Pilotage©

The demise of Pilotage due to GPS poisoning is to be expected. Much the same problem began to kill pilots and destroy airplanes in WWII when pilots began to rely on electronic aids. A B-29 in my Group on Tinian took off to local slow-time an engine with a partial crew. After months of reliance on an APQ-13 radar set with 100 mile range and an APN-4 LORAN with 2400 mile range, an ADF with range limited only by reception distance, and an early form of an inertial position indicator, the crew was being positionally challenged. No one had paid attention to their dead reckoning position. A series of unknown events made their electronic navigational aids either unreliable or unusable. Radio calls for help could not help for the crew knew not where they were and searchers knew not where to look. The plane and its partial crew were lost.

Near my home field's VOR is a four thousand foot mountain that stands alone. Reception of the VOR from the east-south-east gives a very strong and reliable signal. Use it from that direction below four-thousand and you will fly into Mt. Diablo. It had this name long before the VOR was placed. The mountain eats an airplane/people sandwich caught tracking the VOR from the ESE every few years. The VOR makes navigation both easy and deceptively dangerous. We are now entering the GPS age with all its advantages and inherent dangers.

In the next ten years we will soon have a cadre of flight instructors who have learned to use and will teach GPS navigation. Pilotage and DR will be introduced and perhaps even tested but there will be changes in emphasis. We will see the diversion exercise performed via GPS and again as an exercise in pilotage.

Those of you who have had an chance to experience the Flight-Trac flight analysis on your computer can visualize exactly how flight tests passage of the future may well be decided after a review of the GPS plotted flight by the FAA in Oklahoma City. It is an amazing but not nexpensive system. Where I fly the use of the GPS recording tracker is predicated on purchase of a $100 software kit for your computer. My initial impression is that it would make a three axis autopilot go neurotic. Your entire flight is reflown on your computer screen with all instruments showing all your groundspeeds, altitudes, courses, and times on one half of the screen and the route flown plotted on a half screen sectional. I imagine an aerobatic flight would be something to see.

So, will GPS save more aircraft and passengers than it will expose to accidents? I see pilots crowding the fuel margins of their aircraft. The accuracy of fuel consumption, capacity and fuel remaining in present aircraft is far too unreliable to be used with GPS unless it has electronic accuracy with digital readout. With GPS there will be more and more assumptions that programmed flights can be made with out-of-date charts. Anticipate that charts may become annual rather than semi-annual. An all terrain and airspace data base will be an FAR requirement. Otherwise, we will have an increase of controlled flight into terrain and airspace violations. The present most critical factor of VFR GPS is that they do not have the receiver autonomous integrity monitoring program or RAIM. This program in the IFR GPS will flag the GPS operation if the signals fall below a pre-selected standard. A pilot using a GPS without RAIM has no way of knowing the reliability of the GPS information. The present duality of installed navigational aids allows a position to be checked by other means for the next ten years. What then? The rebirth of pilotage?

There is a whole new world of aerospace technologies waiting in the wings. My older son is project director for such a program called ELVIS for the navy. A computer screen on the ground or in the air will be able to provide every pilot with an all seeing eye of any selected airspace or route in real time. Terrain and weather overlays in three dimensions with all or selected traffic will utilize GPS transmitted information from all aircraft much as does a transponder. You can expect to fly with a moving map showing on a heads-up display. It's already here.

The demo that you have on the internet is unclassified and the data is canned and static. The operational version runs on Unix hosts at DoD commands and is fed by a variety of sensors/sources (including GPS and radar surveillance, etc.). ELVIS allows remote users to reach into tactical databases and pull time-critical data of interest.

ELVIS is currently installed at several shore-based facilities and afloat platforms (USN and USCG ships). It has set-ups in Bosnia. Many new capabilities are completed (or in progress) which allow the tactical planners to expand their access beyond positional data to unit schedules, readiness, maintenance status, and planned activities.

We are also exploring the Java language as a vehicle to improve the processing overhead from the server to the client. For example, the range/bearing computation should be client-bound.

ELVIS:
http://Elvis.inri.com:9002

requires Netscape to get beyond first page. This is a demo so many functions will not work without encription key.

User name: gwhitt password: gwhitt (My son gave me my own password.) If you have a problem let me know.
gwhitt@ix.netcom.com
Browsing:
Click 'continue'

At Command Center you have four maps. Click on any one.

Map Options
Hilite ZOOM click interior map area to enlarge by clicking on a top left/bottom right corners of area desired. Resolution depends on map selected.

Hilite Range/Bearing click on any two points to get chart and line on map with bearing and range.

Hilite Center and click on a point that you want centered on map. (Means you never need to fly off a sectional again)

Clicking on ship/ground units brings up data.

Scroll to bottom of page:

Resolution may be changes x8, x4, etc.
Options has sample briefing process
Globe with four arrows moves map
Help... gives all processes available. Scrolling through help is a good overview.

GPS/Datalink info can be overlayed. Anti-collision has great potential both through ATC and cockpit. Weather overlays available. Should do away with airways as we know them. ATC operations will more and more become fitted into the capabilities of the GPS system.

Enter pilotage. The importance of pilotage will become most apparent just when the experienced instructor base for pilotage drops off the screen. Just as now, the FAA and FARs will be accident driven. There will be a data base to show that a deficiency in pilotage skills results in an ever increasing proportion of accidents. Teaching and testing emphasis reverts back to basics.