WWVH
U.S. DEPARTMENT of COMMERCE
NATIONAL INSTITUTE of STANDARDS and TECHNOLOGY
TIME and FREQUENCY SERVICES

NIST RADIO STATION WWVH
P.O. BOX 417
KEKAHA, HAWAII 96752
(808) 335-4361

Revised: August 1992
WWVH CHRONOLOGY

1948 Nov  Began broadcasts from Maui.
1964 Jul  Began voice announcements.
1971 Jul  Transferred operations to Kauai.
1971 Jul  Began Pacific Weather Warnings.
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).
1989 Jun  Began Geophysical Alert Broadcast. 45 minutes.
1990 Mar  Began Global Positioning Satellites Status Report Announcements. 43 and 44 minutes.

TIME SETTING OR KEEPING PRECISION

Telephone  
(808) 335-4363  .05 second
WWVH Broadcast  .001 second
GOES Satellites  100 microseconds
VLF  3-25 microseconds
LORAN-C  1-8 microseconds
GPS Satellites  .1 microsecond

CLOCK/Accuracy

SUNDIAL/Minutes

SPRING/Minutes

PENDULUM/Seconds

QUARTZ/Milliseconds

ATOMIC/Microseconds
Colorado. At WWVH, only one clock is "on the air" at any time. The other two permit clock intercomparison and emergency or standby service. Several synchronization methods are used to keep WWVH clocks "in step" with NIST/Boulder standards: WWVB and Loran monitoring, GOES and GPS satellites, and portable clocks.

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 four 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 high power transmitters and 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.

WWVH BROADCAST FORMAT

VIA TELEPHONE (808) 335-4363 (NOT A TOLL-FREE NUMBER)

STORM INFORMATION

Omega Reports

Geonetics

GPS

LOCATION
21°59'26"N, 156°46'00"W

STANDARD BROADCAST FREQUENCIES AND RADIATED POWER
2.5 MHz - 5 kW
5 MHz - 10 kW
10 MHz - 10 kW
15 MHz - 10 kW

UTC CORRECTIONS
FOR ADDITIONAL INFORMATION CONTACT
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- BEGINNING OF EACH HOUR IS IDENTIFIED BY 0.8-SECOND LONG, 1500-Hz TONE.
- BEGINNING OF EACH MINUTE IS IDENTIFIED BY 0.8-SECOND LONG, 1200-Hz TONE.
- THE 29TH & 59TH SECOND PULSE OF EACH MINUTE IS OMITTED.

NO AUDIO TONE

440 Hz 1-HOUR MARK

NIST RESERVED

STATION ID

MINUTES

45

45

60

60

00

00

45

45

SILENT EXCEPT TCH

SILENT EXCEPT TCH
<table>
<thead>
<tr>
<th>FREQUENCY (MHz)</th>
<th>RADIATED POWER (kW)</th>
<th>½ WAVE ANTENNA</th>
<th>COVERAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>5</td>
<td>Omni-directional</td>
<td>Ground wave - Local</td>
</tr>
<tr>
<td>5.0</td>
<td>10</td>
<td>Directional Array</td>
<td>Skip - Hemisphere</td>
</tr>
<tr>
<td>10.0</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.0</td>
<td>10</td>
<td></td>
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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 from Hawaii supplement those from WWV in Fort 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 Institute of Standards and Technology's UTC time scale. The U.S. primary standard is maintained by the Time and Frequency Division, National Institute of Standards and Technology, Boulder,