

Questioning the System

FSS MODERNIZATION— FACT OR FICTION?

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AOPA 447409

Very few subjects stir the ire of the general aviation community like the painful, step-by-step progress of the FAA's so-called Flight Service Station modernization program.

The 292 full- and part-time FSS installations in the United States have often been described as general aviation's VFR inflight communications system, its operations office. In large measure they serve that function, providing weather and operational information, a flight plan filing facility, en route weather advisory service and a general source of aviation information for a vast community of pilots ranging from corporate Gulfstream III drivers to weekend pilots . . . and air carrier crews, as well.

FAA's Flight Service Modernization Master Plan describes the FSS network's place this way:

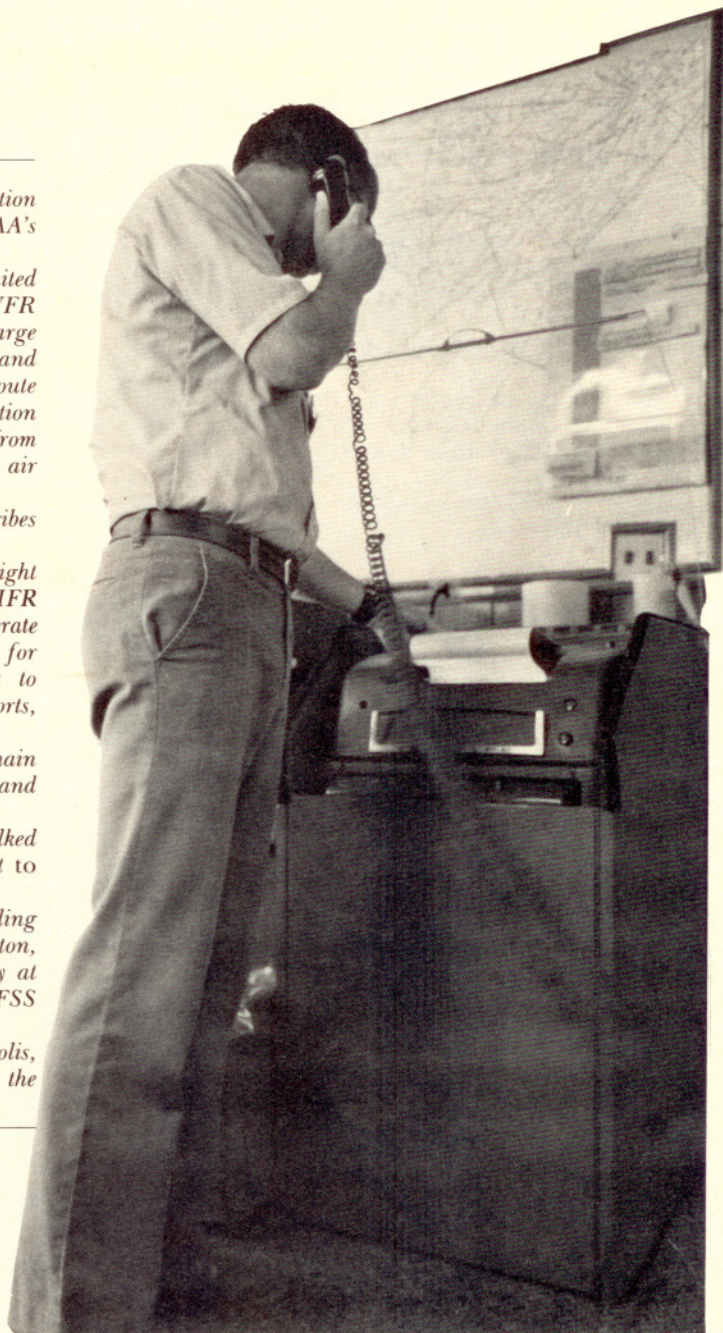
"Flight Service Stations act as the backbone of the flight information system. The FSS's process over 56% of IFR flight plans filed into the National Airspace System; operate the entire VFR flight plan program; are a major source for the National Flight Data Center, and originate Notices to Airmen concerning the operational status of airports, navigation aids, communications outlets and facilities.

"Additionally, Flight Service Stations are one of the main focal points for aviation weather data acquisition and dissemination . . ."

Systematic improvement of the FSS network has been talked about and talked about, and talked about some more, but to this date it just hasn't happened!

From the older facilities like the venerable operation holding the fort in a World War II temporary building at Charleston, W. Va., to contemporary facilities like the modern facility at Spirit of St. Louis Airport in suburban St. Louis, the FSS system has its roots tied to the late 1920's.

With four exceptions — Chicago, Atlanta, Indianapolis, Washington — the age-old Model 28 teletype machine is the



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articles evaluating the
National Airspace System.
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key mechanical ingredient in the FSS network.

This 100-word-per-minute (wpm) machine designed in 1928 is a fitting symbol of today's FSS system. The machine, like the briefers in the field, is trying to cope with 1979's problems without the state-of-the-art tools required. Who suffers from this situation?

We all do. Pilots, FSS journeymen, the FAA and the aviation community in general are all endangered by a system that's just hanging on by its thumbs while the brass hats make up their minds about what's going to happen next.

The key missing element is leadership on the part of FAA's top brass. There is practically no commitment to modernization beyond lip service. The level of importance FSS receives was best expressed, it would seem, by then-Secretary of Transportation Brock Adams who, in budget testimony before Congress, said that there was no funding request for FSS modernization because the program has been completed. Nothing could be further from the truth, as this special report shows.

In future issues we will present AOPA's recommendations for achieving a timely, improved FSS system.

Flickering alphanumeric displays flash information at an astounding rate, remote weather radar is at the FSS briefers' fingertips, and IFR flight plans can be filed directly and quickly.

All of that service could be a phone call away . . . and that's where the rub comes.

The FAA has been spending millions of bucks to develop and implement an all-new, automated FSS system in the mid 1980's, but some serious questions exist about this FSS of the future.

1. Will the system afford adequate, toll-free service to users, overcoming the access problems that abound today?

2. How will a planned FSS staffing level of just over 4,700 meet the U. S. average demand for pilot services in 1984 when it is not meeting today's needs?

The FAA contends its planned two-phase FSS modernization program will not only meet the demand; it will provide enough capacity to handle today's needs and meet tomorrow's projected demand while sorting out the predicted myriad of transitional problems?

How?

Automation of many of the journeyman FSS specialist's routine "housekeeping" tasks; improved mass briefing techniques and consolidation of the FSS network into a series of larger, more efficient facilities colocated at least to some degree with the nation's Air Route Traffic Control Center (ARTCC) facilities.

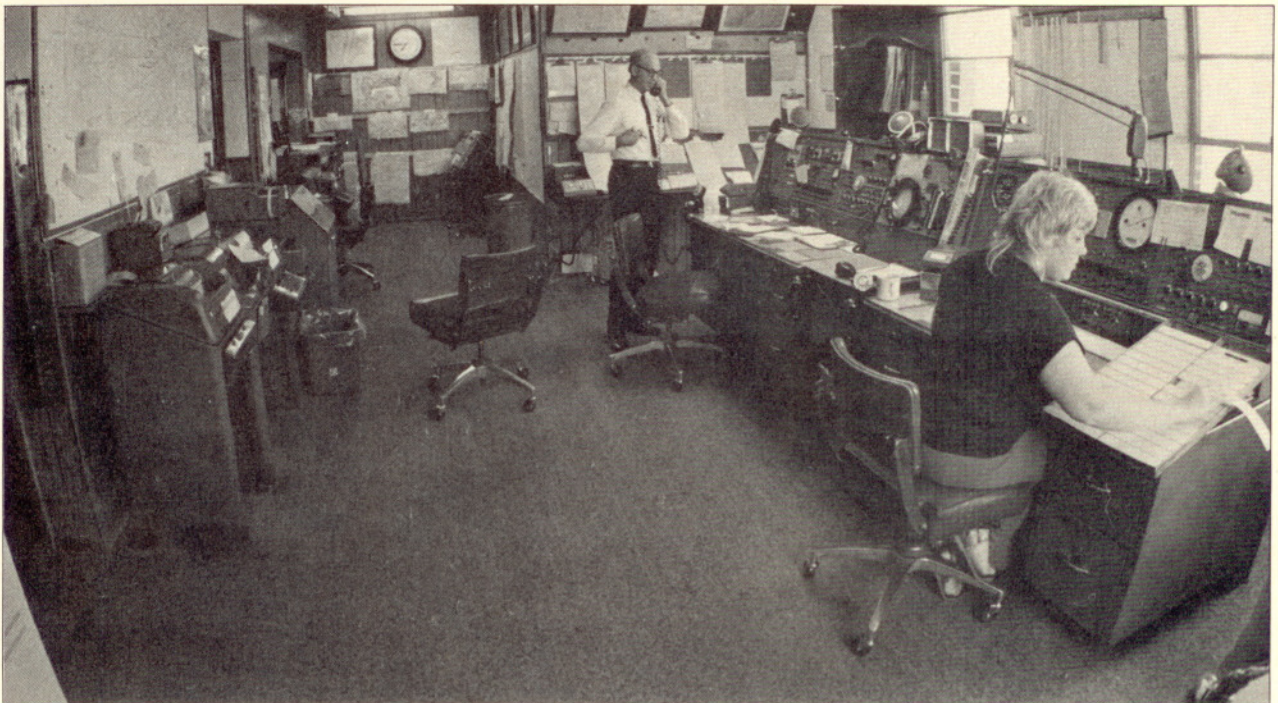
Since FSS modernization started leaking out of the research and development ivory tower and into the field, a body of conflicting evidence is starting to develop that may well require a careful second look at today's state-of-the-art thinking about FSS modernization.

Does automation really work?

Experiment after experiment in Atlanta, Indianapolis, Chicago and Washington has shown that automatic filing, assembling and dissemination of weather and NOTAM information within the FSS network will work from a purely technological standpoint.

In recognition of this fact, the FAA is currently leasing an off-the-shelf weather information system from Western Union, the Lease A service mentioned elsewhere.

The FAA currently plans to implement its automation program in two phases. The first phase will supply the FSS briefing and en route flight advisory service (EFAS) positions with computer-generated alphanumeric information like NOTAM's, sequence reports, special weather observations and other data. Phase two will provide all of the phase one services and add computerized graphics capability. The FAA plans to add a pilot self-briefing (PSB) capability through remote terminals as part of its phase two program.



In visiting FAA's National Aviation Facilities Experimental Center (NAFEC) one can't look at the early Phase One and Two mock-ups and prototype displays without thinking of the National Weather Service's (NWS) on-going automation program.

In fact, if the NWS system could be altered to display NOTAM information currently carried on FAA's Service A teletype circuit, computerized graphics capability as well as a complete display of available weather data could well be in reach in the very near future.

Can automation really increase FSS efficiency, productivity?

The FAA's master plan for FSS improvements depends to a large degree on the productivity increases it is projecting from automation.

Briefer-by-briefer, however, the automation program in any form currently conceived will not allow a briefer to perform faster full-route briefings.

One long-time FAA staff member attached to the FSS branch at NAFEC is firmly convinced that: "We have reduced the full-route briefing to an irreducible minimum time. In fact, studies at Washington FSS indicate the automated briefing may well take longer than the old-style."

Does this mean the FAA, with the industry's blessing, has spent millions of dollars to create equipment that will lead to longer briefings in the name of automation?

Not really. George Barboza, NAFEC's FSS branch chief says, "The automated briefing will be more current, route-oriented and more pertinent. This briefing may take a few more seconds because the briefer has more information."

Actual studies conducted at the Washington FSS before and after installation of a prototype automation system did indeed show preflight weather briefings were longer, but significant time savings were discovered in other areas.

Preflight briefings "before" required an average of 2.16 man-minutes, and the automated briefing covered 2.85 man-minutes . . . an increase of .69 man-minutes.

However, automated preflight briefings with an IFR flight plan took only 6.34 minutes with direct entry of flight plans into the FSS computer. The old system required 8.74 minutes. That's a 2.4-minute improvement with automation.

"I don't think we're ever going to provide more briefings per man per hour," Barboza told *The Pilot*. "But an automated system will free briefers from 'housekeeping' functions, and they will be available to handle their primary job.

"When you're talking about improved productivity from automation, you've got to take it on a per facility basis."

One FSS journeyman put it simply: "We will not get shorter briefings without a serious quality problem with automation or without."

Can improved mass briefing techniques help FSS overloading?

Obviously, one of the most effective ways to cut down on the amount of time FSS briefers spend per call would be to put more information into the pilot's hands before he talks to a briefer.

This thought hasn't been lost on FAA's planners, but

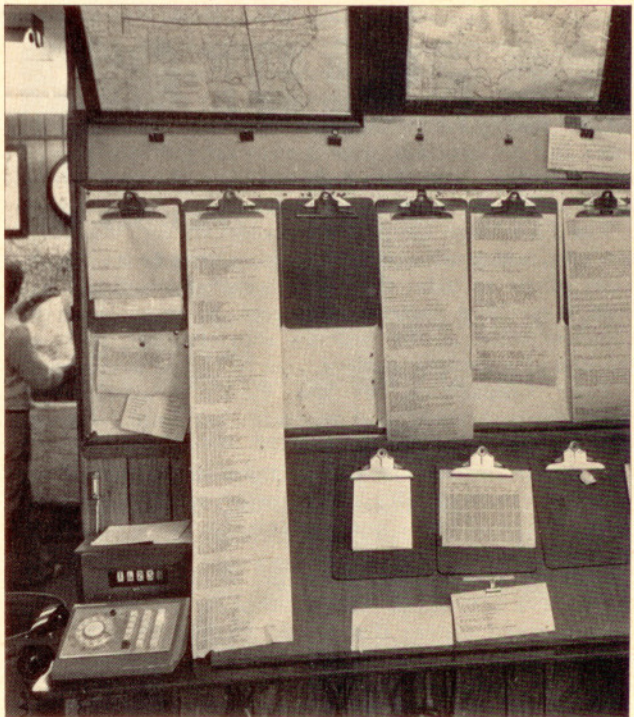
execution of the improved mass briefing idea has been a little less than timely.

The FAA has embarked on several programs to improve its mass weather briefing capability, including an improved Pilot's Automatic Telephone Weather Answering Service (PATWAS) program demonstrated in the New York City area, a telephone managed Voice Response System (VRS) in the Washington area, and continuing work on a voice-activated system at NAFEC.

The New York PATWAS project and VRS in the Washington area have been almost spectacularly successful. However, the PATWAS program in New York has been shut down.

The PATWAS program, conducted in cooperation with the LaGuardia office of the National Weather Service, was designed to make the PATWAS system more current and more route oriented.

Forecasters at LaGuardia were turning out specialized aviation weather forecasts two or three times each

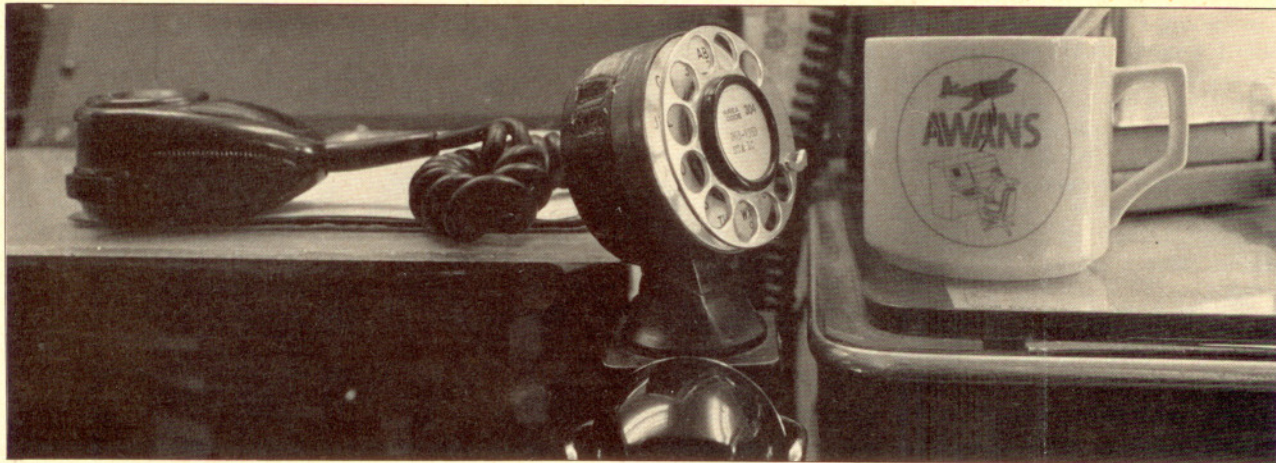


morning and adding them to the regular local, northeast and southwest information.

In terms of both call volume and FSS service improvement, the FAA said the program was an *unqualified* success. An evaluation team looked over the data developed and came to these conclusions:

1. The trial PATWAS produced a substantial decrease in the number and length of FSS person-to-person briefings.
2. The trial PATWAS was responsible for disseminating an unprecedented amount of weather information for preflight planning to general aviation pilots in the area.
3. The full potential for PATWAS development has not yet been realized.

The evaluation team made several key recommendations, including elimination of the basic PATWAS and its replacement with the trial system. They also recommended development of a program whereby a



pilot could file a flight plan automatically through the PATWAS connection, providing "one-call service."

Well, what happened to this project?

"They (area pilots) loved it so much we (FAA) shut it down," was one FAA'er's brief judgment of the situation. "It was the best system in the country, and it should have stayed that way, but the 'wizards' said that's an FAA function, took it away from NWS, moved it to Teterboro, and the whole mess is right back where it was before we started the project."

The FAA-Mitre Corp. VRS project in the Washington area, which allowed pilots with access to a Touch-Tone phone to tailor their own weather briefings, has been a qualified success, and work is being done to eliminate some of the system's shortcomings, such as the lack of a synoptic outlook and NOTAM availability.

Vince Constantino, of the FAA's research and development branch, said recently that improvements in these areas were "in the works."

In the meanwhile many Washington area pilots have found the existing VRS collection of surface observations, forecasts and upper winds to be a valuable preflight planning tool.

Working under the direction of Frank Staiano, NAFEC's R&D troops are attempting to develop a voice-activated system that would enable pilots to call and receive a computer-generated voice briefing and file a flight plan with one call.

"Using this system, all a guy has got to do is call, get his briefing and then either ask the machine for a specialist or tell it he wants to file a flight plan.

"The machine is sensitive to several key words like 'file' or 'specialist' and will respond appropriately," Staiano said.

What's being done to improve pilot access to the FSS system?

Almost any pilot who operates regularly from a major metropolitan area has had his share of time shuffling his feet before a pay phone waiting for his friendly FSS briefer to get around to his particular call, or that lucky pilot has had the honor to try time and again to work his way past the busy signals and into the holding pattern.

Simply put, FSS access is a function of three things:

1. Facility staffing level.
2. Number of phone lines available.
3. Availability of a toll-free phone line.

Issues one and two are inseparable. If a pilot calls and can't get through that station has not got enough incoming phone lines, and if the pilot's call gets through to catch the "all briefers are busy" recording, there aren't enough briefers available.

Simple? No.

The issue of phone lines and personnel available at any particular time are closely tied. People represent the FSS system's most critical resource, and the shortage of personnel requires that the available manpower be apportioned wisely.

Just moving a man or two around on a facility's staffing schedule can make all of the difference in the world in terms of service.

For example, the Washington FSS has put a phone service monitoring device to good use in reshuffling its work schedule. Assistant facility chief Barry P. Siford said an analysis of the data developed from monitoring average hourly calls, and average holding and answering time led to changing the facility's morning shift.

"We've discovered we needed to have our morning shift people start coming in earlier to catch the rush," Siford said. "It's caused us some personnel problems with our people having to get up and started earlier, but it has helped us meet our morning demand."

Careful allocation of available people, however, doesn't solve the basic lack of trained FSS manpower available today. The chief of a busy southwestern FSS put it this way:

"We're trying to run a pretty busy 24-hour facility with just five journeyman briefers, and anytime anyone is on vacation or out sick this place is a circus. I've got guys doubling back in and working all kinds of overtime.

"If a guy is just beat into the floor, what kind of service is he going to be able to perform when it really counts?"

The question of nationwide toll-free telephone access to the FSS system opens another can of worms.

The Canadian Ministry of Transportation has recently commissioned a program whereby any pilot with access to a telephone anywhere in the dominion can reach an FSS via toll-free line.

That's obviously not the case in the United States, and there is little chance it will become a national policy, according to the FAA.

During a recent briefing, AOPA officials were told simply that telephone service was a "regional problem" that must be handled on a regional basis, and that no

FAA-wide policy on telephone service was in force.

Various regions are working to improve toll-free access to facilities.

A few rays of sunshine for the IFR pilot may be peeking over the horizon, however. The Southwest region and Albuquerque ARTCC have started a program within the state of New Mexico where pilots needing to file an IFR flight plan can call the center

toll-free from anywhere in the state to file.

No weather information or VFR flight plan service will be available with this program, however.

Has limited consolidation worked?

One of the key ingredients of FAA's master plan for FSS modernization is consolidation of smaller, less efficient facilities into larger units to make the most of available manpower.

Consolidation, when first unveiled in a Department of Transportation (DOT) report in August 1973, created a massive groundswell of complaint. Thanks to efforts by AOPA and others in the industry, the Congress prohibited any further FSS closings or reduction of hours without specific, case-by-case congressional approval.

A limited consolidation testbed, however, was approved, and by July 1977 the Washington FSS had been relocated from its quarters at Washington National Airport to the Leesburg, Va., ARTCC. Outlying facilities in Richmond and Charlottesville were closed and their personnel and functions were consolidated with the new automated Washington FSS.

The Virginia FSS closings created a storm of protest, and AOPA's approval of the project caused a lot of unrest among members in the Richmond and Charlottesville areas. The test-bed FSS plan called for five facilities to be consolidated, but to date that has not come to pass because of space problems at the Washington ARTCC, according to the FAA.

However limited the Leesburg experiment has been, some positive benefits of consolidation have been demonstrated through "before and after" (BAA) studies of service afforded pilots.

Although "before" data was collected during severe clear weather and the "after" period was largely marginal VFR and complete IFR, production per specialist was up some 39.4%.

Before consolidation, the average Richmond briefer gave just under 10 briefings per hour in VFR weather, while the Charlottesville FSS was turning out 3.6. Washington FSS briefers were handling 14.5 briefings and flight plans per hour.

The same briefers consolidated into a common facility serving the entire area were handling an average of 14.5 briefings and flight plans per hour during a period of much worse weather during the "after" sampling period.

While average waiting time for callers from the Richmond and Charlottesville area was higher, Washington area pilots were probably waiting less, according to FAA material.

It's very difficult to draw an informed decision on FSS consolidation from the limited Washington FSS experiment, but certainly enough information has been developed to warrant proceeding with a full consolidation of the original five stations into the Washington FSS to permit a full evaluation.

Colocation: Can it work?

Much has been said over the last several years about FSS consolidation. A part of the FAA master plan at one point was to collocate a series of so-called "hub" facilities with ARTCC units around the country. The move from old quarters at National Airport to the Washington ARTCC by the consolidated Washington

TIRED OF WAITING? TRY TWO MINUTES

Waiting in line is irritating to many people, and winding up in a telephone waiting line listening to an uninterested irritating tape recording say, "All briefers are busy. Please stand by, and your call will be answered in turn," time after time has been known to drive even the most even-tempered pilot almost to the point of insanity.

In fact, some pilots have even gone so far as to call FSS operations hundreds of miles away from their location just to get through on the telephone.

One FSS specialist said he has been regularly answering calls from pilots in a city 185 miles away because the callers don't want to wait for a briefer.

In other cases business jet operators coming into Washington National Airport have reported calling their home base FSS rather than wait for an answer at the Washington FSS.

Nearly anyone who has tried to get a telephone briefing during normally busy hours of the day or in periods of marginal weather has spent his share of time holding at the phone booth with a very uncertain "expect further clearance" time.

Although everybody has a favorite horror story about busy signals for 45 minutes or holding for 15 to 20 minutes, real-world scientific data about FSS-call holding periods has been very hard to come by until recently.

As part of its Washington FSS experiment, the FAA placed a telephone monitoring device on incoming lines at the Leesburg, Va., site to see just what the situation was.

Well, it turns out pilots are not very patient people, according to assistant facility chief Barry Siford. "We have a lot of callers who hang up the instant they get the recording, and a few more hang on for just a few more seconds."

The average hold, however, isn't as long as many pilots seem to think, according to Siford.

"We've found that if a pilot will give us two minutes after he hears the recording we will answer something over 80% of the incoming calls," Siford relates.

"If we don't get to you in two minutes or so, it's probably best to hang it up and have another go at it later.

"If our experience at Leesburg is any indication of how FSS people are doing, as a rule, if your call isn't answered in two minutes, it may take 10 minutes."

Obviously, the Washington FSS isn't a typical operation in many instances, but Siford's guidance has merit. So, next time the old "all briefers are busy" recording rears its head, wait a couple of minutes before packing it in. The odds are you just may get an answer to your call.

FSS has brought some interesting facts to light.

While it is true that colocation of the FSS and ARTCC has some solid economic basis since common buildings, grounds, power and security can obviously bring about some cost savings, FSS specialists and ARTCC personnel are apparently about as compatible as oil and water.

"Sure, we've got morale problems here," one FSS veteran said. "Our guys [FSS personnel] are working their tails off . . . eating at their positions, and just barely able to sneak off to the can."

"Then they get a look into the chow hall and see a room full of controllers horsing around, and it's got to stick in your craw."

Pay-scale differences also serve to add fuel to the problem, since the journeyman FSS specialist and his counterpart at the center are in most cases at least one pay grade apart.

In fact, the Washington FSS is being moved out of the Washington Center complex as quickly as other arrangements can be made, according to the FAA. "The (Eastern) region is working on it," the *Pilot* learned. The rumor mill has the facility moving to Dulles International Airport, but there has been no word on the exact location.

How is the FSS specialist looking at this period of uncertainty?

For many years pilots have looked at the "friendly" FSS man as a source of information and assistance in time of trouble. Well, the FSS specialist is still a source of information and help, but the "friendly" is certainly starting to show some wear around the edges.

The FAA and the National Association of Air Traffic Specialists (NAATS) are currently involved in new contract negotiations and labor negotiations always seem to have a bad effect on the troops in the field.

NAATS boss Lawrence Cushing has said he is looking forward to a tough session, and, while no threats have been made about job actions and other NAATS reactions to FAA's bargaining position, the thought is enough to keep the troops on edge.

One FSS specialist in northwest Arkansas had a typical reaction to the work NAATS has done. "Those union guys in Washington really haven't done much . . . have they?"

Another specialist from the same general area is completely in the NAATS camp saying, "Larry's done a heck of a job. I just don't know what kind of situation we would be in without a voice in Washington."

EFAS-equipped stations have an additional problem, according to both FAA headquarters people and NAATS, since EFAS-qualified specialists are entitled to benefits other journeymen aren't getting.

Rotating shifts, for example, favor the EFAS man since he does not have to pull any midnight duty.

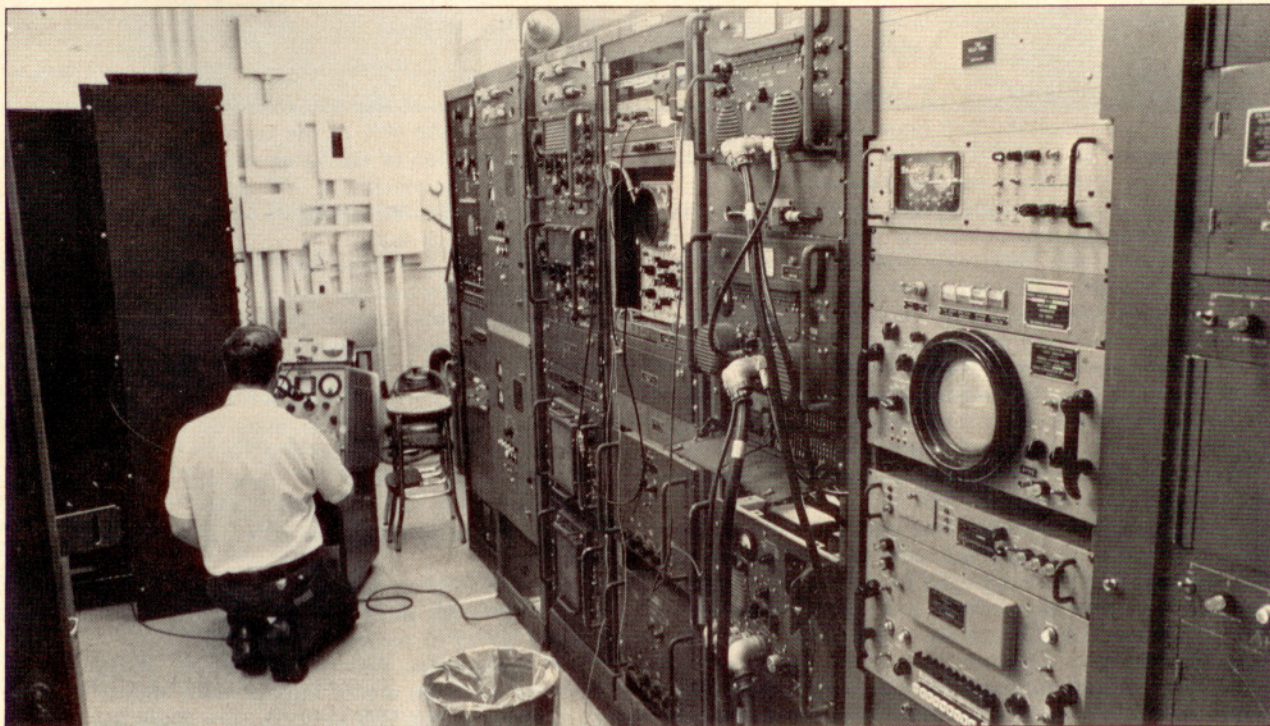
"Sure it's a little problem," according to an FSS assistant chief, "and we need more little problems like Napoleon needed more snow when he invaded Russia."

"Our EFAS people can be pulled off EFAS at times to help with other briefings, but we can't put a journeyman on an EFAS position . . . and our EFAS guys go home when we close the position down at 11 p.m. The other guys working 'mids' can't help but be a little envious."

Direct labor relations problems aside, a five-week informal, drop-in survey on FSS specialists in 12 states shows the FSS system to be manned with frustrated people.

"We've rocked along here with inadequate people and equipment for years," one specialist said. "Just look around at this gear . . . the teletype system came in during the late 1920's and hasn't changed . . . this building was built during World War II!"

Another briefer said, "Unless we get some relief in



the way of new equipment we're going to drown out here (in a fairly active Level II station).

The assistant chief of a large station probably put it best saying, "We're just a victim of circumstances. Funding, people and equipment are all going to other parts of the air traffic service, and we're just sitting out here trying to make do."

"Until something happens to get some of the things that the FAA has been talking about into the field we're going to continue to get last choice."

What should be done?

"There are many things that could be done," AOPA Senior Vice President-Policy and Technical Planning Victor J. Kayne said, "but the bottom line is—we must have service improvements and access improvements to

achieve better service to general aviation."

More people and a vastly improved telephone access program are high on AOPA's shopping list of FSS changes, according to Kayne.

"I don't care how they do it, but we're going to have to get a better means of getting into the FSS system. More people would solve a lot of problems, and development of a large-scale toll-free telephone network would be fairly straightforward if FAA would just move forward on it . . ."

Moving forward strikes a responsive nerve in almost anyone involved in FSS improvements. "We've talked and we've researched and developed, and we've talked some more," one FSS specialist said. "Now it's time to drag the whole modernization mess out of the R&D shop and get it into the field where we can use it to save a few lives . . ." □

SLIPPING IN NEW FSS EQUIPMENT

We've all had the experience . . . weather is bad . . . call the FSS . . . get the "all briefers are busy" recording . . . wait for what seems like hours . . . finally talk to a briefers and find out the weather is so bad that we aren't going anyway.

Maybe the purpose of the call was to file an IFR or VFR flight plan. Well, the scene would be just about the same, complete with wait, unless a fast-file line was available.

Demand has finally got the FSS network down in much of the country. Sure, there are areas where pilots can call their FSS, get a quick answer, a briefing, file a flight plan and be on their way in just a few minutes, but that situation is slowly changing for the worse.

User-pressure on the current system is going to increase, and the highly labor intensive nature of the FSS as we know it just can't be afforded, according to the FAA.

These pressures may well be allowing "modernization" to slip in through the back door ahead of the FAA's full automation and modernization programs that are still some time away from implementation.

Installation of a new high-speed weather dissemination and storage system at the 150 busiest facilities is under way; contracts have been signed for installation of \$7 million worth of digitized weather radar displays at 43 stations; 101 new VHF direction finders are currently on order, and an additional 15 DF units will be installed in the Alaskan region in 1980.

The "Lease A" weather information system the FAA has obtained from Western Union has been operating at the Chicago FSS for some months now, and it has received high marks from both journeymen briefers and Chicago area pilots.

The Western Union system was installed in St. Louis, Denver, Kansas City, Portland, and Islip FSS's during July, and the FAA contract calls for installation of not less than 10 systems per month until all en route flight advisory stations (EFAS) and the top facilities have the high-speed service.

The Lease A system, essentially, is a data collection service which is tied into the Weather Message

Switching Center (WMSC) in Kansas City, Mo. Each of the systems will periodically receive and store routine Service A data transmitted from the WMSC and file a large amount of the information within storage equipment at the FSS.

The FAA says the Lease A system will give each FSS the capability to store up to 95% of the weather information it routinely needs.

The system will completely replace the existing 100-wpm Model 28 teletype service with a 2,400-wpm system that will completely update its weather data base far faster than is currently possible.

In addition, any information that is not contained in the on-site memory will be directly obtained from the WMSC through the Lease A lines. So the FSS specialist will not have to use a slow 100-wpm request-and-reply teletype circuit.

Terrell Wilson, of FAA's air traffic service headquarters staff, said the 150 stations receiving Lease A equipment handle 80% of the current briefing load.

"Implementation of the Lease A service will also be a big help to the remaining 140 stations," Wilson said, "since it will thin out the needs and circuit use on the existing Service A lines."

While the FAA is implementing a program that will put weather information into the FSS briefers' hands quicker, it has also moved to install digitized weather radar displays with 44 units scheduled for installation at EFAS locations.

The units will display weather radar data obtained from long-range FAA radar units as well as National Weather Service WSR-57 and WSR-74 units.

An additional 101 VHF DF units will be flowing into the FSS network starting in May 1980. These units will be used to supplement the existing network of 161 units.

"Our objective," according to the FAA, "is to provide national coverage along principal VFR flyways at 5,000 feet and above in the contiguous U.S."

New equipment, faster information retrieval and better DF coverage are of limited value unless there is better access to the FSS network (See page 54).