FT-1500M Operating Manual

Front Panel Controls & Switches

VOL Knob

This control adjusts the volume level of the receiver's audio. Clockwise rotation increases the volume level.

DIAL

This 20-position detented rotary switch is used for tuning, memory selection and most function settings. Note that the microphone's UP/DOWN buttons duplicate the tuning functions of the Main Dial.

Display

The display consists of segmented digits which indicate operating frequency, status of functions, alpha/numeric memory labels, and MENU functions.

MHz

This button allows tuning in 1-MHz steps (the MHz digits will blink on the display).If receiving on a memory, pressing this button the first time activates the Memory Tune (MT) mode, and pressing it again enables 1-MHz steps.

Press and hold this key for one second to activate the Set Mode.

REV

During split-frequency operation, such as through a repeater, this button reverses the transmit and receive frequencies.

Press and hold this key for one second to activate the Dual Watch feature, described in the Operation chapter ("PRI" will be displayed on the LED, indicating "Priority Channel" monitoring).

LOW

Toggle this button while receiving to select high/low transmitter power (?/? watts).

Press and hold this key for one second to while receiving on a memory, pressing this button toggles the display between indication of the frequency and the channel's Alpha/Numeric label.

D/MR

This button selects the operation modes: VFO mode, Memory mode, and HOME channel.

Press and hold this key for one second to activate the Memory Storage mode.

PWR Switch

This is the main "ON/OFF" switch for the transceiver.

LCD

Memory Skip
DTMF Memory Mode
BELL
Frequency
Auto Power OFF Active
LOCK Feature Active
S- and TX Power Meter
LOW Power
Memory Mode
Repeater Shift
Priority Channel Scanning
Tone Encoder/Squelch Enabled
Smart Search
Programmable Memory Scan
Home Channel
VFO

Side Panel Connector

Microphone Jack

This 6-contact modular jack accepts transmit audio, tone call (burst) or Dial / Memory selection, and Scanning control from the microphone.

Pin 1: Sw 2 (Multi-function switching)
Pin 2: Cloning
Pin 3: +9V
Pin 4: GND
Pin 5: Microphone Input
Pin 6: Sw 1 (Multi-function switching)

Rear Panel Connector

ANT Coaxial Socket

Connect a resonant 144-MHz antenna to this type-M (SO-239) socket using 50-W coaxial cable and a type-M (PL-259) plug.

13.8V DC Cable Pigtail w/Fuse

This is the power supply connection for the transceiver. Use the supplied DC cable to connect this pigtail to the car battery or other DC power supply capable of at least 10 Amperes (continuous duty). Make certain that the red lead connects to the positive side of the supply. The fuse in the DC Cable is rated at 15-A, fast-blow.

EXP SP Jack

This 2-contact 3.5-mm phone jack provides receiver audio output for an optional external speaker. The audio impedance is 4 Ohms, and the level varies according to the setting of the front panel's VOL control. Inserting a plug into this jack disables audio from the transceiver's internal speaker.

DATA Jack

This six-pin mini-DIN jack accepts AFSK or FSK input from a Terminal Node Controller (TNC) ; it also provides fixed-level Receiver Audio Output, Push-To-Talk (PTT), and Ground lines.

Accessories & Options

Accessories Supplied with the FT-1500M

Operating Manual
Warranty Card

Available Options for your FT-1500M

???????????

Availability of accessories may vary: some accessories are supplied as standard per local regulations and requirements, others may be unavailable in some regions. Check with your Yaesu dealer for additions to the above list.

Installation

This chapter describes the installation procedure for integrating the FT-1500M into a typical amateur radio station. It is presumed that you possess technical knowledge and conceptual understanding consistent with your status as a licensed radio amateur. Please take some extra time to make certain that the important safety and technical requirements detailed in this chapter are followed closely.

Preliminary Inspection

Inspect the transceiver visually immediately upon opening the packing carton. Confirm that all controls and switches work freely, and inspect the cabinet for any damage. Gently shake the transceiver to verify that no internal components have been shaken loose due to rough handling during shipping.

If any evidence of damage is discovered, document it thoroughly and contact the shipping company (or your local dealer, if the unit was purchased over-the-counter) so as to get instructions regarding the prompt resolution of the damage situation. Be certain to save the shipping carton, especially if there are any punctures or other evidence of damage incurred during shipping; if it is necessary to return the

unit for service or replacement, use the original packing materials but put the entire package inside another packing carton, so as to preserve the evidence of shipping damage for insurance purposes.

Installation Tips

To ensure long life of the components, be certain to provide adequate ventilation around the cabinet of the FT-1500M.

Do not install the transceiver on top of another heat-generating device (such as a power supply or amplifier), and do not place equipment, books, or papers on top of the FT-1500M. Avoid heating vents and window locations that could expose the transceiver to excessive direct sunlight, especially in hot climates. The FT-1500M should not be used in an environment where the ambient temperature exceeds +60° C (140° F).

Safety Information

The FT-1500M is an electrical apparatus, as well as a generator of RF (Radio Frequency) energy, and you should exercise all safety precautions as are appropriate for this type of device. These safety tips apply to any device installed in a well-designed amateur radio station.

ρ Do not allow unsupervised children to play in the vicinity of your transceiver or antenna installation.

ρ Be certain to wrap any wire or cable splices thoroughly with insulating electrical tape, to prevent short circuits.

ρ Do not route cables or wires through door jambs or other locations where, through wear and tear, they may become frayed and shorted to ground or to each other.

ρ Do not stand in front of a directional antenna while you are transmitting into that antenna. Do not install a directional antenna in any location where humans or pets may be walking in the main directional lobe of the antenna's radiation pattern.

ρ In mobile installations, it is preferable to mount your antenna on top of the roof of the vehicle, if feasible, so as to utilize the car body as a counterpoise for the antenna and raise the radiation pattern as far away from passengers as possible.

ρ During vehicular operation when stopped (in a parking lot, for example), make it a practice to switch to Low power if there are people walking nearby.

ρ Never wear dual-earmuff headphones while driving a vehicle.

Antenna Considerations

The FT-1500M is designed for use with antennas presenting an impedance of near 50 W at all operating frequencies. The antenna (or a 50 W dummy load) should be connected whenever the transceiver is turned on, to avoid damage that could otherwise result if transmission occurs accidentally without an antenna.

Ensure that your antenna is designed to handle 50 Watts of transmitter power. Some magnetic-mount mobile antennas, designed for use with hand-held transceivers, may not be capable of this power level. Consult the antenna manufacturer's specification sheet for details.

Most all FM work is performed using vertical polarization. When installing a directional antenna such as a Yagi or Quad, be certain to orient it so as to produce vertical polarization, unless you are engaged in a special operating situation where horizontal polarization is used.

Note that this transceiver is designed with wide frequency coverage in the VHF spectrum. For general listening, you may wish to have a broadband antenna such as a discone available, as a directional antenna such as a Yagi will have degraded performance outside the 2-meter Amateur band.

Excellent reference texts and computer software are available for the design and optimization of VHF antennas. Your dealer should be able to assist you with all aspects of your antenna installation requirements.

Use high-quality 50 ohm coaxial cable for the lead-in to your FT-1500M transceiver. All efforts at providing an efficient antenna system will be wasted if poor quality, lossy coaxial cable is used. Losses in coaxial lines increase as the frequency increases, so an 8-meter-long (25') coaxial line with 0.75 dB of loss at 28 MHz may have a loss of 1.8 dB or more at 146 MHz; choose your coaxial cable carefully based on the installation location (mobile vs. base) and the overall length of the cable

required (for *very short* runs of cable in a mobile installation, the smaller, more flexible cable types may be acceptable).
For reference, the chart below shows approximate loss figures for typically-available coaxial cables frequently used in VHF installations.

Loss in dB per 30 m (100 feet) for Selected 50-ohm Coaxial Cables
(Assumes 50-ohm Input/Output Terminations)

Cable Type	Loss: 144 MHz
RG-58A	6.5
RG-58 Form	4.7
RG-8A, RG-213	3.0
RG-8 Form	2.0
Belden 9913	1.5
1/2" "Hardline"	1.0
7/8" "Hardline"	0.7

Loss figures are approximate; consult cable manufacturers' catalogs for complete specifications.

In outdoor installations, be certain to weatherproof all connectors thoroughly, as water entering a coaxial cable will cause losses to escalate rapidly, thus diminishing your communications effectiveness. The use of the shortest possible length of the highest quality coaxial cable that fits within your budget will ensure the best performance from your FT-1500M.

Mobile Installation

The FT-1500M must only be installed in vehicles having a negative ground electrical system. Mount the transceiver where the display, controls, and microphone are easily accessible, using the supplied MMB-?? mounting bracket. The transceiver may be installed in any position, but should not be positioned near a heating vent nor anywhere where it might interfere with driving (either visually or mechanically). Make sure to provide plenty of space at the rear of the transceiver so that air can flow freely through the heatsink. Refer to the diagrams showing proper installation procedures.

Transceiver Installation

ρ Choose a mounting location with sufficient clearance for the transceiver. Using the mounting bracket as a template for the mounting holes, use a 4.8 mm (3/16") bit to drill the mounting holes, and secure the mounting bracket with the supplied screws, washers, and nuts (see diagram).

ρ Position the transceiver in the bracket so that the holes in the side are aligned with those in the bracket, and bolt the transceiver into place using the supplied short screws and flat washers.

Mobile Power Connections

To minimize voltage drop and avoid blowing the vehicle's fuses, connect the supplied DC power cable directly to the battery terminals. *Do not attempt to defeat or bypass the DC cable's fuse-it is there to protect you, your transceiver, and your vehicle's electrical system.*

Warning!

Never apply AC power to the power cable of the FT-1500M, nor DC voltage greater than 15.2 Volts. When replacing the fuse, only use a 15-A fast-blow type. Failure to observe these safety precautions will void the Limited Warranty on this product.

ρ Before connecting the transceiver, check the voltage at the battery terminals while revving the engine. If the voltage exceeds 15 Volts, adjust the vehicle's voltage regulator before proceeding with installation.

ρ Connect the **RED** power cable lead to the **POSITIVE** (+) battery terminal, and the **BLACK** power

cable lead to the **NEGATIVE** (–) terminal. If you need to extend the power cable, use #12 AWG or larger insulated, stranded copper wire. Solder the splice connections carefully, and wrap the connections thoroughly with insulating electrical tape.

ρ Before connecting the cable to the transceiver, verify the voltage and polarity of the voltage *at the transceiver end of the DC cable* using a DC voltmeter. Now connect the transceiver to the DC cable.

Mobile Speakers

The optional SP-7 External Speaker includes its own swivel-type mounting bracket, and is available from your Yaesu dealer.

Other external speakers may be used with the FT-1500M, if they present the specified 4-ohm impedance and are capable of handling the 3.5 Watts of audio output supplied by the FT-1500M.

Base Station Installation

The FT-1500M is ideal for base station use as well as in mobile installations. The FT-1500M is specifically designed to integrate into your station easily, using the information to follow as a reference.

AC Power Supplies

Operation of the FT-1500M from an AC line requires a power source capable of providing at least 10 Amps continuously at 13.8 Volts DC. The FP-1023A, FP-1025A, and FP-1030A AC Power Supplies are available from your Yaesu dealer to satisfy these requirements. Other well-regulated power supplies may be used, as well, if they meet the above voltage and current specifications.

Use the DC power cable supplied with your transceiver for making power connections to the power supply. Connect the **RED** power cable lead to the **POSITIVE** (+) power supply terminal, and connect the **BLACK** power cable lead to the **NEGATIVE** (-) power supply terminal.

Packet Radio Terminal Node Controller (TNC)

The FT-1500M provides a convenient rear-panel DATA jack for easy connections to your TNC. This connector is a standard mini-DIN connector.

The FT-1500M's DATA jack connections are optimized for the data transmission and reception speed in use. In accordance with industry standards, the signal levels, impedances, and bandwidths are significantly different on 9600 bps as opposed to 1200 bps. If your TNC does not provide multiple lines to accommodate such optimization, you may still be able to utilize your TNC, if it is designed for multiple-radio use, by connecting the TNC "Radio 1" port to the 1200 bps lines on the FT-1500M, and the "Radio 2" port to the 9600 bps lines.

The pin connections of the Data connector are shown below.

Pin	Label	Notes
1	?	?
2	?	?
3	?	?
4	?	?
5	?	?
6	?	?

Note that 9600 bps packet transmit-deviation adjustment is very critical to successful operation, and can only be accomplished using a calibrated deviation meter (such as that found on an FM Service Monitor used in a communications service center). In most cases, the Packet Data Input level (set via a potentiometer inside the TNC) must be adjusted to provide a deviation of ±2.75 kHz (±0.25 kHz). Check with your packet node's sysop if you have any questions about the appropriate deviation level for your network.

The setting of the 1200 bps Packet Data Input level is much less critical, and satisfactory adjustment to the optimum (±2.5 ~ ±3.5 kHz) deviation can usually be done "by ear" by adjusting the TNC's 1200 bps TX Audio Level potentiometer so that the outgoing packets (as monitored on a separate VHF or UHF receiver) are approximately the same level as (A) the DTMF tones or (B) the 1750 Hz

Burst tone produced by the MH-???? microphone.
Typical connections to a TNC are shown below.

1200 bps Packet Setup
9600 bps Packet Setup

Finally, note that Menu ("PCKT") allows you to enable or disable the microphone during packet operation. Normally, the default setting ("Microphone Disabled during Packet TX") is appropriate; when the microprocessor detects PTT input from the Data connector, the microphone will be disabled.

Basic Operation

Power On and Off

Press the **PWR** switch momentarily to turn the radio on.
To turn the radio off, press and hold in the **PWR** switch for one second.

Adjusting the Volume Level

Rotate the **VOL** control to adjust the receiver volume. Clockwise rotation increases the audio output level.

Squelch Setup

The Squelch system is designed to keep the receiver quiet until a signal is received. The Squelch should be adjusted to the point where the background noise is just silenced; any "higher" setting will reduce the receiver's sensitivity to weak signals.
To adjust the setting of the Squelch system:

1. Rotate the **Main Dial** to select a clear frequency (where no signals are present).
2. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "SQL."
3. Press the [MHz] key momentarily, then rotate the Main Dial knob to select the squelch threshold level (OFF, or 1 to 15). While you are making this adjustment, you will be able to hear the background noise appear when the Squelch setting is too low. The best sensitivity will be realized when the Squelch is set to one number past the point where noise is muted.
4. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

Transmitting

To transmit, simply close the PTT (Push To Talk) switch on the microphone when the frequency is clear. Hold the microphone approximately 25 mm (1") from your mouth, and speak into the microphone in a normal voice level. When your transmission is complete, release the PTT switch; the transceiver will revert to the receive mode.

Tuning: The "DIAL" (VFO) Mode

This mode is used for selecting a frequency utilizing the Main Dial knob and microphone [UP] and [DWN] buttons allow the Variable Frequency Oscillator (VFO) to tune in the selected step size. When scanning in the VFO mode, the same steps are used as in manual tuning.
Clockwise rotation of the Main Dial knob increases the operating frequency, while counter-clockwise rotation tunes toward a lower frequency.
To move frequency rapidly (in 1 MHz steps), press the [MHz] key momentarily, then rotate the Main Dial knob. The 1 MHz digit of the frequency display will blink while "1 MHz Tuning" is enabled. When you have selected the desired "1 MHz" frequency digit, press the [MHz] key momentarily once more, then resume normal tuning using the Main Dial knob.

Direct Keypad Frequency Entry

The keypad of the MH-?? DTMF Microphone may be used for direct entry of the operating frequency. It also may be used for recall of memory channels.

To enter a frequency from the MH-?? keypad:

1. Press the [D/MR] key, if necessary, to set the transceiver into the VFO mode.
2. While receiving on any VFO frequency, enter the digits of the desired frequency.
   For example, to enter 146.520 MHz, press [1]–[4]–[6]–[5]–[2]–[0].
   A high-pitched "beep" will confirm each key closure as you enter the digits; the final "beep" will be of longer duration, to confirm that the frequency entry is complete.
3. The [#] key may be used to abbreviate the entry procedure. Pressing the [#] key sets the current digit and all following digits to "0" to complete the entry.
   For example, to enter 146.500 MHz, press [1]–[4]–[6]–[5]–[#].
   To enter 144.000 MHz, press [1]–[4]–[4]–[#].

Recalling memories is equally simple (see page ?? for details on memory operation). You can recall a memory from the MH-?? from any operating mode: VFO, Home, or Memory.

1. Press the Channel Number you wish to recall, then press the [*] key. For example, to recall Memory Channel 2, press [2]–[*]. To recall Channel number 135, press [1]–[3]–[5]–[*].
2. To return to the VFO mode, press the front panel's [D/MR] key or the microphone's [D] key.
3. If you are in the Memory Recall mode, you can enter a new operating frequency directly, as described above for VFO operation. However, you will observe that a "MR" indicator will be blinking appear at the left side of the display; this indicates that you have switched to the "Memory Tune" mode, which is described in detail on page ??.

Changing the Transmitter Power Level

Four power output levels are available on this transceiver: 5 watts (Low 3), 10 watts (Low 2), 25 watts (Low 1) and 50 watts (High).

To change the power level, press the [REV] key to select one of four power setting. These power levels will be stored in memory registers, at the time of memory storage (see page ?? for details on Memory operation).

During transmission, the Bar Graph will deflect in the display, according to the power output selected.

Transmitter Thermal Protection Sensor

Changing the Channel Steps

Tuning steps are factory preset to default increments which are appropriate for the country to which this radio is exported.

To change to another step size, use the following procedure:

1. Press and hold the [MHz] key for one second, then rotate the Main Dial knob to select "STEP."
2. Press the [MHz] key, then rotate the Main Dial knob to select the desired step size: 5.0/10.0/12.5/15.0/20.0/25.0/50.0 (kHz).
3. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

Keyboard Locking

In order to prevent accidental frequency change or inadvertent transmission, various aspects of the FT-1500M's keys and switches may be locked out. The possible lockout combinations are:

KEY:	Just the front panel keys are locked out
DIAL:	Just the front panel DIAL is locked out
K + D (KEY + DIAL) :	Both the DIAL and Keys are locked out
PTT:	The PTT switch is locked (TX not possible)
K + P (KEY + PTT) :	Both the keys and PTT switch are locked out
D + P (DIAL + PTT) :	Both the DIAL and PTT switch are locked out
ALL:	All of the above are locked out

To lock out some or all of the keys:

1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "LOCK."

2. Press the [MHz] key, then rotate the Main Dial knob to choose between one of the locking schemes as outlined above.
3. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

Repeater Operation

The FT-1500M includes a host of convenience features which makes operation on amateur repeaters both efficient and enjoyable.

Repeater Splits

This transceiver offers three methods of setting up split-frequency operation on repeaters:

[1] Manual selection of preset repeater shifts;

[2] Automatic Repeater Shift (ARS), providing automatic activation of repeater shifts within designated repeater frequency subbands; and

[3] Independently stored transmit and receive frequencies (typically not corresponding to established repeater frequency shifts).

[1] Standard Repeater Shifts

The FT-1500M has been shipped ready for use on the repeater shift typically used in your country. For customers in the United States, for example, the standard repeater shift will be 600 kHz, and the direction of the shift will depend on the part of the band in which you are operating.

To activate the standard shift manually:

1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "RPTR."
2. Press the [MHz] key, then rotate the Main Dial knob to select the desired shift direction: ARS (Automatic Repeater Shift), SHIFT– , SHIFT+, or OFF (Simplex).
3. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

With repeater shift activated, you can temporarily reverse the transmit and receive frequencies by pressing the front panel's [REV] key. Use this feature to display the transmit frequency *without transmitting*, and to check the strength of signals on a repeater uplink frequency (so as to determine whether or not a particular station is within "Simplex" range, for example).

Changing the Default Repeater Shift

The repeater offset is usually set to 600 kHz from the factory. You can change the offset by using following procedure, if needed:

1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "SHIFT."
2. Press the [MHz] key, then rotate the Main Dial knob to set the desired offset. Note that the resolution of the "standard" repeater shift is to the nearest 50 kHz multiple.
3. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

Note: Do not use the above procedure if you just want to operate on one "odd split" frequency. Use the "Independent Transmit/Receive Frequency" mode, as described in section [3] on the next page.

[2] Automatic Repeater Shift

The ARS (Automatic Repeater Shift) feature in the FT-1500M allows easy and convenient repeater operation by automatically activating the repeater shift function whenever you tune to a standard repeater sub-band. The ARS function is preset at the factory to conform to the standards for the country to which it is exported.

The ARS function is enabled at the factory. To disable it:

1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "ARS."
2. Press the [MHz] key, then rotate the Main Dial knob to change the display to "OFF."

3. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

To enable the ARS function again, select "ON" in step (2) above.

[3] Separate Transmit Frequency Memories

All memory channels can store independent receive and transmit frequencies, to accommodate occasional non-standard offsets with greater frequency resolution than is available using the "standard" shift feature.

Here is the procedure for storing an "odd split" frequency pair into a memory. A full discussion of memory channel storage and recall is found in the next section.

1. First store the receive (repeater output) frequency. In the VFO mode, tune the transceiver to the desired receive frequency. Now press and hold in the [D/MR] key for one second.
2. Within five seconds of pressing the [D/MR] key, use the Main Dial knob (or the microphone's [UP]/[DWN] buttons) to select the memory channel number on which you wish to store the frequency pair. If the memory register already has data stored in it, the display will blink "CHnnnUSD" where "nnn" is the channel number.
3. Now press the [D/MR] key for one second to store the receive frequency into the selected memory.
4. Next, store the transmit (repeater input) frequency. Since you are still in the VFO mode, tune the transceiver to the desired transmit frequency.
5. Now press and hold in the [D/MR] key for one second.
6. Press and hold the PTT switch, then press the [D/MR] key while holding in the PTT switch. This will not cause transmission, but rather it will instruct the transceiver that you are programming a separate transmit frequency into memory.

When you have finished the above procedure, press the [D/MR] key momentarily. The channel number will flash onto the display momentarily, to be followed by the repeater downlink frequency. If you press the PTT switch, you will observe the display changing to indicate the repeater's uplink frequency. Note also that the display shows "– +" in the upper left-hand corner; this indicates that an "odd" (non-standard) shift has been stored on this channel.

Advanced Operation

Supply Voltage Display

When you turn on the radio, the current DC supply voltage will be indicated on the display for 2.5 second. After this interval, the display will resume its normal indication of the operating frequency.

To view the supply voltage at any time during operation, use the following procedure:

1. Press and hold the [MHz] key for one second, then rotate the Main Dial knob to select "DC IN."
2. Press the [MHz] key momentarily to display the current DC supply voltage on the LCD.
3. Press and hold in the [MHz] key for one second to exit to normal operation.

Keypad Beeper

A key/button beeper provides useful audible feedback whenever a button is pressed. Each key and button has a different beep pitch, and each function has a unique beep combination.

If you want to turn the beeper off (or back on again):

1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "BEEP."
2. Press the [MHz] key, then rotate the Main Dial knob to select the display to "OFF."
3. Press and hold the [MHz] key for one second to save the new setting and exit to normal operation.

Display Brightness

The FT-1500M display illumination has been specially engineered to provide high visibility with minimal disruption of your "night vision" while you are driving. The brightness of the display is manually adjustable, using the following procedure:

1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "DIMR."
2. Press the [MHz] key, then rotate the Main Dial knob. You will observe the brightness of the display changing.

3. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

RF Squelch

A special "RF Squelch" feature is provided on this radio. This feature allows you to set the squelch so that only signals exceeding a certain *S-meter level* will open the squelch.

To set up the RF squelch circuit for operation, use the following procedure:

1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "RFSQL."
2. Press the [MHz] key momentarily, then rotate the Main Dial knob to select the desired signal strength level for the squelch threshold (OFF, or S-1 to S-10).
3. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

Note: The receiver's squelch will open based on the highest level set by the two squelch systems (Noise Squelch and RF Squelch). For example:

1. *If the Noise Squelch (Menu #29) is set so that signals at a level of S-3 will open the squelch, but the RF Squelch (Menu #23) is set to "S-9," the squelch will only open on signals which are S-9 or stronger on the S-meter.*
2. *If the RF Squelch is set to "S-3," but the Noise Squelch is set to a high level which will only pass signals which are Full Scale on the S-meter, the squelch will only open on signals which are Full Scale on the S-meter. In this case, the Noise Squelch overrides the action of the RF Squelch.*

Automatic Power-Off (APO) Feature

The "Automatic Power-Off" (APO) feature will turn the radio completely off after a user-defined period of PTT or key/button inactivity. If you do not press any front panel keys or buttons, rotate the Main Dial knob, use the microphone's keys and buttons, or transmit, and so long as the transceiver is not scanning or engaged in priority monitoring, the radio will shut itself off after the specified time period. This feature is useful in minimizing battery drain in a mobile installation if you forget to turn the transceiver off when you leave your vehicle.

To activate the APO feature as follows:

1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "APO."
2. Press the [MHz] key, then rotate the Main Dial knob to select the desired "switch-off" time (between 1 and 12 hours, or OFF).
3. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

Transmitter Time-Out Timer (TOT)

The "Time-Out Timer" (TOT) feature is designed to force the transceiver into the "receive" mode after a preset time period of continuous transmission (the default is 6 minutes). This feature prevents your transceiver from transmitting a "dead carrier" for a long period of time in the event that the microphone PTT switch is accidentally locked in the "TX" condition.

The Time-Out Timer's "switch-to-receive" time may be adjusted, in one minute increments, for any period between 1 and 60 minutes.

To change the default (6 minute) time setting as follows:

1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "TOT."
2. Press the [MHz] key, then rotate the Main Dial knob to select the desired time interval (between 1 and 60 minutes, or OFF).
3. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

Programmable Microphone Keys (P1/P2/P3/P4)

Default FT-1500M key functions have been assigned (at the factory) to the microphone's [P1], [P2], [P3], and [P4] buttons. These may be changed by the user, if you wish to define another function for a particular key or keys.

To change the assignment of a key's function:

1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to the Menu Item # corresponding to the key to be assigned a function (18 PRG P1, 19 PRG P2, 20 PRG P3, or 21 PRG P4).
2. Press the [MHz] key momentarily, then rotate the Main Dial knob to select the function you wish to assign to the key or button you selected in the previous step. The available choices are:

   MON Opens the Squelch to allow un-muted reception.
   S. SRCH Initiates Smart Search scanning.
   T. SRCH Initiates scanning for (unknown) CTCSS tone.
   WX ??
   SQ. TYP Selects CTCSS mode and frequency.
   T. CALL Activates 1750 Hz Tone Burst.
   SHIFT Selects Repeater Shift direction.
   TX POWER Allows setting of the transmitter power level.
   AN ??
3. Press the [MHz] key momentarily to lock in the new setting.
4. Rotate the Main Dial knob to select another programmable key or button to modify, if desired, from the remaining Menu items. Follow the procedure outlined above.
5. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

Tone Calling (1750 Hz)

If you own a non-European version of the FT-1500M, but plan on visiting a country which requires a 1750 Hz tone for repeater access, you may set up the Programmable key for 1750 Hz Tone operation. See page ?? for details.

Weather Broadcast Reception

The FT-1500M includes a unique feature which allows reception of weather broadcasts in the 160-MHz frequency range. Ten standard Weather Broadcast channels are pre-loaded into a special memory bank.

To listen to a Weather Broadcast Channel:

1. Press the [P4] key to recall the Weather Broadcast channels.
2. Turn the Main Dial knob to select the desired Weather Broadcast channel.
3. If you wish to check the other channels for activity by scanning, just press and hold the [UP] or [DWN] key for one second, or press the PTT switch.
4. To exit to normal operation, again press the [P4] key. Operation will return to the VFO or Memory channel you were operating on before you began Weather Broadcast operation.

You can also append an alpha-numeric "Tag" (label) to a Weather Broadcast channel. See page ??.

Channel	Frequency	Channel	Frequency	Channel	Frequency
WX 1	162.550MHz	WX 5	162.450 MHz	WX 9	161.775 MHz
WX 2	162.400 MHz	WX 6	162.500 MHz	WX 10	163.275 MHz
WX 3	162.475 MHz	WX 7	162.525 MHz		
WX 4	162.425 MHz	WX 8	161.650 MHz		

Tone Squelch Modes

Repeater systems often require an access signal for activation of the repeater. These access tones are often required so as to reduce false activation of the repeater by random noises or other signals on the band. Additionally, these systems can allow silent monitoring of busy channels until a call directed to your radio is received, offering less disruption to family activities, etc.

CTCSS (Continuous Tone Coded Squelch System)

This system superimposes a continuous, subaudible tone on your transmitted audio. When decoded at the other station, the CTCSS signal triggers their squelch to open and receive your transmission. Some "closed" repeaters use this to limit access, or to prevent signals intended for other repeaters (with the

same input frequency) in fringe areas from locking up the repeater. There are 47 selectable CTCSS tones provided in the FT-1500M.
To use CTCSS, both stations must be on the same frequency, and must have selected the same CTCSS tone.
To select and activate CTCSS operation:
1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "TONE."
2. Press the [MHz] key, then rotate the Main Dial knob to select the desired squelch type from the following:
   μ "ENC"(Encode) appears when the CTCSS tone generator is activated for transmission only.
   μ "ENC/DEC" (Encode/Decode) appears when the CTCSS Tone Squelch is activated for both TX and RX (only signals "Encoded" with the matching tone will open your radio's squelch).
3. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

Now that you have selected the Tone Mode to be used, you need to select the CTCSS tone, that you and the other station have both agreed to use:
1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "TN FRQ."
2. Press the [MHz] key, then rotate the Main Dial knob to choose the desired CTCSS tone.
3. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

CTCSS settings may stored in any memory register at the time of frequency programming. To change a memorized tone or tone system, just recall the memory channel, reset the tone or function, and store the memory again. If you activate CTCSS on a PMS memory, it will be active when that memory pair is used to start PMS scanning or tuning.

Tone Search Scanning

In operating situations where you don't know the CTCSS tone being used by another station, you can command the radio to listen to the incoming signal and scan in search of the tone being used.
Before you begin the tone search, please check the (programmable) setting of the microphone's [P3] button (Menu #20); it should be set to "T.SRCH" for proper operation.
To scan for the CTCSS tone in use:
1. Set the radio up for the CTCSS operation.
2. Press the [P3] button on the microphone momentarily to start scanning for the incoming CTCSS tone.
3. When the radio detects the correct tone, it will halt on that tone, and audio will be allowed to pass.
4. Press and hold in the [D/MR] key for one second; the CTCSS tone detected will be stored as the "current" tone, so it may be used for memory storage purposes.
   It can be viewed by accessing Menu #33 (TN FRQ).
5. Press and hold in the [MHz] key for one second to exit to normal operation.

CTCSS Bell Operation

CTCSS Bell Paging adds an alert ringer to CTCSS tone squelch operation, for added convenience. When you receive a call with a matching CTCSS tone, the ringer will sound to alert you to the presence of the incoming call.
1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "BELL."
2. Press the [MHz] key, then rotate the Main Dial knob to change the display to "ON."
3. To de-activate CTCSS Bell operation, select "OFF" in step 2 above.

Calls without a matching CTCSS tone will be ignored during CTCSS Bell operation.
Note that other stations do not need to have the CTCSS Bell function to call you; they can just use

standard CTCSS encoding.
When you reply to a CTCSS Bell call, you may want to turn off the Bell function, or else the transceiver will ring every time your squelch opens.
You can store the CTCSS Bell Paging function into a memory, along with the CTCSS tone and encode/decode state.

Memory Operation

The FT-1500M provides a wide variety of memory system resources. These include:
µ 120 "Standard" memory channels, numbered "1" through "120."
µ A Home channel, allowing storage and quick recall of one prime frequency.
µ Nine sets of band-edge memories also known as "Programming Memory Scan" channels, labeled "L1/U1" through "L9/U9".

Memory Storage

To store a frequency into memory:
1. In the VFO mode, select the desired frequency, repeater shift, CTCSS tone, and TX power level.
2. Press and hold in the [D/MR] key for one second. A memory number (or letters and numbers) will appear (blinking) on the display.
3. Within five seconds of pressing the [D/MR] key, use the Main Dial knob or the microphone's [UP]/[DWN] buttons to select the desired memory for storage. If you see an Asterisk (*) by any channel number, it means that the channel currently has no data written on it (i.e the channel is "free").
4. Press the [D/MR] key again, this time momentarily, to store the displayed data into the selected memory channel slot. The memory label will stop blinking, and the display will now be blank, except for a blinking digit at the left side of the display. If you wish to append a name to the just-memorized channel, move quickly to the next step.
   Note: If the left digit quits blinking, this indicates that the Alpha-Numeric Storage Timer has expired. The frequency data will not be lost if this happens, however.

Labeling Memories

1. While the right-most digit is still blinking in step (4) above, rotate the Main Dial knob to select the first character in the name you wish to store, then press the [D/MR] key to move on to the next character. Letters (both upper and lower case), numbers, and symbols are available for storage.
2. Again rotate the Main Dial knob to select the desired number, letter, or symbol, then press the [D/MR] key to move on to the next character's slot.
3. Repeat step (2) as many times as necessary to complete the name tag for the memory, then press and hold in the [D/MR] key for one second to save the A/N (Alpha-Numeric) name entry and exit to normal operation.

Note: If you wish to append a label to a memory after the Alpha-Numeric Storage Timer has expired, first recall the memory channel (see below), then press the [MHz] key for one second to enter the Menu mode. Rotate the Main Dial to select Menu item #01 (ALPH), then press the [MHz] key momentarily. You will now be ready to begin with step 1 above.

Memory Recall

From the VFO mode, momentarily press the [D/MR] key once to activate the "MR" (Memory Recall) mode.
When more than one memory has been stored, use the Main Dial knob to select a memory for operation. Alternatively, microphone's [UP] and [DWN] buttons may be used to step or scan through the available memories. When using the microphone's buttons, press and immediately release the button to move one step up or down; press and hold the [UP] or [DWN] button for one second to begin memory scanning.
While you are operating in the MR mode, the "MR" notation will appear at the left side of the display.

Memory Recall from MH-?? Microphone

While operating in the VFO, Home Channel (see below), or Memory Recall mode, the keypad of the

MH-?? may be used for direct recall of memory channels.
To do this, press the Channel Number you wish to recall, then press the [*] key. For example, to recall Memory Channel 5, press [5]–[*]. To recall Channel number 118, press [1]–[1]–[8]–[*].

To Turn on the Alpha-Numeric Memory Name Display

If you are in the "MR" mode, press and hold the [A/N] key for one second, to replace the frequency display with the Alpha-Numeric Label.

HOME Channel Memory

A convenient one-touch "Home" channel memory is available to simplify return to your most-often-used frequency. This memory does not appear in the regular memory bank, to simplify operation.
To recall the Home channel while in the MR mode, just press the [D/MR] key momentarily. From the VFO mode, press [D/MR] twice. While you are operating on the Home channel, an "HM" will appear at the right side of the display.

The factory default frequency for the Home channel is 146.520 MHz. You can re-program the Home channel in a manner identical to that used for the regular memories:

1. From the VFO mode, tune in the frequency you wish to store, and set all repeater shifts and other data just the way you do for "normal" memory channel storage.
2. Press and hold the [D/MR] key for one second, then rotate the Main Dial knob to select "HOME."
3. Press the [D/MR] key momentarily to store the new Home channel.
4. At this point, the right-most digit will be blinking, as a reminder that you can store an Alpha-Numeric label to the Home channel. Use the A/N storage procedure described previously.

Memory Offset Tuning

Once you have recalled a particular memory channel, you may tune off that channel, as though you were in the VFO mode.

1. With the FT-1500M in the "MR" mode, select the desired memory channel.
2. Press the [MHz] key momentarily.
3. Now rotate the Main Dial knob, as desired, to tune to a new frequency. This new frequency may be stored in a new memory register, if you like, using the procedures described earlier.
4. If you wish to return to the original memory frequency, press the [D/MR] key momentarily. Any offset tuning will be discarded, and the original memory contents will appear on the display.

Masking Memories

With 138 total memories available, there frequently are situations where you may desire to "Mask" certain memorized frequencies. The procedure for deleting a channel is quite simple:

1. Press and hold in the [D/MR] key for one second.
2. Rotate the Main Dial to select the channel to be "Masked". Note that Memory Channel 1 may not be deleted, as it is the Priority Channel.
3. Press the [LOW] button. This will cause the display to shift to Memory Channel 1, and the previously-selected memory will be deleted.
4. To Unmask the hidden memory, repeat the above procedure: press and hold in the [D/MR] key for one second, rotate the Main Dial to select the masked memory's number, then press [LOW] to restore the memory channel's data.

Memory Only Mode

Once memory channel programming has been completed, you may place the radio in a "Memory-Only" mode, whereby VFO and Home channel operation are impossible. This may be particularly useful during public-service events where a number of operators may be using the radio for first time, and ultimate simplicity of channel selection is desired.
To place the radio into the Memory-Only mode, turn it off. Now press and hold in the [D/MR] key while turning the radio on. The VFO and Home channel will now be disabled.
To return to normal operation, repeat the above power-on procedure.

Scanning

The FT-1500M's scanning capability provides the operator with many convenient methods of rapid frequency navigation.

Basic Scanner Operation

Before activating the scanner, make sure that the Squelch is set to silence the background noise when no signal is present. If noise is being heard, the scanner will not function (because the radio will "think" that it is on a "Busy" channel).

Scanning may be started or stopped using the microphone's [UP] and [DWN] buttons. The following techniques are used during scanning operation:

1. Pressing and holding in either the [UP] or [DWN] button for one second in the VFO mode will cause upward or downward band scanning, respectively, to begin.
2. Pressing and holding in either the [UP] or [DWN] button for one second in the Memory Recall mode will cause memory channel scanning toward a higher- or lower-numbered memory channel, respectively.
3. Scanning pauses when a signal opens the squelch, and the decimal point on the display will blink. You can choose one of two scan-resume modes (described later).
4. To halt the scan manually, the easiest way is to push the PTT switch on the microphone momentarily (no transmission will occur while you are scanning).
   The scan may also be halted manually by pressing the microphone's [UP] or [DWN] button, or the [D/MR] key on the front panel of the radio.

Scan-Resume Options

Three scan-resume modes are available on the FT-1500M:

BUSY: In this mode, the scanner will remain halted for as long as there is carrier present on the channel; after the carrier drops at the end of the other station's transmission, the scanner will resume.

5SEC: In this mode, the scanner will halt for five seconds only, after which scanning will resume (whether or not the other station is still transmitting).

HOLD: In this mode, the scanner will halt on a signal it encounters. It will not restart automatically; you must manually re-initiate scanning if you wish to resume.

To change the scan-resume mode:

1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "SCAN."
2. Press the [MHz] key, then rotate the Main Dial knob to select the desired scan-resume mode (BUSY, 5SEC, or HOLD).
3. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

Memory Skip Scanning (MR Mode)

When you have some continuously-active channels (like Weather broadcasts) in memories, you may wish to skip them for scanning, but still have them available for manual selection.

To select a memory to be skipped during scanning:

1. Recall the memory channel to be skipped. Note that Memory Channel 1 may not be skipped, as it is the Priority Channel.
2. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "SKIP."
3. Press the [MHz] key, then rotate the Main Dial knob to select "SKIP."
4. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

To re-enable a "Skipped" memory channel, select "STOP" in step (3) above.

Temporary Memory Skip

If the scanner repeatedly stops on a channel due to temporary noise or interference, you can temporarily mark it to be skipped. The channel will be skipped until you manually stop the scan (by

pressing the PTT switch, for example).
To skip a channel temporarily, press the [MHz] key momentarily while the scanner has stopped on the channel to be skipped. The scanner will instantaneously resume, and that channel will not be scanned during this scanning session. Note that Memory Channel 1 may not be skipped, as it is the Priority Channel.

Programmable (Band Limit) Memory Scan (PMS)

This feature allows you to set sub-band limits for either scanning or manual VFO operation. For example, you might wish to set up a limit (in North America) of 144.300 MHz to 148.000 MHz so as to prevent encroachment into the SSB/CW "Weak Signal" portion of the band below 144.300 MHz. Here's how to do this:

1. Using the techniques learned earlier, store (per the above example) 144.300 MHz into Memory Channel #L1 (the "L" designates the Lower sub-band limit).
2. Likewise, store 148.000 MHz into Memory Channel #U1 (the "U" designates the Upper sub-band limit).
3. With any of these memories recalled, press the [MHz] key momentarily to activate the Programmable Band-Scan Limits. The "PMS" notation will appear at the left side of the display, reminding you that you are using the Programmable Band Limits.

The frequencies stored in memories "L" and "U" will now serve as tuning and scanning limits, thus creating a tuning sub-band.

To cancel the sub-band limits and return to normal memory operation, press the [D/MR] key momentarily.
Note:
µ If the frequency in memory channel "Lx" is equal to or greater than the frequency stored in memory channel "Ux," you can not activate the PMS operation.
µ Nine pairs of Band Limit memories, labeled L1/U1 through L9/U9 are available.

Band Edge Beeper

Smart Search Operation

The Smart Search feature allows you to load frequencies automatically according to where activity is encountered by your radio. When Smart Search is engaged, the transceiver will search above and below your current frequency, storing active frequencies as it goes (without stopping on them even momentarily); these frequencies are stored into a special Smart Search memory bank, consisting of 31 memories (15 above the current frequency, 15 below the current frequency, plus the current frequency itself).
Two basic operating modes for Smart Search are available:
SINGLE: In this mode, the transceiver will sweep the current band once in each direction starting on the current frequency. All channels where activity is present will be loaded into the Smart Search memories; whether or not all 31 memories are filled, the search will stop after one sweep in each direction.
CONTINUE: In this mode, the transceiver will make one pass in each direction as with One-Shot searching; if all 31 channels are not filled after the first sweep, however, the radio will continue sweeping until they are all filled.

Setting the Smart Search Mode

1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "S.SRCH."
2. Press the [MHz] key, then rotate the Main Dial knob to select the desired Smart Search mode (see above).
3. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

Storing Smart Search Memories

1. Press the [P2] key.*
2. The Smart Search process will now cause the radio to scan upward on current band, loading channels on which it encounters a signal strong enough to open the squelch.
3. Depending on the mode you set for Smart Search operation (SINGLE or CONTINUE), the Smart Search scan will eventually terminate, and the LCD will revert to Smart Search Memory Channel 0.
4. To recall the Smart Search Memories just stored, rotate the Main Dial knob or press the microphone's [UP] or [DWN] key.
5. If you find particular channels which you wish to store into the "regular" memory system, follow the memory storage procedures described on page ??.
6. Press the [D/MR] key momentarily to exit the Smart Search mode.

Note that these memories are so-called "soft" memories; they will be lost if you exit the Smart Search mode or initiate a new Smart Search sweep.

* The (user-programmable) [P2] key is set at the factory for Smart Search operation.
  It may be assigned to one of the other programmable keys, if you like. See page ??.

Priority Channel Scanning (Dual Watch)

The FT-1500M scanning features include a two-channel scanning capability which allows you to operate on a VFO or Memory channel, while periodically checking a user-selectable Priority Channel for activity.

Here is the procedure for activating Priority Channel Dual Watch operation:

1. Press and hold in the [D/MR] key for one second, then rotate the Main Dial knob to select "Priority" Channel.
2. Press and hold in the [D/MR] key for one second.
3. Set the radio to the VFO mode or HOME channel by pressing the [D/MR] key.
4. Press and hold in the [REV] key for one second, to start Priority Channel Scanning (a small "PRI" notation will appear on the LCD).
5. To cancel priority monitoring, press the [D/MR] key momentarily.

During priority monitoring, the displayed frequency will shift to the priority memory briefly about every five seconds, while the receiver checks for the presence of a signal.

While no signal appears on the Priority memory (causing the squelch to open), you can tune, transmit and receive on the VFO, or select and operate on other memories; however, you cannot scan (except manually, one step at a time, using the microphone's [UP] and [DWN] buttons), as the scanning logic circuits are already dedicated to the priority scanning activities.

Priority Revert Mode

During Priority channel operation (Dual Watch), a special feature is available which will allow you to move to the Priority Channel instantly, without waiting for activity to appear on the Priority Channel.

When this feature is enabled, and Priority monitoring is engaged, just press the microphone's PTT button. Operation will instantly revert to the Priority Channel.

To enable Priority Revert operation:

1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "RVRT."
2. Press the [MHz] key, then rotate the Main Dial knob to select "ON."
3. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

To disable Priority Revert operation, select "OFF" in step (2) above.

DTMF Operation

Manual DTMF Tone Generation

You can generate DTMF tones during transmission manually.

1. Press the PTT switch to begin transmission.

2. While transmitting, press the desired numbers on the keypad.
4. When you have sent all the digits desired, release the PTT key.

DTMF Autodialer

Eight DTMF Autodialer memories are available on the FT-1500M. These DTMF Autodialer memories can store up to 16 digits of a telephone number for, repeater autopatch or other uses.

To load DTMF Autodialer memories, use following procedure:

1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "DT MEM."
2. Press the [MHz] key, then rotate the Main Dial knob to select the DTMF Autodialer memory channel number into which you wish store a telephone number ("1" to "8").
3. Press the [D/MR] key momentarily.
4. Rotate the Main Dial knob to select the first digit of the telephone number you wish to store.
5. When you have selected the correct digit, press the [D/MR] key momentarily.
   Now rotate the Main Dial knob to select the second of the 16 available numbers in the current DTMF Autodialer memory register.
6. Repeat this procedure for each digit in the telephone number.
7. When entry of all digits is complete, press and hold the the [D/MR] key for one second to save the new setting. If you wish to store another DTMF string, rotate the Main Dial knob to select another DTMF Memory register, then repeat steps (3) through (6) above.
8. When all required DTMF memories are filled to your satisfaction, press and hold in the [MHz] key for one second to save the new settings and exit to normal operation.

To transmit the memorized telephone number, use the following procedure:

1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "DTMF."
2. Now press the [MHz] key momentarily to enable selection of the Autodialer Memory.
3. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "DT MEM."
4. Now press the [MHz] key momentarily to enable selection of the Autodialer Memory.
5. Rotate the Main Dial knob to select the DTMF Autodialer Memory channel to be transmitted.
6. Press and hold in the PTT switch.
7. While still holding the PTT switch in, press the [MHz] key momentarily to transmit the tone string.

Once you have pressed the [MHz] button above step, you can release the PTT switch, as Autodialer transmits the whole DTMF string automatically.

The speed at which the DTMF digits are sent can be changed. Two speed levels are available: Low (10 digits per second) and High (20 digits per second: default).

To toggle between Low and High speed, use the following procedure:

1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "DT SPD."
2. Press the [MHz] key, then rotate the Main Dial knob to select the desired speed: "50 ms" (High speed) or "100 ms" (Low speed).
3. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

You can also set a longer delay between the time you press the [MHz] key (with PTT pressed) and the first DTMF digit is sent.

To set a delay time, use the following procedure:

1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "DT DLY."

2. Press the [MHz] key, then rotate the Main Dial knob to select the desired speed (50/250/450/750/1000 ms).
3. Press and hold in the [MHz] key for one second to save the new setting and exit to the normal operation.

Interface of Packet TNCs & Reset

The FT-1500M provides a convenient rear-panel DATA jack for easy TNC interconnections, Refer to the graphic and table for pin-out connections.
Data rate selection (1200/9600 bps) can be selected via Menu "P RATE."

Normally, the microphone will be cut off during packet transmission, so as to avoid interference to the data stream by voice input. However, this protection feature can be disabled, if you have some reason to want the microphone to be active during packet transmission.
To re-activate the microphone during packet transmission:
1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "PCKT."
2. Press the [MHz] key, then rotate the Main Dial knob to select "MIC ON."
3. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

To disable the microphone during packet transmission (the typical configuration), select "MIC OFF" in step 2 above.
Packet operating procedures are governed by the software used by your computer and TNC. Consult the documentation accompanying the software for details on packet operation.

FM Bandwidth & Mic Gain Control

You can reduce the microphone input level and transmitter bandwidth when operating on tightly-clustered frequencies (channel spacing of 12.5- or 15-kHz). This will reduce the transmitter deviation, thus minimizing interference to other users.
To reduce the microphone input level:
1. Press and hold in the [MHz] key for one second, then rotate the Main Dial knob to select "W/N DV."
2. Press the [MHz] key, then rotate the Main Dial knob to change the display to "NARROW."
3. Press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

To restore the normal (higher) microphone input level and normal (15 kHz) receiver bandwidth, select "WIDE" in step 2 above.

Microprocessor Resetting

To perform a CPU master reset for all memories and Menu settings, press the [LOW], and [D/MR] keys while turning the transceiver on.

Set Mode Resetting

To reset all Menu settings to their factory defaults, press the [REV] key and [D/MR] buttons while turning the transceiver on.

Cloning

You can transfer all data stored in one transceiver to another set by utilizing the handy "Cloning" feature. This requires a user-constructed cloning cable which connects the MIC jacks on the two transceivers as shown below.
To clone from one transceiver to another, use the following procedure:
1. Insert the Clone Cable into the MIC jack of each transceiver.
2. Turn both transceivers off, then press and hold in the [LOW] key on each radio while turning the power on again. The "CLN" notation will appear on the display.
3. On the "destination" radio, press the [D/MR] button.
4. Now, on the "source" radio, press the [MHz] key.

5. If there is a problem during the cloning process, "CLN ERR" will be displayed. Check your cable connections and try again.
6. If cloning is successful, turn the "destination" radio off. Now turn the "source" radio off.

Remove the clone cable. Channel and operating data for both radios are now identical. They both may be turned on now for normal operation.

Set Mode

The FT-1500M's Menu system allows a number of transceiver operating parameters to be custom-configured for your operating requirements.

The Menu is easy to activate and set, using the following procedure:

1. Press and hold in the [MHz] key for one second.
2. Rotate the Main Dial knob to select the Menu item to be adjusted.
3. Press the [MHz] key, then rotate the Main Dial knob to adjust the status or value of the Menu item.
4. After completing your adjustment, press and hold in the [MHz] key for one second to save the new setting and exit to normal operation.

Menu items are conveniently arranged in alphabetical order.

Menu Selection Summary

Set Mode Details

Set Item [ALPH]
Function: Programming an Alpha/Numeric label for a memory.
See page ?? for details.
Set Item [APO]
Function: Enable/Disable the Automatic Power Off feature.
Available Values: 1 ~ 12 Hours, or OFF
Default: OFF
Set Item [ARS]
Function: Enable/Disable the Automatic Repeater Shift function.
Available Values: ON/OFF
Default: ON
Set Item [BEEP]
Function: Enable/Disable the key/button beeper.
Available Values: ON/OFF
Default Setting: ON
Set Item [BELL]
Function: Enable/Disable the CTCSS Bell Paging feature.
Available Values: ON/OFF
Default Setting: OFF
Set Item [CH NUM]
Function: Enable/Disable the momentary display of the Memory Channel Number as the Main Dial knob is rotated.
Available Values: ON/OFF
Default Setting: OFF
Set Item [CK SFT]
Function: Shifting of CPU clock frequency..
Available Values: ON/OFF
Default Setting: OFF
Set Item [DC IN]
Indicate the Supply Voltage
Set Item [DIMR]
Function: Setting of the front panel display's illumination level.
Available Values: 1 ~ 10 or OFF

Default Setting: 10
Set Item [DTMF]
Set Item [DT DLY]
Function: Setting of the DTMF Autodialer Delay Time
Available Values: 50/250/450/750/1000 ms.
Default Setting: 450 ms.
Set Item [DT MEM]
Function: Loading of the DTMF Autodialer Memories. See page ??.
Set Item [DT SPD]
Function: Setting of the DTMF Autodialer Sending Speed
Available Values: 50/100 ms.
Default Setting: 50 ms (high speed)
Set Item [EDG BP]
Function: Enable/Disable the Band-edge beeper while scanning.
Available Values: ON/OFF
Default Setting: OFF
Set Item [LOCK]
Function: Enable/Disable the key/button Lock
Available Values: KL/DL/K+D/PL/K+P/D+P/ALL/OFF
Default Setting: OFF
Set Item [PCKT]
Function: Enable/Disable the Microphone during Packet transmission.
Available Values: Mic ON/Mic OFF
Default Setting: Mic OFF
Set Item [P RATE]
Function: Set the transceiver's circuitry for the Packet baud rate to be used.
Available Values: 1200/9600 bps
Default Setting: 1200
Set Item [PRG P1]
Function: Programming the function assigned to microphone key P1
Available Values: MON/S.SRCH/T.SRCH/WX/SQ.TYP/T.CALL/SHIFT/TX POWER/AN
Default Setting: MON (Squelch OFF)
Set Item [PRG P2]
Function: Programming the function assigned to microphone key P2
Available Values: MON/S.SRCH/T.SRCH/WX/SQ.TYP/T.CALL/SHIFT/TX POWER/AN
Default Setting: S.SRCH (Smart Search)
Set Item [PRG P3]
Function: Programming the function assigned to microphone key P3
Available Values: MON/S.SRCH/T.SRCH/WX/SQ.TYP/T.CALL/SHIFT/TX POWER/AN
Default Setting: T.SRCH (Tone Search)
Set Item [PRG P4]
Function: Programming the function assigned to microphone key P4
Available Values: MON/S.SRCH/T.SRCH/WX/SQ.TYP/T.CALL/SHIFT/TX POWER/AN
Default Setting: WX (Weather Channel)
Set Item [REV/HM]
Function: Select the [REV] key function..
Available Values: REV/HOME
Default Setting: REV
Set Item [RF SQL]
Function: Adjust the RF Squelch threshold level.
Available Values: OFF/S-1 to S-10

Default Setting: OFF
Set Item [RPTER]
Function: Enable/Disable the Automatic Repeater Shift feature and Setting of the Repeater Shift Direction
Available Values: ARS/Shift -/Shift +/OFF
Default Setting: ARS
Set Item [RVRT]
Function: Enable/Disable the "Priority Channel Revert" feature
Available Values: OFF/ON
Default Setting: OFF
Set Item [SCAN]
Function: Select the Scan Resume mode.
Available Values: BUSY/5SEC/HOLD
Default Setting: BUSY
Set Item [SHIFT]
Function: Set the magnitude of the Repeater Shift
Available Values: 0.00 ~ 99.95 MHz (only shifts of less than 4 MHz will work)
Default Setting: 600 kHz
Set Item [SKIP]
Function: Enable/Disable Skipping of a channel during scanning.
Available Values: SKIP/STOP
Default Setting: STOP (Stop on busy channel)
Set Item [SQL]
Function: Set the Squelch threshold
Available Values: OFF/1 ~ 15 (arbitrary scale)
Default Setting: 1
Set Item [STEP]
Function: Setting of the synthesizer steps used in VFO/Memory Tune operation.
Available Values: 5/10/12.5/15/20/25/50 kHz per step
Default Setting: 5 kHz
Set Item [S.SRCH]
Function: Select the Smart Search Sweep mode.
Available Values: Single/Continue
Default Setting: Single
Set Item [TONE]
Function: Select the CTCSS mode.
Available Values: OFF, T, TSQ
Default Setting: OFF
Set Item [TN FRQ]
Function: Setting of the CTCSS Tone Frequency.
Available Values: 39 standard CTCSS Tones
Default Setting: 100.0 Hz
Set Item [TOT]
Function: Set the time-out limit for the Time-Out Timer
Available Values: 1 ~ 60 minutes, or OFF
Default Setting: 6 minutes
Set Item [W/N DV]
Function: Reduction of the Microphone Gain/Deviation and receiver bandwidth
Available Values: WIDE/NARROW
Default Setting: WIDE (±5 kHz Deviation, 15 kHz bandwidth)