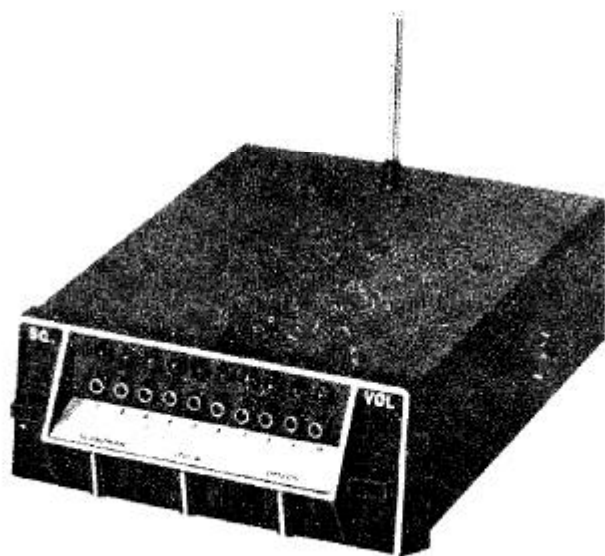




ACT-R-106

**10 CHANNEL • 5 BAND
MONITORADIO/SCANNER**



INSTRUCTION MANUAL

6-76

UNPACKING

- 1 - Receiver Unit
- 1 - AC Power Cord
- 1 - DC Power Cord
- 1 - Telescopic Antenna
- 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.

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 15)..... 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

Spurious Rejection (except Primary Image)..... 50 DB

Modulation Acceptance..... ± 7 KHz

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

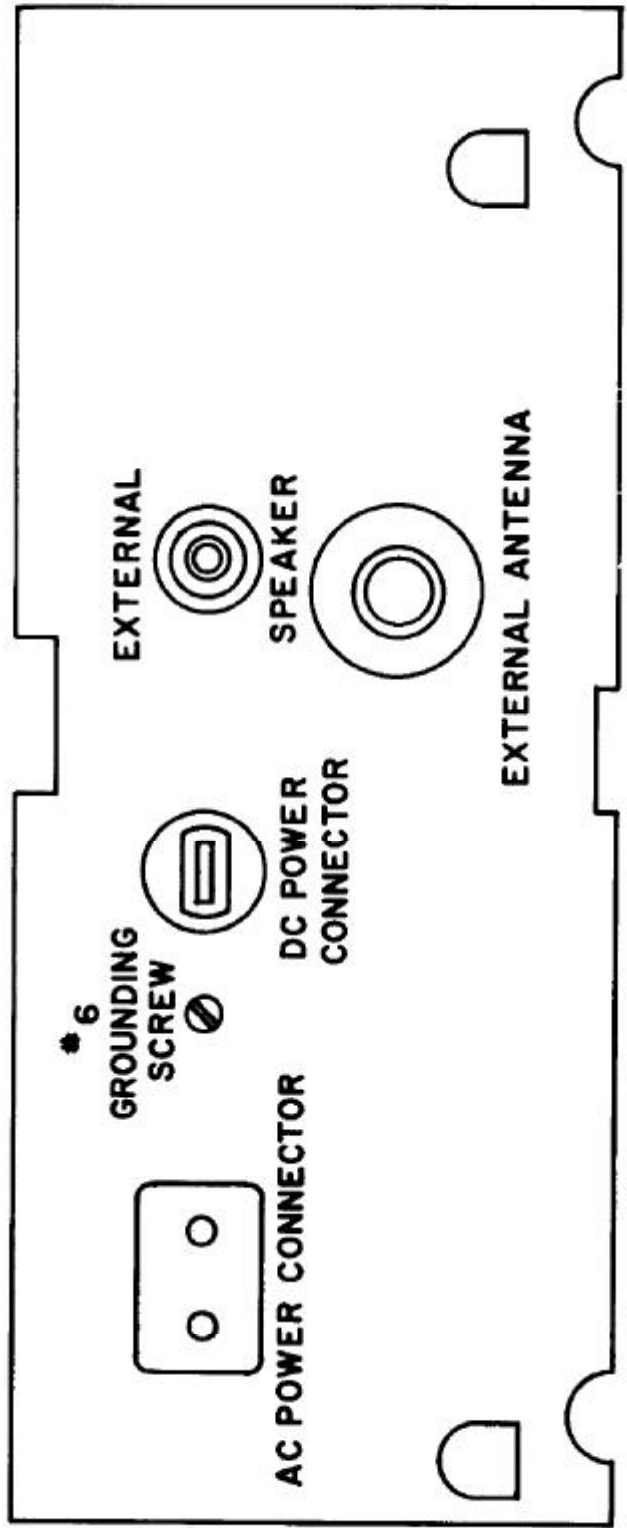
117 VAC Installation:

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 or 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.



REAR PANEL

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.

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 ran 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 de-activate (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. First, activate the channel you want to monitor (if not previously activated). Next, hold the Step Switch in the RIGHT position until the red channel indicator directly above the desired channel number is lighted and then release it.

For example, if the Scanner was on Channel 3 and you wanted to monitor Channel 5, you would first activate Channel 5. Then you would push the Step Switch to the RIGHT and hold it there until Channel 5 Indicator is lighted. At this time you would quickly release the Step Switch. The receiver can either be 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.

For ease in re-programming, group all of the crystals into bands (and their specific segments) and install the crystals in this manner in the receiver.

Insert the crystal in the proper socket pins as indicated on the Crystal Location Diagram on page 12.

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).

There is one row of Band Segment pins (6 pins) and one row of Channel Programming pins (10 pins).

The Channel Programming pins, when connected to a Band Segment pin by way of Channel Programming Wires, determine the Band (and its specific segment) that a particular channel will operate on.

To help avoid confusion, channels should be programmed from Left to Right. Channel 1 is on the LEFT.

Starting with Channel 1, connect the Programming Wire for Channel 1 to the appropriate Band Segment pin (look at the frequency marked on the crystal installed in Channel 1 to determine the proper Band Segment pin). If Channel 2 is to be programmed for the same Band as Channel 1, merely connect the Programming Wire for Channel 2 to the Programming pin on Channel 1. This is essentially a stacking method of programming. If Channel 2 is to be programmed for a different Band than Channel 1, then connect the Programming Wire for Channel 2 to the proper Band Segment pin.

NOTE: ALL CHANNELS MUST BE PROGRAMMED FOR THE RECEIVER TO WORK PROPERLY. If a particular channel is not used (in other words, there is not a crystal installed for that channel), the programming wire must still be connected either to a Band Segment pin or Channel Programming pin which is connected to a Band Segment pin.

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)

* Actually connects to the Programming pin of Channel 1

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:

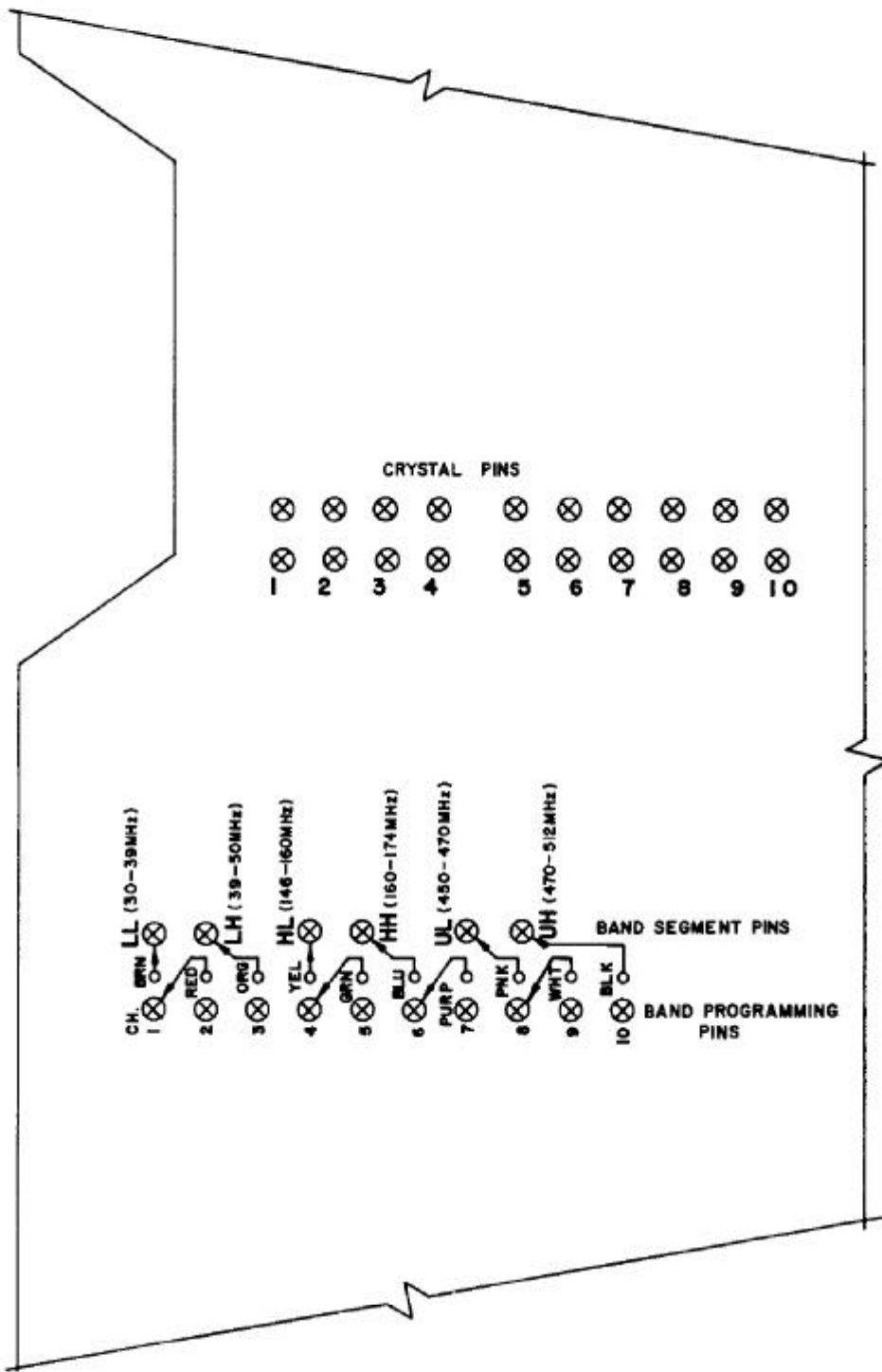
A. Low VHF Band Crystals

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).



CRYSTAL LOCATION DIAGRAM

B. High VHF Band Crystals

1. Crystal frequency, determined as follows:

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

Example:

Crystal frequency =

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

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 $1.5 \mu\text{v}$ sensitivity from 160 to 170 MHz and the Low segment is tuned to give better than $1.5 \mu\text{v}$ sensitivity from 146.5 to 160 MHz. In the UHF Band, the High segment is tuned to give better than $1.5 \mu\text{v}$ from 475 to 500 MHz and the Low segment is tuned to give better than $1.5 \mu\text{v}$ 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 Department for proper re-alignment. Please allow at least two weeks for the unit to be returned to you. This Special Alignment (performed by our Customer Service 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 on page 17).

If you are located within 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 requirement.

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

<u>STATE</u>	<u>CITY</u>	<u>FREQ.</u>	<u>STATE</u>	<u>CITY</u>	<u>FREQ.</u>
Alabama	Mobile	162.55	Maryland	Baltimore	162.4
Alaska	Anchorage	162.55	Massachusetts	Boston	162.40
	Seward	162.40		Hyannis	162.55
California	Eureka	162.55	Michigan	Detroit	162.55
	Los Angeles	162.55	Minnesota	Minneapolis	162.55
	Monterey	162.40	Missouri	Kansas City	162.55
	Oxnard	162.40		St. Joseph	162.40
	Sacramento	162.40		St. Louis	162.55
	San Diego	162.40	New Jersey	Atlantic City	162.40
	San Francisco	162.55	New York	Buffalo	162.55
Colorado	Denver	162.55		New York	162.55
Connecticut	New London	162.40	North Carolina	Morehead City	162.40
D.C.	Washington	162.55		Wilmington	162.55
Florida	Jacksonville	162.55	Ohio	Akron	162.55
	Miami	162.55		Cleveland	162.55
	Pensacola	162.40		Sandusky	162.40
	Tampa	162.55	Oregon	Astoria	162.55
	West Palm Beach	162.40		Eugene	162.40
Georgia	Atlanta	162.55		Portland	162.55
	Savannah	162.40	Pennsylvania	Erie	162.40
Hawaii	Hilo	162.55	South Carolina	Charleston	162.55
	Honolulu	162.55	Texas	Brownsville	162.55
	Mr. Huleakala	162.40		Corpus Christi	162.55
Illinois	Chicago	162.55		Dallas	162.40
Indiana	Indianapolis	162.55		Fort Worth	162.55
Iowa	Des Moines	162.55		Galveston	162.55
Kansas	Wichita	162.55	Utah	Salt Lake City	162.55
Louisiana	Baton Rouge	162.45	Virginia	Norfolk	162.55
	Lake Charles	162.55	Washington	Seattle	162.55
	New Orleans	162.55			
Maine	Portland	162.55			
	Rockland	162.40			

THE LAW_____concerning possession and use of monitor receivers 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 | 10-41 | Beginning tour of duty |
| 10-1 | Unable to copy - change location | 10-42 | Ending tour of duty |
| 10-2 | Signals good | 10-43 | Information |
| 10-3 | Stop transmitting | 10-44 | Request permission to leave patrol ... for ... |
| 10-4 | Acknowledgement | 10-45 | Animal carcass in ... lane at |
| 10-5 | Relay | 10-46 | Assist motorist |
| 10-6 | Busy - stand by unless urgent | 10-47 | Emergency road repairs needed |
| 10-7 | Out of service (Give location and/or telephone number) | 10-48 | Traffic standard needs repairs |
| 10-8 | In service | 10-49 | Traffic light out |
| 10-9 | Repeat | 10-50 | Accident - F, PI, PD |
| 10-10 | Fight in progress | 10-51 | Wrecker needed |
| 10-11 | Dog case | 10-52 | Ambulance needed |
| 10-12 | Stand by (Stop) | 10-53 | Road blocked |
| 10-13 | Weather and road report | 10-54 | Livestock on highway |
| 10-14 | Report of prowler | 10-55 | Intoxicated driver |
| 10-15 | Civil disturbance | 10-56 | Intoxicated pedestrian |
| 10-16 | Domestic trouble | 10-57 | Hit and run - F, PI, PD |
| 10-17 | Meet complainant | 10-58 | Direct traffic |
| 10-18 | Complete assignment quickly | 10-59 | Convoy or escort |
| 10-19 | Return to ... | 10-60 | Squad in vicinity |
| 10-20 | Location | 10-61 | Personnel in area |
| 10-21 | Call ... by telephone | 10-62 | Reply to message |
| 10-22 | Disregard | 10-63 | Prepare to make written copy |
| 10-23 | Arrived at scene | 10-64 | Message for local delivery |
| 10-24 | Assignment completed | 10-65 | Net message assignment |
| 10-25 | Report in person to (Meet) ... | 10-66 | Message cancellation |
| 10-26 | Detaining subject, expedite | 10-67 | Clear to read net message |
| 10-27 | Drivers license information | 10-68 | Dispatch information |
| 10-28 | Vehicle registration information | 10-69 | Message received |
| 10-29 | Check records for wanted | 10-70 | Fire alarm |
| 10-30 | Illegal use of radio | 10-71 | Advise nature of fire (Size, type, and contents of building) |
| 10-31 | Crime in progress | 10-72 | Report progress on fire |
| 10-32 | Man with gun | 10-73 | Smoke report |
| 10-33 | Emergency | 10-74 | Negative |
| 10-34 | Riot | 10-75 | In contact with |
| 10-35 | Major crime alert | 10-76 | En Route |
| 10-36 | Correct time | 10-77 | ETA (Estimated Time of Arrival) |
| 10-37 | Investigate suspicious vehicle | 10-78 | Need assistance |
| 10-38 | Stopping suspicious vehicle (Give station complete description before stopping). | 10-79 | Notify coroner |
| 10-39 | Urgent - use light and siren | 10-80 | Chase in progress |
| 10-40 | Silent run - no light or siren | 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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