USE OF ADVANCED TECHNOLOGY ON FAA PRACTICAL TESTS

LESLIE HENNINGER

CHICAGO DESIGNATED PILOT EXAMINER ASSOCIATION

In the past few years, there has been a proliferation of personal electronic devices, as well as computer applications which have changed preflight planning and flying itself. Few people will be flying without some access to and use of these valuable tools in the future. It is important that FAA Inspectors and Designated Pilot Examiners agree on how these tools will be incorporated into testing of pilots. The overall policy is favorable to supporting the use of technology in the test environment, while still ensuring that fundamentals are evaluated as necessary. These guidelines will outline the appropriate use of these advanced tools in the Practical Test environment as established by the Examiner Association, and reviewed by the DuPage FSDO.

There are considerations about how to implement this new approach which include regulations, practical test standard requirements, and an applicant's ability to effectively use the tools. There will be serious attention paid to all of the Single Pilot Resource Management special emphasis areas, which can be impacted both positively and negatively by the use of advanced technology. These include Situational Awareness, Aeronautical Decision Making, Risk Assessment, Task Management, Controlled Flight Into Terrain and Automation Management. Other special emphasis areas are impacted by more complicated cockpit environments. These can include Cockpit Resource Management, Collision Avoidance, Positive Aircraft Control, Runway Incursion Avoidance and others.

There will be different types of practical tests covered in these guidelines: VFR tests including Private and Commercial Single and Multiengine, Instrument tests, and Flight Instructor tests. The discussion will also address how different technologies can be used in preflight planning and flight portions. There is, of course, no implication that pilots use advanced technologies if they choose not to, as long as they can successfully use all the equipment in the aircraft they supply for the test.

FAR 91.21(b)(5) states that any portable electronic device used in the aircraft has to have been determined to not interfere with the navigation and communication systems by the pilot in command. Therefore, when asked about the use of these devices in flight, the pilot should be prepared to explain how he or she has determined there is no interference from the device. Beyond that, there is no restriction on the use of iPads, other tablet computers and cellular phones. Be advised that any electronic display has to be capable of depicting an entire document, for example, an approach plate, in a way that can be legible to the pilot. This would effectively eliminate the use of cellular phones for approach plates or charts except, of course, in an emergency.

GROUND PORTIONS

CHARTS: VFR, IFR, AND APPROACH PLATES

The Practical Test Standards require that the applicant provide current charts and plates. The new wording in the PTS will read: "Current aeronautical charts (printed or electronic)." If you are planning a VFR cross country for private or commercial tests, remember that the trip is planned with *reference to landmarks and not navigation aids.* If you are able to plan the trip on an iPad and mark the VFR checkpoints on your course, you will be allowed to do so. One can also use the computer to determine distance and heading. However, you can also be asked to use a plotter on a paper chart to determine a true course. Computing time and distance, headings, and fuel consumption can also be accomplished with the use of an E6B, an electronic E6B, or other calculators. You may be asked to demonstrate how to do this with sample data.

You can be tested on any aspect of VFR or IFR charts and if you do not provide a printed one, the examiner may do so. Viewing the entire trip on a paper chart can facilitate the ground portion of the test. Discussing airspace and special use airspace can also be easier to manage on paper. Therefore, it is recommended, although not mandatory, that you have the flight plan available on printed chart.

While in flight, you will NOT be able to use an electronic depiction of the airplane on the electronic chart to determine your position. **That function will have to be disabled for the flight.**

FLIGHT PLANS:

You will be expected to have a prepared navigation log and flight plan for the proposed trip, whether VFR or IFR. This can be accomplished on paper or in a flight planning computer application. Accessing the information while in flight should not be a distraction from the rest of the flight duties, so a printed version of the navigation log would be recommended. The flight plan can be filed electronically, but the ability to file with a briefer might be tested as well.

WEATHER:

Weather for the day of the actual flight is required to establish a go/no go decision. Obtaining weather can be done in a number of ways. However this is accomplished, it must include all elements of a standard weather brief as well as related graphics. A DUAT printout highlighting pertinent data with supporting graphics is always effective. Presenting the weather on a computer or tablet computer can be done with the examiner observing your techniques. Plain language weather products are readily available and can be used. If using coded weather, reference to products that translate abbreviations is acceptable. A number of websites and applications such as ForeFlight provide a variety of very effective tools to present weather. Depiction of the weather overlaid on the chart itself is especially useful. Contact with a FSS briefer will be made to update information gathered and verify TFR status before flight.

NOTAMS:

NOTAMS pertinent to the flight and airports will be obtained with any available tools. A technique for applying that information should be created. Notations made on airport diagrams and approach charts works well. If using electronic charts, notes on a kneeboard should be readily accessible.

FLIGHT PORTIONS

AIRPORT OPERATIONS: (AC 91.73)

Electronic displays of airport taxi diagrams are very useful for planning and executing ground operations. The audible warnings provided by some applications when approaching and crossing runways is very useful in avoiding runway incursions and should be used if available. When taxiing, a pilot is expected to write down taxi instructions. This can be accomplished in several ways. Some tablet applications allow you to sketch to route on the diagram itself. One can make notes on the tablet in a scratch pad mode. Having the notes on a screen that is different than the diagram itself can provide a distraction while taxiing. Notes on paper would eliminate that problem. It is critical that the use of the technology not distract the pilot from the taxi operation. Programming anything while moving is inappropriate in a single pilot operation could be a failure of Task Management, Automation Management or Situational Awareness and even Runway Incursion Avoidance.

If the tablet computer is going to be used for navigation while in flight on a VFR or IFR test, the function that displays the aircraft's position on the screen will be disabled before takeoff by changing to "airplane mode."

NAVIGATION/ VFR TESTS:

It has been determined that there is no requirement under Part 91 of the FARs that there be duplicate charts available, whether paper or electronic. It certainly is desirable to have some paper or electronic backup since electronics and batteries are fallible. An iPad used for ground portions can have a depleted battery by the time of the flight. It is also quite possible that an examiner might "fail" a device during the test. The ability to use all available resources, including air traffic controllers, will be evaluated within the scenario given by the examiner to determine if you would have a positive outcome in the event of the loss of some of the technology upon which you are depending. The best solution to electronic failures is access to paper backup.

DIVERSION:

When faced with a diversion scenario you will be required to determine heading and estimated time and distance with the use of pilotage. The diversion will be made with reference to landmarks. Airport information can be obtained from a chart or Airport Facilities Directory. Evaluation of the applicant's ability to use electronic navigation with VORs and GPS will be evaluated separately during the test. If the aircraft has autopilot, you would be able to utilize that while managing the diversion. Autopilot should also be accessed at some point when the examiner simulates inadvertent entry into IFR conditions with a view limiting device.

AIRSPACE:

To verify clearance from airspace a pilot can rely on depictions shown on electronic charts on equipment installed in the aircraft and certified with current data. Remember, that for the initial navigation of a preplanned course, the course will not be programmed into the GPS. If using a tablet, the airplane will not be depicted, and reference to landmarks will be required to define dimensions of airspace.

NAVIGATION/IFR TESTS

Aircraft with GPS installations must have a current database when used for a flight test. When an aircraft has an autopilot installed, it will be demonstrated during the flight test. Glass cockpit aircraft are expected to be flown as they would normally be operated; that is with extensive use of the autopilot. You will, however be asked to hand fly some tasks.

GPS should be used to improve situational awareness even when executing approaches which do not require it. Using the depiction of the approach to fly it is not acceptable in lieu of programming the required navigation aids. Last minute programming of GPS as back up to an approach that does not require it can be a distraction that could result in a failure of Task and Automation Management. An examiner will expect the use of GPS for any test in aircraft so equipped. Pilots should know when it is appropriate to substitute GPS for other fixes such as NDBs or DME distances and avail themselves of that resource.

PARTIAL PANEL IN GLASS COCKPIT

In order to test failure of primary instrument displays in glass cockpit aircraft, the primary flight display will be dimmed until dark by the applicant. Unusual attitude recovery will then be done on the standby gauges. Then the reversionary mode will be selected allowing the use of the multifunction display for a non-precision approach. This will be hand flown as many aircraft will not be able to use the autopilot with the actual loss of primary flight display depictions.

FLIGHT INSTRUCTOR TESTS

GENERAL:

Applicants for flight instructor ratings will be expected to effectively teach the use of any advanced electronics they bring to the test or are installed in the aircraft. In addition, they will be expected to be able to use and teach more traditional methods.

FLIGHT PLANNING:

Students may want to use less expensive tools in their training. Therefore, the use of paper charts, plotters, navigation logs and E6Bs can be tested in addition to the more advanced technology of iPads and computer applications for flight planning.

OBTAINING WEATHER AND NOTAMS:

Flight instructor applicants will be expected to read and interpret coded weather products.

FLIGHT PORTIONS:

Since VFR tests for private and commercial certificates require training and testing of navigation based on landmarks, pilotage should initially be taught without the backup of GPS. However, when teaching in GPS and glass cockpit equipped aircraft, training and testing will also include the use of all of the technology available at the level for the certificate or rating sought. Flight instructor applicants will be prepared to teach all of these techniques.