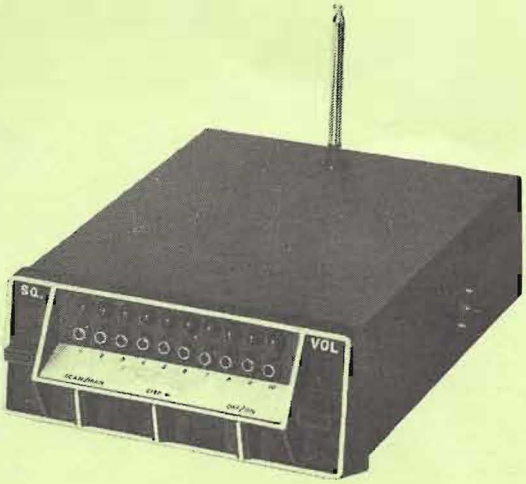
Regency®

ACT-R-106

10 CHANNEL • 5 BAND MONITORADIO/SCANNER

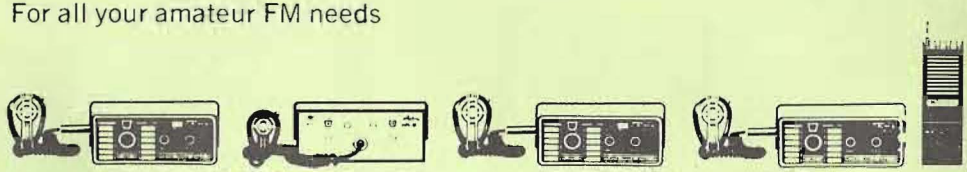


INSTRUCTION MANUAL

8-78

AMATEUR RADIO

For all your amateur FM needs

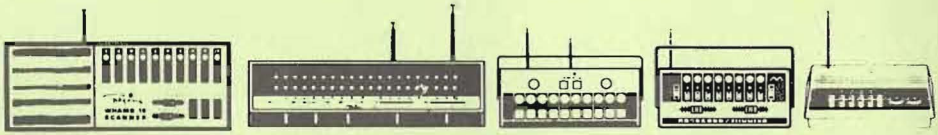


MARINE RADIO

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

Low-cost, powerful 2-way communications in High or Low VHF
and UHF Bands for business, public service and farms

UNPACKING

1 - Receiver Unit
1 - AC Power Cord
1 - DC Power Cord
1 - Telescopic Antenna
1 - Mobile Mounting Bracket
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 intial 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-106 is a fully programmable, 10-channel, crystal-controlled, three-band (two segments per each of the three bands), FM monitor receiver. It is a double conversion, super-heterodyne receiver designed for use in the narrow-band FM channels of the public service VHF and UHF communication bands. Police, fire, civil defense, amateur radio operators and radio telephone are just a few of the numerous services included in the bands that cover 30-50 MHz, 146-174 MHz and 450-512 MHz.

Any combination of one to ten channels can be scanned automatically. A slide switch on each channel permits the listener to monitor

only those channels of immediate interest, or all ten if so desired. Manual selection of channels is also provided in case the listener wants to continuously monitor a particular channel.

The ACT-R-106 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.

Some extra features include: connection for an external or remote speaker and an outside antenna.

SPECIFICATIONS

(Subject To Change Without Notice)

Frequency Range VHF Band (Low) ..... 30-50 MHz
VHF Band (High) ..... 146-174 MHz
UHF Band ..... 450-512 MHz
UHF Band (See Page 11) ..... 406-420 MHz

Frequency Separation (Refer to Special Alignment)
VHF Band (Low) ..... LL; 6 DB Bandwidth; 30-39 MHz
LH; 6 DB Bandwidth; 39-50 MHz
VHF Band (High) ..... HL; 10 DB Bandwidth; 146-160 MHz
HH; 10 DB Bandwidth; 160-170 MHz
UHF Band ..... UL; 10 DB Bandwidth; 450-470 MHz
UH; 10 DB Bandwidth; 475-500 MHz

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) ..... 0.4 Microvolt
VHF Band (High) ..... 0.5 Microvolt
UHF Band ..... 0.6 Microvolt

Selectivity ..... 6 DB@ ±7 KHz
50 DB @ ±18 KHz

rious Rejection (except Primary Image) ..... 50 DB
lation Acceptance ..... ±7KHz

AFC Range (UHF Only) ..... Approx. 8 KHz (± 4 KHz)

I.F. Frequencies ..... 1st I.F.: 10.7 MHz (crystal filter)
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

F.C.C. Certified ..... Part 15, Subpart C

INSTALLATION

117 VAC Installation:

Plug the AC power cable into any 117 VAC, 60 Hz receptacle. The ACT-R-106 needs very little ventilation; however, it is good practice to avoid excessively warm locations such as near radiators or heating vents.

Antenna:

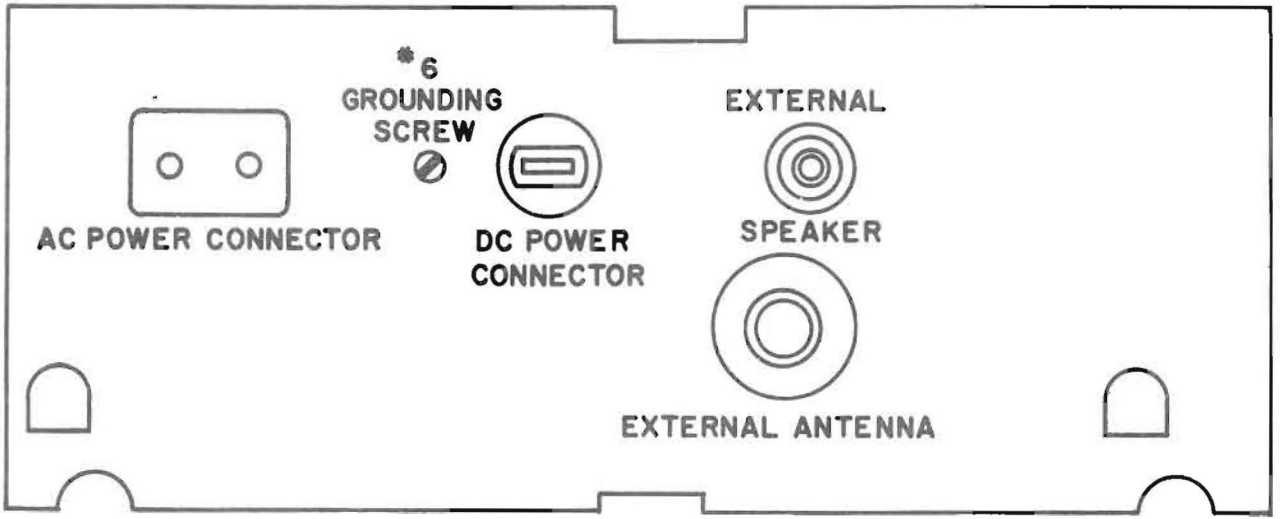
For areas with low moderate signal strength, the telescopic antenna will be an adequate receiving antenna. Insert it through the hole in the cabinet top and screw it onto the 6-32 bolt projecting upward.

In areas of very low signal strength, it may be necessary to use a better antenna system for proper reception. An external antenna mounted as high above the ground as practical will greatly increase the signal strength. If it is determined that proper reception will require an external or outside antenna, then it is suggested that a tri-band antenna (it covers both VHF bands, 30-50 MHz and 146-174 MHz, and UHF) be used. There are several manufacturers of tri-band, monitor type antennas. They are usually available at the source from which the receiver was purchased.

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

External Speaker:

An external (or remotely mounted) 8 Ω speaker, such as Regency's MA-108 can be used by merely inserting the mating miniature phone plug into the miniature phone jack on the unit's rear panel. An 8 Ω speaker is recommended for optimum performance; do NOT use a 3-4 Ω speaker. The internal speaker is automatically disconnected when an external speaker is used.


#6
GROUNDING
SCREW
EXTERNAL
AC POWER CONNECTOR
DC POWER
CONNECTOR
SPEAKER
EXTERNAL ANTENNA

REAR PANEL

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-106 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 female quick-connect terminal is then pushed on to the male terminal in the DC power connector (RED). 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 the #6 grounding screw located on the rear panel and run to the nearest negative or ground point of the system.

To use the accessory MA-18 Cigarette Lighter Power Cord, two connections will have to be made to the receiver (both are located on the unit's rear panel). First, connect the unshielded spade lug to the #6 grounding screw. This provides the "ground" connection to the receiver. The shielded female quick-connect terminal is then pushed on to the male terminal in the DC power connector (RED). After both of these connections are secured, plug the Cigarette Lighter Plug end of the power cord into the vehicle's lighter receptacle. This completes the required power connections.

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

In many cases, suitable reception can be obtained with the unit merely placed on the front seat (or transmission hump) and the telescopic antenna extended.

OPERATION

NOTE: The Power, Scan/Manual and Channel Programming Switches are all 2-position slide type switches. The channel Step Switch is also a slide type switch, but it has a spring-return action.

Power Switch:

The Power Switch is pushed to the right to turn the unit ON and pushed to the left to turn it OFF.

Volume Control:

The Volume Control is located to the far right of the unit. This control varies the audio output level for the internal speaker and external speaker (if connected).

Sliding the knob UPWARD increases the volume (audio output).

Squelch Control:

This control eliminates background noise in the absence of a signal. The Squelch Control is located on the far left of the unit. Sliding the knob fully upward removes all squelch action. Sliding the knob DOWNWARD until the noise disappears permits the receiver to be "quiet" until an actual signal is received. Even if the squelch control is set fully downward, the unit will still operate properly and not be locked-out or prevented from receiving a signal.

Programming Switches:

The ten Channel Programming Switches are located directly below their respective Channel Indicators. To activate a particular channel, the corresponding Program Switch is pushed to the UP position. To deactivate (or disable) a given channel, merely push that channel's programming switch to the DOWN position.

Scan/Manual and Step Switch:

The Scan/Manual Switch is pushed to the LEFT for automatic scanning. In addition, the receiver must be squelched off. To squelch off the unit, slide the squelch control knob DOWN until all the "noise" from the speaker is eliminated and proper scanning action is obtained.

The Scan/Manual Switch is pushed to the RIGHT for Manual selection of the channel to be monitored.

Make sure the desired channel is activated.

Push the Step Switch to the right and release it. Each time the Step Switch is pushed and released, the channel selected will move one channel to the right. Any channel that is deactivated will be skipped.

Push and release the Step Switch whatever number of times is necessary to step to the desired channel.

The receiver can be either squelched or unsquelched when Manual channel selection is used.

Band Programming Procedure and Crystal Installation:

Prior to changing the Band Programming or installing a crystal, the receiver's cover will have to be removed. To remove the cover, first remove the telescopic antenna if it is installed. Second, unscrew the two large knurled thumb screws located at the sides of the unit. The cover may then be slipped off by sliding it toward the rear of the unit.

As shipped from the factory, the first two channels are programmed

for LL (low portion of Low VHF Band 30-39 MHz). The third channel is programmed for LH (high portion of Low VHF Band 39-50 MHz). The fourth and fifth channels are programmed for HL (low portion of High VHF Band 146-160 MHz). The sixth and seventh channels are programmed for HH (high portion of High VHF Band 160-174 MHz). The eighth and ninth channels are programmed for UL (low portion of UHF Band 450-470 MHz). The tenth channel is programmed for UH (high portion of the UHF Band 470-512 MHz). The diagram on page 9 shows the factory programming.

Programming is a process of connecting together all of the channels to be used in each band segment and then connecting the group to the proper band segment pin.

Each channel has one program WIRE and one program PIN. Refer to the diagram on page 9 to locate the wires and pins. Channels of the same group are connected together by connecting the program WIRE from one channel to the program PIN of another channel. The group of channels are connected to the proper band segment PIN by connecting the program WIRE from the first channel in each group to the band segment PIN which covers the frequencies in that group.

The program WIRE of any channel should NEVER be connected to the program PIN of the same channel. In other words, the program WIRE of any channel should always be connected to either another channel's program PIN or to a band segment PIN.

Upon completion of programming the desired channels, Step 7 MUST be performed to insure proper scanner operations.

The channels may be programmed in any order desired, however, the programming can be simplified by starting with channel one and progressing to channel ten.

Step 1:

Group all of the crystals to be used in each band segment together. Refer to the frequency marked on the crystals and the chart on page 8 to determine the proper band segment for each group. There may be any number from one to ten crystals in each group. The number of groups may be any number from one to six.

Step 2:

Select the group of crystals to be installed. This may be any one of the groups and the crystals may be installed in any order within the group.

Step 3:

Install the first crystal from the selected group in the desired channel crystal sockets. See page 9 for Crystal Location Diagram.

Step 4:

Connect the program WIRE for the channel selected in Step 3 to the proper band segment PIN. If this group has only one crystal, proceed to the next group by starting over with Step 2. If the group has more than one crystal, continue with Step 5.

Step 5:

Install the second crystal of the group in the desired channel crystal socket. Connect the program WIRE for this channel to the program PIN of the channel selected in Step 4. This connects the two channels in this segment together. If the group has only two crystals, proceed with the next group by starting over with Step 2. If the group has more than two crystals, continue with Step 6.

Step 6:

Continue the process of installing crystals and connecting the channels together until the group programming is completed. Repeat Steps 2 through 6 for each of the remaining groups.

If there are any unused channels remaining at the completion of programming, continue with Step 7.

Step 7:

Connect all of the UNUSED channels together by connecting the pro-program WIRE for each unused channel to the program PIN of another unused channel. Upon completion of connecting all of the UNUSED channels together, connect the program WIRE from the last channel either to the program PIN of any used channel that has been programmed, or to any unused band segment PIN.

The following is an example of programming, showing 5 crystals installed in channels 1 through 5. In this example, there are four groups of frequencies. The first group has two frequencies, each of the remaining 3 groups have one frequency each.

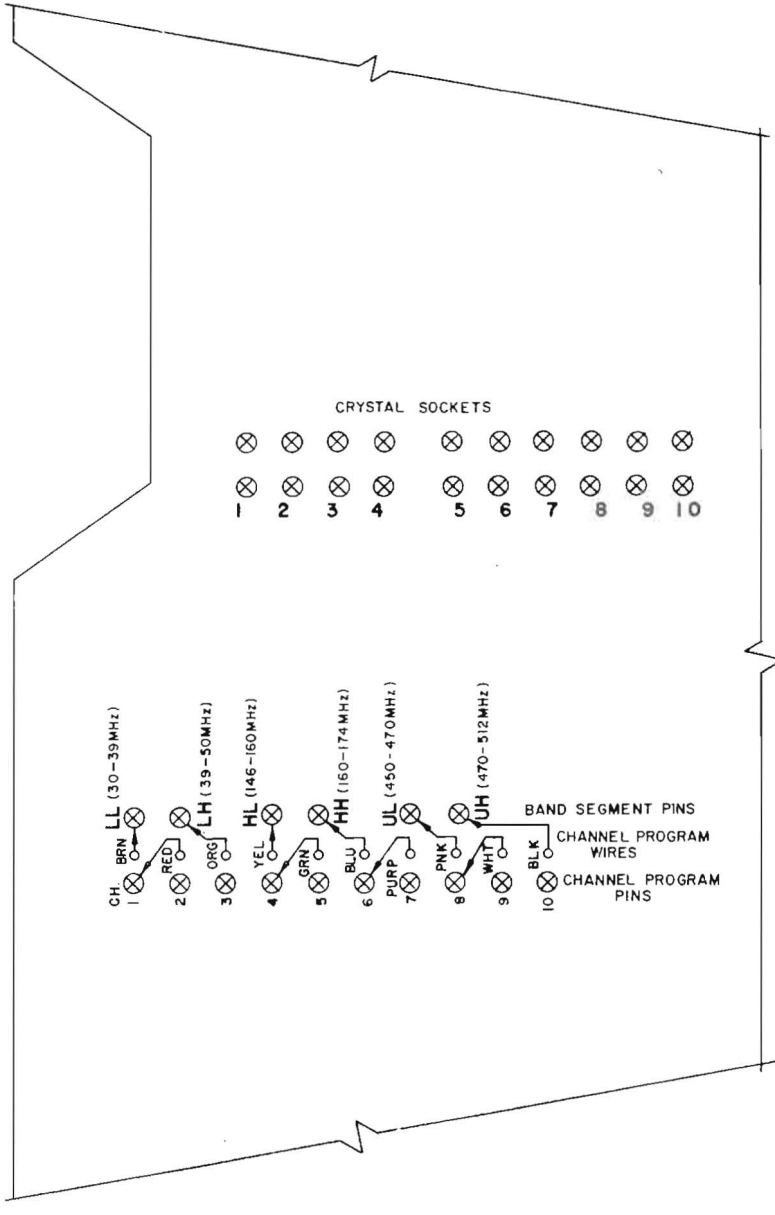
Programming Example:

CH No.	Crystal Frequencies	Program in this Segment
1	35.02 MHz	LL (30-39 MHz)
2	37.32 MHz	LL (30-39 MHz) *
3	155.19 MHz	HL (146-160 MHz)
4	162.55 MHz	HH (160-174 MHz)
5	460.025 MHz	UL (450-470 MHz)

*Program WIRE connects to the Program PIN of Channel 1

Segment Chart:

LL:	30-39 MHz	HH:	160-174 MHz
LH:	39-50 MHz	UL:	450-470 MHz
HL:	146-160 MHz	UH:	470-512 MHz



CRYSTAL LOCATION DIAGRAM

Crystal Information:

Due to the numerous frequencies or channels involved, the crystal is not normally installed by the factory, but by the seller or owner of the unit. Miniature, plug-in crystals are simply installed by inserting them in the receptacles on the circuit board. Because of the accuracy required, Shepherd Industries' crystals are recommended. They are usually available at the source from which the radio was purchased. Specify the exact frequency.

If desired, the crystals may be purchased from other manufacturers. The following information must be included in the order:

A. Low VHF Band Crystals
   1. Crystal frequency, determined as follows:
      Crystal frequency = Channel frequency + 10.7 MHz

      Example:

      Crystal frequency = 39.5 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).

B. High VHF Band Crystals
   1. Crystal frequency, determined as follows:

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

      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).

C. UHF Band Crystals (450 to 470 MHz)
   1. Crystal frequency, determined as follows:

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

      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 capacitance 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).

D. UHF Band Crystals (470 to 512 MHz)

1. Crystal frequency, determined as follows:

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

Example:

$$\text{Crystal frequency} = \frac{488.00\ \text{MHz} - 10.7\ \text{MHz}}{10} = \frac{477.30\ \text{MHz}}{10} = 47.730\ \text{MHz}$$

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

E. UHF Band Crystals (406 to 420 MHz)

NOTE: See Special Alignment

1. Crystal frequency, determined as follows:

$$\text{Crystal frequency} = \frac{\text{Channel frequency} - 10.7\ \text{MHz}}{8}$$

Example:

$$\text{Crystal frequency} = \frac{418.00\ \text{MHz} - 10.7\ \text{MHz}}{8} = \frac{407.30\ \text{MHz}}{8} = 50.9125\ \text{MHz}$$

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

Special Alignment:

As shipped from the factory, the unit covers two segments each in the three bands. In almost all cases, they will give you the performance that you desire. The two segments in the Low VHF Band will give you optimum coverage from 30 to 39 and 39 to 50 MHz; no retuning should ever be necessary.

In the High VHF Band, the High segment is tuned to give better than 1.5 μv sensitivity from 160 to 170 MHz and the Low segment is tuned to give better than 1.5 μv sensitivity from 146.5 to 160 MHz. In the UHF Band, the High segment is tuned to give better than 1.5 μv from 475 to 500 MHz and the Low segment is tuned to give better than 1.5 μv from 450 to 470 MHz.

For customers with crystals outside the factory tuned segments in the High VHF (170-174 MHz) and UHF (406 to 420 or 500 to 512 MHz) Bands, the set may be returned to Regency's Customer Service De-

partment for proper realignment. Please allow at least two weeks for the unit to be returned to you. This Special Alignment (performed by our Customer Serivce Department) will not affect your warranty.

If there is no concern over the warranty (perhaps the warranty period has expired), the Special Alignment can be performed by any competent electronic technician who has the normal complement of service or repair equipment.

Weather Broadcasts:

The National Weather Service provides a continuous (24-hour) broadcast of local and area weather conditions. These weather messages are repeated until the next or up-dated report is issued. The Weather Service has broadcast facilities in many metropolitan areas of the country (see list).

If you are located with 25 to 30 miles of one of these cities, reception usually can be obtained with the telescopic antenna. Your local Regency Dealer can advise you about your specific antenna requirements.

NOTE: When set to automatic scan, the ACT-R-106 will stop and remain on the Weather Channel (since it broadcasts continuously). Thus, this channel should only be activated when you desire to hear the current weather report.

CURRENT LISTING OF CITIES WITH NATIONAL WEATHER SERVICE

STATE	CITY	FREQ.
Alaboma	Mobile	162.55
Alaska	Anchorage	162.55
	Seward	162.40
California	Eureka	162.55
	Los Angeles	162.55
	Monterey	162.40
	Oxnard	162.40
	Sacramento	162.40
	San Diego	162.40
	San Francisco	162.55
Colorado	Denver	162.55
Colorado	New London	162.40
D.C.	Washington	162.55
Florida	Jacksonville	162.55
	Miami	162.55
	Pensacola	162.40
	Tampa	162.55
	West Palm Beach	162.40
Georgia	Atlanta	162.55
	Savannah	162.40
Hawaii	Hilo	162.55
	Honolulu	162.55
	Mt. Huleakala	162.40
Illinois	Chicago	162.55
Indiana	Indianapolis	162.55
Iowa	Des Maines	162.55
Kansas	Wichita	162.55
Louisiana	Baton Rouge	162.45
	Lake Charles	162.55
	New Orleans	162.55
Maine	Portland	162.55
	Rockland	162.40

STATE	CITY	FREQ.
Maryland	Baltimore	162.40
Massachusetts	Boston	162.40
	Hyannis	162.55
Michigan	Detroit	162.55
Minnesota	Minneapolis	162.55
Missouri	Kansas City	162.40
	St. Joseph	162.40
	St. Louis	162.55
New Jersey	Atlantic City	162.40
New York	Buffalo	162.55
	New York	162.55
North Carolina	Morehead City	162.40
	Wilmington	162.55
Ohio	Akron	162.55
	Cleveland	162.55
	Sandusky	162.40
Oregon	Astoria	162.55
	Eugene	162.40
	Portland	162.55
Pennsylvania	Erie	162.40
South Carolina	Charleston	162.55
Texas	Brownsville	162.55
	Corpus Christi	162.55
	Dallas	162.40
	Fort Worth	162.55
	Galveston	162.55
Utah	Salt Lake City	162.55
Virginia	Norfolk	162.55
Washington	Seattle	162.55

Regency®

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 stopping).
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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