



Weather Check

Getting the most out of the
briefing/forecasting system

by EDWARD G. TRIPP / AOPA 308674

If you're old enough to have seen "The Crimson Pirate," you may recall one of Burt Lancaster's lines that has stuck with us since: "Believe nothing you hear and only half of what you see."

This might be a healthy attitude for more pilots to apply to weather and weather briefings. Weather accidents are still too large a percentage of the overall aviation accident rate, and a large part of the fatals. Don't think that weather accidents are restricted to neophyte pilots, either; the record shows what we consider to be a very large number of weather-related accidents involving high-time pilots.

From our point of view there are two sides to the problem: the quality of information and its accessibility, and the diligence and knowledge pilots apply to extract the most and the best

information possible out of the briefing/forecasting system.

Too many pilots don't know how to obtain a useful briefing; too many are intimidated by the assumed superior knowledge of the briefer and stop asking as soon as they hear, "VFR not recommended," or "Possibility of icing in clouds and precipitation," or they accept whatever the briefer provides as the entire picture of what is and what is predicted to be.

On the other hand, there seem to be just as many who, when they bother to get a briefing, don't believe the person on the other side of the desk or the other end of the telephone and punch into more weather than they can handle. Many accident reports state that the pilot obtained a briefing and went, only to have an accident as a result of forecast weather.

There are considerations other than accidents, however. The most discouraging thing to an aircraft user is to realize that utility is limited by the vagaries of weather. If that person gets bad briefings either because he doesn't know how to get valid information or because he is intimidated by the negative outlook of some specialists, he often gives up trying—and flying. Analyzing weather and making decisions is a learning process as much as the basic manipulation of the airplane. As experience is gained and as judgments are tested in the real-life experience of flying, the body of knowledge of the individual builds and the utility of his airplane increases.

The System

We don't mean to put the blame solely on the shoulders of the pilot, by any means. "The system" must share the responsibility. The weather system consists primarily of the National Weather Service (NWS), which is part of the Department of Commerce, and the FAA's network of flight service stations (FSS's). NWS gets readings from more than 600 weather data collection points around the country (some of which are FAA facilities, some independent contractors) and prepares reports of actual weather and forecasts. It also mans weather facilities for the analysis and dissemination of the information. The FSS specialists who are bona fide briefers are trained and certified by NWS. They relate, but do not interpret, the available information to pilots.

Most of us are aware of the deteri-

oration in the FSS system and the several plans to modernize, contract, and otherwise change the system (AOPA is working full time on this issue and is tracking developments closely). How many remember the comparative ease with which one could visit an NWS facility and get a briefing in great detail from a genuine forecaster? The NWS facilities are diminishing in number, just as flight service stations are, and the people manning the stations seem to have less time for—and in many instances less good will toward—pilots and their needs.

NWS has a relatively small staff and a small budget and must serve the needs of all citizens, not just pilots. The aviation specialists are no more. Quite a bit of staff time now goes to providing the data for commercial television's show-business approach to weather. Much of the equipment is incompatible, old-fashioned, slow and of low capacity (particularly in the area of dissemination).

NWS and FSS briefers are no more perfect than their pilot counterparts. Personal attitudes, standards and competence vary greatly from person to person. One can receive a thorough, enlightening picture from an FSS specialist yet call the same place five minutes later and get a gruff, uncooperative operator—or, worse yet, a completely incompetent one. Local knowledge in some areas gets the word around that "... if so and so or such and such a type answers, hang up immediately and call back."

There is a bit of a CMA (not to be defined) game carried on in the business, as well. The old warnings against VFR or about thunderstorms or ice are all too often a part of that game and reflect the lack of professionalism on the part of the briefer or the inability of the pilot to get the information needed. For every pilot who gets involved in a weather accident through ignoring the information given in a briefing, there are those who get caught, only to learn later that briefers had warned about something far less widespread than their records would indicate. In a nasty, descending spiral, the more pilots who learn the caution of the briefer in the CMA game, the more there are who are tempted to ignore the valid information and go out to have a weather-related accident.

If weather collection, analysis and dissemination for pilots had the budget of an agency such as Health, Education and Welfare, we would all carry our personal weather forecaster around with us. But aviation is relatively low priority these days and there aren't enough funds to provide for its needs (unless one can afford one of the excellent private forecasting serv-

ices). What we get is less than what we need, but if one knows how to get the proper information and analyze it in terms of one's capabilities, mission and equipment, it is satisfactory—most of the time. And, like our creaking and groaning, inefficient ATC system, it's the best one on earth.

Just as with the problem between ATC and the flight crew—who's in charge—there is a fundamental problem with too many pilots who seem to want to share the responsibility for planning and decision making with someone else. When problems arise, however, the fault is almost invariably laid on the pilot, not on the system.

The only solution is for each of us to become better informed, to learn more about the information available, how to get it and how to apply it. In the balance of this article we will present the sources of information that are more or less readily available. In subsequent issues, we will cover the kinds of questions to ask, the strategy of analyzing weather for a particular flight and the nature of certain kinds of weather phenomena, such as thunderstorms and ice, and how to deal with them.

The Basics

There are many sources that cover weather and the weather reporting system. We highly recommend *Weather Flying* by Richard N. Buck for the practical aspects of weather and how they relate to flying decisions. But if you, like many pilots, haven't gone through a study of what weather is and how it develops since getting your rating, such basic books as the joint FAA/NWS book, *Aviation Weather*, make useful refresher sources.

The basic sources of available weather information and what they provide are listed in many places such as the *AOPA Handbook for Pilots*, the J-Aid section of Jeppesen's *Airway Manual Service* and the *Airman's Information Manual* published by the FAA. They also list the frequencies for transcribed weather broadcasts and provide the keys to weather symbols and glossaries of contractions necessary for interpreting teletype reports and forecasts. They also include telephone numbers for briefing facilities, as does *AOPA's Airports U.S.A.*

There are some useful films that enable pilots to see weather while learning about it. The FAA has several available. GAMA has several new ones, plus a revision of "Weather Wise," in the process of being released. The

AOPA Air Safety Foundation's show, "Weather Watch," which packs just about every kind of hazardous weather into an 18-minute presentation, is quite dramatic as well as informative. The Foundation also has three new weather films in production.

These and other sources provide good update information on the basic considerations. But the most important part of dealing with weather is to get as much information as possible, from the "big picture" down to the actual route of flight and time of day.

Self-Briefing

A good way to start the day is with a newspaper that has a weather section. Many include satellite depictions. Some morning television news programs have good, general weather reports. "A.M. Weather," with AOPA, FAA and NWS providing the primary effort, is now available on 152 public television stations across the country (see article on this page).

Another step in getting ready for a specific briefing is to utilize one of the broadcast or telephone self-briefing services available. The two primary aids are: the Pilot's Automatic Telephone Weather Answering Service (PATWAS) and Transcribed Weather Broadcasts (TWEB).

The PATWAS is particularly useful in self-briefing as an indicator of those phenomena to examine more closely and as a source of information for making a basic go/no-go decision during those periods when the telephone lines to a facility are tied up.

The recorded information includes a forecast of anticipated weather over a 12-hour period, although some evening forecasts cover an 18-hour period.

The TWEB's are similar to PATWAS but are broadcast continuously over the low frequency (200-415 kHz) range and on some VOR's. Also, there are receivers on the market, either to adapt existing AM radios or as self-contained receivers, to enable pilots to receive TWEB's within range at home, in the office or in a car.

The usual format includes station identification, general forecast or synopsis for the area (usually a 50-mile radius), pilot reports (PIREPS), radar reports as available, winds aloft forecasts and NOTAMS.

Both PATWAS and TWEB reports can include route forecasts. In some locations PATWAS discrete telephone numbers are assigned to cover local and north/south or east/west routes.

The problem with both is that they are very low duty priority for FSS specialists and suffer from being updated least when most needed.

There is one other source of transcribed information available at some

stations, which can be useful for local flight planning. At some ATIS's (Automatic Terminal Information Service), telephone access is provided. However, it, too, gets low priority updating.

The final—and usually most up-to-date and reliable—self-briefing tool available at some locations is the good old teletypewriter. Weather information collected and analyzed by the NWS is disseminated through the weather center in Kansas City over several teletype circuits. It contains the same weather reports and forecasts available to NWS and FSS facilities. The abbreviations and symbols take some getting used to, and one must know the station identifiers, but a practiced pilot can extract good information. The only things missing are the depiction charts, which are available at NWS and FSS facilities.

Using one or more of these aids to get an idea of weather conditions is a good way to develop specific questions to ask a specialist when you visit a facility or call one on the telephone.

Two-way briefings

The ideal way to check weather is a face-to-face briefing with a solidly professional briefer. This is becoming increasingly difficult, both in terms of available locations and staff. It puts an even greater responsibility on pilots to know what is available and to be persistent in getting answers to their questions.

In person or by telephone, the best

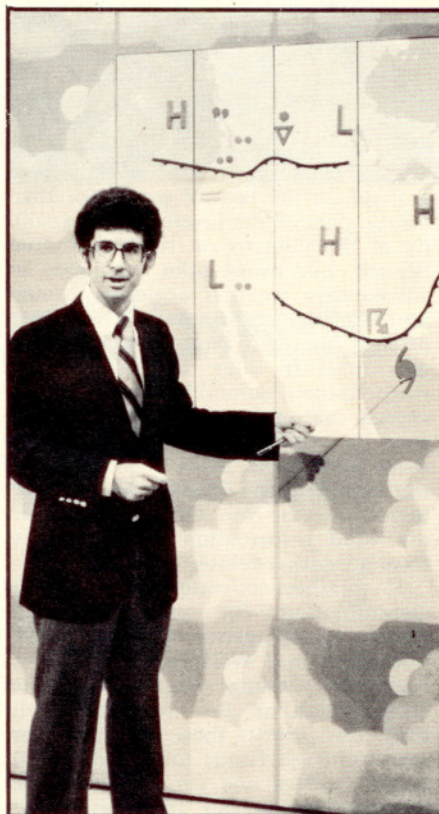
results come from a knowledge of what to ask and what information will be used by the person on the other end. There are two broad categories of information: actual weather and forecast weather.

Actual Weather Information

Sequence Reports are produced hourly at over 600 observing stations and include cloud cover, ceiling, visibility, precipitation or significant weather, temperature, dew point, wind speed and direction, barometric pressure, runway visual range, significant changes, PIREPS, and NOTAMS.

Special Observation Reports are issued to record a significant change in any one of the categories covered by normal Sequence Reports.

PIREPS can and should be the most useful sources of information about real weather, particularly when it's bad or substantially different from forecast. Facilities are required to solicit pilot reports in marginal or severe weather conditions, and pilots are repeatedly urged to make them. Both the Feds and pilots are to blame, but PIREPS that are made often don't get to all the sources who could use them to inform other pilots. Part of the problem is the form in which pilots provide the information, which can make it difficult to transmit to other FSS's, NWS facilities, control towers, ARTCC's and the Weather Service Forecast office. But the pilot must ask for them. Don't assume there aren't any PIREPS just because a briefer doesn't offer them.



A.M. Weather

A Great Way to Start Your Day

Rise and shine for "A.M. Weather," a 15-minute television program that offers airmen an early picture of Nature's stirrings amidst the airways. While not intended as a replacement for detailed weather briefings, the live broadcasts contain sufficient information to open the sleepest eyes or send the flier back to the pillow. And the program is important to nonpilots as well; persons who work

Weather maps and color satellite pictures are among over a dozen possible graphic illustrations utilized by the professional meteorologists who announce the PBS weather programs.

Briefers will often provide only the information that is specifically requested.

Radar Reports are hourly summaries based on weather radar at 90 NWS locations, 32 Department of Defense units (plus 15 in Alaska) and 18 FAA radar sites. Significant precipitation or thunderstorm activity is disseminated throughout the reporting network.

Flight Advisories, or SIGMETS and AIRMETS, are observations of conditions of sudden or severe weather, which require flight planning and in-flight precautions. SIGMETS are issued for conditions that would create difficulty for all aircraft. AIRMETS are issued for conditions that present actual or potential problems for light aircraft.

Weather Depiction Charts enable a pilot or briefer to tell at a glance what cloud cover exists and includes bases and visibility. Viewing several (they are issued roughly every three hours) can give good information on change and/or thunderstorms.

Constant Pressure Charts are issued twice daily and are based on weather balloon data such as actual wind velocity and direction, temperature and dew point at several pressure levels.

Radar Summary Charts, which are issued every three hours on the average, show significant weather echoes and are useful to determine if any vertical development is taking place—which can mean heavy precipitation and/or thunderstorms.

Winds Aloft Charts are issued four times a day for altitudes from 5,000 to 60,000 feet msl, but are often several hours old when received at a facility. They can be useful for trac-

ing developments, but are probably the least useful weather charts for most purposes.

Forecast Weather Information

Area Forecasts are issued every 12 hours (they formerly were issued every 6) and cover an 18-hour period. They include information on cloud cover, weather and frontal conditions, AIRMETS or SIGMETS, height of clouds and icing conditions. The area encompassed is usually for several states to help give a broad idea of conditions. They also provide anticipated conditions for the 12 hours following the forecast period.

There are a couple of tricks to remember with respect to Area Forecasts. Cloud tops and icing conditions are given in height above sea level (asl), and cloud bases are also, unless specifically noted. On the other hand, ceiling is given in height above ground level (agl).

Terminal Forecasts are issued three times a day. They cover a 24-hour period and contain basically the same information as the Area Forecast. However, they provide the information for specific airports within a 5-mile radius (although some include a remarks section for conditions within a 20-mile radius). The last 6 hours of the forecast period states whether conditions are VFR, marginal VFR or IFR.

Winds and Temperatures Aloft Forecasts are 12-hour forecasts of wind direction and speed, and tem-

perature in centigrade (celsius) for 3,000, 6,000, 9,000, 12,000, 18,000, 24,000, 30,000, 34,000, and 39,000 feet.

Weather Warnings and Severe Weather Forecasts mean what they say. All are issued by the Weather Center in Kansas City.

Low-level Prognostic Charts ("progs") give a good depiction of anticipated weather. They include the location of fronts, patterns of circulation, areas of precipitation, cloud cover and any other significant phenomena for 12- and 24-hour periods. Generally speaking, they are the most useful presentations for a pilot as they provide a detailed picture over a large area.

The Future

In a relatively new program, FAA and NWS have developed a program to station trained meteorologists in Air Route Traffic Control Centers (ARTCC's). They will be equipped with color weather radar and/or radar facsimile machines (some have them already) to enable them to analyze and advise controllers of hazardous weather. When fully developed, the agencies plan to install the program in all 20 ARTCC's and the major FSS's including all Enroute Flight Advisory Station (EFAS) locations.

Both agencies are committed to automation as the way of the future largely because of the labor intensiveness of the present system and because of reducing funds. One of their joint R&D ventures is the Buck Rogersh Aviation Automated Weather Observation System (AV-AWOS). The new black box measures ceiling, visibility, temperature, dew point, wind direction and velocity, barometric pressure, any significant precipitation and thunderstorm activity. It also features a computer-generated voice that will talk to pilots on the telephone. There will also be AV-AWOS junior and a grandson: simpler versions dubbed ALWOS (Automated Low-cost Weather Observation System) and WAVE (Wind, Altimeter, Voice Equipment).

The system is being tested now, but it isn't perfect. Only push-button telephones can be used to contact aviation weather's very own Hal at the test locations. Users must learn how to communicate with the beast, since human language must be fitted into the limited understanding and flexibility of a machine. The computer can cut man-hours of labor, but it is an expensive, demanding creation. The machine replacement to collect, massage and relate weather information is many years away.

Until 1984 or whenever, we must do our best to get what we need from the system of yesterday and today. □

outdoors can get a good idea of when weather might interfere with their activities, or a commercial airline traveler might decide whether to carry an umbrella.

Satellite photos open the program and enable viewers to look at major weather systems—or lack of them—as they appeared during the preceding 24 hours. Infrared photo data even makes it possible to pinpoint thunderstorm activity hidden in the cloud cover of weather systems viewed from space while motion presentations show the movements of those systems.

Three professional meteorologists are on hand to provide an analysis of current weather activity as well as 12- and 24-hour forecasts—in plain English with a minimum of professional jargon. They use as many as 15 different maps in supplying specific information on temperature, winds aloft, fronts, highs, lows and other facts pertinent to national and regional weather; a Sky Watch map pinpoints especially hazardous areas

created by thunderstorms, heavy snow, icing, and other serious weather perils for pilots. Two of the meteorologists are from the National Weather Service (NWS) and one is from the National Environmental Satellite Service.

The Monday through Friday program, produced by the Maryland Center for Public Broadcasting, is being aired by more than 150 stations in the Public Broadcasting System (PBS). Programs directed at eastern U.S. weather conditions are shown live at 6:45 a.m. EST and on tape at 7:45 a.m. for stations carrying a later report. The western part of the country is covered by a live broadcast at 8:45 a.m., followed by a taped broadcast at 9:45 a.m.

The bulk of the more than \$360,000 funding for the series has come from the FAA and AOPA. Additional moneys, administered by AOPA, have come from the General Aviation Manufacturer's Assn., National Business Aircraft Assn., and the National Pilots Assn.—R.R.