

Packing List

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Description

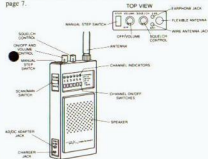
Your Regency HX650 is a pocket size, hand held, 4 band, 6 channel, crystal controlled FM monitor receiver. It is a double conversion, superheterodyne designed to receive any frequency in the public safety, business and amateur 2-meter bands: 70-90 (MIDVHF), 140-170 (High VHF) and 450-512 (two segments in UHF) MHz.

Channel switches are provided to permit scanning any combination of two to six channels when set to automatic scan. Manual selection permits continuous monitoring of any one channel.

This unit operates on 4 AAA dry cell or Nickel-Cadmium batteries as well as 220 Volt AC current. An AC Adapter/Charger is available to recharge Nickel-Cadmium batteries or provide AC power when desired. The HX650 can be operated while the Nickel-Cadmium batteries are being recharged.

The HX650 utilizes silicon transistors throughout for dependability. The use of Integrated Circuits provides compactness and circuit reliability. A crystal filter in the first I.F. and a ceramic filter in the second I.F. ensures optimum performance in areas of the country where many of the services are very closely grouped together. In addition, an Automatic Frequency Control (AFC) circuit (for UHF only) provides automatic adjustment to the receiver's local oscillator frequency in order to compensate for any small change to the station's carrier or receiver frequency.

Other features include: AC power adapter jack, battery charger jack, earphone jack and wire antenna jack. A list of optional accessories includes: package of 4AAA Nickel-Cadmium batteries, AC Adapter/Charger, carrying case, earphone and flexible antenna — see page 7.



Controls

OFF/VOLUME

The knob marked "VOLUME" controls the audio output of the speaker and also provides power to the unit. Rotating this knob clockwise turns the unit on. A "Click" indicates power is on. Further clockwise turning of this knob increases the volume. Set the knob such that the white indicator is pointing toward the word "VOLUME" prior to programming. When turning off the unit, be sure the "VOLUME" knob is turned fully counterclockwise until the "click" is heard or the unit will remain on and needlessly discharge the batteries.

SQUELCH CONTROL

The knob marked "SQUELCH" is used to eliminate background noise in the absence of a signal. Turning the knob clockwise decreases squelch action. When turned all the way clockwise, background noise will be heard. In addition, the unit will stop on a channel and not scan. The proper adjustment is the point where the background noise just disappears and proper scanning action is obtained. Turn the squelch knob counterclockwise until this is achieved. Further counterclockwise turning of the squelch knob past this point may result in poor reception of weaker signals. During scan, the squelch knob may have to be turned counterclockwise just enough to eliminate false stopping on channels without a signal or crystals.

SCAN/MAN

This switch is used to select either automatic scanning or manual selection of the channels and is located on the left side of your unit. With the switch in the UP (SCAN) position and the squelch set, the unit will scan up to 6 channels from left to right. Pushing the switch DOWN (MAN), allows each channel to be selected manually using the STEP switch.

STEP SWITCH

The STEP switch, located to the left of the VOLUME knob, can be used to select the channels when the SCAN/MAN switch is DOWN (MAN). Pushing the STEP switch DOWN and then releasing it, causes the scanner to move one channel. Push the STEP switch whatever number of times is necessary to reach the desired channel. NOTE: Any channel that is de-activated (turned off) will be skipped. This holds true also when scanning — see page 6.

Crystal Selection and Installation

ORDERING CRYSTALS

This receiver requires one crystal for each frequency you wish to receive. The frequency of the various services varies from area to area. Your local Regency dealer can assist you in ordering crystals and provide the frequency information you need for your area. Crystals are usually available from place of purchase.

If you decide to order crystals, however, the ordering information should include the model number of the receiver (HX650) as well as the frequency you wish to receive. The following information should also be included.

A. Low VHF Band Crystals (70 to 90 MHz)

1. Crystal frequency, determined as follows:

$$\text{Crystal frequency} = \frac{\text{Channel frequency} + 10.7\text{MHz}}{2}$$

2. Frequency tolerance of .002%
3. Series resonance — 450 Hz; 3rd Overtone

B. High VHF Band Crystals (140 to 170 MHz)

1. Crystal frequency, determined as follows:

$$\text{Crystal frequency} = \frac{\text{Channel frequency} - 10.7\text{MHz}}{3}$$

2. Frequency tolerance of .001%
3. Series resonance — 450 Hz; 3rd Overtone

C. UHF Crystals (450 to 470 MHz)

1. Crystal frequency, determined as follows:

$$\text{Crystal frequency} = \frac{\text{Channel frequency} - 10.7\text{MHz}}{9}$$

2. Frequency tolerance of .001%
3. 3rd Overtone; load capacitance of 18 PF.

D. T-Band Crystals (470 to 512 MHz)

1. Crystal frequency = $\frac{\text{Channel frequency} - 10.7\text{MHz}}{10}$

2. Frequency tolerance of .001%
3. 3rd Overtone; load capacitance of 18PF.

E. All Crystals

1. Maximum equivalent series resistance of 35 ohms.
2. Maximum drive level of 1 milliwatt.
3. Holder is an HC-25/u with pin leads (plug-in type).

Crystal Installation and Programming

NOTE: THIS RADIO WILL NOT OPERATE UNTIL THE PROPER CRYSTALS ARE INSTALLED.

The crystal access cover is located at the top of the right side panel of the unit. To remove the cover, place thumb on ridges and push outward in direction of arrow (see figure 1). A crystal layout diagram is located inside the cover.

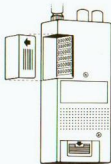


Figure 1

Up to six crystals may be installed in any order desired; all mid band, all high band, all UHF, T-Band, or in any combination. Figure 2 shows the crystal socket layout. For mid band crystals, use the first and third socket holes from the LEFT. For high band crystals, use the second and fourth socket holes from the LEFT. For UHF band crystals, use the second and fourth socket holes from the RIGHT. For T-band crystals, use the first and third socket holes from the RIGHT. Channel 1 is nearest the top of the radio.

Insert each crystal into the desired socket until firm contact is made. There is no polarity to be observed when installing crystals. **IMPORTANT:** Metal base crystals should be inserted so that the crystal base does not touch the top of the socket pin. A fully seated metal base crystal may cause the oscillator circuit to operate improperly.

After all crystals have been installed, snap the cover into place.

Battery Installation

Four AAA batteries are required to operate your HX650 pocket scanner. Your Regency dealer stocks AAA dry cells as well as the pack of 4 Nickel-Cadmium rechargeable batteries (accessory MAS05) to fit your unit.

Dry cell batteries should be replaced when your unit fails to scan and/or the volume becomes low. In addition, do NOT leave discharged batteries in the unit for any length of time as leakage may damage the receiver. It is highly recommended that AAA alkaline batteries be used because of their longer life in this type of operation.

The battery compartment is located on the back of the unit. Remove the cover by pressing down on the ridges and pushing outward in direction of arrow (see diagram below).

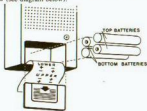


Figure 2

Insert the four AAA batteries into the compartment as indicated by the diagram. **IMPORTANT:** Be sure to observe battery polarity during installation. If batteries are incorrectly inserted, the unit will not operate and possible damage to the batteries and/or unit may result.

NOTE: If unit is to be unused for several months, remove AAA dry cell batteries to prevent possible power loss and leakage.

Antenna

FLEXIBLE

Prior to operation, insert the flexible antenna into the antenna socket located on the top of your unit — see diagram on page 1. Tighten until metal base of antenna is secured against top of radio.

WIRE

A special wire antenna, complete with phone plug attachment, can be used instead of the flexible antenna if better reception is desired. Insert the plug at the end of the wire antenna into the jack marked "ANT" on the top of your unit. Stretch the wire to its fullest vertical extension for maximum reception capability.

Operation

With crystals, batteries and antenna properly installed, your unit is ready for operation. Turn the receiver on by rotating the "VOLUME" knob clockwise. A "click" indicates the receiver is on. Set the squelch following the instructions outlined on page 2.

Each of the channels has an on/off switch located just below the channel number. When the switch for any channel is ON (up position), that channel will be included in the scanning sequence or the manual step function. Pushing the switch to OFF (down position) turns the channel off and it will not be included in either scan or manual step functions.

To scan each channel automatically, push the SCAN/MAN switch located on the left side of the unit UP (SCAN). Each channel with its switch up will be sampled for activity. Be sure squelch has been set properly — see page 2. The red channel indicator above each channel light is as is sampled. When a signal is received, the unit will stop scanning and the channel's indicator will remain lighted while the transmission is broadcast. At its conclusion, the unit will wait approximately two seconds for a reply before resuming scanning automatically.

If the unit stops on a very active channel during the scanning process, push the SCAN/MAN switch DOWN (MAN). Now the unit is in manual on that channel. Instead of resuming scanning after the transmission ends, the unit will stay on that channel for continuous monitoring until the SCAN/MAN switch is moved to SCAN.

With the SCAN/MAN switch in the MAN position, the step switch located to the left of the VOLUME knob can be used to step to a desired channel manually, one at a time in numerical order. Simply depress the step switch and release. Continue until the desired channel is reached.

AC OPERATION

CAUTION: To avoid possible damage to the receiver and batteries, use only the Regency accessory, MA508 AC Adapter/Charger.

Plug one end of the MA508 AC Adapter/Charger into the jack marked "PWR 6V DC" on the left side of the unit. The other end of the adapter should be inserted into any 220V wall outlet. If desired, the adapter may be left plugged into the AC outlet even when the unit has been disconnected for portable use.

Earphone Jack

An earphone jack is located on the top of the unit for your convenience. Simply plug the earphone attachment into the earphone socket (EAR) on the unit. The speaker will be automatically disconnected and the radio reception will be heard only through the earphone. Your Regency dealer can provide the proper earphone attachment (MA507).

Nickel-Cadmium Batteries

For greater operating economy, rechargeable Nickel-Cadmium batteries are recommended. Ask your Regency dealer for part number MA505 which consists of 4 AAA size, 1.2V Nickel-Cadmium batteries.

If Nickel-Cadmium batteries are used, they should be recharged when the unit fails to scan and/or the volume becomes low.

CHARGING NICKEL-CADMIUM BATTERIES

CAUTION: To avoid possible damage to the receiver and batteries, use only the Regency AC Adapter/Charger (Accessory MA508).

The Regency AC Adapter/Charger can be used to charge the 4 AAA Nickel-Cadmium batteries as needed. Insert one end of the Adapter/Charger into the jack on the left side of the unit marked "CHARGE". Plug the other end into any 220V wall outlet.

IMPORTANT: DO NOT plug the AC Adapter/Charger into the jack labeled "CHARGE" unless rechargeable batteries are installed. Regular batteries (i.e. zinc-carbon, mercury, alkaline) may EXPLODE if recharging is attempted. Only those batteries clearly marked Rechargeable Nickel-Cadmium are to be left installed when the "CHARGE" jack is used.

Approximately 14 hours are required to fully charge the batteries. If batteries are charged for 24 hours and do not hold their charge, they should be replaced with new batteries. It is also recommended that Nickel-Cadmium batteries be recharged for the same amount of time the receiver was used. Moderate over-charging will not damage the batteries, however they should receive an overnight charge if the unit has not been used for several months.

IMPORTANT: The Regency HX650 portable scanner CAN be operated while the Nickel-Cadmium batteries are being recharged. Allow 30 hours for proper charging if the unit is being charged and operated at the same time.

Available Accessories and Replacement Parts

MA508 — Use this AC Adapter/Charger instead of batteries when desired. The unit plugs into any 220V, 50/60 Hz power source and comes with a cord and plug to fit the "PWR 6V DC" jack on the receiver.

The MA508 may also be used to charge Nickel-Cadmium batteries when used instead of standard AAA batteries.

MA505 — Pack of 4 1.2V AAA Nickel-Cadmium batteries to replace standard AAA batteries. Nickel-Cadmium batteries may be recharged many times and will provide many hours of service.

MA506 — Carrying case to protect your receiver as well as provide a safe way to carry the unit.

MA507 — Earphone attachment to permit listening without disturbing others. Includes cord and plug to fit "EAR" jack on the receiver.

MA509 — Flexible Antenna.

Troubleshooting Guide

NOTE: Please perform the simple checks indicated for improper operation before returning the unit for service.

TROUBLE	CHECK
No channel light, no sound	OFF/VOLUME knob should be turned clockwise. Batteries not installed — see page 3. AC Adapter/Charger not connected — see page 6.
Channel light, no sound	Volume control setting — turn clockwise. Squelch control setting — see page 2.
Sound present, no light	Channel switches — should be up — see page 6.
No reception (no station heard)	Channel switches — should be up — see page 6. Flexible antenna should be installed and tightened until secure — see page 5. Wire antenna should be stretched to its fullest vertical extension. Crystal not installed properly — both leads must be firmly inserted into the sockets and metal base not touching the sockets — see page 4. Crystal frequency — see page 3 (can only be measured by service personnel).
Weak or poor reception	Flexible antenna should be installed and tightened until secure — see page 5. Wire antenna should be stretched to its fullest vertical extension. Crystal frequency — see page 3 (can only be measured by service personnel).
Does not scan	Squelch control setting — see page 2. Channel switches — should be up — see page 6. SCAN/MAN switch should be pushed up (SCAN).
Does not manually step	Channel switches — should be up — see page 6. SCAN/MAN switch should be pushed down (MAN). STEP switch — must be depressed and released to move to next channel.

Specifications

Frequency Ranges	
VHF Band (MID)	70-90 MHz
VHF Band (High)	140-170 MHz
UHF Band	450-470 MHz
UHF Band (T)	470-512 MHz
Frequency Separation	
VHF 68-88 MHz	10db bandwidth
VHF 140-170 MHz	10db bandwidth
UHF 450-470 MHz	10db bandwidth
UHF 470-500 MHz	10db bandwidth
Sensitivity (at tune up) for 20 DB quieting	
VHF Band (MID)	0.4 μ v
VHF Band (High)	0.5 μ v
UHF Band	0.6 μ v
UHF Band (T)	0.6 μ v
Squelch Sensitivity (Threshold)	
VHF Band	0.4 μ v
UHF Band	0.5 μ v
Selectivity	60db @ 30 KHz
Spurious Rejection (except Primary Image)	
VHF Band	40db
UHF Band	20db
Modulation Acceptance	\pm 7 KHz
AFC Range (UHF only)	Approx. 8 KHz (\pm 4 KHz)
I.F. Frequency	
1st	10.7 MHz; crystal filter
2nd	455 KHz; ceramic filter
Scanning rate (typical)	approx. 15 channels per second
Audio output (8 ohms)	More than 0.1W @ 10% distortion
Power Requirements	6V DC (dry cell batteries) 4.8V DC (Nickel-Cadmium batteries) 6V DC (ext. power)*
Current Drain	16 mA Max. (Stand-by; squelch) 70 mA Max. (0.1W audio output)
Size	3 3/4" W x 5 1/2" H x 1" D
Weight	Approx. 9 oz. (without batteries)

* Accessory MA-508 AC adapter/charger provides the necessary conversion from 230V AC to 6V DC.