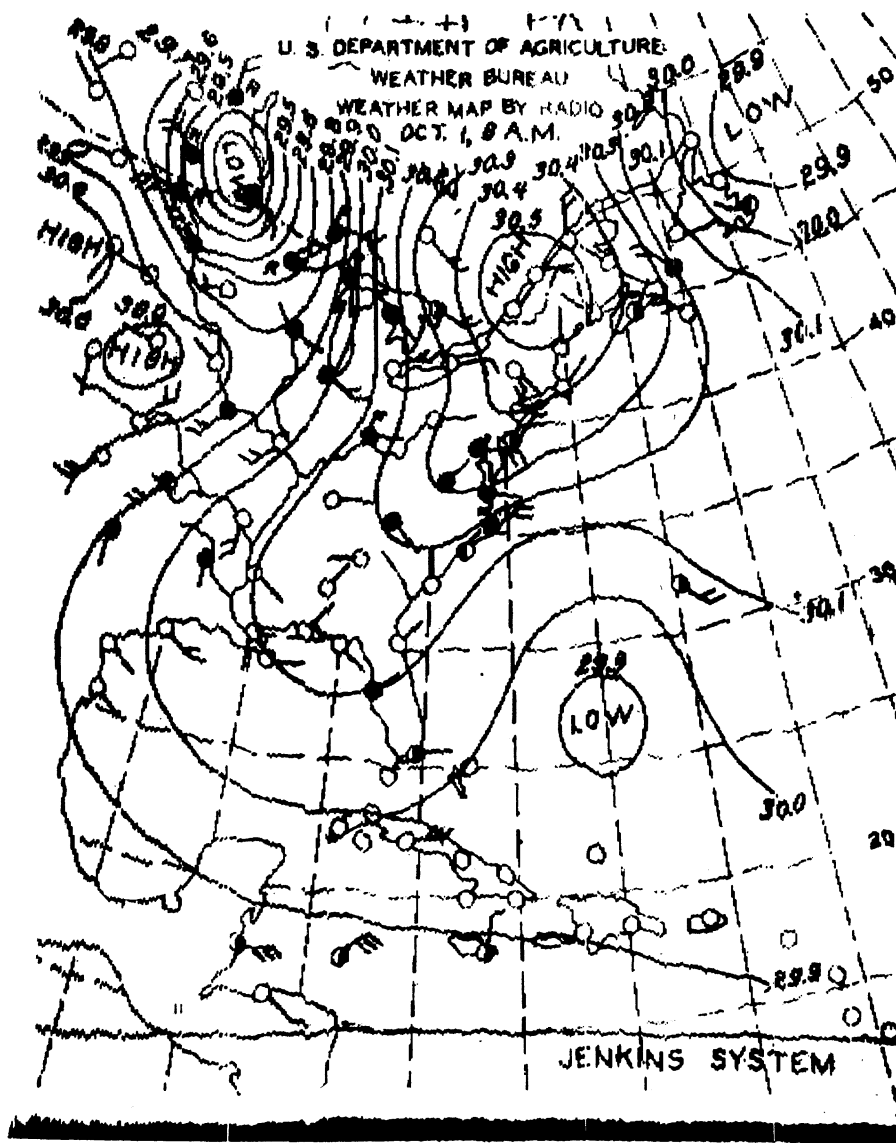


World Wide Radio Service Aids Weather Prediction



Specimen weather map as transmitted by radio using Jenkins process.

The process of collecting and distributing weather information has been revolutionized by radio. Reports of atmospheric conditions at thousands of places on land and sea are now swiftly assembled at central points in different countries and broadcasted at regular intervals. The interchange of current weather news extends over the greater part of the globe, and the forecaster, whose business it is to size up today's weather in order to anticipate tomorrow's, enjoys a bird's-eye view of the atmosphere such as was hardly dreamed of a few years ago. Lastly, a new era in practical meteorology has dawned with the transmission of weather maps by radio-telegraphy.

Weather travels. Even in the days of Benjamin Franklin the movement of storms from southwest to north-

east over eastern North America was recognized, and in the course of the next generation a good deal was learned about the traveling atmospheric systems that we now call "highs" and "lows." All that was needed to insure the beginning of a weather forecasting service was some means of transmitting information about approaching weather faster than the movement of the weather itself.

During the French Revolution a method of telegraphing by means of semaphores was introduced. A far-seeing meteorologist urged the use of this device for giving advance notice of storms, but the idea was never carried out. Very soon after the electric telegraph came into general use it began to be applied in a small way to the transmission of weather reports. A great calamity is generally

needed to bring about a great reform, and so it was not until a violent storm in 1854 sank many ships and wrought havoc in the camps of the Allied armies engaged in the Crimean War that the world awoke to the necessity of establishing a regular telegraphic storm-warning service. This project was put into operation in Europe in 1855 under the direction of the French astronomer Le Verrier. Within the next few decades nearly all civilized countries had founded more or less elaborate organizations for collecting weather reports by telegraph, drawing weather maps, and distributing, also by telegraph, notice of coming storms and weather changes.

As atmospheric movements ignore political boundaries, the necessity of an interchange of reports between different countries was recognized from the outset. Before the World War this interchange was effected entirely by wire telegraphy, though radio had been used to some extent in the subsidiary task of collecting weather reports from ships and in the broadcasting of bulletins and forecasts for the benefit of mariners. In America, where reports from the weather stations of the United States and Canada were given precedence over other business by the telegraph companies and were sent over prearranged circuits, the telegraphic system was quite efficient. In the Old World, however, delays in transmission, especially from one country to another, were so great that the report of a weather station was often many hours old before it reached some of the forecasting centers, and the forecasts based on such reports were equally slow in reaching the public. There was also somewhat meager interchange of weather reports by cable between continents and islands. This enabled the United States Weather Bureau, just before the war, to undertake the publication of a daily telegraphic weather map of the Northern Hemisphere, but it was far less complete and up-to-date than the maps of the same area that can now be prepared with the aid of radio.

During the war meteorologists in Europe were called upon to keep a vast fleet of aircraft informed concerning current and forthcoming weather conditions wherever flights were undertaken, and the old plan of gathering reports of observations by wire proved entirely inadequate for

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Radio Aids Weather Prediction

(Continued from Page 133)

this purpose. Not only did the aeronauts demand prompt service than the weather-reporting system had previously rendered, but they also required information at more frequent intervals and in much greater detail. Recourse was had to radio to meet these demands, and the essential features of the systems then established were retained by the European meteorological services after the war.

In 1919 an international meteorological conference was held in Paris. At this meeting plans were laid for the European radio weather service practically as it exists today. Each country has a network of weather stations at which observations are made at prescribed hours; generally four times a day. The reports of these observations are promptly centralized in each of the countries by radio, wire telegraphy or telephone. In some countries centralization is effected in two stages; district centers collect the reports for their several areas, and then transmit them to the national center.

A time-table has been drawn up by international agreement, assigning to each country certain hours for broadcasting the reports collected within its own territory, and an elaborate cipher code is used for transmission. This system applies not only to the whole of Europe, but also to northern Africa, Syria, Iceland and the Azores; in addition to which Russia broadcasts reports from Siberian stations, and the Eiffel Tower broadcasts reports from numerous places in the United States, Canada, Alaska, the West Indies, etc., together with vessel reports, collected directly or relayed from the United States.

This sounds like an ambitious program, but it is only a part of the vast system of daily weather messages that now crowds the ether. Besides the national broadcasts above mentioned, there are sent out from a few high-power radio stations so-called "international collective reports." Thus the Eiffel Tower broadcasts four times a day reports of observations taken at 50 or 60 places in and about Europe, these being a repetition, in abridged form, of reports previously broadcasted by the various national centers. From these collective messages alone it is possible to draw skeleton weather maps of the whole European area. Somewhat less comprehensive international broadcasts are issued from London, Hamburg, Leningrad and other places.

In addition to these national and

international broadcasts of reports that have a general bearing upon the weather of Europe, many bulletins of a more local character are issued from the national centers and elsewhere. These include weather forecasts for particular areas, special information affecting various flying routes (issued, in some cases, at hourly intervals), forecasts and reports for agriculture, data concerning ice in channels and harbors, and other miscellaneous announcements having to do in one way or another with weather. Since many of the broadcasts above enumerated require a good deal of time for transmission, the entire program of radio weather messages sent out from European stations is a "continuous performance," from midnight to midnight, and during much of the day entails simultaneous broadcasting from two or more places.

Although other parts of the world do not yet vie with Europe in the multiplicity of their radio weather reports, such reports are now issued on an extensive scale in most civilized countries. The United States Weather Bureau still collects reports from weather stations within its own territory by wire, but receives a great number of reports from outlying regions by radio, and broadcasts weather information on a large scale through Naval and commercial radio stations. The broadcasts include data, both in code and in plain language, for the marine and aviation interests, and the twice-daily weather synopses and forecasts with which radio "fans" throughout the country are familiar. Canada, Mexico, the West Indies, some American countries, Australia, New Zealand, China, Japan, British India, the Philippines, South Africa and Madagascar are some of the other regions from which weather data, storm warnings and the like are regularly issued by radio broadcast.

Two novel enterprises connected with the world's radio weather service are the "floating weather bureau" and the radio weather map. During the past five years the French training-ship *Jacques Cartier*, during frequent voyages back and forth across the Atlantic, has served as a clearing-house of weather information for the benefit of mariners and as a means of gathering reports from ships for the use of forecasters on land. Hundreds of such reports are received on board by radio in the course of each voyage, and are charted in conjunction with the reports from land stations on both sides of the ocean. From the charts thus drawn meteorologists attached to the ship prepare weather

forecasts and storm warnings for different sections of the Atlantic, and these are broadcasted on regular daily schedules. Within the next few years it is likely that several ships will be similarly employed in centralizing and distributing weather reports at sea.

Broadcasting numerical data from which weather maps may be drawn by those who have the time and skill to draw them is of much less benefit to humanity than broadcasting the map itself. The latter feat has lately been achieved through the use of an invention of C. Francis Jenkins of Washington. A complete weather map of eastern North America and the western Atlantic is now broadcasted daily from the Naval radio station at Arlington, and some ships have already installed apparatus for receiving it. A weather map of Western Europe is broadcasted from Munich, and one of the North Atlantic, radioed experimentally from Hamburg last spring, was successfully received in midocean.

The joint efforts of several countries will, it is hoped, eventually give us a daily "mosaic" radio weather map of the Northern Hemisphere, to which each country will contribute a certain section. Perhaps we may even have one of the entire globe.

Science News-Letter, November 27, 1926

The Indians made glues from animal and plant substances.

Growing the longleaf pine is advocated as a profitable business in the South by the United States Department of Agriculture.

At Yakutsk, Siberia, the temperature goes as low as 82 degrees Fahrenheit below zero in winter, and 102 degrees above in summer.

The Norsemen established a colony in Greenland which flourished for several centuries and then mysteriously collapsed in the fifteenth century.

When George Stephenson, pioneer railroad builder, declared that 15 miles an hour was a practical speed for travel, his sanity was questioned.

Many Indians feared to have their portraits drawn or painted, because they believed that the artist must take some of the life force of the sitter in reproducing his image.

The blood-sweating hippopotamus is so called because its pink underskin shows when the pores of its skin become open, and drops of water rolling off the animal look like blood.