

Loran Is Back, Baby

You can't buy the box yet, but enhanced Loran will combine with GPS to improve your RNAV.

by Robert Gardner

Those of you who thought that Loran was dead need to go down into the cellar and check on the coffin; that creaky noise you hear is a new and different Loran pushing its way out. Unless you're the owner of a legacy Loran, you can forget about identifying chains, stop worrying about the effect of station geometry on accuracy, and banish any thought of precipitation static affecting the information displayed by your receiver-indicator.

Some credit for Loran's rehabilitation goes to the motivations of other nations around the world who are uncomfortable with the idea of a single source of navigation information controlled by the US military. The Global Navigation Satellite System (GNSS, which includes GPS and the Russian GLONASS) is a reflection of this concern, but it's a space-based system.

It's fairly well agreed by all nations that any satellite system is vulnerable to jamming; the strength of the signal received from a single GPS satellite has been compared to a Christmas tree bulb in Los Angeles as seen from New York City. Common sense would suggest that a backup system must be terrestrial. *Voila—Loran lives.*

Why Loran?

It gets into canyons and forests where a GPS signal cannot penetrate; it even penetrates into the man-made canyons of a modern city. Why do you care? Because there are many users of navigational signals on the surface, and their political clout makes it easier for the Department of Transportation to give a thumbs-up. That it is harder to disrupt is obvious: If an e-Loran receiver can choose from 40 transmitted signals, how can the loss of one or two shut down the system?

Geezers like me can remember the early days of Loran...matching waveforms, counting time delays, plotting fixes on a chart covered with colored lines and trusting that skywave contamination would not put us on the beach or off of our planned route of flight. Those of us who were on the transmitter end, living in near isolation on various islands and atolls around the world, dealt with the vagaries of vacuum tubes and analog readouts. The solid-state revolution brought microprocessors, and with them came waypoints, lat-long readouts, groundspeed, course deviation indicators, time-to-station, and similar

wonders. And then came GPS, with all of that and more...and Loran was placed on life support.

The cost of operating and maintaining a modern e-Loran system has been considerably reduced; automation has pretty much eliminated the need for manpower, and the advantages of solid-state electronics over vacuum tubes need no explanation to readers of IFR.

The newly resurrected enhanced Loran (e-Loran) doesn't bother the air or sea-borne navigator with chain selection; a ninth pulse has been added to the transmitted signal, and among its many functions is station identification. All-in-view receivers select the best position solution from 10 to 15 Loran transmitters at a time without any intervention by the pilot. Locus, Inc., of Madison, Wisconsin, in conjunction with Rockwell Collins, has developed Loran receivers that take advantage of the improvements, and they are working with FreeFlight Systems of Waco, Texas to come up with a Loran/GPS/WAAS box.

Owners of legacy Loran equipment will still be able to use their boxes, of course, but without the whiz-bang technology. The pilot will not and need not know where the best solution has come from; however, there will probably be a GPS/Loran/both switch. New antennas, also developed by Locus, use the H component of the transmitted signal to reduce the effect of precipitation static to near zero. These antennas look much like ADF loop antennas.

The displays being developed by FreeFlight will offer a two-line digital readout, similar in many ways to that in legacy displays. My guess is that once the DOT has blessed the future funding of e-Loran, interfaces to moving maps will be a slam-dunk.

Test flights have shown the accuracy of e-Loran as equal to that of GPS, and it meets the RNP 0.3 standard for non-precision approaches. We will have ILS for a long time to come, of course, and the Europeans will still have MLS, but navigators worldwide will not be held hostage by someone with a jamming device built in a garage.

Bob Gardner, author of ASA's Complete Pilot series, put two Loran-C stations on the air while in the USCG.