FANFARE 182

PHASE LOCKED LOOP

18 CHANNEL

MOBILE CITIZENS BAND TRANSCEIVER

TYPE ACCEPTED – RB 249

FANON

INSTRUCTION MANUAL

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PLL FREQUENCY SYNTHESIZER

Most Citizens Band Transceivers in the past used Frequency Synthesizers utilizing 12 or more quartz crystals to generate the various radio signals for receiving and transmitting the assigned CB channels. The frequency stability of each channel, when receiving or transmitting, was dependent largely upon the crystals used to generate the frequencies for that channel. The frequency accuracy and stability of one channel was often better than another.

Citizens Band transceivers of recent design, such as the transceiver you have purchased, utilize the most advanced design of frequency synthesizers called Phase Locked Loop (PLL) Frequency Synthesizers. These synthesizers utilize a minimal number of crystals as reference frequencies from which transmitting and receiving frequencies are developed. The transmitting and receiving frequencies are stabilized by phase comparing to the reference frequency and thus providing a phase-locked loop.

There are several types of PLL circuits in use; the one your transceiver uses incorporates the best features of these designs. Your transceiver uses crystal controlled standards with digital type programmable frequency dividers for selection of the channel frequencies, which are always locked to the reference frequency. If for any reason the PLL is not "locked" the transmitter will not transmit.

SECTION II, INSTALLATION

A. Mobile Station

CAREFULLY READ ALL INSTALLATION INFORMATION IN THIS MANUAL BEFORE ATTEMPTING TO INSTALL THE TRANSCEIVER IN A VEHICLE OR AS A BASE STATION.

1. Location

a) Locate the transceiver under the dash or on the hump of the vehicle. DO NOT POSITION ON TOP OF THE DASH OR ANY LOCATION THAT WILL INTERFERE WITH THE OPERATION OF THE VEHICLE.

b) Use the VEHICLE MOUNTING BRACKET as a template to locate and mark the mounting holes. Refer to fig. 1 for identification of the mounting hardware.

c) Position the transceiver in the mounting bracket for best view and accessibility to the front panel controls.

2. Power Connections

a) CAUTION: Be sure the transceiver POWER SWITCH is in the OFF position before making any connections to the power source. ROTATE THE VOLUME CONTROL FULLY TO THE COUNTERCLOCKWISE POSITION.

b) The transceiver has a polarity reversal protection diode across the power input circuit. If the polarity of the power source is reversed, the fuse in the positive power lead will burn out. CHECK CAREFULLY THE POLARITY OF THE POWER SOURCE BEFORE CONNECTING TO THE TRANSCEIVER.

c) UNDER NO CIRCUMSTANCES SHOULD A FUSE OF GREATER AMPERAGE THAN 1.5 AMPERES BE USED TO REPLACE A BURNED OUT FUSE. ALSO, NEVER BYPASS THE FUSE WITH A JUMPER WIRE. IN EITHER CASE SEVERE DAMAGE WILL RESULT TO THE TRANSCEIVER AND VOID THE WARRANTY.

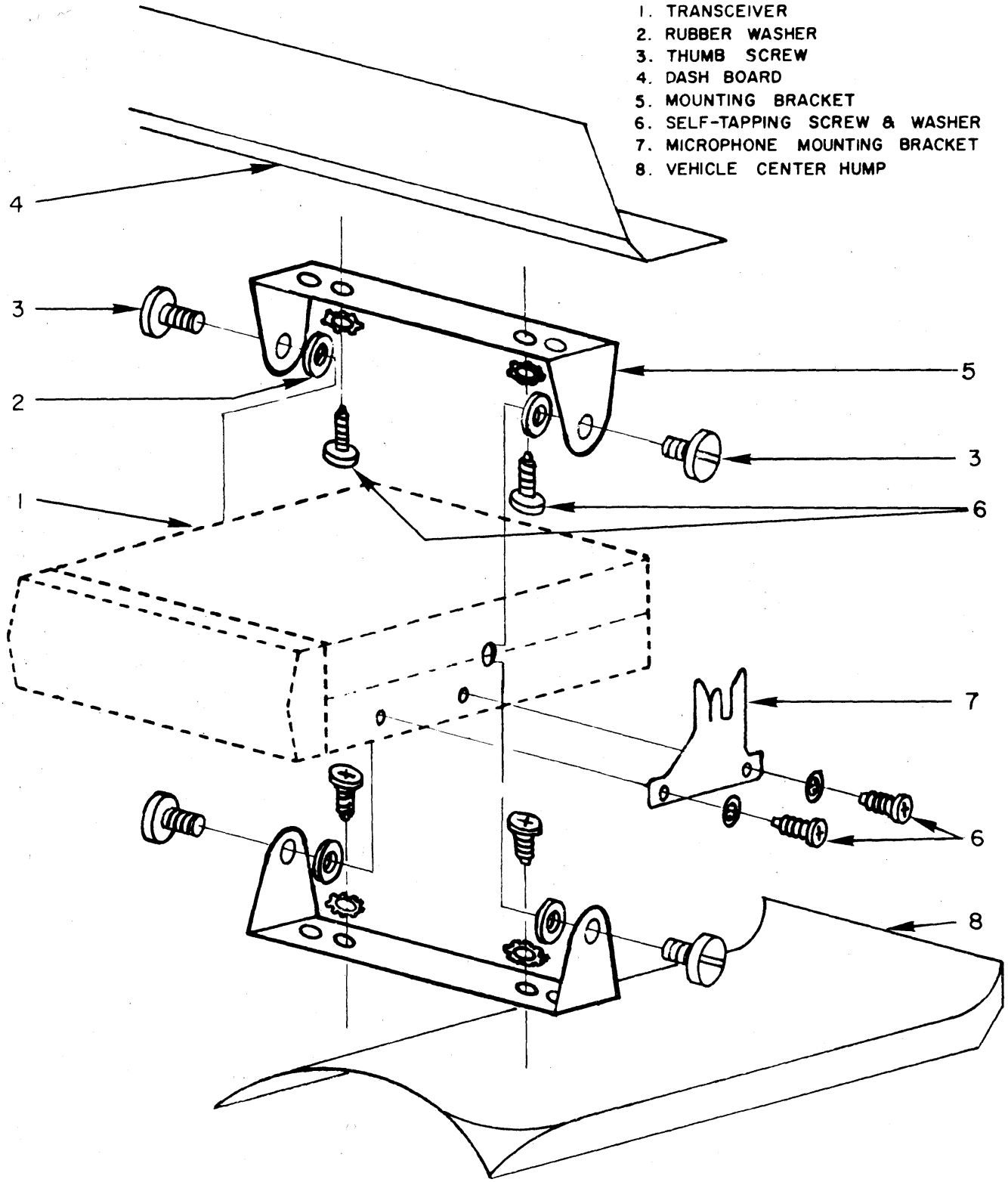


FIGURE 1, TYPICAL VEHICLE MOUNTING BRACKET INSTALLATION

d) Negative Grounded Power System Connections

Connect the FUSED power lead (RED) to the POSITIVE (+) terminal of the power source (a battery in most vehicles) or to the accessory terminal on the ignition switch or to the accessory fuse on the fuse block (refer to fig. 2).

Connect the other power lead (BLACK) to the NEGATIVE (-) terminal of the power source or to the frame of the vehicle or to the COMMON (-) ground connection.

e) Positive Grounded Power System Connections

Connect the FUSED power lead to the FRAME of the vehicle or to the POSITIVE (+) terminal of the power source (refer to fig. 2).

Connect the other lead (NEGATIVE) to the NEGATIVE terminal of the power source or to the accessory terminal on the ignition switch or to the accessory fuse on the fuse block.

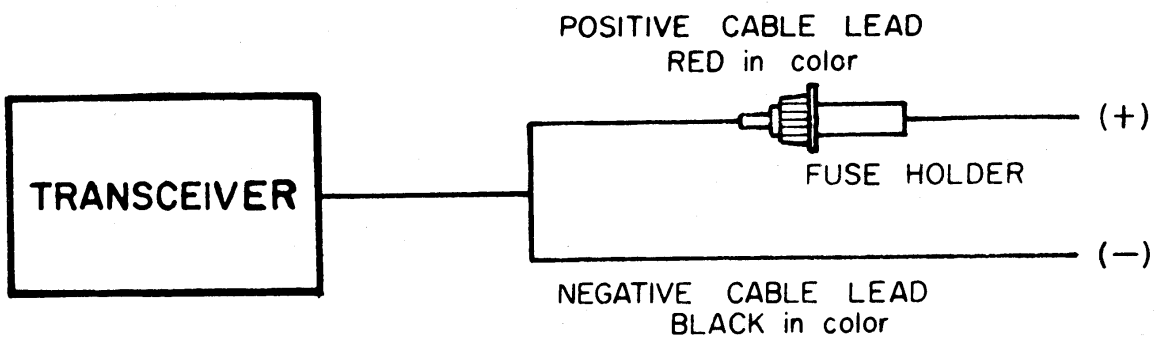


FIGURE 2, POWER CABLE, LEAD INDENTIFICATION DIAGRAM

3. Microphone

Connect microphone plug into transceiver jack and mount microphone hanger as follows:

a) In the package containing the mounting hardware, there are screws and the microphone hanging bracket. For convenience, locate the hanger on the dashboard within easy reach of the operator, so that the microphone may be grasped without the operator having to take his eyes off the road.

b) When an approximate location has been chosen, use the hanger as a template and center punch the centers of the two #30 (.120 Dia.) holes, drill and mount the hanger with the two #6 self-tapping screws.

4. Mobile Station Antennas

CAUTION: NEVER OPERATE YOUR TRANSCEIVER WITHOUT A PROPERLY MATCHED ANTENNA.

Many styles and types of mobile antennas are available for installation on just about every type of vehicle, including boats and aircraft. You should discuss this with your dealer.

Location

The position of the antenna on a vehicle is very important as it will affect the directional characteristics (radiation pattern). Figure 3 shows four possible locations for a standard "quarter wave" antenna. The ROOFTOP is usually considered the best location.

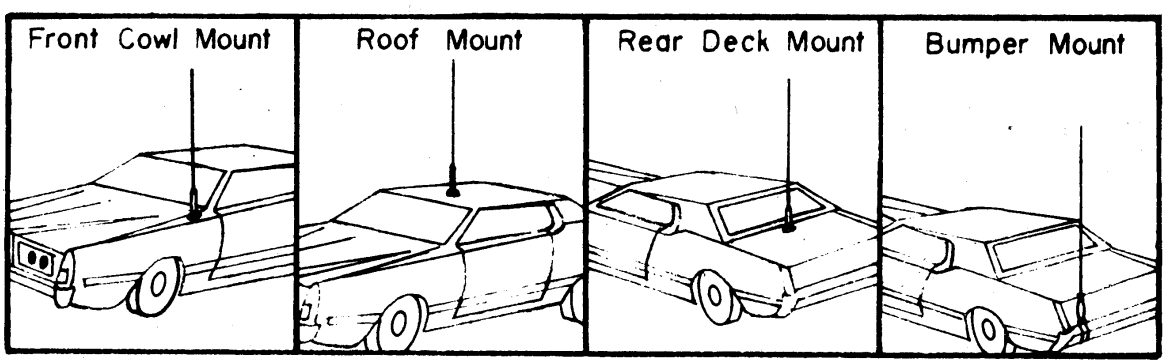


FIGURE 3, MOBILE ANTENNA LOCATION DIAGRAM

B. Base Station Installation

1. The unit was basically designed for mobile operation; however, it may be used as a base station by the addition of a 13.8VDC External Power Supply.

2. Locate the transceiver on a shelf or table out of the path of foot traffic and near a 117VAC/60Hz power outlet.

3. An external rooftop antenna may be used or a simple whip type which connects directly to the antenna connector on the transceiver. Most of your dealers can give you advise.

4. Refer to fig. 2 for the proper connections to the external power supply.

C. Antenna and Cable Information

1. The antenna is a very important part of your radio station, whether it is a mobile or base station. Antenna height is of prime importance. Refer to the FCC Rules and Regulations for the maximum height from the ground or building you are allowed. The higher the terrain or structure on which the antenna is mounted, the greater the range of communication will be.

2. The unit is designed to operate with any good quality Citizens Band mobile or base station antenna. The type of antenna you should use depends in large measure upon WHERE the antenna is to be mounted and the radiation pattern you require. All your dealers are well qualified to assist you in selecting the proper type.

3. Transmission Cable Requirements

In most cases the coaxial cable supplied with mobile CB antennas are of the proper length for connecting directly to the antenna connector on the rear panel of the transceiver; however, if it is necessary to change the length, type RG58/U is recommended for lengths up to 50 feet.

4. Length Calculations

The length of the transmission cable is very important, as the length will vary according to the transmission "velocity factor" of the cable. The length of cables with a velocity factor of 0.66 (regular type cable) should be in odd multiples of 6 feet for a frequency of 27 MHz.

Cables with a velocity factor of 0.82 (foam type dielectric) should be in odd multiples of 7.5 feet for 27 MHz installations.

5. The formula for determining the length in feet of the cable you may use, is as follows:

$$\text{Cable length} = \frac{246\ V}{f}$$

Where V = Transmission Velocity Factor of the cable

f = Frequency in Megahertz

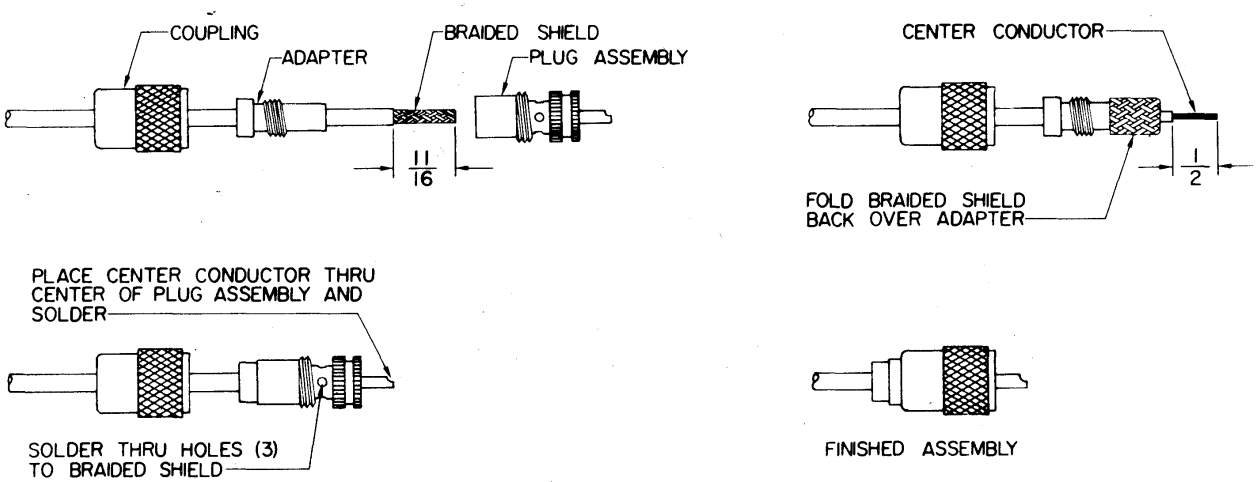


FIGURE 4, CABLE CONNECTOR ASSEMBLY DIAGRAM

D. Voltage Standing Wave Ratio (VSWR) Measurements

The VSWR of the antenna system should not be greater than 1.5 to 1. Use a COURIER Model Port-A-Lab 500 D Voltage Standing Wave Ratio Meter, or equivalent instrument; follow the instructions given with the instrument.

F. External Speaker Connections

1. External Speaker

Prepare an 8 ohm speaker as shown in fig. 5 and insert into the EXT-SPK jack on the rear panel. The internal speaker will be bypassed when the external speaker plug is inserted.

CAUTION: POWER SWITCH MUST BE IN THE OFF POSITION BEFORE INSERTING THE SPEAKER PLUG INTO THE JACK ON THE REAR PANEL. THE SPEAKER LEADS MUST NOT BE CONNECTED IN ANY WAY TO THE VEHICLE CHASSIS OR TO THE TRANSCEIVER CASE, AS SHORTING MAY OCCUR AND CAUSE DAMAGE TO THE SPEAKER AND TRANSCEIVER COMPONENTS.

2. Public Address Speaker

The transceiver volume control controls only the audio level of the CB receiver. Therefore, if it is desired to control the audio level of the PA function it is necessary to prepare an insulated cable with minature phone plug (H.H.Smith #480, or equivalent), horn or speaker, and add a volume control as shown in fig. 5. Insert the miniature phone plug into the PA SPK jack.

CAUTION: BE SURE THAT THE EXTERNAL SPEAKER OR THE PUBLIC ADDRESS SPEAKER CABLE, DO NOT MAKE AN ELECTRICAL CONNECTION IN ANY WAY TO THE TRANSCEIVER CASE, AS THE UNIT MAY BE SHORTED AND CAUSE DAMAGE TO THE TRANSCEIVER COMPONENTS.

Turn the transceiver volume control down to minimum and set the CB/PA switch to PA. Press the microphone switch and adjust the added volume control for the desired audio level at the PA speaker or horn. When the CB/PA switch is in the PA position, the CB transmit function of the transceiver is inhibited, and the internal speaker is bypassed.

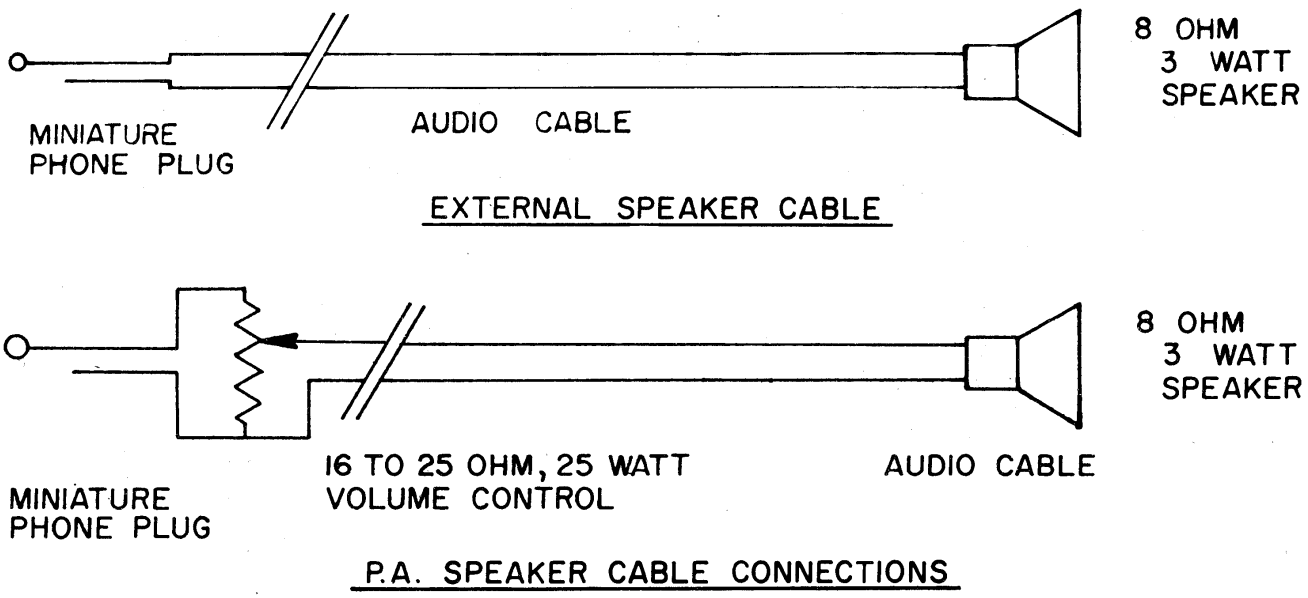


FIGURE 5, EXTERNAL SPEAKER CABLE DIAGRAM

SECTION III, STATION OPERATION

A. Function of Controls, Indicators and Connectors (Fig. 6)

VOLUME CONTROL - POWER ON/OFF SWITCH

When this control is turned fully counterclockwise, the power switch is in the OFF position. Turning the control clockwise turns the power ON and controls the volume level.

S/RF POWER METER

Meter indicates relative signal strength of incoming signals from 1 through 9. A reading of 1 indicates a weak or distant station and a reading of 9 would indicate a local or a higher power station. The RF power scale indicates the relative RF power in watts being transmitted by your transmitter.

AUTO NOISE LIMITER

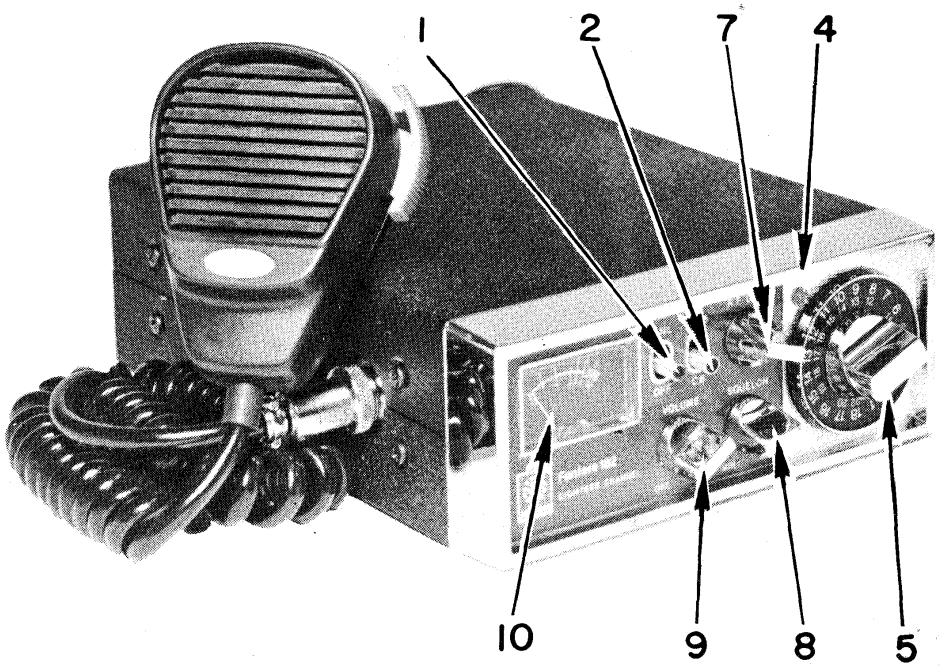
This control reduces excessive noise impulses. When the control is in the UP position, the noise is reduced, when in the OFF position the circuit does not function.

CB/PA SWITCH

This switch selects the mode of operation. When set in the CB position, the transceiver will function as a Citizens Band Radio. When set in the PA position, and an EXTERNAL PA SPEAKER and volume control is connected to the PA jack on the rear panel, the unit operates as a public address amplifier.

RF GAIN CONTROL

This control is used to increase the sensitivity of the receiver so that distant stations may be received more clearly, or to decrease the sensitivity so that very strong stations may be received more clearly.



1	Auto Noise Limiter	8	Squelch Control
2	CB/PA Switch	9	Volume ON/OFF Switch
3	RF Gain Control	10	S/RF Power Meter
4	Transmit Indicator	11	Antenna Connector
5	Digital Channel Indicator	12	External Speaker Jack
6	Instrument "DIM/BRIGHT" Switch	13	PA Speaker Jack
7	Channel Selector	14	Power Cable

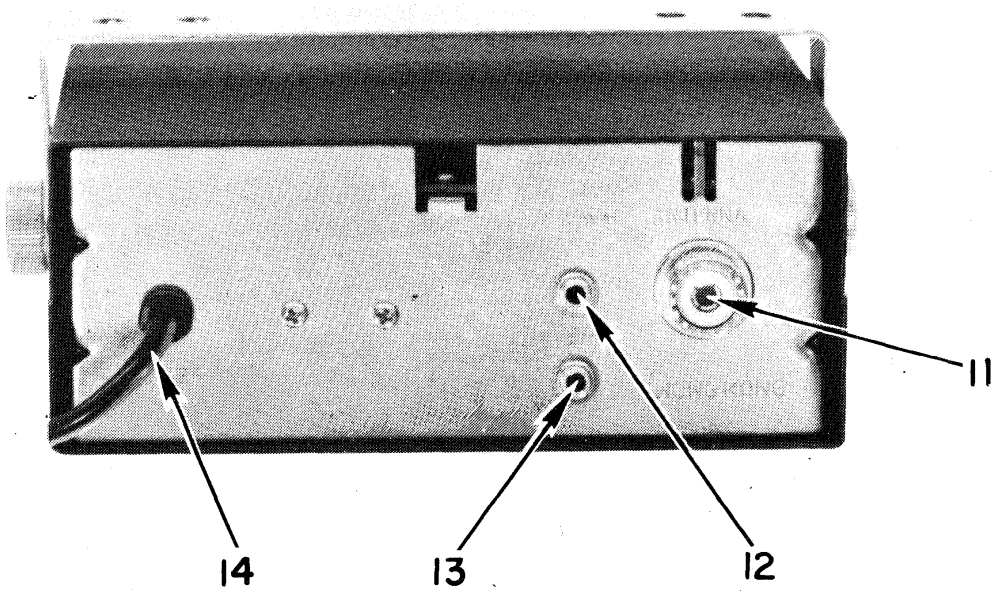


FIGURE 6, CONTROLS, INDICATORS AND CONNECTORS

CHANNEL SELECTOR

The Channel Selector sets the channel frequencies simultaneously for the receiving and transmitting modes. Refer to the RB11 Rules and Regulations for complete information on the use of the various channels.

SQUELCH CONTROL

The word "squelch" means to silence; therefore, the function of the control is to silence the atmospheric noise (hash) usually present in all high frequency AM radio communications. The maximum squelch is obtained when the control is in full CLOCKWISE position, minimum squelch when in COUNTERCLOCKWISE position.

ANTENNA CONNECTOR

A standard PL-259 coaxial connector fits this connector on the rear panel. The output impedance is 50 ohms.

EXT SPKR JACK

A standard miniature phone plug fits this jack on the rear panel. When an external speaker is connected, the internal speaker is disconnected.

PA SPKR JACK

A standard miniature phone plug fits this jack on the rear panel. An external volume control is required to control the audio level of the PA speaker.

POWER CABLE

The DC power cable supplied with the transceiver has a fuse holder in the positive lead containing a 1.5 ampere fuse.

B. Good CB Practices

In order that all CB operators may obtain maximum benefit from their CB radio station, the we strongly urge all CB radio operators to observe the following "Good CB Practices":

1. Channel Selection

In selecting a channel for your station, it is very important that the following factors be considered:

a. Channel 6 is the recommended calling channel.

b. There are only a limited number of channels available for use by all CB stations.

c. Channel 5 may be used for emergency communications only (situations which require immediate assistance to a motorist, etc.).

d. Any one of the other channels are to be used to conduct personal and business radio communications.

2. Channel Usage

Cooperate to the fullest extent possible in sharing the CB channels. Always be courteous and considerate when using a channel. In order to assure that all CB operators will have an equal opportunity to use the frequencies, radio communications between CB stations (interstation) must be limited to no longer than 5 continuous minutes to be followed by a silent period of at least one minute. Operators should restrict their time on the air to a practical minimum.

The importance of all CB users disciplining themselves from needlessly transmitting for long periods of time cannot be stressed enough.

3. Identification

See RB14 for examples of communication proceedures. Identify your radio transmissions with your own licensed call sign before and after each transmission. This call sign is unique in that it is unlike any other CB radio station call sign. Be proud to identify your radio transmissions with it. "Nicknames" or "handles" may also be used to identify your radio transmissions provided they are accompanied by the assigned call sign. It is not necessary to transmit the call sign of the station with whom you are talking.

4. Equipment

Have frequency, power and modulation measurements made at regular intervals. Do not tamper with the equipment. A licensed commercial technician is required to perform any adjustments that might affect the proper operation of the transceiver.

5. Promote "Good CB Practices"

Encourage other CB users to follow the above suggested practices.

If all CB users make a serious attempt to understand and follow the above recommended practices, we believe efficient utilization of the shared CB channels will be maximized.

6. Telecom approved phonetic alphabet

A Alpha	J Juliet	S Sierra
B Bravo	K Kilo	T Tango
C Chalie	L Lima	U Uniform
D Delta	M Mike	V Victor
E Echo	N November	W Whisky
F Foxtrot	O Oscar	X X-ray
G Golf	P Papa	Y Yankee
H Hotel	Q Quebec	Z Zulu
I India	R Romeo	

CHANNEL FREQUENCY CHART

	Australian Channel No.	U. S. A. Channel No.	Frequency MHz.
	1	5	27.015
	2	6	27.025
	3	7	27.035
	4	8	27.055
*	5	9	27.065
**	6	11	27.085
	7	-	27.095
	8	12	27.105
	9	13	27.115
	10	14	27.125
	11	15	27.135
	12	16	27.155
	13	17	27.165
	14	18	27.175
	15	19	27.185
	16	-	27.195
	17	20	27.205
	18	22	27.225

* Emergency Channel.
** Calling Channel

RECEIVER OPERATION

1. Set the front panel controls as follows:

CHANNEL SELECTOR	to	Desired Channel
VOLUME CONTROL	to	1/2 Rotation CW
SQUELCH CONTROL	to	Full CCW
RF GAIN CONTROL	to	Full CW
AUTO NOISE LIMITER SWITCH	to	OFF
PA/CB SELECTOR	to	CB

2. Rotate the CHANNEL SELECTOR and locate an incoming signal. Adjust the VOLUME CONTROL as desired.

3. If a very strong signal is being received, set the RF Gain control CCW and observe that the audio level is reduced. Readjust the VOLUME as required.

4. The S-Meter will indicate the strength of the station being received when the RF Gain control is in the CW position. A reading of 1 to 4 indicates a distant or low power signal. A reading of 5 to 9 indicates a higher power or local station.

5. Squelch Adjustment

   a. Locate a channel where there is no signal and rotate the SQUELCH CONTROL from full CCW to a point where the noise just stops.

   b. Rotate the CHANNEL SELECTOR to a channel where there is a signal and observe that the audio comes through loud and clear.

   c. Do not set the SQUELCH CONTROL too far past the quiet point, as weak signals may not overcome the squelch and will not be heard.

6. Automatic Noise Limiter

   When there is excessive electrical disturbance, set the Automatic Noise Limiter switch to the ANL position, observe that the noise is reduced and the signal is received clearly.

TRANSMITTER OPERATION

BEFORE TRANSMITTING, IT IS MANDATORY THAT YOUR TEMPORARY OR PERMANENT LICENSE BE POSTED WITH YOUR TRANSMITTER.

1. Set the front panel controls as follows:

CHANNEL SELECTOR	to	Clear Channel
VOLUME CONTROL	to	1/2 Rotation CW
SQUELCH CONTROL	to	Noise Quiet Point
RF GAIN CONTROL	to	Center Position
AUTO NOISE LIMITER SWITCH	to	OFF or as required
PA/CB	to	CB

2. Select a clear channel or wait for an opportunity to "break-in" on a desired channel.

3. Position the microphone approximately 2 inches from your mouth and hold the Press-to-Talk switch down. Speak in a normal tone and level of voice, do not speak for more than five minutes. Release the Press-to-Talk switch and listen for the reply.

4. Double numbers on the Channel Selector
The large outside numbers on the channel selector indicate the official Australian channels. The smaller inside numbers indicate the equivalent American channel numbers allowing ease of cross reference with other operators using old 23 channel transceivers not built to the largest Australian specification. Note that the large numbers are the official ones.

PUBLIC ADDRESS AND EXTERNAL SPEAKER OPERATION

1. Public Address Speaker (Figure 5)

   Turn the transceiver volume control to the minimum position, set the CB/PA switch to PA and press the transmit switch on the microphone. Speak into the microphone and set the added volume control to provide the desired audio level at the PA speaker. When the CB/PA switch is in the PA position, the internal speaker is bypassed.

2. External Speaker (Figure 5)

   When the external speaker is used, the internal speaker is disconnected.

SECTION IV, TECHNICAL DATA/SERVICE & MAINTENANCE

General Description

The FANFARE 182 is an AM Citizens Radio Service Band Transceiver. The unit incorporates the most advanced design in Phase Locked Loop (PLL) Frequency Synthesizer circuitry for the generation and precision control of the official Australian 18 channel frequencies.

The transceiver is designed to operate in vehicles using power supplies providing 13.8 Vdc. The unit may also be used in base station installations when used with a 13.8 Vdc external power source.

Special Features:

* Phase Locked Loop (PLL) Frequency Synthesizer
* Self-contained Heavy Duty Speaker
* Illuminated S/RF Power Meter
* External and PA JACK
* Low Noise RF Stages
* Automatic Noise Limiter
* Public Address Mode
* RF Gain Control
* Automatic Transmit Inhibit Circuit
* Automatic Level Control (A.L.C.)
* Squelch Control
* Spurious Radiation Control Circuits

Nominal Specifications

General

Operating Temperature Range - 30°C to +50°C
Solid State Devices
- Transistors - 22
- Diodes - 12
- Integrated Circuits (IC) - 1
- Zener Diodes - 1
- Varicaps - 1

RECEIVER SECTION

* Frequency Range	27.015 to 27.225 MHz
* Sensitivity	0.25uV for 10 db S/N at 1 kHz at 30% Modulation
* Selectivity	BW 2.5 kHz min. at 6 db down
* Adj. Channel Rejection	Better than 60 db
* Audio Distortion at 1 kHz	Less than 10% at 3W
* Squelch Sensitivity	0.2uV
* Squelch Stop Sensitivity	45 to 30,000uV (adjustable)
* Noise Limiter	Series gate

TRANSMITTER SECTION

* Frequency Range	27.015 to 27.225 MHz
* Power Output at 13.8 VDC	3.5 to 4 watts
* Modulation (4mV at microphone)	100%
* Emission (Class D operation)	6A3
* Hum and Noise	Better than 40 db down
* Frequency and Tolerance	Better than ± .005%
* Antenna Impedance	50 ohms
* Switching	Electronic
* Modulation Distortion	Less than 10% at 95% modulation at 1 kHz

SERVICE AND MAINTENANCE

WARNING

THE POSTAL AND TELECOMMUNICATIONS DEPT. REQUIRES THAT ONLY PERSONS POSSESSING A VALID FIRST OR SECOND CLASS RADIOTELEPHONE OPERATOR'S LICENSE ARE ALLOWED TO MAKE ADJUSTMENTS OR REPAIRS TO THE TRANSMITTING SECTION OF THIS TRANSCEIVER.

MODIFICATION TO THE TRANSMITTER SECTION IN ANY WAY NOT RECOMMENDED BY THE IMPORTER OR TELECOM IS ILLEGAL. MODIFICATIONS INCLUDE, BUT ARE NOT LIMITED TO, SUBSTITUTION OF CRYSTALS, REPLACEMENT OF COMPONENT PARTS NOT OF THE SAME ELECTRICAL RATING, ADDITION OF ANY COMPONENT PART(S), CONNECTIONS, DEVICE OR ACCESSORY INTERNALLY OR EXTERNALLY TO THE TRANSMITTER.

Troubleshooting assistance may be obtained by writing to Expo International Pty. Ltd. Address your inquiry to the attention of the Customer Service Department. Always state the Model, Serial Number and Issue of Schematic Diagram to which the unit was built. The schematic issue letter may be found in the lower right hand corner of the schematic or from the legend on the printed circuit board.

When ordering parts, refer to the part number listed in the Replacement Parts List and give a description of the part. Mail to the attention of Parts Department.

WARRANTY OR OTHER SERVICE

In the first instance your transceiver should be retuned to the Dealer from which it was purchased. In the event of difficult, service is availble directly from Expo International Pty. Ltd. 47-49 Buckley Street, Marrickville, N.S.W. 2204, Australia.

Transceiver should be carefully packed and post paid. Return packing and postage will be charged. Free Warranty Service is only available through your Dealers.

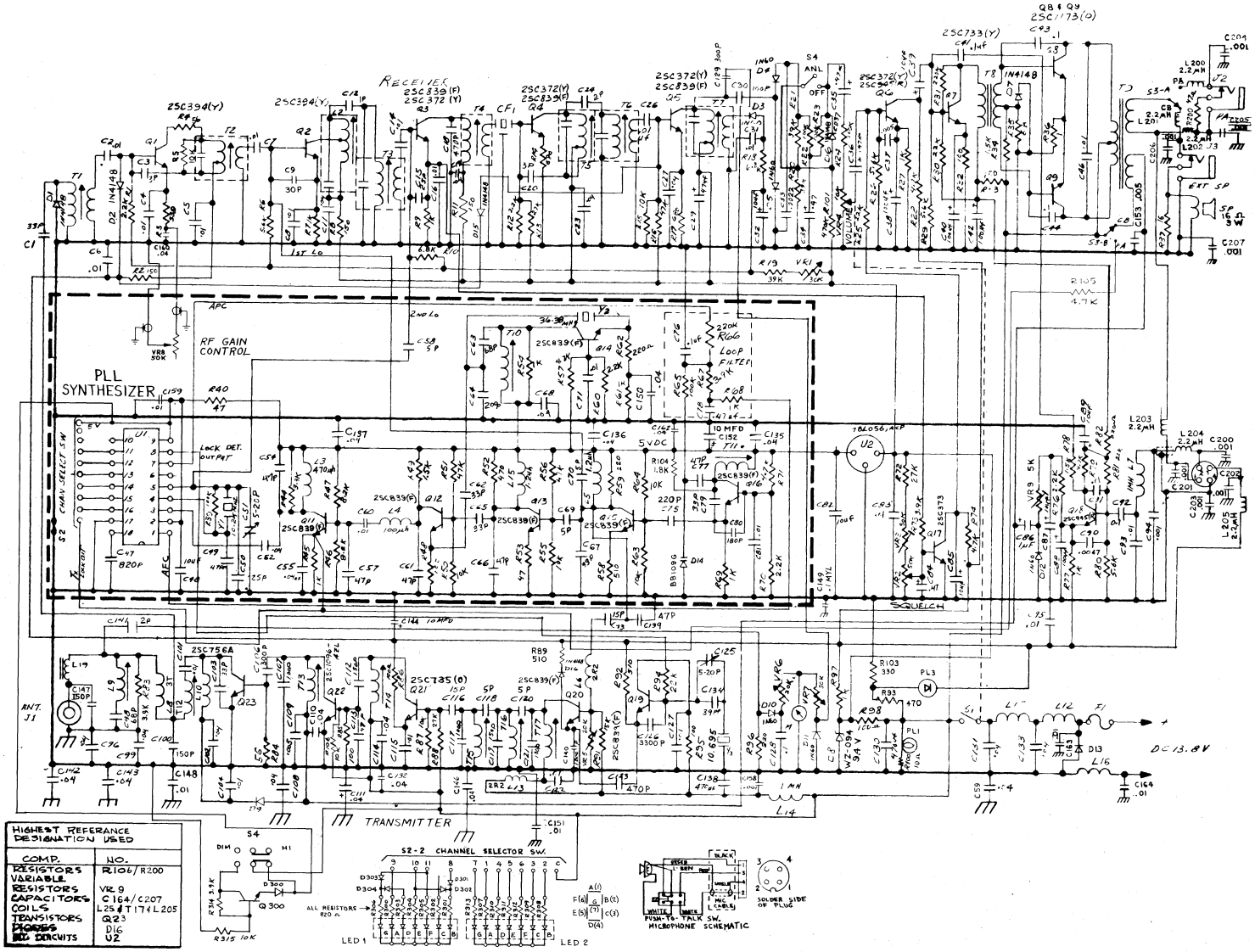


FIGURE 7, SCHEMATIC DIAGRAM

FANFARE 182

SPECIAL REPLACEMENT PARTS LIST

SYMBOL	DESCRIPTION	PART NUMBER
	SOLID STATE DEVICES	
Q1,2	Transistor, 2SC394 (Y)	1080-01
Q3,4,5,11, 12,13,14, 15,16,19, 20	" 2SC839 (F)	1080-20
Q6	" 2SC372 (Y)	2017-117
Q7	" 2SC733 (Y)	1080-03
Q8,9	" 2SC1173 (O)	1080-130
Q17	" BC-337	2086-12
Q18	" 2SC945 (B)	1080-21
Q21	" 2SC735 (O)	1080-07
Q22	" 2SC1096AZL	2017-108
Q300	" 2SC1474-3	2086-72
D1,2,6,7,15, 301,302,303, 304	Silicon Diode, IN4148/CD37	2086-66
D3,4,5,10, 11,12	" " IN60	294-42-9
D9	" " IN4817	2049-33
D13,300	" " SRIK-1 or IN4001	1080-08 or 2021-05
D14	" " BB109G (Siemens)	2049-32
D301,302 303,304	" " IN4148	2019-45
D8	Zener Diode WZ-094 9.4V	2049-34
PL3	LED TLR107	2086-13
U1	I.C. Resdel 86345-PLL	2049-01
U2	I.C. MC78L05C, ACP	2049-03
	CRYSTALS	
Y1	10.240 MHz	2049-05
Y2	36.380 MHz	2049-06
Y3	10.695 MHz	2049-07

SPECIAL REPLACEMENT PARTS LIST (CONTINUED)

SYMBOL	DESCRIPTION	PART NUMBER
	COILS AND TRANSFORMERS	
T1	RF Transformer 27 MHz	1080-11
T2	RF Transformer 27 MHz	1080-12
T3	IFT 10695 MHz	1080-14
T4	IFT 455 kHz	1080-15
T5,6	IFT 455 kHz	1080-16
T7	IFT 455 kHz	1080-17
T8	Input Transformer EI-19 2.2K:2K	1080-137
T9	Output Transformer EI-28 400 :8	1080-138
T10,11,16, 17	RF Coil	1043-22
T12,14	RF Coil	2086-63
T13	RF Tank Coil	1080-23
T15	RF Filter Coil	1043-23
L2	IFT 10.695 MHz	1080-13
L3	Fixed Inductor 470 uH	1079-08
L4	" " 100 uH	1079-09
L5,15	" " 1.2 uH	2049-08
L6,13,200 201,202, 203,204, 205	" " 2.2 uH	1080-27
L7,14	" " 1 mH	CH-4
L8	Ant. Coupling Coil, Air	1043-26
L9	" " "	1045-24
L10	RF Tank Coil	1080-22
L12,16	RF Choke	1080-26
L17	RF Choke	1080-28
L19	Toroidal Coil 81 MHz Trap 7T	2049-64
	CONTROLS	
S1,3	Slide Switch 2F 2T 1-12mm	1080-136
S4	" "	2086-07
S2	Channel Switch	2086-63
VR9	Semifixed Resistor 5K ohm	1042-99
VR5,6	" " 20K	1042-97
VR1,7	" " 30K	1079-19

SPECIAL REPLACEMENT PARTS LIST (CONTINUED)

SYMBOL	DESCRIPTION				PART NUMBER
	CONTROLS (CONTINUED)				
VR 3	Semifixed Resistor 50K				1080-32
VR4	On-Off Volume Control 10K (A)				1080-29
VR8,2	RF Squelch Control & Gain Control 50K (B) SL-20mm				1080-31
	FILTERS				
	Ceramic Filter 455 kHz				2086-23
	CAPACITORS				
C12	Ceramic	SL	±0.25pF	1pF	1080-40
C24,141	"	"	"	2pF	1080-41
C3,20	"	"	"	3pF	1080-42
C58,69,70 118,120	"	"	"	5pF	1080-43
C73,116	"	"	"	15pF	2018-10
C15	"	"	"	25pF	160-97-9
C1,62, 65,67,103	"	"	"	33pF	1080-46
C54,57,61, 66,,113, 139	"	"	"	47pF	2049-35
C30,107,147	"	"	"	100pF	1080-48
C100,112,147	"	"	"	150pF	1042-156
C75	"	"	"	220pF	160-07-9
C106,129	"	"	"	300pF	1004-102
C123	"	"	"	470pF	1080-51
C94,140,158, 200,201,202, 203,204,205, 206,207	"	"	+80(-)20%	.001mfd	1080-54
C33	"	"	"	.002mfd	1080-52
C37,109,153	"	"	"	.005mfd	1080-44

LIMITED WARRANTY

TO VALIDATE WARRANTY CLAIM the original sales receipt must accompany the product to the Service Centre.

EXPO INTERNATIONAL PTY. LTD. warrants each new electronic product manufactured by it to be free from defective material and workmanship and agrees to remedy any such defect or to furnish a new part (at the Company's option) in exchange for any part of any unit of its manufacture which under normal installation, use and service disclosed such defect; provided the unit is delivered by the owner to us or to our authorized distributor from whom purchased, or authorized service station, intact, for our examination, with all transportation charges prepaid to our factory, within 90 days from the date of sale to original purchaser and provided that such examination discloses, in our judgment, that it is thus defective.

Written authorization must be obtained before any merchandise is returned to the factory.

This warranty does not extend to any of our electronic products which have been subjected to misuse, neglect, accident, incorrect wiring not our own, improper installation, unauthorized modifications, or to use in violation of instructions furnished by us, nor units which have been repaired or altered outside of our factory, nor to cases where the serial number thereof has been removed, defaced or changed.

This warranty is in lieu of all warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our electronic products.

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