





# ECOM - 220

## VHF-FM TRANSCEIVER

### OWNER'S MANUAL

**LIMITED**

 **WARRANTY** 

General Aviation Electronics, Inc. (Genave), warrants this product to be free from material defects for a period of 90 days from the date of purchase, provided the warranty registration card properly filled out is returned by the purchaser to Genave within 10 days after purchase. This warranty is limited to the original retail purchaser and is not extended to second owners of the product.

Our obligation under this warranty is limited to replacement of any parts (except periodic maintenance items such as bulbs, fuses, etc.) which, upon our examination, appear to us to be defective in materials or workmanship. The parts will be replaced within 45 days after receipt of the unit, provided the unit is delivered to the Factory (Customer Service Dept., General Aviation Electronics, 4141 Kingman Drive, Indianapolis, Indiana 46226) within 90 days after the date of purchase, shipping prepaid. All shipping costs and labor charges shall be born by the purchaser.

The owner may elect to have the unit repaired at an authorized Genave repair facility in which case Genave, within 45 days after receipt of the unit, will replace only those defective parts returned shipping prepaid to the Factory (Customer Service Dept., General Aviation Electronics, 4141 Kingman Drive, Indianapolis, Indiana 46226). Purchaser shall bear any and all other costs including but not limited to labor, transportation and freight.

This warranty does not apply to defects, malfunction, or breakage due to improper installation or to the servicing thereof by other than an authorized Genave dealer nor to units that have been damaged by lightning or other acts of God, excess current, or any units that have had serial number altered or removed. Abuse, misuse, tampering, submersion in water or willful destruction of the unit will also void this warranty.

This warranty gives you specific legal rights. You also have implied warranty rights. In the event of a problem with warranty service or performance, you may be able to go to a small claims court, a State court, or a Federal District court.

**Genave offers this warranty in lieu of any and all other guarantees or warranties, either EXPRESSED or IMPLIED, including but not limited to warranties of merchantability and/or fitness for a particular purpose. Any implied warranties are specifically and expressly limited to the 90-day period specified herein. Damages for breach of any warranties, either expressed or implied are limited to replacement of any defective parts as specified herein and any other incidental or consequential damages are expressly excluded.**

**General Aviation Electronics, 4141 Kingman Drive, Indianapolis, Indiana 46226 - Area 317-546-1111**

GENERAL AVIATION ELECTRONICS, INC.

4141 Kingman Drive, Indianapolis, Indiana 46226

AREA (317) 546-1111

Specifications subject to change without notice

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Printed in U.S. A. Oct. 1977

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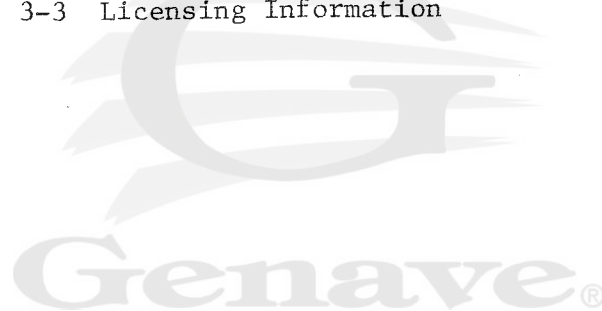
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# SECTION I

## GENERAL INFORMATION

### 1-1. INTRODUCTION

This manual contains all the information normally required to license, install, and operate the Genave ECOM-220 VHF-FM transceiver.

The maintenance manual contains all the above information, in addition to unit schematics, alignment data, and parts lists.

### 1-2. DESCRIPTION

The ECOM-220 is designed to provide reliable, high-quality communications for various business radio services, such as: Public Safety, Industrial Radio, and Land Transportation. The radio was under strict quality control during its fabrication, and was thoroughly checked prior to shipment from the factory. It will provide many years of satisfactory operation, if given reasonable care and handling.

The ECOM-220 is a solid-state, VHF-FM transceiver designed for the transmission and reception of frequency modulated (16F3) radio signals on either of two possible channels within the VHF range from 143.9 to 173.4 MHz. Either frequency can be selected by use of a front-panel, two-position rotary switch.

The unit is complete with an attached hand microphone and internally-mounted speaker. All circuitry employed is the latest state-of-the-art design, using the latest in semiconductor and integrated circuit technology -- including a solid-state T/R switching circuit.

A 15-pin male plug mounted on rear panel of the ECOM-220 transceiver is designated as an "Accessory Connector," and mates with a 15-pin female connector to provide a convenient method of connecting power or optional accessories to the unit. Standard wiring of

the accessory connector utilizes only five pins, leaving the remainder available for options or customized installation. See Section 2-10.

The transmitter RF output is typically 20 watts from 143.9 MHz to 160.0 MHz, and 15 watts minimum from 160.0 MHz to 173.4 MHz. The output impedance is 50-ohms using a standard UHF-type connector (83-1SP or PL259). An improved heat sink provides increased transmit-power stability.

The receiver is a crystal-controlled, dual-conversion superheterodyne employing a 4-pole monolithic crystal filter for good selectivity. A single integrated circuit performs limiting and detection functions. The 10.7 MHz 1st IF provides good image rejection, while the 455 kHz 2nd IF improves receiver stability.

The ECOM-220 transceiver is designed to operate on +13.75 volts DC primary power. The Genave PSI-10 power supply can be utilized when it is desired to operate the instrument from a 117 volt, 50-60 Hz source. For mobile operation, the source may be a battery or the vehicle electrical system (negative ground).

An easily-removed, two-piece plastic case protects the instrument from dirt and physical damage.

Provisions are made within each transceiver for the addition of an optional SA-1 Subaudible Tone Encoder-Decoder. This subaudible-tone system keeps the receiver squelched until a signal containing the proper subaudible, continuous tone is received. The SA-1 board generates the subaudible tone used to modulate the transmitter to activate the receivers in the system, and also decodes incoming signals. Note that all operating channels installed in the ECOM-220 must utilize the same tone

frequency -- there are no provisions for omitting (or changing) subaudible tone on one channel only. A ceramic resonator on the SA-1 printed-circuit board determines the frequency of subaudible tone being used.

NOTE: If subaudible-tone system is used, the carrier is automatically modulated by the subaudible tone

during entire time that transmission is taking place. Also, the operating frequency must be monitored to ascertain that it is NOT in use prior to originating a call. This monitoring is accomplished automatically by removing the microphone from its hang-up bracket.

### 1-3. SPECIFICATIONS

#### GENERAL:

Front-Panel Size:	2-9/16" (6.50 cm) x 8-3/16" (20.79 cm)
Over-all Dimensions:	2-9/16" (6.50 cm) x 8-3/16" (20.79 cm) x 12-1/8" (30.79 cm)
Power Supply:	13.75 VDC, negative ground; min. 11.5V
Current Drain:	6.5 amps max. xmit; 0.2 amps receive
Frequency Range (MHz):	143.9 to 173.4; two-chan. separation 60 kHz min. and 1 MHz max.
Number of Channels:	Two
Temperature Range:	-30° to +60°C
Weight:	Approx. 5 lbs. (2.27 kg)

#### RECEIVER:

Sensitivity:	0.35 $\mu$ V max. for 12 db SINAD - less than 0.55 $\mu$ V for 20 dB quieting
Selectivity:	+7.5 kHz
Squelch Threshold:	Less than 0.35 $\mu$ V
Modulation Acceptance Bandwidth:	More than 5 kHz
Adjacent Channel Rejection:	40 dB min. @ +25 kHz (EIA); 55 dB for 20 dB quieting
Intermodulation Response:	60 dB minimum (EIA)
Image Response:	60 dB minimum (EIA)
Spurious Response:	60 dB minimum (EIA)
Audio Output Power:	5 watts; 4 watts at 15% distortion
Hum & Noise Level:	Better than 35 dB below rated output
Frequency Accuracy:	+500 Hz
Frequency Stability:	<u>+0.001%</u>

#### TRANSMITTER:

Power Output:	20 watts, typical; 143.9 to 160.0 MHz 20 watts minimum; 160.0 to 173.4 MHz 15 watts minimum
Frequency Range (MHz):	143.9 to 173.4
Output Impedance:	50-ohms
Deviation:	4 kHz minimum; 5 kHz maximum
Frequency Accuracy:	+200 Hz Subaudible deviation, 1 kHz +200 Hz Subaudible freq. tolerance, <u>+0.3 Hz</u>
Frequency Stability:	.0005%
Transmitter Spurious:	-56 dB minimum

## SECTION II

# INSTALLATION MANUAL

### 2-1. INTRODUCTION

This section provides installation data and recommendations for fixed, mobile, or portable operation of the ECOM-220 VHF transceiver. For complete technical specifications of the unit, refer to Section 1-3 (Specifications) in this manual.

### 2-2. EQUIPMENT SUPPLIED

- a. ECOM-220 Communications Transceiver with hand microphone and hang-up mounting clip.
- b. Mounting Bracket with thumbscrews and washers.
- c. Accessory Connector, 15-pin female.

### 2-3. EQUIPMENT REQUIRED, BUT NOT SUPPLIED

- a. Vehicle or Base Antenna, 50 - ohm
- b. Antenna Cable, RG-8A/U or RG-58A, as required.
- c. Co-axial Connector, PL-259 (83-1SP)
- d. Cabling for Power and Audio wiring, as required.

### 2-4. OPTIONAL EQUIPMENT AVAILABLE

- a. SA-1 Subaudible-Tone PC board.
- b. Remote Speakers, SP-5 or SP-6.
- c. PSI-10, AC Power Supply.

### 2-5. PRE-INSTALLATION CHECK

Visually inspect the unit for any obvious external damage - such as broken knobs, dents, damaged mic or radio case. Any damage NOT related to shipping must be reported to General Aviation Electronics, Inc., 4141 Kingman Drive, Indianapolis, Ind., (46226), Telephone (317) 546-1111, as soon as possible.

If the packing case shows damage, make a notation to that effect on the express receipt or freight bill. Report to the transportation company any damage due to shipping, and file a claim promptly.

### 2-6. INSTALLATION PLANNING

The unit has been pre-aligned at the factory on transmit and receive frequencies listed on tag attached to the unit. If it should be necessary to change the transmit or receive frequency, alignment procedures contained in the ECOM-220 maintenance manual should be performed by an authorized technician, using proper test equipment; however, if new frequency differs from the factory-alignment frequency by not more than one half of maximum channel separation as listed in the Specifications (normally 1 MHz,) it will only be necessary to install and net the new crystals.

If ECOM-220 is equipped with optional SA-1 (Subaudible-Tone Squelch System), the subaudible-tone frequency will be listed on tag attached to the unit, and also on a label affixed to the inside of transceiver. If it should be necessary to readjust subaudible-tone frequency from factory-set value, refer to "Tone-Frequency Adjustment" procedure in this manual.

Before starting transceiver installation, determine desired mounting method and location; ascertain that required AC or DC power is available; determine location for antenna installation and routing of co-ax cable to transceiver.

**NOTE:** In choosing an operating location for the instrument, remember that F.C.C. Rules require that: "Each transmitter shall be so installed and protected that it is not accessible to or capable of operation by persons other than those duly authorized by the licensee," and, that "The operating position must be under the control and supervision of the licensee."

The transceiver may be mounted in any convenient position; unit performance is not affected by the mounting position. However, the unit should NOT be

mounted directly above a hot-air register or radiator.

## 2-7. FIXED OR MOBILE INSTALLATION

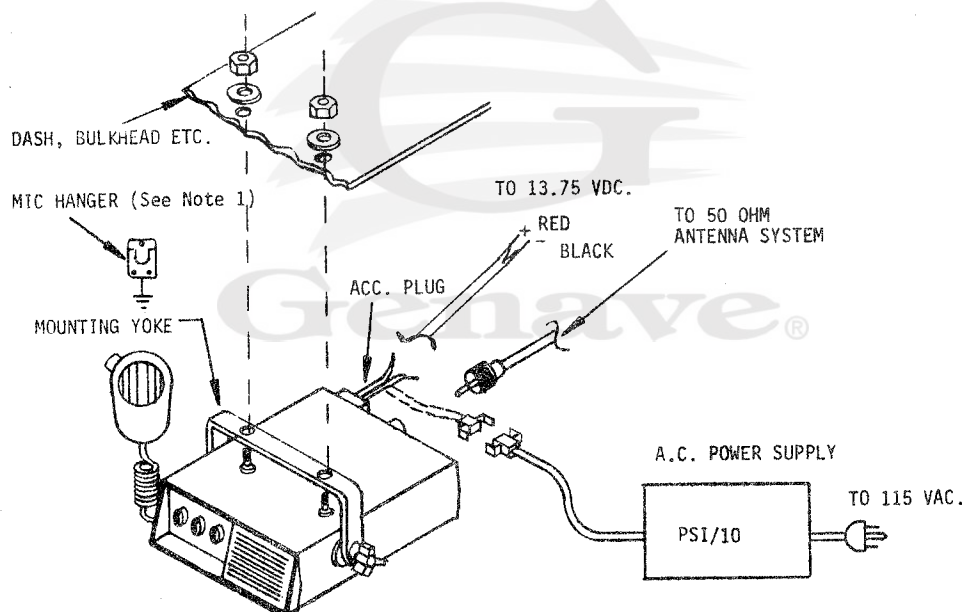
1. Refer to Figure 2-1. If mounting yoke has been installed on transceiver, remove yoke temporarily. For fixed operation, yoke may be repositioned on bottom side of unit to function as a supporting stand. For either fixed or mobile operation, the yoke may be secured in the desired location (under dash or shelf, on console or desk top, or overhead, etc.) with appropriate screws or bolts through two holes provided in the mounting yoke.
2. Connect color-coded power leads, terminated in the rear-panel 15-pin connector, to a power source. For fixed operation, the source may be a well-regulated, low-ripple AC power supply, such as the Genave Model PSI-10. For mobile operation, the source may be a battery or the vehicle's electrical system. This transceiver is designed to operate ONLY on a supply with neg. ground.

Be SURE to connect RED power lead to +13.75 volts, and BLACK lead to -13.75 volts (ground). If it is necessary to extend power leads, use #14 or heavier gauge insulated copper wire.

If supply polarity is reversed accidentally, the unit will be inoperative. In this event, check wiring polarity (RED to positive, and BLACK to negative), and check the protective fuse located on transceiver circuit board just below the rear-panel power connector. A blown fuse should be replaced ONLY with a type 3AG 7 amp fuse.

3. The ECOM-220 transceiver is equipped with an attached hand microphone; the microphone-mounting clip is attached to the desired mounting surface, using two small screws or bolts.

NOTE: If the SA-1 subaudible-tone option is included in transceiver, then mounting clip MUST be electrically connected to chassis ground of the transceiver in order to provide "hang-up" receiver squelching.



### NOTES.

1. HANGER MUST BE CONNECTED TO CHASSIS GROUND WHEN USING TONE SQUELCH.

Figure 2-1. Typical Installation.

4. After any optional or custom wiring has been completed, replace transceiver in mounting yoke, and tighten both thumbscrews.
5. Connect 15-pin female receptacle to mating rear-panel plug. Secure the connecting wires at appropriate points.
6. Install co-axial connector on antenna cable as shown in Figure 2-2, and insert antenna connector into rear-panel mounted antenna receptacle.

NOTE: The transceiver is designed to match standard 50-ohm VHF communications antennas. In the interest of maximum efficiency, the antenna system should exhibit a low VSWR.

2-8. RESERVED

tions should be tight and weatherproof. Ideally, the antenna should be installed over a perfectly flat ground surface to assure omnidirectional radiation; therefore, the center of the auto roof is the best place to mount the VHF vertical antenna. The flat portion of the rear trunk deck can be used, but will result in a directional pattern.

For maximum efficiency, the antenna should be fed with low-loss 50-ohm co-axial cable. The loss per 100 feet at 144 MHz is shown in Table 2-1 for several popular types of co-ax cable:

Table 2-1.

Cable Type	Impedance	dB Loss
RG58/A-AU	53-ohms	5.7 dB
RG58 Foam	50-ohms	4.1 dB
RG8/A-AU	52-ohms	2.5 dB
RG8 Foam	50-ohms	2.2 dB

### 2-9-1. Antenna Connector Assembly

The procedure for installing a PL-259 (83-1SP) antenna connector is dependent upon type co-axial cable used - the PL-259 is installed directly on 0.405" OD cable such as RG8/A, whereas, the plug requires an adapter when used with the 0.195" OD cable such as RG58/A. The procedures for both cable types are given below, and shown in Figure 2-2.

## 2-9. ANTENNA CONSIDERATIONS

Communications within the VHF-FM band are "line-of-sight;" thus, the higher the antenna is placed, the greater the operating distance. When considering characteristics of an antenna system, it is important to know that an antenna which provides good, effective transmitting gain will also provide the same relative gain when receiving.

In mobile installations, the antenna should be securely fastened to the vehicle, as far from the engine compartment as practicable, and all connec-

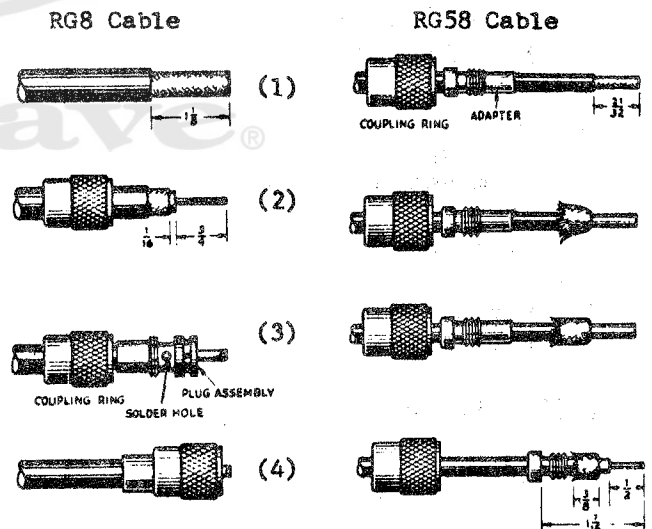


Figure 2-2. Connector Assembly

## 2-9-2. RG8 Cable Procedure

1. Trim end of cable flush; remove vinyl jacket from 1-1/8" of cable as shown in Figure 2-2(1). Do NOT nick braid.
2. Bare 3/4" of center conductor. Trim braided shield 1/16" and tin. Slide coupling ring on cable. See 2-2 (2) above.
3. Screw plug assembly on cable; solder plug assembly to braid through solder holes; solder center conductor to plug assembly center pin.
4. Screw coupling ring on assembly.

## 2-9-3. RG58 Cable Procedure

1. Trim end of cable flush; remove vinyl jacket from 21/32" of cable as shown in Figure 2-2 (1). Do NOT nick braid. Slide coupling ring and adapter on cable.
2. Fan braid slightly and fold back over cable. See Figure 2-2 (2).
3. Compress braid around cable, Figure 2-2 (3), and position adapter to dimension given in Figure 2-2 (4). Press braid over adapter sleeve and trim to dimension shown.
4. Bare 1/2" of center conductor as shown -- do NOT nick the conductor. Pre-tin exposed center conductor.
5. Screw plug assembly onto adapter sleeve, and solder the braid to plug assembly through solder holes. Next, solder center conductor to plug assembly center pin.
6. Screw coupling ring on plug assembly.

## 2-10. ACCESSORY CONNECTOR - P101

The 15-pin male plug mounted on rear panel of the ECOM-220 transceiver is designated as an "Accessory Connector," and mates with a 15-pin female connector

to provide a convenient method of connecting power or optional accessories to the unit. Standard wiring of the accessory connector utilizes only five pins; therefore, ten of the pins are available for options or customized installation. Figure 2-3 illustrates standard wiring of the accessory connector, and the recommended connections for use with an external speaker.

NOTE: An external speaker (3.2-ohm) can be connected to pins 2 and 7 of the female connector or, a jumper can be connected between pins 2 and 10 to activate the internal speaker. Another suggestion is to use a SPDT switch to select either the internal or the external speaker at will.

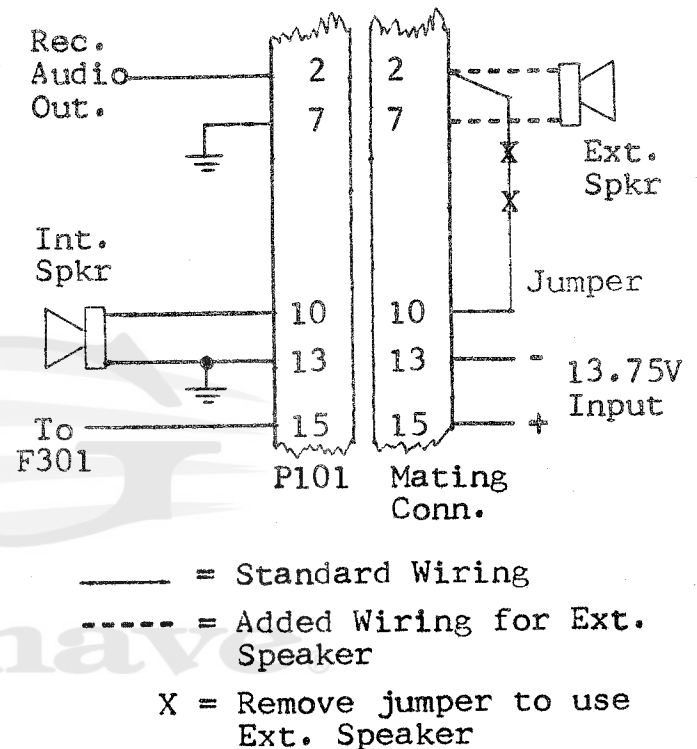


Figure 2-3. Accessory Connector

## 2-11. REMOVING INSTRUMENT TOP COVER

To gain access to the interior of unit remove plastic top cover by removing two 6/32 screws which secure rear of top cover to heatsink. Then, lift rear



of cover upward while sliding cover toward rear of instrument.

NOTE: If thumbscrews have not been removed from sides of transceiver, they must be loosened a few turns before attempting to remove unit covers.

## 2-12. TONE-FREQUENCY ADJUSTMENT

The SA-1 tone-squelch board is located at left-center of main PC board. If it is necessary to change tone frequency from the factory-set value, proceed as follows:

1. With top cover removed from transceiver, locate the Ceramic Resonator on subaudible - tone PC board. This Resonator determines the tone frequency; therefore, a different Resonator is required for each discrete subaudible - tone frequency.
2. Remove SA-1 subaudible-tone board from the transceiver by lifting the board up and off mating pins. Unsolder and remove Ceramic Resonator.
3. If subaudible-tone frequency is between 67 and 136.5 Hz, connect pin 8 of IC102 to pin 14 of IC101; but, if frequency is between 141.3 and 250.3 Hz, connect pin 8 of IC102 to pin 6 of IC101. Refer to Figure 2-4.
4. Solder new Resonator leads in place and carefully replace tone board in transceiver. Connect transceiver to its power source.

5. If another unit with the correct subaudible-tone frequency is available, it may be used for on-the-air testing; otherwise, set a signal generator to a 10  $\mu$ V level on the appropriate operating frequency with  $\pm 1$  kHz deviation at the desired subaudible - tone frequency.
6. With test signal applied to receiver, note that receiver unsquelches and operates normally.
7. The transmitter subaudible deviation should be checked. The deviation should be 1 kHz  $\pm 200$  Hz.

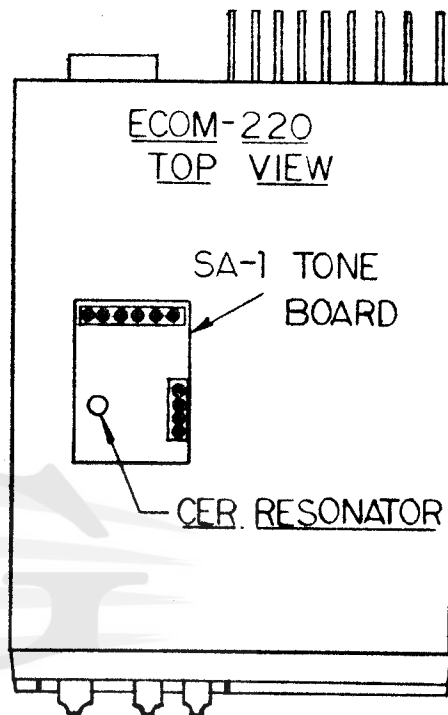
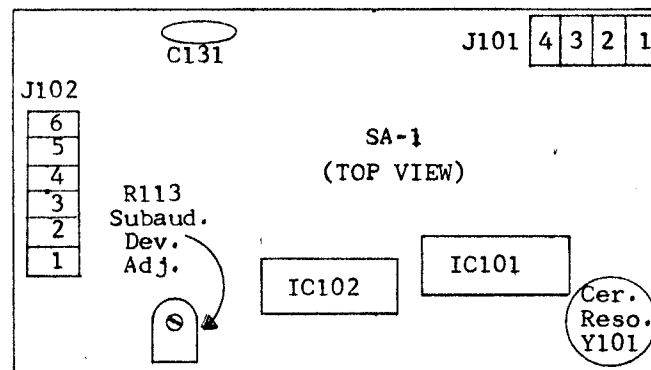
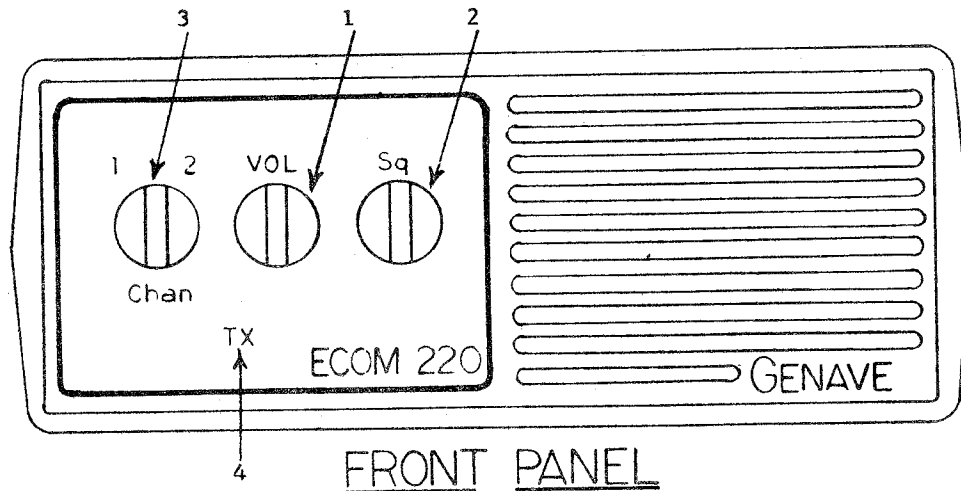


Figure 2-4. SA-1 Tone Board



# SECTION III

## OPERATING MANUAL



### 3-1. OPERATING CONTROLS

For reliability and operating convenience, only essential operating controls are installed on the unit's front panel. The functions of these controls are as follows:

1. Volume control/On-Off switch
2. Squelch control
3. Channel-Selector switch
4. Transmit-Indicator lamp

The push-to-talk button on the microphone also functions as an operating control. Unit operation is quite simple, as explained below:

### 3-2. OPERATING INSTRUCTIONS

1. Turn VOLUME (#1) and SQUELCH (#2) controls fully counterclockwise.
2. Rotate CHANNEL SELECTOR (3) to desired operating frequency.
3. Rotate VOLUME control clockwise until switch clicks; this turns ON transceiver.

4. If transceiver is equipped with the SA-1 subaudible-tone option, it is necessary to deactivate tone-controlled squelch by removing microphone from its hanger. This breaks the "tone-enable" ground, and disables tone-squelch system.

5. Now, rotate VOLUME control clockwise to adjust receiver volume to desired level.

6. Turn SQUELCH control clockwise until background noise just disappears. NOTE: Do NOT attempt to adjust SQUELCH control if a signal is being received.

7. To transmit, depress microphone pushbutton. If unit is equipped with subaudible-tone system, it is important to monitor channel before transmitting to insure that it is clear. The hand microphone circuitry is designed in such manner that receiver squelching is deactivated when microphone is removed from its hanger

8. The TRANSMIT-INDICATOR lamp (#4) will illuminate when transmitter is operating; then, hold microphone 3 to 6 inches from your mouth, and talk in a normal voice.
9. Release TRANSMIT pushbutton to listen.

NOTE: The squelch circuit, which is adjusted by front-panel control, quiets receiver in the absence of an incoming signal on the assigned operating frequency; however, any station in your vicinity, operating on this frequency, will be heard. With the tone-squelch system, however, only transmitted signals carrying the proper subaudible tone are heard, as explained previously.

### 3-3. LICENSING INFORMATION

Licensing requirements vary with the service for which this unit will be used; however, all services require the station transmitter to be licensed. Further, all transmitter adjustments or tests during or coincident with the installation, servicing, or maintenance of a radio station, which may affect the proper operation of such station, shall be made by or under the immediate supervision and responsibility of a person holding a first- or second-class commercial radio operator license, either radiotelephone or radiotelegraph, who shall be responsible for the proper functioning of the station equipment. Note, however, that in many services an unlicensed person, after having been authorized to do so by the station licensee, may operate from a control point a mobile, base, or fixed station or from a dispatch point a base or fixed station, during the course of normal rendition of service. The minimum class of operator authorization required for each specific classification of station is set forth in the appropriate F.C.C. rule part.

The following technical information is intended to aid ECOM-220 users in completing the application for radio sta-

tion authorization. Only technical data pertaining to the transceiver are shown below; all other station particulars must be furnished by the licensee.

Transmitter Input Power:	45 watts
Transmitter Output Power:	20 watts
Type of Unit:	Transceiver
Type Acceptance/Model No:	T-7043200
Frequency Range (MHz);	143.9 to 173.4
Frequency Tolerance:	.0005%
Emission:	16F3
Approved under Rule Part Numbers:	21, 74, 81, 87, 89, 91, and 93

For additional information on filling out the appropriate application forms, consult the F.C.C. instruction sheet provided with that form. Note that some forms may be completed either by PRINTING IN INK, or by TYPING; whereas, TYPING is MANDATORY for certain F.C.C. Application forms. Two of the more common forms used to apply for a license for the ECOM-220 transceiver are F.C.C. forms 400 or 425, depending upon the usage and/or geographic location of the proposed station. To determine which form is required, contact nearest FCC Field Engineering Office as listed below -- they will also supply the appropriate forms.

The procedures for obtaining necessary licenses are found in the Federal Communications Commission Rules and Regulations. The services and the corresponding F.C.C. rule part numbers, under which the ECOM-220 can be used, are as follows:

Any of these volumes may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

### 3-3-1. F.C.C. Rule Part Numbers

#### Domestic Public Radio Services (Other than Maritime Mobile)

F.C.C. Rules & Regulations, Volume VII, Part 21  
Domestic Public Land Mobile Radio Service  
Rural Radio Service

#### Experimental, Auxiliary, and Special Broadcast,

F.C.C. Rules & Regulations, Volume III, Part 74  
Remote Pickup Stations

#### Stations on Land in the Maritime Services

F.C.C. Rules & Regulations, Volume IV, Part 81  
Public Coast Stations  
Marine Utility Stations  
Fixed Stations Associated with the Maritime Mobile Service  
Stations Operated in the Land Mobile Service for Maritime Purposes

#### Aviation Services

F.C.C. Rules & Regulations, Volume V, Part 87  
Civil Air Patrol Stations

#### Public Safety Radio Services

F.C.C. Rules & Regulations, Volume V, Part 89  
Local Government Radio Service  
Police Radio Service  
Fire Radio Service  
Highway Maintenance Radio Service  
Forestry-Conservation Radio Service  
Special Emergency Radio Service

#### Industrial Radio Services

F.C.C. Rules & Regulations, Volume V, Part 91  
Power Radio Service  
Petroleum Radio Service  
Forest Products Radio Service  
Motion Picture Radio Service  
Relay Press Radio Service  
Special Industrial Radio Service  
Business Radio Service  
Manufacturers Radio Service  
Telephone Maintenance Radio Service

#### Land Transportation Radio Services

F.C.C. Rules & Regulations, Volume V, Part 93  
Motor Carrier Radio Service  
Railroad Radio Service  
Taxicab Radio Service  
Automobile Emergency Radio Service

### 3-3-2. F.C.C. Field Engineering Offices

ALASKA, ANCHORAGE 99510  
G-63 U.S.P.O. and Courthouse Bldg.  
Box 644, 4th and F Streets

CALIFORNIA, LONG BEACH  
Room 501  
3711 Long Beach Blvd.

CALIFORNIA, SAN DIEGO 92101  
Fox Theatre Bldg.  
1245 7th Ave.

CALIFORNIA, SAN FRANCISCO 94111  
323-A Customhouse  
555 Battery St.

COLORADO, DENVER 80202  
Suite 2925, The Executive Tower  
1405 Curtis St.

DISTRICT OF COLUMBIA, WASHINGTON 20554  
Room 411  
1919 M St. NW.

FLORIDA, MIAMI 33130  
Room 919  
51 Southwest 1st Ave.

FLORIDA, TAMPA 33602  
809 Barnett Office Bldg.  
1000 Ashley Dr.

GEORGIA, ATLANTA 30309  
440 Massell Bldg.  
1365 Peachtree St. NE.

HAWAII, HONOLULU 96808  
502 Federal Bldg.  
Box 1021, 355 Merchant St.

ILLINOIS, CHICAGO 60604  
3935 New Federal Bldg.  
230 South Dearborn St.

LOUISIANA, NEW ORLEANS 70130  
829 F. Edward Hebert Federal Bldg.  
600 South St.

MARYLAND, BALTIMORE 21201  
819 Federal Bldg.  
31 Hopkins Plaza.

MASSACHUSETTS, BOSTON 02109  
1600 Customhouse  
165 State St.

MICHIGAN, DETROIT 48226  
1054 Federal Bldg.  
231 West LaFayette St.

MINNESOTA, ST. PAUL 55101  
691 Federal Bldg. and U.S. Courthouse  
316 North Robert St.

MISSOURI, KANSAS CITY 64106  
1703 Federal Bldg.  
601 East 12th St.

NEW YORK, BUFFALO 14202  
1307 Federal Bldg.  
111 West Huron St.

NEW YORK, NEW YORK 10014  
201 Varick St.

OHIO, CINCINNATI 45231  
8620 Winton Road

OREGON, PORTLAND 97204  
1782 Federal Office Bldg.  
1220 Southwest 3d Ave.

PENNSYLVANIA, PHILADELPHIA 19106  
James A. Byrne Federal Courthouse  
601 Market St.

PENNSYLVANIA, MONROEVILLE 15146  
(Pittsburgh Area)  
William Penn Highway

PUERTO RICO, HATO REY 00918  
747 Federal Bldg.

TEXAS, DALLAS 75242  
13E7 Earle Cabell Federal Bldg.  
1100 Commerce St.

TEXAS, HOUSTON 77002  
5636 New Federal Office Bldg.  
515 Rusk Ave.

VIRGINIA, NORFOLK 23502  
Military Circle  
870 North Military Highway

WASHINGTON, SEATTLE 98174  
3256 Federal Bldg.  
915 2nd Ave.

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SB-7806

October 10, 1978

SUBJECT: ECOM-220; Failure of IC102 and IC103.

Reports from the field indicate that in certain types of ECOM-220 installations (mainly vehicular), excessive failures of the FM Detector (IC102) and the Audio Output (IC103) have been experienced.

An engineering analysis of the failures indicates that the ICs are being destroyed by short-duration voltage spikes (transients) existing on the 13-VDC input line. The problem can be corrected by installing a 50 uH choke (Genave P/N 1802678) in series with the 13-volt line, between fuse F301 and polarity-protection diode CR304. Mounting holes for choke Z101 already exist in the transceiver PC board; thus, it is only necessary to remove a jumper, and then solder Z101 in place. See Figure 1 below.

The 50 uH choke Z101 (Genave P/N 1802678) will be supplied NO CHARGE to dealers who encounter this problem.

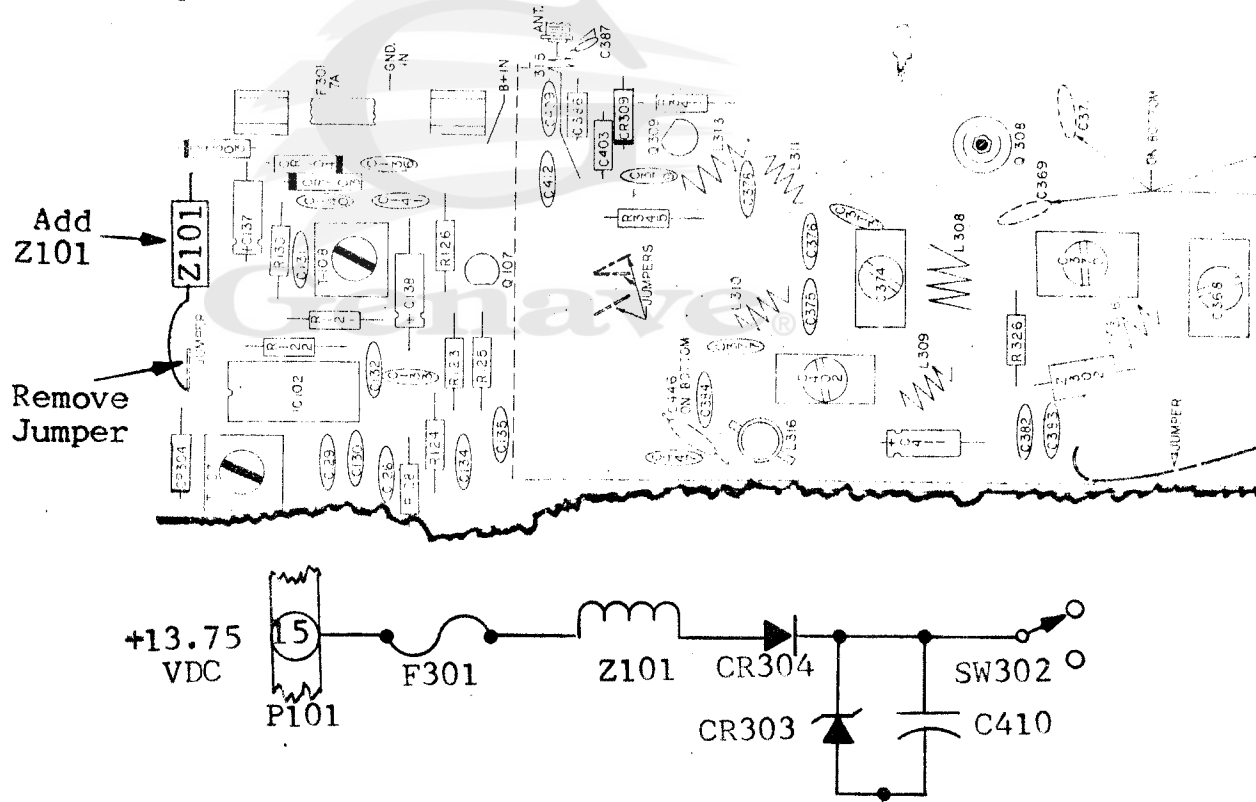
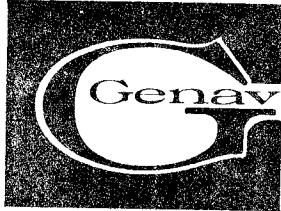


Figure 1.

GENERAL  
AVIATION  
ELECTRONICS  
INC.

# Service Bulletin



4141 KINGMAN DRIVE  
INDIANAPOLIS, IND. 46226  
AREA 317 • 546-1111

SB-7905

June 22, 1979

SUBJECT: ECOM-220 & GMT-Series Transceivers;  
Rear-Panel Support Bracket.

In some radio installations used in heavy-duty vehicles, vibration may be severe enough to cause the transceiver to pivot on the two thumbscrews which secure unit to its mounting bracket. This may allow unit to rotate so that controls on front panel are inaccessible and, for units housed in a plastic case, can damage the plastic stabilizing teeth on the transceiver case positioner.

The engineering department has devised a rear-panel support bracket for those installations in which vibration is a problem. The bracket consists of a short piece of perforated hanger strap which is bolted through the fins on the rear-panel heat-sink as shown in Figure 1. The remaining end of the strap should be anchored to a suitable support in the vehicle. The necessary hardware is readily available at your local hardware store.

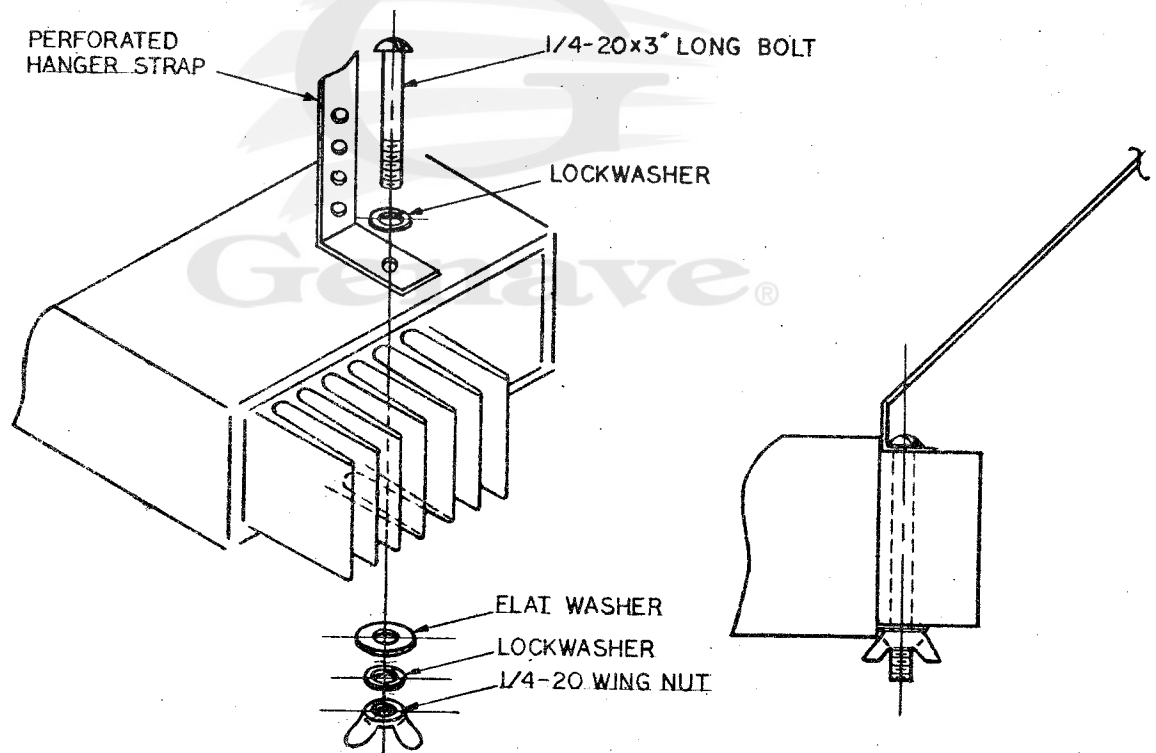


Figure 1.