Introduction

The FT-897 is a rugged, innovative multiband, multimode portable transceiver for the amateur radio MF/HF/VHF/UHF bands. Providing coverage of the 160-10 meter bands plus the 6 m, 2 m, and 70 cm bands, the FT-897 includes operation on the SSB, CW, AM, FM, and Digital modes, yielding the most comprehensive performance package available for field operation.

Designed for use from (1) an external DC power source, (2) internal battery (requires optional FNB-78 Ni-MH battery pack), or (3) AC power source (requires optional FP-30 External AC Power Supply), the FT-897 provides 100 watts of power output from a 13.8-Volt external power supply or AC operation. When using the optional FNB-78 Ni-MH Battery Pack, the FT-897 automatically switches to 25 Watts of output power.

The multi-function Liquid-Crystal Display includes various backlighting, which may be disabled for battery conservation. The display includes bar-graph indication of power output, ALC voltage, SWR, and modulation level. Also include are a number of operating status icons, as well as the function displays for the three operating function keys (A, B, and C).

Among the advanced features of the FT-897 are many incorporated only in large base-station transceivers. These include Dual VFOs; Split-Frequency operation; Digital Signal Processing (Bandpass Filtering, Noise Reduction, Notch, and Microphone Equalizer); IF Shift; Clarifier ("R.I.T."); IF Noise Blanker; AGC Fast/Slow/Auto/Off selection; RF Gain and Squelch control; IPO (Intercept Point Optimization) and a receiver front-end Attenuator; AM Aircraft reception; AM and FM Broadcast reception; VOX; Built-in Electronic Keyer; Adjustable CW Pitch; Automatic FM Repeater Shift (ARS); Built-in CTCSS Encoder/Decoders; ARTS™ (Auto-Range Transponder System); Smart Search™ Automatic Memory Loading System; Spectrum Scope; 200 Memories plus Home Channels and Band-limiting Memories; Alpha-Numeric Labeling of Memories; Automatic Power-Off (APO) and Time-Out Timer (TOT) functions; Computer Interface capability; and Cloning capability.

We urge you to read this manual in its entirety, so as to gain a full understanding of the amazing capability of the exciting FT-897 Transceiver.

Specifications

<u>General</u>

Frequency Range:	Receive:	100 kHz-56 MHz
		76 MHz-108 MHz
		118 MHz-164 MHz
		420 MHz-470 MHz
	Transmit:	160 - 6 Meters
		2 Meters
		70 Centimeters (Amateur bands only)
		5.1675 MHz
		Alaska Emergency Frequency (USA only)

Emission Modes: A1 (CW), A3 (AM), A3J (LSB/USB), F3 (FM),

F1 (9600 bps packet), F2 (1200 bps packet)

Synthesizer Steps (Min.): 10 Hz (CW/SSB), 100 Hz (AM/FM/WFM)

Antenna Impedance: 50 Ohms, Unbalanced (M)

Operating Temp. Range: -10 °C to +60 °C (+14 °F to +140 °F)

Frequency Stability: $\pm$ 4 ppm from 1 min. to 60 min after power on.

@25 °C: 1 ppm/hour

$\pm$ 0.5 ppm/1 hour @25 °C, after warmup

(with optional TCXO-9)

Supply Voltage: Normal: 13.8 VDC$\pm$ 15 %, Negative Ground

Current Consumption: Squelched: 500 mA (Approx.)

Receive: 1 A

Transmit: 22 A

Case Size: ???" x ??" x ??" (??? (W) x ??? (H) x ??? (D) mm)

Weight (Approx.): ? kg (w/Alkaline battery, antenna, w/o Microphone)

<u>Transmitter</u>

RF Power Output:	HF-50MHz:	100 W (SSB/CW/FM), 25 W (AM Carrier)
@13.8 V DC	144MHz:	50 W (SSB/CW/FM), 12.5 W (AM Carrier)
	430MHz:	20 W (SSB/CW/FM), 5 W (AM Carrier)

Modulation Types: SSB: Balanced Modulator

AM: Early Stage (Low Level)

FM: Variable Reactance

FM Maximum Deviation: $\pm$ 5 kHz (FM-N: $\pm$ 2.5 kHz)

Spurious Radiation: -50 dB (1.8-29.7 MHz)

-60 dB (50/144/430 MHz)

Carrier Suppression: >40 dB

Opp. Sideband Suppression: >50 dB

SSB Frequency Response: 400 Hz-2600 Hz (-6 dB)

Microphone Impedance: 200-10k Ohms (Nominal: 600 Ohms)

Receiver

Circuit Type: Double-Conversion Superheterodyne

Intermediate Frequencies: 1st: 68.33 MHz (SSB/CW/AM/FM); 10.7 MHz (WFM)

2nd: 455 kHz

Sensitivity:

	SSB/CW	AM	FM
100 kHz-1.8Hz	-	32 µV	-
1.8 MHz-28 MHz	0.2 µV	2 µV	-
28 MHz-30 MHz	0.2 µV	2 µV	0.5 µV
50 MHz-54 MHz	0.125 µV	1 µV	0.2 µV
144/430 MHz	0.125 µV	-	0.2 µV

(SSB/CW/AM = 10 dB S/N, FM = 12 dB SINAD)

Squelch Sensitivity:

	SSB/CW/AM	FM
100 kHz-1.8Hz	-	-
1.8 MHz-28 MHz	2.5 µV	-
28 MHz-30 MHz	2.5 µV	0.32 µV
50 MHz-54 MHz	1 µV	0.16 µV
144/430 MHz	0.5 µV	0.16 µV

Image Rejection: HF/50 MHz: 70 dB

144/430 MHz: 60 dB

IF Rejection: 60 dB

Selectivity (-6/-60 dB): SSB/CW: 2.2 kHz/4.5 kHz

AM: 6 kHz/20 kHz

FM: 15 kHz/30 kHz

FM-N: 9 kHz/25 kHz

CW-N (option): 500 Hz/2.0 kHz

AF Output: 2.5 W (@4 Ohms, 10% THD or less)

AF Output Impedance: 4-16 Ohms

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ACCESSORIES & OPTIONS

Supplied Accessories

Available Options

FP-30   External AC Power Supply

FNB-78   Ni-MH Battery Pack (13.2 V, 4800 mAh)

PA-26B/C/U   Ni-MH Battery Charger

YF-122S   Collins SSB Filter (2.3 kHz/4.7 kHz: -6 dB/-66 dB)

YF-122C   Collins CW Filter (500 Hz/2 kHz: -6 dB/-60 dB)

TCXO-9   TCXO Unit (±0.5 ppm)

FC-30   External Automatic Antenna Tuner

ATAS-120   Active-Tuning Antenna System

ATBK-100   Antenna Base Kit

ATAS-25

VL-1000   Solid-State Linear Amplifier

MD-200A8X   Desktop Microphone

MH-36E8J   DTMF Microphone

CT-62   CAT Interface Cable

CT-39A   Packet Cable

CT-58   BAND DATA Cable

Installation

Power Connections

The **FT-897** is designed use from (1) an external DC power source, (2) internal battery (requires optional **FNB-78** Ni-MH battery pack), or (3) AC power source (requires optional FP-30 External AC Power Supply).

External DC power source operation

The DC power connector for the **FT-897** must only be connected to a DC source providing 13.8 Volts DC (±15%), and capable of at least 22 Amperes of current. Always observe proper polarity when making DC connections:

The Red DC power lead connects to the Positive (+) DC terminal; and

The Black DC power lead connects to the Negative (–) DC terminal.

In mobile installations, noise pickup may be minimized by connecting the DC cable directly to your vehicle's battery, rather than to the ignition switch or "accessory" circuitry. Direct connection to the battery also provides the best voltage stability.

Tips for Successful Mobile Installations:

❒ Before connecting the DC cable to the battery, measure the voltage across the battery terminals with the engine running fast enough to show a charge. If the voltage is above 15 Volts, the vehicle's voltage regulator should be adjusted to reduce the charging voltage to 14 Volts or lower.

❒ Route the DC cable as far away from the ignition cables as possible.

❒ If the DC cable is not long enough, use #12 AWG (minimum) stranded, insulated wire to extend it. Be certain to solder the connections at the splice securely, and provide ample insulation for the soldered splice (heat shrink tubing plus black electrical tape work well).

❒ Check the battery terminal connections frequently to be sure they are tight and not corroded.

Caution

Permanent damage can result if improper supply voltage, or reverse-polarity voltage, is applied to the **FT-897**. The Limited Warranty on this transceiver does not cover damage caused by application of AC voltage, reversed polarity DC, or DC voltage outside the specified range of 13.8V ±15%. Never attempt to connect the **FT-897** to a 24 Volt battery

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system.

When replacing fuses, be certain to use a fuse of the proper rating. The **FT-897** requires a 25A fast-blow fuse.

AC power source operation (requires optional FP-30 **AC power supply)**

For base station installations, Yaesu recommends the use of the **FP-30** AC power supply.

Installation
1. Remove the six screws (three screws on bottom side and rear side), then lift off the bottom cover.
2. Attach the **FP-30** to the bottom of the **FT-897**, then affix it in place with the six screws removed above steps.
3. Connect the 6-pin Molex plug from the **FP-30** to the **INPUT** jack on the rear panel of the **FT-897**.
4. Make sure that your AC voltage is correct and turn the **FP-30** POWER switch to off, connect the AC power cable between the **INPUT** jack on the rear panel of the **FP-30** and AC wall outlet.

Operation
1. To turn the transceiver on, turn on the **POWER** switch on the **FP-30** <u>before</u> turning on the **PWR** switch on the **FT-897**.
2. To turn the transceiver off, turn off the **PWR** switch on the **FT-897** <u>before</u> turning off the **POWER** switch on the **FP-30**.

<u>Internal battery operation (requires optional FNB-78 Ni-MH battery pack)</u>

The optional **FNB-78** Ni-MH Battery Pack provides 13.2 Volts of DC power for your **FT-897**, with a maximum capacity of 4800 mAh (you may install the two **FNB-78** into the **FT-897**, in this time, maximum capacity is 9.6 Ah!).

Installation
1. Remove the six screws (three screws on bottom side and rear side), then lift off the bottom cover.
2. Insert the **FNB-78** into the battery compartment "A" or "B" on the bottom of the radio so that the battery's mounting tab is aligned with the mounting hole on the radio's chassis.
3. Connect the 3-pin connector from the **FNB-78** to the battery jack on the radio's

chassis, which is same label ("A" or "B") of the battery compartment witch is the **FNB-78** installed.

4. Remove the plastic cap, which is same label ("A" or "B") of the battery compartment witch is the **FNB-78** installed, from the to bottom cover, before turning the plastic cap so that the small project of the cap is aligned with the slot of the bottom cover.

5. Replace the bottom cover and its six screws.

Charging

Charging of the **FNB-78** requires the use of the optional **PA-26** Battery Charger and **CD-22** Charge Adapter.

1. Turn the radio off.

2. Connect the cable plug from the **PA-26** battery charger into the **INPUT** jack on the **CD-22** Charge Adapter, then insert the cable plug from the **CD-22** into the "**CHG-A**" or "**CHG-B**" jack on the rear of the radio.

3. Connect the AC cable into the **AC** jack on the **PA-26**, then plug the **PA-26** into the AC wall outlet.

4. The "**BATT-A**" or "**BATT-B**" indicator on the front panel of the **FT-897** will glow red (Charging) while the battery is being charged. When charging is completed, the red LED indicator will change to green (Fully Charged). A fully-discharged pack will be charged completely in about <<??>> hours.

5. Unplug the cable from the **CHG** terminal, then disconnect the **PA-26** from the AC wall outlet.

Operation

Before turn the radio on, select the battery to be used by top panel's **A-B** switch.

Grounding

The provision of an effective ground system is important in any successful communications station. A good ground system can contribute to station efficiency in a number of ways:

❒   It can minimize the possibility of electrical shock to the operator.

❒   It can minimize RF currents flowing on the shield of the coaxial cable and the chassis of the transceiver which may cause interference to nearby home entertainment devices or laboratory test equipment.

❒   It can minimize the possibility of erratic transceiver operation caused by RF feedback or improper current flow through logic devices.

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An effective earth ground system may take several forms; for a more complete discussion, see an appropriate RF engineering text. The information presented below is intended only as a guideline.

Inspect the ground system – inside the station as well as outside – on a regular basis so as to ensure maximum performance and safety.

Mobile Station Grounding

Although satisfactory grounding in most installations will be achieved via the DC cable's negative lead and the antenna system's coaxial cable shield, it is often recommended that you provide a direct ground connection to the vehicle chassis at the mounting location of the transceiver (installation using the optional **MMB-??** Mobile Bracket will accomplish this, if the **MMB-??** itself is mounted to the vehicle's chassis). Due to unexpected resonance which may naturally occur in any location, improper communication system performance may result from insufficient grounding. These symptoms may include:

- ❒ RF feedback (resulting in distortion on your transmitted signal);
- ❒ Unintended frequency change;
- ❒ Blinking or blanking of the frequency display;
- ❒ Noise pickup; and/or
- ❒ Loss of memory.

Note that these conditions may occur in any communications installation. The **FT-897** includes extensive filtering designed to minimize the chance of such problems; however, random currents set up by insufficient RF grounding can nullify such filtering. Bonding the rear panel Ground lug of the **FT-897** transceiver to the vehicle or vessel's ground system should clear up any such difficulties.

Yaesu does not recommend the use of "on glass" mobile antennas unless the shield of the coaxial cable is securely grounded near the feedpoint of the antenna. Such antennas frequently are responsible for the ground-related difficulties described above.

Base Station Earth Grounding

Typically, the ground connection consists of one or more copper-clad steel rods, driven into the ground. If multiple ground rods are used, they should be configured in a "V" configuration, and bonded together at the apex of the "V" which is nearest the station

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location. Use a heavy, braided cable (such as the discarded shield from type RG-213 coaxial cable) and strong cable clamps to secure the braided cables to the ground rods. Be sure to weatherproof the connections to ensure many years of reliable service. Use the same type of heavy, braided cable for the connections to the station ground bus (described below).

Do not use gas line pipes in an attempt to provide a ground connection! To do so creates a serious risk of explosion!!

Inside the station, a common ground bus consisting of a copper pipe of at least 25 mm (1") diameter should be used. An alternative station ground bus may consist of a wide copper plate (single-sided circuit board material is ideal) secured to the bottom of the operating desk. Grounding connections from individual devices such as transceivers, power supplies, and data communications devices should be made directly to the ground bus using a heavy, braided cable.

Do not make ground connections from one electrical device to another, and thence to the ground bus. This so-called "Daisy Chain" grounding technique may nullify any attempt at effective radio frequency grounding. See the drawings below for examples of proper and improper ground connections. If your coaxial cable does not connect directly to the station ground bus, you may connect a ground cable to the Ground lug on the **FT-897** rear panel.

Antenna Considerations

The antenna systems connected to your **FT-897** transceiver are, of course, critically important in ensuring successful communications. The **FT-897** is designed for use with any antenna system providing a 50Ω resistive impedance at the desired operating frequency. While minor excursions from the 50Ω specification are of no consequence, the power amplifier's protection circuitry will begin to reduce the power output of there is more than a 50% divergence from the specified impedance (less than 33 Ω or greater than 75 Ω, corresponding to a Standing Wave Ratio (SWR) of 1.5:1).

Two antenna jacks are provided on the rear panel of the **FT-897**. The "**HF/50 MHz ANT**" jack is used for HF and 50 MHz, while the "**144/430 MHz ANT**" jack is used for 144 MHz and 430 MHz.

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Guidelines for successful base and mobile station installations are shown below.

Mobile Antenna Installations

Mobile antennas for the HF bands, with the possible exception of those designed for 28 MHz, display very high "Q" due to the fact that they must be physically shortened, then resonated using a loading coil. Additional system bandwidth may be realized using the Yaesu **FC-30** Automatic Antenna Tuner, which will present a 50Ω impedance to your transceiver on the 1.8 ~ 50 MHz bands so long as the SWR on the coaxial line connected to the **FC-30** is below 3:1.

On the VHF and UHF bands, coaxial line losses increase so rapidly in the presence of SWR that we recommend that all impedance matching to 50Ω be performed at the antenna feedpoint.

Yaesu's Active-Tuned Antenna System (**ATAS-120**) is a unique HF/VHF/UHF mobile antenna system, which provides automatic tuning when used with the **FT-897**. See page <<??>> for full details on the **ATAS-120**.

For VHF/UHF weak-signal (CW/SSB) operation, remember that the antenna polarization standard for these modes is horizontal, not vertical, so you must use a loop or otherwise horizontally-polarized antenna so as to avoid cross-polarization loss of signal strength (which can be 20 dB or more!). On HF, signals propagated via the ionosphere develop mixed polarizations, so antenna selection may be made strictly on mechanical considerations; vertical antennas are almost always utilized on HF for this reason.

Base Station Antenna Installations

When installing a "balanced" antenna such as a Yagi or dipole, remember that the **FT-897** is designed for use with an (unbalanced) coaxial feedline. Always use a balun or other balancing device so as to ensure proper antenna system performance.

Use high-quality 50Ω coaxial cable for the lead-in to your **FT-897** 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 a coaxial line with 0.5 dB of loss at 7 MHz may have 6 dB of loss at 432 MHz (thereby consuming 75% of your transceiver's power output!). As a general rule, smaller-diameter coaxial cables

tend to have higher losses than larger-diameter cables, although the precise differences depend on the cable construction, materials, and the quality of the connectors used with the cable. See the cable manufacturers' specifications for details.

For reference, the chart below shows approximate loss figures for typically- available coaxial cables frequently used in HF installations.

Always locate antennas such that they can never come in contact with outdoor power lines in the event of a catastrophic support or power-pole structural failure. Ground your antennas' support structure(s) adequately, so as to dissipate energy absorbed during a lightning strike. Install appropriate lightning arrestors in the antenna coaxial cables (and rotator cables, if rotary antennas are used).

In the event of an approaching electrical storm, disconnect all antenna lead-in, rotator cables, and power cables completely from your station if the storm is not immediately in your area. Do not allow disconnected cables to touch the case of your **FT-897** transceiver or accessories, as lightning can easily jump from the cable to the circuitry of your transceiver via the case, causing irreparable damage. If a lightning storm is in progress in your immediate area, do not attempt to disconnect the cables, as you could be killed instantly if lightning should strike your antenna structure or a nearby power line.

If a vertical antenna is utilized, be certain that humans and/or pets and farm animals are kept away both from the radiating element (to prevent electrical shock and RF exposure danger) and the ground system (in the event of an electrical storm). The buried radials of a ground-mounted vertical antenna can carry lethal voltages outward from the center of the antenna in the event of a direct lightning strike.

RF Field Exposure
This transceiver is capable of power output in excess of 50 Watts, so customers in the United States may be required to demonstrate compliance with Federal Communications Commission (FCC) regulations concerning maximum permissible exposure to radio frequency energy. Compliance is based on the actual power output used, feedline loss, antenna type and height, and other factors which can only be evaluated as a system.

Information regarding these regulations may be available from your Dealer, your local

radio club, from the FCC directly (press releases and other information can be found on the FCC's site on the World Wide Web at <http://www.fcc.gov>), or from the American Radio Relay League, Inc. (225 Main St., Newington CT 06111 or <http://www.arrl.org>).

Although there is negligible radio frequency (RF) leakage from the **FT-897** transceiver itself, its antenna system should be located as far away from humans and animals as practicable, so as to avoid the possibility of shock due to accidental contact with the antenna or excessive long-term exposure to RF energy. During mobile operation, do not transmit if someone is standing adjacent to your antenna, and use the lowest power possible.

Never stand in front of an antenna (during testing or operation) when RF power is applied, especially in the case of 430 MHz directional arrays. The 20 Watt power output supplied by the **FT-897**, combined with the directivity of a beam antenna, can cause immediate heating of human or animal tissues, and may cause other undesirable medical effects.

Electromagnetic Compatibility

If this transceiver is used with, or in the vicinity of, a computer or computer-driven accessories, you may need to experiment with grounding and/or Radio Frequency Interference (RFI) suppression devices (such as ferrite cores) to minimize interference to your communications caused by energy from the computer. Computer-generated RFI is usually a result of inadequate shielding of the computer's cabinet or I/O and peripheral connections. While computer equipment may "comply" with RF emission standards, this does not ensure that sensitive Amateur Radio receivers like the **FT-897** will not experience interference from the device!

Be certain to use only shielded cables for TNC-to-Transceiver connections. You may need to install AC line filters on the power cord(s) of the suspected equipment, and decoupling ferrite toroidal chokes may be required on interconnecting patch/data cables. As a last resort, you can try installing additional shielding within the computer's case, using appropriate conductive mesh or conductive shielding tape. Especially check "RF holes" where plastic is used for cabinet front panels.

For further information, consult amateur radio reference guides and publications relating to RFI suppression techniques.

Heat and Ventilation

To ensure long life of the components, be certain to provide adequate ventilation around the cabinet of the **FT-897**. The cooling system of the transceiver must be free to draw cool air in from the side of the transceiver and expel warm air from the rear of the transceiver.

Do not install the transceiver on top of another heat-generating device (such as a linear amplifier), and do not place equipment, books, or papers on top of the transceiver. Place the transceiver on a hard, flat, stable surface. Avoid heating vents and window locations that could expose the transceiver to excessive direct sunlight, especially in hot climates.

Linear Amplifier Interfacing

The **FT-897** provides the switching and drive-control lines required for easy interfacing to most all commonly-available amplifiers sold today.

These include:
- ❒ The Antenna Jacks ("**HF/50MHz**" and "**144/430MHz**");
- ❒ A T/R control line (open circuit on RX, closure to ground on TX); and
- ❒ A negative-going **ALC** jack (control voltage range: 0V to –4V DC).
- ❒ When interfacing to the **VL-1000** Solid State 1 KW Linear Amplifier, the optional **CT-58** Interface Cable provides for easy interconnection (requires that the Menu Mode **No-80** [**SIO MODE**] setting changes to "**LINEAR**").

The rear-panel **ACC** jack is a miniature stereo type, which accepts ALC control voltage input on the tip connection, and T/R control on the ring connection. The main shaft is used for the ground connection.

Typical amplifier interface circuits are shown below.
Note that some amplifiers, particularly VHF or UHF "brick" amplifiers, offer two methods of T/R switching: application of +13V or a closure to ground.

Be sure to configure your amplifier so that it switches via a closure to ground, as provided by your **FT-897**. Alternatively, many of these amplifiers use "RF Sensing" to control their relays; if yours is not in this category, you may then use the T/R control line from the ring of the **ACC** jack for control of your HF linear amplifier, if desired.

The T/R control line is a transistor "open collector" circuit, capable of handling positive amplifier relay coil voltages of up to +50V DC and current of up to 400 mA. If you plan on using multiple linear amplifiers for different bands, you must provide external band-switching of the "Lin Tx" relay control line from the "ring" connection of the **ACC** jack.

Important Note!
Do not exceed the maximum voltage or current ratings for the **ACC** jack. This jack is not compatible with negative DC voltages, nor AC voltages of any magnitude.

Most amplifier control relay systems require only low DC voltage/current switching capability (typically, +12V DC at 25 ~ 75 mA), and the switching transistor in the **FT-897** will easily accommodate such amplifiers.

CW Key/Keyer Connections
All commonly-available keyer paddles should work perfectly with the built-in Electronic Keyer. The wiring configuration for the paddle is shown below.

For straight-key operation, only the tip and shaft connections are used.

Note: Even when using a straight key, you must use a three-conductor ("stereo") plug. If a two-conductor plug is used, the key line will be constantly shorted to ground.

When using an external electronic keyer, be absolutely certain that it is configured for "positive" keying, not "negative" or "grid block" keying. The "key-up" voltage of the **FT-897** is +5V, and the "key-down" current is only about 1 mA.

For CW automated keying using a personal computer, with an external memory keyer providing for manual sending, it usually is possible to connect the keyed lines together via a "Y" connector. Check with the documentation accompanying your keyer and your contest/DX software for any cautions which need to be observed.

Receiver Accessories (Tape Recorder etc.)
Connection of a tape recorder or other such receiver accessory is easily accomplished by using the **DATA** jack's Data Out (1200 bps) terminal (Pin 5) and Ground (Pin 2). The audio output is fixed at 100 mV, with an impedance of 600 Ω.

Adjusting the Front Feet

The two front feet of the transceiver allow the transceiver to be tilted upward for better viewing. Simply fold both feet forward to raise the front of the transceiver, and fold them back against the bottom case to lower the front of the **FT-897**.

Front Panel Control & Switches

(1) Liquid Crystal Display

The Liquid Crystal Display (LCD) provides indication of the operating frequency and other aspects of transceiver status.

(2) **FUNC** Keys

These three keys select many of the most important operating features of the transceiver. When press the [**F**] key then rotating the **MEM/VFO CH** knob; the current function of that key (appeared above each of the [**A**], [**B**], and [**C**] keys (along the bottom of the LCD)) scrolls the display through 17 rows of functions available for use via the [**A**], [**B**], and [**C**] keys.

The available features are shown in chart below.

Multi Function Row "a" (MFa) [**A/B**, **A=B**, **SPL**]

[**A**] Key: **A/B**

Press the [**A**](**A/B**) key to switch between VFO-A and VFO-B on the display.

[**B**] Key: **A=B**

Press and hold in the [**B**](**A=B**) key for one second to copy the contents of VFO-A into the VFO-B register, so that the two VFOs' contents will be identical.

[**C**] Key: **SPL**

Press the [**C**](**SPL**) key to activate Split frequency operation between VFO-A and VFO-B.

Multi Function Row "b" (MFb) [**MW**, **MC**, **TAG**]

[**A**] Key: **MW**

Press and hold in the [**A**](**MW**) key for one second to transfer the contents of the VFO

into a Memory register.

[**B**] Key: **MC**

Press the [**B**](**MC**) key to designate the current Memory channel to be "skipped" during scanning.

[**C**] Key: **TAG**

Press the [**C**](**TAG**) key to select the display type (Frequency or Alpha-numeric Tag) during Memory operation.

Multi Function Row "c" (MFc) [**STO**, **RCL**, **PROC**]

[**A**] Key: **STO**

Press the [**A**](**STO**) key to store the contents of the VFO into the QMB (Quick Memory Bank) register.

[**B**] Key: **RCL**

Press the [**B**](**RCL**) key to recall the QMB Memory.

[**C**] Key: **PROC**

Press the [**C**](**PROC**) key to activate the speech processor for SSB transmission.

Press and hold in the [**C**](**PROC**) key for one second to recall Menu Mode **No-074** [**PROC LEVEL**] (for setting the compression level of the AF Speech Processor).

Multi Function Row "d" (MFd) [**RPT**, **REV**, **VOX**]

[**A**] Key: **RPT**

Press the [**A**](**RPT**) key to select the direction of the uplink frequency shift (+, –, or simplex) during FM repeater operation.

Press and hold in the [**A**](**RPT**) key for one second to recall Menu Mode **No-076** [**RPT SHIFT**] (for setting the shift frequency offset).

[**B**] Key: **REV**

Press the [**B**](**REV**) key to reverse the transmit and receive frequencies while working through a repeater.

[**C**] Key: **VOX**

Press the [**C**](**VOX**) key enable the VOX (voice-operated transmitter switching

system) in the SSB, AM, and FM modes.

Press and hold in the [**C**](**VOX**) key for one second to recall Menu Mode **No-090** [**VOX GAIN**] (for setting the VOX gain level).

Multi Function Row "e" (MFe) [**TON/ENC**, ----/**DEC**, **TDCH**]

[**A**] Key: **TON/ENC**

Press the [**A**](**TON**) key to activate the CTCSS or DCS operation.

When the Split Tone feature is activated via the Menu Mode **No-85** [**TONE SPLIT**], this key function changes to "ENC." Press the [**A**](**ENC**) key to activate the CTCSS encoder or DCS encoder.

Press and hold the [**A**](**TON/ENC**) key for one second to recall the Menu Mode **No-084** [**TONE FREQ**] (for selecting the CTCSS tone frequency).

[**B**] Key: ----/**DEC**

Normally, this key is No Action.

When the Split Tone feature is activated via the Menu Mode **No-85** [**TONE SPLIT**], this key function changes to "DEC." Press the [**B**](**DEC**) key to activate the CTCSS decoder or DCS decoder.

Press and hold the [**B**](**DEC**) key for one second to recall the Menu Mode **No-032** [**DCS CODE**] (for selecting the DCS code).

[**C**] Key: **TDCH**

Press the [**C**](**TDCH**) key to initiate the Tone or DCS Search.

Multi Function Row "f" (MFf) [**ARTS**, **SRCH**, **PMS**]

[**A**] Key: **ARTS**

Press the [**A**](**ARTS**) key to initiate the Auto-Range Transponder mode.

Press and hold the [**A**](**ARTS**) key for one second to recall the Menu Mode **No-008** [**ARTS BEEP**] (for selecting the ARTS "Beep" option).

[**B**] Key: **SRCH**

Press the [**B**](**SRCH**) key to activate the Smart Search feature.

Press and hold in the [**B**](**SRCH**) key for one second to initiate the Smart Search.

[**C**] Key: **PMS**

Press the [**C**](**PMS**) key to activate the Programmable Memory Scan feature.

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Multi Function Row "g" (MFg) [**SCN, PRI, DW**]

[**A**] Key: **SCN**

Press the [**A**](**SCN**) key to initiate the Scanning (in the direction of higher frequencies).

[**B**] Key: **PRI**

Press the [**B**](**PRI**) key to activate the Priority Scan.

[**C**] Key: **DW**

Press the [**C**](**DW**) key to activate the Dual Watch feature.

Multi Function Row "h" (MFh) [**SSM, WIDH, STEP**]

[**A**] Key: **SSM**

Press the [**A**](**SSM**) key to activate the Spectrum Scope Monitor feature.
Press and hold in the [**A**](**SSM**) key for one second to initiate the Spectrum Scope.

[**B**] Key: **WIDH**

Press the [**B**](**WIDH**) key to select the visible bandwidth for the Spectrum Scope Monitor.
Press and hold the [**B**](**WIDH**) key for one second to select the operating mode for the Spectrum Scope Monitor.

[**C**] Key: **STEP**

Press the [**C**](**STEP**) key to select the channel steps for Spectrum Scope Monitor.
Press and hold in the [**C**](**STEP**) key for one second to activate the MAX HOLD feature, which is holding the maximum signal strength level for each channels.

Multi Function Row "i" (MFi) [**MTR, ----, DISP**]

[**A**] Key:

Pressing the [**A**](**MTR**) key repeatedly allows selection of the display function of the meter in the transmit mode.

    PWR → ALC → SWR → MOD → PWR …

The selected function is appeared above the [**B**] key.
Press and hold the [**A**](**MTR**) key for one second to recall the Menu Mode **No-060** [**MTR PEAK HOLD**] (for setting the "Peak-Hold" function of the meter).

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[**B**] Key:

Pressing the [**B**] key repeatedly allows selection of the display function of the meter in the transmit mode.

PWR → MOD → SWR → ALC → PWR …

[**C**] Key: **DISP**

Press the [**C**](**DISP**) key to switch the display between the Large Character and Small Character modes.

Multi Function Row "j" (MFj) [**SPOT, BK, KYR**]

[**A**] Key: **SPOT**

Press the [**A**](**SPOT**) key to activate the CW receiver spotting heterodyne oscillator.

[**B**] Key: **BK**

Press the [**B**](**BK**) key to activate the CW "Semi" break-in operation.

Press and hold in the [**B**](**BK**) key for one second to recall the Menu Mode **No-023** [**CW DELAY**] (for setting the CW delay time).

[**C**] Key: **KYR**

Press the [**C**](**KYR**) key to activate the built-in Electronic Keyer.

Press and hold in the [**C**](**KYR**) key for one second to recall the Menu Mode **No-029** [**CW SPEED**] (for setting the Keyer speed).

Multi Function Row "k" (MFk) [**TUN, SHRT, EXTD**]

[**A**] Key: **TUN**

Press the [**A**](**TUN**) key to activate the optional Automatic Antenna Tuner or Active Tuning Antenna System.

Press and hold in the [**A**](**TUN**) key for one seconds to initiate tuner or antenna retuning.

[**B**] Key: **SHRT**

Press and hold in the [**B**](**SHRT**) key to lower the ATAS-120 antenna.

[**C**] Key: **EXTD**

Press and hold in the [**C**](**EXTD**) key to raise the ATAS-120 antenna.

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Multi Function Row "l" (MFl) [**NB**, **AGC**, ----]

[**A**] Key:

Press the [**A**](**NB**) key to activate the receiver's IF Noise Blanker.

Press and hold in the [**A**](**NB**) key for one second to recall the Menu Mode **No-63 [NB LEVEL**] (for setting of the NB level).

[**B**] Key: **AGC**

Press the [**B**](**AGC**) key to activate the receiver's AGC system.

[**C**] Key: **AGCSPEED**

Press the [**C**](**AGCSPEED**) key to select the recovery time (SLOW, FAST, or AUTO) for the receiver's AGC system.

Multi Function Row "m" (MFm) [**IPO**, **ATT**, **NAR**]

[**A**] Key: **IPO**

Press the [**A**](**IPO**) key to bypass the receiver preamplifier, thereby activating Intercept Point Optimization for improved overload characteristics while operate on the HF bands.

Press the [**A**](**IPO**) key to activate the receiver preamplifier while operate on the 50 MHz band.

[**B**] Key: **ATT**

Press the [**B**](**ATT**) key to engage the receiver front-end attenuator, which will reduce all signals and noise by approximately 10 dB.

The ATT feature does not function on 144/430 MHz.

[**C**] Key: **NAR**

Press the [**C**](**NAR**) key to selects the low-deviation mode required for HF FM operation on 29 MHz.

Multi Function Row "n" (MFn) [**CERF**, **OPF1**, **OPF2**]

[**A**] Key:

Press the [**A**](**CERF**) key to select the 2.4 kHz ceramic IF filter.

[**B**] Key:

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Press the [**B**](**OPF1**) key to select the optional IF filter which is located on the "OPF1" slot on the Main Unit.

When the optional filter is not installed on the"OPF1" slot, this key function is disabled, and its label is "**non**."

[**C**] Key:

Press the [**C**](**OPF2**) key to select the optional IF filter which is located on the "OPF2" slot on the Main Unit.

When the optional filter is not installed on the"OPF2" slot, this key function is disabled, and its label is "**non**."

Multi Function Row "o" (MFo) [**PLY1**, **PLY2**, **PLY3**]

[**A**] Key: **PLY1**

Press the [**A**](**PLY1**) key to send the CW message which is memorized in the keyer memory channel 1.

[**B**] Key: **PLY2**

Press the [**B**](**PLY2**) key to send the CW message which is memorized in the keyer memory channel 2.

[**C**] Key: **PLY3**

Press the [**C**](**PLY3**) key to send the CW message which is memorized in the keyer memory channel 3.

Multi Function Row "p" (MFp) [**DNR**, **DNF**, **DBF**]

[**A**] Key: **DNR**

Press the [**A**](**DNR**) key to activate the DSP Noise Reduction system.

Press and hold in the [**A**](**DNR**) key for one second recall the Menu Mode **No-047** [**DSP NR LEVEL**] (for setting the degree of DSP Noise Reduction).

[**B**] Key: **DNF**

Press the [**B**](**DNF**) key to activate the DSP's Auto Notch Filter.

[**C**] Key: **DBF**

Press the [**C**](**DBF**) key to activate the DSP's receiver Bandpass Filter.

In the SSB, AM, FM, and AFSK modes, press and hold in the [**C**](**DBF**) key for one

second to recall Menu Mode **No-050** [**DSP HPF CUTOFF**] (for adjust the high-frequency cutoff of the DSP Bandpass Filter).

In the CW mode, press and hold in the [**C**](**DBF**) key for one second to recall Menu Item **No-048** [**DSP BPF WIDTH**] (for setting the CW band width).

Multi Function Row "q" (MFq) [**PG A**, **PG B**, **PG C**]

[**A**] Key: **PG A**

Press the [**A**](**PG A**) key to activate the user programmed function which is determined by the Menu Mode **No-065** [**PG A**].

[**B**] Key: **PG B**

Press the [**B**](**PG B**) key to activate the user programmed function which is determined by the Menu Mode **No-066** [**PG B**].

[**C**] Key: **PG C**

Press the [**C**](**PG C**) key to activate the user programmed function which is determined by the Menu Mode **No-067** [**PG C**].

*The Multi Function number ("MFa" ~ "MFq") appears at the right bottom on the LCD.

(3) **MIC** Jack

Connect the supplied **MH-31** Hand Microphone to this jack.

(4) **PHONES** Jack

This 1/4-inch, 3-contact jack accept either monaural or stereo headphones with 2- or 3-contact plugs. When a plug is inserted, the loudspeaker is disabled. The audio level varies according to the setting of the front panel's **AF** knob.

(5) **PWR** Switch

Press and hold in the **PWR** switch for one second to turn to the transceiver on or off.

(6) **F** Key

Press this key momentarily to enable the changing of the function of the Multi Function keys ([**A**], [**B**], and [**C**]) by the **MEM/VFO CH** knob.

Press and hold this key for one second to activate the "Menu" mode.

(7) **LOCK** Key

Pressing this key locks the front panel keys so as to prevent accidental frequency change.

(8) **MAIN DIAL**

This is the main tuning dial for the transceiver. It is used both for frequency tuning as well as "Menu" setting in the transceiver.

(9) **SQL/RF** Knob

In the USA version, this (outer) **SQL/RF** knob adjusts the gain of the receiver's RF and IF stages. Using Menu Mode **No-081** [**SQL RF GAIN**], this control may be changed to function as a Squelch control, which may be used to silence background noise when no signal is present. In the other versions, its default setting is set to "Squelch."

(10) **AF** Knob

The (inner) **VOL** knob adjusts the receiver audio volume level presented to the internal or external speaker. Clockwise rotation increases the volume level.

(11) **CLAR/IF SHIFT** Key

Pressing this key activates the Receiver Clarifier feature. When this feature is activated, the **CLAR** knob is used to set a tuning offset of up to ±9.99 kHz. The transmitter's frequency is not affected by the setting of the Clarifier.

Press and hold this key for one second to activate the IF Shift feature, which allows you to use the **MEM/VFO CH** knob to adjust the center frequency of the IF filter's passband response.

(12) **CLAR** Knob

This knob tunes the clarifier offset frequency up to ±9.99 kHz, when the Receiver Clarifier feature is activated by pressing the **CLAR/IF SHIFT** key.

(13) **MEM/VFO CH** Knob

This detented rotary switch is used for VFO frequency tuning, memory selection, and function selection for the [**A**], [**B**], [**C**] keys of the transceiver.

This rotary switch is also used for adjust the center frequency of the IF filter's

passband response, when the IF Shift feature is activated by press and holding the **CLAR/IF SHIFT** key for one second.

(14) **DSP** Button

Pressing this button momentarily provides instant access to Multi Function Row "p" (MFp), which contains the command key for the receiver's Digital Signal Processing system. The available functions will appear as the functions displayed above the [**A**], [**B**], and [**C**] keys, described previously.

(15) **HOME** Key

Pressing this key momentarily recalls a favorite "HOME" frequency memory.

(16) **V/M** Key

Pressing this key switches frequency control between the VFO and Memory Systems.

(17) **MODE(◄)/MODE(►)** Key

Pressing either of these keys momentarily will change the operating mode. The selections available are:

… USB ⇔ LSB ⇔ CW ⇔ CWR ⇔ AM ⇔ DIG ⇔ PKT ⇔ USB …

(18) **BAND**(**DWN**)/**BAND**(**UP**) Key

Pressing either of these keys momentarily will cause the frequency to be moved up or down by one frequency band. The selections available are:

… 1.8 MHz ⇔ 3.5 MHz ⇔ 7.0 MHz ⇔ 10 MHz ⇔ 14 MHz ⇔ 15 MHz ⇔ 18 MHz ⇔ 24 MHz ⇔ 28 MHz ⇔ 50 MHz ⇔ 88 MHz ⇔ 108 MHz ⇔ 144 MHz ⇔ 430 MHz ⇔ 1.8 MHz …

(19) **DSP** Indicator

This indicator glows green when the DSP feature is activated by pressing the **DSP** button.

(20) **TRANSMIT/BUSY** Indicator

This indicator glows green when the squelch opens, and turns red during transmit.

(21) **CW-T** Indicator

This indicator glows green when the CW Training feature is activated via the Menu Mode **No-030** [**CW TRAINING**].

(22) **BATT-A**, **BATT-B** Indicators

These LEDs indicate the battery status for the optional **FNB-78** Ni-MH battery pack while internal battery operation.

The LED glows orange when the battery pack is waiting (switch to off by the **A-B** switch on the top panel), and turns orange when the is the battery pack en the radio operate the corresponded battery pack by the **A-B** switch on the top panel. It also glows red during charging of the optional **FNB-78** Ni-MH battery pack.

Rear Panel Connectors

(1) **INPUT** Jack

This is the DC power supply connection for the transceiver, used when operating the transceiver with an external power supply. Use the supplied DC cable to connect this jack to the car battery or DC power supply, which must be capable of supplying at least 22A @ 13.8 VDC. For base station operation, the optional **FP-30** External AC power supply attached to the bottom of the transceiver and connect the output pigtail of the **FP-30** to this jack.

(2) **GND** Terminal

For best performance and safety, this Ground lug may be connected to a good earth ground using a short, heavy, braided cable.

(3) **CAT/LINEAR** Jack

This 8-pin mini-DIN jack is used for connection to the **FC-30** External Automatic Antenna Tuner or **ATAS-120** Active-Tuning Antenna System. It is also used for interfacing to a personal computer for control of the transceiver using the CAT system, and for interconnection to the **VL-1000** Linear Amplifier.

(4) **DATA** Jack

This 6-pin, mini-DIN jack accepts AFSK input from a Terminal Node Controller (TNC); it also provides fixed-level Receiver Audio Output, Push-To-Talk (PTT), Squelch Status, and ground lines.

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(5) **ACC** Jack

This 3.5-mm 3-pin jack accepts external ALC (Automatic Level Control) voltage from a linear amplifier on the tip connection, and provides TX/RX control to a linear amplifier (closure to ground on transmit) on the ring connection. The main shaft is the ground return.

(6) **KEY** Jack

This 3.5-mm, 3-pin jack is used for connection to a CW keyer paddle or a straight key.

(7) **EXT SPKR** Jack

This 3.5-mm, 2-pin jack provides variable audio output for an external speaker. The audio output impedance at this jack is 4 Ω ~ 16 Ω, and the level varies according to the setting of the front panel's **AF** control.

(8) **144/430 MHz** Antenna Jack

Connect your 144 and/or 430 MHz antenna's 50 Ω coaxial cable to this M-type ("SO-239") connector.

(9) **HF/50 MHz** Antenna Jack

Connect your HF and/or 50 MHz antenna's 50 Ω coaxial cable to this M-type ("SO-239") connector.

(10) **CHG-A**, **CHG-B** Terminals

In the default transceiver, there are vacant slots and covered these by the plastic caps.

When install the optional **FNB-78** Ni-MH battery pack to the radio, connect the charge plug to these terminals.

Top Panel Switch

(1) **A-B** Switch

Select the battery pack to be used, when install the two optional **FNB-78** Ni-MH battery packs into the **FT-897**.

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Bottom Panel Connector

(1) METER Jack

This 3.5-mm 2-pin jack is used for connection to an analog meter (Vertex Standard does not product).

Operation

<u>RF Says:</u> Hi! I'm R.F. Radio, and I'm here to guide you through the fine points of the setup and use of your new FT-897. I know your anxious to get on the air, but I encourage you to read the "Operation" section of this manual as thoroughly as possible, so you'll get the most out of this fantastic new rig. Now. . .let's get operating!

Turning the Transceiver On and Off

1. To turn the transceiver on, press and hold in the **PWR** switch for one second.
2. To turn the transceiver off, again press and hold in the **PWR** switch for one second.

<u>R. F. Says:</u> When you are operate the **FT-897** with the optional **FP-30** External power supply, always turn on the **MAIN** switch on the **FP-30** <u>before</u> turning on the **PWR** switch on the **FT-897**. To turn off the **PWR** switch on the **FT-897** <u>before</u> turning off the **MAIN** switch on the **FP-30**.

Operating Band Selection

This transceiver covers an incredibly wide frequency range, over which a number of different operating modes are used. Therefore, this transceiver's frequency coverage has been divided into different operating bands, each of with has its own pre-set channel steps and operating modes. You can change the channel steps and operating mode once you get started, of course, per the next section.

To change the frequency band, press either the **BAND(DWN)** or **BAND(UP)** key to move to the next lower or higher operating band, respectively.

… 1.8 MHz ⇔ 3.5 MHz ⇔ 7.0 MHz ⇔ 10 MHz ⇔ 14 MHz ⇔ 15 MHz ⇔ 18 MHz ⇔ 24 MHz ⇔ 28 MHz ⇔ 50 MHz ⇔ 88 MHz ⇔ 108 MHz ⇔ 144 MHz ⇔ 430 MHz ⇔ 1.8 MHz …

<u>R.F. Says:</u> VFOa and VFOb are independent VFOs, so they may be set to different

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bands. See the "Stacked VFO System" discussion on page <<??>> for details.

Mode Selection

Press either the **MODE(◄)** or **MODE(►)** key to move among the eight settings for the operating modes, respectively.

    … LSB ⇔ USB ⇔ CW ⇔ CWR ⇔ AM ⇔ FM ⇔ DIG ⇔ PKT ⇔ LSB …

<u>R.F. Says:</u> You can also set VFOa and VFOb to different modes in the same band, allowing you to have a "Phone" VFO and a "CW" VFO, for example.

Adjusting the Audio Volume Level

Rotate the **AF** knob to set a comfortable listening level.

When operating in the "**DIG**" or "**PKT**" modes, you may set the **AF** knob to any comfortable setting, or even all the way off, because the output from the **DATA** jack is a fixed-level audio signal.

<u>R. F. Says:</u> Start with the **AF** knob set fully counter-clockwise, especially when using FM (the background noise on FM can be surprisingly loud)!

Menu Quick Start

Many aspects of this transceiver's configuration may be customized using the convenient "Menu" system, which allow you to configure many "set and forget" settings just the way you want to. A full discussion of the Menu system beings on page <<??>>; for now, here is a brief discussion on how to change Menu settings:

1. Press and hold in the [**F**] key for one second to enter the Menu mode.
2. Rotate the **MEM/VFO CH** knob to recall the Menu Item to be changed (for example, Menu Mode **No-001** [**EXTEND**], which Enables or Disables the extended Menu Modes).
3. Rotate the **DIAL** knob to set this feature (in this example, the default setting is "**OFF** (Disables)," so rotate the **DIAL** knob to set this feature to "**ON** (Enables)."
4. Press and hold in the [**F**] key for one second to save the new setting and exit to normal operation.

<u>R. F. Says:</u> If you have momentarily pressed the [**F**] key to enable the changing of the function of the Multi Function keys ([**A**], [**B**], and [**C**]) by the **MEM/VFO CH** knob.

Adjusting the RF Gain and Squelch

The **SQL/RF** Gain control is configured differently, depending on the country to which the **FT-897** has been exported. In the U.S. version, the default function of this control is "RF Gain." The configuration of the **SQL/RF** Gain control is set via Menu Mode **No-081** [**SQL RF GAIN**]; see page <<??>> for details.

If your transceiver is configured for "RF Gain" use, rotating this control fully clockwise in the SSB/CW/Digital modes will provide best sensitivity. To reduce the receiver's RF Gain somewhat, rotate this control counter-clockwise slightly. You will observe an increasing number of bars on the S-meter as you rotate the RF Gain control counter-clockwise; this indicates increasing AGC voltage, which is causing the front-end gain to be reduced. In the FM and Packet modes, this control will automatically be set to "Squelch," even though the setting of Menu #45 is set to "RF Gain."

If this control is configured for "SQL" operation, the FT-897's RF Gain will be set for maximum sensitivity in all modes, and the **SQL/RF** Gain control will function solely as a Squelch control. In this case, rotate the **SQL/RF** Gain control to the point where the background noise is just silenced; this will provide the best sensitivity to weak signals, while keeping the receiver quiet when no signal is received. The LED just above the Main Dial will glow Green when the squelch is opened by an incoming signal or noise.

R. F. Says: Battery consumption is significantly reduced if the receiver is squelched, as the audio amplifier stage is shut off when the receiver is muted.

Setting the Operating Frequency

1. In the "**SSB**/**CW**/**DIG**" modes, rotate the **DIAL** knob to set the frequency. Clockwise rotation of the **DIAL** increases the operating frequency.
2. In the "**AM**/**FM**/**PKT**" modes, rotate the **MEM/VFO CH** knob to set the frequency. Clockwise rotation of the **MEM/VFO CH** increases the operating frequency.
3. You may also use the **MEM/VFO CH** knob to adjust the operating frequency in the "**SSB**/**CW**/**DIG**" modes. The **MEM/VFO CH** knob provides faster tuning, ideal for making quick changes in frequency when you want to move across the band in a hurry. You can then use the **DIAL** to make fine frequency adjustments.
4. If you press the **MEM/VFO CH** knob momentarily, then rotate the **MEM/VFO CH** knob, you can now change the operating frequency in 1 MHz steps, allowing very

quick frequency excursions. This can be particularly helpful on the VHF and UHF bands.

5. In step 2 above, it was mentioned that tuning in the "**AM**/**FM**/**PKT**" modes is accomplished using the **MEM/VFO CH** knob. By default, the **DIAL** is disabled in these modes; if you wish to enable the **DIAL** in these modes, use Menu Mode **No-004** [**AM/FM DIAL**]; see page <<??>>.

6. The synthesizer steps for the **MEM/VFO CH** knob may be adjusted independently by mode. Use Menu Mode **No-006** [**AM STEP**] for AM, **No-053** [**FM STEP**] for FM, and **No-083** [**SSB STEP**] for SSB/CW/Digital. See pages <<??>> for details.

R. F. Says: The main **DIAL** synthesizer's tuning rate (the number of steps per rotation of the **DIAL**) can be adjusted using Menu Mode **No-036** [**DIAL STEP**]. See page <<??>> for details.

Stacked VFO System

1. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "a" [**A/B**, **A=B**, **SPL**] appears on the display.

2. Now press the [**A**](**A/B**) key to toggle between the "A" and "B" VFOs. There are two such VFOs provided on each Amateur band, so you may set VFO-A to the CW sub-band, and VFO-B to the SSB sub-band, if you like. The operating mode will be preserved, along with the frequency information, on each VFO.

Receiver Accessories

Locking Front Panel Controls

The front panel **LOCK** button allows you to disable the **DIAL** and/or the front panel controls.

In the transceiver's default configuration, pressing the **LOCK** button disables just the **DIAL**, while the other keys and switches are unaffected.

To lock out the remainder of the controls and the **MEM/VFO CH** knob, use Menu Mode **No-055** [**LOCK MODE**];

1. Press and hold in the [**F**] key for one second to enter the Menu mode.

2. Rotate the **MEM/VFO CH** knob so as to recall **No-055** [**LOCK MODE**].

3. Rotate the **DIAL** to select the desired .

DIAL: Locks **DIAL** knob only.

FREQ.: Locks front panel keys and knobs related to frequency control (such as **BAND**(**UP**) and **BAND**(**DWN**) key, [**A**](**A/B**) key., etc.)

PANEL: Locks all front panel keys and knobs (except **POWER** and **LOCK** keys)

ALL: Locks all front panel keys and knobs (except **POWER** and **LOCK** keys) and microphone keys.

4. When you have made your selection, Press and hold in the [**F**] key for one second to save the new setting and exit to normal operation.

When the controls are locked out, press the **LOCK** button once more to release them to normal operation.

Clarifier (Receiver Incremental Tuning)

The Clarifier (RIT) allows you to set an offset of up to ±9.99 kHz of the receive frequency relative to your transmit frequency. To achieve a wider offset than this, you may use the "Split" operating mode, described later.

1. Press the **CLAR/IF SHIFT** button momentarily to activate the Clarifier function.
2. Turn the **CLAR** knob, which allows the receiver frequency to be varied over a range of 9.99 kHz.
3. When the receiving frequency is higher than transmit frequency, the "↑" icon will appear at the right of the frequency display. Similarly, when the receiving frequency is lower than transmit frequency, the "↓" icon will appear at the right of the frequency display.
4. When the receiving frequency is equal to transmit frequency (Clarifier offset is zero) while the Clarifier is activated, the "–" icon will appear at the right of the frequency display.
5. To turn the Clarifier off, again press the **CLAR/IF SHIFT** button momentarily. When you turn the Clarifier back on, the offset previously stored will still be applied.
6. To reset the Clarifier offset to zero, turn the Clarifier off, then turn the **DIAL** by any amount. The Clarifier will reset to zero after the first "step" of the **DIAL**.

R. F. Says: 1) If you leave the Clarifier on, moving the **DIAL** will not cause the offset to be cancelled.

2) You may change the control knob for the clarifier offset to the **DIAL** or **MEM/VFO CH** knob by the Menu Mode **No-020** [**CLAR DIAL SEL**].

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IF SHIFT

The receiver's IF SHIFT feature is an effective interference-reduction tool, which allows you to shift the passband response higher or lower without changing the pitch of the incoming signal.

1. Press and hold the **CLAR/IF SHIFT** button for one second to activate the IF SHIFT feature. A "●", "▲(small shifted to the upper side)," "stacked ▲(large shifted to the upper side)," "▼(small shifted to the lower side)," or "stacked ▼(large shifted to the lower side)" icon will appear at the right of the frequency display to indicate the IF SHIFT's current position.

2. Rotate the **MEM/VFO CH** knob, as needed, to reduce or eliminate the interference.

3. To turn the IF SHIFT feature off, again press and hold the **CLAR/IF SHIFT** button for one second. The last setting of the IF SHIFT control will be retained until you change it again.

4. If you wish to make a more permanent shift in the receiver's IF passband, use Menu Mode **No-015** [**CAR LSB R**] (for LSB mode) or **No-017** [**CAR USB R**] (for USB mode). This allows you to set up a higher or lower listening pitch, if you prefer such as compared to the default passband response. See page <<??>>.

AGC (Automatic Gain Control)

The receiver recovery time constant of the AGC system may be modified to match your operating needs.

1. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "l" [**NB**, **AGC**, **----**] appears on the display.

2. Press the [**B**](**AGC**) key to activate the AGC function. The "parenthesis" will appear at the both side of the "**AGC**" indication.

3. Press the [**C**] key toggle the AGC recovery time constant among the following selections:
   AGCauto → AGCfast → AGCslow → AGCoff → AGCauto …
   where "AUTO" represents "FAST" on CW and DIG(AFSK), and "SLOW" on the voice modes.

R. F. Says: If disable the AGC by pressing the [**B**](**AGC**) key, the S-meter (which monitors AGC voltage) will cease to function.

Noise Blanker

The IF Noise Blanker may be useful in reducing or eliminating some types of impulse

noise, especially noise generated by automotive ignition systems.

1. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "l" [**NB**, **AGC**, **----**] appears on the display.

2. Press the [**A**](**NB**) key to activate the Noise Blanker. The "parenthesis" will appear at the both side of the "**NB**" indication.

3. To adjust the blanking level;
    press and hold the [**A**](**NB**) key for one second. This instantly activates Menu Mode **No-063** [**NB LEVEL**], which allows adjustment of Noise Blanking Level. Rote the **DIAL** to set a higher or lower blanking level (on a scale of 1 to 100). When done, press and hold the [**F**] key for one second to save the new setting(s) and return to normal

4. Press the [**A**](**NB**) key again to turn the Noise Blanker off.

IPO (Intercept Point Optimization)

The IPO feature bypasses the receiver RF preamplifier, thereby eliminating the preamp's gain. This feature is not available on the 144 MHz and 430 MHz.

1. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "m" [**IPO**, **ATT**, **NAR**] appears on the display.

2. Press the [**A**](**IPO**) key to bypass the receiver input preamplifier. The "parenthesis" will appear at the both side of the "**IPO**" indication.

3. Press the [**A**](**IPO**) key once more to re-activate the preamp.

R. F. Says: On the bands below 14 MHz, the input preamplifier is rarely necessary, and activation of the IPO feature will provide substantial protection against intermodulation and other problems associated with strong signal input to the receiver. Rule of thumb: so long as the S-meter is moving on background noise, additional front-end gain is not necessary.

IPO (Intercept Point Optimization)

The IPO feature bypasses the receiver RF preamplifier, thereby eliminating the preamp's gain. This feature is not available on the 144 MHz and 430 MHz.

1. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "m" [**IPO**, **ATT**, **NAR**] appears on the display.

2. Press the [**A**](**IPO**) key to bypass the receiver input preamplifier. The "parenthesis" will appear at the both side of the "**IPO**" indication.

3. Press the [**A**](**IPO**) key once more to re-activate the preamp.

ATT (Front End Attenuator)

The Attenuator will reduce all signals (and noise) by 10 dB, and it may be used to make reception more pleasant under extremely noisy conditions. This feature is not available on the 144 MHz and 430 MHz.

1. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "m" [**IPO**, **ATT**, **NAR**] appears on the display.

2. Press the [**B**](**ATT**) key to activate the Attenuator. The "parenthesis" will appear at the both side of the "**ATT**" indication.

3. Press the [**B**](**ATT**) key once more to switch the Attenuator out of the receiver front end circuit.

DSP Bandpass Filter

In the SSB mode, the receiver's selectivity may be enhanced via the DSP Bandpass Filter. The bandwidth of the DSP filter may be modified per the procedure below.

1. Press the **DSP** button, which selects Multi Function Row "p" [**DNR**, **DNF**, **DBF**] on the display.

2. Press the [**C**](**DBF**) key to activate the DSP Bandpass Filter. The "parenthesis" will appear at the both side of the "**DBF**" indication.

3. To adjust the Low-Cut and High-Cut characteristics of the DSP Bandpass Filter:

    Press and hold in the [**C**](**DBF**) key for one second. This instantly activates Menu Mode **No-049** [**DSP LPF CUTOFF**], which allows adjustment of the High-Cut (Low-Pass) filter.

    Turn the **DIAL**, as desired, to adjust the high-frequency cutoff of the DSP Bandpass Filter.

    Now rotate the **MEM/VFO CH** knob one click clockwise to select Menu Mode **No-050** [**DSP HPF CUTOFF**], which allows adjustment of the Low-Cut (High-Pass) filter.

    Turn the **DIAL**, as desired, to adjust the low-frequency cutoff of the DSP Bandpass Filter.

    When done, press and hold the [**F**] key for one second to save the new setting(s) and return to normal operation.

4. Press the [**C**](**DBF**) key once more to disable the DSP Bandpass Filter.

Vertex Standard Co., Ltd.

DSP CW Peaking Filter

In the CW mode, pressing the [**C**](**DBF**) key in Multi Function Row "p" [**DNR**, **DNF**, **DBF**] activates a narrow-bandwidth peaking filter, which may be ideal for use under very crowded conditions. The **DSP CW PEAKING FILTER** also is especially helpful under VHF/UHF weak-signal situations.

The center frequency of the **DSP CW PEAKING FILTER** is automatically aligned to be centered on the response you have selected via the Menu Mode **No-026** [**CW PITCH**]. See page <<??>> for details.

To change the bandwidth of the **DSP CW PEAKING FILTER**:

1. Press and hold the [**C**](**DBF**) key for one second on the CW mode. This instantly activates Menu Mode **No-048** [**DSP BPF WIDTH**], which allows select of the bandwidth of the **DSP CW PEAKING FILTER**.

2. Rotate the **DIAL** to select the desired bandwidth. The available values are 60 Hz, 120 Hz, and 240 Hz (default value: 240 Hz).

3. When you have made your selection, press and hold the [**F**] key for one second to save the new setting and return to normal operation.

DSP Noise Reduction (NR)

The **NOISE REDUCTION** feature of the DSP system may be used to enhance signal-to-noise ratio on weak signals.

1. Press the [**DSP**] key, which selects Multi Funtion Row "p" [**DNR**, **DNF**, **DBF**] on the display.

2. Press the [**A**](**DNR**) key to activate the **DSP NOISE REDUCTION** feature. The "parenthesis" will appear at the both side of the "**DNR**" indication.

3. Now press and hold in the [**A**](**DNR**) key for one second. This instantly activates Menu Mode **No-047** [**DSP NR LEVEL**], which allows adjustment of the **DSP NOISE REDUCTION** level.

4. Rotate the **DIAL** to find the point where best signal-to-noise ratio is obtained under the current noise conditions.

5. Press and hold the [**F**] key for one second to save the new setting and exit to normal operation.

6. To turn off the **DSP NOISE REDUCTION** feature, press the [**A**](**DNR**) key again.

R. F. Says: If noise is present at a level which causes indication on the S-meter, the

performance of the Noise Reduction filter may be enhanced by rotating the **SQL/RF** (RF GAIN) control in a counter-clockwise direction so as to set the (fixed) S-meter reading at the same level as the noise peaks. This adjustment raises the AGC threshold of the receiver.

DSP Notch Filter

The DSP system's Notch Filter may be helpful in removing one or more offending carrier or heterodyne signals from the audio passband.

1. Press the [**DSP**] key, which selects Multi Function Row "p" [**DNR**, **DNF**, **DBF**] on the display.
2. Press the [**B**](**DNF**) key to activate the Notch Filter. The "parenthesis" will appear at the both side of the "**DNF**" indication. You will notice that the audio level of the carrier signal is being reduced.
3. Press the [**B**](**DNF**) key once more to turn the Notch Filter off.

R. F. Says: Do not activate this filter in the CW mode, as incoming CW signals will be notched out of the audio passband!

AM/FM DIAL

In the AM and FM modes, the **DIAL** knob is locked out (via the setting of Menu Mode **No-004** [**AM&FM DIAL**]) so as to allow "channelized" tuning on these modes. To adjust the operating frequency, rotate the **MEM/VFO CH** knob.

If you wish to enable the **DIAL** for tuning in the AM and FM modes, change the setting of Menu Mode **No-004** [**AM&FM DIAL**]. See page <<??>> for details.

R. F. Says: The "channelized" mode of tuning on AM and FM automatically rounds off the frequency to the next "logical" step when you rotate the **MEM/VFO CH** knob one "click" in either direction. This eliminates the inconvenience of having to preset the frequency to an "even" channel.

Automatic Power-Off Feature

The APO feature helps conserve battery life by automatically turning the transceiver off after a user-defined period of time within which there has been no dial or key activity. The available selections for the time before power-off are 1 ~ 6 hours, as well as "APO Off." The default condition for the APO is OFF, and here is the procedure for activating

it:

1. Press and hold the [**F**] key for one second to enter the Menu mode.

2. Rotate the **MEM/VFO CH** knob to recall Menu Mode **No-007** [**APO TIME**].

3. Rotate the **DIAL** knob to select the desired time period after which the radio will automatically shut down.

4. Press and hold the [**F**] key for one second to save the new setting and exit to normal operation.

Once you have programmed a time interval, the APO countdown timer will start whenever some front panel action (tuning, transmission, etc.) is completed.

When the APO is activated, the "TIMER" icon will appear at the center top on the LCD. If there is no action by you within the time interval programmed, the microprocessor will shut down the radio automatically.

Just press and hold in the **PWR** switch for one second to turn the transceiver back on after an APO shutdown, as usual.

<center>Transmitter Operation</center>

SSB/AM Transmission

<u>Basic Setup/Operation</u>

1. Press the **MODE(◄)/MODE(►)** key so as to select either SSB (LSB/USB) or AM mode. In the SSB mode, if you are operating on the 7 MHz or lower bands, select the LSB mode. If you are operating on the 14 MHz or higher bands, select the USB mode.

2. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "i" [**MTR**, **----**, **DISP**] appears on the display, then press the [**A**](**MTR**) or [**B**] key to select the "ALC" meter function ("**ALC**" will appear at the above of the [**B**] key).

3. Press the microphone's **PTT** switch, and speak into the microphone in a normal voice while watching the meter. The ideal audio input level to the transmitter from the microphone will cause a few "segments" of indication on the ALC meter. Release the **PTT** switch to return to receive mode.

4. If the ALC meter is too high, or too low, you may need to reset the Microphone Gain:
   Press and hold in the [**F**] key for one second to enter the Menu mode.
   Rotate the **MEM/VFO CH** knob to recall Menu Mode **No-082** [**SSB MIC GAIN**] (on

the SSB mode) or **No-005** [**AM MIC GAIN**] (on the AM mode).

Close the **PTT** switch, and while speaking into the microphone rotate the **DIAL** until the proper ALC indication is achieved on voice peaks.

When done, press and hold in the [**F**] key foe one second to save the new setting for the Microphone Gain.

R. F. Says: 1) The AM carrier level is preset to 25 Watts during alignment at the factory, and should not require further adjustment. It is important to remember that AM transmission requires that power must be distributed among the carrier and voice sidebands; therefore, if excessive carrier power is used, there will be insufficient power available for the information-carrying voice sidebands.

2) The [**TONE**] switch on the back of the **MH-31A8J** microphone provides adjustment of the microphone's frequency response. Setting this switch to the "**2**" position will roll off some of the bass response, resulting in improved "talk power" in many instances. The "**1**" position is primarily used in countries like Japan, where vowel sounds are of critical importance in conveying information; in Western languages, consonant sounds (which are rich in high-frequency components) are frequently more important.

VOX Operation

The VOX system provides automatic transmit/receive switching based on voice input to the microphone. With the VOX system enabled, you do not need to press the **PTT** switch in order to transmit.

1. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "d" [**RPT**, **REV**, **VOX**] appears on the display.

2. Press the [**C**](**VOX**) key to activate the VOX circuitry. The "parenthesis" will appear at the both side of the "**VOX**" indication.

3. Without pressing the **PTT** switch, speak into the microphone in a normal voice level. When you start speaking, the transmitter should be activated automatically. When you finish speaking, the transceiver should return to the receive mode (after a short delay).

4. To cancel VOX and return to **PTT** operation., again press the [**C**](**VOX**) key. The "parenthesis" will disappear.

5. The VOX Gain may be adjusted, so as to prevent accidental transmitter activation in a noisy environment. To adjust the VOX Gain:

    While still in Multi Function Row "d" [**RPT**, **REV**, **VOX**], press and hold in the [**C**](**VOX**) key for one second. This is a "hot key" feature which will instantly

recall Menu Mode **No-090** [**VOX GAIN**].

While speaking into the microphone, rotate the **DIAL** to the point where the transmitter is quickly activated by your voice, without causing background noise to activate the transmitter.

When you have selected the optimum setting, press and hold the [**F**] key for one second to save the new settings and return to normal operation.

6. The "Hang-Time" of the VOX system (the transmit-receive delay after the cessation of speech) may also be adjusted via the Menu. The default delay is one second. To set a different delay time:

Press and hold in the [**F**] key for one second to activate the Menu mode.

Rotate the **MEM/VFO CH** knob to select Menu Mode **No-089** [**VOX DELAY**].

Rotate the **DIAL** while saying a brief syllable like "Ah" so as to set the desired delay time.

When your adjustments are complete, press and hold in the [**F**] key for one second to save the new setting and return to normal operation.

R. F. Says: The delay time for return to the receive mode is set independently on CW and voice modes; for CW, use Menu Mode **No-023** [**CW DELAY**] (see next section).

AF Speech Processor Operation

The AF Speech Processor increases your average power output while operating on SSB and AM modes.

1. Press the [**F**] key, as necessary, to recall Multi Function Row "c" [**STO**, **RCL**, **PROC**].

2. Press the [**C**](**PROC**) key to activate the AF Speech Processor. The "parenthesis" will appear at the both side of the "**PROC**" indication.

3. Now press the **PTT** key (unless you have VOX enabled), and speak into the microphone in a normal voice level, as usual.

4. To deactivate the AF Speech Processor, again press the [**C**](**PROC**) key.

5. The Compression Level may be adjusted via the Menu, as follows:

While still in Operating Function "c" [**STO**, **RCL**, **PROC**], press and hold in the [**C**](**PROC**) key for one second. This instantly recalls Menu Mode **No-074 [PROC LEVEL]**.

Rotate the **DIAL** to set a new level of Compression (the default value is "50").

When you have made your selection, press and hold the [**F**] key for one second to save your new setting and return to normal operation.

Make some on-the-air checks, or use a monitor receiver in your station, to

ensure that good voice quality has been obtained via your adjustment.

R. F. Says: Excessive advancement of the Compression Level may lead to distortion. Each operator's voice pattern is different, so try several settings to find the one which is best for your voice.

DSP Microphone Equalizer

In the SSB, AM, and FM transmission modes, you may use the DSP system to change the frequency response of the audio stage. This will allow you to roll off excessive high- and/or low-frequency components of your voice's audio characteristics.

To set up the DSP Microphone Equalizer feature;

1. Press and hold in the [**F**] key for one second to enter the Menu mode.

2. Rotate the **MEM/VFO CH** knob to recall Menu Mode **No-046 [DSP MIC EQ]**.

3. Rotate the **DIAL** to select one of the following equalization choices:

    OFF: Microphone Equalization Off

    LPF: High Cut (lower frequencies are emphasized)

    HPF: Low Cut (higher frequencies are emphasized)

    BOTH: High/Low Cut (mid-range frequencies are emphasized)

4. When you have made your selection, Press and hold in the [**F**] key for one second to save the new setting and exit to normal operation.

CW Transmission

Operation using Straight Key/External Keying Device

When using a straight key, an external electronic keyer, or a computer-generated keying device, please follow the instructions in this section.

1. Insert your key's (three-conductor) plug into the rear-panel **KEY** jack.

2. Press the **MODE(◄)**/**MODE(►)** key, as needed, to select one of the CW (CW/CWR) modes.

    R. F. Says: The "CW" mode utilizes USB-side carrier injection, while the CWR (Reverse) mode utilizes LSB-side injection.

3. Press the [**F**] key momentarily, then then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "j" [**SPOT**, **BK**, **KYR**] appears on the display.

4. Press the [**B**](**BK**) key, as needed, to activate "Semi Break-In" operation. The "parenthesis" will appear at the both side of the "**BK**" indication.

5. The CW hang time can be adjusted using the Menu Mode. To adjust the CW hang time:

    While still in Multi Function Row "j" [**SPOT**, **BK**, **KYR**], press and hold in the

[**B**](**BK**) key for one second. This is a "hot key" feature which will instantly recall Menu Mode **No-023** [**CW DELAY**].

Rotate the **DIAL** to select a longer or shorter delay time (default: 250 ms). This transceiver was not expressly designed for "full QSK" operation. However, the Menu Mode **No-023** [**CW DELAY**] is set to "FULL," the transceiver operate on the full break-in mode.

When done, press and hold in the [**F**] key for one second to save the new setting and exit to normal operation.

6. To practice your CW sending (without transmitting), press the [**B**](**BK**) key to make the "parenthesis" disappear. Now, pressing the key will cause the CW sidetone to be heard, but your radio will not be transmitting a signal on the air.

7. You can adjust the CW sidetone volume level via Menu Mode **No-028** [**CW SIDE TONE**]. To adjust the CW sidetone volume level:

Press and hold in the [**F**] key for one second to enter the Menu mode.

Rotate the **MEM/VFO CH** knob to select Menu Mode **No-028** [**CW SIDE TONE**].

Rotate the **DIAL** to select a new level; on the arbitrary scale of "0" ~ "100," the default value is "50."

When done, press and hold in the [**F**] key for one second to save the new setting and exit to normal operation.

8. You also can adjust the CW sidetone pitch using Menu Mode **No-026** [**CW PITCH**]. This adjustment also controls the BFO offset (actual pitch of your transmitted signal relative to your current receive frequency). To adjust the CW sidetone pitch:

Press and hold in the [**F**] key for one second to enter the Menu mode.

Rotate the **MEM/VFO CH** knob to Menu Mode **No-026** [**CW PITCH**].

Rotate the **DIAL** to select a new pitch tone/BFO offset. The available offset range is 300 ~ 1000 Hz (default value is "700 Hz").

When done, press and hold in the [**F**] key for one second to save the new setting and exit to normal operation.

R. F. Says: Because the CW Pitch corresponds to the actual pitch of your transmitted signal, the sidetone may be used in a "CW Spot" capacity. Just tune the pitch of the received signal to the same pitch as that of your transceiver's sidetone, and you will be perfectly "zero beat" with the other station.

The **FT-897** can generate a "CW Spot" tone; just press and hold in the **HOME** key for one second.

Operation using Built-in Electronic Keyer

The built-in Electronic Keyer provides a convenient method of generating CW. The Electronic Keyer includes weight and speed adjustments.

1. Connect your keyer paddle's cable to the **KEY** jack on the rear panel of the transceiver.

2. Press the **MODE(◄)/MODE(►)** key, as needed, to select the CW (CW/CWR) mode.

3. Press the [**F**] key momentarily, then rotate the **SEL** knob, as needed, until Multi Function Row "j" [**SPOT**, **BK**, **KYR**] appears on the display.

4. Press the [**C**](**KYR**) key to activate the Electronic Keyer. The "parenthesis" will appear at the both side of the "**KYR**" indication.

5. The keyer speed may be adjusted using Menu Mode. To adjust the Keyer speed:

    While still in Multi Function Row "j" [**SPOT**, **BK**, **KYR**], press and hold in the [**C**](**KYR**) key for one second. This is a "hot key" feature which will instantly recall Menu Mode **No-029** [**CW SPEED**].

    Press the **MEM/VFO CH** knob if you wish to select display of "cpm" (characters per minute) instead of "wpm" (words per minute). The "cpm" selection is based on the international "PARIS" standard, which stipulates five characters per word.

    Rotate the **DIAL** knob, while sending, to set the desired sending speed.

    When done, press and hold in the [**F**] key for one second to save the new setting and exit to normal operation.

6. The Dot:Dash weighting ratio may be adjusted via Menu Mode. To adjust the Dot:Dash weighting ratio:

    Press and hold in the [**F**] key for one second to enter the Menu mode.

    Rotate the **MEM/VFO CH** knob to select Menu Mode **No-031** [**CW WEIGHT**].

    Rotate the **DIAL** knob to set the desired weight.

    When done, press and hold in the [**F**] key for one second to save the new setting and exit to normal operation.

7. You may select "normal" or "reverse" paddle polarity via Menu Mode **No-025** [**CW KEY REV**]. The default setting for this feature is "NOMAL," whereby the "Tip" connection on the Key Plug is "Dot" and the "Ring" connection is "Dash." To change the paddle polarity:

    Press and hold in the [**F**] key for one second to enter the Menu mode.

    Rotate the **MEM/VFO CH** knob to select Menu Mode **No-025** [**CW KEY REV**].

    Rotate the **DIAL** knob to select the new setting.

    When done, press and hold in the [**F**] key for one second to save the new setting

and exit to normal operation.

FM Transmission

Basic Setup/Operation

1. Press the **MODE(◄)/MODE(►)** key so as to select the FM mode.
2. Press the microphone's **PTT** switch, and speak into the microphone in a normal voice.
3. Release the **PTT** switch to return to the receive mode.
4. If you get reports that your modulation level is too high or too low, you may need to adjust the FM-mode microphone gain. The procedure is similar to that used on SSB:

    Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "i" [**MTR**, **----**, **DISP**] appears on the display, then press the [**A**](**MTR**) key to select the "Deviation" meter function ("**mod**" will appear at the top of the [**B**] key).

    Press and hold in the [**F**] key for one second to enter the Menu mode.

    Rotate the **SEL** knob to recall Menu Mode **No-052** [**FM MIC GAIN**].

    Increase or decrease the setting of the FM Mic Gain, depending on the level correction required, then press and hold the [**F**] key to save the new setting.

    Close the **PTT** switch, and while speaking into the microphone observe the meter indication; the proper setting of the FM Mic Gain will produce five "bars" of indication on voice peaks, slightly less on lower levels of speech input.

    When done, press and hold in the [**F**] key to save the new setting for the FM-mode microphone gain.

5. The VOX feature is operational during FM transmission. From Multi Function Row "d" [**RPT**, **REV**, **VOX**], press the [**C**](**VOX**) key to activate/deactivate VOX.

Repeater Operation

1. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "d" [**RPT**, **REV**, **VOX**] appears on the display.
2. Press the [**A**](**RPT**) key to activate repeater operation. One press of the [**A**](**RPT**) key will have set the transceiver for "Minus Shift" operation. In this situation, you will observe the "**–**" indicator on the display. The transmitter frequency will be shifted down by a default value so as to access the repeater input frequency. If your repeater uses a positive shift (instead of negative), press the [**A**](**RPT**) key again; the "**+**" indicator will replace the "**–**" indicator on the display.
3. If the default repeater shift is not appropriate for your area, it may be set

independently for each band. To change the repeater shifts:

Press and hold the [**A**](**RPT**) key for one second. This instantly recalls Menu Mode **No-076** [**RPT SHIFT**].

Rotate the **DIAL** knob to select the desired shift frequency.

When done, press and hold in the [**F**] key for one second to save the new setting and exit to normal operation.

4. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob one click clockwise to appears Multi Function Row "e" [**TON**, **----**, **TDCH**] on the display.

5. Press the [**A**](**TON**) key to activate the CTCSS tone encoder, which provides a subaudible repeater access tone. One press of the [**A**](**TON**) key will activate the CTCSS tone encoder. In this situation, you will observe the "**T**" indicator on the display. If you press the [**A**](**TON**) key repeatedly, you will observe "**TSQ**" (CTCSS Encode/Decode), followed by "**DCS**" (Digital Coded Squelch, Encode/Decode). One additional press will disable all repeater-access tone systems. See the next section for a discussion of DCS operation.

6. If the default repeater access tone are not appropriate for your area, it also may be set independently for each band. To change the repeater access tone:

Press and hold the [**A**](**TON**) key for one second. This instantly recalls Menu Mode **No-084** [**TONE FREQ**].

Rotate the **DIAL** knob to select the desired CTCSS frequency.

When done, press and hold the [**F**] key for one second so save the new setting and exit to normal operation.

7. Set the transceiver's receiver to the repeater output (downlink) frequency.

8. Close the **PTT** switch and speak into the microphone. You will observe that the transmitted frequency has shifted according to the setting of the [**A**](**RPT**) key in the Multi Function Row "d" [**RPT**, **REV**, **VOX**].

9. Release the **PTT** switch to return to the Receive mode.

10. With repeater shift activated, you can temporarily reverse the transmit and receive frequencies by pressing the [**B**](**REV**) key in the Multi Function Row "d" [**RPT**, **REV**, **VOX**]. The "**–**" icon will blink while "Reverse" shift is activated. Press the [**B**](**REV**) key again to revert to the "Normal" shift direction.

11. When you are finished with repeater operation, you may wish to set the repeater shift to simplex by pressing the [**A**](**RPT**) key in the Multi Function Row "d" [**RPT**, **REV**, **VOX**], and disable the CTCSS or DCS tone by pressing the [**A**](**TON**) key in the Multi Function Row "e" [**TON**, **----**, **TDCH**].

12. On many transceiver versions, the Automatic Repeater Shift (ARS) feature is

enabled at the factory. This feature automatically activates the appropriate repeater shift when you are operating inside the designated 144 MHz or 430 MHz FM repeater sub-bands in your country. If you wish to change the settings for the ARS, use Menu Mode **No-002** [**144MHz ARS**] or Menu Mode **No-003** [**430MHz ARS**] (see page ??).

R. F. Says: If your local repeaters need a 1750-Hz burst tone for access (typically in Europe), press and hold in the front panel's [**HOME**] key to transmit the burst tone.

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.

To scan for the CTCSS tone in use:

1.   Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "e" [**TON**, **----**, **TDCH**] appears on the display.

2.   Press the [**A**](**TON**) key to activate CTCSS Encoder/Decoder; (the "**TSQ**" icon will appear on the display)

3.   Press the [**C**](**TDCH**) key to start scanning for the incoming CTCSS tone.

4.   When the radio detects the correct tone, it will halt on that tone, and audio will be allowed to pass.

5.   Press and hold in the [**C**](**TDCH**) key for one second; the CTCSS tone detected will be stored as the "current" tone, so it may be used for memory storage purposes, and you may now exit to normal operation.

DCS Operation

Another form of tone access control is Digital Code Squelch, or DCS. It is a newer, more advanced tone system that is less susceptible to false triggering than CTCSS. A DCS Encoder/Decoder is built into your transceiver, and operation is very similar to that described above for CTCSS.

1.   Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "e" [**TON**, **----**, **TDCH**] appears on the display.

2.   Press the [**A**](**TON**) key four times to activate the DCS Encoder/Decoder (the "**DCS**" icon will appear on the display). The receiver will remain muted until a matching DCS code is received on an incoming signal.

3. Press and hold the [**A**](**TON**) key for one second. This instantly recalls Menu Mode **No-032** [**DCS CODE**].

4. Rotate the **DIAL** to select the desired DCS code, then Press and hold the [**F**] key for one second to save new setting and exit to normal operation.

5. Press the [**A**](**TON**) key once to cancel DCS operation (the "**DCS**" icon will disappear).

<div align="center">DCS Search Scanning</div>

In operating situations where you don't know the DCS code being used by another station, you can command the radio to listen to the incoming signal and scan in search of the code being used.

To scan for the DCS code in use:

1. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "e" [**TON**, **----**, **TDCH**] appears on the display.

2. Press the [**A**](**TON**) key to activate DCS (the "**DCS**" icon will appear on the display).

3. Press the [**C**](**TDCH**) key to start scanning for the incoming DCS code.

4. When the radio detects the correct DCS code, it will halt on that code, and audio will be allowed to pass.

5. Press and hold in the [**C**](**TDCH**) key for one second; the DCS code detected will be stored as the "current" code, so it may be used for memory storage purposes, and you may now exit to normal operation.

Split Tone Operation

The FT-897 can be operated in a Split Tone configuration via the Menu mode.

1. Press and hold the [**F**] key for one second to enter the Menu mode.

2. Rotate the **MEM/VFO CH** knob to select Menu Mode **No-085** [**TONE SPLIT**].

3. Rotate the **DIAL** knob to select "**ON**" (to enable the Split Tone feature).

4. Press and hold the [**F**] key for one second to save the new setting and exit to normal operation.

When the Split Tone feature is activated, the Multi Function Row "e" changes to [**ENC**, **DEC**, **TDCH**]. So, you can set the desired encoder (by [**A**](**ENC**) key) and decoder (by [**B**](**DEC**) key) separately.

ARTS^{TM} (Auto Range Transpond System) Operation

The ARTS^{TM} system uses DCS signaling to inform you when you and another ARTS^{TM}-equipped station are within communications range. This can be especially valuable during search-and-rescue operations, as a base station can quickly use ARTS^{TM} to alert a field unit that it is out of range; the field unit can then move to a better location to re-establish communications.

1. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "f" [**ARTS**, **SRCH**, **PMS**] appears on the display.

2. Press the [**A**](**ARTS**) key to activate ARTS^{TM} operation.

3. Your display will change to "**out range**" to indicate the beginning of ARTS^{TM} operation. Every 25 seconds, your radio will transmit a "polling" call to the other station. When that station responds with its return ARTS^{TM} polling signal, your display will change to "**in range**" to confirm reception of the response.

4. To cancel ARTS operation, press the [**A**](**ARTS**) key again (the "**out range**" or "**in range**" indication will disappear from the LCD).

R. F. Says: The ARTS^{TM} feature offers a choice of beep options to alert you to the current status of ARTS^{TM} operation. Use MENU #09 (ARTS BEEP) on page <<??>> to select the beep option that is best for your operating needs..

ARTS Alert Beep Options

The ARTS feature allows two kinds of alert beeps (with the additional option of turning them off), so as to alert you to the current status of ARTS operation. Depending on your location and the potential annoyance associated with frequent beeps, you may choose the Beep mode which best suits your needs. The choices are:

IN RANGE:	The beeps are issued only when the radio first confirms that you are within range, but does not re-confirm with beeps thereafter.
ALWAYS:	Every time a polling transmission is received from the other station, the alert beeps will be heard.
OFF:	No alert beeps will be heard; you must look at the display to confirm current ARTS status.

To set the ARTS Beep mode;

1. While still in Multi Function Row "f" [**ARTS**, **SRCH**, **PMS**], press and hold the [**A**](**ARTS**) key for one second. This is instantly recall Menu Mode **No-008** [**ARTS BEEP**].

2. Rotate the **DIAL** to select the desired ARTS Beep mode (see above).

3. When you have made your selection, press and hold the [**F**] key for one second to save the new setting and exit to normal operation.

CW Identifier Setup

The ARTS feature includes a CW identifier, as discussed previously. Every ten minutes during ARTS operation, the radio can be instructed to send "DE (your callsign) K" if this feature is enabled. The callsign field may contain up to 16 characters.

Here's how to program the CW Identifier:

1. Press and hold the [**F**] key for one second to enter the Menu mode.
2. Rotate the **MEM/VFO CH** knob to select the Menu Mode **No-010** [**ARTS IDW**].
3. Press the **MEM/VFO CH** knob momentarily to initiate callsign storage (an "under bar" will appear below the first character location of the callsign).
4. Rotate the **DIAL** knob to select the first letter/number of your callsign, then rotate the **MEM/VFO CH** knob one click clockwise to save the first leter/numver and move to the next entry position.
5. Repeat the previous step as many times as nessesary to complete your callsign.
6. Press the **MEM/VFO CH** knob momentarily to save your completed callsign and exit.
7. Rotate the **MEM/VFO CH** knob one click counter-clockwise to select the Menu Mode **No-009** [**ARTS ID**].
8. Rotate the **DIAL** to set the CW ID function to "**ON**."
9. Press and hold the [**F**] key for one second to save the new setting and exit to normal operation.

Digital Mode Operation (SSB-Based AFSK)

The **FT-897** provides extensive capability for digital mode operation on the HF, VHF, and UHF bands. The use of AFSK (Audio Frequency-Shifted Keying) configurations allows a wide variety of different communication modes to be utilized. The Menu provides for specific digital mode selections, which include custom BFO offsets to optimize the receive and transmit passbands for the mode selected.

Before beginning Digital operation, you need to define which Digital mode will be utilized. To do this, use Menu #26 as follows (in this example, we will set up RTTY as the Digital mode):

1. Press and hold in the [**F**] key for one second to enter the Menu mode.

2. Rotate the **MEM/VFO CH** knob to select Menu Mode **No-039** [**DIG MODE**].

3. Rotate the **DIAL** knob to select "**RTTY**."

4. Press and hold in the [**F**] key for one second to save the new setting and exit.

<u>R. F. Says:</u> Use this technique to set up any digital mode.

<u>RTTY (Radio TeleType) Operation</u>

The "RTTY" mode on the **FT-897** is based on LSB-side carrier injection, in accordance with long-standing amateur practice. If you need USB-side injection for your application, see the "User" mode discussion below.

1. Connect your TNC (Terminal Node Controller) or terminal modem to the FT-897's rear-panel **DATA** jack, per the illustration.

2. Press the **MODE(◄)/MODE(►)** key, as needed, to select the DIG mode (the "**DIG**" icon will appear on the display). Be certain to use the "TX Audio" line from your TNC, not an "FSK Key" line, for the transmit-data connection.

3. Press the **MODE(◄)/MODE(►)** key, as needed, to select the DIG mode (the "**DIG**" icon will appear on the display). You should now be able to tune around the band, and any RTTY signals heard should be capable of being decoded.

4. If the optional **YF-122C** 500 Hz filter has been installed, it may be used for RTTY work. Recall Multi Function Row "n" [**CERF**, **OPF1**, **OPF2**], then press the [**B**](**OPF1**) or [**C**](**OPF2**) key to engage the narrow filter.

5. To set up the transmit side, be sure that the Meter is set to monitor ALC voltage. If not, press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob to select to select Multi Function Row "i" [**MTR**, **----**, **DISP**], then press the [**A**](**MTR**) or [**B**] key so as to select metering of ALC.

6. Press and hold in the [**F**] key for one second to enter the Menu mode, then rotate the **MEM/VFO CH** knob to select Menu Mode **No-038** [**DIG GAIN**].

7. Following the instructions for your TNC's software, activate the transmitter from the computer keyboard; this should cause the AFSK output from the TNC to be sent to the radio. While transmitting, view the ALC meter; <<??>> "dots" of ALC indication should be observed. If not, rotate the **DIAL** knob to adjust the AFSK level within the FT-897 for <<??>> dots of indication on the ALC meter.

8. Press and hold in the [**F**] key for one second to save the new AFSK level setting and return to normal operation. You are now ready for RTTY operation.

<u>R. F. Says:</u> Because RTTY is a continuous-duty transmission mode, try to keep your

transmission short when running on battery power, so as to minimize current drain.

PSK31 Operation

Two dedicated PSK31 modes are available, one each for USB-side and LSB-side injection. For BPSK work, the injection does not matter, but for QPSK the two working stations must use the same sideband.

Connect the FT-897 to your computer's sound card or interface.

Setup for PSK31 operation is basically identical to that previously described for RTTY operation. As before, use the "DIG" mode. However, in Menu Mode **No-039** [**DIG MODE**], select PSK31-L (for LSB injection) or PSK31-U (for USB injection. As with RTTY, Menu #25 may be used to set the drive to the transmitter. And the **YF-122C** 500 Hz filter may also be utilized, as described previously.

"USER" Defined Digital Modes

Also provided in the FT-897 are two convenient "USER" Digital modes, one each providing USB- and LSB-side injection, which may be used for SSTV, Fax, Pactor, and other digital operating modes.

Here is an example involving the configuration of the USER mode for RTTY with USB-side injection (as opposed to LSB injection, used in the default "RTTY" mode):

1. Use Menu Mode **No-039** [**DIG MODE**] to set the Digital mode to "**USER-U**."
2. Press the **MODE(◄)**/**MODE(►)** key, as needed, to select the DIG mode (the "**DIG**" icon will appear on the display).
3. Now use Menu mode to configure the transceiver's passband response. Once in the Menu mode, rotate the **MEM/VFO CH** knob to select Menu Mode **No-040** [**DIG SHIFT**], and rotate the **DIAL** knob to set the desired BFO offset (depending on how your TNC's tones are set up). For typical high-frequency tone use, a setting of about "**+2100**" will be a good starting point.
4. Finally, depending on how you wish the display to respond, you may program in a corresponding display shift, using Menu Mode **No-037** [**DIG DISP**]. Remember to press and hold in the [**F**] key for one second when exiting the Menu mode.
5. The setup of the AFSK drive level is identical to that described previously for RTTY operation.

R. F. Says: The USER-L and USER-U Digital modes should allow you to operate on any SSB-based AFSK Digital mode. Note that the "PSK31" configurations will also work well for many Digital operating situations.

Packet (1200/9600 bps FM) Operation

The FT-897 is designed for operation on either 1200 bps or 9600 bps packet, and setup is similar to that described previously for SSB-based modes. A separate Data input adjustment is provided, allowing you to optimize the deviation on the FM Packet modes separately from the SSB-based Digital modes. The RX-Data output lines are fixed-level outputs, not affected by the setting of the AF Gain control.

1. Connect your TNC to the FT-897's rear-panel **DATA** jack, per the illustration. Note that different connections are used for 1200 bps and 9600 bps Packet.

2. Use Menu Mode **No-073** [**PKT RATE**] to select the desired Packet mode. Once you have entered the Menu and have selected Menu Mode **No-073** [**PKT RATE**], rotate the **DIAL** knob to select either "**1200**" or "**9600**" (bps) as the Packet rate.

3. Press the **MODE(◄)/MODE(►)** key, as needed, to select the PKT mode (the "**PKT**" icon will appear on the display).

4. You are now set up for reception on Packet. If you are operating on 1200 bps, try now to connect to another station or node; you may well find that the drive level needs no further adjustment.

5. If you are having trouble connecting due to insufficient or excessive drive from the TNC to the FT-897, use Menu Mode **No-071** [**PKT 1200**] (for 1200 bps Packet) or **No-072** [**PKT 9600**] (for 9600 bps Packet)to set the drive. Use your terminal software's "test" protocol to send out test tones, and adjust the deviation by rotating the **DIAL** knob, which will vary the data input level to the FT-897's modulator. Remember to press and hold in the [**F**] key for one second when adjustments are completed, so as to save the new setting for Menu Mode **No-071** [**PKT 1200**] or **No-072** [**PKT 9600**].

R. F. Says: The 9600 bps Packet deviation setting is very critical to successful operation, and it can only be accomplished using a calibrated deviation meter; the optimum setting is usually ±2.75 kHz (±0.25 kHz). For 1200 bps, the optimum level is much less critical, with the optimum deviation being between ±2.5 kHz and ±3.5 kHz.

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WeatherFax Monitoring

Monitoring of HF WeatherFax broadcasts is easily accomplished using the FT-897.

1. Before proceeding, be certain that the WeatherFax demodulator is properly connected to Pins 5 and 2 of the rear panel **DATA** jack.

2. Set the transceiver to the VFO mode, and set the operating mode to "**DIG**," setting Menu Mode **No-039** [**DIG MODE**] to "**PSK31-U**," as described previously.

3. Now, select the operating frequency of the station transmitting the WeatherFax broadcast. Note that, in the USB mode, the frequency you should program onto the display is typically 1.90 kHz below the station's "assigned" frequency. Thus for a WeatherFax station assigned to 8.682.0 MHz, tune to 8.680.1 MHz.

4. When the WeatherFax broadcast begins, no further operator intervention should be needed from the transceiver standpoint. The audio level from the **DATA** jack on the rear of the transceiver is fixed, and cannot be adjusted.

Fine adjustments in the gray-scale and the frame alignment are accomplished using the computer and software connected to your WeatherFax demodulator.

Split Frequency Operation

This transceiver provides convenient split-frequency operation, using the VFO-A and VFO-B, for DX working and other operating situations requiring unique split frequency pairs.

The example below will describe a typical split-frequency DX situation on the 20-meter band, with a DX station transmitting on 14.025 MHz, listening 10 kHz higher in the band.

1. Set VFO-A to 14.035.00 MHz CW (DX station's listening frequency).

2. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "a" [**A/B**, **A=B**, **SPL**].

3. Press the [**A**](**A/B**) key momentarily to select VFO-B.

4. Tune the VFO-B frequency to 14.025.00 MHz (DX station's transmitting frequency).

5. Press the [**C**](**SPL**) key momentarily. The transceiver will now transmit using the VFO-A frequency, and will receive using the VFO-B frequency. The "parenthesis" will appear at the both side of the "**SPL**" indication, and the "**SPL**" icon will appear at the upper left corner of the display.

6. To listen to the pile-up calling the DX station (so as to align your frequency more

closely to that of the station being worked by the DX), press the [**A**](**A/B**) key to reverse the VFOs. You will now be tuning in the vicinity of 14.035 MHz, and you can zero in on the DX station's listening frequency by tuning in on the station in QSO with the DX.

Press the [**A**](**A/B**) key again to return to reception on the DX station's frequency.

7.   Press the [**C**](**SPL**) key once more to cancel split operation; the "parenthesis" and "**SPL**" icon will disappear from the display.

Time-Out Timer

Most often used on FM, the transmitter's Time-Out Timer (TOT) feature disables the transmitter after a user-defined period of transmission. This feature may be useful in preventing a "stuck microphone" (accidental closure of the **PTT** switch) from causing interference to other users, and it will also force you to keep your transmission short, thereby conserving battery power.
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To activate the Time-Out Timer:

1.   Press and hold in the [**F**] key for one second to enter the Menu mode.

2.   Rotate the **MEM/VFO CH** knob to recall Menu Mode **No-086** [**TOT TIME**].

3.   The default setting for this feature is "**OFF**." Rotate the **DIAL** knob to set a new time-out setting (from **1** minute to **20** minutes).

4.   When you have made your selection, press and hold in the [**F**] key for one second to save the new setting and exit to normal operation.

Active-Tuning Antenna System (ATAS-120) Operation

The optional ATAS-120 Active-Tuning Antenna System provides operation on a number of HF bands (7/14/21/28 MHz) plus 50 MHz, 144 MHz, and 430 MHz. The FT-897 provides microprocessor control of the tuning mechanism in the ATAS-120 for convenient automatic tuning.

Before operation can begin, you must instruct the FT-897's microprocessor that the ATAS-120 is being used. This is done using the Menu Mode:

1.   Press and hold in the [**F**] key for one second to activate the Menu mode.

2.   Rotate the **MEM/VFO CH** knob to recall Menu Mode **N0-087** [**TUNER/ATAS**].

3.   The default setting for this Menu is "OFF." Rotate the **DIAL** to change the setting to "ATAS(ALL)," if you are using the ATAS-120 for all bands (you must connect an

external diplexer to combine the two antenna ports so as to use the ATAS-120 on all bands). Or make the setting "ATAS(HF&50)," if you are using the ATAS-120 on 7 ~ 50 MHz, with a dual-band VHF/UHF antenna connected separately to the 144/430 MHz antenna port. If you are just using the ATAS-120 on HF band only, with a dual-band VHF/UHF antenna connected separately to the 144/430 MHz antenna port, make the setting "ATAS(HF)."

4. Press and hold in the [**F**] key for one second to save the new setting and exit to normal operation.

Automatic Tuning

1. Press the [**F**] key, as needed, to recall Multi Function Row "k" [**TUN**, **SHRT**, **EXTD**].
2. Press the [**A**](**TUN**) key to turn the ATAS-120 on (this action only supplies voltage to the antenna at this point; re-tuning does not begin). The "parenthesis" will appear at the both side of the "**TUN**" indication.
3. Now press and hold in the [**A**](**TUN**) key for one second to initiate ATAS-120 tuning. The transmitter will automatically be activated, a carrier will be sent, and the antenna's length will be adjusted for best SWR.
4. If the microprocessor determines that the antenna's length is radically incorrect from the optimum value, no carrier will be sent out. Instead, in the receive mode, the antenna will retract to its shortest position (this may take up to one minute). While this is happening, do not press the [**A**](**TUN**) key again. When the ATAS-120 reaches its minimum length, automatic tuning will be initiated, and the transmitter will automatically shut off when a satisfactory SWR is achieved.
5. On the 144 MHz and 430 MHz bands, the ATAS-120 does not require a tuning process. SWR will be satisfactory when the antenna is fully retracted.
6. When you wish to conclude ATAS-120 operation, press the [**A**](**TUN**) key so that the "parenthesis" will disappear at the both side of the "**SPL**" indication.

Manual Tuning

In some instances, the SWR may be slightly improved by manual adjustment of the antenna position. This may be needed for operation on bands like 17 meters, where the "Q" of the ATAS-120 is high, causing a narrow resonance range.

Before Manual Tuning, press the [**F**] key, as needed, to recall Multi Function Row "i" [**MTR**, **----**, **DISP**], then press the [**A**](**MTR**) or [**B**] key to change the meter function to the SWR meter ("SWR" icon will appear at the upper of the [**B**] key).

To tune the ATAS-120 manually, recall Multi Function Row "k" [**TUN**, **SHRT**, **EXTD**], then press and hold in the microphone **PTT** switch. With the transceiver in the "transmit" mode, press and hold in the [**C**](**EXTD**) key (to raise the antenna) or the [**B**](**SHRT**) key (to lower the antenna). While you hold in one of these keys, the FT-897 will generate a carrier, and you may watch the top scale of the FT-897's meter, looking for the meter indication to reach its minimum value. When this is reached, release the [**C**](**EXTD**) or [**B**](**SHRT**) key, then release the **PTT** key to return to the "receive" mode.

R. F. Says: 1) Once automatic matching has been successfully accomplished, you must change frequency by at least 10 kHz before attempting automatic matching again. Within a window of ±10 kHz from a match point, the transceiver's microprocessor will ignore any command to attempt automatic matching.

2) Antenna tuning is accomplished using a "CW" carrier, although the mode indication will not change to "CW" (if you are operating on another mode) during antenna tuning.

3) If you see a "HI SWR" Icon on the LCD, it may mean that there is a problem in your coaxial cable (bad connection, etc.) which is preventing successful tuning. Replace the cable, or try adding a few feet/meters of cable (to eliminate the possibility of adverse "transformer action" in the 50Ω cable during the tuning process).

4) If you are able to achieve an SWR of less than 2:1 via manual tuning, the FT-897 will "accept" the manual setting, and you may then re-tune automatically when changing bands.

5) If, however, you stop manual tuning at a non-optimum setting (SWR >2:1), the FT-897 will not permit further automatic tuning. To refresh the setting of the ATAS-120, press the [**B**](**SHRT**) key until the ATAS-120 will fully retract. You may then restart automatic tuning per the procedures described earlier.

ATAS-120 Operating Tips

The information below will help you derive the best performance possible from the ATAS-120 Active-Tuning Antenna System.

Grounding

It is critically important that you establish a good mechanical and RF ground connection for your ATAS-120 (as with all vertical antennas). Mobile mounts which are bolted through the vehicle's roof, or otherwise mechanically affixed, will usually be satisfactory. However, magnetic mounts do not provide the RF grounding necessary for good

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performance, and are not recommended for use with this antenna.

Tuning Procedure

The feedpoint impedance of the ATAS-120 (resistance and reactance) will necessarily vary over a wide range when you change bands. Occasionally, the transceiver's microprocessor will not initially be able to determine the proper direction for the ATAS-120 to travel (inward or outward) for best SWR.

To resolve this situation, the transceiver will then command the ATAS-120 to retract fully to its minimum height, and thence restart the tuning process. In this instance, the "UN" icon will remain on the display after you press the [B](TUN) key. If this happens, do not press the [B](TUN) key repeatedly. The transceiver will remain in the receive mode as it retracts (this may take up to one minute). Thereafter, the transmitter will be engaged, and the ATAS-100 will be automatically adjusted for best SWR. The "UN" icon will then disappear from the LCD, and you will be ready for operation.

The command which retracts the ATAS-120 to its minimum height utilizes a fixed timer. If the ATAS-120 reaches its minimum height before the timer has expired, you may observe the antenna's motor continuing to rotate; this is normal, as the ATAS-120's retraction mechanism includes a clutch assembly to prevent damage to the antenna or motor.

External Wattmeters

If you wish to use an external wattmeter in conjunction with the transceiver and your ATAS-120, please check the wattmeter with an Ohmmeter prior to installation. Be sure there is a direct connection between the "In" and "Out" jacks of the wattmeter (zero resistance), and also ensure that there is a completely open circuit between the center pin and shield of the wattmeter's output jack. Some wattmeters use a coil or other device which shorts the center pin to ground at DC, and this type of internal wattmeter circuitry will not allow the tuning function of the ATAS-120 to operate.

Operation on 30/17/12 Meters

Although the ATAS-120 is not specified for operation on the above bands, and optimum operation is therefore not guaranteed, the ATAS-120 generally can be tuned successfully on these bands (some manual adjustment may be required). Operation of the ATAS-120 on these bands will not damage the antenna's components; please feel free to experiment

on these bands, if you like.

FC-30 Automatic Antenna Tuner Operation

The optional FC-30 Automatic Antenna Tuner provides automatic tuning of a coaxial line so as to present a nominal 50Ω impedance to the FT-897's HF/50 MHz antenna port.

Before operation can begin, you must instruct the FT-897's microprocessor that the FC-30 is being used. This is done using the Menu Mode:

1. Press and hold in the [**F**] key for one second to activate the Menu mode.
2. Rotate the **MEM/VFO CH** knob to recall Menu Mode **No-087** [**TUNER/ATAS**].
3. The default setting for this Menu is "**OFF**." Rotate the **DIAL** to change the setting to "**TUNER**." Press and hold in the [**F**] key for one second to save the new setting and exit to normal operation.
4. Turn the FT-897's power Off, then On again, to re-initialize the FT-897's microprocessor regarding the tuner status (no other setting will be affected).

Operation is similar to the procedure for the ATAS-120:

1. Press the [**F**] key, as needed, to recall Multi Function Row "k" [**TUN**, **SHRT**, **EXTD**].
2. Press the [**A**](**TUN**) key to turn the **FC-30** on. The "parenthesis" will appear at the both side of the "**TUN**" indication.
3. Press and hold in the [**A**](**TUN**) key to initiate automatic tuning. The FT-897 transmitter will be activated, a carrier signal will be sent out, and the coils and capacitors in the **FC-30** will be selected/adjusted for optimum SWR. When tuning is complete, the transmission will cease, and you will be ready for operation on this frequency.

R. F. Says: Tuning data will be stored in the **FC-30**'s Memory system. See the discussion on the next page for details on how this works.

Antenna Tuner Memory System

The **FC-30**, working in concert with the FT-897, can store impedance matching data in its micro-computer memory, so as to provide instant adjustment as you transmit in different areas of a particular band. A total of 100 memories are provided: 11 of these are "general" memories apportioned one per band, while the remaining 89 are allocated for specific frequency data within the various bands, with the capability to resolve new

tuning data every 10 kHz. A few guidelines should be noted regarding the FC-30's memory system:

1. Tuning data is stored when you make an active effort to store it by pressing and holding in the [**A**](**TUN**) key for one second. Although the tuner will automatically activate itself if it encounters more than 1.5:1 SWR, this memory will not be stored unless you have pressed the [**A**](**TUN**) key for one second. This allows you to store your favorite operating frequency areas into tuner memory without tying up memory space with matching data on seldom-used frequencies.

2. If the **FC-30** cannot resolve a satisfactory match because the SWR is above 3:1 (2:1 on the 50 MHz band), the tuning process will stop, and no memory data will be stored. However, you may wish to move frequency a few kHz, then press the [**A**](**TUN**) key again for one second, as slight changes in the reactance may allow a match to be obtained. Then go back to the original frequency and try again.

3. Another technique which may allow matching in some situations is to add a few feet or meters of coaxial cable on the "antenna side" of the **FC-30**. This will change the impedance transformation taking place in the coaxial cable, possibly moving the impedance presented to the **FC-30** into an acceptable range. Note that this is not changing the actual antenna SWR, but only the impedance "seen" by the **FC-30**'s matching circuits.

4. If your antenna system presents an SWR of less than 1.5:1, you may wish to turn off the antenna tuner, as full transmitter power will be delivered to the antenna system without intervention by the **FC-30**.

5. If the impedance encountered by the **FC-30** exceeds 3:1, and the "HI SWR" icon is illuminated, the microprocessor will not retain the tuning data for that frequency, as the **FC-30** presumes that you will want to adjust or repair your antenna system so as to correct the high SWR condition.

Memory Operation

QMB Channel

QMB Channel Storage

1. Tune in the desired frequency and set the operating mode and bandwidth. If this is an FM channel, set up any required CTCSS/DCS and repeater shift configurations.

2. Press and hold in the **V/M** key until a double "beep" is heard. The second beep provides audible confirmation that the data has been stored into the QMB memory.

R. F. Says: Pressing the [**A**](**STO**) key momentarily while in Multi Function Row "c" [**STO**, **RCL**, **RCL**] will also store a frequency into the QMB register.

QMB Channel Recall
1. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "c" [**STO**, **RCL**, **RCL**] appears on the display.
2. Press the [**B**](**RCL**) key momentarily to recall the QMB memory. "**QMB**" will appear at the upper left corner on the display.
3. Press the [**B**](**RCL**) key once more to return to the previous frequency (either a VFO frequency or a Memory channel).

R. F. Says: If you move the **DIAL** knob or **MEM/VFO CH** knob while in the QMB mode, you can change frequencies as if you were in a "VFO" mode. You also can change operating mode by pressing the **MODE**(◄) or **MODE**(►) key. When this is done, the "**MTQMB**" will appear in the display, where "**MT**" represents "Memory Tuning." Press the [**B**](**RCL**) key once more to return to the originally-stored QMB frequency.

Memory Operation on "Regular" Memory Channels
Normal Memory Storage
1. Tune in the desired frequency, and set the operating mode and bandwidth. If this is an FM channel, set up any required CTCSS/DCS and repeater shift configurations. Standard (default) repeater shifts do not require you to utilize the "split" frequency memory technique, described later.
2. Press the [**F**] key momentarily, then rotate the **SEL** knob, as needed, until Multi Function Row "b" [**MW**, **MC**, **TAG**] appears on the display.
3. Press the [**A**](**MW**) key momentarily to enter the "Memory Check" mode, which is used to find an unused memory channel. The frequency stored (if any) on the current memory channel will be shown in the display.
4. Rotate the **MEM/VFO CH** knob to select the channel number on which you wish to store the current frequency data.
5. Press and hold in the [**A**](**MW**) key for one second until you hear a double beep; the second beep confirms that the frequency information was successfully stored.

Split-Frequency Memory Storage
You can also store "Split" frequencies, such as when operating on a repeater system not

utilizing a "standard" offset. This procedure may also be used for DX work on 7 MHz SSB, etc.

1. In the VFO mode, set the desired Receive frequency and mode.

2. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "b" [**MW**, **MC**, **TAG**] appears on the display.

3. Press the [**A**](**MW**) key momentarily to enter the "Memory Check" mode, which is used to find an unused memory channel. The frequency stored (if any) on the current memory channel will be shown in the display.

4. Rotate the **MEM/VFO CH** knob to select the channel on which you wish to store the receive frequency data.

5. Press and hold in the [**A**](**MW**) key for one second until you hear a double beep, which confirms that the Receive frequency data is now stored.

6. Now, set the desired Transmit frequency and mode on the VFO.

7. Press the [**A**](**MW**) key momentarily; do not rotate the **MEM/VFO CH** knob!

8. While the "memory channel number" is blinking, press and hold in the **PTT** switch; while holding it in, press and hold in the [**A**](**MW**) key for one second. The double "beep" will confirm that independent Transmit frequency data is now stored. You may now release the **PTT** switch.

R. F. Says: In step 8 above, pressing the **PTT** switch does not activate the transmitter. It simply sends a signal to the microprocessor that an independent Transmit frequency is being stored on the same channel as a previously-stored Receive frequency.

Memory Channel Recall

1. If you currently are in the VFO tuning mode, press the **V/M** key once to enter the "Memory" mode (a memory channel number "**M-*nnn***" will appear on the display in she space previously occupied by "**VFOa**" or "**VFOb**").

2. To select another memory channel, turn the **MEM/VFO CH** knob.

3. When your memory channels are partitioned into Memory Groups via Menu Mode **No-056** [**MEM GROUP**], it is easy to change Memory Groups; press the **MEM/VFO CH** knob momentarily (a Group Number ("**a**" ~ "**j**") will blink), then turn the **MEM/VFO CH** knob to step through the channels until you enter another. You may now press the **MEM/VFO CH** knob once more to restrict memory channel access to the newly-selected Group.

4. Once you are operating on a memory channel, you may tune off of the originally-memorized frequency (as though you were in the VFO mode). Just rotate the **DIAL**

knob; the "Memory Channel Number" will be replaced by one which indicates "**MTUNE**," indicating that you have now shifted into the "Memory Tuning" mode. When operating the Memory Tuning mode, if you find another frequency you wish to store into another memory channel, just press the [**A**](**MW**) key momentarily, select a new memory channel via the **MEM/VFO CH** knob, then press and hold in the [**A**](**MW**) key until you hear the double beep.

5. To exit the Memory Tuning mode, press the **V/M** key as follows:
   ❒ One touch of the **V/M** key returns you to the original memory frequency.
   ❒ A second touch of the **V/M** key will cause you to exit the Memory mode and return to the VFO mode (the memory channel number will be replaced by "**VFOa**" or "**VFOb**".

R. F. Says: When operating on a "Split" frequency memory, a special "+,–" indication will appear on the LCD.

Masking Memory

Frequency data stored on a memory channel can be deleted, if desired, from any memory channel except channel "1." The deletion process is not a "hard" erasure, so if you erase a channel by mistake using this procedure, the memory channel contents can be recovered.

1. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "b" [**MW**, **MC**, **TAG**] appears on the display.
2. Press the [**A**](**MW**) key momentarily, then rotate the **MEM/VFO CH** knob to select the memory channel to be deleted.
3. Press the [**B**](**MC**) key momentarily. The frequency display field on the LCD will go blank, and the memory channel number will blink.
4. Wait about three seconds; when the memory channel number stops blinking, the data will now be "masked" and will not be available for operation.
5. To restore the masked frequency data, repeat the above steps. However, if you store new frequency information on a channel containing masked data, the masked data will be over-written and lost.
6. Memory Channel 1 is used for Priority operation, and frequency information may only be over-written (not masked) on this channel.

Memory Operation on "HOME" Channel Memories

Four Special one-touch "Home" channels are available, for special frequencies you use

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often. Either "simplex" or "split" frequency/mode data may be stored in the "Home" channel locations. Special "Home" channels are available for HF (any frequency between 1.8 and 29.7 MHz), 50 MHz, 144 MHz, and 430 MHz.

These memories may prove particularly useful for monitoring propagation beacons, providing one-touch recall of the beacon frequency for a quick check of band conditions.

<u>HOME Channel Storage</u>
1. Tune the desired frequency, and set the operating mode. If this is an FM channel, set up any required CTCSS/DCS and repeater shift configurations.
2. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "b" [**MW**, **MC**, **TAG**] appears on the display.
3. Press the [**A**](**MW**) key momentarily to enter the "Memory Check" mode.
4. Press and hold in the **HOME** key for one second. This stores the frequency data into the "Home" channel location. As usual, you will hear a double beep to confirm the successful storage of the frequency data.
5. If you wish to store a "Split" frequency pair into the "Home" channel, store the Receive frequency in steps 1 ~ 4 above. Now set the desired Transmit frequency.
6. Once more, press the [**A**](**MW**) key momentarily.
7. Press and hold in the microphone's **PTT** switch; while holding the **PTT** switch, again press and hold the **HOME** key for one second. This stores the transmit frequency data into the "Home" channel location.

<u>HOME Channel Recall</u>
1. Press the **HOME** key momentarily to recall the Home Channel on the band group where you currently are operating (HF, 50 MHz, 144 MHz, or 430 MHz). The "**HOME**" indication will appear on the display.
2. Press the **HOME** key once more to return to the previously-used frequency (either a VFO frequency or a memory channel).

Labeling Memories
You may wish to append an alpha-numeric "Tag" (label) to a memory or memories, to aid in recollection of the channel's intended use (such as a club name, etc.). This is easily accomplished using the Menu mode.
1. Recall the memory channel onto which you wish to appended a label.
2. Press and hold in the [**F**] key for one second to enter the Menu mode.

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3. Rotate the **MEM/VFO CH** knob to recall Menu Mode **No-057** [**MEM TAG**].

4. Press the **MEM/VFO CH** knob to enable the programming of the label.

5. Rotate the **DIAL** knob to select the first character (number, letter, or symbol) in the name you with to store, then rotate the **MEM/VFO CH** knob clockwise to move to the next character.

6. Again rotate the **DIAL** knob to select the next number, letter, or symbol, then rotate the **MEM/VFO CH** knob clockwise to move to the next character's slot.

7. Repeat step 6 as many times as necessary to complete the name tag for the memory, then press and hold in the [**F**] key for one second to save the A/N (Alpha-Numeric) name entry and exit to normal operation.

During Memory operation, press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "b" [**MW**, **MC**, **TAG**] appears on the display. Press the [**C**](**TAG**) key momentarily to activate the alpha-numeric Tag. Repeatedly pressing this key will toggle operation between "Frequency" display and "Tag" display.

R. F. Says: You can recall Menu Mode **No-057** [**MEM TAG**] instantly by pressing and holding in the [**C**](**TAG**) key for one second.

Spectrum Scope Monitor Operation

The Spectrum Scope Monitor allows viewing of operating activity on above and below your current frequency channel in the VFO mode, or viewing of memory channel activity on the current memory group when in the Memory mode. When the Spectrum Scope Monitor is activated, the display indicates the relative signal strength on channels immediately adjacent to the current operating frequency.

Two basic operating modes for Spectrum Scope are available:

CONT: In this mode, the transceiver sweeps the current band repeatedly until the Spectrum Scope is turned off.

CHK: In this mode, the transceiver sweeps the current band one cycle every 10 seconds.

Setting the Spectrum Scope Mode

1. Press and hold in the [**F**] key for one second to enter the Menu mode

2. Rotate the **SEL** knob to select Menu #43 (**SCOPE**).

3. Rotate the **DIAL** to select the desired sweep mode (see above).

4. When you have made your selection, press and hold in the [**F**] key for one second to save the new setting and exit to normal operation.

Activate the Spectrum Scope

1. Set the transceiver to the VFO mode in the desired band or desired memory group.
2. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "h" [**SSM**, **WIDH**, **STEP**] appears on the display.
3. Press the [**A**](**SSM**) key momentarily to engage the Spectrum Scope.
4. When the Spectrum Scope is in operation, the relative signal strength of stations on channels immediately adjacent to the current frequency will be indicated on the display.
5. While the Spectrum Scope is activated in the VFO mode, press the [**B**](**WIDH**) key to change the visible band width. Available selections are ±10, ±15, and ±63 channels (default). Press the [**C**](**STEP**) key to change the visible step. Available selections are ???.
6. To disable the Spectrum Scope, press the [**A**](**SSM**) key once more.

R. F. Says: The receiver's audio output and S-meter are disabled when using the Spectrum Scope.

Smart Search™ Operation

The Smart Search™ feature automatically stores frequencies where activity is encountered on the current band. When Smart Search™ is engaged, the transceiver quickly searches above your current frequency, storing active frequencies as it goes (without stopping on them even momentarily). These frequencies are stored in a special Smart Search™ memory bank, consisting of 50 memories. This feature available on the FM and AM modes.

The Smart Search™ feature is especially helpful when traveling, as you can instantly store active FM repeater frequencies without having to look up the frequencies in a reference book.

1. Set the **SQL** knob to the point where background noise is silenced. A typical setting, for effective Smart Search™ operation, will be at 12 o'clock or slightly clockwise from this position.
2. Set the VFO to the frequency on which you wish to begin the search (the Smart

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Search^{TM} feature is available on the VFO mode only).

3. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "f" [**ARTS**, **SRCH**, **PMS**] appears on the display.

4. Now press the [**B**](**SRCH**) key momentarily; the blinking "**SRCH**" indicator will appear on the LCD, and the transceiver will sweep upward on the current band, loading channels on which it encounters a signal strong enough to open the squelch.

5. All channels where activity is present (up to 50 channels) will be loaded into the Smart Search^{TM} memories. Whether or not all 50 memories are filled, the search will stop after one sweep.

6. Now you can turn the **MEM/VFO CH** knob to select from the just-stored Smart Search^{TM} memories. If you find frequencies you wish to store into a "regular" memory, just follow the procedures described previously; just don't press the [**B**](**SRCH**) key while storing these memories, because this will disable Smart Search^{TM} operation (see step 7).

7. To disable Smart Search^{TM} operation, press the [**B**](**SRCH**) key momentarily.

R. F. Says: The Smart Search^{TM} memories are so-called "soft" memories; they will be lost if you initiate a new Smart Search^{TM} sweep of the band.

Scanning Operation

This transceiver contains a wide variety of scanning capabilities. Whether you are in the VFO mode or one of the memory modes, scanning operation is fundamentally identical in all configurations, but with the following differences:

❍ In the VFO mode, scanning causes the transceiver to sweep up or down the band, pausing or halting on any signal encountered;

❍ In the Memory mode, the scanner will scan the programmed memories, and can be instructed to skip certain memories during scanning;

❍ In the Programmable Memory Scan (PMS) mode, the scanner will scan the band within user-programmed frequency limits.

Scanning Operation

1. Set the **SQL** knob to the point where background noise is silenced. A typical setting, for effective scanning operation, will be at 12 o'clock or slightly clockwise from this position.

2. Set the transceiver into the operating configuration in which you wish to scan (VFO

or Memory; PMS will be described later).

3. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "g" [**SCN**, **PRI**, **DW**].

4. Press the [**A**](**SCN**) key momentarily to start upward scan (toward higher frequencies or higher memory channel numbers).

5. Rotate the **DIAL** knob or **MEM/VFO CH** knob counterclockwise to toggle the scanning direction downward.

6. The scanner will now cause the transceiver to increment in the chosen direction until a signal is detected. When a signal is encountered which opens the Squelch, In the FM/AM modes, the scanner will pause until the signal disappears (at the end of the other station's transmission), at which point scanning will resume. While the transceiver is in the "Pause" condition, the decimal points in the frequency display area will blink. See "Scan-Resume Choices" on page <<??>> for details of how to customize the resumption of scanning. In the SSB/CW modes, the scanner will slow down (but doesn't stop).

7. Press the **PTT** switch on the microphone to cancel scanning.

R. F. Says: You may also press and hold in either the [**UP**] or [**DWN**] key on the microphone for one second to initiate upward or downward scanning, respectively, if Menu Mode **No-058** [**MIC SCAN**] is set to "**ON**."

Scan Skip Programming (Memory Mode Only)

Among the memories you have programmed, there may be some stations which you do not wish to scan. For example, broadcast signals (which are transmitted continuously) will cause the scanner to stop, and such channels may be skipped so as to avoid this inconvenience.

To remove a channel from the scanning loop:

1. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "b" [**MW**, **MC**, **TAG**] appears on the display.

2. Recall the memory channel to be skipped.

3. Press the [**B**](**MC**) key momentarily. The "hyphen" in the memory channel number will change to become a "dot"; this shows that this channel now is not included in the scanning loop.

4. Repeat steps 2 and 3 as many times as necessary to skip all the channels you do not wish to scan.

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5. Initiate memory scanning; you will observe that the channels you marked to be skipped are not included in the scanning loop.

6. Press the **PTT** switch to stop the scan; you may now use the **MEM/VFO CH** knob to step through the channels manually - one at a time - and you will observe that the "Skipped" channels are, nonetheless, available for recall by manual means.

7. You may restore a previously-skipped channel to the scanning loop by selecting the channel manually, then pressing the [**B**](**MC**) key momentarily so that the "dot" changes to become a "hyphen."

Programmable Memory Scan (PMS) Operation

To limit scanning (or tuning) within a particular frequency range, you can use the Programmable Memory Scanning (PMS) feature, which utilizes 20 special-purpose memory pair ("**M-P1L/ M-P1U**" through "**M-P20L/ M-P20U**"). The PMS feature is especially useful in helping you to observe any operating sub-band limits which apply to your Amateur license class.

PMS setup is simple to accomplish;

1. Store the upper and lower frequency limits of the desired range into the PMS memory pair ("**M-PxL**" and "**M-PxU**")

2. Switch to the Memory mode by pressing the **V/M** key once, then rotate the **DIAL** to select the Memory channel "**M-PxL**" or "**M-PxU**".

3. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "f" [**ARTS**, **SRCH**, **PMS**] appears on the display.

4. Press the [**C**](**PMS**) key. The "**PMS-x**" indication will appear at the upper left corner of the LCD, signifying that the PMS feature is engaged. Tuning and scanning (by pressing the [**A**](**SCN**) key on the Multi Function Row "g" [**SCN**, **PRI**, **DW**]) are now limited within the range between the selected PMS memory pair, keeping operation inside this programmed range.

Example: Limit tuning & scanning to the frequency range 144.30 - 148.00 MHz

1. Press the **V/M** key, as necessary, to recall the VFO mode. Tune the **MEM/VFO CH** or **DIAL** knob to 144.300 MHz.

2. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "b" [**MW**, **MC**, **TAG**] appears on the display.

3. Press the [**A**](**MW**) key momentarily, then turn the **MEM/VFO CH** knob to select memory channel "**M-P1L**."

4. Press and hold in the [**A**](**MW**) key for one second to write the VFO frequency into "**M-P1L**."

5. Now, tune the **MEM/VFO CH** or **DIAL** knob to 148.000 MHz.

6. Press the [**A**](**MW**) key momentarily, then turn the **MEM/VFO CH** knob to select memory channel "**M-P1U**."

7. Press and hold the [**A**](**MW**) key for one second to write the VFO frequency into "**M-P1U**."

8. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob one click clockwise to recall Multi Function Row "c" [**STO**, **RCL**, **PMS**].

9. Press the [**C**](**PMS**) key momentarily. Tuning and scanning are now limited to the 144.30 - 148.00 MHz range until you press the **V/M** key to return to memory or VFO operation.

<u>NOTE</u>

The frequency resolution for these sub-band limits is 100 kHz, although the channel resolution of the sub-band limit memories in whatever you have selected as the current step size. As a result, the frequencies stored in these special memories (**M-PxL** and **M-PxU**) are both rounded down to the nearest 100 kHz for their roles as sub-band limits. Therefore, in the above example, any frequency between 144.300 and 144.399 MHz may be used to store a lower tuning limit of "144.300 MHz" in memory **M-PxL**.

"Priority Channel" Scanning

The FT-897's scanning features include a two-channel scanning capability which allows you to operate on a VFO or Memory channel, while periodically checking a Memory Channel "1" for activity. If a station is received on the Memory Channel "1" which is strong enough to open the Squelch, the scanner will pause on that station in accordance with the Scan-Resume mode set via Menu Mode **No-078** [**RESUME**]. See page xx.

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

1. Rotate the **SQL** control until the background noise is just silenced, then store the frequency to be the "Priority" channel into the Memory Channel "1."

2. Set the FT-897 for operation on another memory channel, or on a VFO frequency.

3. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "g" [**SCN**, **PRI**, **DW**] appears on the display.

4. Press the [**B**](**PRI**) key momentarily to start the "Priority" monitoring (the "**P**" icon will appear at the upper of the frequency display.

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

When 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.

If a station you wish to talk with appears on the Priority channel, press the PTT switch momentarily while receiving their signal (no transmission will occur) to halt Priority scanning. Otherwise, when a signal appears on the Priority channel, Priority monitoring will just pause on the channel. Priority monitoring will resume

To cancel Priority monitoring, press again the [**B**](**PRI**) key.

Scan-Resume Choices
Scanning operation requires that you have the **FT-897**'s audio squelched. The transceiver then "assumes" that the opening of the squelch corresponds to the discovery of a signal you may wish to listen to.
Once the scan has been halted, one of three things may happen:

TIME (default action): In this mode, the transceiver pauses on the signal and stays locked on its frequency for five seconds. Thereafter, scanning will resume whether or not the other station's transmission has ended. The pause time is adjustable from 0 to 10 seconds via Menu Mode **No-078** [**RESUME**].
BUSY: In this mode, the scanner will halt until the other station's transmission ceases (at which point the squelch will close). One second after the squelch closes, scanning resumes automatically.
STOP: In this mode, the scanner will find a signal, and lock on that frequency without resuming the scan.

To choice the Scan-Resume mode;
1. Press and hold in the [**F**] button for one second to activate the Menu mode.
2. Rotate the **MEM/VFO CH** knob to select Menu Mode **No-077** [**SCAN MODE**].
3. Rotate the **DIAL** knob to select the desired Scan-Resume mode.
4. Press and hold in the [**F**] button for one second to exit the Menu mode.

Dual Watch Operation

Dual Watch is similar, in some respects, to scanning. In Dual Watch, however, the transceiver monitors (squelched) on the VFO-A frequency while periodically checking VFO-B for activity (or vice-versa). A typical example might be for you to set VFO-A to 50.110 MHz, watching for DX stations who might call CQ on that frequency, while periodically checking 28.885 MHz for stations reporting band openings on 6 meters.

To activate Dual Watch:

1. Set up transmit and receive operation on VFO-A, establishing your primary monitoring frequency. Set up the frequency to be checked periodically on VFO-B.
2. Recall VFO-A, then rotate the **SQL** control until the background noise is just silenced.
3. Press the [**F**] key momentarily, then rotate the **MEM/VFO CH** knob, as needed, until Multi Function Row "g" [**SCN**, **PRI**, **DW**] appears on the display.
4. Press the [**C**](**DW**) key momentarily to activate Dual Watch operation (the "**D**" icon will appear at the upper of the frequency display.
5. The transceiver will continue to monitor (squelched) on the current (VFO-A) frequency, but every five seconds will switch briefly to VFO-B frequency, looking for activity.
6. If a station is detected on the VFO-B frequency, the transceiver will pause on the VFO-B frequency (the decimal point in the frequency will blink).
7. Press the [**C**](**DW**) key again to cancel Dual Watch operation (the "**D**" icon will disappear).

RF. Says: Note that pressing the **PTT** switch on the microphone does not cancel Dual Watch operation.

Operation on Alaska Emergency Frequency: 5167.5 kHz (U.S. Version Only)

Section 97.401(d) of the regulations governing amateur radio in the United States permit emergency amateur communications on the spot frequency of 5167.5 kHz by stations in (or within 92.6 km of) the state of Alaska. This frequency is only to be used when the immediate safety of human life and/or property are threatened, and is never to be used for routine communications.

The FT-897 includes the capability for transmission and reception on 5167.5 kHz under such emergency conditions via the Menu system. To activate this feature:

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1. Press and hold in the [**F**] button for one second to activate the Menu mode.

2. Rotate the **MEM/VFO CH** knob to select Menu Mode **No-051** [**EMERGENCY**].

3. Rotate the **DIAL** knob to select "**ON**."

4. Press and hold in the [**F**] button for one second to exit the Menu mode.

Emergency communication on this spot frequency is now possible:

Press the **V/M** keys, as necessary, to enter the Memory mode, then rotate the **MEM/VFO CH** knob to select the emergency channel (**M-EMG**), which is found between channels **M-P20U** and **M-001**.

Note that the receive-mode CLARIFIER functions normally while using this frequency, but variation of the transmit frequency is not possible. Activation of Menu Mode **No-051** [**EMERGENCY**] does not enable any other out-of-amateur-band capability on the transceiver. The full specifications of the FT-897 are not necessarily guaranteed on this frequency, but power output and receiver sensitivity should be fully satisfactory for the purpose of emergency communication.

If you wish to disable operation on the Alaska Emergency Frequency, repeat the procedure detailed above, but set Menu Mode **No-051** [**EMERGENCY**] to "**OFF**" in step 3 of the procedure.

In an emergency, note that a half-wave dipole cut for this frequency should be approximately 45'3" on each leg (90'6" total length).Emergency operation on 5167.5 kHz is shared with the Alaska-Fixed Service. This transceiver is not authorized for operation, under the FCC's Part 87, for aeronautical communications.

Display Customization

Display Lamp Mode

The FT-897 illumination lamp has four options for activating the lamp are provided.

To setup the Lamp mode;

1. Press and hold in the [**F**] button for one second to activate the Menu mode.

2. Rotate the **MEM/VFO CH** knob to select Menu Mode **No-045** [**DISPLAY MODE**].

3. Rotate the **DIAL** knob select the desired mode. Available selections are:

    OFF: Disable the LCD illumination.

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AUTO1: Illuminates the LCD while the FT-897 operate on the external power supply. <<??>>

AUTO2: Illuminates the LCD for five seconds when any button is pressed, or rotate the **DIAL** or **MEM/VFO CH** knob. <<??>>

ON: Illuminates the LCD continuously.

4. When you have completed, press and hold in the [**F**] button for one second to exit the Menu mode.

Display Color

The LCD color may be changed using the Menu Mode for each operating status.

1. Press and hold in the [**F**] button for one second to activate the Menu mode.

2. Rotate the **MEM/VFO CH** knob to select Menu Mode **No-043** [**DISPLAY COLOR**].

3. Rotate the **DIAL** to select the desired operating status which you wish utilize. Available selections are:

VFO: ???

MTR: ???

MEM GROP: ??

FIX: ???

BAND: ???

ART: ???

4. Press the **MEM/VFO CH** knob momentarily, then rotate the **DIAL** to select the desired color to be illuminated in place of the regular color.

5. When you have completed, press and hold in the [**F**] button for one second to exit the Menu mode.

Display Contrast

The LCD's contrast may be adjusted using the Menu Mode, as well.

1. Press and hold in the [**F**] button for one second to activate the Menu mode.

2. Rotate the **MEM/VFO CH** knob to select Menu Mode **No-044** [**DISPLAY CONTRAST**].

3. Rotate the **DIAL** knob to adjust the contrast. As you make the adjustment, you will be able to see the effects of you changes.

4. When you have completed, press and hold in the [**F**] button for one second to exit the Menu mode.

Display Dimmer

The LCD illumination may be adjusted using the Menu Mode, as well.

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1. Press and hold in the [**F**] button for one second to activate the Menu mode.

2. Rotate the **MEM/VFO CH** knob to select Menu Mode **No-042** [**DISPLAY INTENSITY**].

3. Rotate the **DIAL** knob to adjust the display illumination for a comfortable brightness level. As you make the adjustment, you will be able to see the effects of you changes.

4. When you have completed, press and hold in the [**F**] button for one second to exit the Menu mode.

Programming the Key Function

The Function ([**A**], [**B**], [**C**]) key in the Multi Function Row "p" [**PG A**, **PG B**, **PG C**] and optional MH-36E8J microphone's ([**P1**], [**P2**], and [**ACC**]) button may be assign the function for a particular key. Available selections are Multi Function features and short-cut function for the recalling Menu Mode.

To assign the key function;
1. Press and hold in the [**F**] button for one second to activate the Menu mode.

2. Rotate the **MEM/VFO CH** knob to select Menu Mode corresponding to the key to be assigned a function (**No-065**: [**PG A**] key, **No-066**: [**PG B**] key, **No-067**: [**PG C**] key, **No-068**: [**PG ACC**] key, **No-069**: [**PG P1**] key, **No-065**: [**PG P2**] key).

3. Rotate the **DIAL** knob to select the feature or function you wish to assigned to the key or button.

4. When you have completed, press and hold in the [**F**] button for one second to exit the Menu mode.

Menu Operation

The Menu System allows you to customize a wide variety of transceiver performance aspects and operating characteristics. Once you have gone through the various Menu customization procedures initially, you will find that you will not have to resort to them frequently during everyday operation.

Menu Operation
1. Press and hold in the [**F**] key for one second. The Menu Item number and a title for the Menu Mode will appear in the display.

2. Rotate the **MEM/VFO CH** knob to select the Menu Item you wish to work on.

3. When you have chosen the desired Menu Item number, rotate the **DIAL** knob to

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change the value or condition for the Menu Item.

4. When you have made your selection, press and hold in the [**F**] key for one second to save the new setting and exit to the normal operation.

R. F. Says: 1) In step 3 above, if you press the [**HOME**] key momentarily, it will reset the setting of that Menu Item to its factory-default value.

2) In step 4 above, if you press the [**C**] key momentarily, you will exit to normal operation without saving the new setting.

MENU MODE No-001 [**EXTEND**]

Function: Enable/Disable the extended Menu Mode.
Available Values: OFF/ON
Default: ON

MENU MODE No-002 [**144 MHz ARS**]

Function: Activate/deactivate the Automatic Repeater Shift when operating on the 144 MHz band.
Available Values: OFF/ON
Default: ON (depending on transceiver version)

MENU MODE No-003 [**430 MHz ARS**]

Function: Activate/deactivate the Automatic Repeater Shift when operating on the 430 MHz band.
Available Values: OFF/ON
Default: ON (depending on transceiver version)

MENU MODE No-004 [**AM&FM DIAL**]

Function: Enabling/disabling the **DIAL** knob on the AM and FM modes.
Available Values: ENABLE/DISABLE
Default: DISABLE

MENU MODE No-005 [**AM MIC GAIN**]

Function: Adjust the microphone gain level for the AM mode.
Available Values: 0 ~ 100
Default: 50

MENU MODE No-006 [AM STEP]

Function: Select the tuning steps for the **MEM/VFO CH** knob on the AM mode.

Available Values: 2.5/5/9/10/12.5/25kHz

Default: 5 kHz (depending on transceiver version)

MENU MODE No-007 [APO TIME]

Function: Select the Auto Power Off time (time before power goes off).

Available Values: OFF/1h ~ 6h

Default: OFF

MENU MODE No-008 [ARTS BEEP]

Function: Select the ARTS beep mode.

Available Values: ALL/RANGE/OFF

Default: RANGE

ALL: A high tone beep will sound every time a polling transmission is received from the other station, and a low beep will sound once when the other station goes out of range.

RANGE: A high tone beep will sound when the transceiver first detects that you are within range, and a low beep will sound when the other station goes out of range.

OFF: No alert beeps sound; you must look at the display to determine current ARTS status.

MENU MODE No-009 [ARTS ID]

Function: Enables/disables the CW identifier during ARTS operation.

Available Values: OFF/ON

Default: OFF

MENU MODE No-010 [ARTS IDW]

Function: Store your callsign into the CW identifier. Up to ten characters may be stored. The storage procedure is as follows:

1. Press the **MEM/VFO CH** knob momentarily to initiate callsign storage (an "under-bar" will appear below the first character location of the callsign).
2. Rotate the **DIAL** knob to select the first letter/number of your callsign, then rotate the **MEM/VFO CH** knob one click clockwise to save the first letter/number and move to the next entry position.
3. Repeat the previous step as many times as necessary to complete your callsign.
4. Press the **MEM/VFO CH** knob to save your completed callsign and exit.

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Default: YAESU

MENU MODE No-011 [**BEACON TEXT**]

Function: Store the message for the Beacon. Up to 40 characters may be stored. The storage procedure is as follows:

MENU MODE No-012 [**BEACON TIME**]

MENU MODE No-013 [**BEEP TONE**]

Function: Select the beep frequency

Available Values: 440/880/1760 Hz

Default: 880 Hz

MENU MODE No-014 [**BEEP VOL**]

Function: Select the beep volume

Available Values: 0 ~ 100

Default: 50

Press the [**B**] key to monitor the setting level.

MENU MODE No-015 [**CAR LSB R**]

Function: Set the Rx Carrier Point for LSB

Available Values: −300 ~ +300 Hz

Default: 0 Hz

MENU MODE No-016 [**CAR LSB T**]

Function: Set the Tx Carrier Point for LSB

Available Values: −300 ~ +300 Hz

Default: 0 Hz

MENU MODE No-017 [**CAR USB R**]

Function: Set the Rx Carrier Point for USB

Available Values: −300 ~ +300 Hz

Default: 0 Hz

MENU MODE No-018 [**CAR USB T**]

Function: Set the Tx Carrier Point for USB

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Available Values: −300 ~ +300 Hz

Default: 0 Hz

MENU MODE No-019 [CAT RATE]

Function: Set the transceiver's circuitry for the CAT baud rate to be used.

Available Values: 4800bps/9600bps/38400bps

Default: 4800bps

MENU MODE No-020 [CLAR DIAL SEL]

Function: Define the control knob for the clarifire offset frequency.

Available Values: CLAR/SEL/MAIN

Default: CLAR

MENU MODE No-021 [CW AUTO MODE]

Function: Select whether the **KEY** jack shall be "Enabled" or "Disabled" while the SSB/AM/FM modes.

Available Values: CW/BOTH

Default:

CW: The **KEY** jack is enabled on the CW mode only.

CW: The **KEY** jack is enabled on the all mode (SSB mode: A1, AM mode: A2, FM mode: F2).

MENU MODE No-022 [CW BFO]

Function: Set the CW carrier oscillator injection side on the CW mode.

Available Values: AUTO/LSB/USB

Default:

AUTO: Inject the CW carrier oscillator to the LSB side while operate on the 10 MHz band and below, USB side while operate on the 10 MHz band and up.

LSB: Inject the CW carrier oscillator to the LSB side

USB: Inject the CW carrier oscillator to the USB side

MENU MODE No-023 [CW DELAY]

Function: Set the receiver recovery time during pseudo-VOX CW semi-break-in operation.

Available Values: FULL/30 ~ 3000 msec

Default: 250 msec

The recovery time may be adjusted in steps of 10 msec. A longer delay may be preferable if you pause frequently while sending.

MENU MODE No-024 [**CW PADDLE**]

Function: Enable/disable CW keying by the microphone's [**UP**]/[**DWN**] keys.

Available Values: ELEKEY/MIC-KEY

Default: ELEKEY

When this Menu Item is set to "MIC-KEY," press the microphone's [**UP**] key to send a "dot," and press the microphone's [**DWN**] key to send a "dash" (while the built-in electronic keyer is engaged).

MENU MODE No-025 [**CW KEY REV**]

Function: Select the keyer paddle's wiring configuration.

Available Values: NORMAL/REVERSE

Default: NORMAL

<u>NORMAL</u>: Keyer paddle polarity is normal. The "tip" plug connection produces dots, and the "ring" plug connection produces dashes.

<u>REVERSE</u>: Keyer paddle polarity is inverted. The "tip" paddle produces dashes, and the "ring" paddle produces dots.

MENU MODE No-026 [**CW PITCH**]

Function: Setting of the pitch of the CW sidetone, BFO offset, and CW filter center frequencies.

Available Values: 300 ~ 1000 Hz

Default: 700 Hz

The CW pitch may be adjusted in steps of 50 Hz.

MENU MODE No-027 [**CW QSK**]

Function: Select the time delay between when the PTT is keyed and the carrier is transmitted during QSK operation when using the internal keyer.

Available Values: 10mS/20mS/30mS

Default:

MENU MODE No-028 [**CW SIDETONE**]

Function: Setting of the CW sidetone volume level.

Available Values: 0 ~ 100

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Default:

MENU MODE No-029 [CW SPEED]

Function: Set the sending speed for the built-in Electronic keyer.

Available Values: 4wpm ~ 60 wpm (1wpm/step)/20cpm ~ 300 cpm (5cpm/step)

Default: 12 wpm (60 cpm)

You can set the sending speed according to either of two units of speed

(wpm: words per minute; cpm: characters per minute)

To switch units between "wpm" and "cpm," just press the **MEM/VFO CH** knob.

MENU MODE No-030 [CW TRAINING]

Function:

Available Values:

Default:

MENU MODE No-031 [CW WEIGHT]

Function: Set the Dot:Dash ratio for the built-in electronic keyer.

Available Values: 1:2.5 ~ 1:4.5

Default: 1:3.0

MENU MODE No-032 [DCS CODE]

Function: Setting the DCS code.

Available Values: 104 Standard DCS codes

Default: 023

You can set the DSC code to separately.

To switch between "ENCODE" and "DECODE," just press the **MEM/VFO CH** knob.

MENU MODE No-033 [DCS INV]

Function: Select "Normal" or "Inverted" DCS coding.

Available Values: Tn-Rn/Tn-Riv/Tiv-Rn/Tiv-Riv

Default: Tn-Rn

"n" = "normal

"iv" = "inverted"

MENU MODE No-034 [DEMO MODE]

Function:

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Available Values: ON/OFF

Default: OFF

MENU MODE No-035 [DEMO MODE START]

Function:

Available Values:

Default:

MENU MODE No-036 [DIAL STEP]

Function: Setting of the **DIAL** knob's tuning speed.

Available Values: FINE/COARSE

Default: FINE

You may choose between two speeds for the **DIAL** knob. Selecting "COARSE" doubles the tuning rate compared to the default value.

FINE: 10 Hz/step @SSB/CW mode, 100 Hz/step @AM/FM

COARSE: 20 Hz/step @SSB/CW mode, 200 Hz/step @AM/FM

MENU MODE No-037 [DIG DISP]

Function: Define the displayed frequency offset during DIG (USER-L or USER-U) mode operation

Available Values: –3000 ~ +3000 Hz

Default: 0 Hz

MENU MODE No-038 [DIG GAIN]

Function: Adjust the audio input level from terminal equipment (such as a TNC or PSK-31 sound card) during DIG (Digital) mode operation

Available Values: 0 ~ 100

Default: 50

MENU MODE No-039 [DIG MODE]

Function: Select the mode and sideband (if applicable) in the DIG (Digital) mode.

Available Values: RTTY-L/RTTY-U/PSK31-L/PSK31-U/USER-L/USER-U

Default: RTTY

RTTY-L: AFSK RTTY operation on the LSB mode

RTTY-U: AFSK RTTY operation on the USB mode

PSK31-L: PSK-31 operation on the LSB mode

PSK31-U: PSK-31 operation on the USB mode

USER-L: User-programmed costume operation based on LSB mode

USER-U: User-programmed costume operation based on USB mode

R. F. Says: In the USER-L and USER-U modes, you can define the display frequency offset and carrier frequency offset by Menu Mode **No-037** [**DIG DISP**] and **No-040** [**DIG SHIFT**].

MENU MODE No-040 [**DIG SHIFT**]

Function: Define the carrier frequency offset during DIG (USER-L or USER-U) mode operation.

Available Values: –3000 ~ +3000 Hz

Default: 0 Hz

MENU MODE No-041 [**DIG VOX**]

Function: Adjust the input level for the DIG mode.

Available Values: 0 ~ 100

Default: 50

MENU MODE No-042 [**DISP INTENSITY**]

Function: Setting of the display brightness level.

Available Values: 0 (Dim) ~ 2 (Bright)

Default:

MENU MODE No-043 [**DISP COLOR**]

Function: Select the illumination color for each operating status.

MENU MODE No-044 [**DISP CONTRAST**]

Function: Setting of the display contrast level.

Available Values: 1 ~ 15

Default: 5

MENU MODE No-045 [**DISP MODE**]

Function:

Available Values: OFF/AUTO1/AUTO2/ON

Default:

OFF:

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AUTO1:

AUTO2:

ON:

MENU MODE No-046 [DSP MIC EQ]

Function: Set the DSP microphone equalization pattern.

Available Values: OFF/LPF/HPF/BOTH

Default: OFF

OFF: This function is disabled.

LPF: Lower frequencies are emphasized.

HPF: Higher frequencies are emphasized.

BOTH: Mid-range frequencies are emphasized.

MENU MODE No-047 [DSP NR LEVEL]

Function: Setting the degree of DSP Noise Reduction.

Available Values: 1 ~ 16
Default:

MENU MODE No-048 [DSP BPF WIDTH]

Function: Setting the bandwidth for the DSP CW audio filter.

Available Values: 60/120/240 Hz
Default:

MENU MODE No-049 [DSP LPF CUTOFF]

Function: Adjust the high-cut characteristics of the DSP LPF filter.
Available Values:
1000/1160/1320/1480/1650/1800/1970/2130/2290/2450/2610/2770/2940/3100/3260/3420/
3580/3740/3900/4060/4230/4390/4550/4710/4870/5030/5190/5390/5520/5680/5840/6000
(Hz)
Default:
R.F. Says: This Menu Item determines the high-cut frequency of the DSP LPF filter in the SSB, AM, and FM modes. Best voice-mode interference rejection will usually be obtained with a setting of between 2130 and 2770 Hz.

MENU MODE No-050 [DSP HPF CUTOFF]

Function: Adjust the low-cut characteristics of the DSP HPF filter.

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Available Values: 100/160/220/280/340/400/460/520/580/640/700/760/820/880/940/1000 (Hz)

Default:

<u>R.F. Says:</u> This Menu Item determines the low-cut frequency of the DSP HPF filter in the SSB, AM, and FM modes. Generally, acceptable voice fidelity will be obtained only if you do not set this parameter much above 400 Hz.

MENU MODE No-051 [**EMERGENCY**]: USA Version only

Function: Enable Tx/Rx operation on the Alaska Emergency Channel, 5167.5 kHz.

Available Values: OFF/ON

Default: OFF

When this Menu Item is set to "ON," the spot frequency of 5167.5 kHz will be enabled. To get to this frequency, use the **MEM/VFO CH** knob to navigate; the Alaska Emergency Channel will be found between the Memory channel "**M-PU**" and "**M-001**."

<u>R. F. Says:</u> Use of this frequency is restricted to amateurs operating in (or within 92.6 km of) the U.S. State of Alaska, and it is to be used for emergency communications only (involving the immediate protection of life or property).

MENU MODE No-052 [**FM MIC GAIN**]

Function: Adjust the microphone gain level for the FM mode.

Available Values: 0 ~ 100

Default: 50

MENU MODE No-053 [**FM STEP**]

Function: Select the tuning steps for the **MEM/VFO CH** knob on the FM mode.

Available Values: 5/6.25/10/12.5/15/20/25/50 kHz

Default: Depends on operating band and transceiver version.

MENU MODE No-054 [**HOME VFO**]

Function: Enable/disable the moving HOME channel data to the VFO.

Available Values: ON/OFF

Default:

MENU MODE No-055 [**LOCK MODE**]

Function: Select the operation of the front panel's **LOCK** key.

Available Values: DIAL/FREQ./PANEL/ALL

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Default:

DIAL: Locks **DIAL** knob only.

FREQ.: Locks front panel keys and knobs related to frequency control (such as **BAND**(**UP**) and **BAND**(**DWN**) key, [**A**](**A/B**) key., etc.)

PANEL: Locks all front panel keys and knobs (except **POWER** and **LOCK** keys)

ALL: Locks all front panel keys and knobs (except **POWER** and **LOCK** keys) and microphone keys.

MENU MODE No-056 [MEM GROUP]

Function: Enable/disable the memory grouping feature

Available Values: OFF/ON

Default: OFF

When this Menu Item is set to "ON," the ??? "standard" memory channels are partitioned into ten Memory Groups, each holding up to 20 memory channels.

MENU MODE No-057 [MEM TAG]

Function: Store Alpha-Numeric "Tags" for the memory channels.

Up to eight characters may be stored. The storage procedure is as follows:

1. Recall the memory channel on which you wish to append a label.
2. Recall this Menu Item (**MENU MODE No-057** [**MEM TAG**]).
3. Press the **MEM/VFO CH** knob momentarily to initiate storing of the Tag (an under-bar will appear below the first character location).
4. Rotate the **DIAL** knob to select the first character (number, letter, or symbol) in the name you with to store, then rotate the **MEM/VFO CH** knob clockwise to move to the next character.
5. Again rotate the **DIAL** knob to select the next number, letter, or symbol, then rotate the **MEM/VFO CH** knob clockwise to move to the next character's slot.
6. Repeat step 5 as many times as necessary to complete the name tag for the memory.
7. Press the **MEM/VFO CH** knob to save the A/N (Alpha-Numeric) Tag and exit.

MENU MODE No-058 [MIC SCAN]

Function: Enable/disable scanning access via the microphone's [**UP**]/[**DWN**] keys.

Available Values: OFF/ON

Default: ON

MENU MODE No-059 [**MIC SEL**]

Function:.

Available Values: NOR/RMT/CAT

Default: ON

MENU MODE No-060 [**MTR PEAK HOLD**]

Function: Enabling/disabling of the "peak hold" function of the meter.

Available Values: OFF/ON

Default: ON

MENU MODE No-061 [**MTR ATX SEL**]

Function: Select the analog meter display while the transceiver is transmitted.

Available Values: PWR/ALC/MOD/SWR/VLT/RS1/RS2/OFF

Default:

PWR: Indicate the relative transmit power.

ALC: Indicate the relative Automatic Level Control voltage.

MOD: Indicate the

SWR: Indicate the relative Standing Wave Ratio (forward:reflected).

VLT: Indicate the battery voltage.

RS1: Indicate the input level at the

RS2:

OFF: Disable the analog meter.

MENU MODE No-062 [**MTR ARX SEL**]

Function: Select the analog meter display while the transceiver is received.

Available Values: SIG/CTR/VLT/RS1/RS2/FSADJ/OFF

Default:

SIG: Indicate the

CTR: Indicate the

VLT: Indicate the battery voltage.

RS1:

RS2:

FSADJ:

OFF: Disable the analog meter.

MENU MODE No-063 [**NB LEVEL**]

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Function: Setting of the blanking level of the noise blanker.

Available Values: 0 ~ 100

Default:

MENU MODE No-064 [OP FILTER]

Function: Store Alpha-Numeric "Tags" for the optional filter.

Up to eight characters may be stored. The storage procedure is as follows:

1. Recall the memory channel on which you wish to append a label.
2. Recall this Menu Item (**MENU MODE No-060** [**OP FILTER**]).
3. Press the **MEM/VFO CH** knob momentarily to initiate storing of the Tag (an under-bar will appear below the first character location).
4. Rotate the **DIAL** knob to select the first character (number, letter, or symbol) in the name you with to store, then rotate the **MEM/VFO CH** knob clockwise to move to the next character.
5. Again rotate the **DIAL** knob to select the next number, letter, or symbol, then rotate the **MEM/VFO CH** knob clockwise to move to the next character's slot.
6. Repeat step 5 as many times as necessary to complete the name tag for the memory.
7. Press the **MEM/VFO CH** knob to save the A/N (Alpha-Numeric) Tag and exit.

MENU MODE No-065 [PG A]

Function: Programming the [**A**] key (in the Operating Function Row 17) assignment.

Available Values: All Multi Function , all Menu Item, MONI, Q.SPL, TCALL, and ATC.

Default:

MENU MODE No-071 [PKT1200]

Function: Adjust the audio input level from the TNC during 1200 bps Packet operation.

Available Values: 0 ~ 100

Default:

MENU MODE No-072 [PKT9600]

Function: Adjust the audio input level from the TNC during 9600 bps Packet operation.

Available Values: 0 ~ 100

Default:

MENU MODE No-073 [PKT RATE]

Function: Set the transceiver's circuitry for the Packet baud rate to be used.

Available Values: 1200/9600 (bps)

Default:

MENU MODE No-074 [PROC LEVEL]

Function: Set the compression level for the AF speech processor in the SSB/AM modes.

Available Values: 0 ~ 100

Default:

MENU MODE No-075 [RF POWER SET]

Function: Setting the maximum power level for the current band.

Available Values: 5 ~ 100

Default:

MENU MODE No-076 [RPT SHIFT]

Function: Set the magnitude of the repeater shift.

Available Values: 0.00 ~ 99.99 (MHz)

Default:

MENU MODE No-077 [SCAN MODE]

Function: Select the desired Scan-Resume mode.

Available Values: TIME/BUSY/STOP

Default:

This Menu Item allows you to select your favorite method of scan-restart after the scanner has stopped on an incoming signal (when the squelch opens).

TIME: The scanner will hold for a fixed length of time, set via **MENU MODE No-078** [**RESUME**], then resume whether or not the other station is still transmitting.

BUSY: The scanner will hold until the signal disappears, then will resume after one second.

STOP: The scanner will stop when a signal is received, and will not restart.

MENU MODE No-078 [RESUME]

Function: Set the delay time for scan, as described in **MENU MODE No-077 [SCAN MODE]**.

Available Values: 1 ~ 10 (sec)

Default:

MENU MODE No-079 [**SEL DIAL MODE**]

Function: Select the function which is the press **MEM/VFO CH** knob

Available Values: 1MHz MEM/10MHz MEM/CW SIDETONE/CW SPEED/MIC GAIN/NB LEVEL/RF POWER/STEP

Default:

MENU MODE No-080 [**SIO MODE**]

Function: Select the device which is connected to the **CAT/LENEAR** jack on the rear panel

Available Values: CAT/TUNER/LINEAR/EXTEND

Default:

MENU MODE No-081 [**SQL RF GAIN**]

Function: Select the configuration of the front panel's **SQL/RF** knob.

Available Values: RF-GAIN/SQL

Default: Depends on transceiver version.

MENU MODE No-082 [**SSB MIC GAIN**]

Function: Adjust the microphone gain level for the SSB mode.

Available Values: 0 ~ 100

Default:

MENU MODE No-083 [**SSB STEP**]

Function: Select the tuning steps for the **MEM/VFO CH** knob on the SSB mode.

Available Values: 1kHz/2.5kHz/5kHz

Default:

MENU MODE No-084 [**TONE FREQ**]

Function: Setting the CTCSS Tone Frequency.

Available Values: 50 Standard CTCSS tones

Default:

MENU MODE No-085 [**TONE SPLIT**]

Function: Enables/disables split CTCSS/DCS cording.

Available Values: OFF/ON

Default:

MENU MODE No-086 [**TOT TIME**]

Function: Select the Automatic Power Off time.

Available Values: OFF/1 ~ 20 (sec)

Default:

MENU MODE No-087 [**TUNER/ATAS**]

Function: Select the device (FC-30 or ATAS-120) to be controlled via the front panel's [**A**](**TUN**) key.

Available Values: OFF/ATAS(HF)/ATAS(HF&50)/ATAS(ALL)/TUNER

Default:

<u>OFF</u>: The [**A**](**TUN**) key is disabled.

<u>ATAS(HF)</u>: The [**A**](**TUN**) key will activate the optional ATAS-120 on the HF amateur bands.

<u>ATAS(HF&50)</u>: The [**A**](**TUN**) key will activate the optional ATAS-120 on the HF amateur bands and 50 MHz amateur band.

<u>ATAS(ALL)</u>: The [**A**](**TUN**) key will activate the optional ATAS-120 on the all amateur bands which enable to the FT-897 transceiver.

<u>TUNER</u>: The [**A**](**TUN**) key will activate the optional FC-30.

MENU MODE No-088 [**TX IF FILTER**]

Function: Select the TX IF filter.

Available Values: CERF/OPF1/OPF2

Default:

MENU MODE No-089 [**VOX DELAY**]

Function: Set the "hang time" for the VOX circuitry.

Available Values: 100 ~ 3000 (ms)

Default:

MENU MODE No-090 [**VOX GAIN**]

Function: Set the gain of the VOX circuitry's input audio detector.

Available Values: 1 ~ 100

Default:

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MENU MODE No-091 [**TRANSVERTER**]

Function:
Available Values: OFF/X VTR A/X VTR B
Default:

MENU MODE No-092 [**XVTR A FREQ (kHz)**]

Function: 00,000,00 ~ 99,999,99 (kHz)
Available Values:
Default:

MENU MODE No-093 [**XVTR B FREQ (kHz)**]

Function: Select the TX IF filter.
Available Values: CERF/OPF1/OPF2
Default:

CAT Operation

The FT-897's CAT System allows the transceiver to be controlled by a personal computer. This allows multiple control operations to be fully automated as a single mouse click, or it allows a third-party software package (such as contest logging software) to communicate with the FT-897 without (redundant) operator intervention.

The Optional CAT Interface Cable CT-62 is a connection cable for the FT-897 and your computer. The CT-62 has a built-in level converter, allowing direct connection from the rear panel **CAT/LINEAR** jack to the serial port of your computer, without the need for an external RS-232C level converter box.

Vertex Standard does not produce CAT System operating software, due to the wide variety of personal computers, operating systems, and applications in use today.

The information presented in this section will allow the programmer to understand the command structure and opcodes used in the FT-897's CAT System.

CAT Data Protocol
All commands sent from the computer to the transceiver consist of five-byte blocks, with up to 200 ms between each byte. The last byte in each block is the instruction opcode,

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while the first four bytes of each block are arguments (either parameters for that instruction, or dummy values required to pad the block out to five bytes). Each byte consists of 1 start bit, 8 data bits, no parity bit, and two stop bits.

There are 17 instruction opcodes for the FT-897, listed in the chart on next page. Many of these opcodes are On/Off toggle commands for the same action (e.g. "PTT On" and "PTT Off" Most of these commands require some parameter or parameters to be set. Irrespective of the number of parameters present, every Command Block sent must consist of five bytes.

Accordingly, any CAT control program must construct the five-byte block by selecting the appropriate instruction opcode, organizing the parameters as needed, and providing unused "dummy" argument bytes to pad the block to its required five-byte length (the dummy bytes can contain any value). The resulting five bytes are then sent, opcode last, from the computer to the FT-897 CPU via the computer's serial port and the transceiver's **CAT/LINEAR** jack.

All CAT data values are hexadecimal.

Constructing and Sending CAT Commands

Example #1: Set the VFO frequency to 439.70 MHz

❐ Per the CAT command table, the opcode for "Set Frequency" is 01. Placing the opcode into the 5th data bit position, we then enter the frequency into the first four data bit positions:

DATA 1	DATA 2	DATA 3	DATA 4	DATA 5
43	97	00	00	01
	Parameter			Command

Send these five bytes to the transceiver, in the order shown above.

Example #2: Turn the Split Mode "On"

❐ Per the CAT command table, the opcode for "Split On/off" is 02. Placing the opcode into the 5th data bit position, we then enter dummy values into all other parameter locations:

Power-on Microprocessor Reset Procedure

Some or all transceiver settings can be reset to their factory-default states using one of

the following power-on routines:

❑ [**V/M**] + **POWER ON**: Resets all memories and following menu settings to their factory-default values.

Menu #06 (**AM STEP**), 23 (**DCS CODE**), 30 (**FM STEP**), 35 (**MEM TAG**), 42 (**RPT SHIFT**), 47 (**SSB STEP**), and 48 (**TONE FREQ**).

❑ [**F**] + **POWER ON**: Resets all menu settings (except the following menu items) to their factory-default values.

Menu #06 (**AM STEP**), 23 (**DCS CODE**), 30 (**FM STEP**), 35 (**MEM TAG**), 42 (**RPT SHIFT**), 47 (**SSB STEP**), and 48 (**TONE FREQ**).

❑ [**HOME**] + **POWER ON**: CPU master reset for all memories and menu settings.

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 **CAT/LINEAR** 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 **CAT/LINEAR** jack of each transceiver, then .

2. Turn both transceivers off, then press and hold in the [**MODE(◄)**] and [**MODE(►)**] buttons on each radio while turning the power on again. The "**CLONE MODE**" notation will appear on the display.

3. On the "destination" radio, press the [**C**] key.

4. Now, on the "source" radio, press the [**A**] key. Data will now be transferred to the "Destination" radio from the "Source" radio.

5. If there is a problem during the cloning process, "**Error**" 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.

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

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Installation of Optional Accessories

Optional Filter :YF-122S or YF-122C

1. Turn the transceiver's power off by pressing and holding in the **PWR** switch for one second, then disconnect the DC cable from the **INPUT** jack on the rear panel of the transceiver, when operating the **FT-897** with a DC power supply or optional **FP-30** AC power supply.

2. Referring to Figure 1, remove the eight screws affixing the top cover of the transceiver then disconnect the speaker's connector from the MAIN Unit.

3. Fold the top cover centering around the carrying hand side from the main chassis.

4. Refer to Figure 2 for the mounting locations for the optional filters. Position the filter so that its connectors are aligned with the mounting pins on the board, and push it into place (these slots does not distinction for the installed filter).

5. Replace the top cover and its eight screws (remember to replace the internal speaker's plug), then connect the DC cable to the **INPUT** jack when operating the **FT-897** with a DC power supply or optional **FP-30** AC power supply.

6. Change the setting of the Menu Mode **No-064** [**OP FILTER**].

    Turn the transceiver on by press and holding the **PWR** switch for one second.

    Press and hod the [**F**] key for one second to enter the Menu mode.

    Rotate the **MEM/VFO CH** knob to recall the Menu Mode **No-064** [**OP FILTER**].

    Set the filter slot ("**OP FILTER 1**" or "**OP FILTER 2**") which is installed the optional filter by the **DIAL** knob.

    Press the **MEM/VFO CH** knob momentarily, then rotate the **DIAL** knob to change the setting of menu to "**2.3**" (if install the **YF-122S**) or "**500**" (if install the **YF-122C**).

    Press and hod the [**F**] key for one second to save the new setting and exit to normal operation.

7. Filter installation is now complete.

To use the optional filter, press the [**B**](2.3 or 500) key (in Multi Function Row "n" [CERF, 2.3 or 500, 2.3 or 500]) to activate the optional filter which is installed on the "OPF1" slot. Press the [**C**](2.3 or 500) key (in Multi Function Row "n" [CERF, 2.3 or 500, 2.3 or 500]) to activate the optional filter which is installed to "OPF2" slot.

Note: If you wish to use the optional filter for the TX IF filter while operatin in the SSB mode, change the setting of Menu Mode **No-088** [**TX IF FILTER**] to "**OPF1**" or "**OPF2**" (which is installed the optional **YF-122S** filter).

Optional High Stability Reference Oscillator TCXO-8

The **TCXO-9** provides high stability over a wide range of ambient temperatures, so as to enhance digital-mode operating.

1. Turn the transceiver's power off by pressing and holding in the **PWR** switch for one second, then disconnect the DC cable from the **INPUT** jack on the rear panel of the transceiver, when operating the **FT-897** with a DC power supply or optional **FP-30** AC power supply.

2. Referring to Figure 1, remove the eight screws affixing the top cover of the transceiver then disconnect the speaker's connector from the MAIN Unit.

3. Fold the top cover centering around the carrying hand side from the main chassis.

4. Referring to Figure 2, locate the factory-installed REF UNIT on the board. Remove the factory-installed REF UNIT from the board, then position the **TCXO-9** so that its connectors are aligned with the mounting pins on the board, and push it into place.

5. Replace the top case (remember to replace the internal speaker's plug).

6. **TCXO-9** installation is now complete. Connect the DC cable to the **INPUT** jack when operating the **FT-897** with a DC power supply or optional **FP-30** AC power supply.

Appendix

Setup of Memories for Low Earth Orbit (LEO) FM Satellite Operation

Although the FT-817 is not capable of "full duplex" operation (simultaneous transmission and reception), its flexible memory system is ideal for configuring a set of memories for LEO satellite work.

The example below is designed around the popular satellite UO-14, but the same principles apply to operation using AO-27, SO-35, and other such satellites.

First, set up a table of the required operating frequencies. For UO-14, a typical setup table is shown below:

CHANNEL #	RX FREQ.	TX FREQ.	NOTES
1	435.080	145.970.0	AOS
2	435.075	145.972.5	
3	435.070	145.975.0	Mid Pass

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| 4 | 435.065 | 145.977.5 | |
| 5 | 435.060 | 145.980.0 | LOS |

AOS = Acquisition of Signal (Beginning of Pass)

LOS = Loss of Signal (End of Pass)

The above frequencies are nominal, and the changing frequencies reflects the Doppler Shift which occurs on such satellites, which display rapid apparent motion relative to an earth-based observer. But if we can accommodate a set of several frequency pairs in our memory system, frequencies that reflect the frequency relationships encountered during a typical pass, we will have a good chance of having our frequencies properly aligned when it is time for making a QSO.

So we need to store the above frequency matrix into memories. Note that the receiving frequency and transmitting frequency are on different bands. Therefore, we will use the "Split Frequency Memory" storage technique described on page <<??>>.

First, press the [F] key momentarily, then rotate the SEL knob to select Operating Function Row 1 [A/B, A=B, SPL]. Press the [A(A/B)] key, if necessary, to select VFOa.

Now press the BAND( ) or BAND( ) key to select the 70 cm band. Check the setting of Menu #04 [AM&FM DL]. and set this to "ENABLE" to allow smaller frequency increments to be accommodated.

Set the VFOa operating frequency to 435.080.00 MHz. Now press the [A(A/B)] key in Operating Function Row 1 to select VFOb, and set VFOb to 145.970.00 MHz. Again press the [A(A/B)] key to return to VFOa. Be sure that both VFOs are set to the FM mode, as well.

Press the [F] key momentarily, and rotate the SEL knob one click clockwise to select Operating Function Row 2 [MW, MC, TAG].

Press the [A(MW)] key momentarily, then rotate the SEL knob while the memory channel number is blinking; select memory channel M-001, then press and hold in the [A(MW)] key until you hear the double beep. We have just stored the first downlink (earth station receiving) frequency into memory.

Press the [F] key momentarily, then rotate the SEL knob one click counter-clockwise to

re-select Operating Function Row 1 [A/B, A=B, SPL]. Press the [A(A/B)] key to select VFOb (145.970 MHz).

Again press the [F] key momentarily, and rotate the SEL knob one click clockwise to re-select Operating Function Row 2 [MW, MC, TAG]. Press the [A(MW)] key momentarily; the "M-001" indicator will flash; press and hold in the microphone's PTT key, and while holding it in press the [A(MW)] key until you hear the double beep. You have now stored the uplink (earth station transmitting) frequency into the same memory register as we did previously for the downlink frequency.

It's now time to store the other frequencies in the matrix. Return to Operating Function Row 1 [A/B, A=B, SPL], and press the [A(A/B)] key to return to VFOa on 435.080.00 MHz. Now rotate the DIAL knob to set the frequency to 435.075.00 MHz. Press the [A(A/B)] key again to select VFOb (145.970 MHz), and rotate the DIAL knob to set the frequency to 145.972.50 MHz. Press the [A(A/B)] key to return to VFOa on 435.075.00 MHz.

Return to Operating Function 2 [MW, MC, TAG], and repeat the Split Memory storage process, selecting memory channel M-002 this time when initially storing the 435.075 MHz receiving frequency.

Now repeat this entire process three more times, filling memory channels M-003, M-004, and M-005 with the frequencies shown in the chart above.

When it's time to operate, press the [V/M] key, if necessary, to recall the Memory mode, and rotate the SEL knob to select channel M-001. This will be the first frequency pair to be utilized during the UO-14 window of workability when it rises above your local horizon. The Doppler effect will cause the nominal 435.070 MHz downlink frequency to appear higher to you, so utilize memory channel M-001 when the satellite first rises. A few minutes later, switch to M-002, and at mid-pass switch to M-003. As the satellite recedes, switch to M-004 and then M-005 toward the end of the pass.

The SEL knob recall of these five channels makes Doppler tracking simple; just choose the memory channel producing the best signal! You have already programmed an uplink frequency corresponding to the optimum downlink frequency, so you will not need to try to make difficult VFO adjustments during the brief satellite passes.

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The FM passbands used on LEO satellites are sufficiently broad that more precise frequency adjustment is not needed.

To aid in channel identification, remember that you can use Menu #35 [MEM TAG] to label each satellite memory (for example, "UO-14a" ~ "UO-14e" for the above five channels).

A complete set of frequencies may be stored for each LEO satellite you wish to utilize, and once configured, the FT-817 provides a flexible and easy-to-use earth station capability for these popular satellites.

BAND DATA FORMAT
The FT-817 BAND DATA Format (available on the ACC jack) is presented below. The BAND DATA line provides a stepped voltage, which denotes the current operating band. This data may be interpreted by an external device (such as an antenna switch or amplifier)to provide automatic band switching.