WEATHER and RADIO

NOAA's Ubiquitous Radio

Edwin P. Weigel

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NOAA Weather Radio is succeeding far beyond its founders' fondest expectations.

This system of continuous broadcasts of storm warnings and weather observations and forecasts was begun back in the 1960's to serve recreational boaters. Since then, it has been expanded to cover just about everyone.

Already there are more than 225 stations, operated by the National Weather Service, and the pace of installations is accelerating, because people like it so much. When completed next year, there will be about 340 stations, covering 90 percent of the U.S. population.

This letter from Neal J. Whyte, a businessman in Pinconning, Michigan, illustrates the type of response that has been flowing into National Weather Service offices all over the country.

Mr. Whyte wrote to the National Weather Service Office in Flint, Michigan:

"You people are doing a fantastic job, (providing) an invaluable service to such industries as farming, commercial fishing, and construction. The list is almost endless. It should save them fortunes.

"I use it for pure enjoyment and for planning my days three days in advance. (I have) nothing but admiration for the professional status of you people. I, for one, will gladly accept any additional increase in taxes to insure its continuation.

"Congratulations. You are just great."

Mr. Whyte added as an afterthought that he has three sets with which to tune in the broadcasts - one at home, one at the office, and a small pocket portable that he carries with him.

A Nebraska weekly newspaper editorialized: NOAA Weather Radio "is probably one of the most beneficial systems that the Government has devised for the taxpayer. Yet too many of us don't take advantage of the protection the system provides."

Further proof of NOAA Weather Radio's popularity is that, as word has spread, a great many States have volunteered to provide facilities, and in some cases staff to augment and speed its availability.

Earl Estelle, program leader for NOAA Weather Radio, wrote recently: "This is one of the hottest things we've ever had going for us. We currently have about 35 States and Puerto Rico cooperating in completing the system. Clearly, they think the system is worthwhile, or they wouldn't be helping us. User surveys by individual Weather Radio stations produce hundreds of letters, almost all highly favorable. A voluntary response of this magnitude is extraordinary. Some of our stations get Christmas cards from listeners.

"Manufacturers are equally enthusiastic. One firm has sold more than 1.4 million receivers capable of picking up the broadcast. A randomly selected retailer in Little Rock told me that Weather Radio receivers were the hottest item in his store, now that the CB rage has passed.

Charna Lester monitors operations of the NOAA Weather Radio at the Washington, D.C., Weather Service Forecast Office. The station is one of more than 225 in the fast-growing network.

Another manufacturer is unable to keep up with customer demand. His last production run increased sixfold over the previous one.

"The Kentucky network, the first one to go in under a cooperative Federal/State agreement two years ago, is getting remarkable results. The meteorologist in charge at Louisville estimates there is at least one Weather Radio for every eight Kentucky families.

"Mansfield, Ohio, wants to donate a total system for us to operate. Several other cities have already done so. South Carolina is working on a bill to provide receivers for every school in the State. Many school districts in other States have already done so.

"Arkansas, Tennessee and Mississippi have passed legislation providing for expanded networks beyond the Federal plan. Other States, for example, Minnesota and Wisconsin, are considering similar action."

In Estelle's view, testimonials, such as these, bear the same authority as a popular referendum - people voting for a program with their dollars - and the response is snowballing.

For members of the NOAA family unfamiliar with NOAA Weather Radio, here's how it works: The latest observations and forecasts are tape-recorded by local Weather Service offices in messages that last from three to five minutes. These messages are replayed continually, guaranteeing reception any time of the day or night at the push of a button or the twist of a dial.

The tape-recorded messages are revised very three to four hours, more frequently when appropriate. When severe weather threatens, forecasters at the local Weather Service office interrupt the broadcasts with storm warnings, either tape-recorded or "live" as the situation demands.

Furthermore, the system has a feature which allows you to be alerted automatically, if you choose, when dangerous weather, such as a tornado or flash flood, is on the way. Radio receivers available for as little as $35 will silently monitor the NOAA weather broadcasts and automatically either sound a siren or come up to audible volume when the forecaster presses a button in his office signifying that a storm bulletin is forthcoming. These "warning-alarm receivers" are especially valuable for schools, hospitals, nursing homes, factories, mobile-home com-

munities and other places where large numbers of people are congregated. They are also of vital importance to radio and TV stations and public-safety officials.

Because of its unique warning capability, the NOAA Weather Radio system was designated in January 1975 by the White House Office of Telecommunications Policy as the sole federally operated radio system to provide warnings directly into people's homes - not only for natural disasters, but also in the event of nuclear attack.

What kind of receiver is needed? One that will receive very high frequency FM broadcasts - considerably above commercial FM broadcasts, which end at 108 megahertz. The frequencies used for NOAA Weather Radio, nationwide, are, 162.40, 162.475, or 162.55 megahertz. Most radio-specialty shops and many other retail outlets have such "high band" receivers, some for as little as $10 or $15 - if you don't care to have the automatic storm-warning feature.

Effective range of the broadcasts is about 40 miles, depending upon the terrain and the quality of the receiver. Because of the high frequency, transmission is by line of sight, like television, and may be blocked or interfered with by hills, nearby buildings, or commercial radio transmitters. Such problems may sometimes be overcome, or listening range extended, by use of high-quality receivers and high, outside antennas.

Because of these uncertainties, the Weather Service advises people to make final acceptance of a receiver conditional upon a test in the setting in which it is to be used. It urges institutional buyers to select a high-quality receiver with great sensitivity and selectivity.

It's also worth noting that you can purchase receivers that will pick up NOAA Weather Radio broadcasts when you're traveling, as you move from the range of one station to another, so that you will have a continuous source of local weather reports. As the system grows, you will seldom be out of range of a local NOAA Weather Radio broadcast for very long when traveling on interstate highways.

Another boost to NOAA Weather Radio - especially in areas where tornadoes, flash floods and hurricanes are a chronic threat - has been extension of the broadcasts by retransmission over cable television. There are now hundreds of cable-TV companies, serving one out of every eight homes. Many are relaying NOAA Weather Radio broadcasts over designated but otherwise unused channels. Support to NOAA Weather Radio by the broadcast industry doesn't stop with cable TV. An increasing number of radio stations are taping NOAA Weather Radio as a convenient means of staying up on weather conditions. Some of them are using the recordings as an information source for rebroadcast by their own announcers. Others are retransmitting the broadcasts directly. Many stations have bought warning-alarm receivers to be sure of getting severe weather watches and warnings for immediate relay to their listeners. Still other radio stations are tapping into broadcast consoles at Weather Service offices directly by means of land lines, rather than receiving the messages over the airwaves. This assures them of the highest quality signal, and, perhaps more importantly, provides NOAA with an alternate transmitting source in weather emergencies where the NOAA transmitter has been rendered inoperative for any reason.

In Earl Estelle's words: "We are delighted by the various ways the electronic media are cooperating in this program. They are undoubtedly helping us to do a more effective job, especially in storm-warning situations. While we are sure the number of NOAA Weather Radio receivers in the hands of the public will continue to grow, we also know that commercial radio and television will continue to be the primary means by which most people get their weather information." Of continuing interest to Weather Service officials is the variety of ways NOAA Weather Radio is being put to use by the public, and the enthusiasm with which it is received.

Examples:

A spokesman for a Methodist church group in Indiana reported: "We listen at least twice a day. Persons travel to and from our church camps from a radius of 150 miles almost every day of the year. We use it as a check for scheduling plane rides two to four days in advance. Keep up the good work."

The general manager of an electric cooperative in Carrolton, Ohio, commented: "We try, during the winter and summer storm seasons to listen to our Weather Radio at least once each hour, right after the update, to see what is developing. When it appears we are due for snow, wind or other weather extremes that could create power outages, we alert additional standby personnel before they go home for the day. This has been convenient for them and insures us of the personnel we will need. During last January's blizzard, we assumed at first the storm was over the first day when the winds began to subside. We were going to work our men straight through the day until the lines were back up. However, I checked the Weather Radio and found that lots more stormy weather was on the way. So our plan changed

dramatically. We sent some men home for rest breaks so we would have fresh personnel for the night hours. Without this information we would have been in much worse shape on the days that followed."

A school superintendent in Massillon, Ohio, said: "With the radio broadcast and the instant storm warnings, we are able to make better, faster decisions about closing school early, or cancelling school due to weather conditions." He said he found it especially useful during last winter's blizzards.

A radio station in Peoria, Illinois, editorialized: "For those of you who may have missed or overlooked it in the news ... the National Weather Service in Peoria is now on the air with 24-hour weather news. You can now have instant weather at your fingertips in your home. .... Needless to say this service is a must during tornado season in our area. ... In central Illinois this receiver is not a luxury; it's a necessity. You should think seriously about getting one for your home or office."

A businessman in Shawneetown, Illinois, wrote: "I listen to your broadcast every day and I thank you for your instant weather and river reports. I have a fish market and have been in business for about 33 years. (The Weather Radio) is the finest thing that could have happened to my business. All the farmers depend on my giving the river report when we have a quick rise. Keep up your good work."

A nursery operator in Huntingburg, Indiana, wrote: "Just a note to tell you how much we need and appreciate your Weather Radio broadcasts. We must harvest plants throughout the winter and use your broadcasts every morning. We especially appreciate the long-range forecasts, as we can do some planning of work and labor needs."

A Nebraska newspaper, commenting on a tornado episode, editorialized: "Tuesday morning those with Weather Alert radios heard their first alert signal almost an hour before the storm hit."

Bill McKee, Executive Officer for the Weather Service's Eastern Region, reported that during the Tall Ships parade in New York Harbor honoring the Nation's Bicentennial, there was so much random communication on Coast Guard channel 16 by recreational boaters and other vessels that the Coast Guard found it difficult to get through with urgent communications. So a message was broadcast over the NOAA Weather Radio Station in New York City to leave channel 16 free for vital messages. So effective was this request that the Commander of the Third Coast Guard District later wrote Eastern Region Weather Service headquarters thanking them for this assistance. He said Channel 16 was cleared within a half hour after the Weather Radio broadcast - a welcome testimonial to the size and responsiveness of the NOAA Weather Radio listening audience afloat.

Robert K. Goodwin of Des Moines, Iowa, wrote: "Thank you for the wonderful service - continuous weather information - that you provide over KEC-75 from our airport. I am no longer very active in business, but I do find it most valuable in keeping me off the roads during bad weather ... I am sure that it is of great value to those who are active, especially our farmers. You dispense the weather information in a direct, succinct manner that is right to the point. I hope that it will continue and be expanded so that others may benefit."

Clyde W. Crawford of Birmingham, Alabama, wrote: "I think these broadcasts are the greatest thing to come to Birmingham in this century. Your broadcasts are the first thing I listen to before I get up and the last thing I listen to before I go to sleep."

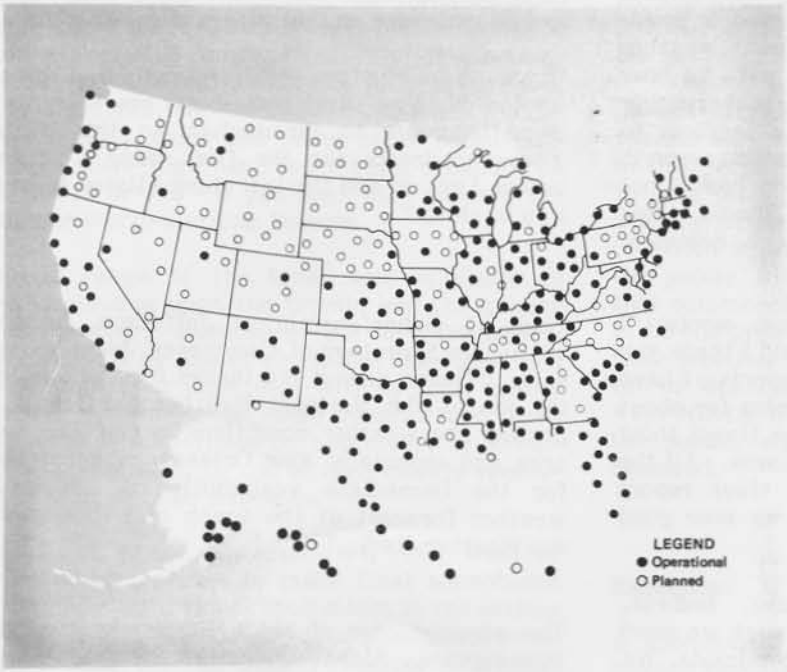
Louis C. Scharfenstein of Jefferson, Lousiana, writing to Secretary of Commerce Juanita Kreps, said: "Please accept my thanks for the outstanding job of the National Weather Service in reporting the weather conditions in the Gulf Coast area and especially New Orleans. I am grateful for the immediate availability of a complete weather forecast at the touch of a fingertip on my Weather Radio."

The administrator of South Highlands Hospital in Birmingham, Alabama, called NOAA Weather Radio "an excellent community service," adding: "We have purchased a Weather Radio which keeps our maintenance department up to date on anticipated severe weather that could or could not create heating and mechanical problems for us. The guesswork is taken out of weather problems that might make it more difficult for us to operate the hospital."

The president of Coosa Cable Company in Pell City, Alabama, wrote: "I must tell you how much I like NOAA Weather Radio station KIH-54. I am carrying this on channel 12 as the sound portion, and of course the weather wire with character generator for the video printout. These two in combination are providing 875 customers with the best weather information they can get, and they really like it."

A representative of American Roofing and Heating, Inc., in Lansing, Kansas, commented that the Weather Service broadcasts provide information "that helps us greatly in our roofing operations and all outside work."

NOAA Weather Radio Transmitters In Operation As Of October 1, 1978



The number following each city identifies the radio frequency on which the station transmits. They are:

(1) 162.550 MHZ
(2) 162.400 MHZ
(3) 162.475 MHZ

Alabama
Anniston ..... (3)
Birmingham ..... (1)
Dozier ..... (1)
Florence ..... (3)
Huntsville ..... (2)
Louisville ..... (3)
Mobile ..... (1)
Montgomery ..... (2)
Tuscaloosa ..... (2)

Alaska
Anchorage ..... (1)
Cordova ..... (1)
Fairbanks ..... (1)
Homer ..... (2)
Juneau ..... (1)
Ketchikan ..... (1)
Kodiak ..... (1)
Nome ..... (1)
Seward ..... (1)
Sitka ..... (1)
Valdez ..... (1)
Wrangell ..... (2)
Yakutat ..... (1)

Arizona
Phoenix ..... (1)

Arkansas
Fayetteville ..... (3)
Fort Smith ..... (2)
Gurdon ..... (3)
Jonesboro ..... (1)
Little Rock ..... (1)
Star City ..... (2)
Texarkana ..... (1)

California
Coachella ..... (2)
Crescent City, Calif. Brookings, Oreg. (1)
Eureka ..... (2)
Fresno ..... (2)
Los Angeles ..... (1)
Monterey ..... (2)
Point Arena ..... (2)
Sacramento ..... (2)
San Diego ..... (2)
San Francisco ..... (1)
San Luis Obispo ..... (1)
Santa Barbara ..... (2)

Colorado
Denver ..... (1)

Connecticut
Hartford ..... (3)
Meriden ..... (2)
New London ..... (1)

Delaware
Lewes ..... (1)

District Of Columbia
Washington, D.C. ..... (1)

Florida
Fort Myers ..... (3)
Daytona Beach ..... (2)
Gainesville ..... (3)
Jacksonville ..... (1)
Key West ..... (2)
Melbourne ..... (1)
Miami ..... (1)
Orlando ..... (3)
Panama City ..... (1)
Pensacola ..... (2)
Tallahassee ..... (2)
Tampa ..... (1)
West Palm Beach ..... (2)

Georgia
Atlanta ..... (1)
Augusta ..... (1)
Chatsworth ..... (2)
Columbus ..... (2)
Pelham ..... (1)
Savannah ..... (2)

Hawaii
Hilo ..... (1)
Honolulu ..... (1)
Kokee ..... (2)
Mt. Haleakala ..... (2)

Illinois
Chicago ..... (1)
Moline ..... (1)
Peoria ..... (3)
Rockford ..... (3)
Springfield ..... (2)

Indiana
Evansville ..... (1)
Fort Wayne ..... (1)
Indianapolis ..... (1)
Lafayette ..... (3)
South Bend ..... (2)

Iowa
Des Moines (1)

Kansas
Colby (3)
Concordia (1)
Dodge City (3)
Ellsworth (2)
Topeka (3)
Wichita (1)

Kentucky
Ashland (1)
Bowling Green (2)
Covington (1)
Hazard (3)
Lexington (2)
Louisville (3)
Mayfield (3)
Somerset (1)

Louisiana
Baton Rouge (2)
Lake Charles (2)
Morgan City (3)
New Orleans (1)
Monroe (1)
Shreveport (2)

Maine
Ellsworth (2)
Portland (1)

Maryland
Baltimore (2)
Salisbury (2)

Massachusetts
Boston (2)
Hyannis (1)

Michigan
Alpena (1)
Detroit (1)
Flint (2)
Grand Rapids (1)
Marquette (1)
Sault Ste. Marie (1)
Traverse City (2)

Minnesota
Duluth (1)
Int'l. Falls (1)
Mankato (2)
Minneapolis (1)
Rochester (3)
Thief River Falls (1)
Willmar (2)

Mississippi
Ackerman (3)
Booneville (1)
Bude (1)
Gulfport (2)
Inverness (1)
Jackson (2)
McHenry (3)
Meridian (1)
Oxford (2)

Missouri
Camdenton (1)
Hannibal (3)
Kansas City (1)
St. Joseph (2)
St. Louis (1)
Springfield (2)

Montana
Great Falls (1)
Helena (2)

Nebraska
Omaha (2)

Nevada
Reno (1)

New Hampshire
Concord (3)

New Jersey
Atlantic City (2)

New Mexico
Albuquerque (2)
Clovis (3)
Farmington (3)
Hobbs (2)
Ruidoso (1)
Santa Fe (1)

New York
Buffalo (1)
New York City (1)
Rochester (2)

North Carolina
Cape Hatteras (1)
New Bern (2)
Wilmington (1)

North Dakota
Fargo (3)

Ohio
Akron (2)
Caldwell (3)
Cleveland (1)
Columbus (1)
Dayton (3)
Lima (2)
Sandusky (2)

Oklahoma
Lawton (1)
Oklahoma City (2)
Tulsa (1)

Oregon
Astoria (2)
Coos Bay (2)
Eugene (2)
Newport (1)
Portland (1)

Pennsylvania
Erie (2)
Philadelphia (3)
Pittsburgh (1)

Puerto Rico
San Juan (2)

Rhode Island
Providence (2)

South Carolina
Beaufort (3)
Charleston (1)
Columbia (2)
Florence (1)
Greenville (1)
Myrtle Beach (2)

Tennessee
Bristol (1)
Chattanooga (1)
Knoxville (3)
Memphis (3)
Nashville (1)

Texas
Abilene (2)
Amarillo (1)
Austin (2)
Big Spring (3)
Brownsville (1)
Bryan (1)
Corpus Christi (1)
Dallas (2)
Del Rio (2)
Fort Worth (1)
Galveston (1)
Houston (2)
Laredo (3)
Lubbock (2)
Lufkin (1)
Midland (2)
Paris (1)
Pharr (2)
San Antonio (1)
Victoria (2)
Wichita Falls (3)
San Angelo (1)
Sherman (3)
Tyler (3)
Waco (3)

Utah
Salt Lake City (1)

Vermont
Burlington (2)

Virginia
Norfolk (1)
Richmond (3)

Washington
Neah Bay (1)
Seattle (1)
Yakima (1)

West Virginia
Charleston (2)
Clarksburg (1)

Wisconsin
Green Bay (1)
LaCrosse (1)
Madison (1)
Menomonie (2)
Milwaukee (2)
Wausau (3)

One of the more exhaustive surveys of listener reactions was made by the Columbia, South Carolina, Weather Service Forecast Office, under the direction of Meteorologist in Charge John C. Purvis.

His official (sic) controls station WXJ-20 at Columbia and WXJ-22 at Florence, South Carolina. Last spring, a message soliciting listeners to comment by mail was broadcast over the air. The result was about 100 replies, almost all highly favorable.

The range of occupational and recreational uses was particularly impressive, along with the responses from people who simply wanted to know what the weather would be so they could plan what to wear, how to dress the children for school, whether to hang clothes out to dry, whether to plan a shopping trip, or stay home and read a good book.

The spectrum ranged from the obvious, such as farmers, commercial fishermen, aviators, outdoor construction workers, school and hospital administrators, and outdoor recreationists, to the manager of an FM station at Columbia Bible College who repeated the information over the air, a realtor planning his work schedule, a representative of a textile supply company, a furniture company owner, the manager of a hardwood sawmill scheduling work for loggers, truck drivers, mill and yard supervisors, the manager of a trailer park planning the best time to put in grass seed, the owner of a TV store who kept the Weather Radio on constantly as an attraction for customers, conservation workers, an outdoor worker in a railroad yard, the plant engineer of Columbia College, and the owner of a retail store catering to bass fishermen.

Many of the writers were especially grateful for the timely and informative warnings of thunderstorms and tornadoes. Letters from two women summed up the sentiment neatly. Mrs. Chanie Beard of West Columbia wrote: "You have come to be a dependable necessity and we thank you." Mrs. Harry Ivey of the same locality said: "Just keep up this most helpfulservice! I would hate to do without it."

part 2

WARNINGS BY LIVE, SIMULTANEOUS BROADCAST FROM NOAA WEATHER RADIO AND COMMERCIAL RADIO/TV

Dennis McCarthy

National Weather Service
Indianapolis International Airport
Indianapolis, Indiana 46241

By the end of 1978, two-thirds of the 340 NOAA Weather Radio (NWR) stations planned for installation around the United States were in operation.

Weather Radio has progressed from a relatively obscure service aimed mainly at boaters along the coasts, to a popular and efficient means of relaying up-to-date weather information and warnings to the general public as well as to special users.

The Weather Radio has become one of the National Weather Service's most important contributions to an effective warning system. Whereas many improvements have taken place in the prediction and detection of hazardous weather, NWR has made a significant impact on the dissemination portion of the warning system by saving the precious seconds, or often minutes, required to type, transmit via teletype, and broadcast warnings from commercial radio and TV stations. Live broadcasts of warnings from NWR can save even more time by avoiding delays necessary for tape recording.

Further enhancement of the speed and efficiency already inherent in live broadcasts from NWR is possible through a system of simultaneous broadcast (simulcast) with cooperating radio and television stations. This system was devised by the news director of a radio station in Belleville, Illinois, just across the Mississippi River from St. Louis, as a means of reducing delays of ten minutes or more in relaying warnings from the Missouri Weather Wire to the Illinois Weather Wire.

The technique is extremely simple and very inexpensive. No additional equipment is required at the National Weather Service Office and the commercial broadcaster makes only a one-time low-cost expenditure for an alert receiver and the wiring necessary to place the receiver in the