Long Wave Radio for US Listeners?

By Bart Lee, K6VK, CHRS Fellow, AWA Fellow

The United States never had any long wave broadcast stations, below 540 KHz or so. Europe had many, but they almost never could be heard in the US. So why did so many American radios of the 1930s, and even later, have a long wave band?

"Everybody talks about the weather but nobody ever does anything about it," said Mark Twain. And while little can be done about the weather then or now, knowing what weather was in store could be very helpful, and even save lives. Newspapers could make some weather predictions following the national Weather Bureau and radio stations could report the newspapers' information. Then a new and reliable source of weather data appeared in the 1930s: Aviation Weather — for fliers — on the radio.

RCA 10K 1936 Console, Long Wave Band Dial

But not on the broadcast band, of course, but rather below it – Long Wave.

Aviation Weather Broadcasts And Beacons

The US Mail Airmail carriers, and civilian passenger and other aircraft needed current weather at every major airport. Airports broadcast AM weather reports, detailed for airmen, 24 hours a day. Radio manufacturers thought these aero weather broadcasts to be of sufficient interest to high-end radio buyers, to make a long wave band available.

Model 733

Airport Super-heterodyne

200 to 1900 Meters

This eight tube super-heterodyne receiver is designed to cover from 200 to 1900 meters in two ranges, viz.: 158 to 475 K. C. (1900 to 631.6 meters) and 520 to 1500 K. C. (576.9 to 200 meters). Uses one 224, two 51, two 27, two 47, one 80 tubes. **Equipped with 10½" S-M dynamic speaker.** For operation on 105-120 volt, 25 to 60 cycle and 210-240 volt, 25 to 60 cycle A. C. Shipping weight: 40 lbs. less tubes

10½" deep
16½" long, 9" high,

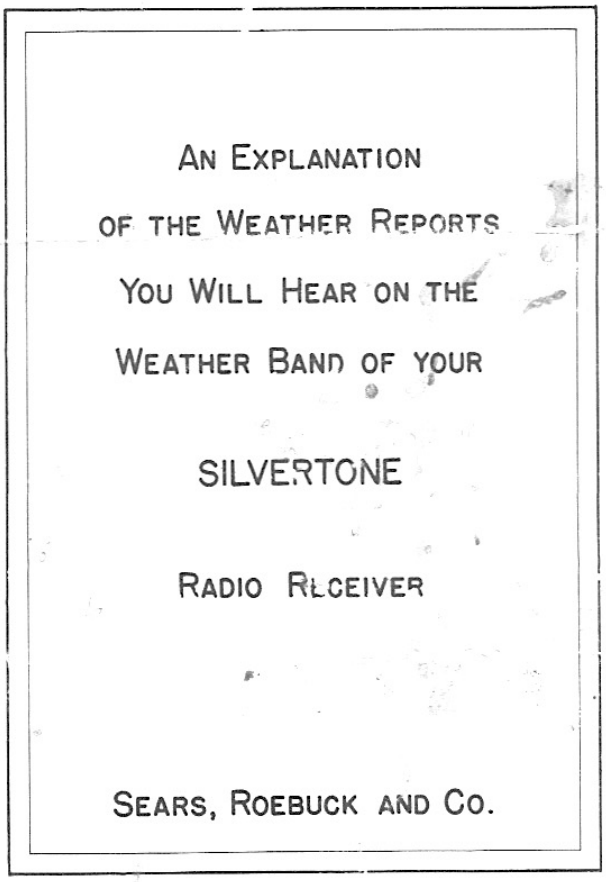
$70.27

Cat. No. 1300

Silver Marshall, c. 1932 from American Sales Co. catalog p. 117

The Silver-Marshall set, above, in 1932 covered long wave aero broadcasts and the broadcast band. In today's money it would cost about $1,500 with tubes.

The CHRS Archives hold a list of these stations in a Sears Silvertone user's guide:



One such station broadcast from the Oakland Airport:

Oakland, Calif.	KCV	242	---	.-	30	Oakland
					50	Oakland-San Francisco to Fresno plus Los Angeles; Oakland-San Francisco to Reno
					55	Oakland-San Francisco to Medford

That's station KCV on 242 KHz three times an hour. Its Morse code ID is O A.

KCV: *

Oakland Airway Radio Station (KCV), California 1928

On the Sears Silvertone list, some 58 long wave aero stations at airports appear in what was known as the "weather band." These include Oakland (KCV), above, Los Angeles (KCT) and Fresno (KCU). The callsigns implement the protocol of K / W for Western and Eastern USA. The second letter "C" of these callsign does not mean a California Station, as stations elsewhere also have such a "C". The first page (only) of the text of the Silvertone brochure follows. The individual station data thereafter probably comes from the Department of Commerce.

* http://www.atchistory.org/facility-photos/?state=California&city [etc.]

THE "WEATHER BAND" OF YOUR SILVERTONE RECEIVER

The Air Navigation Division of the United States Bureau of Air Commerce maintains radio broadcast stations throughout the country. These stations are located near airports and are designed for the assistance of aircraft pilots. They broadcast two kinds of information; a "directional beam" or "range signal" by means of which the pilot can locate the airport and guide his airplane to it; and broadcasts of weather conditions.

The range signal is in the form of a dot and dash code. Each station has its own identifying code signal. For example, the code signal of the Albany, New York, station is two dots. This is sent repeatedly with a slight pause between each group of two dots.

At certain times during the hour, the code range signal is interrupted and voice transmission takes place. This voice transmission is a broadcast of the weather conditions existing along the course which that particular weather broadcast station serves.

For example, the Albany, New York, station, whose call letters are WWAH, will be tuned in at 365 kc. During most of the time, all that will be heard is the identifying "range" signal, which is two dots (..). At ten minutes after the hour, the operator of the station will break the "range" signal, announce his call letters, WWAH, and proceed to broadcast the weather conditions existing along the route from Albany to Buffalo. He will also broadcast the weather conditions existing at Cleveland and then broadcast the weather existing along the route from New York City to Montreal, Canada. At fifteen minutes past the hour, the operator will broadcast the weather conditions existing along the route from Albany to Boston. At thirty minutes past the hour, he will broadcast the weather conditions existing in Albany.

The locations of all of the weather broadcasting stations in the country with their call letters, the frequency at which they can be tuned in on the "Weather Band" of your SILVERTONE receiver, their identifying code "range" signal, the time of the hour they broadcast weather reports and the districts which they serve, are all shown in the list contained in this Leaflet.

Although this information is broadcast primarily for the assistance of aircraft, it also is useful for more earthbound projects. One often wants to know what the prospects for favorable weather will be before planning farm industry activities, or before going on an automobile trip. These broadcast weather reports are always up-to-the-minute, whereas the weather forecast broadcast by conventional broadcasting stations are necessarily made up many hours in advance of the broadcast and conditions may change in the meantime.

Weather forecasting is a very interesting although complex procedure. It is impossible in a Leaflet of this size to give more than just an outline of the elements involved, although this is sufficient for the needs of most people.

Any one desiring to go further into this very interesting subject will find it an absorbing hobby or occupation. Booklets on the subject can be obtained from the Weather Bureau, U. S. Department of Agriculture, Washington D.C. Circular "N", which can be obtained from the Weather Bureau at a cost of twenty-five cents contains a great deal of interesting information about the Airway Weather Reports.

The WEATHER band of your SILVERTONE will be a source of real value and keen enjoyment.

WHAT THE WEATHER BROADCAST CONSISTS OF:

The weather broadcasts contains the following information and usually is given in the order indicated:

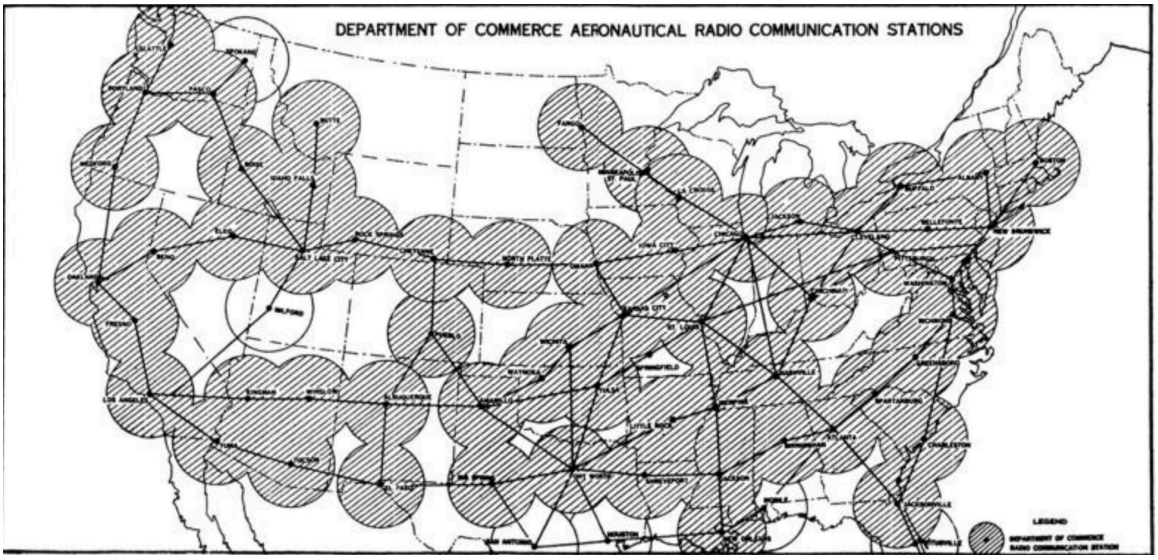
(a) CEILING
(b) SKY
(c) VISIBILITY
(d) WEATHER
(e) OBSTRUCTIONS TO VISIBILITY
(f) TEMPERATURE
(g) DEW POINT
(h) WIND
(i) BAROMETRIC PRESSURE
(j) FIELD CONDITIONS
(k) REMARKS

(a) CEILING:

"Ceiling" is the height of any clouds that may be present above the station and that cover more than half the sky. Often the statement is made that the ceiling is "unlimited".

Long wave radio had an advantage for the navigation beacon aspect of each of these stations. Ionospheric "skip" could conflate beacon signals on the same frequency (the "night effect") but only rarely for these stations below the broadcast band. The "minimum useable frequency" for ionospheric reflection was almost always too high.

Radio News published a map of these long wave aero stations and their coverage in 1932.[†]



These aero stations covered both Big Cities and "Fly-Over Country." More precise Department of Commerce maps of "Aeronautical Radio Range Stations" nationwide provided more information on each station and its various emissions.

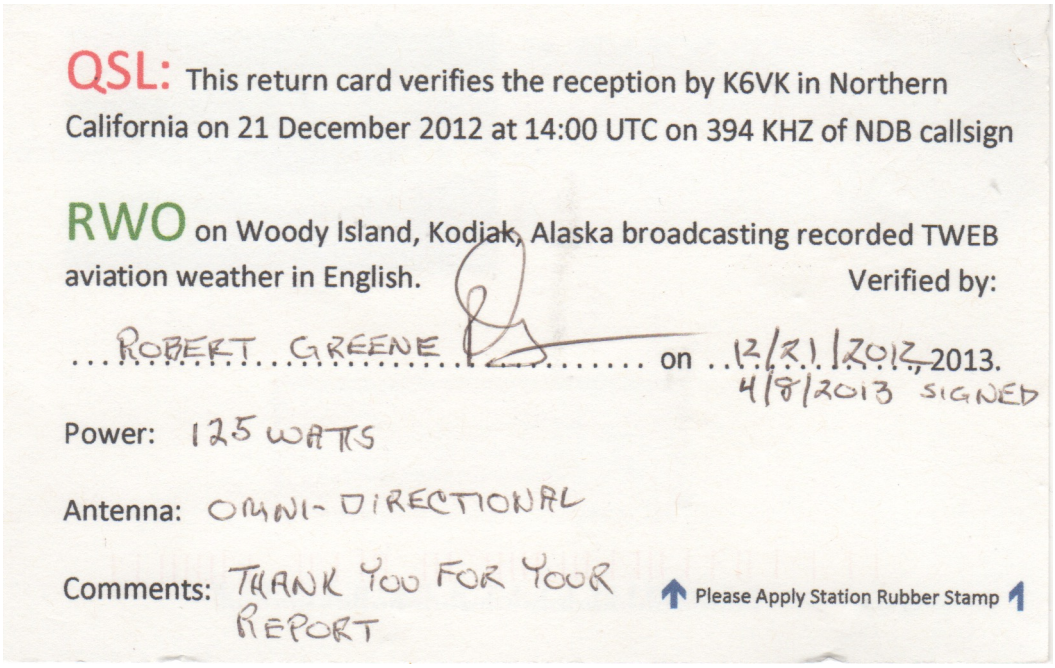
These stations, for listeners at home, provided an aural, audio-only "Weather Channel" on their radio's "weather band." The broadcasts provided direct and nearly

[†] https://www.rfcafe.com/references/radio-news/radio-aloft-september-1932-radio-news.htm

"real time" warnings. Falling barometric pressure, for example, predicts a storm. The stations broadcasted about thunderstorms, and probably risk of tornadoes as well, and blizzards on the way.

The whole list of stations will be posted on the CHRS website on the Library and Archives page.

As late as the 1970s, Oakland airport still broadcast voice aviation weather reports. Until recently Alaskan airports broadcast voice aviation weather on long wave, *e.g.*, RWO on Kodiac Island. Even today, one can hear many airport non-directional beacons (NDBs; AM Morse ID only) on long wave.


QSL: This return card verifies the reception by K6VK in Northern California on 21 December 2012 at 14:00 UTC on 394 KHZ of NDB callsign

RWO on Woody Island, Kodiak, Alaska broadcasting recorded TWEB aviation weather in English. Verified by:

...ROBERT...GREENE..... on ..12/21/2012, 2013.
4/8/2013 SIGNED

Power: 125 WATTS

Antenna: OMNI-DIRECTIONAL

Comments: THANK YOU FOR YOUR REPORT

Please Apply Station Rubber Stamp

Lee Personal Radio Archive

("TWEB" is the ***T***ranscribed ***WE***ather ***B***roadcast. The federal government ended these in 2019).

But Wait, There's More!

The DX-fiends of the day could enjoy another long wave thrill: Morse code letter marine beacon stations. Amplitude modulation also likely conveyed these minimal bits of information. What they had to say meant little compared to their location. They made possible navigation fixes for vessels, their primary purpose, by triangulation of their signals. This process is now subsumed as PNT: position, navigation and time, *e.g.*, GPS.

In 1929 the Department of Commerce reported:

"For the purpose of better safeguarding navigation, particularly in foggy weather, when the greatest need for aid exists, the Bureau of Lighthouses has in operation 23 radiobeacons on the Atlantic coast, 15 on the Pacific coast, 6 on the Gulf coast, and 21 on the coasts of the Great Lakes. These beacons are located in the lighthouses and light vessels. The transmitters send out characteristic signals composed of dashes and dots which serve to identify each beacon. This service is available to ships which are equipped with radio compasses. In other countries there are a total of 57 beacons."‡

These beacons, while fading fast, still operate in many parts of the world. In 1962 the Coast Guard defined them:

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‡ https://docs.fcc.gov › public › attachmentsPDF ; DOC-328544A1.pdf. Annual Report of the Chief of Radio Division to the Secretary of Commerce for the Fiscal Year Ended June 30, 1929.

Continuously Sequenced Radio Beacons - several beacons operating in sequence on the same frequency with the sequence being repeated continually.

Continuously Operating Radio Beacon - a single beacon on a frequency not sharing time and operating without interruption.

Marine Marker Radio Beacon - a continuously operating radio beacon of approximately ten (10) miles service range.

Warning Beacon - an auxiliary radio beacon of short range, modulated by a warbling note, at the same location and operating on the same frequency during the minute immediately following the main radio beacon to warn vessels of proximity to a lightship.

This comes from an FCC source.[§]

One outstanding marine beacon stands offshore in Thailand:

(10 XI 21 v2, de K6VK) ##

[§] https://www.fcc.gov › files › can-nb › beacons