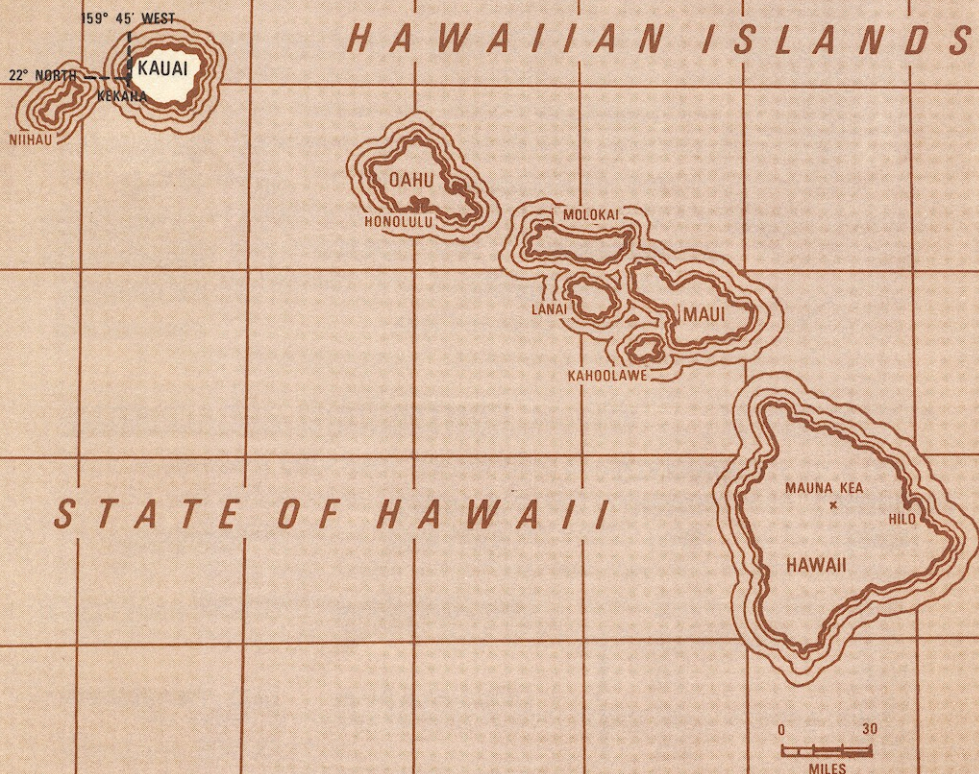


U.S. DEPARTMENT of COMMERCE
NATIONAL BUREAU of STANDARDS
FREQUENCY- TIME BROADCAST SERVICES



CLOCK/Accuracy



SUNDIAL/Minutes



SPRING/Minutes



PENDULUM/Seconds



QUARTZ/Milliseconds



ATOMIC/Microseconds

WWVH CHRONOLOGY

- 1948 Nov Began broadcasts from Maui.
- 1964 Jul Began voice announcements.
- 1971 Jul Transferred operations to Kauai.
- 1972 Jan New UTC time scale begun.
- 1972 Jun First "leap second" in history of time added to the UTC time scale.
- 1974 Jan Changed voice announcements from "Greenwich Mean Time" to "Coordinated Universal Time" (GMT to UTC).

TIME SETTING OR KEEPING PRECISION

Telephone		
(808) 335-4214	.05	second
WWVH Broadcast	.001	second
VLF	3-25	microseconds
LORAN-C	1-8	microseconds
TV Time Transfer	.5	microsecond
Portable Cesium Clock	.1	microsecond

WWVH CONTINUOUS BROADCASTS

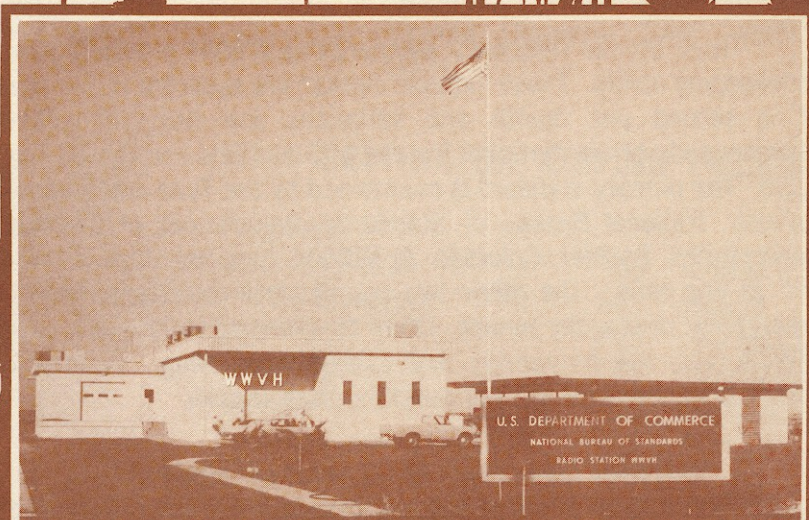
FREQUENCY (MHz)	RADIATED POWER (kW)	½ WAVE ANTENNA	COVERAGE
2.5	5	Omni-directional	Ground wave - Local
5.0	10		
10.0	10	Directional Array	Skip - Hemisphere
15.0	10		
20.0	2.5		

After serving the Pacific area for 23 years from the island of Maui, Hawaii, Radio Station WWVH was relocated to the western edge of the Island of Kauai, Hawaii. This modern \$1.2 million facility is located on 30 acres near Kekaha at Kokole Point. Around the clock, continuous broadcast services are provided by a staff of two engineers, five electronic technicians, a secretary and a maintenance person. Broadcasts from Hawaii supplement those from WWV in Ft. Collins, Colorado, by providing principal coverage in the PACIFIC BASIN.

Three atomic frequency standards at WWVH provide optimum timekeeping ability. These "atomic clocks" are accurate to 1 millionth of a second per month and variations are held to within 5 microseconds of the National Bureau of Standards and the UTC time scale. The primary standard is maintained by the Time and Frequency Division, National Bureau of Standards, Department of Commerce Laboratories, Boulder, Colorado. At WWVH, only one clock is "on the air" at one time. The other two permit clock intercomparison and emergency or standby service. Other timekeeping techniques include WWVB (very low frequency) and LORAN monitoring, TV time synchronization by satellite, and portable clock checks.

A "time code generator" allows recorded voices and special announcements to be programmed automatically into the broadcast format. This information provides modulation through a synthesizer for the five standard broadcast frequencies which are accurate to a few parts in one million million (10^{12}). A female voice announces WWVH's time, thus allowing distinction from WWV's male voice. The RF signals are amplified through linear amplifiers and then fed to the antenna systems. The antennas are modified 1/2 wave dipole phased arrays with the exception of the 2.5 MHz and standby monopoles.

The public is invited to visit WWVH during daily working hours. Telephone 335-4217.



NBS RADIO STATION WWVH, BOX 417, KEKAHA, HI 96752

