OWNER'S MANUAL

TEN-TEC

RX325
SHORTWAVE
RECEIVER

TEN-TEC RX325 SHORTWAVE RECEIVER

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TEN-TEC, INC.
SEVIERVILLE, TENNESSEE 37862

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INTRODUCTION

Carefully remove your RX325 from the packing carton and examine it for signs of shipping damage. Should any damage be apparent, notify the delivering carrier or dealer immediately, stating the full extent of the damage. Retain all damaged cartons. Liability for shipping damage rests with the carrier.

It is recommended that you keep the shipping carton and fillers. In the event that storage, moving or reshipment becomes necessary, they come in handy. An accessory packet, wall power transformer, warranty card, and manual are packed with the RX325. Make sure that you have not overlooked anything.

The RX325 is a microprocessor controlled communications receiver covering the frequency range of 300 kHz to 29.9999 MHz and utilizing Phase Lock Loop technology. Featuring direct frequency entry, 25 memory locations, scratch pad memory, AM,USB, and LSB modes, memory and band scan, vacuum fluorescent display, built-in noise blanker, wide and narrow I-F filters, switchable AGC, clock/timer, and built-in speaker, the RX325 is designed for the serious or casual shortwave listener.

SPECIFICATIONS

Frequency Range: 300 kHz to 29.9999 MHz
Modes: AM, USB, LSB

Sensitivity: (S+N/N 10 dB)	AM	SSB
300 kHz to 2 Mhz	less than 15 µV	less than 2 µV
2 MHz to 29.9999 MHz	less than 3 µV	less than .4 µV

Selectivity: Wide = 4 kHz (-6dB), 10 kHz (-60dB)
Narrow = 2.7 kHz (-6dB), 5 kHz (-50dB)
Image Rejection: greater than 60 dB
I-F Rejection: greater than 60 dB
Frequency Stability: ± 200 Hz during 1st hour after 1 minute of warm-up.
± 100 Hz during any 30 minute period thereafter.
Frequency Accuracy: ± 50 Hz at normal room temperatures.
Frequency Resolution: 50Hz, 500Hz, 1kHz
Audio Output Power: 2 Watts into 8 Ω load @ 10% distortion.
Antenna Impedance: 50 Ω / 500 Ω
Power Consumption: 6 Watts nominal, 13.6 VAC @ 500 mA
I-F Frequencies: 1st = 45 MHz, 2nd = 455 kHz
Dimensions: (HWD) 3-1/4" X 9-1/2" X 7" (8 cm X 24 cm X 18 cm)
Weight: 5 lbs., 5 oz. (2.4 kg)

BASIC OPERATING INSTRUCTIONS

By using this section of the manual, the new owner of the TEN-TEC RX325 will be able to start using the receiver with just a few preliminary steps. Then the detailed instructions will take you step by step thru all of the RX325's unique features.

NOTE: The RX325 uses a 9 volt battery to retain memory information when the receiver is not being powered by the wall transformer. It is recommended that a battery be installed prior to operation. See the section "BATTERY" on page 3-6.

A. Power Supply & Antenna

1. First make sure that the receiver's VOLume control is in the fully counter-clockwise position and that the PWR switch is in the OFF position.
2. Plug the wall transformer's barrel-type connector into the socket marked POWER on the rear panel of the receiver. Then plug the transformer into a standard 110 VAC wall outlet.
3. If a coaxial feedline is available, connect it to the UHF type antenna connector located on the rear panel.
4. If a longwire antenna is available, connect it to the 500 Ω clip type antenna connector .
5. If no antenna is available at this time, it is recommended that you read the ANTENNAS section located on page 4-2. For the purpose of this "getting started" section, even a few feet of wire connected to the 500 Ω clip terminal will do temporarily.
6. Press the PWR switch to the ON position and slowly turn the VOLume control clock-wise to a comfortable listening level.
7. If the receiver has not been used for some time and the 9V battery has just been installed, the receiver will power-up at the frequency of 15.0000 MHz and if band conditions permit, the National Bureau of Standards WWV time/frequency station will be heard in the United States.

B. Entering Frequency

1. There are 2 ways to select a frequency with the RX325, via the keypad or the main tuning knob.
2. The MHz portion of the frequency is entered first followed by the decimal point. If the frequency is less than 1 MHz, the decimal point is entered first.
3. After the decimal point, the remaining kHz portion of the frequency is entered followed by the ENTER key. If the remaining kHz numbers are zeroes, they need not be entered.
4. The following are examples of different frequencies and how to enter them:

15.4375 MHz

press [1], [5], [.], [4], [3], [7], [5], [ENTER]

11.560 MHz

press [1], [1], [.], [5], [6], [ENTER]

950 kHz

press [.], [9], [5], [ENTER]

5. If at any time an error is made entering frequency or any other keypad information, the CLR (clear) key may be used. The receiver will return to the previous frequency. To use CLR:

press [CLR]

C. Using the Main Tuning Knob

1. The main tuning knob will adjust the frequency up or down from the displayed frequency. The receiver tunes in steps (50 Hz, 1 kHz, or 500Hz) which is determined by the position of the FAST switch and the MODE selected.
2. Place the receiver in the AM mode. Then place the FAST switch in the normal (out) position. The receiver will now tune in 50 Hz steps. Now push the FAST switch in and the receiver will tune in 1 kHz steps.

3. Place the receiver in the USB mode. With the FAST switch in the normal position the step size will be 50 Hz. With the FAST switch in the fast position the receiver will tune in 500 Hz steps.

D. **I-F Filters & MODE**

1. To receive AM broadcast, shortwave broadcast, etc. the AM mode must be selected. To receive SBB and CW signals, the USB or LSB modes must be selected. Generally, USB is used for all commercial reception and amateur radio operators use USB above 10 MHz and LSB below 10 MHz.
2. To receive AM signals, set the receiver as follows:
   FAST switch in the normal (out) position
   Filter in the WIDE position
   AGC switch in the FAST position
   Press the AM mode key, the corresponding LED will light indicating the mode in use.
3. To receive SSB signals, set the receiver as follows:
   FAST switch in the normal (out) position.
   Filter in the NARrow position
   AGC switch in the SLOW position
   Press the USB or LSB mode key, the corresponding LED will light indicating the mode in use.
4. Selection of the WIDE/NARrow filters depends on the type of station being received and the amount of interference present from other stations. The WIDE filter is used when listening to the AM broadcast band and to international shortwave broadcasts when little or no interference is present. The NARrow filter is used when listening to SSB and CW signals or in the shortwave band when strong interference is present.
5. With the filter in the WIDE position, tune the receiver to one of the shortwave broadcasts bands and if possible, find a station that has some interference from another station. By selecting the NARrow filter position and adjusting the frequency ± a few kHz, the interference should be reduced and the desired station will become more audible.

The following section will describe in detail all of the receiver's features and controls. In order to fully enjoy the RX325, it is recommended that you read this section thorughly after you have become familiar with the basic operation of the receiver.

DETAILED OPERATING INSTRUCTIONS

KEYPAD

The keypad is used to enter frequency, select reception modes and to access microprocessor controlled features. Most of the keys have two functions with the top functions accessed via the Function (shift) [F] key.

When the Function key is presssed an "F" will appear at the right side of the display indicating that the microprocessor is waiting for a shifted function. The display will return to normal upon completion of the command.

MEMORIES

The RX325 contains 25 memory locations (00 to 24) which can store favorite or often used frequencies. In addition to storing the frequency, each memory location also stores the mode (AM,USB or LSB).

MEMORY STORE

To enter a frequency into memory, first enter the desired frequency via the keypad or the main tuning dial, then select the desired reception mode. Press the STO key and then enter a two digit number corresponding to the desired memory location. The display will show the location number as it is being entered.

For example, to store a displayed frequency into memory location 5:

press [STO], [0], [5]

To store a frequency into memory location 15:

press [STO], [1], [5]

A memory may also be stored without having to specify the location by using the STO/ENTER method. The RX325 will store a frequency/mode in the next available empty location except for memory location "00" which is reserved for use with the timer function. To use this function:

press [STO], [ENTER]

If no more memory locations are available, the display will show "FF" indicating that all memory locations are full.

MEMORY RECALL

To recall a frequency from memory press the RCL key and then the desired two digit location number. For example to recall memory location 21:

press [RCL], [2], [1]

To recall the last location stored using the STO/ ENTER method:

press [RCL], [ENTER]

The memory frequency and the memory location number will show in the display and the corresponding reception mode LED will light. Moving the main tuning knob or entering another frequency via the keypad will return the RX325 to the non-memory mode.

SCRATCH PAD MEMORY

The scratch pad memory can be used to temporarily store and recall a single frequency without affecting the main memory locations. With the desired frequency in the display, press the STO key twice. The display will show "P" indicating that the displayed frequency is in scratch pad memory. The scratch pad memory may be recalled at any time by pressing the RCL key twice.

To store: press [STO], [STO]

To recall: press [RCL], [RCL]

Each time a new frequency is entered into the scratch pad memory, the previous memorized frequency is erased.

MEMORY SCAN

To use the memory scan mode:

press [F], [MS STO]

The microprocessor will then scan through all of the programmed memories (except those that are locked out) stopping at each location for a period of time as determined by the RATE function.

To temporarily stop the scan function:

press [ENTER], then to resume scan: press [▼ MHz ▲]

The receiver will then resume scanning in the direction chosen by the ▼ MHz ▲ key. To exit the scan mode:

press [CLR] and hold until memory location number no longer appears in the display.

NOTE: In order to use memory scan, there must be more than 1 memory location programmed and/or unlocked. If memory scan is attempted under these conditions the receiver will appear to be malfunctioning as the keypad and main tuning knob will not respond. Pressing the CLR key will return the receiver to normal.

MEMORY LOCKOUT

The Memory Lockout function causes selected memory locations to be bypassed during memory scan. The frequency/mode information is retained and may be unlocked at any time.

To lock out a location, recall the location to be locked out and press the Function key followed by the ML key.

For example to lock out memory location #12:

press [RCL], [1], [2], [F], [ML ■]

If the location to be locked out is already in the display, the recall procedure may be omitted. Then the location may be locked out by just pressing the Function and ML keys.

If the locked out location is recalled or tuned via memory tune, the display will show "L" indicating that the location is locked out.

To unlock an individual location, repeat the above procedure.

LOCK CLEAR

The Lock Clear key is used to unlock all of the locked out memory locations. To unlock all locations:

press [F], [LC 0]

MEMORY SCAN MODE

This feature permits scanning by mode only, for example only USB stations. To use memory scan mode, first select the mode you wish scanned using AM, USB or LSB then:

press [F], [MSM 3]

The microprocessor will scan only those memories of the mode selected. Temporary stop, scan direction, and scan exit are controlled in the same way as memory scan.

MEMORY CLEAR

This key will clear all of the memories returning them to their unprogrammed state.

To clear all of the memories:

press [F], [MC CLR], [ENTER]

SCAN RATE

The scan RATE is used in both the memory scan and programmable scan modes and determines the speed or RATE at which the memory locations or frequencies are scanned. To program the scan rate:

press [F], [8] (RATE)

A number from 0 to 9 will appear in the display indicating the scan rate with a 9 being the fastest. Press the ▼ MHz ▲ key to select the desired rate and then press the ENTER key.

PROGRAMMABLE SCAN

The programmable scan function is used to scan between any two frequencies at a scan rate determined by the RATE key.

To program the lower frequency, enter the desired lower frequency into the display using the keypad or the main tuning knob, then:

press [F], [7] (LWR)

To program the upper frequency, enter the desired upper frequency into the display and:

press [F], [9] (UPR)

Select the desired MODE and scan RATE, then use the FAST switch to choose the desired frequency step as outlined in "Using the Main Tuning Knob", page 2-2.

To enter the programmable scan mode:

press [F], [RCL] (PS)

The receiver will now scan between the selected frequencies. To temporarily stop the scan and/or change the direction of the scan:

press [ENTER], then to resume scan: press [▼ MHz ▲]

To exit the programmable scan mode, press the CLR key.

CLOCK

To display the clock:

press [F], [2] (CLK)

The digital display will now show the time instead of the frequency. To return to frequency display, repeat the above procedure or adjust the main tuning knob.

12/24 Mode Select

To change the time format, display the clock as above and:

press [F], [6] (12/24)

Every time this sequence is performed, the time format changes when the display is in the clock mode. If the 12/24 select is in the 12 hour mode an A or a P will appear in the right side of the display indicating AM or PM. If it is desired to return to the other 12/24 mode, simply repeat the above procedure.

To return to frequency display adjust the main tuning knob or:

press [F], [2] (CLK)

Hours, Minutes, & Seconds

This function permits the operator to either display hours, minutes, and seconds or to just display hours & minutes. To change from one type of display to the other, display the clock as per above and:

press [F], [5] (HMS)

This function is operable only in the 24 hour format. Seconds are not displayed in the 12 hour format.

Time SET

The time is entered into the RX325 in the 24 hour format only. For example to set the clock to 12:30:00, display the clock as described above, make sure the clock is in the 24 hour mode and then:

press [F], [4] (SET)

The display will go blank indicating that the hours, minutes and seconds should be entered using the numbers on the keypad:

press [1], [2], [3], [0], [0], [0]

The clock will start counting and the receiver will return to the frequency display mode upon entering the last digit of the seconds.

TIMER

The built-in timer of the RX325 will turn the receiver on and off at selected times within a 24 hour period. For use with a tape recorder, an on/off switch function is provided on the recorder jack on the rear panel. See "Recorder", page 3-6.

The timer uses memory location #00 for the frequency and mode that the receiver will be tuned to when the timer function is activated. Therefore the first step in using the timer function is to program memory location 00 with the desired frequency/mode as outlined in the "memory store" section, page 3-1. If no data has been entered into memory #00, the timer function will use the last frequency/mode in use before the receiver is turned off.

To set the on and off time:

press [F], [1] (TMR), [F], [4] (SET)

The display will show "1" indicating that the 1st or "on" time is to be entered. Enter a 4 digit number corresponding to the desired hours and minutes of the desired turn-on time. Upon entry of the last digit the display will show "2" and the 2nd or "off" time is to be entered. Enter the 4 digit number to select the desired turn-off time in hours and minutes. The time should be entered into the Timer in the 24 hour mode only. To check the information in the timer:

press [F], [1] (TMR) (ON TIME), [4] (SET) (OFF TIME)

The first display will be the turn-on time, the second display will be the turn-off time. To exit, press the CLR key.

To place the receiver in the TIMER mode:

press [F], [1] (TMR), [ENTER]

The display will show a decimal point (.) at the extreme right hand side of the display along with the normal display indicating that the receiver is in the timer mode. The receiver may then be used as normal.

When the PWR switch is turned off, the timer is activated. The audio amplifier, speaker, external speaker and headphone jacks will not be activated when the timer turns on the radio. The audio output to the recorder jack is independent of the Volume control setting.

To disable the timer:

press [F], [1] (TMR), [CLR]

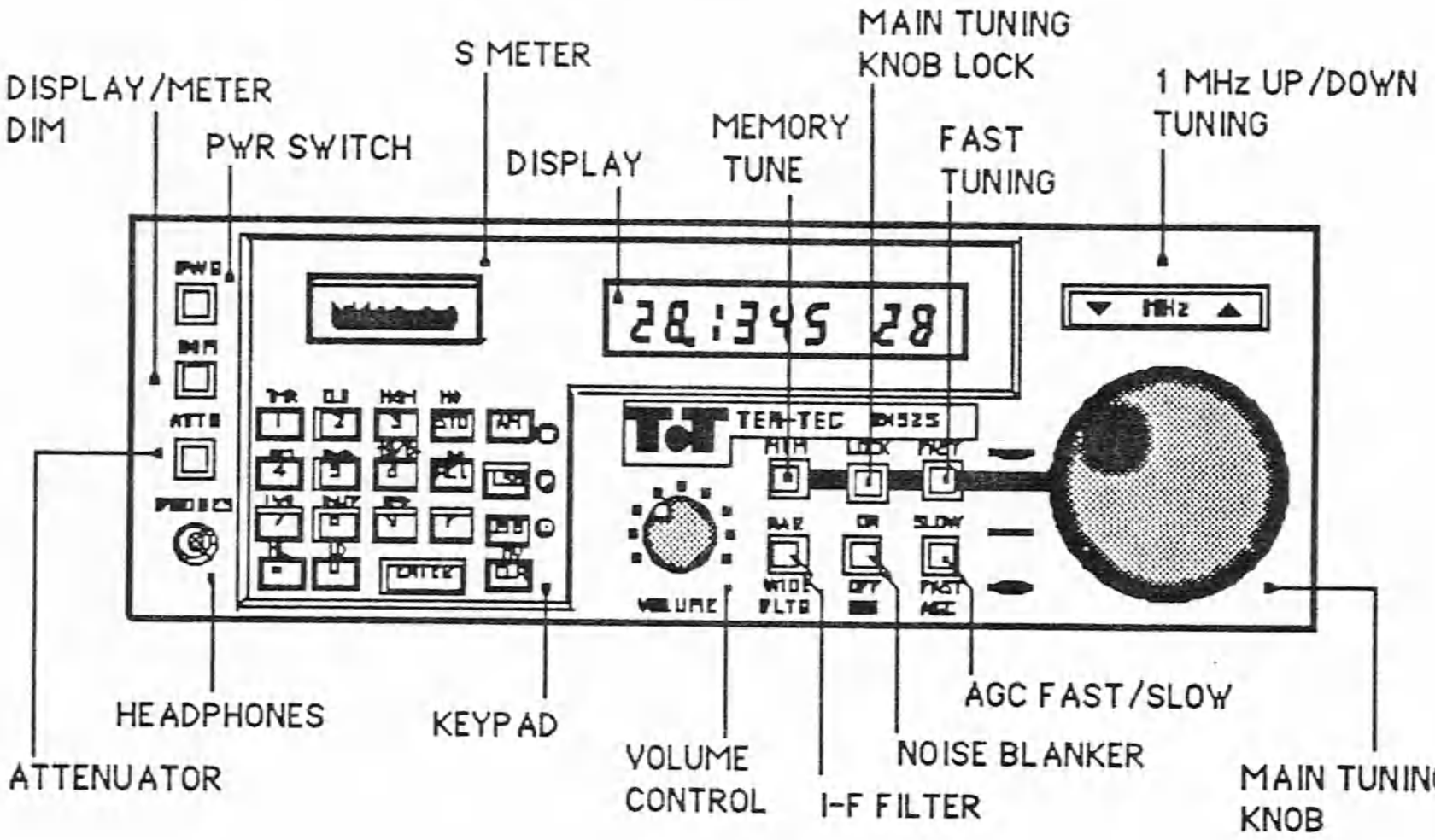
DISPLAY TEST

This function is used to test all of the segments of the digital display. To use this function:

press [F], [ENTER] and keep the ENTER key depressed.

All of the display segments will be turned on and the display will return to normal upon release of the ENTER key.

FRONT PANEL



DIGITAL DISPLAY

A fluorescent tube type display which indicates the received frequency (or clock), the memory location number, and other information used in conjunction with the keypad.

FAST & MAIN TUNING KNOB

The main tuning knob adjusts the received frequency of the receiver. The tuning rate (or frequency resolution) is determined by the MODE and FAST switch positions.

In the AM mode, the normal frequency resolution is 50 Hz steps. Using the FAST function, the resolution is 1 kHz steps.

In USB or LSB the normal resolution is 50 Hz steps. Using the FAST function, the resolution is 500 Hz.

MEM

When this function is used, the main tuning knob will no longer tune the receiver but will tune through all of the programmed memories, including those that are locked out. The locked location will display an "L" (Locked) in front of the memory number. Thus the MEM function also provides a means of determining which memory locations are locked out.

LOCK

Disables the main tuning knob to prevent accidental change of frequency.

MHz DWN/UP

The ▲ key increases the received frequency in 1 MHz steps and the ▼ key decreases the frequency in 1 MHz steps. If the key is held down for more than 1/2 second, the frequency will decrease/increase continuously.

This switch is also used in conjunction with the RATE key on the keypad, and to change scan direction in memory scan and programmable scan.

FLTR NAR/WIDE

Switches the I-F bandwidth from WIDE (4 kHz) to NARrow (2.7 kHz). The WIDE is normally used for AM broadcast reception and NARrow is used for SSB reception and AM reception under crowded conditions. When using the narrow filter for AM reception the frequency of the receiver may have to be adjusted ± 1 kHz for least interference and/or best sound quality.

NOISE BLANKER

The noise blanker (NB), will suppress pulse-type noise on SSB or AM. Place in the ON position to reduce interference.

AGC FAST/SLOW

This switch controls the automatic gain control (AGC). The SLOW position is normally used for CW and SSB reception.

PWR

This switch controls the main power to the receiver. When the timer function is being used the PWR switch is bypassed.

DIM

Dims the digital display and the meter illumination for use when the receiver is being used in low light situations.

ATTN

Attenuates the input by approximately 15 dB for use when listening to extremely strong stations.

VOL

The VOLume control varies the audio output of the receiver. It does not affect the level at the RECORDER rear panel jack.

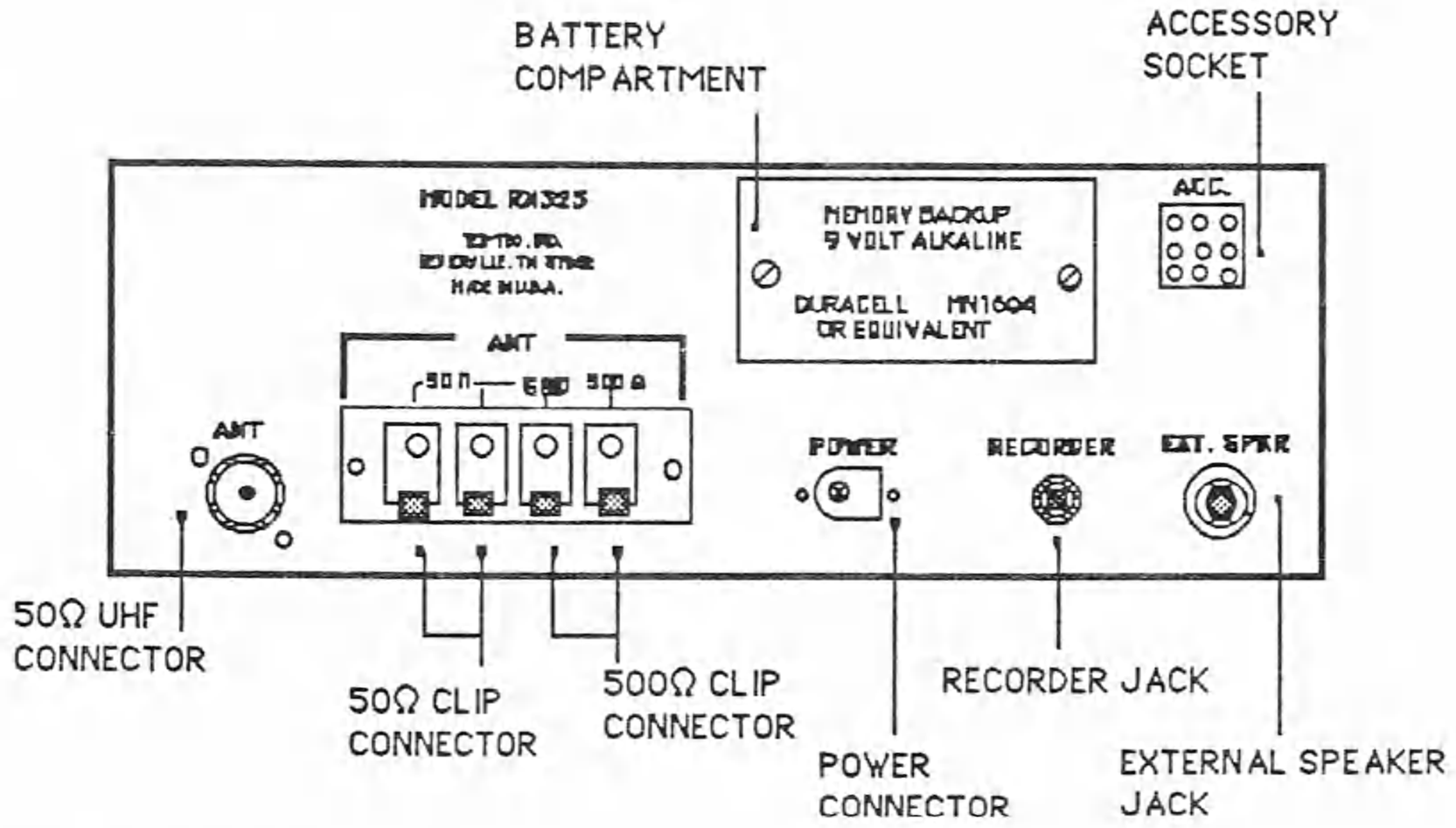
METER

Indicates the received signal strength in both S units and the 5 step SINPO code.

PHONES

This jack is designed to be used with a standard stereo miniature type plug. Headphones with an impedance of 4 to 16 ohms are recommended. Both the internal speaker and external speaker jacks are disabled when headphones are plugged in.

REAR PANEL



UHF coaxial ANT connector

For use with 50Ω coaxial type antenna feeder.

CLIP TYPE ANT CONNECTOR

Connect either a low impedance antenna to the 50Ω terminals or a high impedance antenna such as a longwire antenna to the 500Ω terminals.

POWER

Connect the wall transformer or the optional battery power pack to this connector.
CAUTION: Do Not substitute any other power source for the wall transformer or the battery power pack. Incorrect voltage will permanently damage the receiver.

BATTERY

The battery is used to provide memory backup and will retain memory for approximately 5 hours if the main power (wall transformer) is disconnected.

To replace or install the battery, apply power to the receiver and make sure that the PWR switch is in the on position. Remove the two screws securing the battery cover plate and install a 9 volt alkaline battery. Replace the battery cover.

If the receiver is not to be used and/or connected to the wall transformer for a long period of time, it is recommended that the battery be removed to prevent possible corrosion.

Battery replacement is recommended every 6 months.

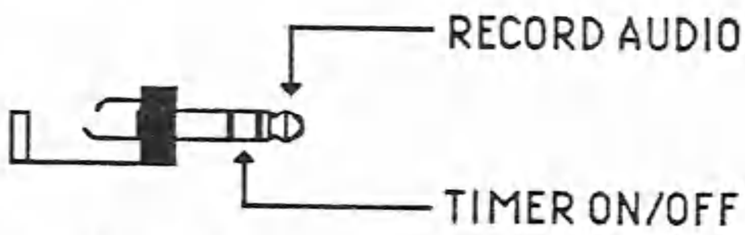
NOTE: Although the memory will be retained as described above, the clock may need to be reset after reconnecting the wall transformer to the receiver.

ACC.

For use with future optional accessories that require connection to the receivers internal microprocessor.

RECORDER

For connection to an external tape recorder using a stereo miniature-type phone plug. This signal level is fixed regardless of the VOLume control setting and should be connected to the LINE level input of the tape recorder. The audio output is on the tip of the recorder plug and the timer on/off connection is on the ring.



NOTE: The on/off connection circuit consists of a transistor switch and will work with many tape recorders that require a switch closure to ground. For other types of recorders, the Model 267 accessory provides a relay type on/off circuit.

EXTERNAL SPEAKER

The optional external speaker Model 265 or any 8Ω speaker may be connected to the RX325 using a standard mono 1/4 inch phone plug. The internal speaker is disconnected when an external speaker is used.

IN CASE OF TROUBLE

If the receiver should fail to operate as normal, please use the following chart to determine the problem. Often the cause of the problem is an overlooked switch or a mistake in entering information into the keypad.

PROBLEM	POSSIBLE CAUSE
1. Main tuning knob will not change frequency.	LOCK switch in lock position.
2. Keypad will not respond to input and main tuning knob will not change frequency.	*Microprocessor may be in process of a selected function routine. Press the CLR key and try again. *Receiver is in memory scan mode with less than 2 memory locations programmed and/or unlocked. Press CLR key and try again.
3. Receiver will not operate, no display or meter light.	Check PWR switch, wall transformer and transformer plug in rear panel.
4. No received signal.	Check antenna connector on rear panel, external speaker and headphones jack, volume control.
5. Received signal strength low.	ATTN switch in attenuation position.

NOTE: If the above procedures do not clear the keypad and/or the display the microprocessor may need to be reset. To reset the processor, turn the PWR switch to the OFF position and remove the wall transformer plug from the rear panel. If the backup 9V battery is installed, open the battery cover and remove the battery. Wait for a few minutes, reinstall the battery/battery cover and connect the wall transformer plug.

SHORTWAVE LISTENING

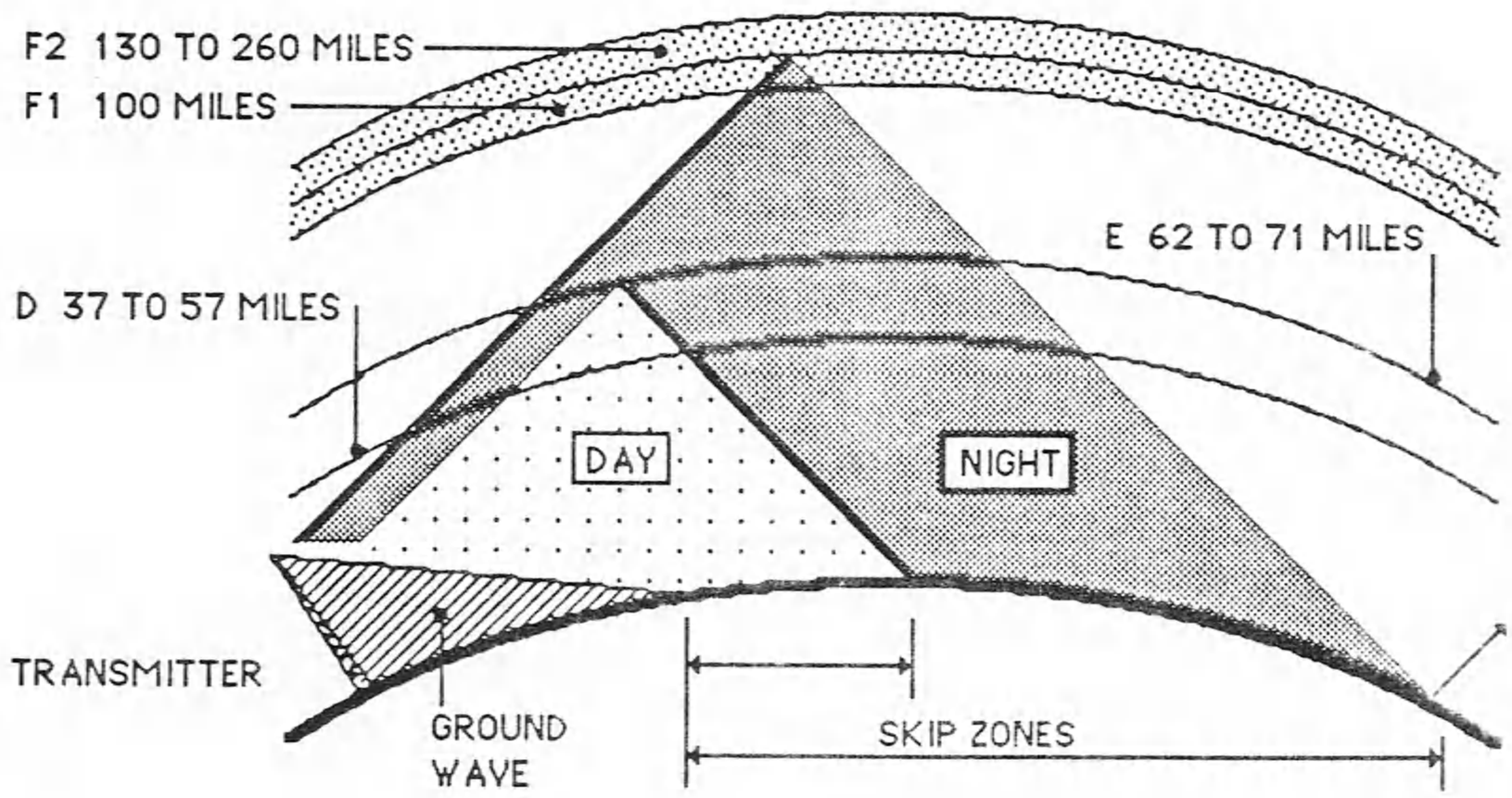
There are many facets to the shortwave listening hobby, the most popular being tuning in to international shortwave broadcasts as almost every country in the world has shortwave broadcast service. Shortwave listeners (SWLs) enjoy news, political views, social customs, and art and music culture from different countries (or their own country when traveling abroad). Also many broadcasters provide educational programs covering science, language, history, religion, etc., and even programs concerning the SWL hobby itself.

Listeners who enjoy seeking far away and sometimes rare stations (DXers), keep careful records of the time, program content, and signal quality of the stations heard. This information is then usually used to obtain verification (QSL) cards from the stations and to help in understanding and predicting shortwave propagation conditions.

Other listening opportunities include transmissions from amateur radio operators, maritime & aeronautical traffic, time signals, telephone links, military & government, and "pirate broadcasting" which includes revolutionary groups and hobby broadcasters.

There are many books and magazines which cover topics of SWL equipment, antennas, broadcast schedules, QSL information, etc. Also there are many SWL clubs that specialize in one or more of the above subjects providing station information and member reception and QSL reports. Information on these clubs in North America may be obtained from The Association of North American Radio Clubs, 557 N. Madison Ave., Pasadena, CA 91101.

PROPAGATION



Direct reception of a transmitted signal (ground wave) is limited to a relatively short distance so therefore long range reception of shortwave radio signals depends on the ability of the ionosphere which surrounds the earth to reflect the signals back to earth. The ionosphere is divided into layers each having its own effect on radio signals and each being affected by the activity of the sun (sun spots, solar flares, etc.) and associated changes in the Earth's magnetic field. The ionization of these layers is constantly changing so reception conditions are never quite the same from hour to hour or from day to day.

The closest layer to the Earth's surface is the D layer which is present during daylight hours. This layer has the effect of absorbing the lower frequency radio signals. The next layer is the E layer which also absorbs the lower frequencies but will reflect the higher shortwave frequencies during the daytime ionization period. The most useful ionospheric layer for long distance shortwave propagation is the F layer which sometimes splits into two layers during the daytime (F1, F2). The F1 layer acts similar to the E layer and usually dissipates after sundown.

Factors that determine how far the signal travels include the time of day for both the transmitting and receiving station, the angle at which the signal is bounced off of the ionosphere, and the effect known as multihop where the reflected signal bounces off the earth to be reflected again by the ionosphere.

AMATEUR RADIO

Many people who start out in shortwave listening as a hobby also become amateur (or "ham") radio operators. This way they not only have the ability to listen but also to communicate, make new friends around the globe or in their own community, provide assistance in times of emergency, and experiment with new technology. Hams use a variety of frequencies from Medium Waves through and beyond the UHF spectrum, use a variety of modulation modes such as CW, SSB, slow scan television, RTTY, FM, etc. Amateur radio operators also use "repeaters" to provide increased distance for small handheld transceivers, operate computer nets, bounce their signals off the moon, and even communicate thru their own amateur satellites.

It is not difficult to get started in ham radio and usually a local ham will be there to help with learning Morse code, basic electronic and radio principles, and regulations required to obtain an amateur radio license.

For more information contact the American Radio Relay League, Newington, CT 06111.

ANTENNAS

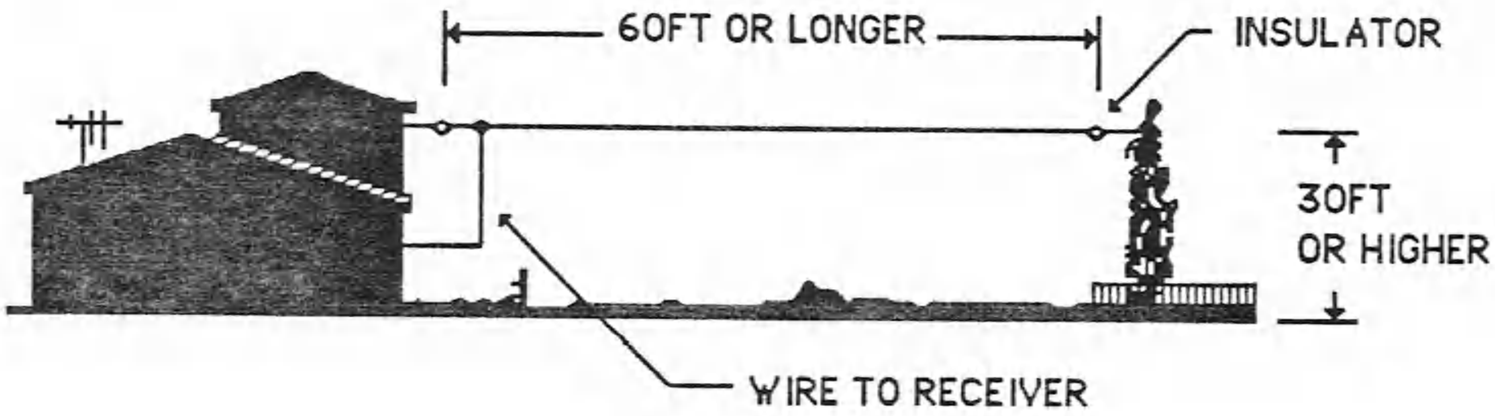
For optimum reception, a good outdoor antenna system is recommended. In limited space applications, a length of wire installed as long and as high as possible will suffice.

In all antenna installations, it is important that the antenna wire and feed line be installed as far away as possible from power lines in the interest of safety and noise reduction. Also the antenna should be installed as far away as possible from buildings, trees, and other objects.

Heavy guage copper wire is recommended for the antenna and nylon cord (or equivalent) should be used between the insulators and the object supporting the antenna system.

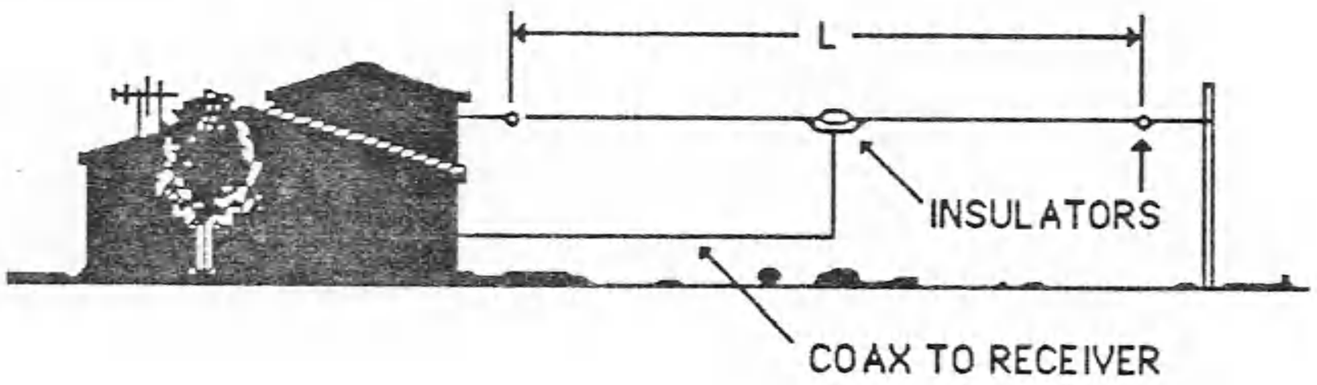
Longwire

The longwire is the simplest type of antenna and is suitable for all-band operation. The feed line to the receiver is a single conductor wire and should be insulated at the point where it enters the building housing the receiver.



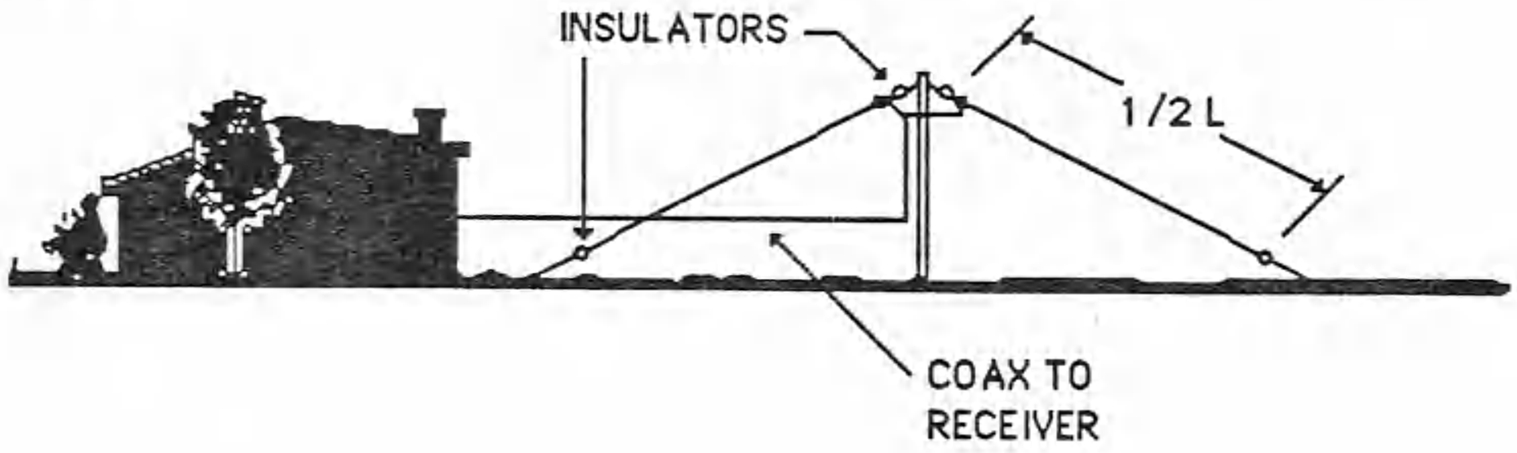
Dipole

The dipole antenna is useful only for the specific band for which it is designed and is somewhat directional with maximum signal strength at right angles to the antenna. The antenna should be fed with 50Ω or 75Ω coaxial cable with the center conductor connected to one side of the antenna and the braid connected to the other side. L(feet)= 468/frequency (MHz).



SLOPING DIPOLE

This antenna is similar to the dipole and is useful where only a single support is available. L(feet)= 486/frequency (MHz).



GROUND

The receiver will operate without a ground however a good earth ground will improve the efficiency of the antenna system as well as reduce the possibility of electrical shock to the operator from other equipment operating from the AC power lines.

A common method used to obtain ground is to connect a copper wire to a copper water pipe. Do not use a plastic pipe or a gas line pipe. A ground system may also be constructed by burying a copper plate, rod, or net in the ground 1 to 6 feet deep.

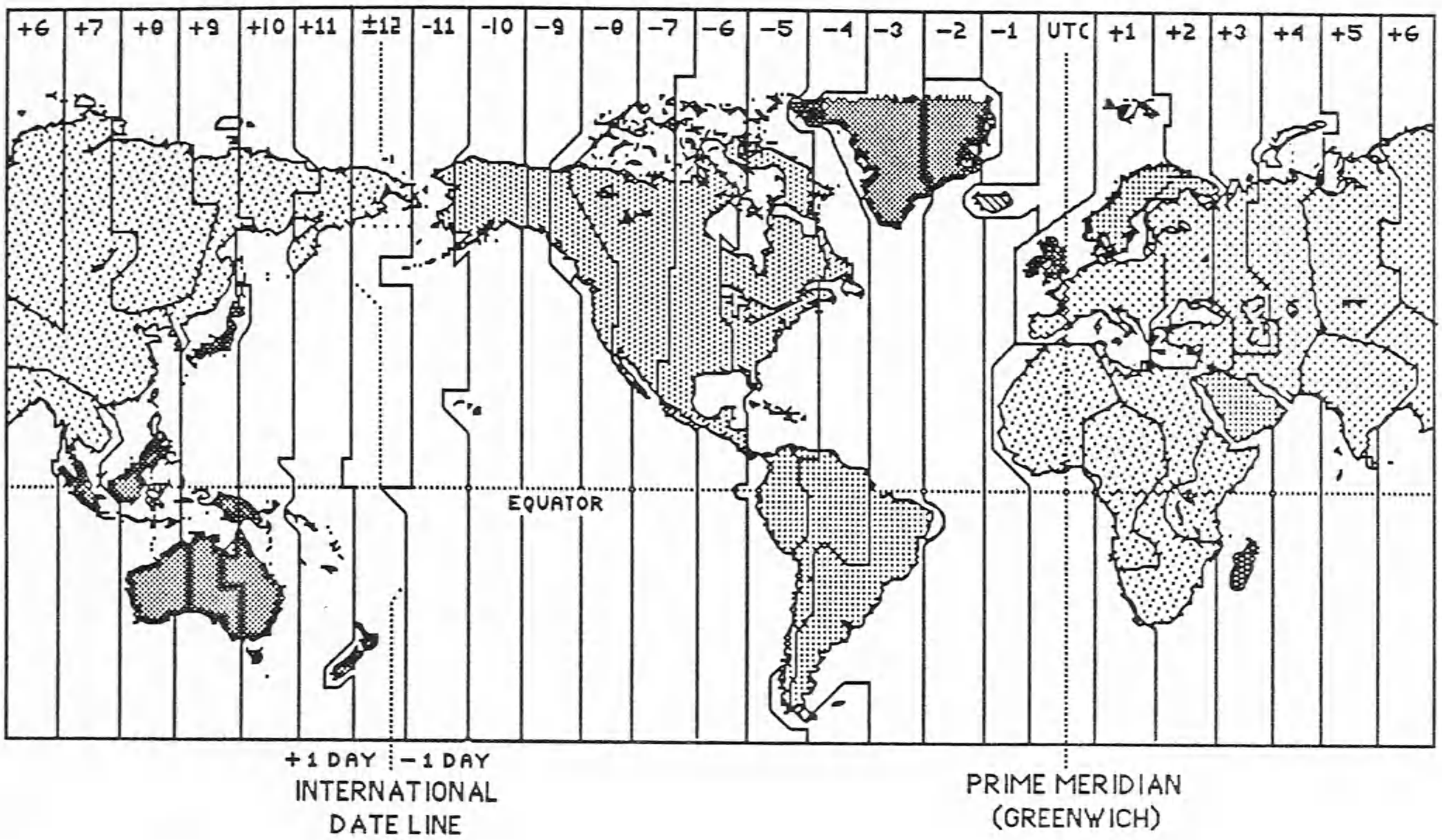
LIGHTNING

As with any tall structure located outside, the antenna system may be prone to lightning effects which could cause damage to the receiver, operator, and surrounding area. Even a lightning strike nearby could induce voltages on the antenna and feedline that may damage the receiver. Although commercial lightning arrestors will help, the best method to prevent damage is to completely disconnect and ground the antenna feed line during thunderstorms and when not using the receiver.

OPTIONAL ACCESSORIES

DESCRIPTION	MODEL NO.
1. External Speaker	265
2. SSB I-F Filter Kit	266
3. Portable Battery Power Pack	925
4. Timer Relay	267

WORLD TIME ZONES



FREQUENCY CHART

BAND	FREQUENCY	USAGE
VLF	10 - 150 kHz	
LW	150 - 285	
BCB	525 - 1605	USA BC
160 m	1.8 - 2 MHz	AMATEUR
120 m	2.3 - 2.495	SWBC TROP
90 m	3.2 -3.4	SWBC TROP
80 m	3.5 - 4	AMATEUR
75 m	3.9 - 4	SWBC
60 m	4.75 - 5.06	SWBC TROP
49 m	5.95 - 6.2	SWBC
41 m	7.1 - 7.3 MHz	SWBC

BAND	FREQUENCY	USAGE
40 m	7 - 7.3	AMATEUR
31 m	9.5 - 9.775	SWBC
25 m	11.7 - 11.975	SWBC
22 m	13.6 - 13.8	SWBC
20 m	14 - 14.35	AMATEUR
19 m	15.1 - 15.45	SWBC
16 m	17.7 - 17.9	SWBC
15 m	21 - 21.45	AMATEUR
13 m	21.45 - 21.75	SWBC
11 m	25.6 - 26.1	SWBC
	26.9 - 27.4	CB
10 m	28 - 29.7	AMATEUR

SWBC = Shortwave Broadcast
SWBC TROP = Shortwave Broadcast
Tropical countries only

CB = USA Citizens Band

REFERENCE CHART

PWR	Main Power Switch
DIM	Display & Meter illumination intensity
ATTN	15 dB front end attenuation
MEM	Memory Tune
LOCK	Main Tuning Knob Lock
NAR / WIDE **FLTR**	I-F Filter selection NAR = 2.7 kHz WIDE = 4 kHz
ON / OFF **NB**	Noise Blanker On/Off
SLOW / FAST **AGC**	Automatic Gain Control Slow/Fast

MODE:

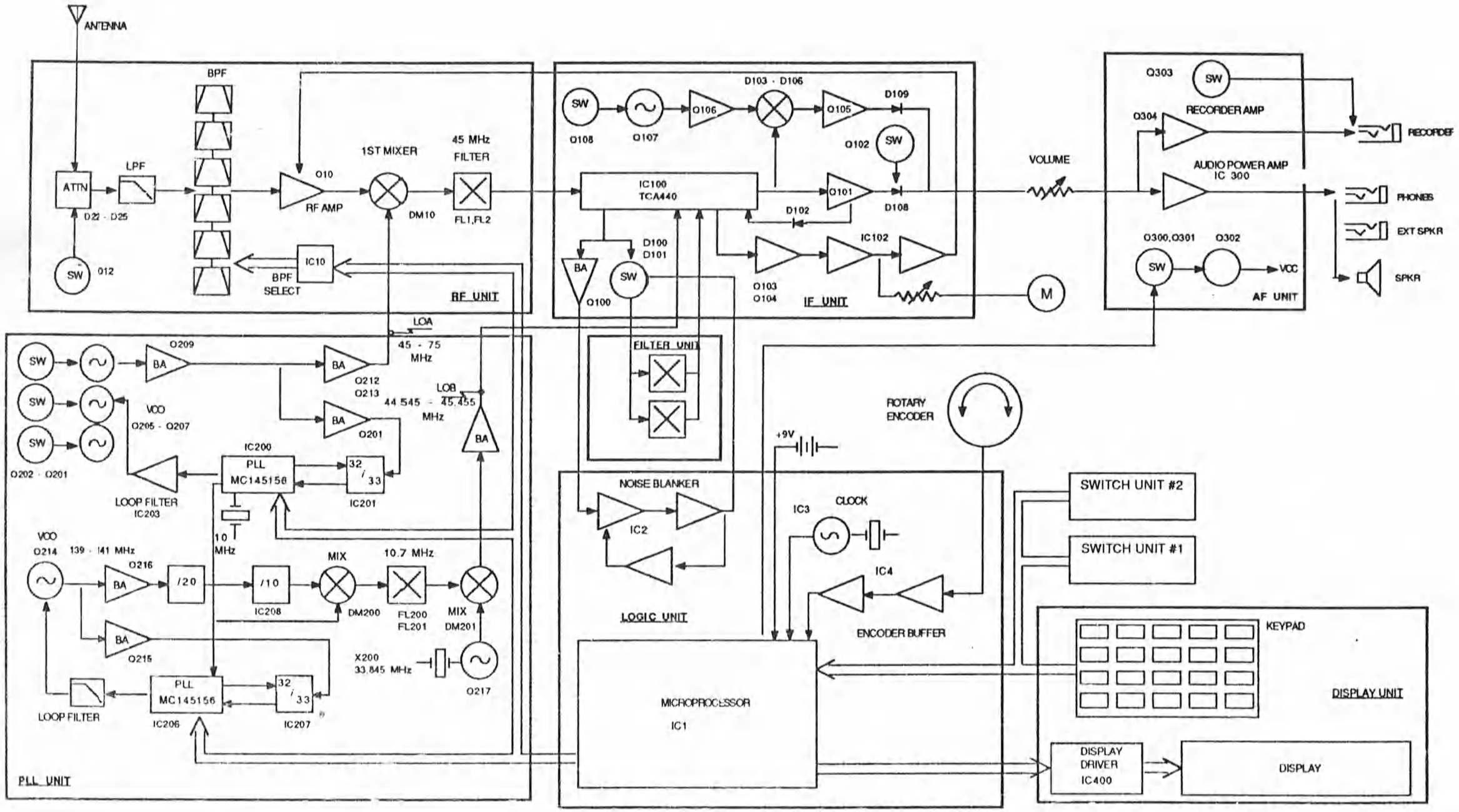
AM	Amplitude Modulation
USB	Upper Sideband/CW
LSB	Lower Sideband/CW

▼ MHz ▲	Up/Dwn Tuning in 1 MHz steps
FAST	Frequency Resolution

AM	FAST	**SSB**	FAST
50Hz	1kHz	50Hz	500Hz

F	TMR **1**	Timer Function
F	CLK **2**	Clock Display & Function
F	MSM **3**	Memory Scan Mode
F	SET **4**	Clock & Timer Set
F	HMS **5**	Clock display in Hours, Minutes, & Seconds or Hours & Minutes
F	12/24 **6**	Clock display in 12 hour mode or 24 hour mode
F	LWR **7**	Lower frequency of Programmable Scan
F	RATE **8**	Rate of Memory Scan & Programmable Scan
F	UPR **9**	Upper frequency of Programmable Scan
F	LC **0**	Memory Lockout Clear

MS **STO**	**F**	Memory Scan Memory Store
PS **RCL**	**F**	Programmable Scan Memory Recall
MC **CLR**	**F**	Memory Clear Clear Key
ML **.**	**F**	Memory Lockout Decimal Point
	F	Function (Shift) Key
	ENTER	Data Enter Key



TEN-TEC RX325
BLOCK DIAGRAM