(B) Interfacing to Other Linear Amplifiers

T/R control can be accomplished either via the BAND DATA jack (for low voltage and low current, high-speed applications such as QSK CW), or via the TX GND jack. Other features assisting with ease of interfacing are:

• If the amplifier has a particularly long receive-to-transmit switching time, Menu Item 7-4 may be used to set a sequencing delay anywhere in the range 0~30 ms, so as to avoid activation of the FT-1000MP's ALC circuitry. When the transceiver's final amplifier protection sensor detects an incompletely-seated relay in the amplifier, power output from the transceiver will be suppressed so as to protect both the amplifier and the transceiver; Menu Item 7-4 allows inhibition of the output for a few milliseconds, to avoid the potential delay in generation of full power output caused by the ALC recovery time constant.

• If the linear amplifier uses vacuum tubes, or otherwise requires manual tuning, a simple circuit can be constructed for connection to the rear panel REMOTE jack, allowing the operator to send a 10W, 50W, or 100W carrier for tuning purposes, independent of the current operating mode (e.g. SSB). The Tuning Mode Power Adjustment parameter is set via Menu Item 4-3.

• The maximum power output from the transceiver may be limited to 10W or 50W, if desired, via Menu Item 4-0.

• ALC adjustment, when connected, is accomplished using the appropriate adjustment potentiometer on the rear panel of the linear amplifier.

Fig.14-1 TX-GND Circuit

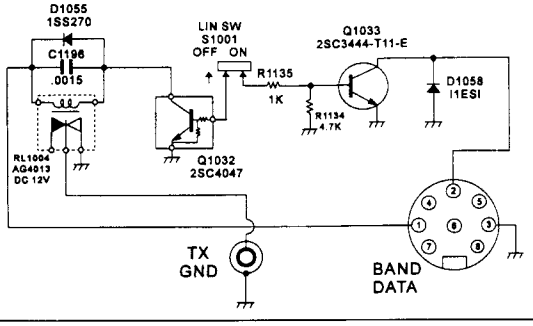
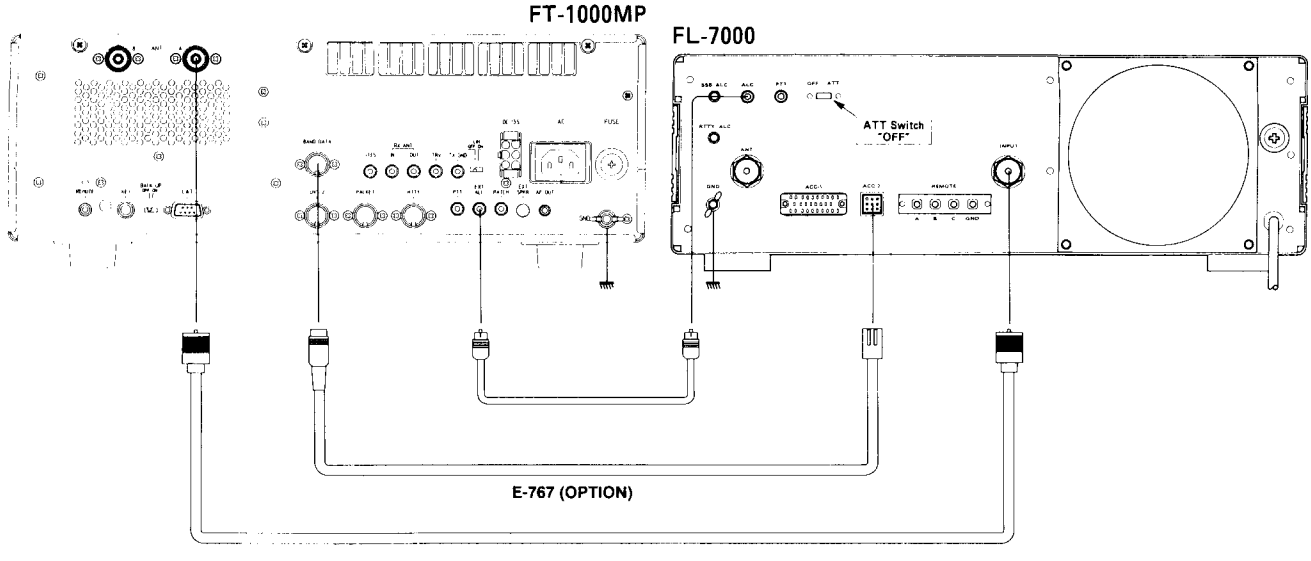


Fig.14-2 FL-7000 LINEAR AMPLIFIER CONNECTIONS



15. Transverter Interfacing

A dedicated transverter interconnection jack (RCA type) is provided on the rear panel for providing RF drive to an after-market transmit converter.

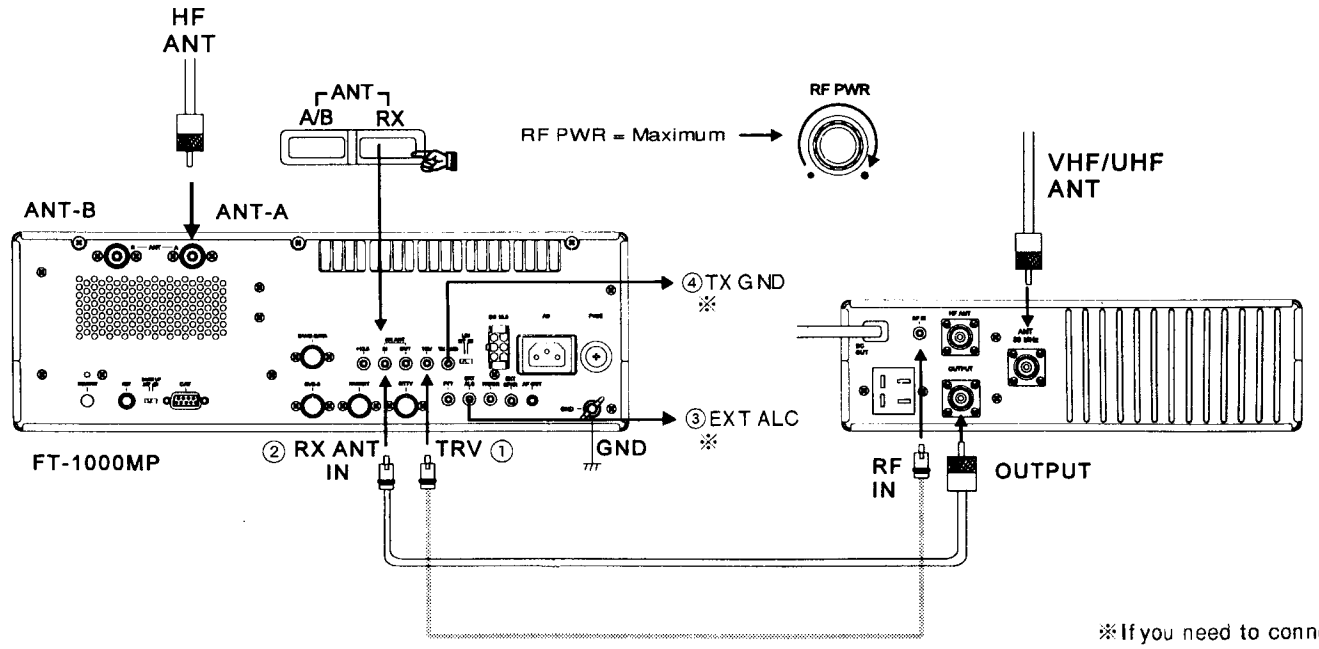
Receive converters may be connected to the RX IN RCA jack on the rear panel, as well, so as to allow utilization of the 28-30 MHz band as a tunable IF for your converter. Via Menu Item 3-3, the frequency display area of the LCD may be changed to show "50," "144," or "430" (MHz) during transverter operation.

A control line, available through the top-cover control panel, allows the final amplifier stage of the FT-1000MP to be disabled during transverter operation.

Table 15-1 TRANSVERTER CONNECTION

1	TRV	LOW LEVEL (–6dBm/50Ω) DRIVE TO TRANSMIT CONVERTER
2	RX ANT IN	TRANSVERTER RX LINE INPUT
3	EXT ALC	EXTERNAL ALC CONNECTION (–4V DC FLL PPOWER)
4	TX GND	CLOSURE TO GROUND ON TX

Fig.15-1 TRANSVERTER CONNECTIONS



16. Top Panel Access and Control

Underneath a small "trap door" access panel on the top cover are a number of controls and switches that are rarely used during actual operation, but which may require occasional adjustmant or re-setting. These include:

(1) HP-M
This control sets the audio level available from the main receiver to headphone jack A (3.5 mm plug).

(2) HPA-S
This control sets the audio level available from the sub receiver to headphone jack A (3.5 mm plug).

(3) HPB-M
This control sets the audio level available from the main receiver to headphone jack B (1/4 inch plug).

(4) HPB-S
This control sets the audio level available from the sub receiver to headphone jack B (1/4 inch plug)

(5) CW
This control adjusts the tuning meter segmant indications for CW Center Tuning.

(6) RTTY
This control adjusts the tuning meter segment indications for RTTY Center Tuning.

(7) PKT
This control adjusts the tuning meter segment indications for PKT Center Tuning.

(8) A-VOX (VOX Anti-Trip)
This control adjusts the level of negative feedback of receiver audio to the microphone, to prevent the receiver audio from activating the transmitter (via the microphone) during VOX operation.

(9) DLAY (VOX Delay)
This control sets the hang time of the VOX circuit, between the moment you stop speaking and the moment the VOX circuit automatically returns the transceiver to the "receive" mode.

(10) VOX
This control sets the sensitivity of the VOX circuit, to establish the level of microphone audio needed to active transmitter.

(11) FM MIC
During FM operation, this control sets the microphone gain (and, hence, the transmitter deviation).

(12) TVR (Transverter Enabling Switch)
During transverter operation, this switch disables the FT-1000MP's PA stage, conserving power and eliminating the need to connect a dummy load to the HF Antenna jack(s) during VHF/UHF operation.

Fig.16-1 TOP PANEL ACCESS and CONTROLS

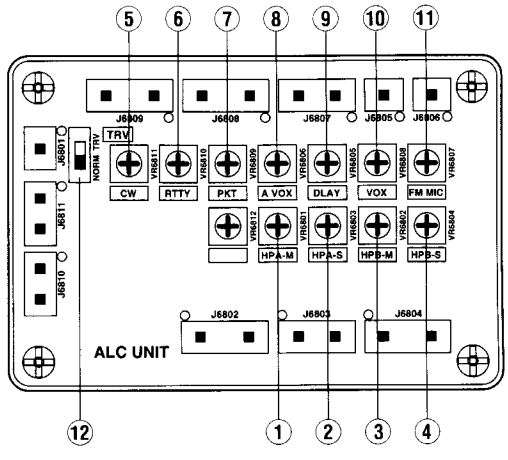
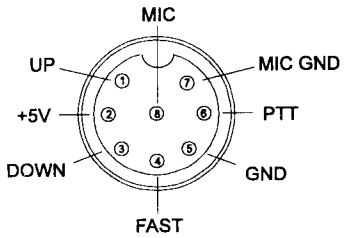


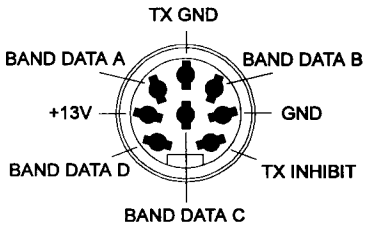
Fig.16-2 PLUG/CONNECTOR PIN OUT DIAGRAMS

MIC



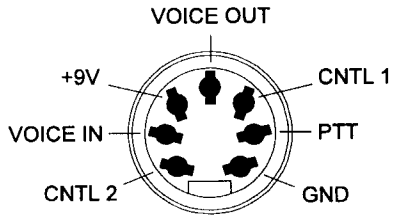
as viewed from front panel

BAND DATA



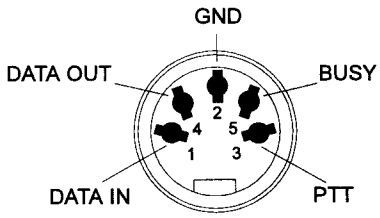
as viewed from rear panel

DVS-2



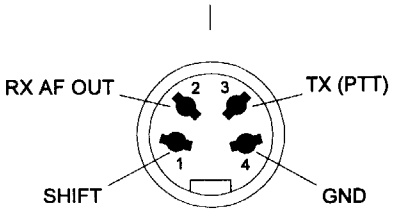
as viewed from rear panel

PACKET



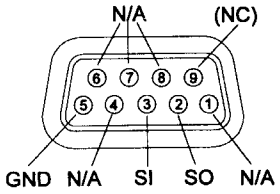
as viewed from rear panel

RTTY



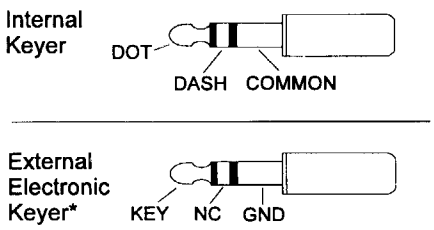
as viewed from rear panel

CAT JACK



as viewed from rear panel

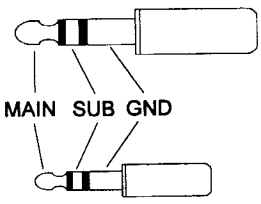
KEY



*do not use 2-conductor type plug

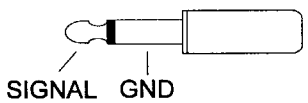
PHONE

1/4" JACK (A)

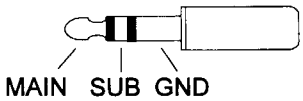


3.5 mm JACK (B)

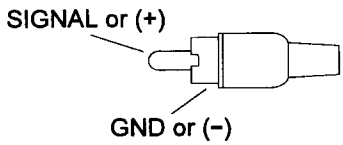
EXT SPKR



AF OUT



RCA PLUG



17. Technical Glossary for the FT-1000MP

This section provides definitions and explanations of the terminology frequently encountered during operation of the FT-1000MP.

[A]

A/B Antenna Switch
This switch allows the operator to select from the two available transceive antenna jacks.

A⇆B Key
Pushing this key swaps the contents of the Main and Sub VFO registers.

A▷B Key
Pushing this key copies the contents of the Main VFO register into the Sub VFO register.

AC Receptacle
This three-pin jack accepts AC power input. Voltages in the range 100~117 V and 200~234 V may be accommodated.

ADC (Analog-to-Digital Converter)
Digital signal processing, and certain other signal manipulation circuits, require that an analog signal be converted to digital form. The ADC is a conversion circuit which breaks up the analog signal into extremely fine segments, assigns a numerical value to each point on the signal according to its characteristics, and then feeds this data stream to the processing circuitry; the "desired" numbers and "undesired" numbers are then kept or discarded by software, according to the operational requirements of the moment.

AF OUT Jack
This 3.5 mm stereo jack on the rear panel provides fixed-level audio output for connection to a recording or decoding device such as a WeatherFax demodulator, or to a stereo amplifier. Peak signal level is 200 mV (rms) at an impedance of 600Ω. Main receiver audio is provided on the Tip connector, and Sub receiver audio is provided on the Ring connector.

AF REV Key
Pressing this key reverses the relationship of the Main and Sub receiver audio as adjusted by the AF Gain control on the front panel.

AFSK (Audio Frequency-Shifted Keying)
AFSK operation is a common technique for generation of the tones needed for digital mode operation. In AFSK operation, two audio tones are supplied by a Terminal Node Controller (TNC) to an SSB modulator, which amplifies them as though they were a voice signal. In the FT-1000MP, AFSK operation is supported via the "Packet" jack and the "PKT" mode of operation. AFSK operation can be easier to accomplish, especially for the neophyte digital operator, because the TNC's decoder is aligned to match the frequencies of its tone generator; therefore, if the operator's computer is successfully copying another station, the chances are good that a connection to that station will be easily possible. If the transmit frequency-shifted tones are generated inside the transceiver, the operator must be somewhat more watchful against accidental programming of transmit frequency offsets.

AGC Switch
The Automatic Gain Control (AGC) system for the receiver includes selectable receiver recovery times of Slow and Fast, with the "Auto" position providing different automatic selections depending on the mode. An "AGC Off" position is also provided, although in most instances the AGC should be left on.

ALC System
The transmitter's Automatic Level Control (ALC) system provides automatic control of the drive levels throughout the transmit chain, so as to promote good linearity on SSB, prevent excessive current consumption or RF output, protect the power amplifier from excessive SWR, and it also provides important reflected-voltage information which is used to control the action of the antenna tuner. Metering of the ALC level is provided on the front panel.

AM Mode Key
Pushing this key activates the AM mode. Pushing this key twice activates the Synchronous Detection mode on AM.

AMTOR
One of the most popular digital operating modes, AMTOR stands for AMateur Teleprinting Over Radio, and is an error-correcting mode of operation.

A▷M
Pushing and holding in this key for 1/2 second writes the contents of (Main) VFO-A into the currently-selected memory channel.

ATT (Attenuator) Switch
The Attenuator switch allows the operator to select receiver input attenuation levels of 6 dB, 12 dB, or 18 dB (one S-Unit steps) in situations where low noise figure is not needed.

Auto Notch Circuit
This popular feature of the EDSP automatically detects and nulls out any carriers or other beat signals within the receiver audio passband. Multiple beats can be eliminated using this circuit.

[B]

Back Up Switch
This switch, located on the rear panel, is used to turn the memory back-up battery on or off. When the switch is in its normal "On" position, memory contents and operational settings are preserved, even though main AC or DC power is cut off.

BAND Keys
These keys on the front panel keypad provide one-touch band change. Two VFO registers are provided for each band, allowing the owner to store, for example, one SSB and one CW "favorite frequency" on each band, if desired.

BAND DATA Jack
This eight-pin interlocking-type DIN connector is used for interconnection to the Yaesu Model FL-7000 Linear Amplifier. Automatic bandswitching information, T/R control, 13.5V DC, and transmitter-inhibiting lines are provided via this jack.

BANDWIDTH Key Matrix
These keys allow operator selection of the desired combination of 8.215 MHz (2nd IF) and 455 kHz (3rd IF) receiver filters.

BAND-PASS Filters (RF)
The FT-1000MP receiver front end includes a bank of eleven Band-Pass filters, which serve to protect the RF amplifier and 1st mixer stages from strong out-of-band signals. These filters are switched using PIN diodes on their inputs, so as to minimize 2nd-order intermodulation problems.

BK-IN Switch
Pushing in this switch activates the CW full break-in feature.

[C]

Carrier Point
The "Carrier Point" is the precise frequency at which the carrier is found in a signal's spectrum, even if it is suppressed (as in SSB telephony). Adjustment of the carrier point relative to the center frequency of an IF filter allows either high-frequency or low-frequency components to be enhanced or suppressed, depending on the mode of operation and the direction of the adjustment.

CAT Jack
The Computer Aided Transceiver (CAT) System, pioneered on Yaesu's FT-980 over a decade ago, now provides for easy interconnection directly to a serial cable from your personal computer's communication port via the rear panel (male) DB-9 CAT connector. The built-in TTL-to-RS-232C level converter eliminates the need for an external interface card. Serial communication is at 4800 baud, and the FT-1000MP is supported by most of the popular software packages available on the market today.

CLAR (Clarifier) Control/Switches
Offset tuning from the current operating frequency is provided by the Clarifier control and switches. An offset of up to ±9.99 kHz may be set via the rotary Clarifier control, and then the RX (RIT) and/or TX (XIT) controls may be utilized to apply this offset to the receive, transmit, or both frequencies.

C/N (Carrier-to-Noise) Ratio
This is a measure of an oscillator's noise spectrum performance, used to evaluate the impact of the oscillator on a transmitter or receiver's net system performance. A quiet oscillator, like those used in the FT-1000MP, will have very, very low noise output either side of the carrier frequency.

Collins® Mechanical Filters
Collins® Mechanical Filters are available in both 2.75 kHz and 500 Hz bandwidths for the FT-1000MP (the SSB filter is factory installed; the CW filters--one each for Main and Sub receivers--are optional accessories). These 455 kHz filters utilize a new manufacturing process, and they provide extremely high reliability and stability, along with excellent signal reproduction characteristics.

COMP (Compression) Metering
During SSB operation utilizing the RF Speech Processor, the COMP scale on the meter indicates the Compression level in use. Adjustment of the Compression level is accomplished using the "PROC" (Processor) control on the front panel.

CPU (Central Processing Unit)
The CPU in the FT-1000MP is the main control and linking center of the FT-1000MP. The M37702 Main processor and its associated sub-processors and interface ICs allow an unprecedented degree of operating flexibility, memory capacity, and frequency resolution thanks to the high computational speed (25 MHz) and low-overhead control software architecture.

CPU Reset
Resetting of the CPU clears all VFO, memory, and antenna tuner memory settings to their factory defaults. To do this, turn off the [POWER] switch, then push the [SUB], [29], and [ENT] keys and hold all three in while turning the transceiver on.

Contour Control/Circuitry
The "Contour" circuits in the receiver EDSP allow the operator to select high-pass, low-pass, mid-band-cut, and band-pass responses by appropriately rotating the Contour control on the front panel. The equivalent function in the transmit mode is the Microphone Equalizer.

CTCSS (Continuous Tone-Controlled Squelch System)
A CTCSS Tone encoder is built into the FT-1000MP, allowing the operator to use a subaudible tone for access to 29 MHz repeater stations requiring such a tone. The CTCSS tone is automatically activated when the [RPT] key is pressed.

CW Mode Key
Pushing this switch activates the CW mode. Pushing this switch a second time places the transceiver in the "CW-Reverse" mode, which utilizes LSB-side injection instead of the default USB-side injection.

[D]

DC 13.5 Jack
This jack may be used for input of DC power, if AC power is unavailable. If both AC and DC power are applied to the transceiver, the external DC power source has priority and the internal AC power supply is disengaged. DC power requirements are 13.5 V at less than 20 Amps.

DDS (Direct Digital Synthesis)
Many of the important oscillator signals utilized in the FT-1000MP are generated using a DDS method, which provides extraordinarily fast lock-up time and low noise. The newly-designed DDS circuitry utilized in the FT-1000MP incorporates a 24-bit data stream, not the usual 18 bit; this allows 64 times more frequency resolution, thus providing the capability of tuning in steps of 0.625 Hz.

DFCS (Duct Flow Cooling System)
This unique Yaesu design concept provides highly-efficient heat transfer for the power amplifier, power supply, and antenna tuner units, thanks to the large cross-flow fan and heat sink.

DOWN Key
Pushing this switch causes the operating frequency to be lowered by 100 kHz (1 MHz when the [FAST] key is engaged), for quick movement around a band.

DUAL Key
Pushing this key activates the Dual Receive feature of the FT-1000MP, in which both the Main and Sub receivers are active at the same time.

DVS-2 Jack
This jack allows connection of the DVS-2 Digital Voice Recorder, a popular accessory among contest operators, which allows storage and playback of repetitive messages often needed during radiosport competitions.

Dynamic Range
The Dynamic Range of a receiver is a measure of its ability to withstand input from strong signals without (A) generating spurious signals of its own, or (B) shutting down due to blocking. The two most commonly-encountered measures of Dynamic Range are 2nd order dynamic range (where strong signals at f_1 and f_2 combine to produce an intermodulation response at $fim_2 = f_1 + f_2$) and 3rd order Dynamic Range (where the intermodulation response appears at $fim_3 = 2f_2 - f_1$ or $fim_3 = 2f_1 - f_2$).

[E]

EDSP (Enhanced Digital Signal Processing) Switch/Circuit
The front-panel [EDSP] switch activates the EDSP feature both on transmit and receive, as enabled through any applicable Menu settings. Utilizing the NEC® µPD77016 operating in a 16-bit environment at a maximum clock speed of 66.666 MHz, the EDSP system provides a wide variety of interference-fighting and signal-customization selections for the owner.

EXT ALC Jack
This RCA-type female connector is provided for injection of externally-generated, negative-going ALC voltage (typically, from a linear amplifier). The control voltage range is 0 to -4 Volts DC.

EXT SPKR Jack
This jack is used to connect an external speaker to the transceiver. The output is mixed (Main plus Sub Receivers), and the acceptable impedance is 4 ~ 16 Ω.

[F]

FAST Key
Pushing this key increases the rate of change of frequency during rotation of the Main Dial, scanning, or frequency-hopping using the [UP] and [DOWN] keys.

FUSE Holder ***NOT AVAILABLE IN EUROPE**
This socket on the rear panel holds the AC line fuse (8 Amps for 100 ~ 117 V, 4 Amps for 200 ~ 234 V). Separate DC fuses are provided in the (optional) DC cable.

[G]

Gain Balance
In many receivers, a byproduct of activating narrow-bandwidth filters is a significant loss of signal strength, due to the additional insertion loss of the narrow filters compared to standard 2.4 kHz SSB filters. In the FT-1000MP, a combination of attenuators (for low-loss elements) and amplifiers (for high-loss elements) maintains essentially unity gain over the entire range of available bandwidth selections, allowing the full benefit of improved signal-to-noise ratio to be realized as the bandwidth is narrowed.

GND (Ground) Lug
This threaded lug is used for connection to an earth ground.

[H]

HPF (High-Pass Filter) Circuits
High-Pass Filter circuits are used to protect later stages from strong signals which are lower in frequency than the current operating frequency. In the case of the FT-1000MP, three HPFs are provided, so as to roll off signals below the 80-, 40-, and 20-meter amateur bands, the most crowded, high-signal environments in the HF spectrum. Attenuation at half frequency is 36 dB or better, and these filters use relay switching so as to utilize no IMD-producing components (such as diodes) ahead of the protection afforded by the HPFs. The result is a 2nd-order intermodulation distortion intercept point typically better than +85 dBm.

[I]

IC
The "IC" indication on the front panel meter displays the current ("I") being drawn by the collectors ("C") of the final amplifier stage.

IF (Intermediate Frequency) Circuits
A modern superheterodyne transceiver utilizes one or more conversions to IFs, frequencies at which some task is to be performed. For example, since it currently is not possible to build a 250 Hz bandwidth frequency-agile CW filter that tunes the entire HF spectrum, the RF signal in converted to one or more IFs, in which the signal is passed through crystal or mechanical filters, amplified, and (in the case of the FT-1000MP) subjected to digital signal processing. .The IFs used in the FT-1000MP are 70.455 MHz, 8.215 MHz, 455 kHz, and 10.24 kHz (EDSP) for the Main Receiver, and 47.21 MHz and 455 kHz for the Sub Receiver.

IF Filters
Pursuant to the above discussion, the FT-1000MP provides banks of up to four 8-pole crystal filters in the 8.215 MHz IF, and as many as five filters (crystal, ceramic, or Collins® Mechanical Filters) in the 455 kHz IF.

IMD (Intermodulation Distortion)
A condition whereby two or more signals mix in a device so as to produce a spurious response. Intermodulation can be a problem both on transmit and receive, and the design team for the FT-

1000MP have taken special care to ensure high immunity from intermodulation throughout the transceiver.

Intercept Point
In receiver design and evaluation, the concept of the "Intercept Point" is an important aspect of concern to engineers. The "Intercept Point" is an imaginary intersection point on a graph of two intersecting lines: one line represents increasing signal strengths of incoming signals, and the other line represents the (more rapidly) increasing signal strength of intermodulation signals. Where the input signals (typically two or more tones) and the intermodulation signals theoretically become the same strength is the "Intercept Point" for the specific type of intermodulation being evaluated, and a "higher" number clearly is "better." Because of gain compression in the RF and IF amplifiers, the Intercept Point can never be observed in practice; the Intercept Point is derived by extending the linear portions of the graphs of input signals and intermodulation signal(s) until they intersect.

The Intercept Point may be quoted in terms of the "Input Intercept" or the "Output Intercept." The two terms are related to the extent that the Output Intercept equals the Input Intercept plus the Gain of the stage under test. Thus, it is possible to specify the Input Intercept of a receiver system, but not a meaningful Output Intercept, because the value of the latter term would depend on the setting of the AF Gain (Volume) control.

IPO (Intercept Point Optimization)
By feeding the receiver first mixer directly, without any RF preamplification, the Intercept Point performance will be enhanced. Eliminating the RF preamplifier will, of course, degrade the Noise Figure (and, hence, the sensitivity) of the receiver, but on frequencies below about 10 MHz the RF preamplifiers may not be necessary (depending on the user's location, antenna, etc.). The potential improvement in Intercept performance is achieved due to (1) the reduction in gain ahead of the first mixer, and (2) the elimination of the RF preamplifier itself, which (since no amplifier is "IMD-free") could contribute to degraded Intercept performance under some conditions.

[K]

KEY Jacks
Two KEY jacks are provided, one each on the front and rear panels, allowing connection of a 1/2 stereo plug for keyer paddle, external electronic keyer, or straight CW key input. The "Key-UP" voltage is +5 V DC, and the "Key-Down" current is 0.5 mA. The two jacks are connected in parallel, thereby allowing the user to connect one jack to an external manual keyer and the other to a computer-driven keying interface for use in conjunction with contest logging software.

KEYER Switch
Pushing this switch activates the built-in Electronic Keyer circuit.

KEYPAD
The front panel keypad allows one-touch band change or direct frequency entry for both the Main and Sub VFO registers.

[L]

LIN Switch
The rear panel LINear switch is used to activate or de-activate the mechanical relay which is connected to the "TX GND" jack. If a linear amplifier is utilized whose T/R relay control voltage is less than about +40 V DC (at 300 mA or less), the relay may not be needed (the transistor-based control line connected to the "BAND DATA" jack may be used). For high-voltage relay control situations, however, the "TX GND" jack may be used once the "LIN" switch is set to the "On" position.

LOCK Switches
These switches, one each for the Main and Sub VFO dials, allow the respective dial mechanisms to be fixed (electronically) on the current frequency, so as to avoid accidental frequency change. Pushing the Main Dial's [LOCK] key in and holding it in while turning the Main Dial will activate the "Tracking" function, in which the Main and Sub VFOs are slaved (moving in tandem).

LSB Key
Pushing this key in activates the LSB mode. The green LED associated with this mode key will also become illuminated during RTTY or Packet operation if LSB-side operation is selected by the user.

[M]

M ▷A Key
Pushing this key transfers the contents of the current memory channel into the register for VFO-A, and simultaneously will switch the transceiver from the memory mode to the VFO mode.

MAIN (AF Gain)
This control is used to adjust the volume level for audio produced by the Main receiver.

MC13020
This is the product designator for the renowned Motorola® IC which uses the C-QUAM method of AM detection. The FT-1000MP uses this IC for both synchronous and envelope detection of AM signals.

MCK Key
Pushing this key activates the "Memory Check" mode, a "scratchpad" condition whereby the contents of the memory channels may be inspected without actually changing the transceiver's current operating frequency. The "Memory Check" display replaces the Sub VFO frequency when this switch is pressed.

MDS (Minimum Detectable Signal)
The MDS is a measure of the minimum signal that can be detected by a receiver, and it is defined as the signal level which produces a 3 dB signal-to-noise ratio when compared to the zero-signal condition. Thanks to the low-noise design techniques and EDSP signal enhancement used in the FT-1000MP, MDS figures in the CW mode of -148 dBm or better are obtainable, making this transceiver particularly outstanding as a tunable IF for a VHF or UHF receive converter.

Memory Mode
This mode of operation utilizes the 108 regular memory channels plus the 5 QMB (Quick Memory Bank) memories to provide instant recall of a previously-stored frequency. In the FT-1000MP, frequency, mode, and bandwidth information are all stored at the same time.

MEM GROUP Key
Pressing this key toggles memory operation from the "All Channel" mode to the "Memory Group" mode, the latter of which allows more important memories to be segregated into up to four groups, so they may be inspected more quickly.

M TUNE Mode
The memory system allows the operator freely to tune off of a memory channel. This "M TUNE" (Memory Tune) mode turns the memory mode into a pseudo-VFO mode, because the memory channel can be retuned to any frequency within the range of the transceiver; mode and bandwidth may also be changed, and a retuned memory's contents may be Pressing the [VFO/MEM] key once during Memory Tuning causes the register to revert to the original memorized frequency; another press of the [VFO/MEM] key shifts the transceiver into the VFO mode.

MEM/VFO CH Control
This knob, in its default configuration, is used to select from among the available memory channels. Through the Menu system, however, it may be changed into a "VFO Channel" selector, whereby the Main VFO will tune in user-defined steps (like 1 kHz or 5 kHz) for quick frequency excursions.

MIC Jack
This eight-pin jack accepts microphone input, along with PTT (Push To Talk) and scanning controls from the microphone. A +5 V line is also provided for powering the MD-100A8X Desk Microphone.

MIC Knob
This control provides adjustment of the microphone input level for SSB and AM operation.

Microprocessor (μP)
See "CPU."

MONI Control and Switch
The MONItor feature utilizes the Sub Receiver to provide monitoring of the actual RF signal as it is being transmitted. This makes the Monitor ideal for making EDSP modulation or keying waveform adjustments. The [MONI] key turns the feature on and off, and the "MONI" knob adjusts the monitoring audio level.

MOX Switch
This switch, when pressed, activates the transmitter by closing the PTT (Push To Talk) line to ground.

[N]

NB (Noise Blanker) Control
This knob adjusts the detection level of the noise blanker circuitry.

NB1 Key
This key activates the narrow-pulse noise blanker, for blanking noises typically emanating from power lines, automotive ignition systems, etc.

NB2
This key activates the wide-pulse noise blanker, for those pulses emulating the width of the now-inactive "Woodpecker" over-the-horizon radar.

Noise Figure
The Noise Figure of a circuit or system, expressed in dB, is the amount of noise added by that circuit or system compared to the noise generated by a 50 Ω resistor at room temperature.

Noise Floor
See "MDS."

NR (Noise Reducer)
The EDSP Noise Reducer feature provides selection from among four noise-reduction protocols in EDSP. The operator rotates the "NR" control so as to find the setting that provides the best reduction of noise; it is impossible to predict which setting will be best, as the four settings represent different mathematical algorithms, not "blanking level" settings.

[O]

Over-Sampling
In the world of digital signal processing, an analog signal in converted into a digital signal by sampling the analog signal and "slicing" it into tiny segments, or samples. Clearly, the smaller (and, hence, more numerous) the samples, the better the resolution and quality of signal reproduction. The degree of Over-Sampling is one index of the digitizing resolution used, so as to gauge the expected signal quality after processing is completed.

[P]

PACKET Jack
This five-pin DIN connector is used for AFSK data input, data output, and PTT (Push To Talk) connections. This jack is active when the "PKT" mode is engaged.

PATCH Jack
This RCA-type jack may be used as an auxiliary microphone audio input port, or it may be used as an auxiliary AFSK data input port.

PHONES (A-B) Jacks
These front panel receptacles (3.5mm stereo and 1/2 stereo) may be used for connection of headphones. When using stereo headphones, the audio from the Main and Sub receivers may be separated during Dual Receive operation, if desired.

PITCH Control
This control is used to adjust the pitch of the CW monitor note, the CW carrier offset, and the center frequency of the receiver passband in tandem, so as to allow the operator to center all

aspects of CW operation around his or her preferred center frequency. Center frequencies anywhere from 300 Hz to 1050 Hz may be selected in 50 Hz steps.

PKT Mode Selection Key
This key activates the "Packet" (AFSK) mode of operation. Repeatedly pushing the [PKT] key allows alternate selection of the "PKT/LSB" and "PKT/FM" modes of operation. An emulation of "PKT/USB" can be set up utilizing the [USER] key, described later.

PMS Memory Channels
These channels (P1 ~ P9) are used for the PMS (Programmable Memory Scan) feature, by which the operator may define and store upper and lower sub-band limits for scanning.

POWER Switch
This is the main On/Off switch for the transceiver.

PROC Switch
Pushing this switch activates the RF Speech PROCessor.

PROC Control
Rotating this control allows adjustment of the compression level for the RF Speech PROCessor.

PTT (Push To Talk) Switch/Circuit
The PTT circuit, throughout the transceiver, is the overall transmit/receive control line. When this line is grounded, the transceiver is switched into the transmit mode; when the line is released from ground, the transceiver reverts to the (default) receive mode. The rear panel "PTT" RCA-type jack may be used for connection of a footswitch for hands-free phone operation, or it may be used for connection to a terminal unit's PTT line for T/R control during data operation. A PTT switch is also found on all Yaesu microphones specified for use with the FT-1000MP, and PTT input lines are also provided on "PACKET," "RTTY," and "DVS-2" jacks.

[Q]

QMB Channels
This is a specially-segregated memory bank of five channels which are available for very-quick storage and recall.

QMB RCL Key
This key is used for recall of the QMB channels.

QMB STO Key
This key is used to write the contents from the Main VFO to the Quick Memory Bank.

[R]

REMOTE Jack
This jack may be used for four different remote control functions, utilizing the optional FH-1 Keypad or a home-built version. The FH-1 may be used for controlling the built-in Contest Memory Keyer, or to replicate front-panel functions.

RF AGC
The RF-stage AGC circuit utilizes PIN diodes, which have excellent immunity from IMD as well as a wide control range for attenuation.

RF Amplifiers (Receive)
Three RF preamplifiers are provided in the FT-1000MP: one is a general purpose wideband preamp which utilizes four junction FETs in a parallel, push-pull configuration; the two others are specially "tuned" preamps, including a source-follower JFET amplifier for the low bands and a dual-gate MOSFET amplifier for the high bands. The RF Amplifiers are selected via the Menu system, and they also may be bypassed, if desired, by pressing the [IPO] (Intercept Point Optimization) key.

RF Gain Control
This control adjusts the gain of the RF and IF receiver stages, so as to allow the operator to control the total receiver system gain or the AGC threshold point precisely.

RF PWR Control
This control allows adjustment of the RF power output.

RPT Key
This key, when pushed, places the transceiver in the "Repeater" mode of operation when on 29 MHz in the FM mode. The "Repeater" mode activates a repeater shift function as well as a (subaudible) CTCSS tone generator.

RTTY Jack
This four-pin DIN connector is used for FSK data input, data output, and PTT control connections. This jack is active when the "RTTY" mode is engaged.

RTTY Mode Selection Key
Pressing this key activates the RTTY (Radio Teletype) mode (FSK). By repeatedly pushing this key, alternating selection of the "RTTY/LSB" and "RTTY/USB" modes is provided.

RX ANT Jacks
These RCA-type connectors may be used for connection of a dedicated receive-only antenna, for insertion of a special-purpose filter or amplifier, or for connection of a VHF/UHF receive converter.

RX ANT Switch
This front-panel switch allows the operator to select the device connected to the RX Antenna jacks on the rear panel. This switch action affects both the Main and the Sub receivers.

RX LEDs
These green LEDs (Light-Emitting Diodes) provide a visual indication of which receiver(s) are currently active. If both RX LEDs are illuminated, this indicates that the transceiver is in the Dual Receive mode.

[S]

SHIFT Control
This control is used for adjustment of the IF Shift circuitry, which is frequently useful in combatting nearby interference.