Questioning the System FSS MODERNIZATION WHY THE HOLD?

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The Flight Service Station system is under manned, under equipped, under funded—in fact it's a tribute to the people who make up the organization that the system hasn't just gone under . . . period.

Although much has been said over the last several years about plans to "modernize" the FSS's, there has been no systematic, comprehensive overhaul of the antiquated, inefficient, overburdened organization.

There has been a lot of talk about and spending for research and development work, but genuine improvements have come into the system only in time to keep its nose above the rising workload.

This situation is obvious everywhere in the FSS organization. Western Union's new high-speed Lease A weather message service (currently being installed at the top 150 FSS locations), digital weather radar repeaters, and improved physical plants were pushed into service only when it had become painfully obvious that the existing facilities could not be patched up any more.

"We've patched the communications. We've patched the equipment. We've patched just about everything," one FSS branch employee at the FAA's headquarters said. "We've got more Band-Aids on the FSS system than a guy shaving in the dark with a dull razor."

FSS Operations and Procedures Branch Chief Bob Bell, in fact, says the "patchwork program is going to take us down the tube."

Will the FSS network indeed go down the tube?

In last month's Pilot we examined a number of questions concerning the future of FSS improvements. This month we will examine some specific thoughts about the needs of this facet of the ATC system.

DO WE HAVE TO WAIT FIVE YEARS FOR BETTER WEATHER SERVICE?

Is the wait on the FAA's plodding research and development service creation of its Phase I and Phase II FSS modernization packages really necessary?

Frankly, no!

Automatic display of digital and graphic weather information isn't a black art needing the incantations of hordes of R&D people and lots of bucks. In fact, Aviation Weather and NOTAM Service (AWANS), developed by E-Systems, Inc., and implemented in the Atlanta and Indianapolis areas, displayed digital and graphic weather information some years ago, thus eliminating the blizzard of teletype paper found in so many FSS's today.

For some reason the FAA was unable to look at the test bed, decide what was required and establish a national system.

However, somebody learned a number of lessons from AWANS. The National Weather Service has long been known for archaic thinking. [The parent Department of Commerce hasn't been known as a big spender either— Ed.] But it looked at AWANS and saw something that could help speed its internal information system.

"We decided on what we wanted in terms of products and configuration, and went out and built a system," is the simple, straightforward description of the weather service's automation program from Russ McGrew.

McGrew's viewpoint comes from his position as Implementation Staff Director for NWS's automation of Field Operations and Services (AFOS) program.

Simply put, AFOS is a completely automated system which displays information, including weather charts, on a television-like unit that is in place today. AFOS will be installed in 218 NWS locations by the end of 1980.

In fact 105 AFOS installations have been completed at this writing.

Obviously, AFOS, being designed for the NWS information requirement, is far more sophisticated than a system required to fulfil the aviation weather requirement, but *the system is available today*. And many feel it's easier to develop a simple service from one more complex than it is to do the opposite.

Why hasn't the FAA moved to add the AFOS system to its FSS modernization package?

On the surface, AFOS would put a modernized, graphic weather system into the FSS network very quickly with very little additional R&D spending.

The issue isn't that simple, according to the FAA. Frank Van Demark, of the agency's R&D service, says AFOS doesn't fit into FAA's plans, and Bell of the FSS operation echoes that opinion. Communications, capacity and reliability are cited as reasons the FAA is moving ahead slowly with its own program.

A careful examination of the situation, however, doesn't seem to square with that assessment. Let's look at the three areas individually.

Reliability: Bell of FAA says, "our system *will* work." McGrew of NWS says, "AFOS *is* very reliable." NWS, according to McGrew, has ironed out the teething problems associated with the introduction of AFOS, and the system is running on line with a high degree of reliability. **Capacity:** Van Demark says AFOS isn't big enough to meet the demand implied in FAA's forecast of activity in 1995. McGrew, commenting on the capacity issue says simply, "We're not screwed to the wall for capacity."

If the decision were to be made on large-scale implementation of AFOS outside the current NWS program, McGrew said the prime requirement would be for additional memory capability.

The system, according to McGrew and Domestic Aviation Weather Program Leader Edward M. Cross, is not "capacity limited" because of its design. Simply put, most of the AFOS processing requirements are handled by "on site" computer equipment, so requests for information, visual display data and other needs seldom get into the main information stream to clog traffic.

What happens, McGrew says, is that AFOS gear in the field is updated periodically by a closed-loop, high-speed communications tie line, which enters and extracts data from the entire AFOS network; the AFOS hardware in the field is able to develop all of the display information required from local storage.

"We don't have to go back on line and ask for most of the information we need to produce AFOS displays," one NWS staffer said. "We've got it on site where we need it . . . all AFOS has to do is call what is needed from memory and put it to work."

Communications: FAA officials say AFOS, or a similar non-FAA development will not fit into the system because





it lacks communications capacity.

The FAA, according to Bell, uses the existing 100 word-per-minute (wpm) FSS teletype communications system for a lot of things aside from basic aviation service data.

The routine Service A weather observations line is just part of the FSS teletype network. Other services include Service C (forecast data), Service O (international weather information), Service B (internal communications for messages, VFR flight plans and other data), and Service F (lines for communications with air route traffic control centers with IFR flight plans).

"Most people think FSS people concentrate on weather, but there's a lot more," Bell said.

Oh, really?

The question arises about the prime function of the FSS system. Should FSS outlets be used as the FAA's internal communications outlets?

"No! We said some years ago they should get that function out of the FSS and into a separate branch," Victor J. Kayne, AOPA Senior Vice President for Policy and Technical Planning, said. "There's no reason why the FAA needs to run an already overworked system even further into the ground."

McGrew and Gross both pointed out that AFOS has all weather data, domestic and international, built into its data base. The existing Services A and O are consolidated along with a large portion of the Service C traffic.

Incorporation of AFOS into the FSS modernization package would require development of a consolidated communications network that would carry both IFR and VFR flight plan information to their appropriate destinations.

High-speed, consolidated flight-plan transmission should be no problem if the FAA's "communications enhancement" program proves out. However, the Digital Terminal Equipment (DTE) planned for use as terminals in a 2,400 wpm transmission system just won't work.

Purchased some time ago, the DTE's were designed as simple replacements for the Model 28 teletype terminals used today, but the decision was made to turn the simple input/output (I/O) box into a data terminal. That hasn't worked. In fact, the DTE's recently flunked an operational test at the FAA's Oklahoma City depot.

"They just sit there and 'eat' information," one FAA staffer said. "As long as you are trying to receive or send with the DTE it works fine, but if you're trying to send a message while continuing to receive and store data the machine just eats the incoming material."

So, at this point the FAA is back to square one in terms of high speed I/O equipment development.



AFOS, or any similar NWS-developed system could flood the pilot or FSS briefer with information since it contains the entire body of NWS data used for all types of forecasting.

So, the question might be better put this way: Can AFOS be configured to meet the FAA and pilot community weather information requirement?

Yes.

Gross: "Pilots and briefers are only using a subset of the total information product available today. This system, or any automated retrieval system, will make today's pilot and briefer a lot better informed and put him in a far better position to make informed decisions about the safety of flight."

A *Pilot* review of the state-of-the-art in information dissemination shows that it would be a relatively simple



task to configure a basic AFOS field terminal to receive only information required for flight safety. This could be done quickly without further R&D spending.

In fact, the weather service was able to shepherd AFOS from concept to installation-ready system at a total cost to the taxpayer of some \$50 million.



AOPA's Kayne: "Somebody has to take command of the FSS operation at the FAA. Without a strong voice close to the administrator, nothing is ever going to get into the field. . . .

"The FSS organization has been allowed to dry up. And without an immediate increase in interest at the administrator's level FSS modernization is going to continue to slide along as a stepchild that gets attention only Now, \$230,000 per installation isn't cheap, but that figure includes all R&D expenses, site preparation, installation and commissioning costs.

Although follow-on equipment should not be as expensive, inflation has affected prices. Installation of an AFOS-type system in the 50 or so high-activity FSS's could cost some \$11.5 million at \$230,000 per installation.

Current plans call for FAA to spend a similar amount over the next five years to prepare a final version of its Phase II FSS package with graphics capability.

"The question of modernization goes much deeper than cost," Kayne said. "We need a modern system today, not a planned system that may be able to jump tall buildings at a single bound in 1985."

The lack of a sense of urgency in the FSS improvement program is troubling to many, both inside and outside the federal sector.

Time-and-again FSS people in the field and in the headquarters organization have talked about the lack of a listening ear at the highest levels of the FAA.

"Those guys in AT [air traffic] can hold up a bunch of burned aluminum from San Diego and say, 'If we don't get help, the ground will be covered with these,' but all we can do is say, 'If we don't get some help, we're going down the tube. . . .' Nobody down there [FAA headquarters] cares.

"Sure there's been a lot of money spent for R&D, but it stays in R&D. About all that's happened in years of FSS modernization experiments and research is that the color of the planning document covers is changed annually. We damn sure don't see anything out here."

Lawrence Cushing, the head man at the National Association of Air Traffic Specialists (NAATS), the FSS union, puts it this way:

"There have been years and years of neglect on the part of FAA higher-ups. . . ." The situation has decayed to the point of FAA's attitude being almost "criminal neglect," Cushing said.

when it is in serious trouble.

"We (AOPA) are not interested in where an idea comes from, or how that idea is executed . . . at least to a point. . . . Our main concern is service.

"When one of our members picks up a phone to call an FSS he should be able to get through to a briefer without undue delay; that briefer should have the best possible tools at his disposal to handle that briefing; our members should be able to receive timely updates on weather en route from radio or En Route Flight Advisory Service (EFAS) when it's called for, and the briefer should be equipped to handle requests for information quickly with timely information.

"If the FAA needs more people and more money to implement an improved FSS network, let's look at a realistic plan; then we will put our support behind getting it into the works.

"The general aviation community is putting a bunch of money away in the trust fund, and it has shown its willingness to work hard when it is necessary to effect changes in the system—the massive response to the earlier FAA proposal to expand positive control and implement a controlled VFR program, for instance—but there has to be a payoff in the end.

"We're not here to just throw rocks at the FAA and say they're stupid for not doing this or that. We're here to work hand-in-hand with the entire community to make aviation safer and more efficient for all concerned." \Box