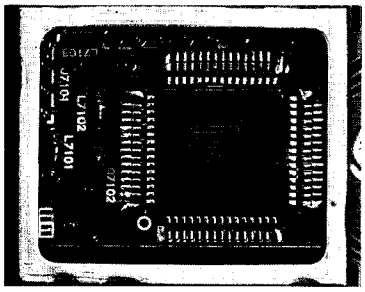
(B) Super-High-Resolution (0.625 Hz) DDS

In a receiver designed to process weak signals (in the 0.1μ V region or lower) which may exist alongside very strong signals, it is important to generate a local oscillator signal with superior Carrier-to-Noise ratio. The proprietary new-generation DDS used in the FT-1000MP has achieved this objective, yielding a broadband noise C/N ratio on the order of -120 dBc/Hz at 2 kHz from a carrier, dropping by another 10 dB over the next 10 kHz of separation.

Moreover, its frequency step resolution is as fine as 0.625 Hz per step, which allows extremely subtle tuning in voice, CW or Packet operation. The main tuning mechanism utilized for the Main and Sub VFO dials is a highly accurate magnetic rotary encoder, which, pursuant to commands from the Menu system, can provide very slow tuning, if needed (as little as 625 Hz per turn). This is due to the 24-bit structure of the main DDS, which produces a frequency resolution 64 times better than usual DDS circuits available in amateur radio equipment.

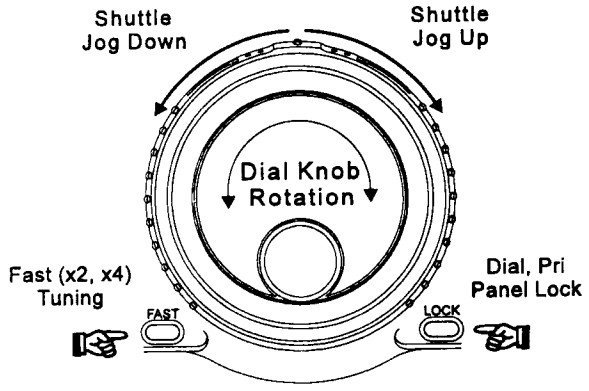


●DDS IC

New on the FT-1000MP is the Shuttle Jog dial, a spring-loaded rotary control just outside the Main VFO Dial, which allows variable-speed manual scanning up or down a band by a simple rotation of the Shuttle Jog to the left or right.

The processing of frequency data, being accomplished by the high-speed DDS, is sufficiently quick that FSK shifted-carrier signal generation is accomplished by actual shifting of the output frequency of the DDS, not by the switching of two audio tones as is often done in HF equipment.
In sum, the local oscillator system is yet another component of the overall design package, each portion of which complements the functions and capabilities of the others, so as to produce the highest level of total transceiver system performance ever made available in the amateur radio market.

Fig.4-3 SHUTTLE JOG DIAL



5. Control Circuitry

(A) Control Circuit Architecture

The circuits controlling the various functions consist of the main CPU, an I/O extender, EEPROM, custom ICs for dial control, and associated circuitry.

The Main CPU is a high-performance 16 bit single-chip M37702 IC, capable of processing amounts of data and its I/O functions rapidly, thanks to its external 25 MHz (!) clock speed. The CPU includes 2 kilobytes of internal memory, and an additional 2 kilobytes of EEPROM holds a vast amount of memory and menu data; as a result, in the event of memory backup battery failure, only the current VFO and antenna tuner contents will be lost, while the Menu settings and all frequency/mode memories will be preserved!

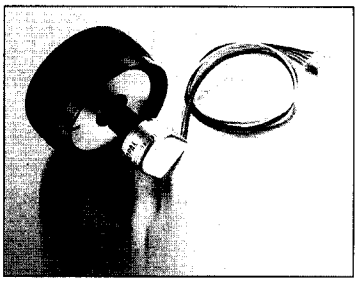
(B) High-Speed Dial Processing

Yaesu has pioneered the development of one-chip high-speed DDS technology in the amateur radio market, and the FT-1000MP is the crowning accomplishment in this proud tradition. Despite the extremely fine synthesizer steps, the CPU and dial data processing IC can accommodate even very rapid rotation of the dial without missing dial pulses and without any processing delay, thus emulating the "feel" of traditional analog tuning.
Through the Menu system, the tuning steps and tuning speed may be selected from a wide variety of choices, allowing an unparalleled degree of customization of this extremely important component of the ergonomic design package.
Sparing no expense to provide first-class performance, even the Clarifier (RIT) control utilizes a highly-accurate magnetic rotary encoder, producing extremely predictable and smooth tuning.

Table 5-1 Main Dial Speed, per Rotation, Set Via Menu Item 1-0 (Step sizes for Main/Sub are set via Menu Items 1-3 and 1-4)

Step Increment	Speed = "2"*	Speed = "4"*
0.625 Hz	310 Hz	625 Hz
1.25 Hz	625 Hz	1.25 kHz
2.50 Hz	1.25 kHz	2.5 kHz
5.00 Hz	2.5 kHz	5 kHz
10.00 Hz	5 kHz	10 kHz
20.00 Hz	10 kHz	20 kHz
100 Hz	50 kHz	100 kHz

* With [FAST] key engaged, dial speed increases by factor of 10.



●Dial

6. Display Features

(A) Large Display with Multi-Function Meter

In the FT-1000MP, the display is more than just an indicator of the operating frequency; it is a comprehensive display of many aspects of transceiver status and tuning conditions.

The newly-developed color reverse LCD was designed so as to provide a wide viewing angle for the many parameters displayed at any given time. The digital metering circuits have significantly less damping than do analog meters, so they are much more responsive during alignment and tuning steps. A Peak-Hold function is available, if desired.

During transmission, multiple parameters may be displayed, allowing the operator to watch power output plus two out of the following six parameters: ALC, SWR, Compression Level, PA Collector Current, PA Input Voltage, and/or Microphone Input Level. On receive, both Main and Sub Receiver S-meter indications are provided, along with a tuning meter (depending on the mode).

The transceiver's main CPU includes an Analog-to-Digital converter, which converts analog information, as needed, into digitally coded information which can be analyzed, processed, and displayed by the LCD. There are eight A/D converter input ports, allowing massive amounts of data to be processed without the perceptible time delay found in inferior designs.

(B) Frequency Display

Frequency indication is a primary task of the color LCD. However, with over four hundred available segments, the display cold become rather cluttered and confusing with careful ergonomic design.

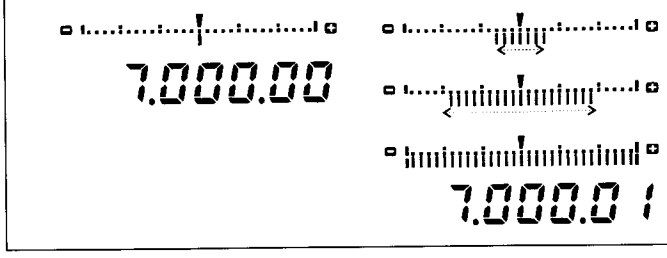
The FT-1000MP's frequency display features amber lighting, to set it apart from other indications on the LCD. The exact shade of color has been carefully chosen to provide the best visibility under a wide variety of ambient lighting conditions.

(C) Enhanced Tuning Scale Display

In its normal (default) mode, the Enhanced Tuning Scale shows a graphical indication of the Clarifier offset from the current operating frequency.

When operating within 5 Hz of the displayed VFO frequency, and when using the ultra-fine 0.625 Hz synthesizer tuning steps, the Enhanced Tuning Scale can also show you, on an expanding (outward) scale, the degree of offset from the highest-resolution digit on the display (one dot on the Enhanced Tuning Scale = 0.625 Hz). This can be of particular merit when tuning carefully on a packet or other digital station.

Fig.6-1 0.625Hz SCALE (1DOT = 0.625Hz)



●CLARIFIER ENHANCED TUNING SCALE

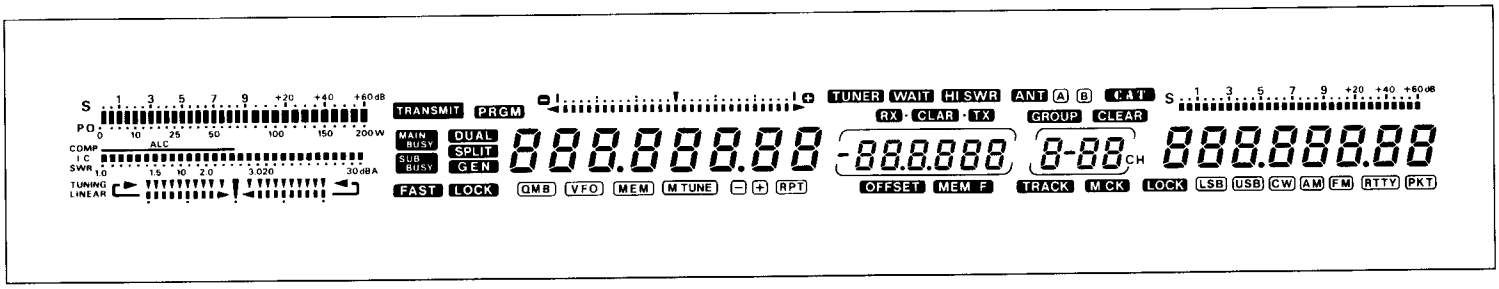
(D) Multi-Display Panel

A small multi-display panel. located between the Main and Sub frequency displays, can be commanded to display one of four items.

In its default condition, it displays the degree of Clarifier offset (in kHz). It can also be commanded to display (A) the frequency of the current memory channel (during VFO operation); (B) the frequency offset between the Main and Sub VFOs during Split operation; and (C) the current CW pitch (default = 700 Hz).

Table 6-1 Multi-Display Selections (Menu Item 3-5)

	COMMENT	DISPLAY
cLAr :	CLARIFIER OFFSET	0.00
cHnL-F :	LAST-USED MEMORY CHANNEL FREQUENCY	7.0000 MEM F
oFFSEt :	FREQUENCY DIFFERENT BETWEEN MAIN+SUB VFOS	00.0000 OFFSET
PI-PitcH :	CW PITCH CENTER FREQUENCY	C-700



7. World-Class CW Performance

The FT-1000MP is without peer with regard to CW performance, both on the receive and transmit sides.

(A) Full Break In (QSK)

Thanks to the ultra-fast DDS performance, full break-in operation without truncation of the characters is now possible, even at high sending speeds. If using a linear amplifier which adds T/R switching time, you can add keying delay time when using the internal electronic keyer, so as to compensate for the truncation caused by the external device.

Traditional "semi-break-in" operation using the VOX circuitry is, of course, included.

(B) Electronic Keyer Built In

The built-in keyer includes menu-driven settings for the dot-space and dash-space ratios, allowing the operator to customize the CW waveform according to his or her preferences.

Table 7-1 Electric Keyer Selections (Menu Item 7-0)

iAbic 1	Electronic Keyer
buG	Mechanical "Bug" Emulation
iAbic 2	Electronic Keyer with Automatic Character Spacing

(C) CW "Normal/Reverse" Facility

Although CW "normally" is received using USB injection, the operator may select LSB injection by pressing the [CW] key a second time. This can be helpful in the avoidance of interference, or to avoid frequency shift when switching from LSB to CW to work a DX station on the low bands.

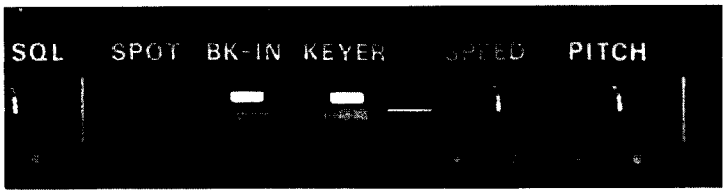
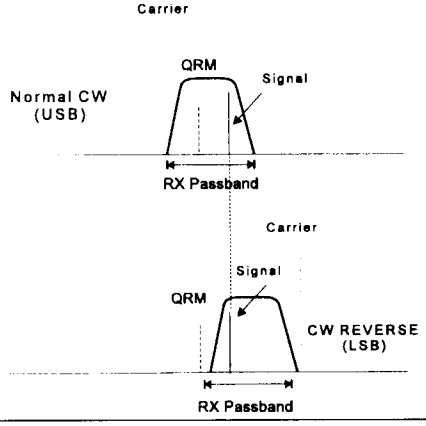


Fig.7-1 CW REVERSE



(D) CW SPOT

One of the more popular features of the FT-1000D and FT-990, the FT-100MP includes a momentary CW [SPOT] key, which causes a spotting tone of the same pitch as your (offset) CW carrier, to allow precise zero-beat alignment on another station.

(E) CW Tuning Meter

A new feature of the LCD is a CW tuning meter, which provides a visual aid in zeroing in on another station. Three arrow indicators tell the operator instantly when alignment is perfect.

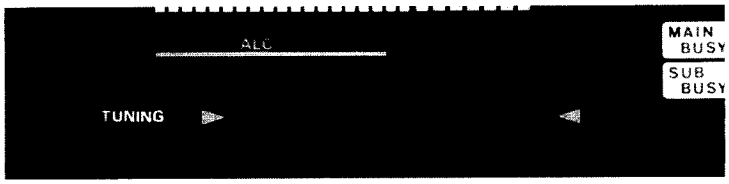
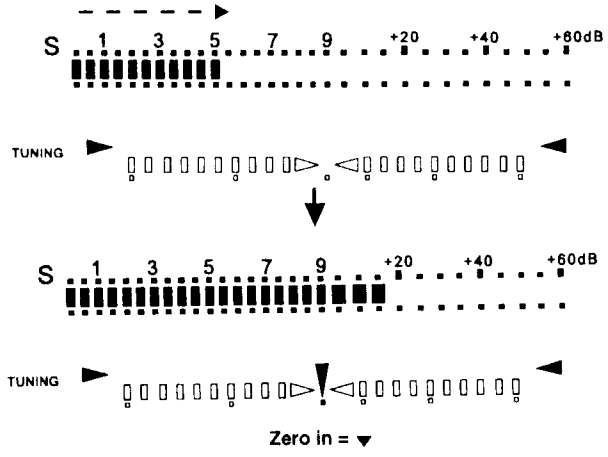


Fig.7-2 CW TUNING METER



(F) CW Pitch Control

This front-panel rotary control allows the operator to shift (A) the center frequency of the receiver passband, (B) the pitch of the (offset) transmitter carrier, and (C) the corresponding pitch of the CW sidetone, so as to align all three parameters for the most comfortable CW pitch. Unlike some competing designs, the FT-1000MP can be aligned lower in frequency, with a total range of 300 ~ 1050 Hz (in 50 Hz steps), allowing operators who like to listen to low tones to do so.

(G) Two Key Input Jacks

Two 1/4 stereo key input jacks are provided, allowing the owner to connect either an iambic paddle (for use of the built-in electronic keyer), or an external keyer, "bug," or straight key.

(H) Contest Memory Keyer

The memory keyer function is activated and controlled via the rear panel "REMOTE" jack. By sending precise voltages from the optional FH-1 Keypad, a variety of functions are available, including:

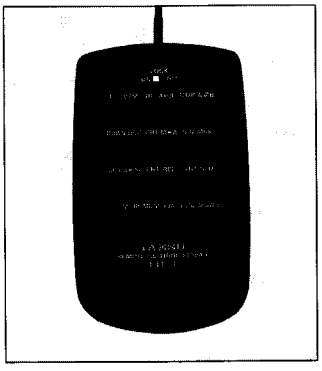
Table 7-2 Contest Memory Keyer Feature

Key#	Function	Remote Control Feature
1	CHC	CQ Message
2	CHI	Contest #
3	CHU	Increment Contest #
4	CHD	Decrement Contest #
5	CH 0	MSG 0
6	CH 1	MSG 1
7	CH 2	MSG 2
8	CH 3	MSG 3
9	CHW	Write Memory
10	MONI	Playback (no Tx)
11	–	N/A
12	TUNING	Tune

- Four memories which can store as many as 50 characters each;
- Your callsign can be stored for one-touch identification; and
- A contest serial number (e.g. "599001") may be imbedded in Memory Register #1. Keypad buttons allow manual incrementing or de-incrementing of the number, if necessary.

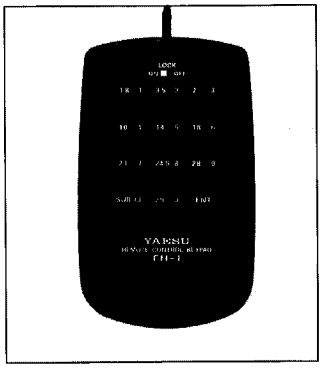
Table 7-3 CONTEST NUMBER TRUNCATION FORMAT

NUMBER (Standard Morse)		NUMBER (Cut Morse)	
0	– – – – –	"T"	– * *
1	. – – – –	"A"	. –
2	. . – – –	"U"	. . –
3	. . . – –	"V"	. . . –
5	. . . . .	"E"	.
7	– – . . .	"B"	– . . .
8	– – – . .	"D"	– . .
9	– – – – .	"N"	– .
	**The standard Morse zero (0) can alternately be sent as "O" (– – –)		+
4-Digit Contest Number Format			
Default	Truncated	Disabled	N/A
XXXX	XXX	OFF	N/A



I. Contest Memory Keyer - the recording and playback of repetitive contest messages are accomplished via the keypad.

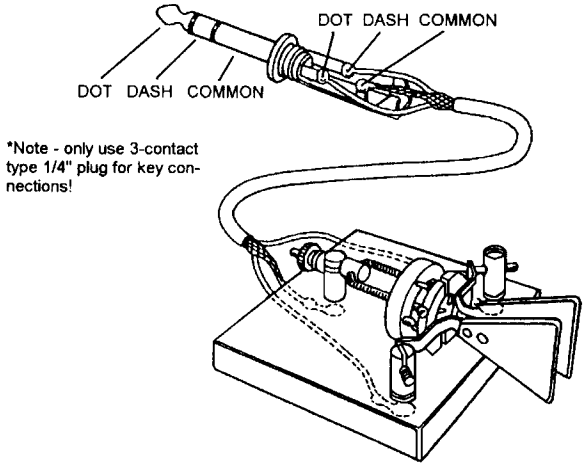
II. VFO/Memory Function Control - in this mode, the remote control keypad duplicates the front panel keys that relate to VFO/Memory selection and programming.



III. Main VFO-A Control - in this mode, the remote control keypad duplicates the functions of the front panel **BAND** keypad as applied to VFO-A.

IV. Sub VFO-B - same as above, except keypad inputs are applied to VFO-B.

Fig.7-3 KEY CONNECTION



8. Convenience Features for HF Operation

The FT-1000MP includes a host of features designed to enhance your HF operating pleasure and convenience, whether you are at home or halfway around the world on a DX-pedition.

(A) Shuttle Jog Dial

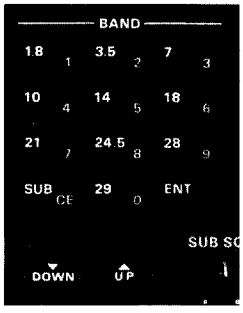
The Yaesu-exclusive Shuttle Jog tuning enhancement provides a new and convenient way to tune. The Shuttle Jog is a spring-loaded rotary dial which surrounds the Main Tuning Dial; by leaning the Shuttle Jog to the left or right, frequency change (manual scanning) at a variable rate will commence. A slight deflection of the Jog dial causes tuning in 10 Hz per step, and maximum deflection of the Jog dial causes tuning in (faster) 50 Hz steps.

The rate of Shuttle Jog scanning can be varied via Menu Item 1-1, wherein the rate can be varied from a minimum speed of 10 steps per second to a maximum or 1000 steps per second.

(B) Band Selection Keys and VFO Registers

The front panel keypad allows one-touch band change. For example, by pressing the [21] key, the operator commands the transceiver to return to the last frequency utilized on the 21 MHz band.

The Band Stacking VFO register concept allows the owner to store two favorite frequencies in VFO registers for each band. In the above example, the user might have most recently been on 21.050 MHz CW; another press of the [21] key will bring the second 21 MHz VFO into operation, perhaps on 21.295 MHz USB. This may be done for each amateur band.



Unlike poorly-thought-out competitors, the FT-1000MP's VFO (and Memory) registers store not only frequency, but (A) the operating mode, (B) the IF bandwidth, (C) the Clarifier (RIT) offset, if any, and (D) the Automatic Antenna Tuner settings, if used.

(C) Direct Keypad Frequency Entry

A desired operating frequency may be entered directly from the keypad. Just press [ENT] followed by the frequency. To accomplish direct frequency entry for the Sub VFO, simply press [SUB] [ENT] then the desired frequency (and mode, if a change is needed).

(D) MEM/VFO CH Control

The [VFO/M CH] knob on the front panel serves a dual function. Its default function is to select memory channels. However, via Menu Item 1-5, this knob may be converted into a convenient "channelized" frequency selection knob.

For quick QSY up or down a band, you may wish to select 5 kHz steps. For broadcast listening, 1 kHz steps may be more appropriate. And for FM work on 10 meters, you may wish to choose 10 kHz per step. Via Menu, the step size may be chosen in 1 kHz increments within the range of 1 ~ 100 kHz per step.

(E) Versatile Memory Functions

The FT-1000MP provides 99 channels of regular memory plus 9 channels for storing band limits or other tuning/scanning limits, as well as five QMB (Quick Memory Bank) registers for quick recall. All memory registers can store frequency, mode, IF Filter bandwidth, antenna tuner settings, and Clarifier (RIT) offset, if any.

Memory contents can be checked quickly, on a "scratchpad" basis without interrupting current-frequency operation, by rotation of the [MEM/VFO CH] knob during VFO operation.

Fig.8-1 MEMORY SYSTEM

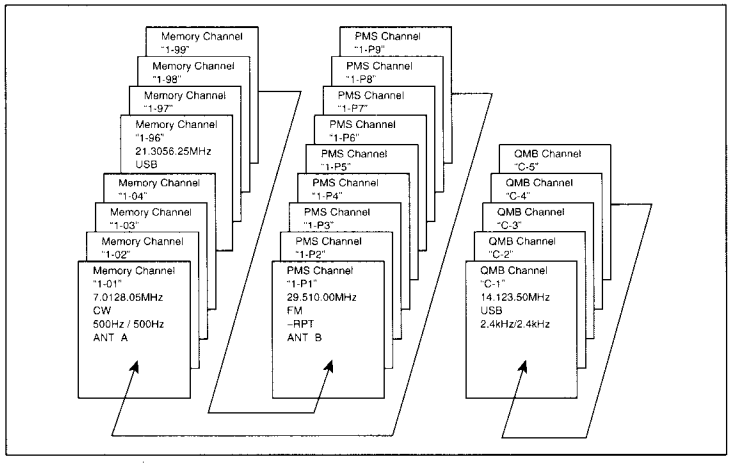


Fig.8-2 MEMORY GROUPING EXAMPLES(Menu Item 0-1/0-2/0-3/0-4/0-5)

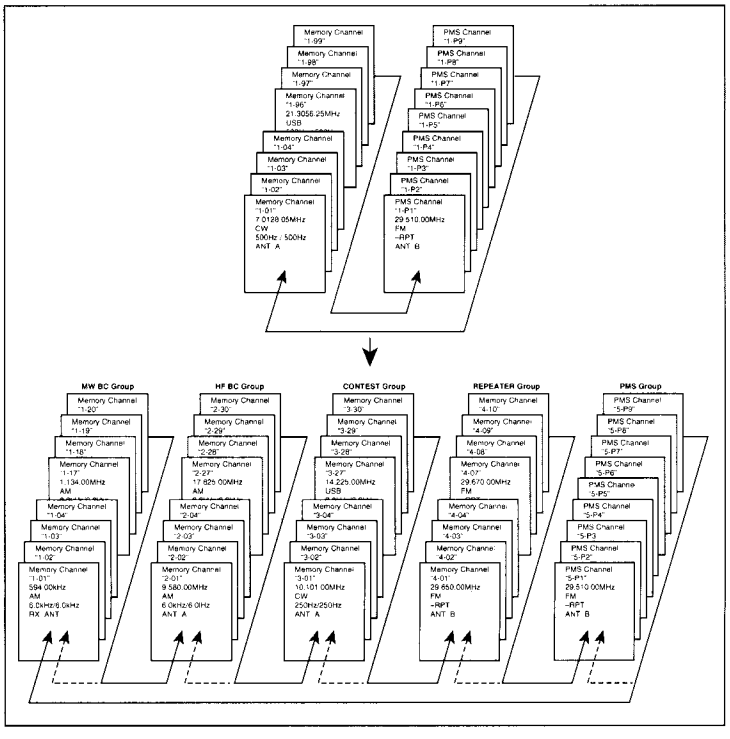
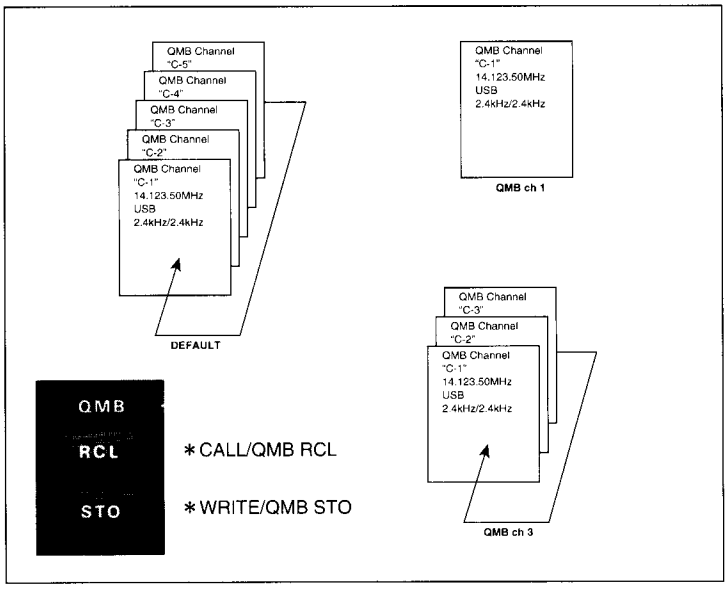


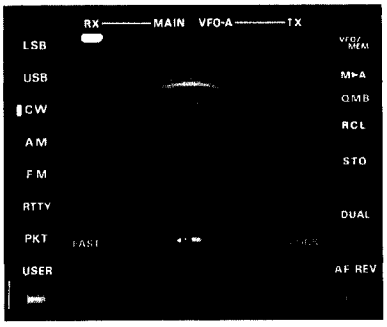
Fig.4-3 QMB MEMORY (MAX 5ch) (Menu Item 0-6)

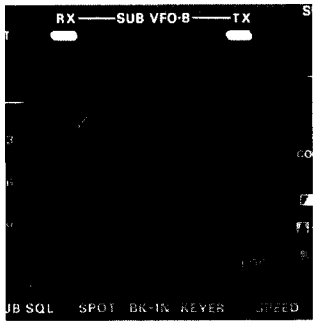


(F) VFO Selection Switches/LEDs

New on the FT-1000MP is an efficient, easy-to-recognize selection technique for selecting the Main and/or Sub VFOs for transmit or receive operation.

Above the Main and Sub VFO tuning dials are two LED/Switch combinations, each pair being labeled "RX" (Green), and "TX" (Red). By pushing these LED/Switches, selection of the Main and/or Sub VFOs for Receive (RX) operation is possible; if both LEDs glow green, then Dual Receive operation is activated. Only one VFO may, of course, be selected for Transmit (TX), operation. This technique is simple and intuitive, a valuable consideration during long operating sessions when operator fatigue is always a factor.





(G) Quick Split Feature

In order to pre-set a TX/RX split (so as to save time in a DX pile-up), Menu Item 1-6 allow you to set an automatic split anywhere from -100 kHz to +100 kHz between the Main and Sub VFOs (in 1 kHz increments). No matter where the Sub VFO is set, with Quick Split activated, a press of the [SPLIT] key will move the Sub VFO to the same band as the Main VFO occupies, with the exact frequency separated by the amount of the pre-programmed split (the default is "UP 5 kHz"). Transmit frequency command also is transferred to the Sub VFO, of course, at the same time.

(H) Carrier-Controlled Slow Scan

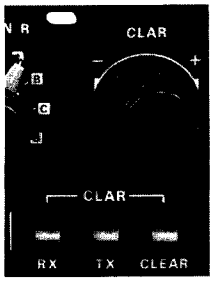
When activated, this feature slows scanning to a very slow speed while the scanner tunes across a CW or SSB signal, allowing the operator plenty of time to stop the scan, if desired.

(I) VFO Tracking

By pressing and holding in the LOCK key while turning the Main Dial, both VFOs will tune in a synchronized manner, in the same steps and at the same tuning rate.

(J) Clarifier

Receiver or transmitter offset tuning from the Main Dial frequency is provided via the "Clarifier" control, which utilizes the same type of precise magnetic rotary encoder as does the Main Dial. As on the Main Dial, Clarifier tuning steps as fine as 0.625 Hz/step can be selected.



The Clarifier maintains its programmed offset as you tune around the band, and the offset can be disabled (but remain programmed for later use) by pushing the [RX] and/or [TX] Clarifier key(s).

(K) Remote Control Terminal

If the Contest Memory Keyer feature is not in use, the "REMOTE" jack on the rear panel may be used to control a number of functions via the optional FH-1 keypad. See the chart below for the list of available functions.

Table 8-1 Remote Control Feature (Menu Selection 7-9)

Key #	Main VFO-A	Sub VFO-B	Memory Control
1	1.8 1	1.8 1	VFO MEM
2	3.5 2	3.5 2	A▸B
3	7 3	7 3	A=B
4	10 4	10 4	SPLIT
5	14 5	14 5	M▸A
6	18 6	18 6	M CK
7	21 7	21 7	A▸M
8	24.5 8	24.5 8	RCL
9	28 9	28 9	STO
10	29 0	29 0	DUAL
11	SUB CE	SUB CE	M CH UP
12	ENT	ENT	M CH DWN

9. Operating Flexibility Example: Two-Operator DX-pedition Setup

The many features of the FT-1000MP have been described in some detail in the preceding pages. The following section will describe the degree of flexibility that is available to DX-pedition operators when dealing with a huge CW pile-up as they operate from a "Most Wanted" location.

The VKØDD operation is just getting under way. The 20-meter Yagis are securely installed: one is pointed at Europe, the other at Japan and North America. Fed with equal lengths of coax, they provide a high-performance "power split" capability designed to saturate the three biggest amateur population centers. A multiband vertical antenna is also in place, to be used as a listening or emergency antenna.

Emergency redundancy is important on an expedition, as the team has already learned. During the landing operation, the cases carrying the laptop computers washed overboard, and all logging/keying will have to be done manually. Fortunately, the team was prepared for this possibility.

In the tent, the operating table is now set up with the FT-1000MP as its centerpiece. The DX-pedition team has configured the FT-1000MP with a number of devices to allow the two 20-meter operators--Dan and Diane–to exploit the pile-up in the most efficient manner:

① Two headphone have been wired so as to route Main Receiver audio to Diane, the right-side operator, and Sub Receiver audio to Dan, the left-side operator.

② The Yagi array is connected to the "Antenna A" TX/RX jack on the rear panel of the FT-1000MP.

③ The vertical antenna is connected via a two-position coaxial switch. In the "normal" position, the vertical is connected to the Receive Antenna input jack of the FT-1000MP; in its second position, the vertical is routed to the "Antenna B" TX/RX antenna jack of the transceiver.

④ Two iambic keyer paddles are connected to the transceiver, one each to the front and rear "KEY" jacks.

⑤ A two-conductor 3.5 mm "Y" connector is plugged into the rear-panel "REMOTE" jack. One branch of this splitter is connected to an FH-1 Remote Control Keypad, situated at Dan's position; the other branch is connected to a small home-built keypad with two switches on it, labeled "5NN" and "VKØDD." This mini-keypad is used by the second operator to allow sending of the most commonly-needed messages.

In Menu, Dan dials up item 4-5, and sets the EDSP CW BPF to 120 Hz, and sets item 7-0 (Electronic Keyer Mode) to "Iambic 2." Dan and Diane sit down to their respective positions, and Dan sets the FT-1000MP's VFOs up for operation. The Main VFO is set to 14.024.00 kHz in 250 Hz bandwidth, and its [LOCK] button is pushed so they won't move off frequency accidentally. Both the Green "RX" and Orange "TX" LEDs for the Main VFO are illuminated, indicating that both receive and transmit control are available on Main VFO-A. The Sub VFO-B is set to 14.030.00 MHz in 500 Hz bandwidth, and the Sub Receiver's Green "RX" LED/Switch is pushed, activating Dual Receive. Diane pushes the [RX CLAR] button, activating the RIT, and adjusts it for a receive frequency on the Main VFO-A of 14.025.00, 1 kHz up from the transmit frequency. Dan pushes the [BK-IN] and [VOX] keys. They're ready.

The operating setup, as configured, now allows the following scenario to unfold.

• Either operator has his or her own keyer paddle, with which to work someone without interfering with the other operator.

• Dan, the left operator, receives and tunes using the SUB Receiver dial. Dan is responsible for watching the range 14.030 ~ 14.035 MHz.

• Diane, the right operator, receives and tunes using the MAIN Receiver's "RX Clarifier" (RIT) knob. Diane is responsible for watching the range 14.025 ~ 14.030 MHz. Although the CLAR knob is somewhat small, the ultra-fine 0.625 Hz steps used on the RIT mean that the tuning rate will be slow enough to separate signals easily, especially using the 250 Hz IF bandwidth plus the 120 Hz EDSP filter of the Main Receiver.

Dan sends the first transmission: "CQ CQ CQ DE VKØDD VKØDD VKØDD QSX UP K." The two operators sweep across their ranges, and Dan finds the first caller, to whom he replies, "VU2RM 5NN" by sending VU2RM's call manually, then pressing the [1] key on the FH-1, which was programmed with the simple signal report "5NN" (599). VU2RM replies with "5NN TU DE VU2RM," and Dan replies by simply sending "TU VKØDD UP."

Now the pile-up erupts with thousands of stations. Diane gets a partial call on 14.026.9, to whom she sends "PA? 5NN." WØPA replies with a 599 report, to whom Diane acknowledges with "WØPA CFM TU;" while Diane was listening to WØPA on the Main Receiver, though, Dan found PA3ABM on 14.033.9 on the Sub receiver, who thought he was being called by VKØDD. Without sending a "QRZ," Dan immediately sends "PA3ABM 5NN" to work the Dutch station. And while Dan is working PA3ABM, Diane comes across PAØLOU, who also thought he was the "PA" station originally being called by VKØDD.

By now, the pile-up is becoming chaotic, as stations are beginning to figure out the "leap-frog" operating technique being utilized by Dan and Diane. Since VKØDD is operating in the "Split" mode, though, there is no QRM on their own transmitting frequency. While Dan is confirming a callsign on the Sub Receiver, Diane is pulling out a partial call on the Main Receiver. Their transmitting sequences become totally uninterrupted:

(Diane)	"PAØLOU TU (Dan) W6RJ 5NN"
(W6RJ)	"VKØDD TU 5NN W6RJ"
(Dan)	"TU (Diane) RW9AR 5NN"
(RW9AR)	"R 5NN DSW"
(Diane)	"TU (Dan) JA1YOE 5NN"
(JA1YOE)	"TU 5NN BK"
(Dan)	"TU (Diane) G3KMA 5NN"
(G3KMA)	"5NN TKS NEW IOTA"
(Diane)	"GL ROGER (Dan) W1CW 5NN" . . .

By virtue of having the completely independent receivers, dual key jacks, and the split Remote Keypad setup, the two operators have been able to take advantage of the "Constant Calling" syndrome

common in DX pile-ups by spreading the pile-up out and never calling "CQ" or "QRZ." Four hours into the operation, when Dan dashes outside for physical relief, he discovers to his astonishment that more than 1,050 QSOs are in the log, double the typical DX-pedition rate, thanks to their operating efficiencies and the outstanding selectivity of the FT-1000MP's receiver.

Pushing the [RX ANT] switch allows the team quickly to work 50 South American stations who are outside the main lobes of the two Yagis. When the VKØDD 40-meter station comes on the air, the 20-meter station experiences no interference, thanks to the HPF and BPF filters in the front end. And when two laptop computers are salvaged and made operational the second day of the expedition, their keying interfaces are connected in place of the two keyer paddles (and the internal electronic keyer turned off), allowing networked computer logging and keying of the transceiver, thus reducing operator fatigue. The ten-day operation concluded with over 78,000 QSOs logged by the eleven operators, who put VKØDD on the air from the Isle of Dundee, a small volcanic crag in the Australian Antarctic that had been buried under ice for thousands of years. The brief eruption of Mount Dundee had melted the surrounding ice, creating yet another DX-pedition opportunity for Yaesu, The Choice of the World's Top DXers.

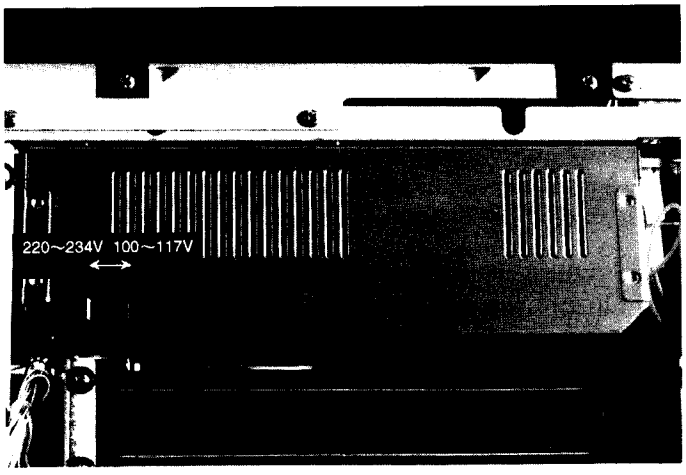
Although the above story is fictional, it accurately depicts the installation and operating flexibility provided by the FT-1000MP. For multioperator DX-pedition or contest work, or for maximum-efficiency single-operator efforts, the FT-1000MP is designed to perform and excel under the most demanding conditions.

10. Low Noise Switching Regulator Power Supply

Except in the case of the FT-1000MP/DC, the FT-1000MP is equipped with a low-noise, highly efficient switching-regulator power supply.

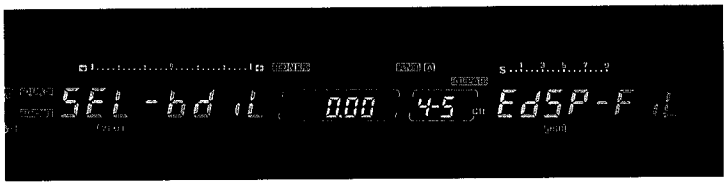
Eliminating the need for a separate power supply unit elsewhere in the station, the switching-regulator AC power supply incorporated into the FT-1000MP features light weight along with sufficient capacity to stand up to heavy-duty operational requirements of contest or DX-pedition operators.

Additionally, the power supply unit is very forgiving of input voltage variations, accepting inputs of 100~125V AC or 200~240V AC, with easy switching from low to high input voltage ranges. In the event that only DC power is available, the optional DC cable (supplied with the FT-1000MP/DC) may be used for 13.5V DC operation.



11. Menu Customization of Transceiver Features

The Menu System of the FT-1000MP allows extensive capability for the operator to customize many aspects of transceiver configuration, so as to provide the most owner-friendly amateur radio apparatus ever created.



(A) Menu Mode

A total of 81 Menu functions are available, pursuant to the chart below. The Menu mode is activated by pushing the [FAST] and [ENT] keys simultaneously; thereafter, the [VFO/M CH] control, the Main Dial, and (for some functions) the Sub Dial are rotated to select the desired Menu item and/or settings.