Realistic TRC-417 (21-1510) Service Manual

REALISTIC®

Service Manual

21-1510

TRC-417
CB 40-CHANNEL TRANSCEIVER
Catalog Number: 21-1510

CUSTOM MANUFACTURED FOR RADIO SHACK, A DIVISION OF TANDY CORPORATION

CONTENTS

NOTE: For disassembly instructions refer to Exploded View/Disassembly Instructions on page 26.

SPECIFICATIONS

GENERAL

Description
Transmitter.....Crystal controlled PLL synthesizer, amplitude modulation
Receiver.....Crystal controlled double conversion, superheterodyne system
Communication frequencies.....All 40 CB channels (26.965 to 27.405 MHz)
Voltage operation.....12-16V DC (positive or negative ground vehicles)
Temperature and humidity range...-22°F to +140°F (-30°C to +60°C) and 10% to 90%
Transmitter/Receiver switching..... Electrical

STANDARD TEST CONDITIONS

Power supply voltage.....13.8V DC
Modulation.....1000Hz, 30%
Receiver output power.....500mW at external SP
Receiver output impedance.....8 ohms, non-inductive
Ant. load impedance of transmitter.....50 ohms, non-inductive
Measuring channel.....18
Ambient conditions
  temperature.....77°F (25°C)
  humidity.....40 to 70%

TRANSMITTER

		UNIT	NOMINAL	LIMIT
Frequency tolerance at 77°F (25°C) (5 minutes after switch on)		Hz	±100	±1300
Carrier power at no mod.		W	3.9	3.6-4.4
Modulation attack time		msec	18	25
Modulation release time		msec	300	100-500
Modulation distortion at 1kHz 80% mod.		%	3	6
Spurious emission 2nd/3rd/4th/6th 7th/8th/9th/10th		dB	70	60
Modulation 100% capability positive/negative		%	90/95	80/80
Current drain at no mod.		mA	1100	1300
at 80% mod.		mA	1400	1800
Modulation freq. resp. (1kHz 0dB ref.)				
upper at 2.5kHz, EIA		dB	-6	-6 ±3
lower at 450Hz, EIA		dB	-6	-6 ±3
Carrier power uniformity CH to CH at no mod.		W	0.2	0.5
Mic sens. AM for 50% mod		mV	1.0	2.0
AMC range at AM between 50 to 100% mod.		dB	40	30
Occupied band width	± 5.0kHz	dB	-35	-28
	± 7.5kHz	dB	-35	-28
	±10.0kHz	dB	-45	-38
	±12.5kHz	dB	-45	-38
	±15.0kHz	dB	-45	-38
	±17.5kHz	dB	-45	-38
	±20.0kHz	dB	-65	-61
	±22.5kHz	dB	-65	-61

RECEIVER

	UNIT	NOMINAL	LIMIT
Max. sensitivity	μV	0.25	0.5
Sensitivity for S/N	μV	0.5	1.0
Squelch sens. at threshold	μV	0.6	1.2
at tight	μV	1000	355-2820
AGC fig. of merit 50mV for 10dB change in audio output	dB	95	85
Overload AGC characteristics from 50mV to 1V	dB	1	±6
Overall audio fidelity			
upper frequency 2500Hz	dB	-6	-6 ±3
lower frequency 450Hz	dB	-6	-6 ±3
Adjacent channel selectivity (10kHz)	dB	80	60
Max. audio output power	W	6.0	4.5
Audio output power at 10% THD	W	5.0	3.5
THD at 500mW AM: 1mV input			
30% mod.	%	1.5	4
50% mod.	%	2	6
80% mod.	%	3	8
S/N ratio at input 1mV	dB	45	35
Image rejection ratio(1st IF/2nd IF)	dB	90/95	60/50
1/2 IF rejection ratio (2nd IF)	dB	70	60
IF rejection ratio (1st IF/2nd IF)	dB	85/90	70/70
Spurious rejection ratio	dB	70	60
Skirt rejection, 20kHz single signal	dB	100	90
Cross modulation, RS standard	dB	60	50
Desensitivity at 100 μV desired, 20kHz away, 3dB desensitivity	dB	60	55
Signal Meter sens. at "D4"	μV	50	10-100
Oscillator on voltage	V	6.5	11
Current drain at no signal	mA	200	300
Current drain at max. output	mA	1000	1500
Noise limitter test at pulse (at pulse 0.5V signal 0.5 μV no mod.)	dB	18	10
Noise limitter test at level (at 1 μV input)	dB	-1.5	-6
Local emission (Ant. Terminal)	dBm	-73	-67

PUBLIC ADDRESS

	UNIT	NOMINAL	LIMIT
Maximum output power	W	6.0	4.5
10% THD output power	W	5.0	3.5
Mic. sens. for PA 4-W output at 1kHz	mV	3	10
Frequency response			
upper frequency 2500Hz	dB	-6	-6 $\pm$3
lower frequency 450Hz	dB	-6	-6 $\pm$3
Current drain at max. power	mA	1200	1500

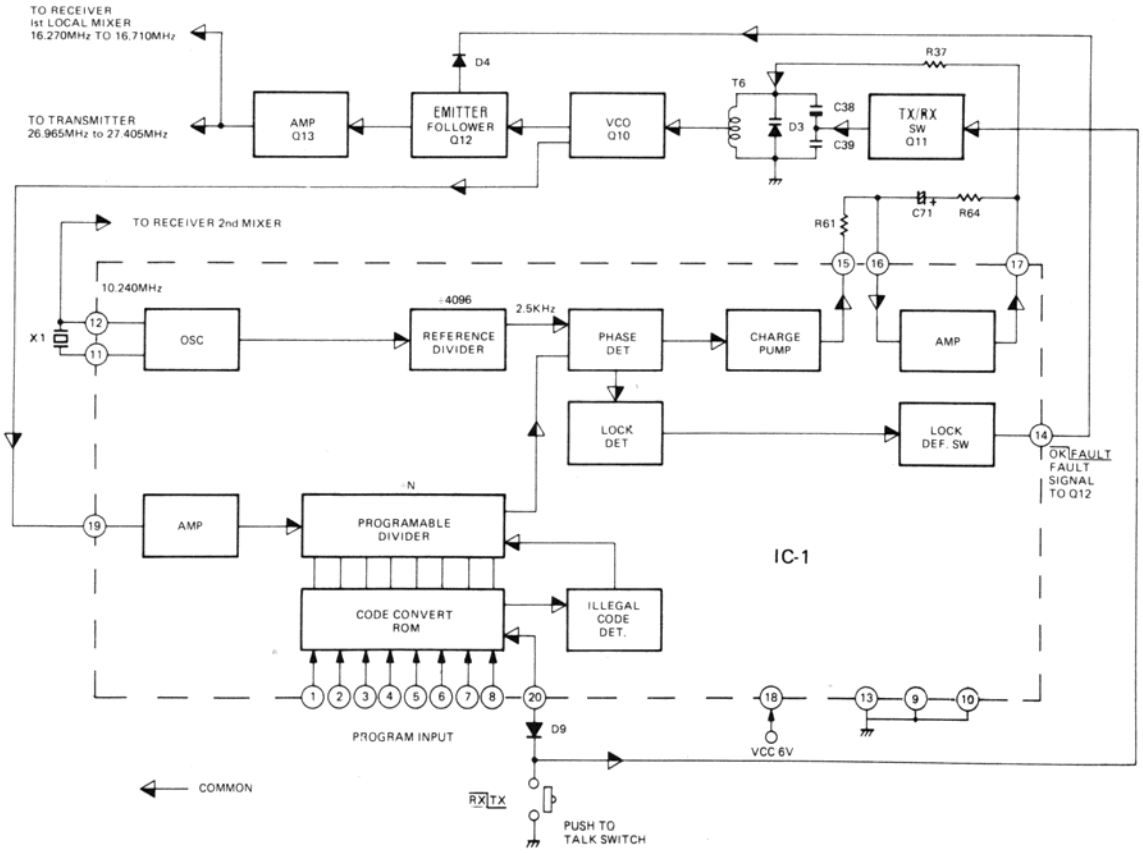
OTHER ITEMS

Fuse.....2 Amp.
General power requirement.....12-16V DC
Dimensions.....1-3/8" x 5-33/64" x 7-1/4"
(35mm x 140mm x 185mm) H.W.D.
Weight..... 2 lbs 2 oz (1kg)

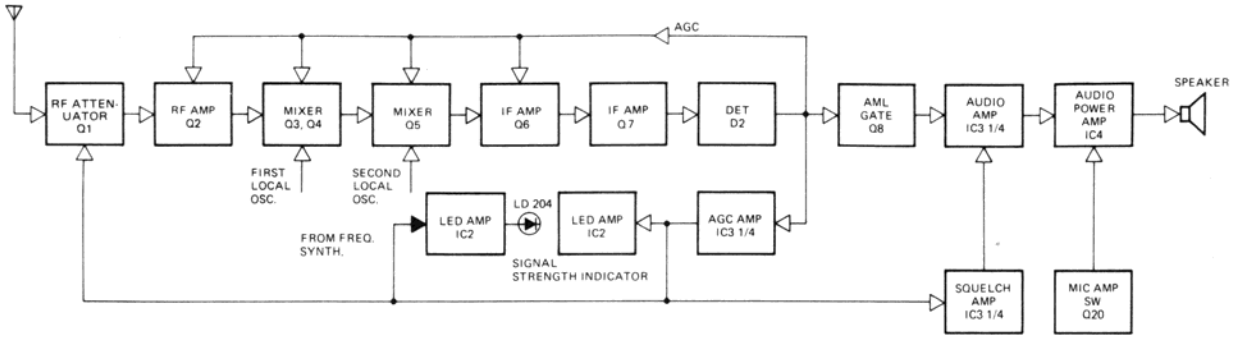
NOTE: Nominal specs represent the design specs; all unit should be able to approximate these--some will exceed and some may drop slightly below these specs. Limit specs represent the absolute worst condition that still might be considered acceptable; in no case should a unit perform to less than within any limit spec.

BLOCK DIAGRAM

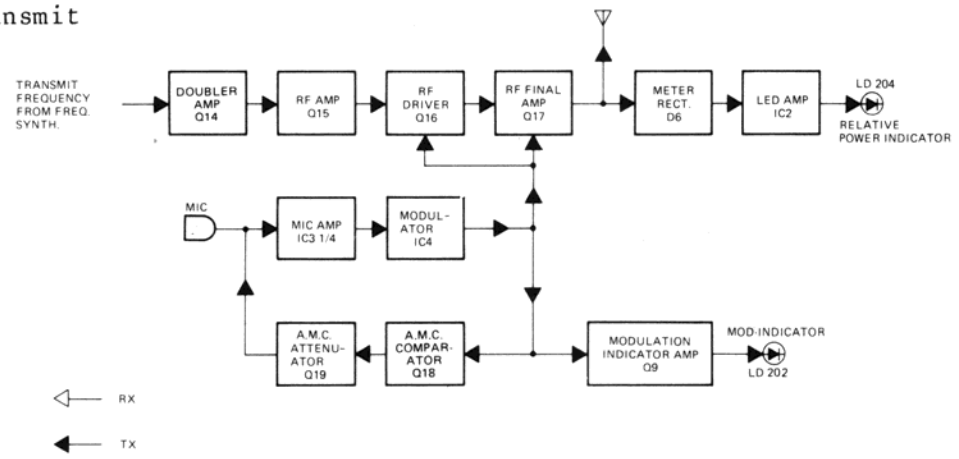
Frequency Synthesizer



Receive



Transmit



CIRCUIT DESCRIPTION

GENERAL

The TRC-417 is a 40-channel, crystal controlled mobile transceiver that consists of a PLL-synthesizer circuit, a receiver circuit and a transmitter circuit. Diode D15 is a polarity-protector. Power is supplied by a car battery (13.8 VDC). Refer to the Block Diagram and the Schematic Diagram as you read the following descriptions.

PLL SYNTHESIZER SECTION

The TRC-417 uses a Phase-Locked-Loop (PLL) circuit to synthesize the local-oscillator frequencies for receiving and transmitting.
It employs one IC and only one crystal. IC1 is a CMOS large scale integrated circuit containing a reference oscillator, phase detector, active low pass filter, reference divider (1/4096 for transmit, 1/2048 for receive) and a programmable divider.

The programmable divider directly divides the output of the VCO (voltage controlled oscillator) down to a 2.5 kHz (5 kHz for the receiver) signal. Crystal X1 provides a reliable frequency standard which controls the local-oscillator frequencies. The reference-frequency divider inside IC1 counts down the oscillator signal to 1/4096, and passes it on to the phase detector, where it is compared with the 2.5 kHz (5 kHz for receiver) signal from the programmable divider. An error voltage is generated by the phase detector, which is proportional to the phase difference between the two 2.5 kHz (5 kHz for receiver) signals.

This error voltage appears at pin 15 of IC1 and passes through the active LPF (low pass filter), where the error voltage is integrated and harmonics and noise are filtered out. The resulting DC voltage is applied to the varicap diode (D3). Its capacity varies with the applied DC voltage. Because of this capacity change, the output frequency of the VCO is corrected. With proper circuit design and precise adjustments, the VCO frequency is accurate and precise when the system is "locked".

This means that the phase detector senses no phase differences between the two 2.5 kHz (5 kHz for receiver) signals, and the VCO generates a frequency that is as accurate and stable as the reference crystal oscillator. The VCO circuit consists of D3, Q10 and T6.

The circuit is connected in the form of a Hartley oscillator with varicap diode D3 as part of the tank circuit. The VCO circuit generates a signal ranging from 13.4825 to 16.710 MHz. The IC1 also includes an unlock-signal-detector circuit. Should the condition occur, the output at pin 14 of IC1, which is normally open, will be shorted to ground. This means that VCO frequency (1st local oscillator for receiving, 1/2 carrier for transmitting) is "sunk" to pin 14 of IC1 through D4, and the transmitter & receiver circuits are inhibited.

TRANSMITTER CIRCUIT

RF Amplication

The output of doubler amp Q14 is fed through doubler tuning (27MHz) T7 and T8 to the base of buffer amp Q15. The output is then supplied through tuning circuit T9 to RF driver amp Q16. The Q16 output capacitance is devided by tuning circuit L9, C59 and C60 and passed through tuning circuit L10 and C65 to the base of final RF stage Q17.

Suppression of Spurious Radiation

The tuning circuit between frequency synthesizer and final amp Q17, and 3-stage "PI" network C63, L3, C66, L2, C67, L1 and C301 in the Q17 output circuit serve to suppress spurious radiation. This network serves to impedance match Q17 to the antenna and to reduce spurious content to acceptable levels. In-band spurious is reduced to acceptable levels by filtering and layout in the freqency synthesizer.

Limiting Power

During factory alignment, the series base resistor of final Q17 (R58) is selected to limit the available power to sightly more than 4 watts. The tuning is adjusted so the actual power is from 3.6 to 3.9 watts, there are no other controls for adjusting power.

Modulation

The mic input is fed to mic amp IC3 and then to audio power IC4, which feeds the signal to the modulation transformer T10. The audio output at the secondary of T10 is fed in series with the B+ voltage through diode D12 to the collectors of Q16 and final Q17 to collector modulate both these stages.

Limiting Modulation

A portion of the modulating voltage is rectified by D10 and Q18 to turn on Q19, which attenuates the mic input to mic amp IC3. The resulting feedback loop keeps the modulation from exceeding 100 percent for inputs approximately 40dB greater than required to produce 50 percent modulation. The attack time is about 13 msec. and the release time is about 320 msec.

RECEIVER CIRCUIT

Receiver

The receiver is a double conversion superheterodyne with the first IF at 10.695MHz and the second IF at 455MHz. The synthesizer supplies the first local oscillator 10.695MHz below the received frequency and the second local oscillator at 10.240MHz. The detector output provides reverse AGC to all previous stages except Q8. The AGC voltage is also amplified by IC3-4 and used to drive RF attenuator Q1, squelch amp IC3-2 and LED amp IC2.

Indicators

Two additonal wafers on the selector switch provide appropriate voltage to a two digit seven segment LED display which indicates the selected channel.

When receiving: The AGC voltage is amplified at IC3-4 and its output is fed to pin 8 of signal indicator IC 2. LD204 will light depending on the strength of the signal.

When transmitting: The "PI" network is coupled with C68. The output voltage is rectified by D6 and supplied to pin 8 of IC2. The transmitted RF power is indicated on LD204. When transmission power becomes 4W, 4 LEDs of LD204 will light altogether.

The modulation voltage is used to switch Q9 which drives LD202 to indicate relative modulation.

FREQUENCIES GENERATED AND MIXED TO OBTAIN EACH CHANNEL

RECEIVE
*VCO FREQUENCY = (N/2048) x REFERENCE FREQUENCY(10.240MHz)

TRANSMIT
*VCO FREQUENCY = (N/4096) x REFERENCE FREQUENCY(10.240MHz)
*TRANSMIT FREQUENCY = VCO FREQUENCY x 2

CHANNEL NUMBERS	BCD INPUT TO IC1	RECEIVE		TRANSMIT		
	IC1 PIN NUMBERS 8 7 6 5 4 3 2 1	N	VCO FREQUENCY (MHz)	N	VCO FREQUENCY (MHz)	TRANSMIT FREQUENCY (MHz)
1	1 1 1 0 1 1 1 1	3254	16.270	5393	13.4825	26.965
2	1 1 1 0 0 0 0 1	3256	16.280	5395	13.4875	26.975
3	1 1 1 0 1 0 0 1	3258	16.290	5397	13.4925	26.985
4	1 1 1 0 1 0 1 0	3262	16.310	5401	13.5025	27.005
5	1 1 1 1 1 0 0 0	3264	16.320	5403	13.5075	27.015
6	1 1 1 1 0 0 0 0	3266	16.330	5405	13.5125	27.025
7	1 1 1 0 1 1 0 0	3268	16.340	5407	13.5175	27.035
8	1 1 1 0 0 0 0 0	3272	16.360	5411	13.5275	27.055
9	1 1 1 0 1 0 0 0	3274	16.370	5413	13.5325	27.065
10	1 1 0 0 0 1 0 0	3276	16.380	5415	13.5375	27.075
11	1 1 0 0 1 1 1 1	3278	16.390	5417	13.5425	27.085
12	1 1 0 0 0 0 0 1	3282	16.410	5421	13.5525	27.105
13	1 1 0 0 1 0 0 1	3284	16.420	5423	13.5575	27.115
14	1 1 0 0 1 0 1 0	3286	16.430	5425	13.5625	27.125
15	1 1 0 1 1 0 0 0	3288	16.440	5427	13.5675	27.135
16	1 1 0 1 0 0 0 0	3292	16.460	5431	13.5775	27.155
17	1 1 0 0 1 1 0 0	3294	16.470	5433	13.5825	27.165
18	1 1 0 0 0 0 0 0	3296	16.480	5435	13.5875	27.175
19	1 1 0 0 1 0 0 0	3298	16.490	5437	13.5925	27.185
20	0 0 1 0 0 1 0 1	3302	16.510	5441	13.6025	27.205
21	1 0 1 0 0 0 0 1	3304	16.520	5443	13.6075	27.215
22	1 0 1 0 0 0 0 1	3306	16.530	5445	13.6125	27.225
23	1 0 1 0 1 0 0 1	3312	16.560	5451	13.6275	27.255
24	1 0 1 0 1 0 1 0	3308	16.540	5447	13.6175	27.235
25	1 0 1 1 1 0 0 0	3310	16.550	5449	13.6225	27.245
26	1 0 1 1 0 0 0 0	3314	16.570	5453	13.6325	27.265
27	1 0 1 0 1 1 0 0	3316	16.580	5455	13.6375	27.275
28	1 0 1 0 0 0 0 0	3318	16.590	5457	13.6425	27.285
29	1 0 1 0 1 0 0 0	3320	16.600	5459	13.6475	27.295
30	1 0 0 0 0 1 0 0	3322	16.610	5461	13.6525	27.305
31	1 0 0 0 1 1 1 1	3324	16.620	5463	13.6575	27.315
32	1 0 0 0 0 0 0 1	3326	16.630	5465	13.6625	27.325
33	1 0 0 0 1 0 0 1	3328	16.640	5467	13.6675	27.335
34	1 0 0 0 1 0 1 0	3330	16.650	5469	13.6725	27.345
35	1 0 0 1 1 0 0 0	3332	16.660	5471	13.6775	27.355
36	1 0 0 1 0 0 0 0	3334	16.670	5473	13.6825	27.365
37	1 0 0 0 1 1 0 0	3336	16.680	5475	13.6875	27.375
38	1 0 0 0 1 0 0 0	3338	16.690	5477	13.6925	27.385
39	1 0 0 0 1 0 0 0	3340	16.700	5479	13.6975	27.395
40	0 1 0 0 0 1 0 0	3342	16.710	5481	13.7025	27.405

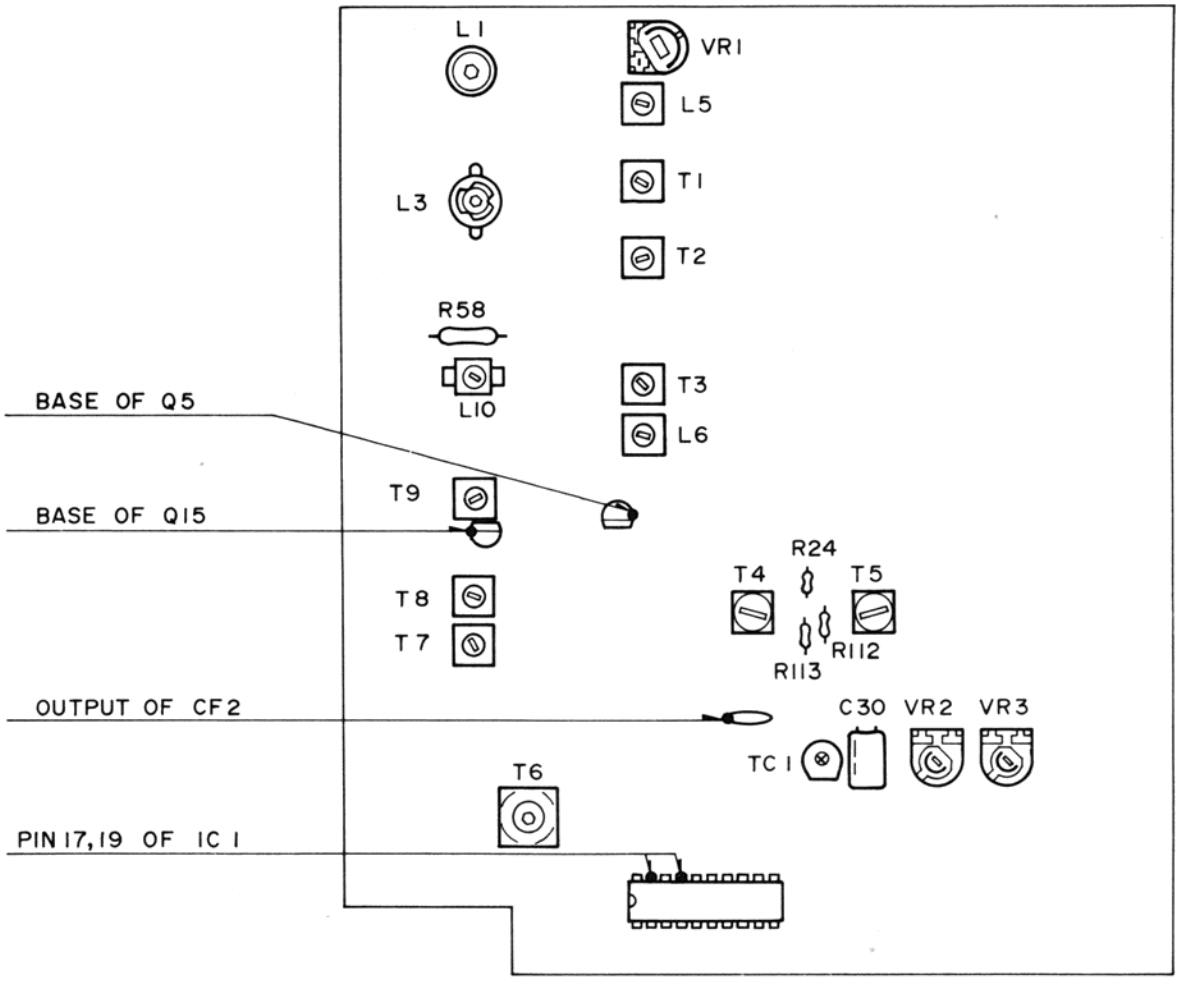

L1
VR1
L5
T1
L3
T2
R58
L10
T3
L6
BASE OF Q5
T9
BASE OF Q15
R24
T4
T5
T8
T7
R112
R113
OUTPUT OF CF2
C30
VR2
VR3
TC1
T6
PIN 17,19 OF IC 1

Figure 1

A. PLL SECTION

1. Test Equipment Required

a. Frequency Counter
b. DC Voltmeter (about 100k ohm)
c. DC Power Supply (13.8V, 2.5 Amp)

NOTE: Figure 1 provides all alignment location information.

2. Test Set-up

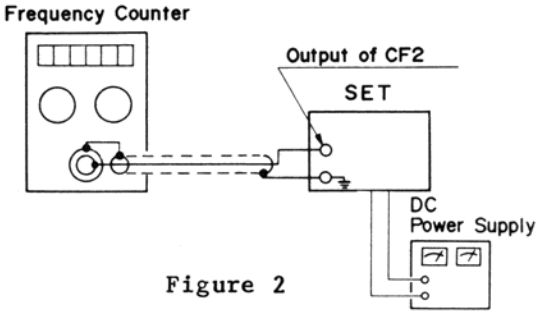


Figure 2

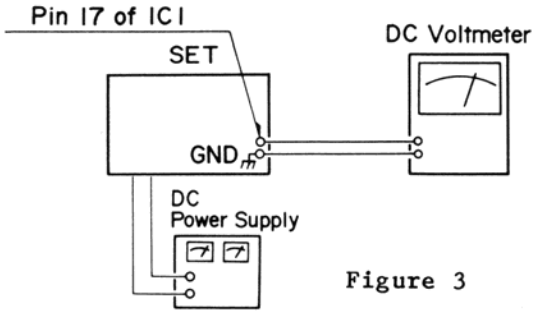


Figure 3

3. Alignment Procedure

STEP	CONTROL SETTING	OUTPUT INDICATOR CONNECTION	ADJUST	ADJUST FOR
1	Alignment of Ref. Osc.			
	Mic: Receive Power: On Volume: Optional Squelch: Optional Channel Selector: Channel 19 CB-PA SW: CB ANL SW: Optional	Connect Frequency Counter to output of CF2. (Figure 2)	TC1	Adjust for 10.240 MHz ±100Hz Indication on Frequency Counter.
2	Alignment of VCO			
	Mic: Transmit Power: On Volume: Optional Squelch: Optional Channel Selector: Channel 40 CB-PA SW: CB ANL SW: OUT	Connect DC Voltmeter to pin 17 of IC1. (Figure 3)	T6	Adjust for 4.5V indication on DC Voltmeter.
3	Mic: Receive Power: On Volume: Optional Squelch: Optional Channel Selector: Channel 1 CB-PA SW: CB ANL SW: Optional	Same as step 2.	Check the indication on DC Voltmeter(must be 2.5-3.5V). If DC Voltmeter does not indicate 2.5-3.5V, readjust T6 and return to step 2.	

B. TRANSMITTER SECTION

1. Test Equipment Required

a. RF Power Meter
b. 50 ohm Load (non-inductive)
c. RF Voltmeter
d. DC Power Supply(13.8V, 2.5 Amp)
e. Field Strength Meter (or Spectrum Analyzer)
f. Frequency Counter
g. Coupler

NOTE: Figure 1 provides test point and all alignment location information.

2. Test Set-up

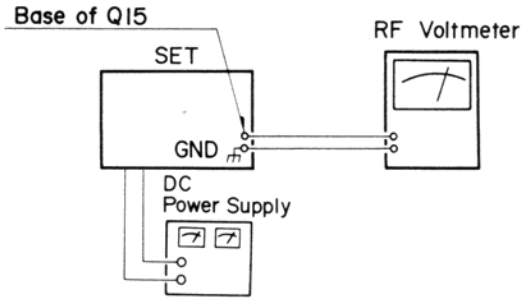


Figure 4

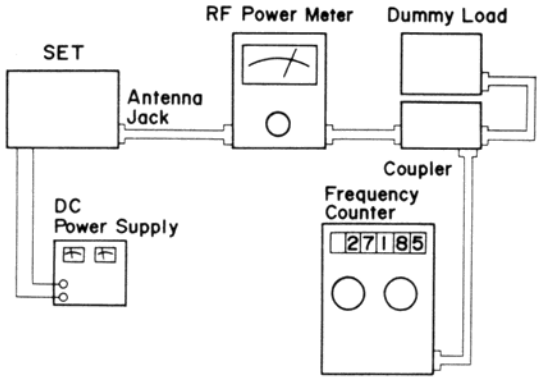


Figure 5

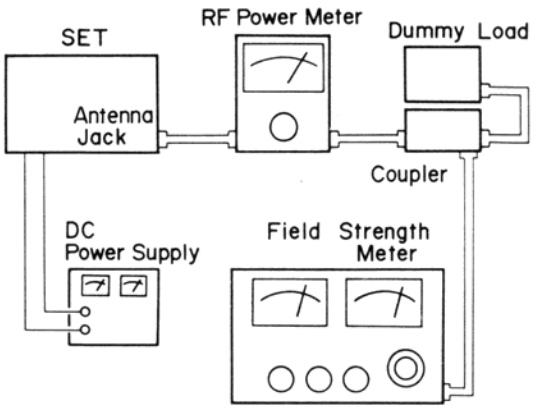


Figure 6

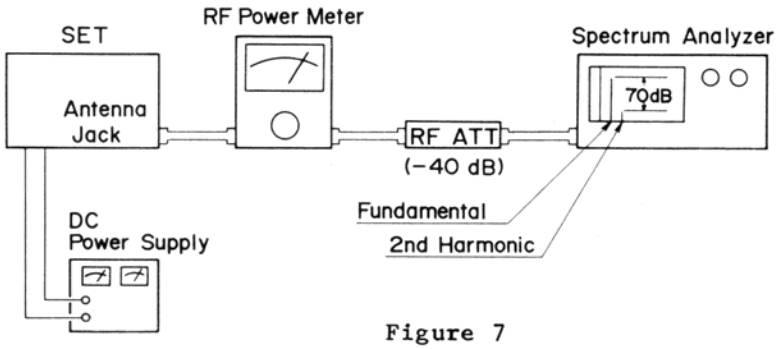


Figure 7

3. Alignment Procedure

STEP	CONTROL SETTING	OUTPUT INDICATOR CONNECTION	ADJUST	ADJUST FOR
1	Set Channel Selector to Channel 19.			
2	Disconnect R58.			
3	Alignment of Predriver Stage			
		Connect RF Voltmeter to base of Q15. (Figure 4)	T7, T8	Adjust for maximum indication on RF Voltmeter.
4	Be sure that the level difference between Channel 1 and Channel 40 is within 30mV on RF Voltmeter. Be sure that the levels on Channel 1 to Channel 40 are above 650mV on RF Voltmeter. If the level difference is over 30mV or the level is below 650mV, repeat step 3 as necessary to obtain maximum output.			
5	Re-connect R58.			
6	Set Channel Selector to Channel 19.			
7	Alignment of Driver and Final Stage			
		Connect Dummy Load and Frequency Counter through Coupler to RF Power Meter. Connect RF Power Meter to EXT. ANT. Jack on Set. (Figure 5)	T9, L1 L10 L3	Adjust for maximum indication on RF Power Meter. Adjust for 4W indication on RF Power Meter.
8		Same as step 7	Check that RF output power is 3.8 to 4.2W on all channels with no modulation. If it is not within the above range, go back steps 3 through 7 and readjust. If still improper change R58 value.	

STEP	CONTROL SETTING	OUTPUT INDICATOR CONNECTION	ADJUST	ADJUST FOR
9		Connect Dummy Load and Field Strength Meter through Coupler to RF Power Meter. Connect RF Power Meter to EXT. ANT. Jack on Set. (Figure 6) Tune to 2nd harmonic frequency (54.37MHz) on Field Strength Meter. Or Connect Spectrum Analyzer and RF Power Meter to EXT. ANT. Jack on Set. (Figure 7)	Check level of fundamental and 2nd harmonic frequency (54.37MHz). Check suppression of 2nd harmonic frequency (54.37MHz) compared to fundamental (must be better than 60dB). Check all channels and if necessary, make sure that is more than -60dB on all channels with no modulation. (Reference: -70dB)	
	Alignment of Transmitter Frequency			
10	Return to Channel 19.	Same as step 8.	TC1	Make sure that the transmitter frequency is 27.185 MHz ±400Hz on Frequency Counter. If not, readjust TC1.
	Alignment of LED RF Meter			
11	Same as step 10.	Same as step 10.	VR1	Adjust for fourth LED on S/RF LED Meter lights.

C. RECEIVER SECTION

1. **Test Equipment Required**
   a. RF Signal Generator
   b. RF Voltmeter
   c. Distortion Meter
   d. AF Voltmeter
   e. Dummy Load (8 ohm)
   f. DC Power Supply (13.8V, 2.5 Amp.)

2. **General Alignment Conditions**
   a. Signal input must be kept as low as possible, to avoid overload and clipping. (Use highest possible sensitivity of output indicator.)
   b. Standard modulation is 1000Hz at 30% amplitude.
   c. A non-metalic alignment tool must be used all for adjustments.
   d. Power Supply is adjusted for 13.8V DC, 2A.

NOTE: Figure 1 provides all alignment location information.

3. **Test Set-up**

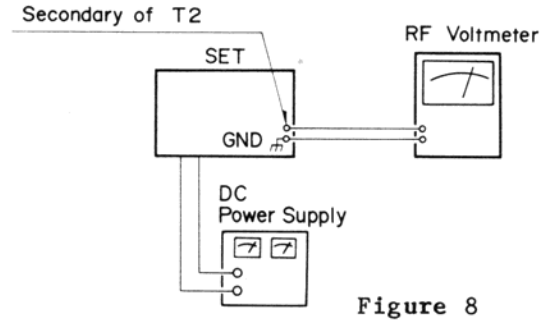


Figure 8

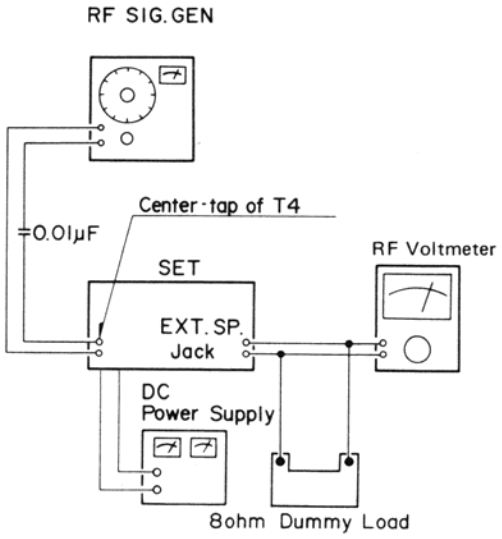


Figure 9

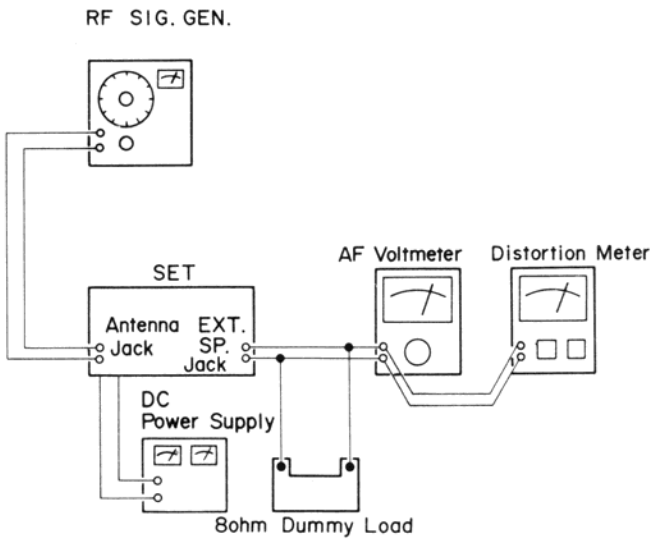


Figure 10

4. Alignment Procedure

STEP	SIGNAL SOURCE CONNECTION	OUTPUT INDICATOR CONNECTION	ADJUST	ADJUST FOR
1	Set Channel Selector to Channel 19.			
2	Turn VR203 (SQUELCH) fully counterclockwise.			
3	Set ANL Switch to OUT and CB-PA Switch to CB.			
4	Turn VR201/2 (VOLUME) fully clockwise.			
5	Alignment of 1st Local OSC			
		Connect RF Voltmeter to secondary of T2. (Figure 8)	L6	Adjust for maximum output.
6	Alignment of 2nd IF			
	Connect RF Signal Generator (455kHz, 30%) to center-tap of T4 through 0.01 µF capacitor. (Figure 9)	Connect RF Voltmeter across EXT. Speaker Jack with 8 ohm dummy load. (Figure 9)	T4, T5	Adjust for maximum output.
7	Alignment of Overall			
	1) Set RF Signal Generator: 1mV at 1kHz, 80% mod. 2) Audio output from RF Signal Generator is 500mW.	1) Connect RF Signal Generator to Ant. Connector. 2) Connect AF Voltmeter and Distortion Meter across Ext. Speaker Jack with 8 ohm dummy load. (Figure 10)	L5, T1, T2, T3, T4	Adjust for maximum indication on Voltmeter.
8	Repeat step 7 as necessary to obtain maximum output.			
9	Alignment of T5			
	Same as step 7.	Same as step 7.	T5	Adjust for minimum indication on Distortion Meter.
10	Alignment of IF Gain			
	Set RF Signal Generator to 0.25 µV (-12dB) output, at 1kHz 30% Mod.	Same as step 7.	R24, R112, R113	Choose the value of combination of R24, R112 and R113 to obtain 50mW audio output. (Table 1)

STEP	SIGNAL SOURCE CONNECTION	OUTPUT INDICATOR CONNECTION	ADJUST	ADJUST FOR
	Alignment of Squelch			
11	Set RF Signal Generator to 1mV (60dB) output. SQUELCH: Fully clockwise	Same as step 7.	VR3	Turn VR3 so that audio output is on.
	Alignment of LED S/RF Meter			
12	Set RF Signal Generator to 50 μV (34dB) output.	Same as step 7.	VR2	Adjust VR2 for the fourth LED on S/RF Meter lights.
13	Check the five LEDs light at the input of 2-100mV.			

	R112	R113	R24	TOTAL VALUES
1	22	--	--	22
2	--	6.8	--	6.8
3	--	--	8.2	8.2
4	22	6.8	--	28.8
5	22	--	8.2	30.2
6	--	6.8	8.2	15
7	22	6.8	8.2	37

Table 1

TROUBLESHOOTING HINTS

SYMPTOM	CAUSE	REMEDY
A. Unit will not turn on	1. Defective power switch SW1. 2. Fuse blown. 3. Broken DC power cable. 4. Poor solder connection or other open connection in power circuit.	Replace. Replace. Replace. Repair or replace.
B. Won't receive sound	1. Defective external speaker jack. 2. Poor contact on microphone connector. 3. Defective push switch on microphone. 4. Defective internal speaker. 5. Defective Q1-Q8 circuit. 6. Check the PLL circuit and defective component(s) in PLL and VCO circuit.	Repair or replace. Repair as required. Repair or replace microphone. Replace. Replace the defective component(s). Replace the defective component(s).
C. No noise from speaker	1. Measure transistor & IC voltages in all audio stages and receiver section. Compare with voltages noted on the IC & Transistor Voltage Chart. 2. Improper local oscillator adjustment. 3. Defective squelch circuit (D14, IC3, VR202 and VR3). 4. If MOD indicator is bright when power switch is on, speaker circuit is open.	 Re-adjust. Replace the defective component(s).
D. No transmission	1. Defective microphone. 2. Defective push switch on microphone. 3. Improper adjustment of carrier oscillator. 4. If you have checked all channels and obtain no RF output, check VCO and/or signal track through transmitter circuit. 5. Defective CB-PA switch (SW202-b). 6. Defective antenna connector. 7. Defective Q14-Q17 circuit.	Repair or replace the microphone. Replace. Re-adjust. Replace. Replace. Replace the defective component(s).

SYMPTOM	CAUSE	REMEDY
E. No modulation	1. Defective microphone. 2. Poor audio output/defective modulator. 3. Defective microphone amplifier (IC3 and IC4). 4. Defective microphone connector. 5. Defective AMC circuit (Q18, Q19, D10 and D12).	Repair or replace. Replace the defective component(s). Replace the defective component(s). Replace. Replace the defective component(s).
F. No squelch	1. Defective IC3,VR3 and VR203 circuit. 2. Improper adjustment of VR3.	Replace the defective component(s). Re-adjust.
G. Meter does not operate but CB operate normally	1. Defective LD204. 2. Defective IC2 and IC3. 3. Defective D6, VR1 or VR2.	Replace. Replace. Replace the defective component(s).
H. Modulation indicator does not light	1. Defective LD202 or Q9. 2. Check the modulation.	Replace the defective component(s). Refer to "E. No modulation".