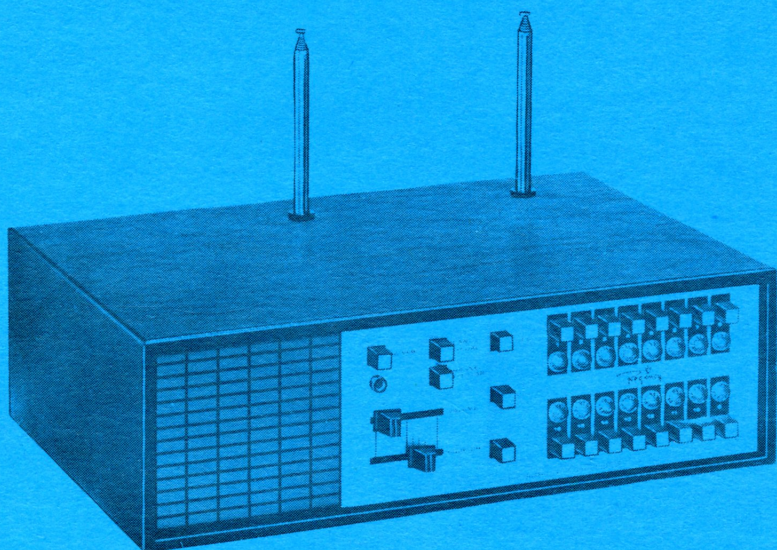




MONITORADIO RECEIVER



MODEL ACT-E 16 H/L

INSTRUCTION MANUAL

7-73

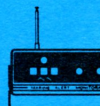
AMATEUR RADIO

For all your 2 Meter FM needs



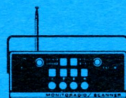
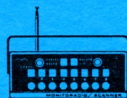
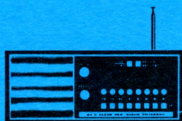
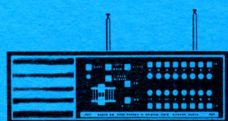
MARINE RADIO

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



ACTION RADIO

More than 25 VHF High and Low Band or
UHF Band Monitorradio / 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
- 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.

DESCRIPTION

The ACT-E16H/L is a programmable, 16 channel, crystal-controlled two band FM Monitor. It is a double-conversion, super-hetrodyne receiver designed for use in the narrow band FM channels of the public service communications VHF 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 and 148 to 174 megahertz.

This unit can be programmed internally for any combination of High VHF band (148-174 megahertz) or Low VHF band (30-50 megahertz) frequencies.

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

In addition to providing for individual channel activation, or deactivation, and High VHF band or Low VHF band, the unit gives the listener the capability of selecting either, or both, groups of eight channels. The RF board for each group is pretuned to cover 30 to 50 MHz and 152-164 MHz. See page 5 for additional information in regards to this versatile programming feature.

The monitor utilizes silicon transistors throughout for dependability. The use of Integrated Circuits provides for 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.

Some extra features included: connections for an external or remote speaker, connectors for external or outside antenna, and two telescopic antennas.

SPECIFICATIONS

Frequency Range

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

Frequency Separation

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

Sensitivity

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

Squelch Sensitivity (Threshold)

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

Selectivity 6 DB @ $\pm$ 7 KHz
50 DB @ $\pm$ 20 KHz

Spurious Rejection (Except primary image) 50 DB

Modulation Acceptance $\pm$ 7 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 3 Watts @ 10%, or less, distortion;
5 Watts maximum

Power 105-130 VAC, 60 Hz @ 17 watts maximum

INSTALLATION

117 VAC Installation:

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

For areas with moderate signal strength, the telescopic antennas will be adequate receiving antennas. Insert them through the holes in the cabinet and screw them onto the 6-32 bolts projecting upward.

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 the unit will require an outside antenna, then it is suggested that a dual-band VHF antenna (it covers both 30-50 MHz and 147-174 MHz) be utilized. To maximize the use of this external antenna system, all frequencies that are of weak or poor reception should be placed in one group (all crystals for these weak channels be installed in the same group of sockets, either left or right). Then the external antenna should be connected to the antenna connector for this group. In other words, one group of eight channels will be utilizing a telescopic antenna and the other group will be using an outside antenna.

For proper input matching, 50 Ω lead-in 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 cables in order to utilize the antenna connectors located on the rear (back) panel of the unit.

An external (or remotely mounted) speaker can be used by first opening the link between terminals No. 3 and No. 4. Then, connect one lead of the external speaker to terminal No. 1 and its other lead to terminal No. 4. A 3 to 4 Ω speaker is recommended for optimum performance.

OPERATION

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

Power:

The Power button is pushed in to turn the receiver on. The green lamp below the Power switch lights whenever the receiver is turned on. To turn the unit off, merely push in the Power button again. The green lamp will thus go out, indicating that the receiver is turned off.

Programming Buttons:

The Group Selector buttons provide the listener the capability of monitoring either one, or both, of the two eight-channel groups. When the button labeled 1-8 is pushed in, the scanner will automatically scan only the upper eight channels. Pushing in the button labeled 9-16 programs the unit to scan only the bottom group of eight channels. For scanning both groups, merely push in the center button (labeled ALL). Only one button should be pushed in at a time. By means of a mechanical inter-lock arrangement, pushing in one of the buttons forces the previous pushed-in button out.

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 above or below the channel number must also be pushed in. In addition, the receiver must be squelched off for proper scanning action. Slide the squelch control knob to the left 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 below or

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.

NOTE: If the receiver is programmed for Manual Selection and then it is turned on, occasionally more than one channel lamp may be lighted. If this condition occurs (which may NEVER happen in your particular unit), merely depress the Channel Selector button and hold it in until only one lamp is lighted. Then proceed with your normal channel selection.

Volume Control

This control varies the audio output level for the internal speaker. It also varies the level of audio present at the external speaker connection. Sliding the knob to the right increases the volume.

Squelch Control:

This control eliminates background noise in the absence of a signal. Sliding the knob fully to the right removes all squelch action. Sliding this knob to the left until the noise disappears permits the receiver to be "quiet" until an actual signal is received.

Crystal Installation and Band Programming:

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. Minature, 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 exact frequency.

For good sensitivity, the channel frequencies specified should be 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.

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

A. High Band Crystals

1. Crystal frequency, determined as follows:

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

Example:

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

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).

B. Low Band Crystals

1. Crystal frequency, determined as follows:

$$= \text{channel frequency} + 10.7 \text{ MHz}$$

Example:

$$\text{Crystal frequency} = 39.5 \text{ MHz} + 10.7 \text{ MHz} = 50.2 \text{ MHz}$$

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).

Prior to installing a crystal, the receiver will have to be partially pulled out of its cabinet. First, remove the telescopic antennas if they are installed. Second, remove the two knobs (volume and squelch). Third, remove the rear panel (cover) by removing the four mounting screws. Fourth, remove the four rubber feet by unscrewing each one. The receiver may then be slid rearward from the cabinet until the crystal socket pins are accessible.

Insert the crystal in the proper socket pins as indicated on the crystal location drawing, page 10.

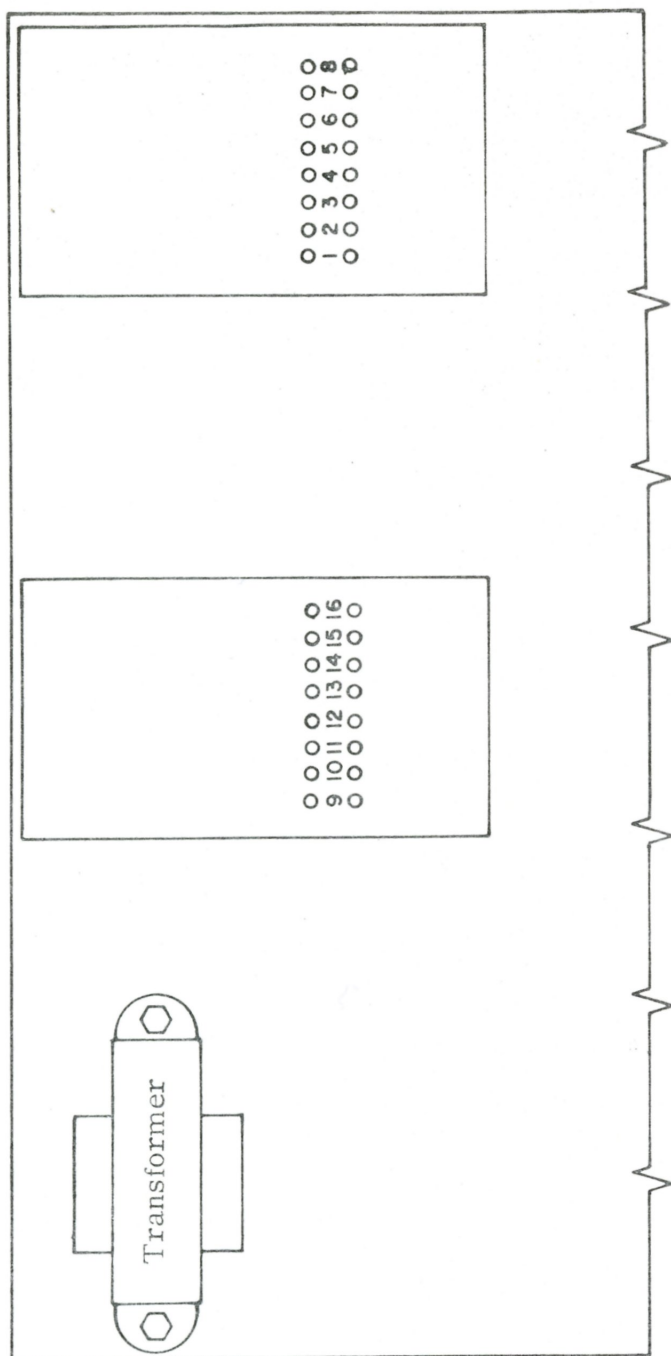
The sockets are numbered, in pairs, from left to right, corresponding to the channel number on the front panel. In other words, channel 1 is the first pair of sockets counting from left to right, for the right side group.

If the crystal inserted is for the High band (148-174 MHz), place the proper color-coded wire and socket onto the proper High band pin; if the crystal is for the low band (30-50 MHz), place the proper wire and socket onto the proper Low band pin. Pictorial B illustrates how the band selection wires are properly connected. Pictorial C shows an example of a partially programmed board. See page 11.

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 pin or to a Low band pin. Thus, for proper scanner operation, all of the band selection wires **MUST** be connected, even though not all channels are used.

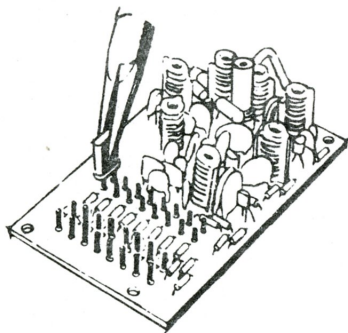
After the crystals are installed and any necessary band programming changes are completed, carefully slide the unit back into the cabinet. Screw the four feet back into place and replace the rear panel. Push the volume and squelch knobs back on their shafts and the unit is again ready for operation.

Rear Of Chassis



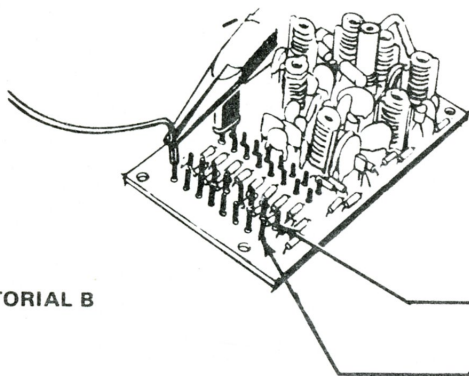
Top View

Crystal Location



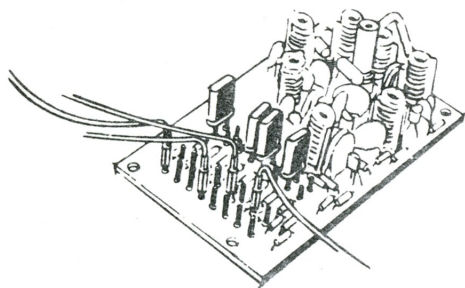
Insert crystal for high or low band frequency of your choice

PICTORIAL A



Connect lead to corresponding high or low band terminal programmer

PICTORIAL B



Repeat procedure for each channel in sequence of your choice

PICTORIAL C

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.

Indiana State 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 |

