Introduction

The purpose of this reference text is to provide aircrew members information to understand the operation, control, capabilities, and limitations of the HAVE QUICK II jam-resistant radio system. It is intended to provide a single source reference document for system users, but is not intended to replace applicable technical orders and manuals.

This reference text will center around the AN/ARC-164 radio set. It will discuss operating procedures for both the old control panel and the new control panel, which features an electronic fill device for automatic MWOD loading: (See Figure i for the old control panel versus the new control panel.)

![Old Control Panel](Image)

![New Control Panel](Image)

Figure i. AN/ARC-164 Old Control Panel vs. New Control Panel

Depending upon which control panel is installed in your particular aircraft, you should refer to the appropriate chapters in this text that describe operating procedures for either the old control panel or the updated control panel. Chapters 1 and 2 are generic and are intended for all users. Chapter 1 provides background information on the HAVE QUICK II Modified Radio; Chapter 2 describes system components and the necessary conditions for successful HAVE QUICK II operation. If your aircraft is equipped with the old control panel, refer to Chapter 3, which details operating procedures for the HAVE QUICK II radio with the old control panel. If your aircraft is equipped with the new control panel with liquid crystal display (LCD), refer to Chapters 4 and 5. Chapter 4 addresses operating procedures using Manual MWOD Loading, and Chapter 5 discusses operating procedures for Electronic MWOD Loading. Chapter 6 contains additional information for all users of the HAVE QUICK II radio system, no matter which control panel is being used.

The concepts and procedures in this reference text are not all inclusive and will probably not answer all of your questions about the HAVE QUICK II system.

However, more information is available: your Weapons Officer should request a copy of the HAVE QUICK Handbook (dated August 1985), which is published by HQ ACC/DOYC at DSN 574-4620.
Local units may duplicate this document and use it to fit their individual unit training needs.

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Chapter 1

Background Information

Electronic Attack

Combat air operations depend heavily on voice communications among a variety of aircraft and ground facilities to achieve mission objectives. Such electronic transmissions are a natural target for enemy electronic attack (EA). Therefore, Combat Air Forces (CAF) have a high-priority need for jam-resistant communications—the function of the HAVE QUICK II system is to allow CAF to conduct operations effectively in spite of enemy communications jamming.

Electronic Protection

The current HAVE QUICK II centers around the AN/ARC-164 radio, which is used by both airborne and ground units. These UHF radios have been modified into HAVE QUICK II radio systems. The HAVE QUICK II radio systems add a jam-resistant capability to your UHF radio through a frequency hopping technique. HAVE QUICK II radios counter jamming by changing frequencies rapidly and continually. The frequency for a given channel automatically changes at a rate and in a pseudorandom pattern common to both transmitters and receivers. This frequency hopping exceeds the rate at which enemy jammers can acquire and jam the signal. The jammer must find the frequency being used, jam it, and then predict or find the next, or it must spread its power over a wider portion of the military UHF spectrum to be effective. Platforms with HAVE QUICK can work closer to the jamming threat than those without it.

The Threat

The HAVE QUICK II system has been designed to defeat communications jammers. The former Soviet Union has invested heavily in communications jamming capability. As a rule, the jammers are deployed as close to the forward edge of the battle area (FEBA) as possible. Jammers are also found with general support jamming battalions.
System Components

General
A general understanding of the main system components will help you to understand what is required to operate the HAVE QUICK II radio. There are four necessary conditions for successful communications using the HAVE QUICK II jam-resistant system. They are:

1. Frequency Hopping Capability
2. Word-Of-Day (WOD)
3. Time-Of-Day (TOD)
4. Net Number Assignment

Frequency Hopping Capability
The HAVE QUICK modification to the UHF radio adds the frequency hopping capability, yet it does not remove any of the previous capabilities of the radio. The HAVE QUICK-modified radio retains the standard, single frequency UHF voice mode of operation. This will be referred to as the “Normal” mode, while frequency hopping operation will be called the “Active” mode. Active mode is also referred to as the Anti-Jam (AJ) mode, but in this text, we will use the term “active.”

Normal Mode
When HAVE QUICK-modified radios are operated in the normal mode, the radio function is unchanged from that of an unmodified radio except for the TONE button which now becomes a time transmission button with a delayed tone signal. In the normal mode, the HAVE QUICK modified radio is interoperable with other voice UHF radio systems. For successful operation in the normal mode, Word-Of-Day and Time-Of-Day are not required. However, standard procedures should call for WOD insertion and TOD even if jam-resistant operations are not anticipated. Having the radio active-mode capable is easier than making it capable after the need presents itself.

Active Mode
The active mode is the jam-resistant, frequency hopping mode of operation. The HAVE QUICK modification enables communications to synchronously hop between many different frequencies in a pseudorandom fashion over the entire UHF frequency bandwidth of the AN/ARC-164 radio. The hop rate is determined by the last two digits of the Word-Of-Day (WOD) element loaded into preset channel 20, the last entry printed for the HAVE QUICK II WOD.

For active mode operation, users must be on the same communications channel (net), in addition to having the same WOD and TOD. In the active mode, a communications channel is defined by a net number assignment instead of a single frequency as in the normal mode.

Word-Of-Day (WOD)
The Word-Of-Day (WOD) is a set of coded numbers that determine the hop pattern, frequencies, and hop rate used during HAVE QUICK operation. The WOD consists of 36 digits of code, broken into 6 elements of 6 digits each which are entered and stored in preset channels 15 through 20 (see Figure 2-1). The WOD element stored in channel 20 determines what mode the radio will be in (training or combat) and the rate at which it will hop among the various frequencies. Each WOD element is stored in a preset channel just as a UHF frequency would be; however, the HAVE QUICK system reads these digits as a code.
HAVE QUICK II radio users can enter a single WOD in preset channels 15-20, (using basic HAVE QUICK procedures). The WOD elements are then transferred to volatile memory for storage (procedures are detailed later in this text). After the WOD elements are stored in memory, preset channels 15 through 19 are available as normal communication channels, but there is a potential problem with using these preset channels. If the operator inadvertently selects channel 20 while in preset operation, it will disable the WOD entry. It is best to enter a single WOD into the non-volatile memory of the expanded memory board (EMB) using Multiple Word-Of-Day (MWOD) procedures. These coded WOD elements which are loaded to the EMB do not interfere with the subsequent use of preset frequencies. (Detailed operating procedures will be discussed in subsequent chapters.)

In order to use the training modes of HAVE QUICK II, 300.0XX must be set in channel 20. The XX can be either 00, 25, 50, or 75 and determines the hop rate. If anything other than 300.0XX is stored in channel 20, the HAVE QUICK II will be in the combat mode. In the training mode, it hops among the five frequencies stored in channels 15-19. In the combat mode, it hops among a larger group of frequencies.

Multiple Word-Of-Day (MWOD)

HAVE QUICK II radios can store up to six (6) Words-of-Day into non-volatile memory. This is called Multiple Word-Of-Day (MWOD). These MWOD codes are manually loaded through channels 20-14 of the radio by either the aircrew or maintenance personnel; however, they do not interfere with or use the preset frequencies. The ability to store up to six WODs has eliminated "Midnight Madness," experienced by the Basic HAVE QUICK system, by allowing the HAVE QUICK II radio to automatically reset itself to the next day's WOD when it recognizes 2400 hours Zulu.

The ability to program six WODs requires the user to program the radio with more information than in the past. HAVE QUICK II reads all six digits of the net number; therefore, it is very important that the radio be properly programmed. Each MWOD must be linked with an associated Day-of-Month. This element, called "date tag," identifies the WOD the radio will use for a specific day. The date is loaded into non-volatile memory through channel 14 following loading of the last WOD element through channel 15. The current day of the month must be loaded through channel 1 to enable the radio to select the correct WOD for that and subsequent day's HAVE QUICK operations.

While HAVE QUICK radios are in the active mode, they are continuously hopping through frequencies. To ensure that all radios hop to each new frequency simultaneously, a method of synchronization is required. The TOD signal, commonly referred to as a Mickey, is the method used to provide coordinated hopping. The TOD message contains universal coordinated time (Time-Of-Day) and may contain date information. The date information applies only to HAVE QUICK II radios. After first applying power, the HAVE QUICK receiver will automatically accept the first valid TOD signal it receives and reject subsequent timing signals unless an update action is taken by the user. The time signal may be automatically broadcast every 10 seconds on a dedicated TOD frequency, or a procedure can be established where the TOD is broadcast on request. There are three methods of obtaining a TOD:

Method 1

The first (and most preferred) method of receiving a Mickey is via the AN/TRC-177 or AN/TRC-187 Time Signal Set. This is the standard TOD generator located at most bases, usually in the command post, squadron, or within radio maintenance. The AN/TRC-177 or AN/TRC-187
timing is coordinated via satellite with other TOD generators around the world.

Method 2
The second method of getting a Mickey is from another HAVE QUICK user. Anyone using HAVE QUICK can pass their TOD to you. Though it is not as accurate as the TOD generator, it gives an acceptable time and allows the users of that common TOD to converse. This method is usually used by C3 assets, AWACS, ABCCC, a flight leader, or the mission commander for a specific package. Also, the squadron may not have an AN/TRC-177 or AN/TRC-187 Time Signal Set but will use its HAVE QUICK radio to get a valid TOD from the command post or radio maintenance. Then, the squadron can pass Mickeys upon request over the squadron common frequency.

Method 3
The third method of getting a Mickey is to self-generate the TOD. This method synchronizes your radio with no one else (until you pass along your TOD to another HAVE QUICK capable aircraft), but has application if operating out of a remote location or if the base TOD generator is inoperative. This procedure allows a flight leader to self-start his radio and then pass his TOD to other flight members. It is possible to send or receive a TOD on both normal and active modes.

One of the primary advantages of HAVE QUICK II over Basic HAVE QUICK is a large increase in the number of frequencies available for hopping. One large hopset has been coordinated for use in NATO (Europe) and another large hopset has been coordinated with all US Armed Services for HAVE QUICK II employment in areas outside Europe (non-NATO hopset). There are 1,000 nets available in HAVE QUICK II for use with NATO countries. Since used as a war reserve, they will not normally be used in peacetime. An additional 1,000 non-NATO nets are available in HAVE QUICK II. They are also a war reserve and will not normally be used in peacetime. These expanded hopsets provide the increase in jam resistance necessary to counter certain jammers that could be optimized against HAVE QUICK.

Training Net Numbers
Training nets (T-nets) and Frequency-Managed Training nets (FMT-nets) are used for training and exercises requiring active mode operation. Valid T-net and FMT-net training mode net numbers are designated on this page. Selecting any other net number while operating on a training mode WOD generates the invalid net alarm (pulsating tone). A training net number in the format A00.X00 selects the T-net training mode. In this mode, the radio set hops between the five frequencies loaded in with the WOD (locations 19 - 15). A training net number ending in .X25 selects the FMT-net training mode. In this mode, the radio set hops between the sixteen FMT-net training frequencies.

Operational Net Numbers
Operational net numbers begin with an “A” and are followed by three digits, “000” to “999”. The last two digits of the display (00, 25, 50, 75) designate the frequency table being used. Net numbers ending in “00” select the original A-net and B-net frequency table. Net numbers ending in “25” select the new NATO/Europe frequency table, and net numbers ending in “50” select the new non-NATO/Europe frequency table. Net numbers ending in “75” are reserved for future use and will generate an invalid net alarm (pulsating tone).

For Basic HAVE QUICK
The four types of nets available for active mode operations in basic HAVE QUICK are A-nets, sectionalized A nets, B-nets, and T-nets.
A-Nets
A-nets are used for combat only. They give the user the greatest amount of jam resistance available to the system.

Sectionalized A-Nets
Sectionalized A-nets are a subset of A-nets.

B-Nets
B-nets were specifically designed for communication with the AWACS.

T-Nets
Training nets (T-nets) are used for training and exercises requiring the use of active mode operation. T-nets hop among 5 UHF frequencies and allow user training on the system without exposing its full jam-resistant capability.

The T-nets are activated by a unique WOD which consists of six elements stored in preset channels 15 through 20. A standardized element designated 300.0XX (where XX determines the hop rate) is contained in preset channel 20. This element prepares the radio for T-net operation. The remaining preset channels are filled with additional WOD elements. For each complete T-net WOD, there are five independent T-nets available (see Table 2-1). The nets are numbered 1-5 and are selected by entering the frequencies A00.000 through A00.400. If an invalid net is selected, such as A00.600, an alert tone (beep, beep, beep...) will be heard. Only those users with the same set of WOD elements entered in preset channels 15-20 and the same TOD will be interoperable.

<table>
<thead>
<tr>
<th>Net</th>
<th>Net Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A00.000</td>
</tr>
<tr>
<td>2</td>
<td>A00.100</td>
</tr>
<tr>
<td>3</td>
<td>A00.200</td>
</tr>
<tr>
<td>4</td>
<td>A00.300</td>
</tr>
<tr>
<td>5</td>
<td>A00.400</td>
</tr>
</tbody>
</table>

The frequencies the radio uses to hop among during HAVE QUICK II operations can be preset in channels 15-19 (basic operations), or they can be stored in HAVE QUICK II non-volatile memory (MWOD operations). The coded MWOD frequencies that are loaded through channels 15-19 using HAVE QUICK II procedures are the frequencies used in the five T-nets. The nets are numbered in the same manner as Basic HAVE QUICK nets; however, since channel memory is not used for WOD storage, preset channels 15-19 are not changed and are available for normal use when not conducting HAVE QUICK operations.

For HAVE QUICK II
The three types of nets available for HAVE QUICK II active mode are NATO nets, non-NATO nets, and frequency-managed training nets (FMT-Nets).

NATO Nets (FMA-Nets)
A specific range of frequencies has been approved for use in NATO countries. These are used for combat only. There are 1000 nets available in HAVE QUICK II for use with NATO countries.

Non-NATO Nets (FMA-Nets)
A specific range of frequencies has been approved for use in non-NATO countries. These are used for combat only. An additional 1000 nets are available in HAVE QUICK II for use with non-NATO countries.

FMT-Nets
Frequency-Managed T-nets (FMT-nets) are used for training and exercises requiring the use of active mode operation and can only be used in HAVE QUICK II operations, not in Basic HAVE QUICK operations.

HAVE QUICK II provides 16 FMT-nets in addition to the 5 T-nets already provided by the Basic HAVE QUICK system. Table 2-2 lists the 16 FMT-Nets. The nets are numbered 1-16 and are identified by the frequencies A00.025 through A01.525. To use the FMT-nets, 16 training frequencies must be loaded into the radio (this function is usually performed by maintenance). Unlike the T-net frequencies, these frequencies are not part of the training Word-Of-Day (WOD). 16 frequencies have been approved for CONUS training by HQ ACC. The 16 frequencies are listed in Chapter 3. The procedures for loading them are also described in Chapter 3 (for old control panel) and Chapter 4 (for new control panel with LCD).
**Table 2-2. Frequency-Managed T-Nets**

<table>
<thead>
<tr>
<th>Net</th>
<th>Net Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A00.025</td>
</tr>
<tr>
<td>2</td>
<td>A00.125</td>
</tr>
<tr>
<td>3</td>
<td>A00.225</td>
</tr>
<tr>
<td>4</td>
<td>A00.325</td>
</tr>
<tr>
<td>5</td>
<td>A00.425</td>
</tr>
<tr>
<td>6</td>
<td>A00.525</td>
</tr>
<tr>
<td>7</td>
<td>A00.625</td>
</tr>
<tr>
<td>8</td>
<td>A00.725</td>
</tr>
<tr>
<td>9</td>
<td>A00.825</td>
</tr>
<tr>
<td>10</td>
<td>A00.925</td>
</tr>
<tr>
<td>11</td>
<td>A01.025</td>
</tr>
<tr>
<td>12</td>
<td>A01.125</td>
</tr>
<tr>
<td>13</td>
<td>A01.225</td>
</tr>
<tr>
<td>14</td>
<td>A01.325</td>
</tr>
<tr>
<td>15</td>
<td>A01.425</td>
</tr>
<tr>
<td>16</td>
<td>A01.525</td>
</tr>
</tbody>
</table>

**System Timing Equipment**

HAVE QUICK II radios require an accurate timing system in order to maintain synchronization while the radios are operating in the active mode. This is done by providing each radio with a programmed pattern and start rate of the frequencies to be used on a given day (WOD) and an accurate clock. Clocks in airborne radios will maintain synchronization for several hours. Those in ground equipment maintain synchronization longer.

**Satellite System**

Six Transit satellites provide the primary time reference for the HAVE QUICK II system. Transit satellites circle the earth in 107-minute polar orbits at an altitude of 600 nautical miles. The orbits do not rotate with Earth; rather Earth rotates within their orbits. The orbital patterns are wide at the equator and narrow at the poles (see Figure 2-2). Thus, every point on Earth passes under each of the six orbits about twice a day. The average interval between a particular point passing under a Transit orbit is 100 minutes at the equator, 60 minutes at 45 degrees north or south latitude. However, because of vision angles and satellite outages, 5 to 7 hours could pass between usable satellite updates.

The satellites provide the correct time with a known accuracy to Universal Coordinated Time (UCT). UCT is an internationally recognized time standard. Transit satellites can be used to synchronize HAVE QUICK II radios theaterwide or worldwide. This assures interoperability among operational units as they rendezvous from widely dispersed locations.

Tying all timekeeping to UCT is a practical convenience since the Transit system is in place and can disseminate time to widely dispersed forces.

![Transit Satellite Orbits](UNCLASSIFIED)

**Figure 2-2. Transit Satellite Orbits**

**Clocks**

The HAVE QUICK II hierarchy of clocks provides various installations with a timekeeping service appropriate to the need. Higher-level clocks have a greater capability and maintain accurate time for a longer period of time.

**AN/TCR-177 Time Signal Set (TSS)**

The TSS is the highest-level clock available in the HAVE QUICK II system. It is composed of a radio receiver (R-2121/TRC) and a reference signal generator (SG-1192/TRC). The RSG (SG-1192/TRC) consists of an RSG SG-1191/TRC, a radio frequency oscillator (0-1800(V)1/TRC, and a battery pack (OP-142/TRC). The RSG SG-1191...
divides into a subassembly and an ARC-164. (See Figure 2-3 for a block diagram of a TSS.)

The antenna preamplifier of the TSS receives a signal, transmitted from one of the Transit satellites. The preamplifier boosts this signal and routes it to the receiver. The receiver uses the satellite information to compute latitude and longitude and UCT. After the TSS tracks a satellite once, the programmed tracking feature predicts when the satellite will be available again and searches for it at the appropriate time. TSS will store each satellite and its tracks, eventually making use of all available satellites.

Once UCT is received by the receiver, the time is transferred to the RSG which, in turn, maintains it to a very high degree of accuracy with the RFO. The RSG can then disseminate the correct TOD to both ground and airborne users.

The Transit receiver's internal batteries provide power for a minimum of 10 minutes during short interruptions. When primary power is restored, the batteries automatically recharge.

Radio Frequency Oscillator (RFO) (1800(V)1/TRC)
The RFO is a high-stability oscillator primarily used to stabilize the timekeeping of other HAVE QUICK II clocks.

Reference Signal Generator (RSG) (SG-1192)
The RSG, which has the best available timekeeping capability, is the principal clock for use at sites such as main operating bases and forward operating locations.

The SG-1191 contains two independent clocks. One is in the subassembly; the other is a temperature compensated crystal oscillator (TCXO), which is internal to the ARC-164 radio. The RFO provides a master timing input for both. If the RFO fails, the clock in the subassembly stops. However, the TCXO will continue to maintain accurate time for 4 to 6 hours.

Both normal and active mode communications are possible through the ARC-164. It can also radiate an adjustable-power UHF signal carrying correct TOD on an automatic basis every 10 seconds or manually when requested.

The RSG has an external battery pack. If the primary power fails, it automatically switches to the battery pack. When primary power is restored, it automatically switches back. The battery pack, which receives a continuous trickle charge during normal operation, will operate the RSG and intergal radio for a minimum of 4 hours when required.

AN/TRC-187 Time Signal Set (TSS)
The TRC-187 performs the same function as the TRC-177 Time Signal Set, but it uses the Global Positioning System (GPS) to acquire time. A time update from the satellites can be acquired in as little as 5 minutes with the TRC-187. GPS time requires that at least five satellites be in view at one time. The frequency is D-Band, between 1000 and 1400 MHz. The TRC-187 can generate datatags for time signals. The GPS receiver is inside the TRC-187 and shows promise of being a much more reliable receiver than was the R-2171.

Even though the TRC-187 is now being fielded as a long-term replacement for the TRANSTT-based
TRC-177, the TRC-187 and the older TRC-177 will co-exist for several more years.

Radio Clocks
The TCXO, inside each HAVE QUICK II radio, is the simplest element of the timing hierarchy. It receives and transmits TOD updates, via UHF radio, in either the normal or active modes. The TCXO maintains time synchronization without update for a minimum of 4 hours.

All HAVE QUICK II radios can receive and transmit TOD via any standard 25 kHz UHF channel.

HAVE QUICK II Command Codes
An understanding of HAVE QUICK II Command Codes (Table 2-3) is essential when using the Verify/Operate, MWOD Load, MWOD Erase, and the FMT-Frequency Load (old control panel) or FMT-Change mode (new control panel) functions of the HAVE QUICK II radio.

Table 2-3. HAVE QUICK II Command Codes

<table>
<thead>
<tr>
<th>Command Code</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>220.000</td>
<td>Verify/Operate</td>
</tr>
<tr>
<td>220.025</td>
<td>MWOD Load</td>
</tr>
<tr>
<td>220.050</td>
<td>MWOD Erase</td>
</tr>
<tr>
<td>220.075</td>
<td>FMT-Net Load (Old Control Panel)</td>
</tr>
<tr>
<td></td>
<td>FMT Change Mode (New Control Panel)</td>
</tr>
</tbody>
</table>

Command codes are used to access memory locations and pass instructions to the radio without unnecessarily consuming preset storage or necessitating switch modifications. The operator enters a six-digit command code into Preset channel 20 to begin the unique initialization procedure. Thereafter, all other switch actions are performed with the radio in the MANUAL mode, but using switch actions normally associated with loading preset channels.

When preset channel 20 is changed to a command code frequency, the radio is switched to the corresponding HAVE QUICK II function to make it possible to load a WOD, erase a WOD, load the frequency management training net, or return the radio to normal operation. The command code frequencies and related functions are described in Table 2-3.

Four command codes have been designated to act as switches when entered into channel 20. The four command codes (listed in Table 2-3) are:

Verify/Operate (220.000)
The VERIFY/OPERATE command puts the radio in the Verify/Operate mode and allows you to talk on the radio. If the radio is in a mode other than Verify/Operate, you will not be able to transmit in either the normal or active modes. You may be able to receive transmissions from other radios in the Verify/Operate mode which can lead to confusion. This command can also be used to check to see if a particular day’s WOD has already been loaded into the radio.

MWOD Load (220.025)
The MWOD Load command takes the radio out of the operate mode and prepares the radio to accept the WOD information.

MWOD Erase (220.050)
The MWOD Erase command erases all WODs currently in the radio.

FMT-NET Load (old control panel) or FMT.CNG (new control panel) (220.075)
The FMT-NET Load/FMT.CNG command is used before loading FMT-Net frequencies into the radio.

To conserve radio presets, the MWOD Load, MWOD Erase, and FMT-Net frequency load or FMT Change switch actions are performed using switch actions very similar to those used to load channel presets, but with the radio in the MANUAL mode. The VERIFY/OPERATE command alerts the radio that the above MWOD/FMT-Net functions have been completed and restores the radio to the normal operating condition where channels are related to PRESET switch actions. This mode is also used to verify that current MWODs are loaded. The radio will not transmit (not even normal UHF) until the radio is returned to the Verify/Operate mode.
HAVE QUICK II
Modified Radio

with

Old Control Panel
HAVE QUICK II
(Old Control Panel)

General
Up to this point, our discussion of HAVE QUICK II has been general in an attempt to help you develop an understanding of the HAVE QUICK II radio system. We will now look at equipment you will use to operate HAVE QUICK II and the procedures that will enable you to work the system.

Radio Equipment and Switchology
Procedures for radio set-up and operation depend on the specific front panel assembly of the radio being used. Figure 3-1 depicts the AN/ARC-164 control unit. Table 3-1 (on the next page) defines the switches and their functions on the front panel assembly of the HAVE QUICK II modified ARC-164.

Figure 3-1. ARC-164 Control Panel (Typical)
<table>
<thead>
<tr>
<th>Switch/Control</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preset channel selector (CHAN switch)</td>
<td>Selects one of 20 preset channel locations</td>
</tr>
<tr>
<td>Manual frequency selectors</td>
<td>Selects tens, units, tenths, and hundredths/thousandths digits of desired frequency in normal mode or selects net number in active mode</td>
</tr>
<tr>
<td>A-3-2-T</td>
<td>Selects 100s digit of desired frequency (either 2 or 3) in the normal mode. The A position selects the active mode. The T position enables the radio to receive a new TOD.</td>
</tr>
<tr>
<td>MANUAL-PRESET-GUARD</td>
<td>Selects mode of frequency selection.</td>
</tr>
<tr>
<td>MANUAL</td>
<td>Frequency is manually selected using the five frequency selector switches</td>
</tr>
<tr>
<td>PRESET</td>
<td>Frequency is selected using the preset channel selector switch; also used when programming the 20 preset channels</td>
</tr>
<tr>
<td>GUARD</td>
<td>The main receiver and transmitter are automatically tuned to the Guard frequency and the Guard receiver is disabled</td>
</tr>
<tr>
<td>Function selector</td>
<td>Selects operating mode</td>
</tr>
<tr>
<td>OFF</td>
<td>Shuts down equipment</td>
</tr>
<tr>
<td>MAIN</td>
<td>Enables main receiver and transmitter</td>
</tr>
<tr>
<td>BOTH</td>
<td>Enables main receiver and transmitter and Guard receiver</td>
</tr>
<tr>
<td>ADF</td>
<td>Enables automatic direction finding (ADF) or homing system (if installed) and main receiver. Disables Guard receiver</td>
</tr>
<tr>
<td>Bandwidth (BW) (NB-WB)</td>
<td>Selects wideband or narrowband selectivity of main receiver. This is a maintenance adjustment only</td>
</tr>
<tr>
<td>PRESET</td>
<td>Stores selected data in specified preset channel</td>
</tr>
<tr>
<td>SQUELCH ON-OFF</td>
<td>Enables and disables squelch of main receiver</td>
</tr>
<tr>
<td>SQUELCH-MN (main squelch)</td>
<td>Adjusts level of squelch for main receiver. This is a maintenance adjustment only</td>
</tr>
<tr>
<td>SQUELCH-GD (Guard squelch)</td>
<td>Adjusts level of squelch for Guard receiver. This is a maintenance adjustment only</td>
</tr>
<tr>
<td>VOL</td>
<td>Adjust audio level</td>
</tr>
<tr>
<td>TONE</td>
<td>Transmits TOD when pressed if the radio TOD clock has been started. If the radio TOD clock has not been started, only a 1020-Hz tone will be transmitted. The tone also follows a TOD transmission if switch remains depressed</td>
</tr>
</tbody>
</table>
Operating Procedures

Normal Mode Operation

**Set-Up**

- To initialize the radio:

  - Set function selector switch to MAIN or BOTH
  - Set MANUAL-PRESET-GUARD switch to PRESET
  - Set CHAN switch to 20
  - Set frequency switches to 220.000 (VERIFY/OPERATE)
  - Lift the access cover assembly and press the PRESET button

- Continue with these steps:

  - Set MANUAL-PRESET-GUARD switch to MANUAL
  - Set SQUELCH switch to OFF and listen for a rushing noise
  - Adjust VOL control for desired listening level
  - Set SQUELCH switch back ON (to reduce background noise)

A channel frequency can be selected two (2) ways: manually or by selecting a preset channel.

*First, let's look at manual selection of a frequency.*
Manual Frequency Selection

- Set MANUAL-PRESET-GUARD switch to MANUAL
- Set frequency switches to desired operating frequency

Next, let’s look at selecting a preset channel:

Preset Channel Selection

- Set MANUAL-PRESET-GUARD switch to PRESET
- Set CHAN switch to the desired operating channel

If you want to load preset channels into the radio, follow these steps:
Preset Channel Loading

- Set MANUAL-PRESET-GUARD switch to **PRESET**
- Select the desired operating frequency with the frequency switches
- Rotate the CHAN switch to the desired channel number (channel 20 is reserved for MWOD operating mode data)
- Press the PRESET button to load the frequency into the preset channel. (Additional frequencies can be loaded into the remaining preset channels.) The frequencies selected for each preset channel can be recorded on the channel frequency chart provided on the radio control panel.

*The radio should now be ready for normal mode communications.*
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Operating Procedures

Active Mode Operation

The following operating procedures outline how to prepare your HAVE QUICK II radio for active use.

Your situation is that you are going to fly a mission and you need to get your radio ready for active use. You will need to load your WOD, get a TOD, and enter an assigned net number. OK, let's get your radio ready by taking you through these procedures. The name of the game here is successful communications in a threat environment.

Set-Up

- To initialize the radio:
  - Set function selector switch to MAIN or BOTH
  - Set CHAN switch to 20
  - Set MANUAL-PRESET-GUARD switch to PRESET
  - Set frequency switches to 220.000 (VERIFY/OPERATE)
  - Press PRESET button and release (single beep)

The next step is to load the Word-of-Day (WOD).
**Single WOD or Multiple WOD (MWOD) Load**

You may manually enter from one to six WODs into your radio using MWOD procedures. These WOD elements which are loaded to the Expanded Memory Board (EMB) are put into non-volatile memory and do not interfere with the subsequent use of preset frequencies, as they do using Basic HAVE QUICK procedures.

- **To load the WOD, you must first select MWOD Load mode:**
  - Make sure the MANUAL-PRESET-GUARD switch is still set to PRESET
  - Make sure the CHAN switch is still set to channel 20
  - Set frequency switches to 220.025 (MWOD Load)
  - Press PRESET button and release (single beep)

*For training purposes, we will use the following WOD elements in our instructions on how to load a WOD:*

```
channel 20  300.050  
channel 19  376.000  
channel 18  359.100  
channel 17  314.300  
channel 16  297.600  
channel 15  287.400  
```
Now, let's load the WOD:

- Set MANUAL-PRESET-GUARD switch to MANUAL (CHAN switch is still set for 20)
- Set frequency switches to WOD element for channel 20 (300.050)
- Press TONE button and release (single beep)

- Set CHAN switch to 19
- Set frequency switches to WOD element for channel 19 (376.000)
- Press TONE button and release (single beep)

- Set CHAN switch to 18
- Set frequency switches to WOD element for channel 18 (359.100)
- Press TONE button and release (single beep)

- Set CHAN switch to 17
- Set frequency switches to WOD element for channel 17 (314.300)
- Press TONE button and release (single beep)

- Set CHAN switch to 16
- Set frequency switches to WOD element for channel 16 (297.600)
- Press TONE button and release (single beep)

- Set CHAN switch to 15
- Set frequency switches to WOD element for channel 15 (287.400)
- Press TONE button and release (single beep)
Because each WOD must be linked with an associated Day-of-Month, a "date tag" is loaded into preset channel 14. Element 14 Day-of-Month Tag format is 3AB.000, where A is the 10's digit and B is the 1's digit of the current Day-of-Month. For example, the format for 27 April is 327.000.

- Set CHAN switch to 14
- Set frequency switches to the Operational Date of this WOD in the format 3AB.000. (Example: 27 April is 327.000)
- Press TONE button and release (double beep)

The first WOD and its Date Tag are now loaded into memory. To load additional MWODs, return to channel 20 and repeat the loading procedure for each additional WOD and Date Tag. The radio will retain the six (6) most recent WODs loaded. Date Tags and WODs entered using MWOD loading procedures are stored in non-volatile memory and are retained when the radio is turned off.

After all WODs and their Date Tags have been entered, the current Operational Date must be loaded prior to active mode operation. The current Operational Date is the current Universal Coordinated Time (UCT) date and must be entered so the radio can select one of the previously loaded WODs for operation. This date is loaded into volatile memory and will be lost when the radio set is turned off.

- Now, enter the current day of month (operational date) into the radio:

- Set CHAN switch to 01
- Set the frequency switches to the current Day-of-Month. The format is 3AB.000. Example: if today is 27 April, the entry is 327.000.
- Press TONE button and release (single beep)
At this point, you may verify MWOD load or you may proceed to getting your TOD.

**Verify MWOD is Loaded**

- **First, return to the Verify/Operate mode:**
  
  - Set MANUAL-PRESET-GUARD switch to PRESET
  - Set CHAN switch to 20
  - Set frequency selector switches to 220.000 (VERIFY/OPERATE)
  - Press PRESET button and release (single beep)

- **Next, verify the storage of a particular day’s WOD as follows:**
  
  - Set MANUAL-PRESET-GUARD switch to MANUAL
  - Set CHAN switch to 20
  - Set frequency switches to Day-of-Month to be verified. The format is 3AB.000. Example: if today is 27 April, the entry is 327.000.
  - Set CHAN switch momentarily to 19 and return to 20. A single beep indicates WOD for that day is loaded. No beep indicates WOD for that day is not loaded
  - Repeat for each day to be verified.

The radio is now ready to receive Time-of-Day (TOD).
If you did not verify MWOD storage in the preceding instructions, make sure you return to Verify/Operate mode before getting your TOD signal.

**Initial TOD**

Once powered up and set to a frequency for a TOD broadcast, the radio will automatically accept the first valid TOD signal it receives and reject subsequent timing signals unless an update action is taken. This helps protect the system from false TOD signals. HAVE QUICK II radios located within the transmission range of the time signal set/reference signal generator (TSS/RSG) broadcast frequency will be initially synchronized according to the following procedures:

- Set frequency selector switches to TSS/RSG broadcast frequency
- Turn the A-3-2-T knob to T momentarily and release (Return to either 3 or 2 as required to receive the TSS/RSG frequency.)
- Listen for short tone signal (beep) received from the TSS/RSG. The TSS will transmit the time once every 10 seconds in the automatic mode or when the user requests it with the brevity code word Mickey if the TSS is in the manual transmit mode.

Note: Activating the “T” switch after turn-on opens a 60-second window to receive time. After 60 seconds, the window closes, and “T” must be reselected if time was not acquired.

Note: If no signal is heard within 60 seconds, proceed to getting a TOD update from another user, or initiate an individual TOD.

Note: If the TOD broadcast is weak or there is signal interference from TAB-V, try SQUELCH OFF for TOD reception.
- To confirm that TOD has been received:

  - Re-tune the radio to another frequency (to preclude transmitting a non-common TOD to another user)
  - Press TONE button
  - Listen for single TOD signal. (If you hear a standard tone, the radio has not received a TOD. If you hear the TOD signal followed by the standard tone, the radio has received the TOD)

Note: The TOD check will assume that some time is loaded, but the only way to determine if it is the correct time is to go active and try a talk test.

TOD Update

TOD updates are required if the aircrew member cannot get an initial TOD from a TSS/RSG transmission, or if at some time after receiving initial TOD, the member determines a TOD update is required.

It is possible to receive and transmit TOD in both in normal and active modes. The purpose of the active mode time transmission is to allow a time update to take place in the event that a radio is drifting out of synchronization. The aircrew member should be aware that his radio requires an update when incoming transmissions from several different radios sound garbled. If the user's TOD has drifted too much, a TOD update in the active mode may not be possible.
• To receive a TOD from another HAVE QUICK II user:

- Establish radio contact in normal mode with another HAVE QUICK II user (sender) possessing the correct TOD.
- Set the radio to receive a TOD by turning the A-3-2-T switch to T (and release). Return to the established frequency. This action tells the radio to accept a new TOD.
- Verbally request a TOD transmission (Mickey) from the sender. The sender transmits a TOD by depressing the TONE button until the standard tone starts.
- Listen to one- or two-step tone within 60 seconds.

• To send a TOD to another HAVE QUICK II radio:

- Establish radio contact/receive request.
- Depress the TONE button to transmit TOD within 60 seconds of receiver's switch action.

Initiating Individual TOD

In the event that synchronization is lost or access to a timing signal (TSS/RSG) is not available, internal synchronization among the users of the same net is possible. One HAVE QUICK II radio acts as the "master clock," and all other radios on the net will synchronize to that radio. The operator designated as master must self-start his radio clock, then pass TOD to others.
To self-start your radio clock:

- Move the A-3-2-T knob to T and hold.
- Depress TONE button while holding A-3-2-T knob at T position
- Release the A-3-2-T knob and TONE button (no tone signal will be heard)
- To confirm that the radio has TOD, depress and hold the TONE button. Listen for short TOD tone followed by normal radio tone, as compared to only the normal radio tone
- TOD can now be passed to other users by pressing the TONE button

Note: Every effort should be made to receive TOD through a TSS, RSG, or other HAVE QUICK II radio. Only self-initiate TOD when these methods are not available.

Note: TOD and WOD may be entered in any order once the radio is turned on. A tone is heard in the headset if TOD has not been initially received, or if WOD has not been transferred/entered (and an active mode is entered). If TOD is not received and/or WOD is not loaded correctly, an alert tone (beep, beep, beep) will be heard.

The final step is entering your net number into the radio.
Active Mode
and
Net Number Assignment

If WOD and TOD entries have been successful, you can proceed to put your HAVE QUICK II radio in the Active mode of operation. You must be in the VERIFY/OPERATE mode before going active.

• First, make sure you are in the Verify/Operate mode:
  - Set MANUAL-PRESET-GUARD switch to PRESET
  - Set CHAN switch to 20
  - Set frequency switches to 220.000 (VERIFY/OPERATE)
  - Press PRESET button and release (single beep)

After you have placed the radio set in the VERIFY/OPERATE mode, there are two ways in which you can select the net number: (1) manually or by (2) using a preset channel which contains the desired net number.
Manual Selection of Net Number

- To manually select a net:
  - Set MANUAL-PRESET-GUARD switch to MANUAL
  - Set the frequency switches to an assigned net number
  - Set A-3-2-T knob to A

Selection of Net Number with Preset Channel

- To select a net number with a preset channel:
  - Set MANUAL-PRESET-GUARD switch to PRESET
  - Set CHAN switch to a preset channel containing the assigned net number
  - Set A-3-2-T knob to A
Additional Operating Procedures

In this section, we will discuss the following three additional operating procedures:

- Loading FMT-Net Frequencies
- Using MWODs after Initial Loading
- MWOD Erase

Loading FMT-Net Frequencies

As mentioned in Chapter 2, System Components, the FMT-nets are used for training and exercises requiring the use of active mode operation. HAVE QUICK II provides 16 FMT-nets which are listed in Chapter 2, Table 2-2. To use these FMT-nets, 16 training frequencies must be loaded into your radio.

- To load FMT-net frequencies, you must first select the FMT-Net Frequency Load mode:

  - Set MANUAL-PRESET-GUARD switch to PRESET
  - Set CHAN switch to 20
  - Set frequency switches to 220.075 (FMT-Net Frequency Load)
  - Press PRESET button and release (single beep)
Next, load the frequencies with these steps:

- Set MANUAL-PRESET-GUARD switch to MANUAL
- CHAN switch remains on 20
- Set frequency switches to training frequency #1
- Press TONE button and release (single beep)
- Set CHAN switch to 19
- Set frequency switches to training frequency #2
- Press TONE button and release (single beep)
- Repeat these steps beginning with setting the CHAN switch to 18 and decreasing the channel number by one for each training frequency until all 16 frequencies are loaded

Note: FMT-net frequencies must be loaded in the same order in all radios to maintain interoperability.

Return to VERIFY/OPERATE mode:

- Set MANUAL-PRESET-GUARD switch to PRESET
- Set CHAN switch to 20
- Set frequency switches to 220.000 (VERIFY/OPERATE)
- Press PRESET load button and release (single beep)

See a sample checklist on the next page for loading FMT-Net frequencies:
This is a sample checklist for loading FMT-Net training frequencies:

- Set MANUAL-PRESET-GUARD switch to PRESET
- Set CHAN switch to 20
- Set the frequency switches to 220.075
- Press PRESET button and release

- Set MANUAL-PRESET-GUARD switch to MANUAL

- Load 235.050 into channel 20. Press and release TONE button.
- Load 225.150 into channel 19. Press and release TONE button.
- Load 252.925 into channel 18. Press and release TONE button.
- Load 239.950 into channel 17. Press and release TONE button.
- Load 271.950 into channel 16. Press and release TONE button.
- Load 267.850 into channel 15. Press and release TONE button.
- Load 262.450 into channel 14. Press and release TONE button.
- Load 257.250 into channel 13. Press and release TONE button.
- Load 314.450 into channel 12. Press and release TONE button.
- Load 308.750 into channel 11. Press and release TONE button.
- Load 303.275 into channel 10. Press and release TONE button.
- Load 298.650 into channel 09. Press and release TONE button.
- Load 293.550 into channel 08. Press and release TONE button.
- Load 289.050 into channel 07. Press and release TONE button.
- Load 284.150 into channel 06. Press and release TONE button.
- Load 279.750 into channel 05. Press and release TONE button.

- Set MANUAL-PRESET-GUARD switch to PRESET
- Set CHAN switch to 20
- Set frequency switches to 220.000 (VERIFY/OPERATE)
- Press PRESET button and release
The 16 frequencies can be accessed in channels 20 through 5 with the MANUAL-PRESET-GUARD switch in MANUAL. To change a particular frequency, you must first put the radio in the "FMT-Net Frequency Load" mode. We will repeat these steps for you as listed below:

• First, put the radio in the FMT-Net Frequency Load mode:

  - Set MANUAL-PRESET-GUARD switch to PRESET
  - Set CHAN switch to 20
  - Set frequency switches to **220.075** (FMT-Net Frequency Load)
  - Press PRESET button and release (single beep)

• To change a particular frequency:

  - Set MANUAL-PRESET-GUARD switch to MANUAL
  - Set CHAN switch to the appropriate channel
  - Set frequency switches to desired frequency
  - Press and release TONE button (single beep)

• To resume operation, return to VERIFY/OPERATE mode:

  - Set MANUAL-PRESET-GUARD switch to PRESET
  - Set CHAN switch to 20
  - Set frequency switches to **220.000** (VERIFY/OPERATE)
  - Press PRESET button and release (single beep)
Next, we will discuss how to use MWODs after initial loading.

→

**Using MWODs after Initial Loading**

There may be times when you will not be loading MWODs into your radio (as they may have been loaded on a previous day or on the same day which you are going to fly). If you are going to fly an aircraft that has (or is expected to have) valid MWODs already loaded in memory, follow these procedures:

**Verify an MWOD is Loaded**

- *First, put the radio into the Verify/Operate mode:*
  - Set function selector switch to **MAIN** or **BOTH**
  - Set MANUAL-PRESET-GUARD switch to **PRESET**
  - Set CHAN switch to channel **20** (single beep)
  - Set frequency switches to **220.000** (VERIFY/OPERATE)
  - Press **PRESET** button and release
Next, verify the storage of a particular day’s WOD as follows:

- Set MANUAL-PRESET-GUARD switch to MANUAL
- Set CHAN switch to 20
- Set frequency switches to Day-of-Month to be verified. The format is 3AB.000, where A is the 10’s digit and B is the 1’s digit of the Day-of-Month. (Example, 27 April is 327.000.)
- Set CHAN switch momentarily to 19 and return to 20. A single beep indicates WOD for that day is loaded. No beep indicates WOD for that day is not loaded.
- Repeat for each day to be verified

MWOD Operation

Once the operator has been assured of or has verified the loading of current MWOD, the radio must be provided the current Day-of-Month. This is so the radio can transfer the correct MWOD segment from memory into the radio’s processor.

There are two ways to enter Day-of-Month information into a HAVE QUICK II radio: (1) by receiving a Mickey from a HAVE QUICK II radio loaded with current Day-of-Month, or (2) by manually entering it.

Receiving a HAVE QUICK II Mickey is the preferred method of initializing a radio loaded with MWODs. A HAVE QUICK II Mickey consists of date information (day-of-year and year) appended to the Time-of-Day (TOD). Upon receipt of a HAVE QUICK II Mickey, a HAVE QUICK II radio will set its clock to the correct Time-of-Day and Day-of-Month (derived from the date information) and transfer the correct MWOD segment into its processor. With these actions completed, the radio is ready for active net selection. If a mission should run into the next Zulu day, the radio’s clock will update to the next day and, if it has been loaded, the correct WOD will be transferred into the radio’s processor. If the next day’s WOD has not been loaded, the current day’s WOD will be repeated.
If a HAVE QUICK II Mickey (date information appended to TOD) is not available, the operator will have to manually enter the current Day-of-Month. With a manually loaded Day-of-Month, the radio is ready for active net selection as if date information was received from a HAVE QUICK II Mickey. A HAVE QUICK II radio can append date information to its Mickey, but this requires the operator to manually enter Day-of-Month and then self-start the radio's clock. When this procedure is completed, the radio appends the Day-of-Month into the Day-of-Year slot of the Mickey and sets the year of the Mickey to 80. Since the clock has been self-started (arbitrary time), the radio should further receive a true Mickey (Zulu time) in order to correctly align its Time-of-Day. Once loaded, the master radio need only be reinitialized following a power interruption or at the beginning of the next month.

To manually enter Day-of-Month, follow these steps:

**First, put the radio into MWOD Load mode:**

- Set MANUAL-PRESET-GUARD switch to PRESET
- Set CHAN switch to channel 20 (single beep)
- Set frequency switches to 220.025 (MWOD Load)
- Press and release PRESET button

**Next, enter the current Day-of-Month (operational date) into the radio:**

- Set MANUAL-PRESET-GUARD switch to MANUAL
- Set CHAN switch to 01
- Set frequency switches to current Day-of-Month. The format is 3AB.000, where A is the 10's digit and B is the 1's digit of the Day-of-Month. (Example, 27 July is 327.000.)
- Press and release TONE button (single beep)
• **Return to the Verify/Operate mode:**

  - Set MANUAL-PRESET-GUARD switch to **PRESET**
  - Set CHAN switch to channel 20 (single beep)
  - Set frequency switches to 220.000 (VERIFY/OPERATE)
  - Press the **PRESET** button

• **Self-start the radio's clock:**

  - Set MANUAL-PRESET-GUARD switch to **MANUAL**
  - Set A-3-2-T knob to T position and hold
  - Press TONE button while holding the A-3-2-T knob at T position
  - Release A-3-2-T knob and TONE button (no signal heard)

• **To confirm that TOD has been received:**

  - Depress and hold the TONE button
  - Listen for single TOD signal. (If you hear a standard tone, the radio has not received a TOD. If you hear the TOD signal followed by the standard tone, the radio has received the TOD)
At this point, the radio should be ready to receive a normal Mickey:

- Set frequency switches to TSS/RSG broadcast (Mickey) frequency
- Request Mickey
- Set A-3-2-T switch to the T position and release
- Listen for short tone signal (beep) received from the TSS/RSG within 60 seconds. The TSS will transmit the time once every 10 seconds in the automatic mode or when the user requests it with the brevity code word Mickey if the TSS is in the manual transmit mode.

When the radio receives the Mickey, it should load the MWOD segment matching the Day-of-Month entered into the radio. The radio should also now be capable of passing HAVE QUICK II Mickey's to other radios.

The last procedure we will discuss is MWOD Erase.
To erase the MWOD memory:

- Set MANUAL-PRESET-GUARD switch to PRESET
- Set CHAN switch to 20
- Set frequency switches to 220.050 (MWOD Erase)
- Press PRESET button and release (single beep)
- Set MANUAL-PRESET-GUARD switch to MANUAL
- Press TONE button and release (single beep)

At this point, all MWODs should have been erased, and transmit is disabled. To enable transmit or, in non-emergency situations, to return the radio to its normal configuration, return to VERIFY/OPERATE mode.

To return to Verify/Operate mode:

- Set MANUAL-PRESET-GUARD switch to PRESET
- The CHAN switch should still be set to channel 20
- Set frequency switches to 220.000 (Verify/Operate)
- Press PRESET button and release (single beep)

The radio should now transmit in normal UHF.
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HAVE QUICK II Modified Radio

New Control Panel
with
Liquid Crystal Display (LCD)

and

*Manual MWOD Loading*
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Chapter 4

HAVE QUICK II
New Control Panel
with Liquid Crystal Display (LCD) and
Manual MWOD Loading

General
This chapter addresses the operating procedures for
the most recent version of the AN/ARC-164, HAVE
QUICK II Radio Set using Manual MWOD Loading.
The new version retains interoperability with original
HAVE QUICK and HAVE QUICK II Radio Sets and
contains the capabilities gained with the addition of
the Expanded Memory Board (EMB). The major
modification to the HAVE QUICK II Radio Set since
1987 is the new control panel shown in Figure 4-1.

Radio Equipment and Switchology
Procedures for radio set-up and operation depend on
the specific front panel assembly of the radio being
used. Figure 4-1 depicts the latest version of the
AN/ARC-164 control unit. Table 4-1 (on the next
page) defines the switches and their functions on the
front panel assembly of this updated control panel.

Figure 4-1. ARC-164 New Control Panel
<table>
<thead>
<tr>
<th>Switch/Control</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preset channel selector (CHAN switch)</td>
<td>Selects one of 20 preset channel locations</td>
</tr>
<tr>
<td>CHAN Indicator</td>
<td>Liquid-crystal display showing selected channel (with the MPG switch in PRESET) or selected memory location (in the MWOD Load or FMT Change modes).</td>
</tr>
<tr>
<td>Manual frequency selectors</td>
<td>Selects tens, units, tenths, and hundredths/thousandths digits of desired frequency in normal mode or selects net number in active mode</td>
</tr>
<tr>
<td>Frequency/Status (f/s) Indicator</td>
<td>Liquid-crystal display (with green front panel lighting compatible with night vision goggle (NVG) equipment) for frequency information, net numbers, and the following operator prompts:</td>
</tr>
<tr>
<td>REMOTE</td>
<td>Indicates radio is under remote control (for dual control installations)</td>
</tr>
<tr>
<td>VER/OP</td>
<td>Indicates radio is in normal operating mode</td>
</tr>
<tr>
<td>M-LOAD</td>
<td>Indicates radio is in MWOD Load mode</td>
</tr>
<tr>
<td>ERASE</td>
<td>Indicates radio is in MWOD Erase mode</td>
</tr>
<tr>
<td>FMT.CNG</td>
<td>Indicates radio is in Frequency Management Training Change mode</td>
</tr>
<tr>
<td>FILL</td>
<td>Indicates a keyfill device is connected to the front panel FILL connector</td>
</tr>
<tr>
<td>WOD OK</td>
<td>Indicates a valid WOD was successfully received from the keyfill device</td>
</tr>
<tr>
<td>BAD</td>
<td>Indicates no WOD or a bad parity WOD was received</td>
</tr>
<tr>
<td>MNL-PRESET-GRD (MPG Switch)</td>
<td>Selects mode of frequency selection.</td>
</tr>
<tr>
<td>MNL</td>
<td>Frequency is manually selected using the five frequency selector switches</td>
</tr>
<tr>
<td>PRESET</td>
<td>Frequency is selected using the preset channel selector switch; also used when programming the 20 preset channels</td>
</tr>
<tr>
<td><strong>Switch/Control</strong></td>
<td><strong>Function</strong></td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>GRD</td>
<td>The main receiver and transmitter are automatically tuned to the guard frequency and the guard receiver is disabled</td>
</tr>
<tr>
<td>Function selector</td>
<td>Selects operating mode</td>
</tr>
<tr>
<td>OFF</td>
<td>Shuts down equipment</td>
</tr>
<tr>
<td>MAIN</td>
<td>Enables main receiver and transmitter</td>
</tr>
<tr>
<td>BOTH</td>
<td>Enables main receiver and transmitter and guard receiver</td>
</tr>
<tr>
<td>ADF</td>
<td>Enables automatic direction finding (ADF) or homing system (if installed) and main receiver. Disables guard receiver</td>
</tr>
<tr>
<td>A-3-2</td>
<td>Selects 100s digit of desired frequency (either 2 or 3) in the normal mode. The A position selects the active mode</td>
</tr>
<tr>
<td>LOAD</td>
<td>Stores selected data in specified preset channel</td>
</tr>
<tr>
<td>ZERO Switch</td>
<td>Automatically erases all MWOD elements</td>
</tr>
<tr>
<td>Fill Connector</td>
<td>A connector to interface with a KYK-13/TSEC electronic fill device for automatic MWOD loading</td>
</tr>
<tr>
<td>STATUS Switch</td>
<td>Selects an alternate display on the f/s and CHAN indicators</td>
</tr>
<tr>
<td>T-TONE Switch</td>
<td>The T position enables the radio to receive a new TOD. This switch also implements the function of the former TONE Switch, which is to transmit TOD if the radio TOD clock has been started or follows a TOD transmission</td>
</tr>
<tr>
<td>TEST DISPLAY Switch</td>
<td>Lights all segments of the f/s and CHAN indicators; used with T-TONE switch for TOD self-clock start</td>
</tr>
<tr>
<td>SQUELCH ON-OFF</td>
<td>Enables and disables squelch of main receiver</td>
</tr>
<tr>
<td>MN SQ (main squelch)</td>
<td>Adjusts level of squelch for main receiver. This is a maintenance adjustment only</td>
</tr>
<tr>
<td>GD SQ (Guard squelch)</td>
<td>Adjusts level of squelch for guard receiver. This is a maintenance adjustment only</td>
</tr>
<tr>
<td>VOL</td>
<td>Adjust audio level</td>
</tr>
</tbody>
</table>
Operating Procedures

Normal Mode Operation

Set-Up

- To initialize the radio:
  - Set function selector switch to MAIN or BOTH
  - Set MNL-PRESET-GRD (MPG) switch to PRESET
  - Set CHAN switch to 20
  - Set frequency switches to 220.000
  - Lift the access cover assembly and press the LOAD button.

The radio is now in the VERIFY/OPERATE mode as displayed on the frequency/status (f/s) indicator in Figure 4-2.

Figure 4-2. Verify/Operate Mode Display
To verify that the radio is in VERIFY/OPERATE mode, press the STATUS switch. You should see "VER/OP" displayed on the frequency/status indicator as shown in Figure 4-3.

Figure 4-3. VER/OP Mode Display with STATUS Switch Pressed

Continue with these steps:

- Set MPG switch to MNL
- Set SQUELCH switch to OFF and listen for a rushing noise
- Adjust VOL control for desired listening level
- Set SQUELCH switch back ON (to reduce background noise)

A channel frequency can be selected two (2) ways: manually or by selecting a preset channel.

First, let's look at manual selection of a frequency.
Manual Frequency Selection

- Set MPG switch to MNL
- Set frequency switches to desired operating frequency

Switch positions and indicator displays for manual selection of a frequency in normal mode is shown in Figure 4-4.

Figure 4-4. Manual Selection of Frequency in Normal Mode
Next, let's look at selecting a preset channel:

**Preset Channel Selection**

- Set MPG switch to PRESET
- Set CHAN switch to the desired operating channel
- Press the STATUS switch to see what frequency is loaded in the selected channel (See Figure 4-5)

![Diagram of Preset Channel Selection](image)

Figure 4-5. Preset Channel Selection with STATUS Switch Pressed

*If you want to load preset channels into the radio, follow these steps:*
Preset Channel Loading

- Set MPG switch to PRESET
- Select the desired operating frequency with the frequency switches
- Rotate the CHAN switch to the desired channel number (channel 20 is reserved for MWOD operating mode data)
- Press the LOAD button to load the frequency into the preset channel. (Additional frequencies can be loaded into the remaining preset channels.) The frequencies selected for each preset channel can be recorded on the channel frequency chart provided on the radio control panel. (See Figure 4-6.)

Figure 4-6. Preset Channel Loading of Frequency in Normal Mode

The radio is now ready for normal mode communications.
Operating Procedures

Active Mode Operation

The following operating procedures outline how to prepare your HAVE QUICK ll radio for active use.

Your situation is that you are going to fly a mission and you need to get your radio ready for active use. You will need to load your WOD, get a TOD, and enter an assigned net number. OK, let's get your radio ready by taking you through these procedures. The name of the game here is successful communications in a threat environment.

Set-Up

- To initialize the radio:
  - Set function selector switch to MAIN or BOTH
  - Set MNL-PRESET-GRD (MPG) switch to PRESET
  - Set CHAN switch to channel 20 (single beep)
  - Set frequency switches to 220.000 (VERIFY/OPERATE)
  - Lift the access cover assembly and press the LOAD button

The radio is now in the VERIFY/OPERATE mode as displayed on the frequency/status indicator in Figure 4-7.
To verify that the radio is in VERIFY/OPERATE mode, press the STATUS switch. You should see "VER/OP" displayed on the frequency/status indicator as shown in Figure 4-8.

The next step is to load the Word-of-Day (WOD).
Manual
Single WOD or Multiple WOD (MWOD) Load

You may manually enter from one to six WODs into your radio using MWOD procedures. These WOD elements which are loaded to the Expanded Memory Board (EMB) do not interfere with the subsequent use of preset frequencies, as they do using Basic HAVE QUICK procedures.

- To load the WOD, you must first select MWOD Load mode:
  - Make sure the MNL-PRESET-GRD (MPG) switch is still set to PRESET
  - Make sure CHAN switch is still set to channel 20
  - Set frequency selector switches to 220.025 (MWOD Load)
  - Press LOAD button (single beep)

The MWOD Load mode is now selected as displayed on the frequency/status indicator in Figure 4-9.

Figure 4-9. Manual MWOD Load Mode
For training purposes, we will use the following WOD elements in our instructions on how to load a WOD:

channel 20 300.050
channel 19 376.000
channel 18 359.100
channel 17 314.300
channel 16 297.600
channel 15 287.400

• Now, let's load the WOD:

  • Set MPG switch to MNL (CHAN switch is still set for 20)
  • Set frequency switches to WOD element for channel 20 (300.050)
  • Set T-TONE switch to the TONE position (single beep)

  • Set CHAN switch to 19
  • Set frequency switches to WOD element for channel 19 (376.000)
  • Set T-TONE switch to the TONE position (single beep)

  • Set CHAN switch to 18
  • Set frequency switches to WOD element for channel 18 (359.100)
  • Set T-TONE switch to the TONE position (single beep)

  • Set CHAN switch to 17
  • Set frequency switches to WOD element for channel 17 (314.300)
  • Set T-TONE switch to the TONE position (single beep)

  • Set CHAN switch to 16
  • Set frequency switches to WOD element for channel 16 (297.600)
  • Set T-TONE switch to the TONE position (single beep)

  • Set CHAN switch to 15
  • Set frequency switches to WOD element for channel 15 (287.400)
  • Set T-TONE switch to the TONE position (single beep)
Because each WOD must be linked with an associated Day-of-Month, a “date tag” is loaded into preset channel 14. Element 14 Day-of-Month Tag format is 3AB.000, where A is the 10’s digit and B is the 1’s digit of the current Day-of-Month. For example, the format for 27 April is 327.000.

- Set CHAN switch to 14
- Set frequency switches to the Operational Date of this WOD in the format 3AB.000. (Example: 27 April is 327.000.)
- Set the T-TONE switch to the TONE position (listen for double beep)

The first WOD and its Date Tag should now be loaded into memory. Return to channel 20 and repeat the loading procedure for each additional WOD and Date Tag. The radio will retain the six (6) most recent WODs loaded. Date Tags and WODs entered using MWOD loading procedures are stored in non-volatile memory and are retained when the radio is turned off.

After all WODs and their Date Tags have been entered, the current Operational Date must be loaded prior to active mode operation. The current Operational Date is the current Universal Coordinated Time (UCT) date and must be entered so the radio can select one of the previously loaded WODs for operation. This date is loaded into volatile memory and will be lost when the radio set is turned off.

- Now, enter the current day of month (operational date) into the radio:
  - Set CHAN switch to 01
  - Set frequency switches to the current Operational Date in the format 3AB.000. (Example: 27 April is 327.000)
  - Set T-TONE switch to TONE position and release
At this point, you may verify MWOD load, or you may proceed to getting your TOD.

**Verify MWOD is Loaded**

- First, return to the Verify/Operate mode:
  - Set MPG switch to PRESET
  - Set CHAN switch to 20
  - Set frequency switches to 220.000 (VERIFY/OPERATE mode)
  - Press the LOAD button

- Next, verify the storage of a particular day's WOD as follows:
  - Set MPG switch to MNL
  - Set CHAN switch to 20
  - Set frequency switches to Day-of-Month to be verified. The format is 3AB.000, where A is the 10's digit and B is the 1's digit of the Day-of-Month. (Example, 27 April is 327.000.)
  - Set CHAN switch momentarily to 19 and return to 20. A single beep indicates WOD for that day is loaded. No beep indicates WOD for that day is not loaded.
  - Repeat for each day to be verified

The radio should now be ready to receive Time-of-Day (TOD).
If you did not verify MWOD storage in the preceding instructions, make sure you return to Verify/Operate mode before getting your TOD signal.

**Initial TOD**

Once powered up and set to a frequency for a TOD broadcast, the radio will automatically accept the first valid TOD signal it receives and reject subsequent timing signals unless an update action is taken. This helps protect the system from false TOD signals. HAVE QUICK II radios located within the transmission range of the time signal set/reference signal generator (TSS/RSG) broadcast frequency will be initially synchronized according to the following procedures:

- Set frequency switches to TSS/RSG broadcast frequency
- Select the T position on the T-TONE switch and release
- Listen for short tone signal (beep) received from the TSS/RSG. The TSS will transmit the time once every 10 seconds in the automatic mode or when the user requests it with the brevity code word *Mickey* if the TSS is in the manual transmit mode.

**Note:** Activating the “T” switch after turn-on opens a 60-second window to receive time. After 60 seconds, the window closes, and “T” must be reselected if time was not acquired.

**Note:** If no signal is heard within 60 seconds, proceed to getting a TOD update from another user, or initiate an individual TOD.

**Note:** If the TOD broadcast is weak or there is signal interference from TAB-V, try SQUELCH OFF for TOD reception.
To confirm that TOD has been received:

- Re-tune the radio to another frequency (to preclude transmitting a non-common TOD to another user)
- Select the TONE position on the T-TONE switch
- Listen for single TOD signal. (If you hear a standard tone, the radio has not received a TOD. If you hear the TOD signal followed by the standard tone, the radio has received the TOD)

Note: The TOD check will assume that some time is loaded, but the only way to determine if it is the correct time is to go active and try a talk test.

TOD Update

TOD updates are required if the aircrew member cannot get an initial TOD from a TSS/RSG transmission, or if at some time after receiving initial TOD, the member determines a TOD update is required.

It is possible to receive and transmit TOD in both in normal and active modes. The purpose of the active mode time transmission is to allow a time update to take place in the event that a radio is drifting out of synchronization. The aircrew member should be aware that his radio requires an update when incoming transmissions from several different radios sound garbled. If the user's TOD has drifted too much, a TOD update in the active mode may not be possible.
• To receive a TOD from another HAVE QUICK II user:

  - Establish radio contact in normal mode with another HAVE QUICK II user (sender) possessing the correct TOD. Verbally request a TOD transmission (Mickey) from the sender.
  - Set the frequency switches or CHAN switch to a predesignated frequency for TOD reception.
  - Set the radio to receive a TOD by selecting the T position on the T-TONE switch and release.
  - Listen to one- or two-step tone within 60 seconds.

• To send a TOD to another HAVE QUICK II radio:

  - Establish radio contact/receive request.
  - Set frequency switches or CHAN switch to the predesignated frequency (for normal mode) or net number (for active mode).
  - Momentarily place the T-TONE switch to the TONE position to transmit TOD.
Initiating Individual TOD

In the event that synchronization is lost or access to a timing signal (TSS/RSG) is not available, internal synchronization among the users of the same net is possible. One HAVE QUICK II radio acts as the "master clock," and all other radios on the net will synchronize to that radio. The operator designated as master must self start his radio clock, then pass TOD to others.

- To self-start your radio clock:
  - Set the T-TONE switch to the T position while simultaneously pressing the TEST DISPLAY switch, then release
  - To confirm that the radio has TOD, place the T-TONE switch to the TONE position. Listen for short TOD tone followed by normal radio tone, as compared to only the normal radio tone
  - TOD can now be passed to other users by placing the T-TONE switch to the TONE position to transmit TOD

Note: Every effort should be made to receive TOD through a TSS, RSG, or other HAVE QUICK II radio. Only self-initiate TOD when these methods are not available.

Note: TOD and WOD may be entered in any order once the radio is turned on. A tone is heard in the headset if TOD has not been initially received, or if WOD has not been transferred/entered (and an active mode is entered). If TOD is not received and/or WOD is not loaded correctly, an alert tone (beep, beep, beep) will be heard.

The final step is entering your net number into the radio:

↓
If WOD and TOD entries have been successful, you can proceed to put your HAVE QUICK II radio in the active mode of operation. You must be in the VERIFY/OPERATE mode before going active.

* First, make sure you are in the Verify/Operate mode:
  
  - Set MPG switch to PRESET
  - Set CHAN switch to .20
  - Set frequency switches to 220.000 (VERIFY/OPERATE mode)
  - Press LOAD button

The radio should now be in the Verify/Operate mode as displayed in Figure 4-10.

Figure 4-10. Verify/Operate Mode Display
To verify that the radio is in VERIFY/OPERATE mode, press the STATUS switch. You should see "VER/OP" displayed on the frequency/status indicator as shown in Figure 4-11.

![UNCLASSIFIED]

Figure 4-11. VER/OP Mode Display with STATUS Switch Pressed

After you have placed the radio set in the VERIFY/OPERATE mode, there are two ways in which you can select the net number: (1) manually or by (2) using a preset channel which contains the desired net number.
To manually select a net:

- Set MPG switch to MNL
- Set the frequency switches to the assigned net number
- Set A-3-2 switch to A

Manual selection of a net number for active mode is displayed in Figure 4-12.

Figure 4-12. Manual Selection of Net Number for Active Mode
Selection of Net Number with Preset Channel

- To select a net number with a preset channel:
  - Set MPG switch to PRESET
  - Set CHAN switch to a preset channel containing the desired net number
  - Set the A-3-2 switch to A

The f/s display in Figure 4-13 shows selection of a net number with a preset channel.

Figure 4-13. Selection of Net Number with Preset Channel
Press the STATUS switch to view the net number on the f/s display as shown in Figure 4-14.

Figure 4-14. STATUS Switch Displays Actual Net Number

**Warning Tones:** If no warning tone is heard, the radio set is in active mode. A steady warning tone will be heard in the headphone when active mode is selected and TOD and/or a valid WOD has not been entered. A pulsating warning tone (beep, beep, beep) is heard in the headphone if an invalid net number is selected.

You should now be active and should engage in successful communications with users of the same net.

---

Next, we will discuss additional operating procedures, such as loading FMT-net frequencies, using MWODs after initial loading, and erasing WODs.
Additional Operating Procedures

In this section, we will discuss the following three additional operating procedures:

- Loading FMT-Net Frequencies
- Using MWODs after Initial Loading
- MWOD Erase

Loading FMT-Net Frequencies

As mentioned in Chapter 2, System Components, the FMT-nets are used for training and exercises requiring the use of active mode operation. HAVE QUICK II provides 16 FMT-nets which are listed in Chapter 2, Table 2-2. To use these FMT-nets, 16 training frequencies must be loaded into your radio.

- To load FMT-net frequencies, you must first select the FMT Change mode:

  - Set MNL-PRESET-GRD (MPG) switch to PRESET
  - Set CHAN switch to 20
  - Set frequency switches to 220.075 (FMT Change mode)
  - Press LOAD button and release (single beep)

The radio should now be set in the FMT Change mode and “FMT.CNG” should be displayed on the f/s indicator as shown in Figure 4-15.
Next, load the frequencies with these steps:

- Set MPG switch to MANUAL
- CHAN switch remains on 20
- Set frequency switches to training frequency #1
- Set the T-TONE switch to TONE (single beep)
- Set CHAN switch to 19
- Set frequency switches to training frequency #2
- Set the T-TONE switch to TONE (single beep)
- Repeat these steps beginning with setting the CHAN switch to 18 and decreasing the channel number by one for each training frequency until all 16 frequencies are loaded
• **Return to VERIFY/OPERATE mode:**

- Set MPG switch to PRESET
- Set CHAN switch to 20
- Set frequency switches to 220.000 (VERIFY/OPERATE)
- Press LOAD button and release (single beep)

The 16 frequencies can be accessed in channels 20 through 5 with the MPG switch in **MNL**.

FMT-net frequencies must be loaded in the same order in all radios to maintain interoperability.

See a sample checklist on the next page for loading FMT-Net frequencies:
This is a sample checklist for loading FMT-Net training frequencies:

- Set MPG switch to PRESET
- Set CHAN switch to 20
- Set the frequency switches to 220.075
- Press the LOAD button and release (single beep)

- Set MPG switch to MNL
- Load 235.050 into channel 20. Set T-TONE switch to TONE.
- Load 225.150 into channel 19. Set T-TONE switch to TONE.
- Load 252.925 into channel 18. Set T-TONE switch to TONE.
- Load 239.950 into channel 17. Set T-TONE switch to TONE.
- Load 271.950 into channel 16. Set T-TONE switch to TONE
- Load 267.850 into channel 15. Set T-TONE switch to TONE.
- Load 262.450 into channel 14. Set T-TONE switch to TONE.
- Load 257.250 into channel 13. Set T-TONE switch to TONE.
- Load 314.450 into channel 12. Set T-TONE switch to TONE.
- Load 308.750 into channel 11. Set T-TONE switch to TONE.
- Load 303.275 into channel 10. Set T-TONE switch to TONE.
- Load 298.650 into channel 09. Set T-TONE switch to TONE.
- Load 293.550 into channel 08. Set T-TONE switch to TONE.
- Load 289.050 into channel 07. Set T-TONE switch to TONE.
- Load 284.150 into channel 06. Set T-TONE switch to TONE
- Load 279.750 into channel 05. Set T-TONE switch to TONE.

- Set MPG switch to PRESET
- Set CHAN switch to 20
- Set frequency switches to 220.000 (VERIFY/OPERATE mode)
- Press LOAD button and release (single beep)

Remember, FMT-Net frequencies must be loaded in the same order in all radios to maintain interoperability.
The 16 frequencies can be accessed in channels 20 through 5 with the MPG switch in MNL. To change a particular frequency, you must first put the radio in the "FMT.CNG" mode. We will repeat these steps for you as listed below:

• **First, put the radio in the FMT.CNG mode:**

  - Set MPG switch to PRESET
  - Set CHAN switch to 20
  - Set frequency switches to 220.075 (FMT Change mode)
  - Press the LOAD button and release (single beep)

The display on the frequency/status indicator is "FMT.CNG" as shown in Figure 4-16:

![Figure 4-16. FMT Change Mode](unclassified)
• To change a particular frequency:

- Set MPG switch to MNL
- Set CHAN switch to the appropriate channel
- Set frequency switches to the desired frequency
- Set the T-TONE switch to TONE to load the new frequency

Note: Any or all of the 16 frequencies can be changed. When changing the frequency switch settings, the f/s indicator will revert to displaying current operating mode (FMT.CNG) if the switches are not used for a period of five (5) seconds. Press the STATUS switch to view current frequency switch settings.

• To resume operation, return to VERIFY/OPERATE mode:

- Set MPG switch to PRESET
- Set CHAN switch to 20
- Set frequency switches to 220.000
- Press the LOAD button and release
Next, we will discuss another operating procedure—how to use MWODs after initial loading.

Using MWODs after Initial Loading

There may be times when you will not be loading MWODs into your radio (as they may have been loaded on a previous day or on the same day which you are going to fly). If you are going to fly an aircraft that has (or is expected to have) valid MWODs already loaded in memory, follow these procedures:

Verify an MWOD is Loaded

- First, put the radio into the Verify/Operate mode:
  - Set function selector switch to MAIN or BOTH
  - Set MPG switch to PRESET
  - Set CHAN switch to channel 20 (single beep)
  - Set frequency switches to 220.000 (VERIFY/OPERATE)
  - Press the LOAD button and release
• Next, verify the storage of a particular day’s WOD as follows:

- Set MPG switch to MNL
- Set CHAN switch to 20
- Set frequency switches to Day-of-Month to be verified. The format is 3AB.000, where A is the 10’s digit and B is the 1’s digit of the Day-of-Month. (Example, 27 April is 327.000.)
- Set CHAN switch momentarily to 19 and return to 20. A single beep indicates WOD for that day is loaded. No beep indicates WOD for that day is not loaded.
- Repeat for each day to be verified

MWOD Operation

Once the operator has been assured of or has verified the loading of current MWOD, the radio must be provided the current Day-of-Month. This is so the radio can transfer the correct MWOD segment from memory into the radio’s processor.

There are two ways to enter Day-of-Month information into a HAVE QUICK II radio: (1) by receiving a Mickey from a HAVE QUICK II radio loaded with current Day-of-Month, or (2) by manually entering it.

Receiving a HAVE QUICK II Mickey is the preferred method of initializing a radio loaded with MWODs. A HAVE QUICK II Mickey consists of date information (day-of-year and year) appended to the Time-of-Day (TOD). Upon receipt of a HAVE QUICK II Mickey, a HAVE QUICK II radio will set its clock to the correct Time-of-Day and Day-of-Month (derived from the date information) and transfer the correct MWOD segment into its processor. With these actions completed, the radio is ready for active net selection. If a mission should run into the next Zulu day, the radio’s clock will update to the next day and, if it has been loaded, the correct WOD will be transferred into the radio’s processor. If the next day’s WOD has not been loaded, the current day’s WOD will be repeated.
If a HAVE QUICK II Mickey (date information appended to TOD) is not available, the operator will have to manually enter the current Day-of-Month. With a manually loaded Day-of-Month, the radio is ready for active net selection as if date information was received from a HAVE QUICK II Mickey. A HAVE QUICK II radio can append date information to its Mickey, but this requires the operator to manually enter Day-of-Month and then self-start the radio's clock. When this procedure is completed, the radio appends the Day-of-Month into the Day-of-Year slot of the Mickey and sets the year of the Mickey to 80. Since the clock has been self-started (arbitrary time), the radio should further receive a true Mickey (Zulu time) in order to correctly align its Time-of-Day. Once loaded, the master radio need only be reinitialized following a power interruption or at the beginning of the next month.

To manually enter Day-of-Month, follow these steps:

- **First, put the radio into MWOD Load mode:**
  
  - Set MPG switch to PRESET
  - Set CHAN switch to channel 20 (single beep)
  - Set frequency switches to 220.025 (MWOD Load)
  - Press LOAD button and release

- **Next, enter the current Day-of-Month (operational date) into the radio:**
  
  - Set MPG switch to MNL
  - Set CHAN switch to 01
  - Set frequency switches to current Day-of-Month. The format is 3AB.000, where A is the 10's digit and B is the 1's digit of the Day-of-Month. (Example, 27 July is 327.000.)
  - Set T-TONE switch to TONE position and release
• **Return to the Verify/Operate mode:**

  - Set MPG switch to PRESET
  - Set CHAN switch to channel 20 (single beep)
  - Set frequency switches to 220.000 (VERIFY/OPERATE)
  - Press the LOAD button

• **Self-start the radio’s clock:**

  - Set MPG switch to MNL
  - Set the T-TONE switch to the T position while simultaneously pressing the TEST DISPLAY switch, then release

• **To confirm that TOD has been received:**

  - Place the T-TONE switch to the TONE position
  - Listen for single TOD signal. (If you hear a standard tone, the radio has not received a TOD. If you hear the TOD signal followed by the standard tone, the radio has received the TOD)
At this point, the radio should be ready to receive a normal Mickey:

- Set frequency switches to TSS/RSG broadcast (Mickey) frequency
- Request Mickey
- Select the T position on the T-TONE switch and release
- Listen for short tone signal (beep) received from the TSS/RSG within 60 seconds. The TSS will transmit the time once every 10 seconds in the automatic mode or when the user requests it with the brevity code word Mickey if the TSS is in the manual transmit mode.

When the radio receives the Mickey, it should load the MWOD segment matching the Day-of-Month entered into the radio. The radio should also now be capable of passing HAVE QUICK II Mickey's to other radios.

The last procedure we will discuss in MWOD Erase.
There are currently two (2) methods available for erasing WODs and can be used while in either normal or active mode of operation.

**MWOD Erase**

- The first method for erasing WODs is to:
  - Press down the ZERO switch (under the front panel access cover)

The word "ERASE" is displayed on the frequency/status indicator as shown in Figure 4-17.

![Image of MWOD Erase Mode](image)

Figure 4-17. MWOD Erase Mode

As this point, all WODs should have been erased.
An alternative method for erasing WODs is:

- Set MPG switch to PRESET
- Set CHAN switch to 20
- Set frequency switches to 220.050 (MWOD Erase mode)
- Press the LOAD button

The word "ERASE" is displayed on the frequency/status indicator as shown in Figure 4-18.

![Figure 4-18. MWOD Erase Mode](UNCLASSIFIED)

To erase all WOD elements:

- Select MNL on the MPG switch and
- Momentarily set the T-TONE switch to the TONE position

At this point, all WOD elements should have been erased, and you should return to Verify/Operate mode as follows:
To return to Verify/Operate mode:

- Set MPG switch to PRESET
- The CHAN switch should still be set to Channel 20
- Set frequency switches to 220.000 (Verify/Operate)
- Press the LOAD button and release (single beep)

The radio should now transmit in normal UHF.
Chapter 5

HAVE QUICK II Modified Radio

New Control Panel
with
Liquid Crystal Display (LCD)

and

Electronic MWOD Loading
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HAVE QUICK II
New Control Panel
with Liquid Crystal Display (LCD) and
Electronic MWOD Loading

General
This chapter addresses the operating procedures for the most recent version of the AN/ARC-164, HAVE QUICK II Radio Set using Electronic Multiple WOD Loading. The new version retains interoperability with original HAVE QUICK and HAVE QUICK II Radio Sets and contains the capabilities gained with the addition of the Expanded Memory Board (EMB). The major modification to the HAVE QUICK II Radio Set since 1987 is the new control panel shown in Figure 5-1.

Radio Equipment and Switchology
Procedures for radio set-up and operation depend on the specific front panel assembly of the radio being used. Figure 5-1 depicts the latest version of the AN/ARC-164 control unit. Table 5-1 (on the next page) defines the switches and their functions on the front panel assembly of this updated control panel.

Figure 5-1. ARC-164 New Control Panel.
<table>
<thead>
<tr>
<th>Switch/Control</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preset channel selector (CHAN switch)</td>
<td>Selects one of 20 preset channel locations</td>
</tr>
<tr>
<td>CHAN Indicator</td>
<td>Liquid-crystal display showing selected channel (with the MPG switch in PRESET) or selected memory location (in the MWOD Load or FMT Change modes).</td>
</tr>
<tr>
<td>Manual frequency selectors</td>
<td>Selects tens, units, tenths, and hundredths/thousandths digits of desired frequency in normal mode or selects net number in active mode</td>
</tr>
<tr>
<td>Frequency/Status (f/s) Indicator</td>
<td>Liquid-crystal display (with green front panel lighting compatible with night vision goggle (NVG) equipment) for frequency information, net numbers, and the following operator prompts:</td>
</tr>
<tr>
<td>REMOTE</td>
<td>Indicates radio is under remote control (for dual control installations)</td>
</tr>
<tr>
<td>VER/OP</td>
<td>Indicates radio is in normal operating mode</td>
</tr>
<tr>
<td>M-LOAD</td>
<td>Indicates radio is in MWOD Load mode</td>
</tr>
<tr>
<td>ERASE</td>
<td>Indicates radio is in MWOD Erase mode</td>
</tr>
<tr>
<td>FMT.CNG</td>
<td>Indicates radio is in Frequency Management Training Change mode</td>
</tr>
<tr>
<td>FILL</td>
<td>Indicates a keyfill device is connected to the front panel FILL connector</td>
</tr>
<tr>
<td>WOD OK</td>
<td>Indicates a valid WOD was successfully received from the keyfill device</td>
</tr>
<tr>
<td>BAD</td>
<td>Indicates no WOD or a bad party WOD was received</td>
</tr>
<tr>
<td>MNL-PRESET-GRD (MPG Switch)</td>
<td>Selects mode of frequency selection.</td>
</tr>
<tr>
<td>MNL</td>
<td>Frequency is manually selected using the five frequency selector switches</td>
</tr>
<tr>
<td>PRESET</td>
<td>Frequency is selected using the preset channel selector switch; also used when programming the 20 preset channels</td>
</tr>
</tbody>
</table>
Table 5-1. ARC-164 Switch/Control Functions (Continued)

<table>
<thead>
<tr>
<th>Switch/Control</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRD</td>
<td>The main receiver and transmitter are automatically tuned to the guard frequency and the guard receiver is disabled</td>
</tr>
<tr>
<td>Function selector</td>
<td>Selects operating mode</td>
</tr>
<tr>
<td>• OFF</td>
<td>Shuts down equipment</td>
</tr>
<tr>
<td>MAIN</td>
<td>Enables main receiver and transmitter</td>
</tr>
<tr>
<td>BOTH</td>
<td>Enables main receiver and transmitter and guard receiver</td>
</tr>
<tr>
<td>ADF</td>
<td>Enables automatic direction finding (ADF) or homing system (if installed) and main receiver. Disables guard receiver</td>
</tr>
<tr>
<td>A-3-2</td>
<td>Selects 100s digit of desired frequency (either 2 or 3) in the normal mode. The A position selects the active mode</td>
</tr>
<tr>
<td>LOAD</td>
<td>Stores selected data in specified preset channel</td>
</tr>
<tr>
<td>ZERO Switch</td>
<td>Automatically erases all MWOD elements</td>
</tr>
<tr>
<td>Fill Connector</td>
<td>A connector to interface with a KYK-13/TSEC electronic fill device for automatic MWOD loading</td>
</tr>
<tr>
<td>STATUS Switch</td>
<td>Selects an alternate display on the f/s and CHAN indicators</td>
</tr>
<tr>
<td>T-TONE Switch</td>
<td>The T position enables the radio to receive a new TOD. This switch also implements the function of the former TONE Switch, which is to transmit TOD if the radio TOD clock has been started or follows a TOD transmission</td>
</tr>
<tr>
<td>TEST DISPLAY Switch</td>
<td>Lights all segments of the f/s and CHAN indicators; used with T-TONE switch for TOD self-clock start</td>
</tr>
<tr>
<td>SQUELCH ON-OFF</td>
<td>Enables and disables squelch of main receiver</td>
</tr>
<tr>
<td>MN SQ (main squelch)</td>
<td>Adjusts level of squelch for main receiver. This is a maintenance adjustment only</td>
</tr>
<tr>
<td>GD SQ (Guard squelch)</td>
<td>Adjusts level of squelch for guard receiver. This is a maintenance adjustment only</td>
</tr>
<tr>
<td>VOL</td>
<td>Adjusts audio level</td>
</tr>
</tbody>
</table>
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Operating Procedures

Normal Mode Operation

**Set-Up**

- To initialize the radio:
  - Set function selector switch to MAIN or BOTH
  - Set MNL-PRESET-GRD (MPG) switch to PRESET
  - Set CHAN switch to 20
  - Set frequency switches to 220.000
  - Lift the access cover assembly and press the LOAD button

The radio is now in the VERIFY/OPERATE mode as displayed on the frequency/status (f/s) indicator in Figure 5-2.

Figure 5-2. Verify/Operate Mode Display
To verify that the radio is in VERIFY/OPERATE mode, press the STATUS switch. You should see "VER/OP" displayed on the frequency/status indicator as shown in Figure 5-3.

![Figure 5-3. VER/OP Mode Display with STATUS Switch Pressed](image)

- **Continue with these steps:**
  - Set MPG switch to MNL
  - Set SQUELCH switch to OFF and listen for a rushing noise
  - Adjust VOL control for desired listening level
  - Set SQUELCH switch back ON (to reduce background noise)

A channel frequency can be selected two (2) ways: manually or by selecting a preset channel.

First, let's look at manual selection of a frequency.
Manual Frequency Selection

- Set MPG switch to MNL
- Set frequency switches to desired operating frequency

Switch positions and indicator displays for manual selection of a frequency in normal mode is shown in Figure 5-4.

Figure 5-4. Manual Selection of Frequency in Normal Mode
Next, let's look at selecting a preset channel:

**Preset Channel Selection**

- Set MPG switch to PRESET
- Set CHAN switch to the desired operating channel
- Press the STATUS switch to see what frequency is loaded in the selected channel (See Figure 5-5)

Figure 5-5. Preset Channel Selection with STATUS Switch Pressed

If you want to load preset channels into the radio, follow these steps:
Preset Channel Loading

- Set MPG switch to PRESET
- Select the desired operating frequency with the frequency switches
- Rotate the CHAN switch to the desired channel number (channel 20 is reserved for MWOD operating mode data)
- Press the LOAD button to load the frequency into the preset channel. (Additional frequencies can be loaded into the remaining preset channels.) The frequencies selected for each preset channel can be recorded on the channel frequency chart provided on the radio control panel. (See Figure 5-6.)

Figure 5-6. Preset Channel Loading of Frequency in Normal Mode

The radio is now ready for normal mode communications.
Operating Procedures

Active Mode Operation

The following operating procedures outline how to prepare your HAVE QUICK II radio for active use.

Your situation is that you are going to fly a mission and you need to get your radio ready for active use. You will need to load your WOD, get a TOD, and enter an assigned net number. OK, let's get your radio ready by taking you through these procedures. The name of the game here is successful communications in a threat environment.

Set-Up

- To initialize the radio:
  - Set function selector switch to MAIN or BOTH
  - Set MNL-PRESET-GRD (MPG) switch to PRESET
  - Set CHAN switch to channel 20 (single beep)
  - Set frequency switches to 220.000 (VERIFY/OPERATE)
  - Lift the access cover assembly and press the LOAD button

The radio is now in the VERIFY/OPERATE mode as displayed on the frequency/status indicator in Figure 5-7.
To verify that the radio is in VERIFY/OPERATE mode, press the STATUS switch. You should see "VER/OP" displayed on the frequency/status indicator as shown in Figure 5-8.

The next step is to electronically load the Word-of-Day (WOD).
Electronic
*Multiple WOD (MWOD) Load*

You may electronically load up to six MWODs using the KYK-13/TSEC keyfill device shown in Figure 5-9. This task may be performed by aircrew members or maintenance personnel. MWOD keying material loaded into the KYK-13 is supplied through COMSEC channels.

![KYK-13/TSEC Keyfill Device](image)

Figure 5-9. KYK-13/TSEC Keyfill Device

Note: We just covered the steps on how to initialize your radio. Keep in mind that the radio must be powered up and in the VERIFY/OPERATE mode to be able to accept a KYK-13 load.

Note: It is not necessary to enter the MWOD Load mode when using the keyfill device.
• **To load MWOD using a KYK-13/TSEC keyfill device:**

  - Lift the front panel access cover on the RT or remote control unit to reveal the FILL connector (Figure 5-10)

  ![Figure 5-10. FILL Connector](image)

• **Continue with these steps:**

  - Set the KYK-13 mode switch to OFF/CHECK
  - Connect the KYK-13 fill device to FILL connector (it is not necessary that the fill cable be used)
  - Set the KYK-13 mode switch to ON

  The frequency/status indicator displays “FILL” as shown in Figure 5-11.
Figure 5-11. Frequency/Status Indicator when KYK-13 Keyfill Device is Connected

- Set the KYK-13 address switch to the applicable channel (1-6)
- Press the LOAD button
- Listen for a series of beeps and look at the f/s indicator display

*If the WOD is successfully loaded, the frequency/status indicator will display "WOD OK" as shown in Figure 5-12.*

Figure 5-12. Successful Loading of WOD with Keyfill Device
If the Operational Date must be loaded:
• Enter the current day of month (operational date) into the radio:

- Press the STATUS switch to view settings of the frequency switches
- Select the date on the frequency switches in the format 3AB.000, where AB is the current Day-of-Month. (For example, 27 April is 327.000)
- Set the T-TONE switch to the TONE position, then release
- Position the KYK-13 mode switch to OFF/CHECK. The radio set returns to its previous mode and both displays return to previous settings after the fill device is removed.

Note: Even if the "WOD OK" message has appeared on the f/s display, at this point, you may verify a particular day's WOD storage, or proceed to getting your TOD. If you wish to verify WOD storage at this point, follow these instructions:

Verify MWOD is Loaded

• First, return to the Verify/Operate mode:

- Set MPG switch to PRESET
- Set CHAN switch to 20
- Set frequency switches to 220.000 (VERIFY/OPERATE mode)
- Press the LOAD button
- Next, verify the storage of a particular day's WOD as follows:

  - Set MPG switch to MNL
  - Set CHAN switch to 20
  - Set frequency switches to Day-of-Month to be verified. The format is 3AB.000, where A is the 10's digit and B is the 1's digit of the Day-of-Month. (Example, 27 April is 327.000.)
  - Set CHAN switch momentarily to 19 and return to 20. A single beep indicates WOD for that day is loaded. No beep indicates WOD for that day is not loaded.
  - Repeat for each day to be verified

The radio should now be ready to receive Time-of-Day (TOD).

\[\downarrow\]

Note: If you did not verify WOD storage in the preceding instructions, make sure you return to Verify/Operate mode before getting your TOD signal.

- To return to the Verify/Operate mode:

  - Set MPG switch to PRESET
  - Set CHAN switch to 20
  - Set frequency switches to 220.000 (VERIFY/OPERATE mode)
  - Press the LOAD button

5-20
Once powered up and set to a frequency for a TOD broadcast, the radio will automatically accept the first valid TOD signal it receives and reject subsequent timing signals unless an update action is taken. This helps protect the system from false TOD signals. HAVE QUICK II radios located within the transmission range of the time signal set/reference signal generator (TSS/RSG) broadcast frequency will be initially synchronized according to the following procedures:

- Set frequency switches to TSS/RSG broadcast frequency
- Select the T position on the T-TONE switch and release
- Listen for short tone signal (beep) received from the TSS/RSG. The TSS will transmit the time once every 10 seconds in the automatic mode or when the user requests it with the brevity code word *Mickey* if the TSS is in the manual transmit mode.

Note: Activating the “T” switch after turn-on opens a 60-second window to receive time. After 60 seconds, the window closes, and “T” must be reselected if time was not acquired.

Note: If no signal is heard within 60 seconds, proceed to getting a TOD update from another user, or initiate an individual TOD.

Note: If the TOD broadcast is weak or there is signal interference from TAB-V, try SQUELCH OFF for TOD reception.
• To confirm that TOD has been received:

- Re-tune the radio to another frequency (to preclude transmitting a non-common TOD to another user)
- Select the TONE position on the T-TONE switch
- Listen for single TOD signal. (If you hear a standard tone, the radio has not received a TOD. If you hear the TOD signal followed by the standard tone, the radio has received the TOD

Note: The TOD check will assume that some time is loaded, but the only way to determine if it is the correct time is to go active and try a talk test.

TOD Update

TOD updates are required if the aircrew member cannot get an initial TOD from a TSS/RSG transmission, or if at some time after receiving initial TOD, the member determines a TOD update is required.

It is possible to receive and transmit TOD in both in normal and active modes. The purpose of the active mode time transmission is to allow a time update to take place in the event that a radio is drifting out of synchronization. The aircrew member should be aware that his radio requires an update when incoming transmissions from several different radios sound garbled. If the user's TOD has drifted too much, a TOD update in the active mode may not be possible.
• To receive a TOD from another HAVE QUICK II user:

- Establish radio contact in normal mode with another HAVE QUICK II user (sender) possessing the correct TOD. Verbally request a TOD transmission (Mickey) from the sender.
- Set the frequency switches or CHAN switch to a predesignated frequency for TOD reception.
- Set the radio to receive a TOD by selecting the T position on the T-TONE switch and release.
- Listen to one- or two-step tone within 60 seconds.

• To send a TOD to another HAVE QUICK II radio:

- Establish radio contact/receive request.
- Set frequency switches or CHAN switch to the predesignated frequency (for normal mode) or net number (for active mode).
- Momentarily place the T-TONE switch to the TONE position to transmit TOD.

**Initiating Individual TOD**

In the event that synchronization is lost or access to a timing signal (TSS/RSG) is not available, internal synchronization among the users of the same net is possible. One HAVE QUICK II radio acts as the "master clock," and all other radios on the net will synchronize to that radio. The operator designated as master must self-start his radio clock, then pass TOD to others.
**To self-start your radio clock:**

- Set the T-TONE switch to the T position while simultaneously pressing the TEST DISPLAY switch, then release.
- To confirm that the radio has TOD, place the T-TONE switch to the TONE position. Listen for short TOD tone followed by normal radio tone, as compared to only the normal radio tone.
- TOD can now be passed to other users by placing the T-TONE switch to the TONE position to transmit TOD.

Note: Every effort should be made to receive TOD through a TSS, RSG, or other HAVE QUICK II radio. Only self-initiate TOD when these methods are not available.

Note: TOD and WOD may be entered in any order once the radio is turned on. A tone is heard in the headset if TOD has not been initially received, or if WOD has not been transferred/entered (and an active mode is entered). If TOD is not received and/or WOD is not loaded correctly, an alert tone (beep, beep, beep) will be heard.

The final step is entering your net number into the radio:

↓
Active Mode and Net Number Assignment

If WOD and TOD entries have been successful, you can proceed to put your HAVE QUICK II radio in the active mode of operation. You must be in the VERIFY/OPERATE mode before going active.

- First, make sure you are in the Verify/Operate mode:
  - Set MPG switch to PRESET
  - Set CHAN switch to 20
  - Set frequency switches to 220.000 (VERIFY/OPERATE mode)
  - Press LOAD button

The radio should now be in the Verify/Operate mode as displayed in Figure 5-14.

Figure 5-14. Verify/Operate Mode Display
To verify that the radio is in VERIFY/OPERATE mode, press the STATUS switch. You should see "VER/OP" displayed on the frequency/status indicator as shown in Figure 5-15.

Figure 5-15. VER/OP Mode Display with STATUS Switch Pressed

After you have placed the radio set in the VERIFY/OPERATE mode, there are two ways in which you can select the net number: (1) manually or by (2) using a preset channel which contains the desired net number.

**Manual Selection of Net Number**

- To manually select a net:
  - Set MPG switch to MNL
  - Set the frequency switches to the assigned net number
  - Set A-3-2 switch to A
Manual selection of a net number for active mode is displayed in Figure 5-16.

Figure 5-16. Manual Selection of Net Number for Active Mode

Selection of Net Number with Preset Channel

- To select a net number with a preset channel:
  - Set MPG switch to PRESET
  - Set CHAN switch to a preset channel containing the desired net number
  - Set the A-3-2 switch to A

The f/s display in Figure 5-17 shows selection of a net number with a preset channel.
Figure 5-17. Selection of Net Number with Preset Channel

Press the STATUS switch to view the net number on the f/s display as shown in Figure 5-18.

Figure 5-18. STATUS Switch Displays Actual Net Number
Warning Tones: If no warning tone is heard, the radio set is in active mode. A steady warning tone will be heard in the headphone when active mode is selected and TOD and/or a valid WOD has not been entered. A pulsating warning tone (beep, beep, beep) is heard in the headphone if an invalid net number is selected.

You should now be active and should engage in successful communications with users of the same net.

Next, we will discuss additional operating procedures, such as loading FMT-net frequencies, using MWODs after initial loading, and erasing WODs.
Additional Operating Procedures

*In this section, we will discuss the following three additional operating procedures:*

- Loading FMT-Net Frequencies
- Using MWODs after Initial Loading
- MWOD Erase

---

**Loading FMT-Net Frequencies**

*As mentioned in Chapter 2, System Components, the FMT-nets are used for training and exercises requiring the use of active mode operation. HAVE QUICK II provides 16 FMT-nets which are listed in Chapter 2, Table 2-2. To use these FMT-nets, 16 training frequencies must be loaded into your radio.*

- **To load FMT-net frequencies, you must first select the FMT Change mode:**

  - Set MNL-PRESET-GRD (MPG) switch to PRESET
  - Set CHAN switch to 20
  - Set frequency switches to 220.075 (FMT Change mode)
  - Press LOAD button and release (single beep)

---

*The radio should now be set in the FMT Change mode and "FMT.CNG" should be displayed on the f/s indicator as shown in Figure 5-19.*
Next, load the frequencies with these steps:

- Set MPG switch to MANUAL
- CHAN switch remains on 20
- Set frequency switches to training frequency #1
- Set the T-TONE switch to TONE (single beep)
- Set CHAN switch to 19
- Set frequency switches to training frequency #2
- Set the T-TONE switch to TONE (single beep)
- Repeat these steps beginning with setting the CHAN switch to 18 and decreasing the channel number by one for each training frequency until all 16 frequencies are loaded
The 16 frequencies can be accessed in channels 20 through 5 with the MPG switch in MNL.

FMT-net frequencies must be loaded in the same order in all radios to maintain interoperability.

• Return to VERIFY/OPERATE mode:

  • Set MPG switch to PRESET
  • Set CHAN switch to 20
  • Set frequency switches to 220.000 (VERIFY/OPERATE)
  • Press LOAD button and release (single beep)

See a sample checklist on the next page for loading FMT-Net frequencies:
This is a sample checklist for loading FMT-Net training frequencies:

- Set MPG switch to PRESET
- Set CHAN switch to 20
- Set the frequency switches to 220.075
- Press the LOAD button and release (single beep)

- Set MPG switch to MNL

- Load 235.050 into channel 20. Set T-TONE switch to TONE.
- Load 225.150 into channel 19. Set T-TONE switch to TONE.
- Load 252.925 into channel 18. Set T-TONE switch to TONE.
- Load 239.950 into channel 17. Set T-TONE switch to TONE.
- Load 271.950 into channel 16. Set T-TONE switch to TONE
- Load 267.850 into channel 15. Set T-TONE switch to TONE.
- Load 262.450 into channel 14. Set T-TONE switch to TONE.
- Load 257.250 into channel 13. Set T-TONE switch to TONE.
- Load 314.450 into channel 12. Set T-TONE switch to TONE.
- Load 308.750 into channel 11. Set T-TONE switch to TONE.
- Load 303.275 into channel 10. Set T-TONE switch to TONE.
- Load 298.650 into channel 09. Set T-TONE switch to TONE.
- Load 293.550 into channel 08. Set T-TONE switch to TONE.
- Load 289.050 into channel 07. Set T-TONE switch to TONE.
- Load 284.150 into channel 06. Set T-TONE switch to TONE
- Load 279.750 into channel 05. Set T-TONE switch to TONE.

- Set MPG switch to PRESET
- Set CHAN switch to 20
- Set frequency switches to 220.000 (VERIFY/OPERATE mode)
- Press LOAD button and release (single beep)

Remember, FMT-Net frequencies must be loaded in the same order in all radios to maintain interoperability.
The 16 frequencies can be accessed in channels 20 through 5 with the MPG switch in MNL. To change a particular frequency, you must first put the radio in the "FMT.CNG" mode. We will repeat these steps for you as listed below:

- **First, put the radio in the FMT.CNG mode:**
  - Set MPG switch to PRESET
  - Set CHAN switch to 20
  - Set frequency switches to 220.075 (FMT Change mode)
  - Press the LOAD button and release (single beep)

*The display on the frequency/status indicator is "FMT.CNG" as shown in Figure 5-20:*

![Diagram of FMT Change Mode](image)

Figure 5-20. FMT Change Mode
- **To change a particular frequency:**

- Set MPG switch to MNL
- Set CHAN switch to the appropriate channel
- Set frequency switches to the desired frequency
- Set the T-TONE switch to TONE to load the new frequency

Note: Any or all of the 16 frequencies can be changed. When changing the frequency switch settings, the f/s indicator will revert to displaying current operating mode (FMT.CNG) if the switches are not used for a period of five (5) seconds. Press the STATUS switch to view current frequency switch settings.

- **To resume operation, return to VERIFY/OPERATE mode:**

- Set MPG switch to PRESET
- Set CHAN switch to 20
- Set frequency switches to 220.000
- Press the LOAD button and release
Next, we will discuss another operating procedure—how to use MWODs after initial loading.

\[\downarrow\]

**Using MWODs after Initial Loading**

There may be times when you will not be loading MWODs into your radio (as they may have been loaded on a previous day or on the same day which you are going to fly). If you are going to fly an aircraft that has (or is expected to have) valid MWODs already loaded in memory, follow these procedures:

---

**Verify an MWOD is Loaded**

- **First, put the radio into the Verify/Operate mode:**

  - Set function selector switch to MAIN or BOTH
  - Set MPG switch to PRESET
  - Set CHAN switch to channel 20 (single beep)
  - Set frequency switches to 220.000 (VERIFY/OPERATE)
  - Press the LOAD button and release

---
• Next, verify the storage of a particular day’s WOD as follows:

  - Set MPG switch to MNL
  - Set CHAN switch to 20
  - Set frequency switches to Day-of-Month to be verified. The format is 3AB.000, where A is the 10's digit and B is the 1's digit of the Day-of-Month. (Example, 27 April is 327.000.)
  - Set CHAN switch momentarily to 19 and return to 20. A single beep indicates WOD for that day is loaded. No beep indicates WOD for that day is not loaded.
  - Repeat for each day to be verified

---

**MWOD Operation**

Once the operator has been assured of or has verified the loading of current MWOD, the radio must be provided the current Day-of-Month. This is so the radio can transfer the correct MWOD segment from memory into the radio’s processor.

There are two ways to enter Day-of-Month information into a HAVE QUICK II radio: (1) by receiving a Mickey from a HAVE QUICK II radio loaded with current Day-of-Month, or (2) by manually entering it.

Receiving a HAVE QUICK II Mickey is the preferred method of initializing a radio loaded with MWODs. A HAVE QUICK II Mickey consists of date information (day-of-year and year) appended to the Time-of-Day (TOD). Upon receipt of a HAVE QUICK II Mickey, a HAVE QUICK II radio will set its clock to the correct Time-of-Day and Day-of-Month (derived from the date information) and transfer the correct MWOD segment into its processor. With these actions completed, the radio is ready for active net selection. If a mission should run into the next Zulu day, the radio’s clock will update to the next day and, if it has been loaded, the correct WOD will be transferred into the radio’s processor. If the next day’s WOD has not been loaded, the current day’s WOD will be repeated.
If a HAVE QUICK II *Mickey* (date information appended to TOD) is not available, the operator will have to manually enter the current Day-of-Month. With a manually loaded Day-of-Month, the radio is ready for active net selection as if date information was received from a HAVE QUICK II *Mickey*. A HAVE QUICK II radio can append date information to its *Mickey*, but this requires the operator to manually enter Day-of-Month and then self-start the radio's clock. When this procedure is completed, the radio appends the Day-of-Month into the Day-of-Year slot of the *Mickey* and sets the year of the *Mickey* to 80. Since the clock has been self-started (arbitrary time), the radio should further receive a true *Mickey* (Zulu time) in order to correctly align its Time-of-Day. Once loaded, the master radio need only be reinitialized following a power interruption or at the beginning of the next month.

To manually enter Day-of-Month, follow these steps:

- **First, put the radio into MWOD Load mode:**

  - Set MPG switch to PRESET
  - Set CHAN switch to channel 20 (single beep)
  - Set frequency switches to 220.025 (MWOD Load)
  - Press LOAD button and release

- **Next, enter the current Day-of-Month (operational date) into the radio:**

  - Set MPG switch to MNL
  - Set CHAN switch to 01
  - Set frequency switches to current Day-of-Month. The format is 3AB.000, where A is the 10's digit and B is the 1's digit of the Day-of-Month. (Example, 27 July is 327.000.)
  - Set T-TONE switch to TONE position and release
• Return to the Verify/Operate mode:
  - Set MPG switch to PRESET
  - Set CHAN switch to channel 20 (single beep)
  - Set frequency switches to 220.000 (VERIFY/OPERATE)
  - Press the LOAD button

• Self-start the radio’s clock:
  - Set MPG switch to MNL
  - Set the T-TONE switch to the T position while simultaneously pressing the TEST DISPLAY switch, then release

• To confirm that TOD has been received:
  - Place the T-TONE switch to the TONE position
  - Listen for single TOD signal. (If you hear a standard tone, the radio has not received a TOD. If you hear the TOD signal followed by the standard tone, the radio has received the TOD)
At this point, the radio should be ready to receive a normal Mickey:

- Set frequency switches to TSS/RSG broadcast (Mickey) frequency
- Request Mickey
- Select the T position on the T-TONE switch and release
- Listen for short tone signal (beep) received from the TSS/RSG within 60 seconds. The TSS will transmit the time once every 10 seconds in the automatic mode or when the user requests it with the brevity code word Mickey if the TSS is in the manual transmit mode.

When the radio receives the Mickey, it should load the MWOD segment matching the Day-of-Month entered into the radio. The radio should also now be capable of passing HAVE QUICK II Mickeys to other radios.

The last procedure we will discuss in MWOD Erase.
There are currently two (2) methods available for erasing WODs and can be used while in either normal or active mode of operation.

**MWOD Erase**

- **The first method for erasing WODs is to:**
  - Press down the ZERO switch (under the front panel access cover)

The word "ERASE" is displayed on the frequency/status indicator as shown in Figure 5-21.

Figure 5-21. MWOD Erase Mode

As this point, all WODs should have been erased.
• An alternative method for erasing WODs is:

- Set MPG switch to PRESET
- Set CHAN switch to 20
- Set frequency switches to 220.050 (MWOD Erase mode)
- Press the LOAD button

The word “ERASE” is displayed on the frequency/status indicator as shown in Figure 5-22.

Figure 5-22. MWOD Erase Mode

• To erase all WOD elements:

- Select MNL on the MPG switch and
- Momentarily set the T-TONE switch to the TONE position

At this point, all WOD elements should have been erased, and you should return to Verify/Operate mode as follows:
• To return to Verify/Operate mode:

- Set MPG switch to PRESET
- The CHAN switch should still be set to Channel 20
- Set frequency switches to 220.000 (Verify/Operate)
- Press the LOAD button and release (single beep)

The radio should now transmit in normal UHF.
Chapter 6

Additional HAVE QUICK II Information

Alert and Warning Tones
Alert and warning tones are heard in your headset when the HAVE QUICK II radio identifies a problem within its system. Generally speaking, if a steady tone is heard when HAVE QUICK operation is attempted, no WOD and/or TOD information is loaded. If an interrupted tone is heard, an incorrect net is in use. When troubleshooting a HAVE QUICK problem, rule out the obvious first:

- Did you load the WOD properly?
- Did you get a TOD?
- Was it a good TOD?
- Did you load the WOD and get the TOD on the same radio?
- Do you have the correct net selected?
- Are you on manual versus a preset?

If the answer to all these questions is yes and an interrupted tone is still heard, you should reload the WOD, get another TOD, and re-check the net frequency.

HAVE QUICK II conferencing options are controlled by the Word-of-Day (WOD) and are not selectable by the hundredths/thousandths frequency selector switch as it was in Basic HAVE QUICK. Conferencing is controlled by the last two digits of the WOD element (six-digit code) loaded into preset 19. Operational and training WOD material is structured to enable conferencing. These last two digits indicate various combinations of conferencing, nonconferencing, and selection of National Security Agency (NSA) algorithm modifications.

Interoperability with Secure Voice Systems
For information on the secure voice systems and their interoperability with HAVE QUICK II, review the HAVE QUICK Handbook (August 1985), which contains extensive information on Secure Voice equipment and operation.

Using HAVE QUICK II in Basic HAVE QUICK Mode
It is necessary to understand how to use a HAVE QUICK II radio to communicate with a basic HAVE QUICK radio.

A-net selection is unchanged from basic HAVE QUICK except the previously used, four-character, net designator must be expanded to six characters by adding 00 (for example, A522 becomes A52.000). Training nets must also be expanded to six characters. While in the training mode, entry of a T-net higher than A00.400 will result in a fault tone (interrupted tone). A translation of basic T-nets to HAVE QUICK II T-nets is shown in Table 6-1.
Table 6-1. Translation of Basic T-Nets to HAVE QUICK II T-Nets

<table>
<thead>
<tr>
<th>Basic T-Net</th>
<th>HAVE QUICK II T-Net</th>
</tr>
</thead>
<tbody>
<tr>
<td>A00.0 (same net as A00.5)</td>
<td>A00.000</td>
</tr>
<tr>
<td>A00.1</td>
<td>A00.100</td>
</tr>
<tr>
<td>A00.2</td>
<td>A00.200</td>
</tr>
<tr>
<td>A00.3</td>
<td>A00.300</td>
</tr>
<tr>
<td>A00.4</td>
<td>A00.400</td>
</tr>
<tr>
<td>A00.5</td>
<td>A00.000</td>
</tr>
</tbody>
</table>