

EAA Proficiency365 Lesson Plan

MISSION ID: EAA 1907 - IFR Exercise: **Arc of a Driver** (20 mins)

MISSION SUMMARY: The VOR DME Rwy 15 at Martin State (KMTN) is an aviation icon. The advent of GPS has made flying a DME Arc easier but you'll still need to be on your game for the step downs on the way to KMTN. Too easy? Then fly it in VLOC mode using the bearing pointer and course arrow on your simulator and keep your eyes off the moving map. Oh... and if you have to go missed then you're on for intercepting another Arc. Old school, the way it was done back in the day.

THE OBJECTIVE: Instruct the pilot-in-training to fly a VOR DME Arc in the new or old fashion way. Whether steering by GPS or VLOC, pilots will be managing multiple step downs as they make their way around the arc to runway 15 at Martin State. Once down at the MDA (920') the pilot-in-training (P-I-T) will still need their hunting license to find the runway environment. It's down there alright - with rain and some sporty winds. Welcome to KMTN.

INSTRUCTOR NOTES: The instructors for this scenario really need to be CFIs who are conversant with the full capabilities of the G1000 and know how to fly a DME arc.

The exercise originates on the 151° radial from EMI, five (5) miles NW of the SLOAF IAF, cleared "direct SLOAF, cross SLOAF at or above 2600'". The weather at KMTN is IFR with a decent crosswind, light turbulence and rain.

April 2, 2019 1319 EDT or 1719 Zulu.

KMTB 021719Z 12015 2SM +RA OVC010 15/13 A2992

The P-I-T has been cleared for the VOR DME Rwy 15 to KMTN, crossing SLOAF at or above 2600'. You're on Potomac Approach (119.0).

There are a variety of ways that this approach can be flown: either GPS or VLOC mode, coupled or hand flown.

The easiest way is to allow the GPS to provide guidance with the autopilot coupled in NAV mode. In this case all the P-I-T has to do is control the step downs (this could be coupled using altitude pre-select and VPTH or VS).

Another way would be to have the GPS provide the lateral guidance and have the P-I-T fly with the autopilot in HDG mode plus altitude pre-select and VPTH or VS. Alternatively the P-I-T could hand fly with the GPS still providing lateral guidance. (If they want to fly with the flight director, then that would include some automation management.)

Kicking things up a notch we can switch to VLOC mode using the CDI button to make the switch. In this case the pilot should use the bearing pointer (tuned to the BAL VOR [115.1]) to provide situational awareness of DME distance and bearing from the VOR, and the course arrow (also tuned to the BAL VOR) with the tail of the arrow on the radials that define the successive waypoints. In addition, if adding automation management to the scenario the pilot would need to be in HDG mode along with altitude pre-select and VS.

Take time to brief the approach with the P-I-T and note the step downs, discussing how they will be identified, along with how they will identify the MAP (if flying the arc with GPS guidance the GPS will sequence to each fix. If flying in VLOC mode they are identified by radials off the BAL VOR). If they have to go missed they'll have to track inbound on the BAL 068° radial to intercept the 11 DME arc and fly it clockwise to BOAST intersection (defined by the 108° radial from BAL).

Have the P-I-T decide how they would like to fly the approach, either in GPS or VLOC mode, and whether coupled or hand flown. If time allows encourage the P-I-T to fly it both ways.

Your P-I-T will want to check the ATIS and start their descent not long after launching so be ready.

TRAINING ELEMENTS:

- Gaining familiarity with a DME arc approach.
- Locating the airport environment at the MDA.
- Transitioning to tricky weather and wind at landing.
- Hand flying the approach either with raw data or with the flight director
- Flying the arc in VLOC mode using the bearing pointer and course arrow
- Automation management.
- Either hand flying the arc in VLOC mode or with the autopilot in HDG mode and descending with VS and altitude preselect.
- How to identify the Missed Approach Point when in VLOC mode
- Introducing the pilot-in-training to the G1000.
- The use of proper pitch/power/configuration to obtain requisite performance without “chasing” airspeeds, or glide slope.
- Developing a good scan.
- Properly and sequentially briefing the approach.
- Proper management of step-downs on approach prior to the final fix.
- Flying a challenging missed approach if necessary.

COMMON ERRORS:

- Over controlling
- Fixation / failure to maintain instrument scan
- Loss of situational awareness
- Failing to identify Missed Approach Point
- Setting the course arrow with head of the arrow on the BAL radial.
- Mistaking the DIS information on the top of the PFD, for the arc DME. (The DIS is to the next fix, not the DME distance.)
- Failure to properly brief the approach
- Improper setup of avionics.
- Not using known control/performance numbers to establish a stabilized approach.
- Flying through the MDA.
- Not anticipating the airport environment in time for a stabilized approach to landing.