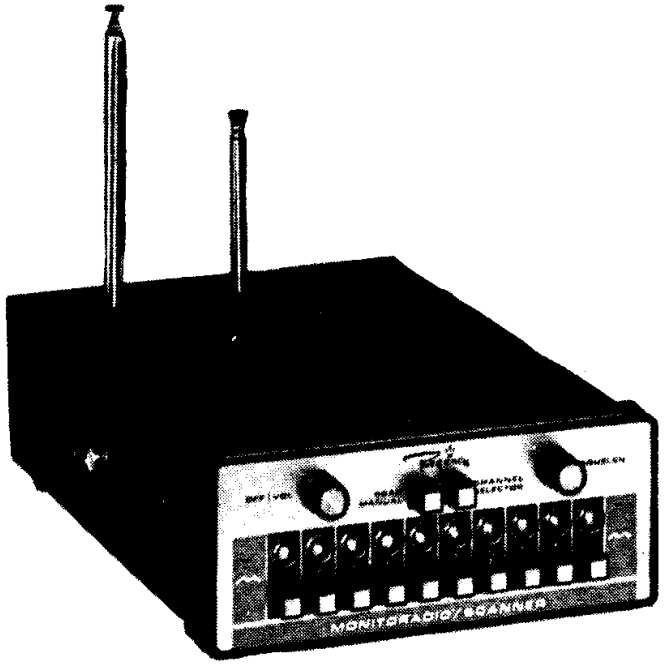
Regency

MONITORADIO RECEIVER



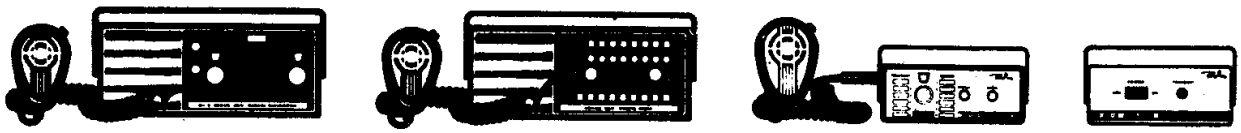
MODEL ACT-R10H/L/U

INSTRUCTION MANUAL

8 - 74

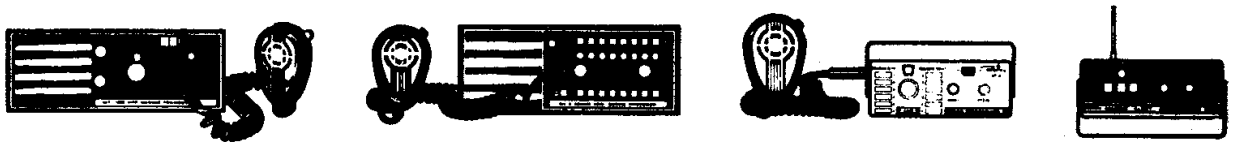
AMATEUR RADIO

For all your 2 Meter FM needs



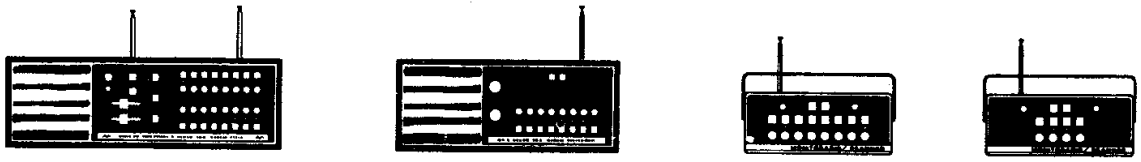
MARINE RADIO

Powerful and positive communications for ship to shore . . . ship to ship



ACTION RADIO

More than 25 VHF High and Low Band or
UHF Band Monitoradio / Scanner Receiver Models



PROFESSIONAL RADIO

New, low-cost, powerful 2 way communications
for business, public service and farms

UNPACKING

1 - Receiver Unit

1 - AC Power Cord

1 - DC Power Cord

2 - Telescopic Antennas

1 - Instruction Manual

1 - Frequency/Service Label

1 - Warranty Card To be filled out and returned to:

Regency Electronics, Inc.

7707 Records Street

Indianapolis, Indiana 46226

OPERATION

It is highly recommended that the sections on Installation and Operation be read before the initial usage of this unit. A few minutes spent in reading these instructions will certainly reduce the number of questions, and problems, that may arise concerning optimum performance and proper usage.

MAINTENANCE

It is recommended that the services of a qualified electronic technician be used for troubleshooting.

DO NOT TAMPER WITH INTERNAL ADJUSTMENTS. DAMAGE TO THE EQUIPMENT AND/OR IMPROPER OPERATION MAY RESULT.

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

DESCRIPTION

The ACT-R 10 H/L/U is a programmable, 10-channel, crystal-controlled three-band FM Monitor. It is a double-conversion, super-heterodyne receiver designed for use in the narrow band FM channels of the public service VHF and UHF communications bands. Police, fire, civil defense, and radio telephone are just a few of the numerous services included in the bands that cover 30 to 50 Megahertz, 148 to 174 Megahertz, and 450 to 470 Megahertz. See page 9 for detailed information for changing the UHF band to cover 470 to 500 Megahertz.

This unit can be programmed internally for any combination (up to ten channels) of High VHF Band (148-174 Megahertz), Low VHF Band (30-50 Megahertz) frequencies, or UHF (450-470 Megahertz) Band.

Any combination of one to ten channels can be scanned automatically. Push button controls permit the listener to monitor only those channels of immediate interest, or all ten if he so desires. Manual selection of channels is also provided in case the listener wants to continuously monitor a particular channel.

The ACT-R 10H/L/U utilizes silicon transistors throughout for dependability. The use of five Integrated Circuits provides compactness and circuit reliability. A ceramic filter employed 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.

Some extra features include: connections for an external or remote speaker and two outside antennas.

SPECIFICATIONS

(Subject To Change Without Notice)

Frequency Range

VHF Band (Low)	30-50 MHz
VHF Band (High)	148-174 MHz
UHF Band	450-470 MHz

Frequency Separation

VHF Band (Low)	6 DB Bandwidth; 33-47 MHz 10 DB Bandwidth; 30-50 MHz
VHF Band (High)	8 MHz (maximum sensitivity) 12 MHz (usable sensitivity)
UHF Band	8 MHz (maximum sensitivity) 12 MHz (usable sensitivity)

Sensitivity (At Tune-Up)

VHF Band (Low)	0.5 microvolt for 20 DB quieting
VHF Band (High)	0.6 microvolt for 20 DB quieting
UHF Band	0.7 microvolt for 20 DB quieting

Squelch Sensitivity (Threshold)

VHF Band (Low)	0.3 Microvolt
VHF Band (High)	0.4 Microvolt
UHF Band	0.5 Microvolt

Selectivity	6 DB @ ±7 KHz 50 DB @ ±18 KHz
Spurious Rejection (Except Primary Image)	50 DB
Modulation Acceptance	±7 KHz
AFC Range (UHF Only)	Approx. 10 KHz (±5 KHz)

I.F. Frequencies..... 1st I.F.: 10.7 MHz
2nd I.F.: 455 KHz (ceramic filter)

Scanning Rate..... Approx. 15 channels per sec.

Audio Output..... 1 Watt @ 5%, or less, distortion;
2 Watts maximum

Power..... 105-130 VAC, 60 Hz @ 13 Watts maximum
11-15 VDC @ 9 Watts maximum

INSTALLATION

117 VAC Installation:

Plug the AC power cable into any 117 VAC, 60 Hz receptacle. The ACT-R 10 H/L/U needs very little ventilation; however, it is good practice to avoid excessively warm locations such as near radiators or heating vents.

Antennas:

For areas with moderate signal strength, the telescopic antenna will be adequate receiving antennas. Insert them through the holes in the cabinet and screw them onto the 6-32 bolts projecting upward. The short (UHF) antenna should be inserted in the hole on the right (as viewed from the front of the unit).

In areas of low signal strength, it may be necessary to use a better antenna system for proper reception. An antenna, such as a ground plane type, mounted as high above the ground as practical will greatly increase the signal strength.

If it is determined that both bands will require an outside antenna, then it is suggested that a dual-band VHF antenna (it covers both 30-50 MHz and 148-174 MHz) be mounted at the top of the mast or whatever is used to vertically support the antennas. The UHF antenna should then be mounted on a cross arm or cross bar several feet below the VHF antenna and at least one foot away from the mast or vertical support. Several manufacturers make special clamps for attaching cross bars or arms to a mast (Antenna Specialists Co. No. ASP-617, for example).

For proper input matching, 50 Ω lead-in coaxial cable such as RG 58/U should be used. A Motorola type antenna (Cinch-Jones No. 13B or H.H. Smith No. 1200) will have to be installed on the receiver end of the cables in order to utilize the antenna connectors located on the rear (back) panel of the unit.

External Speaker:

An external (or remotely mounted) 8 Ω speaker, such as Regency's MA-34, can be used by first opening the link between terminals No. 2 and No. 3. Then, connect one lead of the external speaker to terminal No. 1 and its other lead to terminal No. 1 and its other lead to terminal No. 3. An 8 Ω speaker is recommended for optimum performance; do not use a 3 to 4 ohm speaker.

Mobile (12 VDC) Installation:

NOTE: Mobile reception of a POLICE frequency by UNAUTHORIZED personnel is ILLEGAL in some areas. It is the responsibility of the person making the installation to be sure that the user of this receiver is authorized or cleared through the local police department. Under no conditions can Regency Electronics, Inc., the manufacturer of this set, be held responsible for its unauthorized installation or use.

The ACT-R 10 H/L/U receiver may be used in any car, truck, boat, etc. that has a 12 VDC negative ground system. The red lead with the fuse holder must be connected to the positive terminal side of the battery. The negative or ground connection is normally made through the mounting bracket. If the mounting bracket is not fastened to the metal frame or dash of the vehicle, a separate ground wire will have to be utilized. An 18 gauge conductor, preferably stranded, should be connected to terminal #1 on the rear panel and ran to the nearest negative or ground point of the system.

A "mobile" antenna, with a Motorola type plug on the coax cable, will provide suitable reception and still permit easy removal or installation of the receiver.

Crystal Installation:

Due to the numerous frequencies involved, the crystal is not normally installed by the factory, but by the seller or owner of the unit. Miniature, plug-in crystals are installed by inserting them in receptacles mounted on the printed circuit board.

Prior to installing a crystal, the receiver's cover will have to be removed. To remove the cover, first remove telescopic antennas if they are installed. Second, unscrew the two large bolts located at the sides of the unit. The cover may then be slipped off by sliding it toward the rear of the unit.

Carefully install the crystal in the proper pair of socket pins as indicated in the Crystal Location Drawing on page 12. The crystal MUST be installed in the proper row for correct operation. The numbers located between two of the rows of pins indicate which group of pins correspond to the channel number on the front panel.

If the crystal is for the UHF band (450 to 500 MHz), it should be installed with one lead in a center row pin (labeled COMMON) and its other lead in the corresponding pin in the row labeled UHF (row of pins near the rear of unit). If the crystal is for one of the VHF bands (either High or Low), it should be installed with one lead in a center row pin and its other lead in the corresponding pin in the two labeled VHF (row of pins near the front of unit). Thus, one of the crystal's leads must always be inserted in a center row socket pin while its other lead is inserted in the proper corresponding outer row socket pin.

Band Programming:

As shipped from the factory, the first three channels are programmed for Low Band VHF, the next four (Channels 4 through 7) are programmed for High Band VHF and the last three (Channels 8 through 10) are programmed for the UHF Band. If desired, this arrangement can be changed to any other combination of High, Low or UHF Band channels. Remove the receiver's cover, as described above, and follow the detailed instructions in the next three paragraphs.

If a channel is to be re-programmed (change bands), remove the proper color-coded wire and socket from its present pin and place it onto the corresponding pin in the desired band row. Each row is labeled (see Crystal Location Diagram on page 12) for its respective band (Hi, Lo or UHF). The row of pins nearest front of unit is for the Low VHF Band; the center row is for the Hi VHF Band and row nearest rear of unit is for the UHF Band.

Be sure that each channel has its color-coded wire programmed properly with respect to the crystal installed and to the channel number. Reading from left to right (Channel 1 through 10), the color-coded wires should be in this order; brown, red, orange, yellow, green, blue, purple (or violet), pink, white and black.

NOTE: If a particular channel is not used (in other words, there is no crystal installed for that channel), the band selection wire must still be connected to either a High Band, a Low Band or to a UHF Band pin. Thus, for proper scanner operation, all of the band selection wires MUST be connected, even though not all channels are used.

After the crystals are installed and any necessary band programming changes are completed, reinstall the cover.

OPERATION

Programming Buttons:

NOTE: The Scan/Manual and channel switch are push on-push off type push button switches. The Channel Selector Switch is a momentary, spring-return push button switch.

The Scan/Manual button is pushed in for automatic scanning. To activate a particular channel (provided there is a crystal installed for that channel), the push button directly below the channel number must also be pushed in. In addition, the receiver must be squelched off for proper scanning action. Turn the squelch control counter-clockwise until all of the "noise" from the speaker is eliminated.

When the Scan/Manual button is out, the channel is selected manually. First, activate the channel you want to monitor. Then, push in the Channel Selector button. Hold the button in until the red lamp directly above the desired channel number is lighted and then release it. Thus, if the Scanner was on Channel 3 and you wanted to monitor Channel 5, you would depress the Channel Selector button and hold it until the Channel 5 lamp was lighted. The receiver can be either squelched or unsquelched when manual channel selection is used.

Volume Control/Off-On Switch:

This control varies the audio output level for the internal speaker. It also varies the level of audio present at the external speaker connection. Clockwise rotation of this control turns the receiver on and increases the volume.

Squelch Control:

This control eliminates background noise in the absence of a signal. Full clockwise rotation removes all squelch action. Turning this control counter-clockwise until the noise disappears permits the receiver to be "quiet" until an actual signal is received. Even if the squelch control is set fully counter-clockwise, the receiver will still operate properly and not be locked-out or prevented from receiving a signal.

CRYSTAL INFORMATION

Frequency Ranges:

For good sensitivity, the channel frequencies specified should be within ±4 Megahertz of 458 MHz frequency for the UHF Band, within ±4 Megahertz of 156 MHz for the High VHF Band, and within ±7 Megahertz of 40 MHz for the Low VHF Band. However, for channel frequencies outside of these ranges, the unit will still operate, but with some loss in sensitivity. These ranges can be moved up or down in the bands in which case the RF section of the receiver would have to be realigned.

Special Instructions For 470 To 500 MHz Operation:

The ACT-R 10 H/L/U can have its UHF section retuned to cover an eight Megahertz segment of the 470-500 MHz band. It is recommended that the UHF RF Amplifier &

Oscillator Tripler capacitors be adjusted by a qualified electronic technician. Note that the crystal frequency formula is different from the 450 to 470 MHz range.

Crystal Specifications:

Because of the accuracy required, Shepherd Industries' crystals are recommended. They are usually available at the source from which the receiver was purchased. if desired, the crystals may be purchased from other manufacturers. The following information or specifications must be included in the order:

A. UHF Band Crystals (450 to 470 MHz)

1. Crystal frequency, determined as follows:
Crystal frequency $= \frac{\text{Channel frequency} - 10.7\,\text{MHz}}{9}$

Example:
Crystal frequency =
$\frac{458.00\,\text{MHz} - 10.7\,\text{MHz}}{9} = \frac{447.30\,\text{MHz}}{9} = 49.7000\,\text{MHz}$

2. Frequency tolerance of .001%

3. 3rd Overtone; load capacity of 18 PF; Drive Level of 2 milliwatts.

4. Maximum Impedance of 35 Ohms

5. Holder is an HC-25/U with pin leads (plug-in type).

B. UHF Band Crystals (470 to 500 MHz)

1. Crystal frequency, determined as follows:
Crystal frequency $= \frac{\text{Channel frequency} - 10.7\,\text{MHz}}{10}$

Example:
Crystal frequency =

$$\frac{488.00\ \text{MHz} - 10.7\ \text{MHz}}{10} = \frac{477.30\ \text{MHz}}{10} = 47.7300\ \text{MHz}$$

2. Frequency tolerance of .001%

3. 3rd Overtone; load capacity of 18 PF; Drive Level of 2 milliwatts.

4. Maximum Impedance of 35 Ohms

5. Holder is an HC-25/U with pin leads (plug-in type).

C. High VHF Band Crystals (148 to 174 MHz)

1. Crystal frequency, determined as follows:
Crystal frequency = $\frac{\text{Channel frequency} - 10.7\ \text{MHz}}{3}$

Example:
Crystal frequency =

$$\frac{155.55\ \text{MHz} - 10.7\ \text{MHz}}{3} = \frac{144.85\ \text{MHz}}{3} = 48.2833\ \text{MHz}$$

2. Frequency tolerance of .001%

3. Series resonance - 450 Hz; 3rd Overtone

4. Maximum Impedance of 35 Ohms

5. Holder is an HC-25/U with pin leads (plug-in type).

D. Low VHF Band Crystals (30 to 50 MHz)

1. Crystal frequency, determined as follows:
Crystal frequency = Channel frequency + 10.7 MHz

Example:
Crystal frequency =
39.50 MHz +10.7 MHz = 50.2 MHz

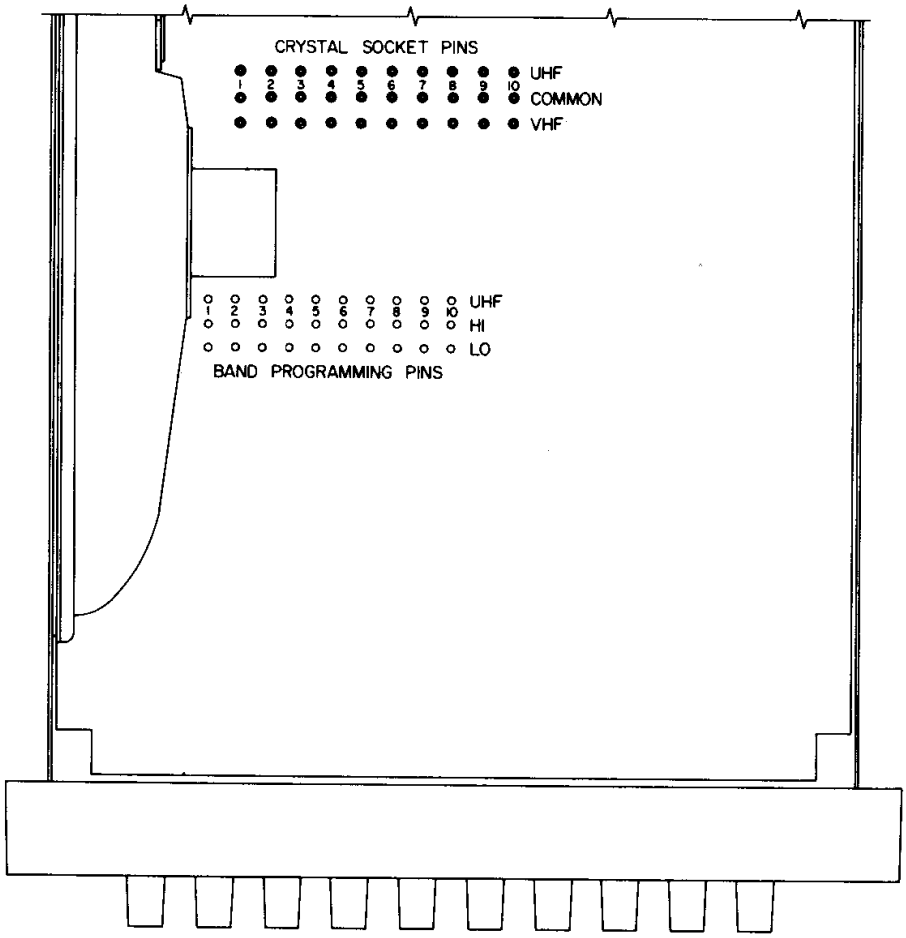
2. Frequency tolerance of .002%

3. Series resonance - 450 Hz; 3rd Overtone

4. Maximum Impedance of 35 Ohms

5. Holder is an HC-25/U with pin leads (plug-in type).

NOTE: "MHz" stand for Megahertz.



CRYSTAL LOCATION DIAGRAM

THE LAW_____concerning possession and use of monitor recievers is embodied in Federal regulations based on Section 605 of the Communications Act of 1934. This FCC regulation does not prohibit listening to Public Service Band frequencies. It does prohibit persons from making use of information heard broadcast on Public Service Bands, for private gain.
Some States' law prohibits the use of mobile monitors except by authorized vehicles.

OFFICIAL NATIONAL TEN CODE SIGNALS

10-0 Caution
10-1 Unable to copy - change location
10-2 Signals good
10-3 Stop transmitting
10-4 Acknowledgement
10-5 Relay
10-6 Busy - stand by unless urgent
10-7 Out of service (Give location and/or telephone number)
10-8 In service
10-9 Repeat
10-10 Fight in progress
10-11 Dog case
10-12 Stand by (Stop)
10-13 Weather and road report
10-14 Report of prowler
10-15 Civil disturbance
10-16 Domestic trouble
10-17 Meet complainant
10-18 Complete assignment quickly
10-19 Return to . . .
10-20 Location
10-21 Call . . . by telephone
10-22 Disregard
10-23 Arrived at scene
10-24 Assignment completed
10-25 Report in person to (Meet) . . .
10-26 Detaining subject, expedite
10-27 Drivers license information
10-28 Vehicle registration information
10-29 Check records for wanted
10-30 Illegal use of radio
10-31 Crime in progress
10-32 Man with gun
10-33 Emergency
10-34 Riot
10-35 Major crime alert
10-36 Correct time
10-37 Investigate suspicious vehicle
10-38 Stopping suspicious vehicle (Give station complete description before stoping).
10-39 Urgent - use light and siren
10-40 Silent run - no light or siren
10-41 Beginning tour of duty
10-42 Ending tour of duty
10-43 Information
10-44 Request permission to leave patrol . . . for . . .
10-45 Animal carcass in . . . lane at
10-46 Assist motorist
10-47 Emergency road repairs needed
10-48 Traffic standard needs repairs
10-49 Traffic light out
10-50 Accident - F, PI, PD
10-51 Wrecker needed
10-52 Ambulance needed
10-53 Road blocked
10-54 Livestock on highway
10-55 Intoxicated driver
10-56 Intoxicated pedestrian
10-57 Hit and run - F, PI, PD
10-58 Direct traffic
10-59 Convoy or escort
10-60 Squad in vicinity
10-61 Personnel in area
10-62 Reply to message
10-63 Prepare to make written copy
10-64 Message for local delivery
10-65 Net message assignment
10-66 Message cancellation
10-67 Clear to read net message
10-68 Dispatch information
10-69 Message received
10-70 Fire alarm
10-71 Advise nature of fire (Size, type, and contents of building)
10-72 Report progress on fire
10-73 Smoke report
10-74 Negative
10-75 In contact with
10-76 En Route
10-77 ETA (Estimated Time of Arrival)
10-78 Need assistance
10-79 Notify coroner
10-80 Chase in progress
10-81 Breathalyzer report
10-82 Reserve lodging
10-83 Work school xing at . . .
10-84 If meeting . . . advise ETA
10-85 Delayed due to . . .
10-86 Officer/operator on duty
10-87 Pick up checks for distribution
10-88 Advise present telephone number of . . .
10-89 Bomb threat
10-90 Bank alarm at . . .
10-91 Pick up prisoner/subject
10-92 Improperly parked vehicle
10-93 Blockade
10-94 Drag racing
10-95 Prisoner/subject in custody
10-96 Mental subject
10-97 Check (Test) signal
10-98 Prison or jail break
10-99 Records indicate wanted or stolen

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