Required Equipment
§91.205(d)

Everything for VFR day and night (if appropriate) plus the following:  
G – Generator/Alternator  
R – Radios (Appropriate For Flight)  
A – Altimeter  
B – Ball (Inclinometer)  
C – Clock (Second Hand Sweep or Digital)  
A – Attitude Indicator  
R – Rate of Turn  
D – Directional Indication

IFR Communications Failure
§91.185

Altitude (Highest of):  
M – MEA  
E – Expected  
A – Assigned  
Route: Ave F  
A – Assigned  
V – Vectored  
E – Expected  
F – As Filed
AIM 5-3-3 IFR Compulsory Reporting Points
Only when “Radar Contact Lost” or “Radar Service Terminated”
(I PTA TEN)

I – ID of Aircraft
P – Position
T – Time
A – Altitude
T – Type of Flight Plan
E – ETA of Next Checkpoint
N – Name of Next Checkpoint (after the above)

Operation Below MDA or DA §91.175 (c)

1) Aircraft is continuously in a position from which a descent to a landing can be made
   using normal maneuvers.

2) The flight visibility is not less than the visibility prescribed.

3) One of the following is distinctly visible
   i. The approach light system
      -Can now descend to 100’ above TDZE

Any of the following in sight will allow descent to the ground.

   ii. Red Terminating or Red Side Row Bars
   iii. Runway End Identifier Lights (REIL)
   iv. Visual Approach Slope Indicator (VASI)
   v. Threshold
   vi. Threshold Lights
   vii. Threshold Markings
   viii. Runway
   ix. Runway Lights
   x. Runway Marking
   xi. Touchdown Zone
   xii. Touchdown Lights
   xiii. Touchdown Markings