

This Manual is provided by  
***CBTricks.com***

**Someone who wanted to help you repair your equipment put together this information.**

**Pearce Simpson Tiger 40A Owner's Manual**  
If you would like to help us put more manuals online support us.

**If you would like to help with this project let us know.**

Supporters of CBTricks.com paid for the hosting so you would have this file.

CBTricks.com is a non-commercial personal website was created to help promote the exchange of service, modification, technically oriented information, and historical information aimed at the Citizens Band, GMRS (CB "A" Band), MURS, Amateur Radios and RF Amps.

CBTricks.com is not sponsored by or connected to any Retailer, Radio, Antenna Manufacturer or Amp Manufacturer, or affiliated with any site links shown in the links database. The use of product or company names on my web site is not endorsement of that product or company.

If your company would like to provide technical information to be featured on this site I will put up on the site as long as I can do it in a non-commercial way.

The site is supported with donation from users, friends and selling of the Galaxy Service Manual CD to cover some of the costs of having this website on the Internet instead of relying on banner ads, pop-up ads, commercial links, etc. Thus I do not accept advertising banners or pop-up/pop-under advertising or other marketing/sales links or gimmicks on my website.

ALL the money from donations is used for CBTricks.com I didn't do all the work to make money (I have a day job). This work was not done for someone else to make money also, for example the ebay CD sellers.

All Trademarks, Logos, and Brand Names are the property of their respective owners.

This information is not provided by, or affiliated in any way with any radio or antenna Manufacturers.

**Thank you for any support you can give.**

# PEARCE-SIMPSON

DIVISION OF **GLADDING** CORP.



# TIGER 40A

# **SECTION 1**

## **GENERAL INFORMATION**

### **DESCRIPTION**

Your new PEARCE-SIMPSON transceiver is a compact, PLL control synthesizing system, 40 channel Citizens Band Transceiver. This radio, because of its low current drain, is ideally suited for mobile operation from a 12.6V, positive or negative ground DC power source. A 12 V DC power cord and a mounting bracket are included with your transceiver. To provide the crystal-controlled, 40 channel operation, PEARCE-SIMPSON utilizes a PLL controlled synthesizing circuit.

The receiver is a sensitive superheterodyne circuit featuring: Dual conversion, low noise RF stage, adjustable squelch, automatic noise limiting, noise blanker, S/RF meter, ceramic filter, external speaker jack, PA jack and instantaneous selection of any of the 40 crystal controlled channels.

The transmitter section is designed around highly reliable silicon transistors and a PLL controlled synthesizing system. This circuit makes use of the output of two crystal-controlled oscillators which are beat together to produce the desired frequency. The transmitter final is a conservatively rated high gain RF power transistor.

## SPECIFICATIONS

Circuitry	2 ICs, 26 Transistors, 14 Diodes, 2 Zener Diodes
Frequency Control	PLL (Phase Lock Loop) Synthesizing System
Channels	40 channels all installed
Mode of Operation	AM
Receiver System	Dual Conversion Superheterodyne
Sensitivity	Nominal $0.7\mu\text{V}$ (S/N 10 dB)
Selectivity	1st : 10.695 MHz 2nd: 455 KHz
Frequency Tolerance	$\pm 0.005\%$
Spurious Rejection	More than 50 dB
RF Output Power	Maximum 4.0 W (F.C.C. Maximum)
Squelch Range	$0.5\mu\text{V} - 500\mu\text{V}$
Receiv-O-Slide	About $\pm 1$ KHz (Receiving only)
Audio Output Power	More than 3 W (EXT. SP at 8 ohms)
Controls	VOLUME CONTROL/POWER SWITCH, SQUELCH CONTROL, TONE CONTROL, RF GAIN CONTROL, CHANNEL SELECTOR, RECEIV-O-SLIDE, CB/PA SWITCH, ANL SWITCH, NB SWITCH
Jacks and Connector	MICROPHONE, PA, EXT. SP, ANTENNA, DC POWER
Speaker	3" dynamic, 8 ohms
Microphone	Dynamic CB mike
Power Source	DC 13.8 V

## FREQUENCIES AVAILABLE FOR CLASS D OPERATION

---

Channel	MHz	Channel	MHz	Channel	MHz
1	26.965	15	27.135	28	27.285
2	26.975	16	27.155	29	27.295
3	26.985	17	27.165	30	27.305
4	27.005	18	27.175	31	27.315
5	27.015	19	27.185	32	27.325
6	27.025	20	27.205	33	27.335
7	27.035	21	27.215	34	27.345
8	27.055	22	27.225	35	27.355
**9	27.065	23	27.255	36	27.365
10	27.075	24	27.235	37	27.375
11	27.085	25	27.245	38	27.385
12	27.105	26	27.265	39	27.395
13	27.115	27	27.275	40	27.405
14	27.125				

\*\*Channel shall be used only for emergency communications. (Ref. FCC Part 95.41 (d) (3) )

### WARNING

Operation of this equipment requires a valid station license issued by the Federal Communications Commission. Do Not transmit with your equipment until you have received your license. Illegal operation can result in severe penalties. Be certain that you have read Part 95 of the FCC Rules and Regulations before operating your station.

License applications are to be made on FCC Form 505 available from your nearest FCC field office. (A copy of this form is included with your new transceiver.)

You are required to maintain a current copy of Part 95 of the FCC Rules as a part of your station records. Copies of Part 95 are available from: Superintendent of Documents GPO Washington, DC. 20402, for a fee of \$3.50.

Your station license is to be posted in accordance with paragraph 95.101 of the Rules and an executed Transmitter Identification Card (FCC Form 452-C) is to be attached to each transmitter. (A copy of this form is included with your new transceiver.)

## **SECTION 2**

### **INSTALLATION & INITIAL ADJUSTMENT**

#### **IMPORTANT**

BEFORE DISCARDING ANY OF THE PACKING MATERIALS, EXAMINE THEM CAREFULLY FOR ITEMS YOU MAY HAVE OVERLOOKED.

### **MOBILE STATION INSTALLATION**

#### **MOUNTING**

For mobile installation, the mounting cradle is designed to serve as a means of mounting your TIGER 40A in any position which is convenient. After you have determined the most convenient location, hold the TIGER 40A and cradle in the exact location desired. If nothing interferes with it, remove the cradle from the TIGER 40A and use it as a template to mark the location for the mounting bolts. Before drilling the holes, make certain nothing will interfere with the installation of the mounting bolts.

#### **POWER CONNECTION**

The TIGER 40A is constructed to be used in vehicles using either positive or negative ground. The red lead is the positive lead and the black lead is the negative lead. If the existing wiring is used, be sure that it is heavy enough to prevent voltage drop to the radio. A good source of battery voltage is at the accessory connection on the ignition switch. Using this as a power source insures the radio will be off when the ignition switch is turned "OFF", and power will be supplied to the radio when it is in the "ON" or "ACCESSORY" position. Determine whether your vehicle has a positive or negative grounded battery system before connecting the power cable.

#### **ANTENNAS**

Your TIGER 40A has been adjusted at the factory to give optimum performance using a 52-ohm antenna. There are a number of 52-ohm antennas available for mobile citizens band use.

For an automobile installation, a whip may be used with good efficiency because the automobile acts as a counterpoise and reduces detuning effects. The mounting location also has a great effect on the efficiency.

The most efficient and practical installation is a full quarter wave whip mounted on the left rear deck of fender top midway between the rear window and bumper.

The so-called "short whip" is a less efficient antenna because the radiation area is reduced. However, full use of its capability may be achieved since a shorter antenna may be mounted in a more advantageous position on an automobile, such as in the middle of the top.

There are also newer mobile antennas on the market which are made to replace the entertainment radio antenna and are similar in appearance. These antennas serve three purposes: AM and FM entertainment broadcast reception and Citizens Band transmission and reception.

For a marine installation, the full-length quarter wave whip antenna is very efficient, however it requires radials which make it hard to mount in small boats. Another excellent antenna is the coaxial sleeve type which requires no radial. A similar antenna is the center loaded 1/2 wave which is about the same as the full length 1/4 wave whip and it requires no radials. Care must be used when choosing one of the shortened type antenna as considerable variation in efficiency will be found between the various makes and models. As a general rule, avoid those with short radiating elements because the greater the radiating area, the stronger the radiated signal will be.

Your PEARCE-SIMPSON dealer is prepared to offer advice and will help you choose the most desirable antenna for your needs.

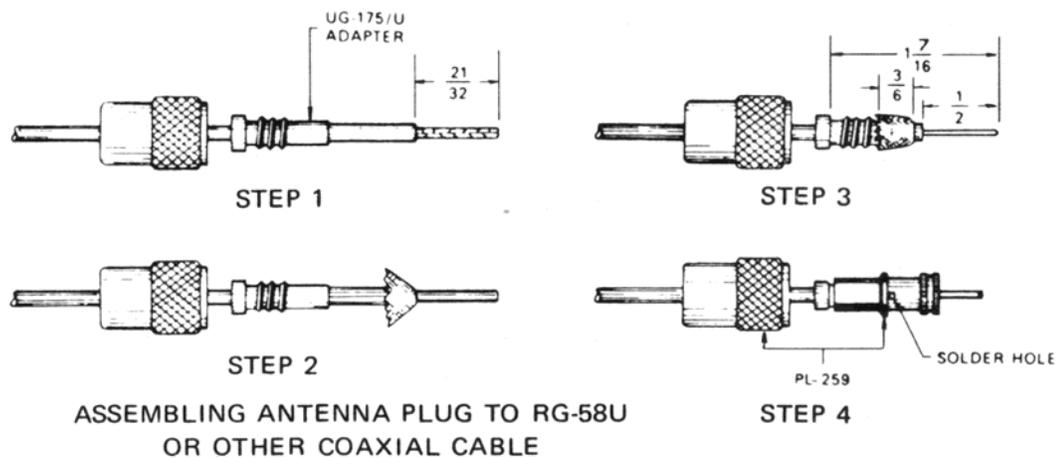


Fig. 1

## **TRANSMISSION LINE**

To connect an antenna to the transceiver, a 52-ohm coaxial transmission line is required.

See Figure 1 for assembling connector to RG-58/U coaxial cable.

## **INSTALLATION ADJUSTMENTS**

The output circuit of the TIGER 40A transmitter has been factory adjusted to operate into any good 52-ohm antenna. No attempt should be made to tune the transmitter to the antenna. Instead, the antenna should be adjusted to present the lowest possible SWR (Standing Wave Ratio). A very low SWR means that the antenna is operating at maximum efficiency and will also mean that it is adjusted to 52 ohms. An improperly adjusted antenna causes standing waves to appear on the feed line. Since this feed line is a fixed 52 ohms, and cannot be adjusted, this mismatch appears at the transmitter. If the transmitter is adjusted to compensate for this mismatch, both it and the antenna will no longer be operating at peak efficiency. Since the transmitter has already been adjusted for 52 ohms output and the coaxial feed line has a fixed 52-ohm value, the only remaining element to be adjusted to this value is the antenna itself. When received, the antenna is probably cut as near as is possible to this value. The mounting location on the vehicle or building and surrounding objects affect the antenna however, and requires that it be adjusted to compensate for them.

Many of the newer Citizens Band antennas provide means of adjusting them for lowest SWR. Instructions for doing so are included with the antenna. For such antennas as the full quarter wave length whip, it is necessary to carefully vary the length until the lowest SWR is obtained. For all adjustments to the antenna, connect an SWR meter in the feed line to the antenna.

The TIGER 40A will work into an antenna system having an SWR as high as 3 : 1. For best communications, you will want this figure as near 1 : 1 as possible so that the antenna will be operating at its best efficiency.

## **NOISE SUPPRESSION**

The TIGER 40A contains automatic noise limiter and input power filtering. In most vehicular installations, the noise suppression for the entertainment radio will be sufficient. Vehicles and boats not having this suppression may require that it be installed. In most cases, installation of distributor suppressors and generator condensers will be sufficient. In severe cases, the services of a qualified technician may be required. See your PEARCE-SIMPSON dealer for advice.

# SECTION 3 OPERATING INSTRUCTIONS

## CONTROLS AND INDICATORS

### FRONT PANEL

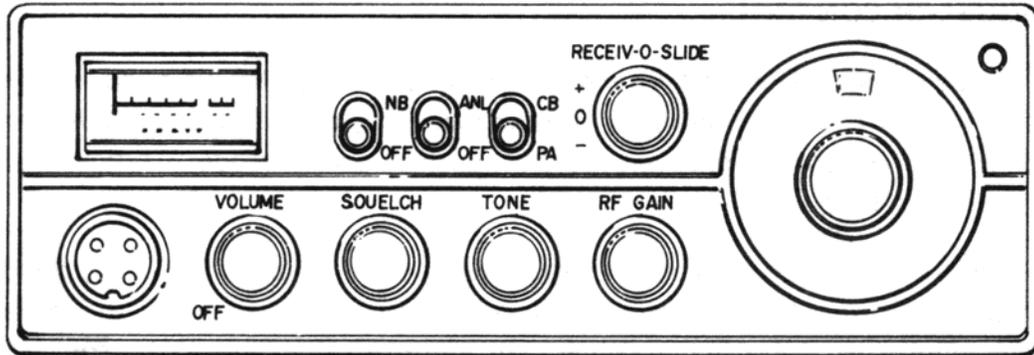


Fig. 2

### REAR PANEL

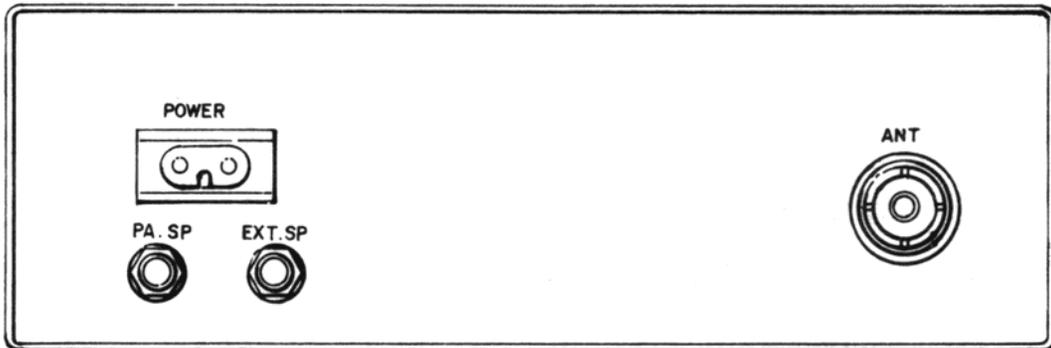


Fig. 3

## **VOLUME CONTROL/POWER SWITCH**

This turns the power on or off. This controls the sound output from the speaker when receiving or from the Public Address (PA) speaker connected to the EXT. CB/PA SPEAKER JACK on the rear panel. The volume control does not affect the transmitted output.

## **SQUELCH CONTROL**

To quiet undesirable background noises when no signal is received, rotate the squelch control clockwise. It functions only in the receive mode and does not affect the receiving volume during receive mode. Adjust this control as follows:

Turn the power on and rotate the volume control until the background noise is heard. Then rotate the squelch control clockwise until the noise just disappears. Incoming signals will automatically release the squelch. But take care not to rotate the squelch control too far, because it decreases reception sensitivity.

## **TONE CONTROL**

This control changes tonal quality in reception. Adjust for your preferences.

## **RF GAIN**

This controls RF gain for receiving. To increase reception sensitivity (RF GAIN), turn the knob clockwise, to decrease, turn counter-clockwise.

## **ANL-OFF SWITCH**

This reduces undesirable atmospheric noise.

## **CB-PA SWITCH**

Place this switch in the PA position when using the transceiver as a simple public address amplifier, and for normal CB operation, always place it in the CB position.

## **NB-OFF SWITCH**

This reduces impulse noises such as ignition noise from vehicles, etc., without significantly affecting the basic sensitivity of the receiver.

## **RECEIV-O-SLIDE**

This 3-positioned switch varies the receiving frequency for about  $\pm 1$  KHz. This enables you to receive stations transmitting slightly off frequency. Place the control in one of the 3 positions where the clearest reception is obtained. This does not affect transmitting frequency.

## **S/RF POWER METER**

This gives the relative strength of incoming signals when receiving and RF power output when transmitting.

## **CHANNEL SELECTOR**

This selects one of the full 40 channels desired.

## **MIC JACK**

This accepts the plug from the Push-To-Talk Microphone supplied with the unit.

## **PA JACK**

To operate this transceiver as a simple PA amplifier, connect a PA speaker to this jack.

## **EXT. SP JACK**

This is used for an external speaker connection. When the plug is inserted into this jack, the built-in speaker is automatically disconnected.

## **ANTENNA CONNECTOR**

This accepts a standard PL-259 type coaxial antenna connector.

## **TRANSMIT INDICATOR LAMP**

This lamp lights up while you are pressing the push-to-talk switch on the microphone, indicating the transceiver is in transmit mode.

## OPERATING THE TIGER 40A

**CAUTION: DO NOT PUSH TRANSMIT SWITCH WITHOUT FIRST CONNECTING A 52-OHM ANTENNA OR DUMMY LOAD.**

Rotate SQUELCH CONTROL fully counterclockwise.

Place the CB-PA Switch in the "CB" position.

Rotate the VOLUME CONTROL clockwise, to apply power, and advance the VOLUME CONTROL until noise or signal is heard in the speaker.

(Since your TIGER 40A uses all transistors, no warmup time is required.)

With no signal present, rotate the SQUELCH CONTROL clockwise to a position in which no noise is heard. Advance this control only far enough to prevent noise from being heard. Advancing it too far may result in the loss of weak signals. With the squelch properly adjusted, only a transmitter operating on the channel to which your TIGER 40A is tuned will be heard. With no transmitter operating, the squelch gate will be closed and all sound will be "Turned Off". Sometimes noise will build up as a result of a passing truck, etc. If this happens, the SQUELCH CONTROL should be advanced just far enough to keep the circuit closed during these noise peaks.

Rotate the CHANNEL SELECTOR to the desired channel.

Adjust the volume as desired for the station you are listening to.

To transmit, hold the microphone 2 to 3 inches from your mouth. Normally, it is best to hold it so that you talk across it rather than directly into it. This will prevent the sound of your breathing being transmitted. Hold the Push-to-Talk button on the microphone in, and speak in a normal conversational level.

When your transmission is completed, release the button on the microphone and listen for a reply.

When listening to a weak signal, adjust your receive-slide switch for strongest signal. The automatic noise limiter will ordinarily be kept on. When under conditions of low noise you may wish to turn it off for extra sensitivity.

## SECTION 4

### MAINTENANCE & SERVICING

#### CIRCUIT DESCRIPTION

Your TIGER 40A is the transceiver employing the most advanced circuitry, PLL (Phase Lock Loop) Frequency Synthesizing circuit which obviates expensive crystals in great numbers but operates with a great reliability.

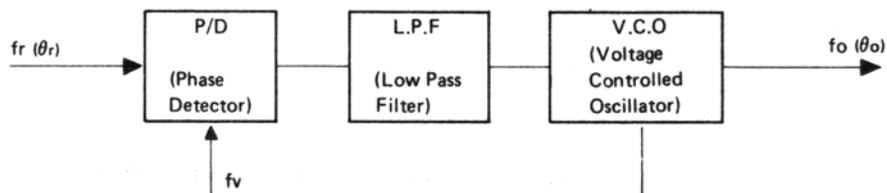
The circuit theory is somewhat complicated but will be given below in a simple manner for your understanding of the new technology employed in your transceiver.

##### 1. Fundamental Theory of PLL Circuitry

The word PLL is an abbreviation of the "Phase Lock Loop" in which a given signal is processed to track the frequency and phase of a reference signal.

In other words, the PLL is an automatic frequency control loop or automatic phase control.

The PLL circuitry consists of the three main units in simple form as shown in Fig. 4.



**Fig. 4 Fundamental Block Diagram of PLL Circuitry**

In the above block diagram, when the reference frequency  $f_r$  and the VCO output frequency  $f_v$  to be compared are applied to the Phase Detector P/D,  $f_v$  is compared with  $f_r$  in terms of phase lag and lead.

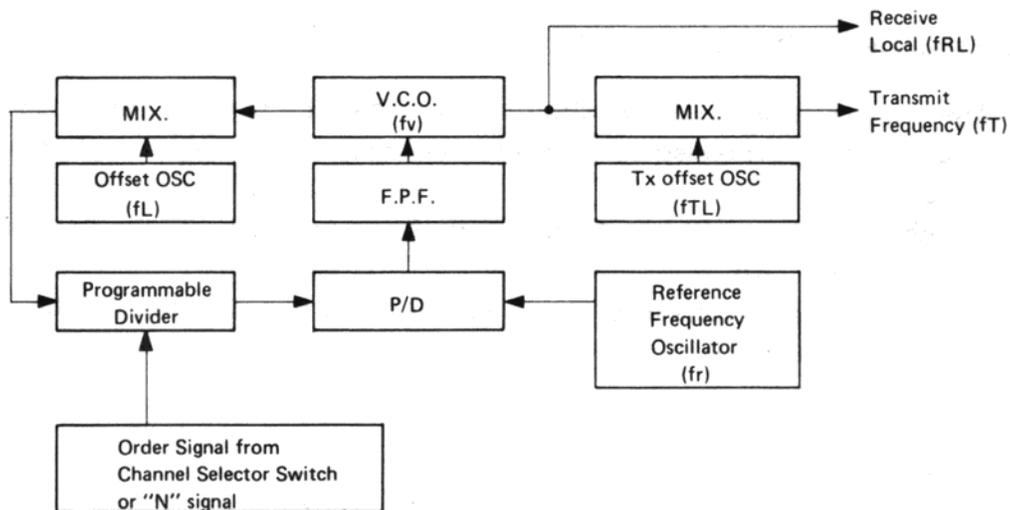
Then the resulting output (Phase difference) is converted into the DC output voltage corresponding to the phase difference. Since the phase comparison is made at every cycle, the DC output may include unnecessary harmonics and noises. The DC output is, then, fed to the low pass filter (L.P.F) and integrated or smoothed to continuous DC voltage in proportion to the phase difference. The frequency of Voltage Controlled Oscillator (V.C.O.) is controlled by the L.P.F. output voltage. Thus controlled VCO output is, then split into two:

One used as a operating frequency of the unit and another will be returned to the P/D, making a closed loop. The closed loop will continue to operate until the following condition is met:

$$\theta_r (t) = \theta_o (t)$$

This condition is called "locked".

Employing the PLL system in a CB transceiver requires some modification so that the VCO generates a specific frequency corresponding to each channel frequency (1 – 40) according to the channel selection. Figure 5 is the new block diagram made with this modification. As you can see, a programmable divider, Mixer and Offset Oscillator are newly added.



**Fig. 5 Block Diagram of PLL Frequency Synthesizer Circuitry for CB transceiver**

In Fig. 5 the first local oscillator frequency for reception fRL is given below

$$fRL = fL + (N \times fr) \dots \dots \dots (1)$$

The transmit frequency fT is

$$fT = fL + fTL \dots \dots \dots (2)$$

$$= fL + (N \times fr) + fTL \dots \dots \dots (3)$$

Where "N" is a order signal from the channel selector switch. When using the system in the transceiver, fr should have the same frequency as the channel spacing, namely, fr = 10 KHz. When receiving channel No. 1, 26.965 MHz, the VCO frequency, fRL should be,

$$f_{RL} = 26.965 + 10.695 = 37.660 \text{ MHz}$$

Then "N" codes will be decided from the equation (1),

$$N = \frac{f_{RL} - f_L}{f_r} \dots\dots\dots(4)$$

substituting the frequencies yields:

$$N = \frac{37.660 - (11.8066 \times 3)}{0.01} = 224$$

This means that selecting the channel No. 1 is to select one of "N" Codes (ie, 224) instead of selecting the proper crystals in a conventional CB transceiver. Thus by varying "N" numbers and selecting one of them, any channel can be selected. This is the major difference between a conventional Crystal Type and PLL Frequency Synthesizer type transceiver.

## 2. Transmitter Circuit

IC101 (PLL LSI), Q101 (VCO), Q102 (MIX 1), Q103 (Buffer 2), Q104 (Buffer 1), Q108 (Buffer 3), Q117 (Reference OSC) & Q105 (11.8066 MHz Oscillator) are being operated regardless of the receive and transmit mode. When the transceiver is set to the transmit mode, Q109, Q110, Q107, Q111, Q112 and Q113 are powered and will operate.

First, the channel selector switch decides the "N" code corresponding to a channel to be selected. The "N" code signals are applied to the proper IC terminals (PIN 11 – 15) to preset the programmable divider in the IC101 for dividing the comparing input frequency from buffer 2 (Q103).

The oscillator Q105 is oscillating at the frequency of 11.8066 MHz, but the third harmonics of the frequency is used and applied to the Q102 Mixer and mixed with the frequency being sent from one of VCO outputs. The mixed and converted output is then led to the buffer amplifier Q103 which in turn feeds its output to the buffer circuit in the IC101. The buffer output is then led to the programmable divider and divided into a low frequency predetermined by the "N" code. Finally, the low frequency is led to the phase detector and compared with the reference frequency sent through the chains of Q117 (Reference frequency oscillator), – Q104 (buffer) – 1/1024 Divider in the IC101.

The Phase Detector generates DC output voltage corresponding to the phase difference between the two signals applied and the DC output is,

then, applied to the VCO circuit through the Low Pass Filter and changes the VCO frequency so that the VCO frequency (in terms of count-down frequency) exactly coincides with the reference frequency. When both frequencies coincide, this phase loop circuitry will be locked and the VCO circuit provides one of stable frequency over the band of 37.66 – 38.10 MHz (depending upon "N" code or "channel" selected). The frequency is then fed to the buffer amplifier Q108. The buffered output of Q108 is split into two: one will be used as a local oscillator signal for receive operation, and another is fed to the Q110 Mixer to produce transmitting frequency.

Thus obtained 27 MHz transmitting signal is fed to the 27 MHz amplifiers Q111, Q112 and Q113 and amplified to the high power level required for transmission.

On the other hand, the microphone signal is applied to the audio amplifier (No. 6 pin of IC102) and the resultant amplified output is then fed to the collectors of Q112 and Q113 through the secondary coil of output transformer T110 and switching diode D105, thus modulating the carrier frequency.

### 3. Receiver Circuit

In the receive mode of operation, transistors Q109, Q110 and Q111 are disoperated. On the other hand, transistors, Q114, Q115, Q118 and Q119 are powered and operate.

Q114 is a 27 MHz RF amplifier and amplifies the signal supplied from the antenna through C154 and T104. The amplified signal is then applied to the Q115 Mixer base where the VCO output frequency (as a receiver local frequency as previously stated in the Transmit Circuit) is being applied, thus resulting in a first IF frequency

$$\begin{aligned} \text{ie : when CH1 is selected} \\ 1\text{st IF} &= 37.66 - 26.965 = 10.695 \text{ MHz} \end{aligned}$$

The 1st IF signal is then applied to the 2nd Mixer (Q116) at which 10.24 MHz injection signal is also being applied from Q117 and 455 KHz 2nd IF signal will be made as follows:

$$2\text{nd IF} = 10.695 - 10.24 = 0.455 \text{ MHz}$$

Thus obtained 455 KHz signal is led to the IF amplifiers Q118 and Q119 and finally detected into the audio signal with the detector diode D110. Thus detected audio signal is fed to the audio amplifier consisting of IC102

and amplified. The final output is supplied to the built-in speaker through the audio output transformer T110.

Since the base bias of Q120 is supplied during receive operation, the squelch circuit will operate during the reception mode of operation.

### **WARNING**

FCC Rules require that ALL transmitter adjustments, other than those supplied by the manufacturer as front panel operating controls, be made by or under the supervision of the holder of an FCC issued 1st or 2nd class radio operator's license.

Replacement or substitution of crystals, transistors, regulator diodes or any other part of a unique nature, with parts other than those recommended by the manufacturer may cause violation of the technical regulations of Part 95 of the FCC Rules or violation of the Type Acceptance requirements of Part 2 of the Rules.

## ALIGNMENT

### 1. Test Voltage

DC 13.8 V  $\pm$  5%, unless otherwise specified.

### 2. Test Equipment

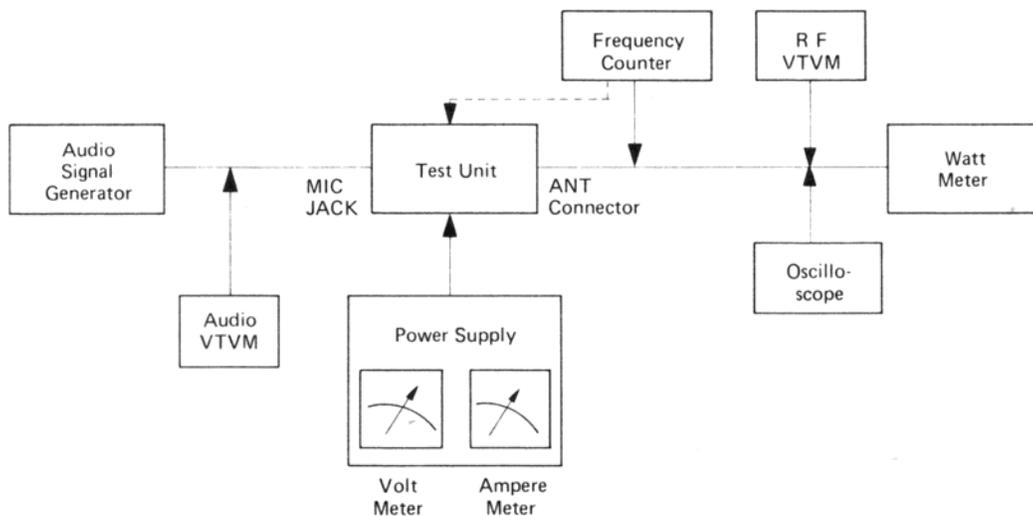
All test equipment should be properly calibrated.

1. Audio Signal Generator, 10 Hz – 20 KHz
2. VTVM, 1 mV measurable
3. DC Ampere Meter, 2A
4. Regulated Power Supply, DC 0 – 20V, 2A or higher
5. Frequency Counter, 0 – 40 MHz, High Input Impedance Type
6. RF VTVM, Probe Type
7. Oscilloscope, 30 MHz, high input impedance
8. RF Watt Meter, thermo-couple type, 50 ohm, 5W
9. Standard Signal Generator, 100 KHz – 50 MHz, – 10 – 100 dB, 50 ohm unbalanced
10. Speaker Dummy Resistor, 8 ohm, 5W
11. Circuit Tester, DC V/20K ohm or higher

### 3. Alignment of Transmit Circuitry

#### 3.1 Test Set-Up

Connect all test equipments as shown below:



**Fig. 6 Connections of test equipment**

- 3.2 To set the transceiver into transmit mode without the microphone, insert the 4-pin plug wired as shown below into the MIC jack on the transceiver. When applying the audio modulation signal to the microphone input circuit, also use the same plug.

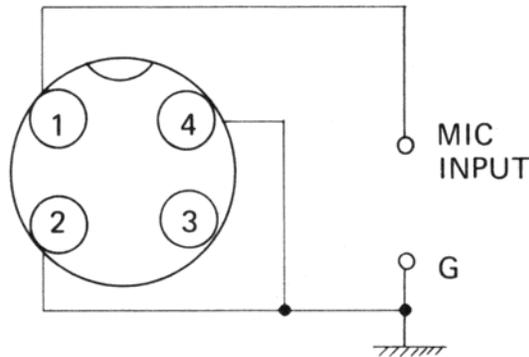


Fig. 7

### 3.3 PLL Circuit Alignment

Before processing alignment, make sure of the operating frequencies at the points which follow, using the frequency counter (through a 1000 PF coupling capacitor connected in series with counter input probe).

- a. 10.24 MHz Buffer 1 (Q104) collector frequency should be  
 $10.239200 \text{ MHz} \pm 0.13 \text{ KHz}$

- b. VCO, Q108 base frequency should be  
 $37.6592 \text{ MHz} \pm 0.38 \text{ KHz}$  at CH1 position

- c. 10.695 MHz OSC 2 (Q109) emitter frequency should be  
 $10.6942 \text{ MHz} \pm 0.12 \text{ KHz}$

#### d. RECEIV-O-SLIDE Circuit

Place the RECEIV-O-SLIDE switch in the "O" position and connect the frequency counter to the base of Q108, the counter should read 37.659200 MHz with channel selector switch placed in CH 1 position. If not, adjust CT101 to obtain the correct reading.

#### e. VCO Alignment

1. Place the channel selector in CH1 position
2. Connect the circuit tester (DC 3V range) between the ground and R114 (TP – 8 side).

3. Adjust T101 core clockwise to obtain  $1.5V \pm 0.1V$  on the tester (the tester should be calibrated and has an input impedance of 20K /V ohm or higher).
4. Place the channel selector in open channel position, the voltage reading of 5.1 – 5.4V will be obtained. Next, place the channel selector in 40 CH position, and read the value on the tester, it should be  $2.7 \pm 0.6V$ .

#### 3.4 Alignment Stages before RF Power Amplifier

1. Place the channel selector in CH 19 position.
2. Adjust Power Supply Voltage to 8.0V.
3. Connect oscilloscope to the base side of T102 (C141) and ground.
4. Adjust L103, L104 and T102 for maximum amplitude on the scope display (27.115 MHz).
5. Next, connect the oscilloscope to the base of Q112 and adjust T102 and T103 for maximum amplitude.

#### 3.5 Alignment of RF Power Amplifier

1. Channel Selector Switch in 19 CH position, Power Supply Voltage 13.8V.
2. Adjust L106 for maximum reading on the RF Watt Meter.
3. Adjust L109 for maximum RF Power Output.
4. Adjust L110 for maximum RF Power Output.
5. Adjust L109 for maximum RF Power Output again.
6. Turn L106 core clockwise so that RF Watt Meter should indicate 4.4W.
7. Turn L110 core counter clockwise until the power reading of 3.8W is obtained.

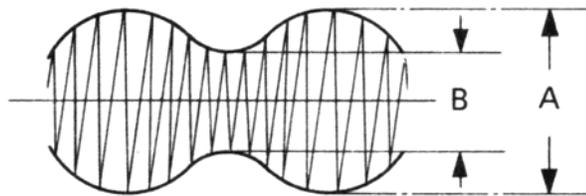
After completion of above alignment, read the total DC current flowing into the power cord, using ampere meter built-in the power supply unit or ampere meter connected series in the power cord. The reading should be 900 mA or less.

#### 3.6 Transmit Frequency Check

1. Set the transceiver into transmit mode, no modulation.
2. Connect the frequency counter to the ANT connector and read the frequency at each channel. The frequency should be within  $\pm 800\text{Hz}$  from each center channel frequency as tabulated in the Frequency Table attached.

### 3.7 Modulation Sensitivity Alignment

1. Set the unit into transmit mode and apply 20 mV, 1 KHz signal to the MIC input circuit.
2. RV – 102 should be adjusted to obtain 90% modulation at this condition.



$$\text{Modulation Ratio} = \frac{A - B}{A + B} \times 100 (\%)$$

**Fig. 8**

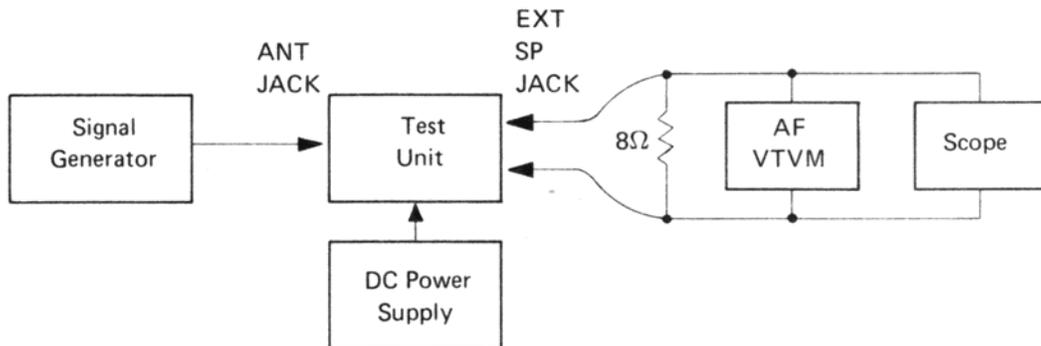
3. Next, decrease signal input to 6 mV and observe that the modulation ratio is still keeping the value higher than 80%.

### 3.8 RF Meter Alignment

Adjust RV – 104 so that the meter pointer should indicate the same wattage as the reading obtained on the watt meter.

## 4. Alignment of Receive Circuitry

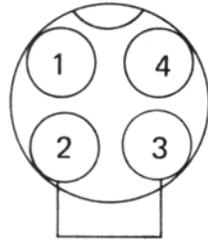
### 4.1 Test Set-Up



**Fig. 9**

Unless otherwise noted, place the RECEIV-O-SLIDE switch in "O" position and ANL switch in the "ON" position.

- 4.2 To place the transceiver into the receiver mode, insert the 4-P plug wired as shown below into the MIC jack on the front panel.



**Fig. 10**

#### 4.3 Receiver Sensitivity Alignment

1. Set the Signal Generator, 27.185 MHz, 1 KHz, 30% modulation. Also set the transceiver into the CH 19 position.
2. Tune the generator to the receiver, CH 19.
3. Adjust T115, T104, T105, L112, T106, T107, T108 and T109 for maximum audio output between the 8 ohm dummy resistor. This alignment should be performed with very small signal input from the signal generator to avoid inaccurate alignment due to agc action.

#### 4.4 Squelch Circuit Alignment

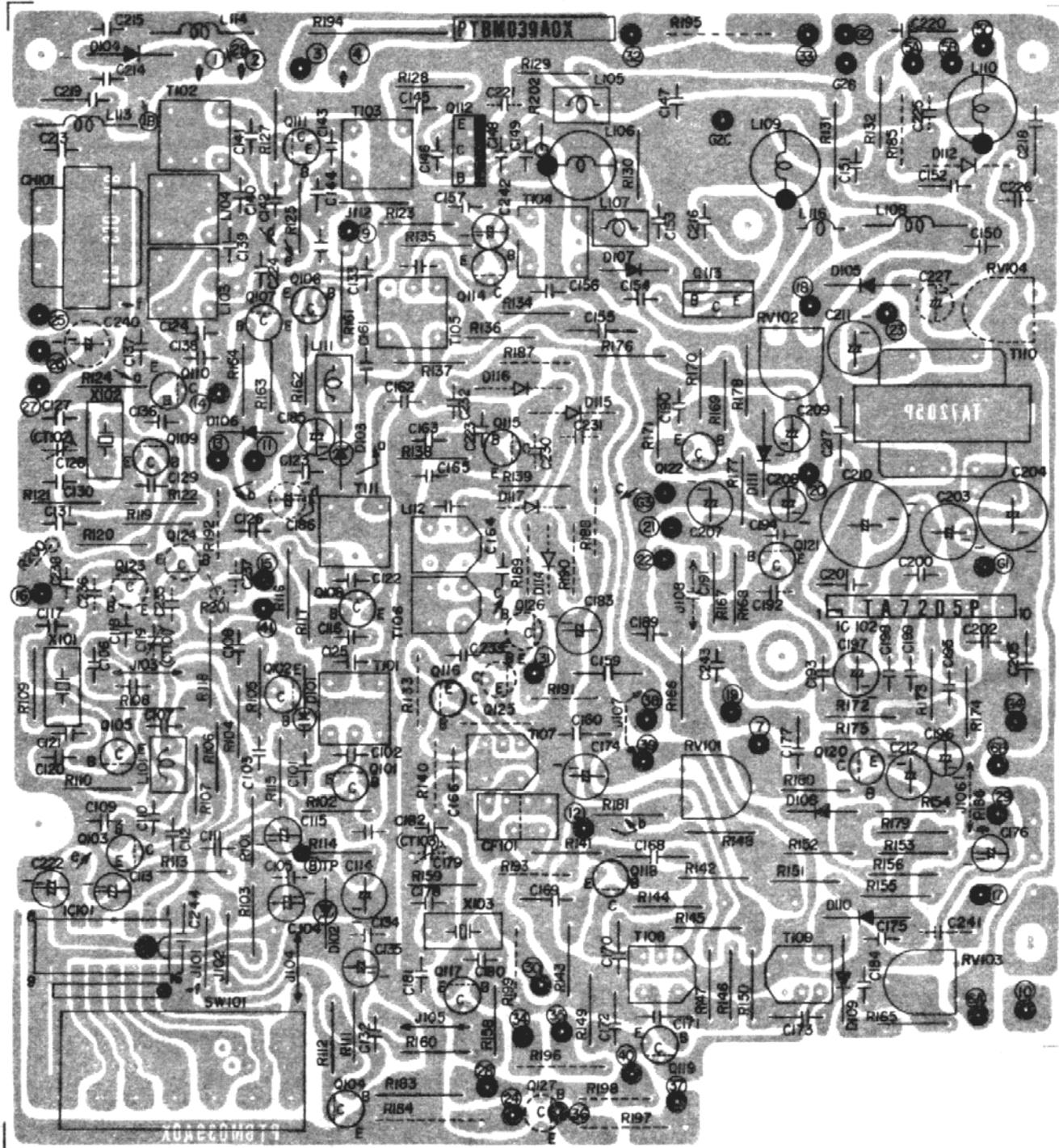
1. Set the signal generator to provide an RF input signal of 300  $\mu$ V (1 KHz, 30% mod.)
2. Rotate the Squelch Control in full clockwise direction.
3. Temporarily adjust the RV – 101 for maximum audio output, and note the audio output level. Then, adjust RV – 101 so that the audio output level decreases by 6 dB.

#### 4.5 S-meter Adjustment

1. Set the signal generator to provide a 100  $\mu$ V signal output.
2. Adjust RV – 103 so that the S-meter pointer should read "9" on the meter provided on the front panel.



# PC BOARD DETAIL



TA 7205P COMBT9

## LIMITED WARRANTY

Electronic equipment from Pearce-Simpson is warranted to the original purchaser for a period of ninety (90) days from the original purchase date — under normal use and service — against defective materials or workmanship. Any implied warranties are also limited in duration to the ninety-day period from the original purchase date. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

This warranty is void if: (1) the equipment has been damaged by accident or unreasonable use, neglect, improper service or other causes not arising out of defects in material or workmanship, (2) if damage is caused by alteration to the product.

Pearce-Simpson shall not be liable for loss of use of the equipment or other incidental or consequential costs, expenses, or damages incurred by the purchaser.

During the above ninety-day period, defective parts will be repaired, adjusted and/or replaced (at Pearce-Simpson's option) without charge to the purchaser when the equipment is returned, prepaid and insured, with proof of purchase date, to an authorized Pearce-Simpson Warranty Service Center.

Equipment returned without proof of purchase date will be repaired, or replaced at the service rates in effect at the time of return.

**PEARCE-SIMPSON**  
DIVISION OF **GLADDING** CORPORATION

**GLADDING** Corporation, America's Oldest Leisure Products Manufacturer, also makes: Gladding cordage, sleeping bags, sleds, toboggans, glass marbles, Aqua-Float and Life-Line water safety equipment, Gladding, South Bend, Glen L. Evans and Horrocks-Ibbotson fishing tackle, Carter and Ringer work clothing, hunting clothing and men's outerwear, and marine and citizen's band radio antennas.

**PEARCE-SIMPSON**  
DIVISION OF **GLADDING** CORPORATION  
P.O. BOX 520800, BISCAYNE ANNEX, MIAMI, FLORIDA 33152  
4701 N.W. 77th AVENUE, MIAMI, FLORIDA 33166

PRINTED IN U.S.A.