

By David Wartofsky, CEO, SuperAWOS and Owner, Potomac (MD) Airfield

IT ISN'T GRANDPA'S AWOS

Insider's viewpoint on the development of nav aids over 20 years, and what's ahead

Back in the 1970s, the National Weather Service thought it would be a grand idea to put automated weather observing systems (AWOS) across the U.S., as a network of data feeds for national meteorological models. To be scientifically consistent it was essential that each scientific sensor platform be identical to every other. Later these initial systems evolved into the more sophisticated Automated Surface Observing Systems, or ASOS. During that time, the Federal Aviation Administration realized that it needed some way to provide approved weather to pilots at select commercial

airports to meet flight requirements for weather. In comparison to subsidizing three shifts of human weather observers, those quarter-million dollar NWS systems looked like a pretty good deal.

The obvious became obvious, as it often does, so with the best of intentions, FAA had NWS put its scientific weather sensors at a few essential commercial airports, where flight service stations were closing and where weather observers had become a thing of the past. Thus was born the FAA program of Automated Weather Observing Systems (AWOS) that pilots have come to know and love.

These expensive scientific sensor platforms — built to the standards of one government agency while used by pilots to meet the requirements of another, and specified and procured under a stifling federal procurement process — were never intended nor optimized for flight operations. Nor

From AWOS to today's products such as SuperAWOS, the technology of nav aids continues to change.

was this technology likely to advance on its own, not any time soon; that took some time and some outside pressures to come about.

IN-HOUSE DEVELOPMENT

About 1987, by the usual bizarre twist of events that leads to such things, my partner and I bought a strange little airport, the Potomac Airfield, located just a few minutes from downtown Washington, D.C. Potomac is an unusual little airport, a great place to try new things, to draw the attention of *lots* of government agencies (in fact, almost all of them), and, if you can survive the present, it's a great place to set interesting new precedents for the future.

As a pilot I knew that any airport's Unicom presence (or lack of it) was the "voice" of the airport. For pilots at Potomac, we wanted to provide a consistent voice, and consistent presence, without having to rely on, or impose on, any one of the tenants.

As anyone running an airport knows, providing consistent Unicom service is a headache. When the airport is quiet, there is no practical way to keep someone standing around in case an isolated pilot might happen by. When an airport is very busy, well, it's just too darn busy.

In time, we developed an Artificial Intelligence (AI) that could

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dynamically respond to patterns of communication on the airport's Unicom frequency, greet inbound pilots, provide radio checks, and also give advisory weather information. Thus was born the first iteration of our Automated Unicom.

Before 9/11, Potomac Airfield had over 70,000 operations per year, from its 2,600-foot runway; that makes for a busy unicom. To keep our system from making a mess of Potomac's busy unicom frequency required that we make the system's transmissions dynamically adaptive to ever-changing frequency congestion,

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INSIDE THE INDUSTRY

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being able to balance operationally important information against frequency congestion, just like a polite human weather observer/pilot would do. While it's easy to know what to say, it's even more important to know when to shut up, so we made the system smart.

OUT TO THE INDUSTRY

Having developed for Potomac a simple solution to a very common problem, we decided to make the system available to other airports as a finished product, and thus was born the Superunicom.

Within any regulated industry every true innovation starts as "illegal," because existing rules are written about what is already known, not about what may be innovated tomorrow. To make innovation more challenging, in addition to overcoming bureaucratic inertia, one also faces challenges by those economically basking under the existing status quo. So began the regulatory journey.

Step one was to get the Federal Communication Commission (FCC) to amend its rules to allow the adaptive AI to share a busy airport unicom frequency. This required first getting the 15 heads at FAA (various internal departments) to agree, without scaring the FCC too much in the process.

Although the FCC amendments took two years, this regulatory breakthrough meant the adaptive system could officially operate right on any airport's existing unicom frequency, just where pilots need it most, just

when they need it most. Even better, operating on Unicom eliminated the two-year paper chase otherwise required for any traditional AWOS to get its required discrete frequency.

The devil finds work for idle minds, so the next regulatory move was to obtain FAA approval for the system's altimeter information,

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to officially unlock our airport's brand spanking new GPS approach. While measuring altimeter was not hard, the real challenge was finding some regulatory precedent for FAA approval. Leaping ahead a year, our Automated Unicom was then anointed an FAA Approved Altimeter Setting Source.

Next came FAA approval of the system's visibility capability. We knew traditional AWOS systems were a maintenance headache, so we found and integrated a military "tactical weather sensor" onto the Automated Unicom. The system was then defined as an Automated Unicom, requiring no AC power (it recharges off a lighted windsock), requiring no frequency allocation (it operates right on unicom) and automatically greeting pilots on Unicom, provides full-service radio-checks and advisory weather, and offers FAA-approved altimeter and visibility, unlocking any

airport to all-weather private and commercial flight operations, 24/7.

In time, FAA asked us downtown for yet another little chat. It seemed that in all the excitement about rolling out GPS approaches, they sort of forgot about providing some form of equally rapidly deployable "approved weather" — necessary for pilots to actually be able to use any of those shiny new GPS approaches.

FAA asked, "Could you please come in and get your Automated Unicom system certified as an AWOS? It should only take about 60-90 days." In a relative bureaucratic flash (two years) the SuperAWOS was born, an FAA-approved plug-and-play, low-cost, low-maintenance AWOS, that provides any airport with full-service Unicom coverage, available for any airport under the FAA/AIP program.

FUTURE INNOVATIONS

Believe it or not, there is verifiable evidence that the future for innovation in all aspects of aviation looks brighter than ever. The safety benefits of innovation have already forced FAA to rethink the way it does business. FAA used to deny 99.99 percent of reliable technology because it wasn't 99.999999 percent reliable; which was silly. The agency finally realized that while there was no harm in striving for perfection, it was unrealistic for FAA to make the industry hold its breath until perfection could be achieved. With trepidation, FAA has developed more realistic standards, providing an equivalent level of safety.

The looming collision between an increasingly overwhelming air

traffic workload, unsolvable with any amount of tax dollars, will eventually drive responsibility for basic traffic separation out of the hands of a relatively small number of over-loaded controllers and into the hands (and cockpits) of many pilots; through a variety of traffic detection systems and devices. FAA's recently announced policy shift moving toward ADS-B is evidence of that inevitable transition. And yes, we have some more exciting tricks up our sleeve on the air traffic front as well.

In all, I'm quite optimistic. Nothing can stand the onslaught of common sense; it always wins in the end. Sometimes it just takes a little while to poke its head through the confusion.

About the Author



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