REALISTIC®

Service Manual

21-1526

CB 40-CHANNEL TRANSCEIVER
TRC-466

Catalog Number : 21-1526

CUSTOM MANUFACTURED FOR RADIO SHACK A DIVISION OF TANDY CORPORATION

CONTENTS

SPECIFICATIONS

GENERAL SPECIFICATIONS

Description

Transmitter ..... Crystal controlled PLL synthesizer, amplitude modulation
Receiver ..... Crystal controlled double conversion, superheterodyne system
Communicating frequencies ..... All 40 CB channels (26.965 to 27.405 MHz)
Voltage operation ..... 12 — 16 V DC
(positive or negative ground vehicles)
Temperature and Humidity range ..... −30° C to +60° C and 10% to 90%
Transmitter/Receiver switching ..... Electronic

STANDARD TEST CONDITIONS

Battery supply voltage ..... 13.8 V DC
Modulation ..... 1000 Hz, 30%
Receiver output power ..... 500 mW at external SP.
Receiver output impedance ..... 8 ohms, non-inductive
Ant. load impedance of transmitter ..... 50 ohms, non-inductive
Ambient conditions
temperature ..... 17 to 23° C
humidity ..... 40 to 70%

TRANSMITTER SPECIFICATIONS

Description	Nominal	Limit
RF power output	4.0 watts	3 — 4 watts
Emission	8A3	
Modulation Capabilities	+90%, −100%	
AMC Range at 1 kHz	40 dB	> 30 dB
Frequency accuracy	0.002%	0.005%
Spurious radiation & Harmonic signal radiation radio from fundamental	−65 dB	−60 dB
Current consumption unmodulated	1200 mA	1800 mA
Current consumption max. modulated	1800 mA	2000 mA
Envelope distortion	10% max. 1000 Hz, 50% mod.	
Hum and Noise level	40 dB min. below max. mod.	
Stability against variation of antenna impedance	Satisfactory when dummy antenna is varied from 40 ohms to 200 ohms.	

RECEIVER SPECIFICATIONS

Description	Nominal	Limit
Intermediate frequency		
1st IF	10.695 MHz	
2nd IF	455 kHz	
Sensitivity for 500 mW output	0.25 μV	0.5 μV
Sensitivity at 10 dB S + N/N	0.5 μV	1.4 μV
Adjacent Channel Rejection	80 dB	60 dB
Image Rejection (5.7 MHz)	50 dB	$>$40 dB
Bandwidth (−6 dB)	7.6 kHz	5 − 9 kHz
Signal-to-Noise ratio		
at 1 mV input	40 dB	35 dB
Distortion at 5 mV input	2.5%	$<$6%
AGC Figure of merit at 50 mV input	105 dB	$>$90 dB
Power output at 500 μV Input		
Undistorted (10% THD)	3.5 W	$>$3.0 W
Maximum	5.0 W	$>$4.0 W
Electrical fidelity compared to 1000 Hz		
400 Hz	−6 dB	− 6 ± 5 dB
2000 Hz	−6 dB	−6 ± 5 dB
Cross Modulation	50 dB	$>$46 dB
Squelch	Adjustable from 0.5 μV to 1 mV	
Current consumption (no signal)	300 mA	$<$450 mA

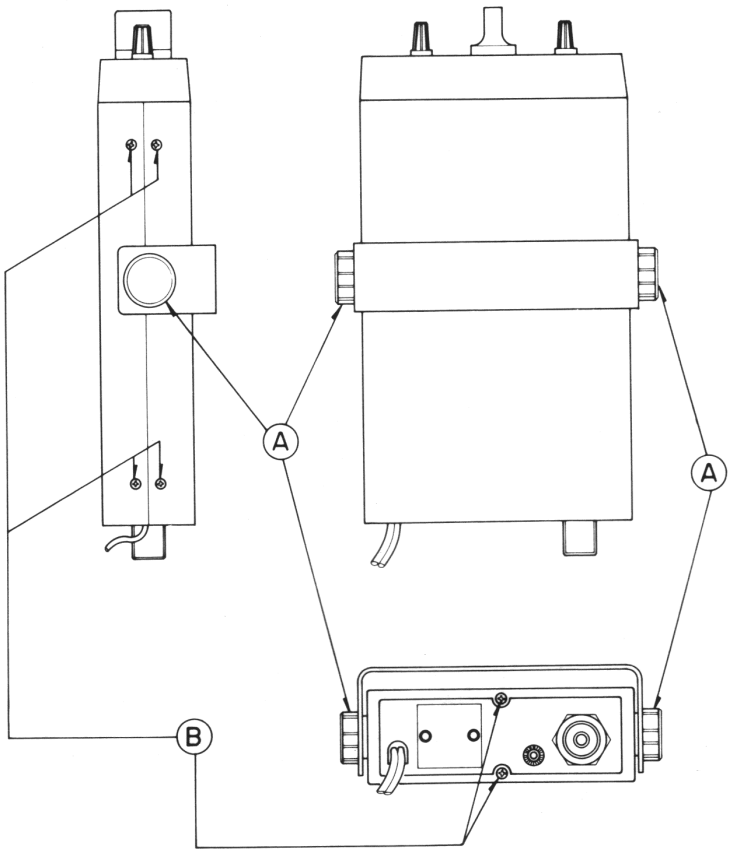
OTHER ITEMS

Fuse	2 Amp.
General power requirement	12 − 16 V DC
Dimensions	(H)1-11/16" (43mm) × (W)5-11/32" (136mm) × (D)9-13/16" (249mm)
Weight	2 Lbs. 14 oz. (1.3 kg)

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

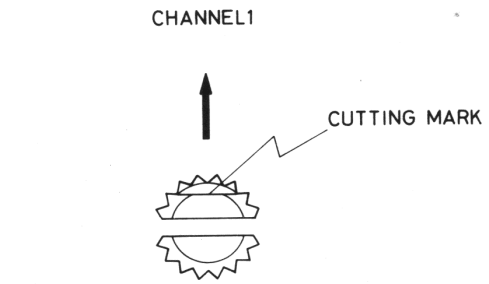
DISASSEMBLY INSTRUCTIONS

1. Remove (2) mounting bracket screws Ⓐ.
2. Remove (10) screws Ⓑ from top and bottom covers.
   (Four screws from each side and two from rear of unit.)
   Caution: Speaker wires are attached to bottom cover.

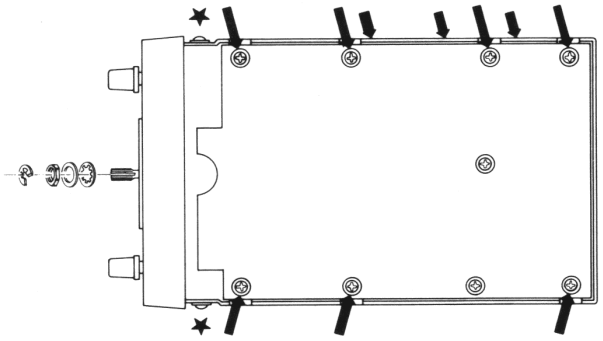


REMOVING PRINTED CIRCUIT BOARD

1. Pull Channel Selector knob off.
2. Remove E Ring, nut, washer and lock washer from Channel Selector shaft.
3. Remove (14) screws from Printed Circuit Board.
   (7 screws marked ⬅, 3 screws marked ⬅ and 4 screws marked ★)
4. Carefully remove P.C.B. from chassis.

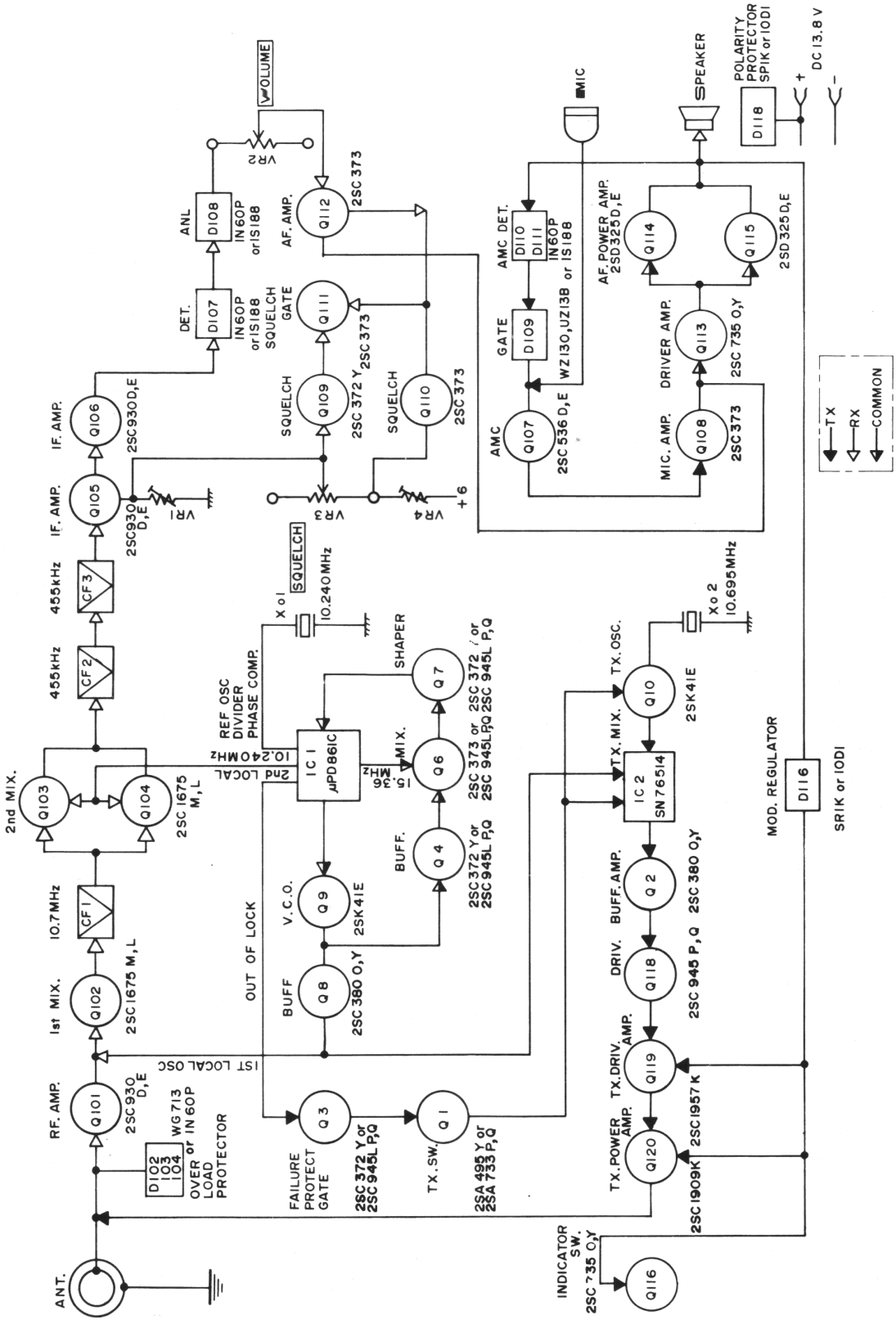


POSITION OF CHANNEL KNOB SHAFT



IMPORTANT NOTE:
When replacing the Channel knob, you must be sure to index it correctly. There is the cutting mark on the switch shaft, rotate the shaft so the cutting mark of the shaft is up and precisely horizontal. Now position the knob to indicate Channel 1 and carefully press the knob in place (don't turn either the knob or shaft while doing this). As a double-check, connect a Frequency Counter to the unit and check Transmit frequency (should be 26.965 MHz).

BLOCK DIAGRAM

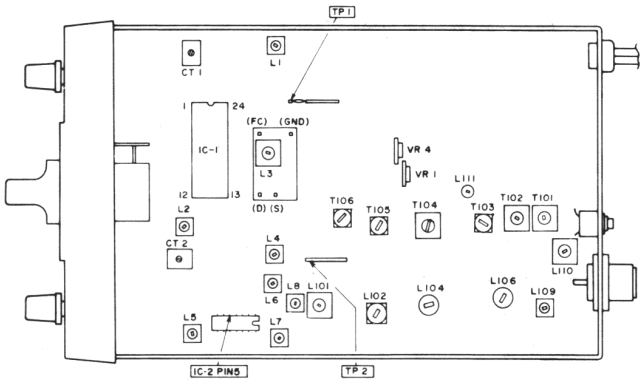


ALIGNMENT INSTRUCTIONS

A. PLL SECTION

1. Test Equipment Required

a. V.T.V.M.
b. Frequency Counter
c. DC Power Supply (13.8 Volt, 2.5 Amp.)
d. Oscilloscope
e. RF Output Power Meter
f. DC Volt Meter (above 100 KΩ /V)



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

2. Alignment Procedure

STEP	CONTROL SETTING	OUTPUT INDICATOR CONNECTION	ADJUST	ADJUST FOR
1	Set Channel Selector to channel 1.			
2	MIC: Receive POWER: "on" VOLUME: Optional SQUELCH: Optional	Connect DC Volt Meter to "FC" on P.C.B. (Figure 2) Also see P.C.B. Bottom View.	L3	Adjust for 1.2 Volt indication on DC Volt Meter.
3	MIC: Receive POWER: "on" VOLUME: Optional SQUELCH: Optional Channel Selector: Channel 40	Same as step 2. (Figure 2)	Check for indication on DC Volt Meter (must be 3 - 3.5 Volt). If DC Volt Meter does not indicate 3 - 3.5 Volt, readjust L3, return to step 2.	
4	Same as step 2. (Return Channel Selector to Channel 1).	Connect Frequency Counter to TP-1. (Figure 3)	CT1	Adjust for 10.240 MHz ± 50 Hz indication on Frequency Counter.
5	Same as step 2.	Connect RF V.T.V.M. to TP-1. (Figure 2)	L1	Adjust for maximum indication on RF V.T.V.M. (reference 160 ± 30 mV)
6	Same as step 2.	Oscilloscope to pin 13 of IC 1 (Figure 4)	L2	Adjust L2 to obtain square wave (must be 5 VP-P). before adjustment ⇒ 5V P-P after adjustment
7	MIC: Receive POWER: "on" VOLUME: Optional SQUELCH: Optional Channel Selector: Channel 20	Connect RF V.T.V.M. to TP-2. (Figure 4)	L4 L6	Adjust for maximum indication on RF V.T.V.M. (reference 120 mV)
8	Check for indication on DC Volt Meter at Channel 1/Channel 40, it must be 1.2 - 1.5 Volt/3 - 3.5 Volt. (See Figure 2) If DC Volt Meter does not read within these tolerances, readjust L3. If readings are still improper, component(s) may be defective.			

B. RECEIVER SECTION

1. Test Equipment Required

a. RF Signal Generator
b. V.T.V.M.
c. Oscilloscope
d. RF V.T.V.M.
e. Distortion Meter

2. General Alignment Conditions

1. Signal input must be kept as low as possible, to avoid overload and clipping. (Use highest possible sensitivity of output indicator.)
2. Standard modulation is 1000 Hz at 30% amplitude.
3. A non-metalic alignment tool must be used for all adjustments.
4. Connection of test equipment is shown in Figure 5.
5. Power supply adjusted for 13.8 V DC, 2 A.

NOTE: Figure 1 provides alignment location information.

3. Alignment Procedure

STEP	SIGNAL SOURCE CONNECTION	OUTPUT INDICATOR CONNECTION	SET SIGNAL	ADJUST	ADJUST FOR
1	Set Channel Selector to Channel 20				
2	Turn VR-3 (SQUELCH) fully counterclockwise.				
3	Turn VR-2 (VOLUME) fully clockwise.				
4	RF Signal Generator connected to Antenna Connector (Figure 5)	V.T.V.M. connected across Ext. Speaker Jack with 8 Ω load (Figure 5)	27.205 MHz (modulation)	L110	Adjust for maximum output
5				T101	
6				T102	
7				T103	
8				T104	
9				T105	
10				T106	
11				L111	
12	Repeat steps 4 through 11 as necessary to obtain maximum sensitivity.				
13	Same	Same	27.205 MHz (modulated) Signal Input should be set to 0.125 μV	VR-1 Gain Control	Adjust for 2.0 Volts V.T.V.M. indication across 8 ohm resistor.
14	Turn VR-3 (SQUELCH) fully clockwise.				
15	Same	Same	27.205 MHz (modulated) Signal Input should be set to 400 μV	VR-4	Output to be 2 volts

C. TRANSMITTER SECTION

1. Test Equipment Required

a. RF Output Power Meter
b. 50 Ohm Load (non-inductive)
c. RF Attenuator
d. Oscilloscope
e. Audio Generator
f. DC Power Supply (13.8 Volt, 2.5 Amp.)
g. Field Strength Meter (or Spectrum Analyzer)
h. Frequency Counter

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

2. Alignment Procedure

STEP	SIGNAL SOURCE CONNECTION	OUTPUT INDICATOR CONNECTION	ADJUST	ADJUST FOR
1	Set Channel Selector to Channel 20			
2	Disconnect R179 (or short base of Q119 to ground with 0.01 μF). See Figure 11.			
3		Connect RF V.T.V.M. to pin 5 of IC2 (Figure 6)	L5	Adjust for maximum indication on RF V.T.V.M.
4		Connect RF V.T.V.M. to base of Q118 (Figure 7)	L7	Adjust for maximum indication on RF V.T.V.M.
5			L8	
6			L101	
7			L5	Adjust for 400 mV indication on RF V.T.V.M.
8	Repeat steps 4 through 7 as necessary to obtain maximum output and 400 mV.			
9	Re-connect R179 (or remove shorting capacitor)			
10		Connect Dummy Load and Frequency Counter through Coupler to RF Power Meter. Connect RF Power Meter to EXT. ANT Jack on Set. (Figure 8)	L102	Adjust for maximum indication on RF Power Meter.
11			L104	
12			L106	
13	Repeat steps 10 through 12 as necessary to obtain maximum output.			
14	Adjust the core of L102 down (1/2 turn).			
15	Adjust the core of L104 up (1/2 turn).			
16		Connect Dummy Load and Frequency Counter through Coupler to RF Power Meter. Connect RF Power Meter to EXT. ANT Jack on Set. (Figure 8)	Check that RF output power is 3.5 to 4 W on all channels with no modulation. If it is not within the above range, go back to steps 11 through 13 and readjust. If still improper, change R179 value (0 — 10 ohms).	

STEP	SIGNAL SOURCE CONNECTION	OUTPUT INDICATOR CONNECTION	ADJUST	ADJUST FOR
17	(Return to Channel 20.)	Same as step 17	CT2	Adjust for 27.205 MHz ± 100 Hz indication on Frequency Counter
18	Audio Generator (1 kHz) across C152 or to Microphone Connector, pin 4. (Figure 9) Adjust audio signal level (about 2 mV) to obtain 80-100% modulation level.	Connect Dummy Load and Oscilloscope through Coupler to RF Power Meter. Connect RF Power Meter to EXT. ANT Jack on Set. (Figure 9)	Check scope pattern for proper modulation	
※ 19		Connect Dummy Load and Field Strength Meter through Coupler to RF Power Meter. Connect RF Power Meter to EXT. ANT Jack on set. (Figure 12) Tune to 2nd harmonic frequency (54.41 MHz) on Field Strength Meter.	L109	Adjust for min. (54.41 MHz) indication on Field Strength Meter.
20	Check level of fundamental and 2nd harmonic frequency (54.41 MHz).			
21	Check suppression of 2nd harmonic frequency (54.41 MHz) compared to fundamental (must be better than −70 dB).			
22	Check all Channels and if necessary, repeat steps 19 through 21 to obtain more than −50 dB on all channels with no modulation.			

※ : If you have a Spectrum Analyzer, you can obtain more precise readings with it.

STEP	SIGNAL SOURCE CONNECTION	OUTPUT INDICATOR CONNECTION	ADJUST	ADJUST FOR
A		Connect Spectrum Analyzer and RF Attenuator through RF Power Meter. Connect RF Power Meter to EXT. ANT Jack on Set. (Figure 10)	L109	Adjust for min (54.41 MHz) indication on Spectrum Analyzer.
B	Go to step 20.			

EQUIPMENT CONNECTIONS

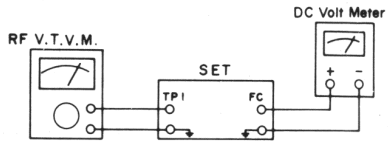


Figure 2

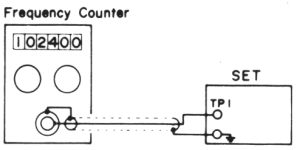


Figure 3

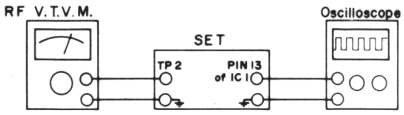


Figure 4

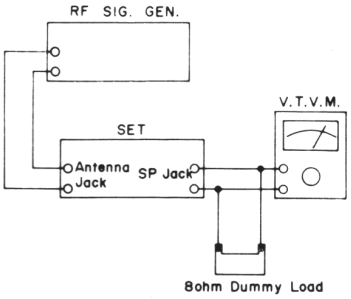


Figure 5

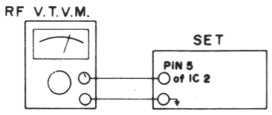


Figure 6

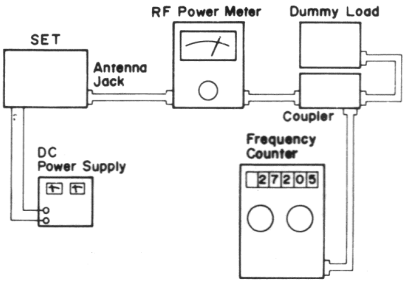


Figure 8

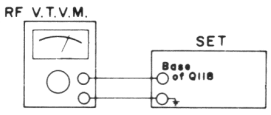


Figure 7

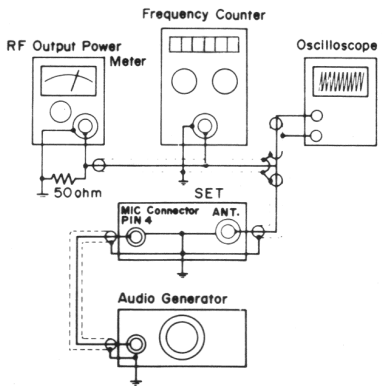


Figure 9

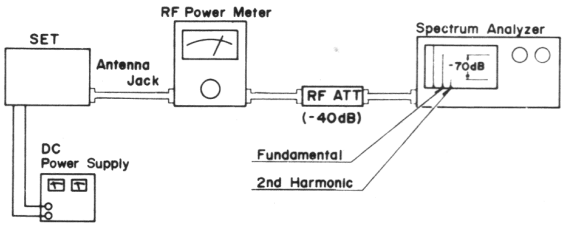


Figure 10

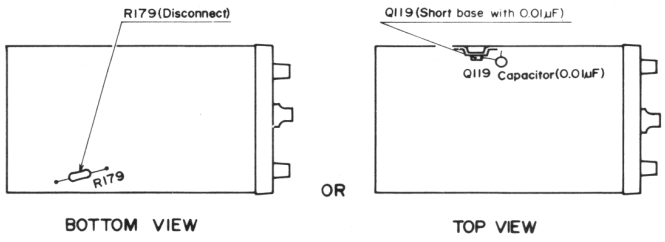


Figure 11

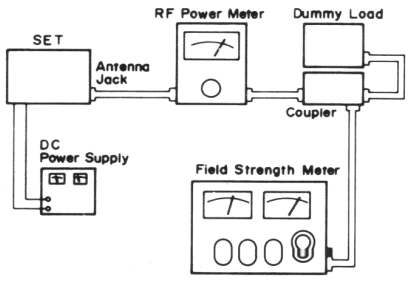


Figure 12

FREQUENCIES GENERATED AND MIXED TO OBTAIN EACH CHANNEL

• VCO FREQUENCY = [(N/1024 + 1.5)] × [REFERENCE FREQUENCY (10.240 MHz)]
• TRANSMIT FREQUENCY = (VCO FREQUENCY) + [1 st IF FREQUENCY (10.695 MHz)]

CHANNEL NUMBERS	BCD INPUT TO IC-1 IC-1 PIN NUMBERS 8765	4321	N	VCO FREQUENCY (MHz)	TRANSMIT FREQUENCY (MHz)
1	0000	0001	91	16.270	26.965
2	0000	0010	92	16.280	26.975
3	0000	0011	93	16.290	26.985
4	0000	0100	95	16.310	27.005
5	0000	0101	96	16.320	27.015
6	0000	0110	97	16.330	27.025
7	0000	0111	98	16.340	27.035
8	0000	1000	100	16.360	27.055
9	0000	1001	101	16.370	27.065
10	0001	0000	102	16.380	27.075
11	0001	0001	103	16.390	27.085
12	0001	0010	105	16.410	27.105
13	0001	0011	106	16.420	27.115
14	0001	0100	107	16.430	27.125
15	0001	0101	108	16.440	27.135
16	0001	0110	110	16.460	27.155
17	0001	0111	111	16.470	27.165
18	0001	1000	112	16.480	27.175
19	0001	1001	113	16.490	27.185
20	0010	0000	115	16.510	27.205
21	0010	0001	116	16.520	27.215
22	0010	0010	117	16.530	27.225
23	0010	0011	120	16.560	27.255
24	0010	0100	118	16.540	27.235
25	0010	0101	119	16.550	27.245
26	0010	0110	121	16.570	27.265
27	0010	0111	122	16.580	27.275
28	0010	1000	123	16.590	27.285
29	0010	1001	124	16.600	27.295
30	0011	0000	125	16.610	27.305
31	0011	0001	126	16.620	27.315
32	0011	0010	127	16.630	27.325
33	0011	0011	128	16.640	27.335
34	0011	0100	129	16.650	27.345
35	0011	0101	130	16.660	27.355
36	0011	0110	131	16.670	27.365
37	0011	0111	132	16.680	27.375
38	0011	1000	133	16.690	27.385
39	0011	1001	134	16.700	27.395
40	0000	0000	135	16.710	27.405

ANTENNA SYSTEM

An antenna system can be considered to include the antenna proper, the feed line and any coupling devices used for transferring power from the transmitter to the line and from the line to the antenna. Some simple systems may omit the transmission line or one or both of the coupling devices.

Selecting an Antenna

For mobile operation at 27 MHz, the vertical whip antenna is almost universally used. Since longer whips present mechanical difficulties, the length is usually limited to a dimension that will

resonate as a quarter-wave antenna in the CB band; the car body serves as the ground connection. This antenna length is approximately 8.5 feet. With the whip length adjusted to resonance in the CB band, the impedance at the feed point, X, Fig. A, will appear as a pure resistance at the resonant frequency.

Mobile Antenna
Minimizing Losses

There is little that can be done about the nature of the coil. However, poor electrical contact between large surfaces of the car body, and especially between the point where the feed line is grounded and the rest of the body, can add materially to the ground-loss resistance.
For example, the feed line, which should be grounded as close to the base of the antenna as possible, might be connected to the bumper, while the bumper may have poor contact with the rest of the body because of rust or paint.

Feeding the Antenna

It is usually found most convenient to feed the whip antenna with coax line. Unless very low-Q loading coils are used, the feed-point impedance will always be appreciably lower than 52 ohms — the characteristic impedance of the commonly-used coax line, RG-8/U or RG-58/U.
One method of obtaining a match is shown in Fig. B. For detailed information on precise loading and matching of Antennas and Transmission line systems, refer to the lastest edition of the **ARRL Handbook**.

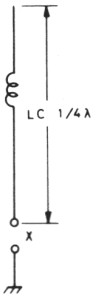


Figure A

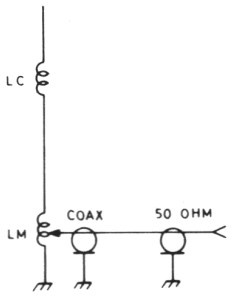


Figure B

TROUBLE SHOOTING HINTS

UNIT WILL NOT TURN ON
1. Defective power switch.
2. Fuse blown.
3. Broken DC power cable.
4. Poor solder connection or other open connection in power circuit.

NO 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 semiconductor in RX circuit.

NO NOISE
1. Apply audio signal to Q112 base. (signal inject/trace).
2. Measure transistor voltages in all audio stages and receiver section and compare with voltage noted in chart.
3. Improper local oscillator adjustment or main oscillator.

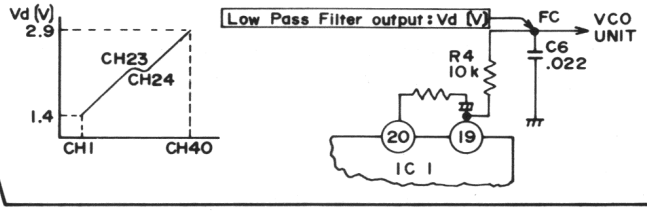
NO TRANSMISSION
1. Defective microphone connector.
2. Defective push switch on microphone.
3. Improper adjustment of main oscillator or local oscillator.
4. If you have checked all channels and obtain no RF output, check DC Control voltage of VCO and/or signal trace through transmitter circuit.
5. Defect in power supply.
6. Defective antenna connector.

NO MODULATION
1. Defective microphone.
2. Poor audio output/Defective modulator.
3. Inoperative microphone amplifier.
4. Defective microphone connector.
5. Apply audio signal to pin No. 4 of microphone connector and trace to defective stage.

PLL TROUBLE SHOOTING HINTS

Local Oscillator (PLL) output frequency NG (TP-2)

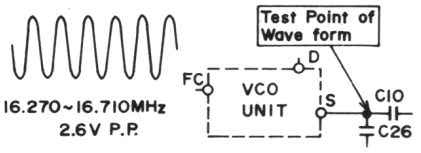
Check DC Voltage of PLL Low Pass Filter output (Vd).



NG

OK

Check whether VCO oscillate.



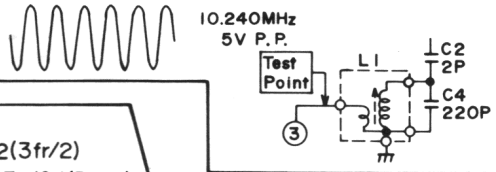
NG

OK

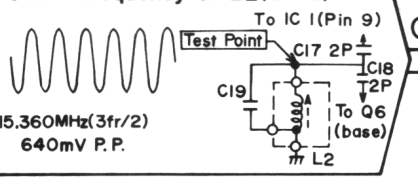
Change VCO UNIT.

Check frequency of XO1. If frequency(fr) is not 10.240MHz, make readjustment of CT 1.

IF "fr" doesn't become to 10.240MHz, replace "XO1" and make readjustment of CT 1.



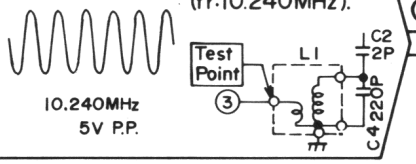
Check frequency of L2(3fr/2)



NG

OK

Check reference frequency (fr:10.240MHz).



NG

OK

Check whether bias voltages of Q4/Q6 are OK. (see voltage chart)

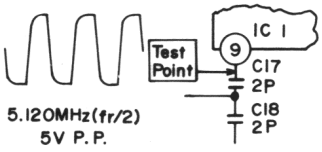
NG

Replace the defective component(s).

OK

Change XO1 and make readjustment of CT 1.

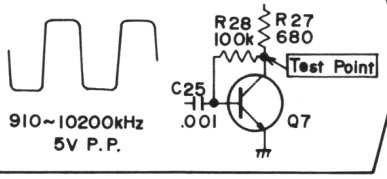
Check frequency of IC 1(PIN 9)



NG

OK

Check collector wave form of Q7.



NG

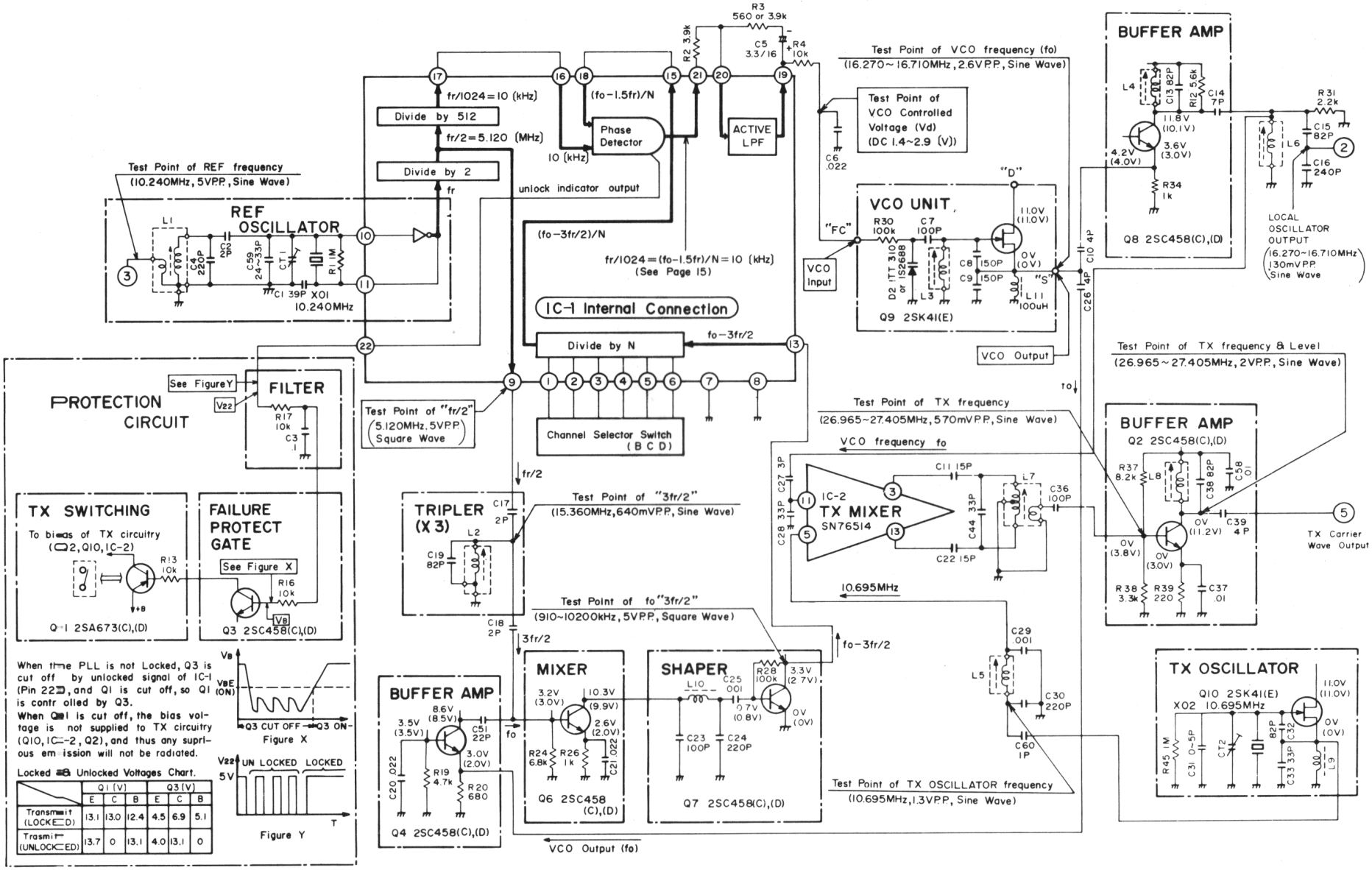
OK

Change IC 1

Make readjustment of L2

Check whether bias voltages of Q7 are OK.(see voltage chart). Replace the defective component(s)

Change IC 1



NOTE

1. ALL VOLTAGE VALUES ARE INDICATED IN VOLTS WITH NO SIGNAL, MEASURED WITH V.T.V.M.
2. ( ): VOLTAGE IN TRANSMIT MODE.

CIRCUIT DESCRIPTION

A. The Basic PLL

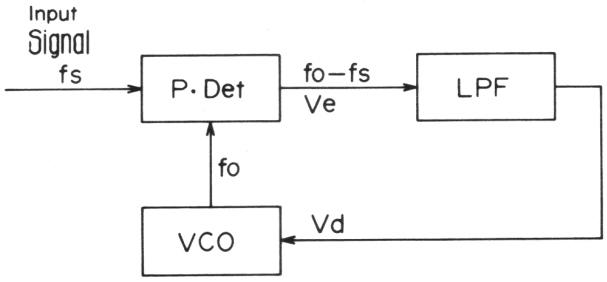


Figure 1A

The Phase Detector (P-Det) detects any phase difference between the Input Signal (f_S) and the output signal from the VCO (f_O). It then generates a voltage proportional to this phase difference.
This proportional-phase-voltage is fed through a Low Pass Filter and is applied to the VCO (Voltage Controlled Oscillator).
The Low Pass Filter (LPF) processes the signal from the Phase Detector and removes any harmonic content which might otherwise produce spurious results from the VCO.

A simple block diagram of the PLL section is shown in Figure 1A.

When there is no input signal (f_S), VCO oscillates at a free-running frequency. When an input signal does not appear, the Phase Detector generates an error voltage (V_e) proportional to the phase difference between the input signal (f_S) and the VCO frequency (f_O). V_e is filtered through the Low Pass Filter and applied to the control terminal of the VCO. As the phase of f_O approaches that of f_S, the error voltage approaches the precise value required for the desired frequency (produced by VCO). This condition is termed "locked".

B. PLL Synthesizer

To accomplish frequency synthesis, a programmable divider is used as shown in Figure 1B.

When the PLL is locked, $f_O = f_r$ (times) N

$$\left(\text{Where } f_r = f_v = \frac{f_o}{N} \rightarrow f_o = Nf_r\right)$$

Thus, we can obtain the desired synthesized frequencies by varying "N" (see Figure 1C)

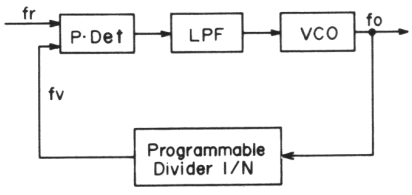


Figure 1B

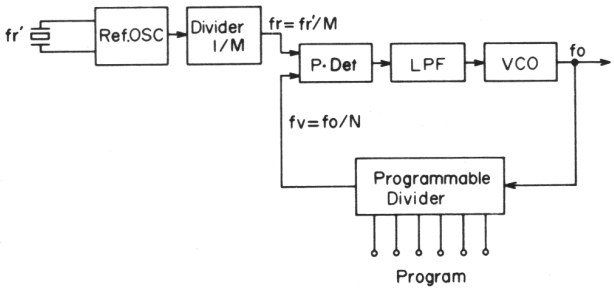


Figure 1C

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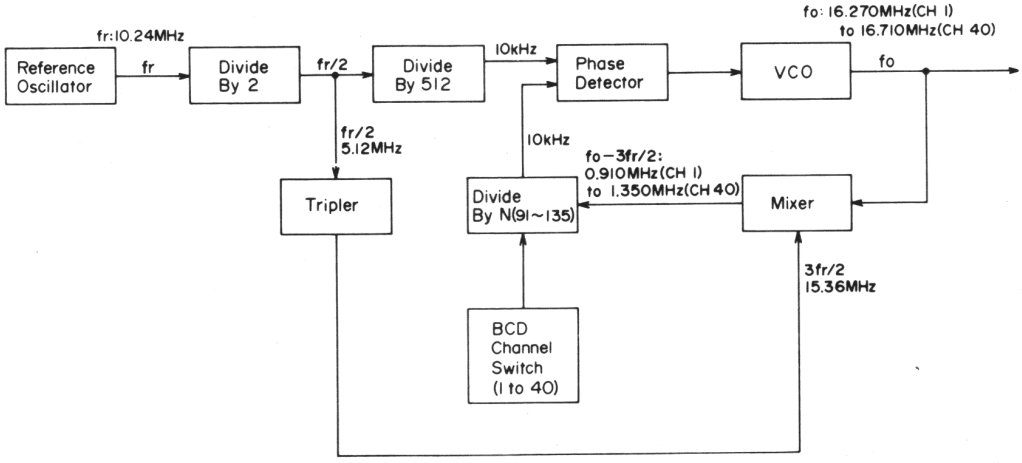
C. Description of PLL as used in the TRC-466

The digital PLL circuit used in this Transceiver generates the CB frequencies 10.695 MHz **below** the CB assigned frequency.

The circuitry is illustrated in Block Diagram form below.



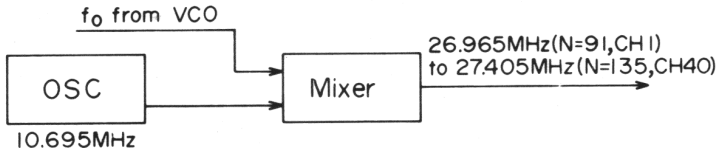
When the PLL is "locked", the relationship between the frequencies is:

$$\frac{f_r}{1024} = \frac{f_o - 1.5f_r}{N} \quad \text{or} \quad f_o = \left(\frac{N}{1024} + 1.5\right) f_r \text{ in MHz}$$

(where the VCO frequency is f_o and the reference frequency, f_r is 10.24 MHz)

Thus, by proper selection of N (from 91 to 135), the system will produce any one of 40 different frequencies. And these frequencies will be exactly 10.695 MHz below the assigned CB channel frequencies.

The VCO output is mixed with the output from a separate 10.695 MHz crystal oscillator, which produces the desired CB frequency.

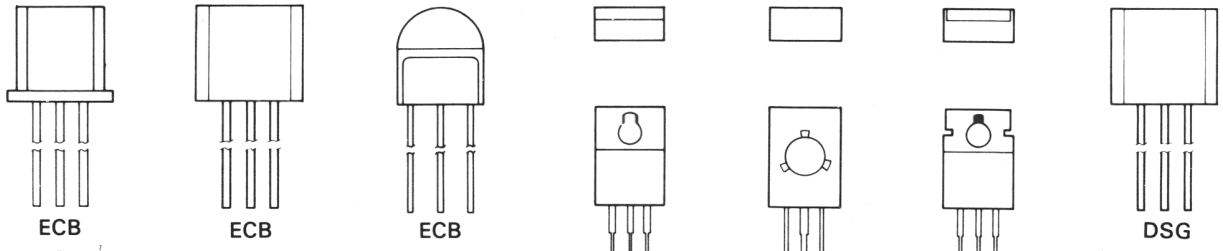


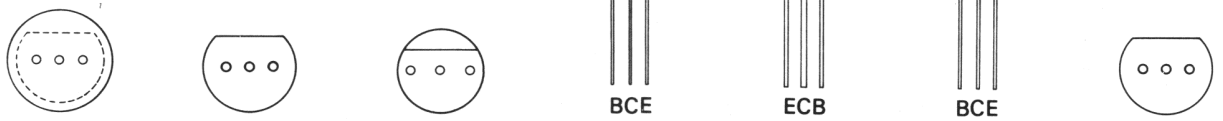
Since f_r is derived from the Reference Oscillator (a crystal oscillator), the tolerance and precision of f_r and f_o will be that of a crystal.

In the Receive mode, the VCO output is used as the 1st Local Oscillator. This is mixed with the incoming receive signal and produces the 1st I.F. of 10.695 MHz. The Reference Oscillator (10.24 MHz) is used as the 2nd Local Oscillator; mixed with the 1st I.F., this produces a 2nd I.F. of 455 kHz.

Note: If the phase of the VCO frequency cannot be locked, the bass-bias of TX OSC is cut off by a protection circuit inside IC-1 (PIN 22) and through Q3 and Q1 thus any spurious emission will not be radiated.

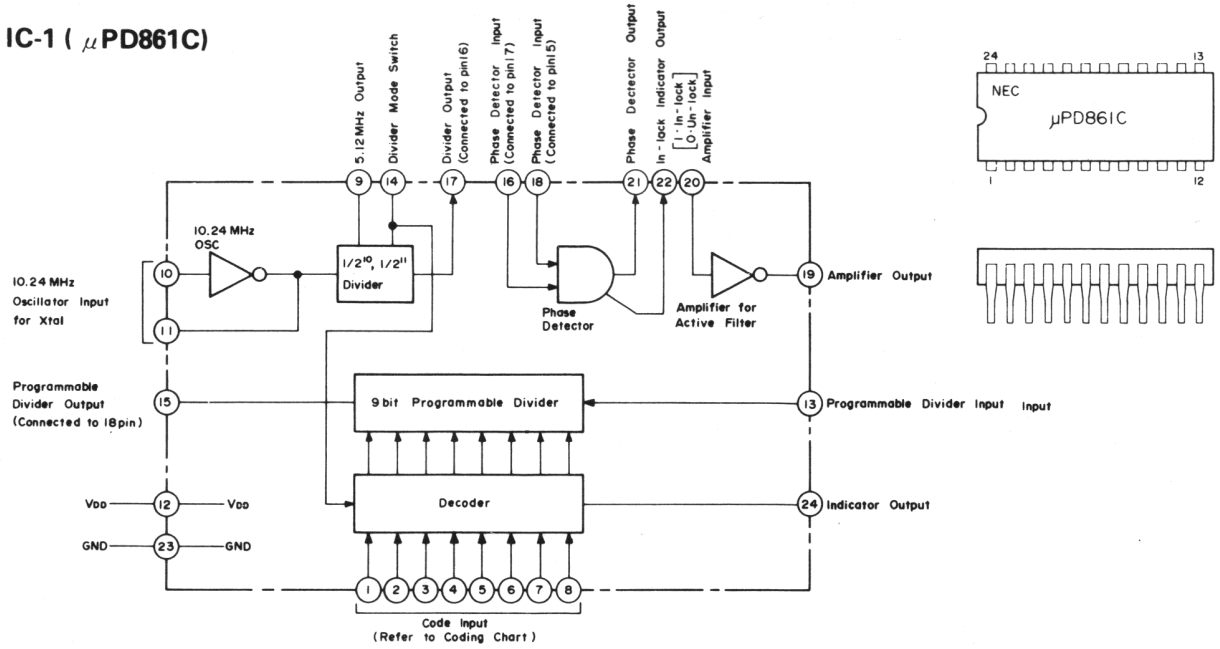
TRANSISTOR LEAD IDENTIFICATIONS & IC INTERNAL CONNECTION



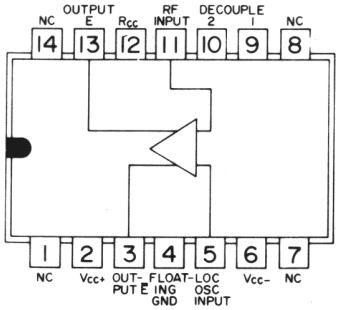


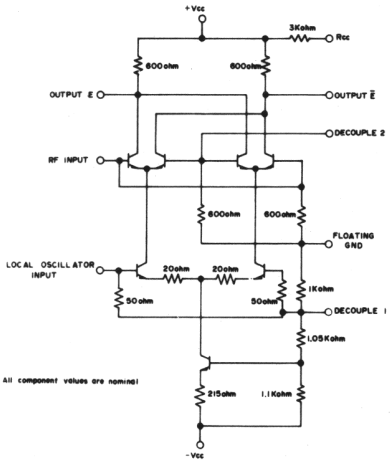
2SA495 2SC372 2SC373 2SC380 2SC735 | 2SA733 2SC536 2SC945 2SC1675 2SC930 | 2SC930 | 2SC1909 | 2SC1957 | 2SD325 | 2SK41

IC-1 (μPD861C)

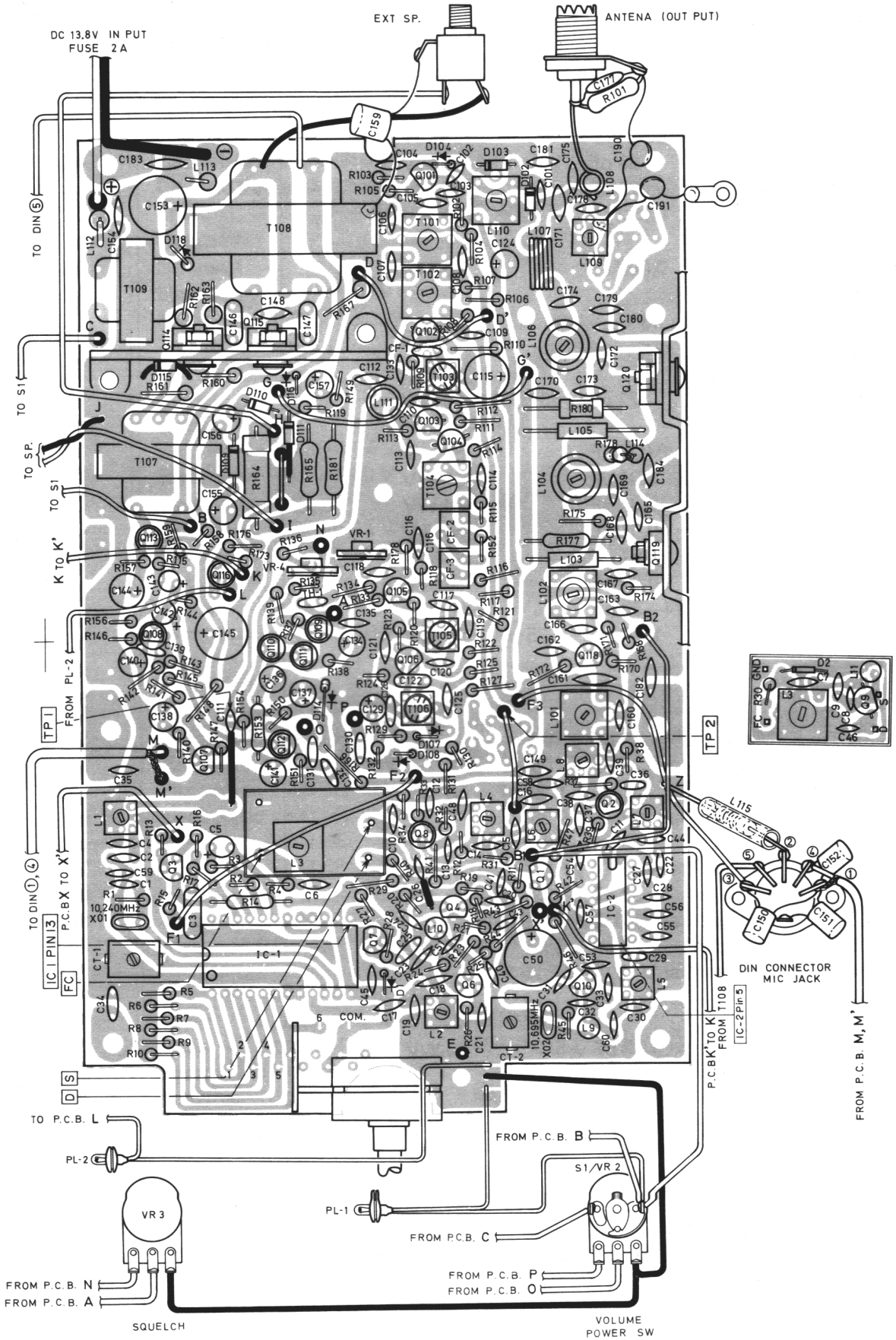


IC-2 (SN76514)



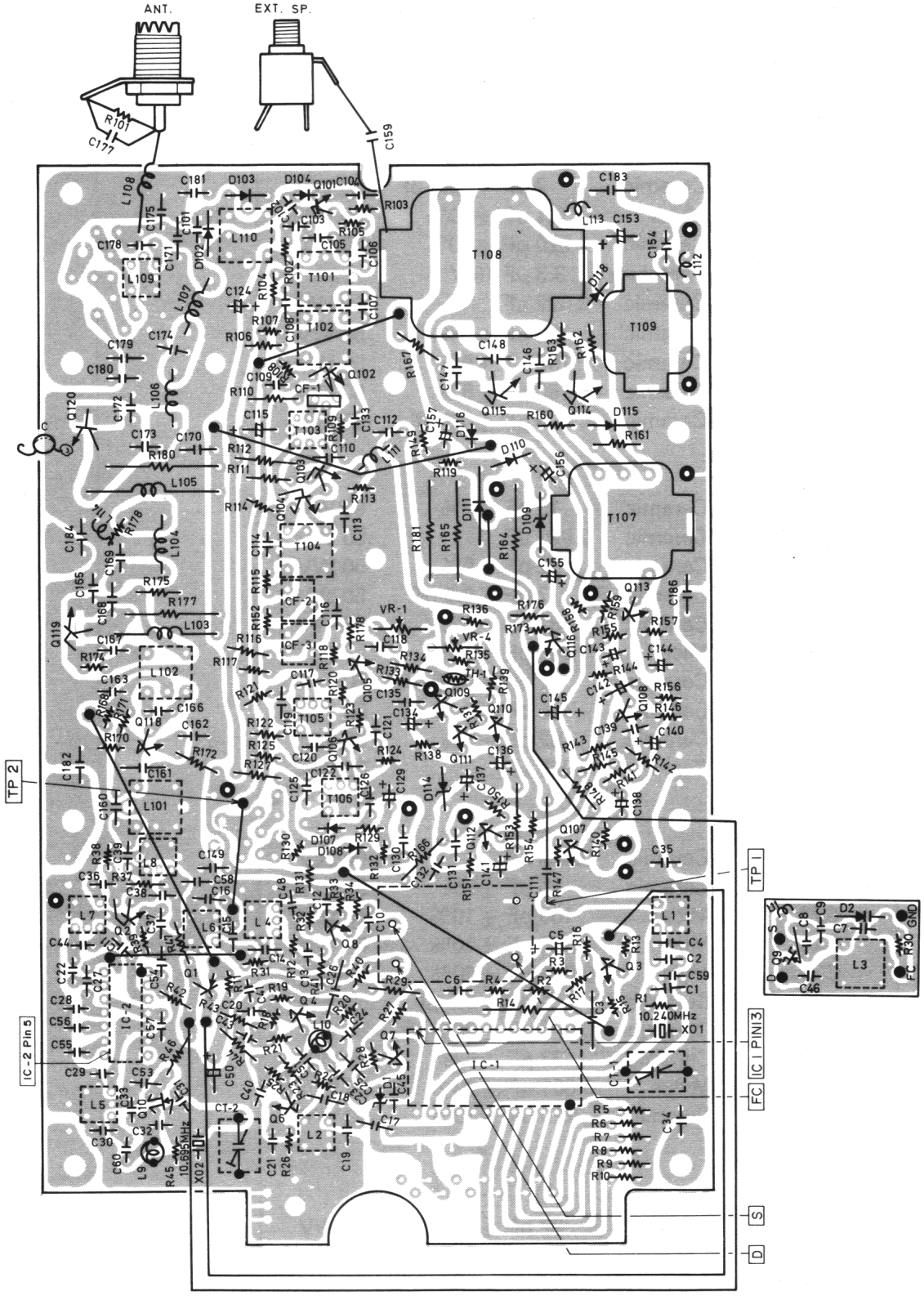


PRINTED CIRCUIT BOARD (TOP VIEW)



TRC-466 P. C. B. TOP VIEW (FEB. '77)

PRINTED CIRCUIT BOARD (BOTTOM VIEW)



TRC - 466 P. C. B. BOTTOM VIEW (FEB. '77)

ELECTRICAL PARTS LIST

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
CAPACITORS			
C1	Ceramic 39 pF ±5% 50 WV		
C2	Ceramic 2 pF ±0.25 pF 50 WV		
C3	Mylar 0.1 μF ±10% 50 WV		
C4	Ceramic 220 pF ±10% 50 WV		
C5	Tantalum 3.3 μF 16 V		
C6	Ceramic 0.022 μF 50 WV		
C7	Ceramic 100 pF ±5% 50 WV		
C8	Ceramic 150 μF ±5% 50 WV		
C9	Ceramic 150 pF ±5% 50 WV		
C10	Ceramic 4 pF ±0.5 pF 50 WV		
C11	Ceramic 15 pF ±5% 50 WV		
C12	Ceramic 0.022 μF 50 WV		
C13	Ceramic 82 pF ±5% 50 WV		
C14	Ceramic 7 pF ±0.5 pF 50 WV		
C15	Ceramic 82 pF ±5% 50 WV		
C16	Mica 250 pF ±10%		
C17	Ceramic 2 pF ±0.25 pF 50 WV		
C18	Ceramic 5 pF ±0.25 pF 50 WV		
C19	Ceramic 82 pF ±5% 50 WV		
C20	Ceramic 0.022 μF 50 WV		
C21	Ceramic 0.022 μF 50 WV		
C22	Ceramic 15 pF ±5% 50 WV		
C23	Mica 100 pF ±10% 50 WV		
C24	Mica 220 pF ±10% 50 WV		
C25	Mylar 0.001 μF ±10% 50 WV		
C26	Ceramic 4 pF ±0.5 pF 50 WV		
C27	Ceramic 2—7 pF ±0.25 pF 50 WV		
C28	Ceramic 33 pF ±5% 50 WV		
C29	Mylar 0.001 μF ±10% 50 WV		
C30	Ceramic 220 pF ±10% 50 WV		
C31	Not used		
C32	Ceramic 82 pF ±5% 50 WV		
C33	Ceramic 33 pF ±5% 50 WV		
C34	Ceramic Barrier 0.01 μF 25 WV		
C35	Ceramic Barrier 0.01 μF 25 WV		
C36	Mica 100 pF ±10% 50 WV		
C37	Ceramic Barrier 0.01 μF 50 WV		
C38	Ceramic 82 pF ±5% 50 WV		
C39	Ceramic 4 pF ±0.5 pF 50 WV		
C40	Ceramic 0.022 μF 50 WV		

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
C41	Ceramic 0.022 μF 50 WV		
C42	Not used		
C43	Ceramic 0.022 μF 50 WV		
C44	Ceramic 33 pF ±5% 50 WV		
C45	Ceramic 0.022 μF 50 WV		
C46	Ceramic 0.022 μF 50 WV		
C47	Not used		
C48	Ceramic 0.022 μF 50 WV		
C49	Not used		
C50	Electrolytic 1000 μF/16V		
C51	Mica 22 pF ±10% 50 WV		
C52	Not used		
C53	Ceramic 0.022 μF 50 WV		
C54	Ceramic 0.01 μF 50 WV		
C55	Ceramic 0.01 μF 50 WV		
C56	Ceramic 0.01 μF 50 WV		
C57	Ceramic 0.01 μF 50 WV		
C58	Ceramic 0.01 μF 50 WV		
C59	Ceramic 24—33 pF ±5% 50 WV		
C60	Ceramic 1—2 pF ±0.25 pF 50 WV		
C101	Mica 39 pF ±10%		
C102	Mica 22 pF ±10%		
C103	Ceramic 1 pF ±0.25 pF 50 WV		
C104	Ceramic Barrier 0.01 μF 25 V		
C105	Mica 33 pF ±10%		
C106	Ceramic Barrier 0.01 μF 25 V		
C107	Mica 33 pF ±10%		
C108	Ceramic Barrier 0.022 μF 25 V		
C109	Ceramic 22 pF ±5% 50 WV		
C110	Ceramic Barrier 0.022 μF 25 V		
C111	Ceramic 33 pF ±5% 50 WV		
C112	Ceramic 330 pF ±10%		
C113	Ceramic Barrier 0.0022 μF 25 V		
C114	Ceramic Barrier 0.022 μF 25 V		
C115	Electrolytic 33 μF/16V		
C116	Ceramic 330 pF ±10%		
C117	Ceramic 1 pF ±0.25 pF 50 WV		
C118	Ceramic Barrier 0.022 μF 25 V		
C119	Ceramic Barrier 0.022 μF 25V		
C120	Ceramic Barrier 0.022 μF 25 V		

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
C121	Ceramic Barrier 0.022 μF 25 V		
C122	Mylar 0.047 μF 50 WV		
C123	Not used		
C124	Electrolytic 4.7 μF/50 V		
C125	Ceramic Barrier 0.022 μF 25 V		
C126	Mylar 0.01 μF ± 10% 50 WV		
C127	Not used		
C128	Not used		
C129	Electrolytic 1 μF/50 V		
C130	Mylar 0.01 μF ± 10% 50 WV		
C131	Mylar 0.033 μF 50 WV		
C132	Mylar 0.01 μF ± 10% 50 WV		
C133	Ceramic Barrier 0.01 μF 25 V		
C134	Electrolytic 3.3 μF/50 V		
C135	Ceramic 0.01 μF 50 WV		
C136	Electrolytic 22 μF/16 V		
C137	Electrolytic 47 μF/10 V		
C138	Electrolytic 4.7 μF/50 V		
C139	Mylar 0.0015 μF ± 10% 50 WV		
C140	Electrolytic 33 μF/10 V		
C141	Electrolytic 33 μF/10 V		
C142	Electrolytic 0.47 μF/50 V		
C143	Alsicon 0.1 μF/25 V		
C144	Electrolytic 100 μF/10 V		
C145	Electrolytic 330 μF/16 V		
C146	Mylar 0.047 μF 50 WV		
C147	Mylar 0.047 μF 50 WV		
C148	Ceramic 0.047 μF 50 WV		
C149	Ceramic 0.047 μF 50 WV		
C150	Mylar 0.0047 μF ± 10% 50 WV		
C151	Mylar 0.0047 μF ± 10% 50 WV		
C152	Mylar 0.0033 μF ± 10% 50 WV		
C153	Electrolytic 470 μF/16 V		
C154	Ceramic 0.022 μF 50 WV		
C155	Electrolytic 22 μF/16 V		
C156	Electrolytic 10 μF/25 V		
C157	Electrolytic 1 μF/50 V		
C158	Not used		
※ C159	Ceramic Barrier 0.01 μF 50 WV		
C160	Mica 82 p—100 pF ± 10%		

※ FOR CANADA ONLY

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
C161	Mica 100 p—470 pF ±10%		
C162	Ceramic Barrier 0.01 μF 25 V		
C163	Ceramic Barrier 0.01 μF 25 V		
C164	Not used		
C165	Ceramic Barrier 0.01 μF 25 V		
C166	Ceramic 33 p—47 pF ±5% 50 WV		
C167	Ceramic 220 pF ±10% 50 WV		
C168	Ceramic 56 pF ±5% 50 WV		
C169	Ceramic 82 pF ±5% 50 WV		
C170	Ceramic 0.047 μF 50 WV		
C171	Ceramic Barrier 0.01 μF 25 V		
C172	Mica 33 pF ±10% 50 WV		
C173	Ceramic 0.0047 μF 50 WV		
C174	Mica 220 pF ±10%		
C175	Mica 220 pF ±10%		
C176	Not used		
C177	Mica 250 pF ±10%		
C178	Mica 39 pF ±10%		
C179	Ceramic 0.022 μF 50 WV		
C180	Ceramic Barrier 0.01 μF 25 V		
C181	Ceramic Barrier 0.01 μF 25 V		
C182	Ceramic Barrier 0.01 μF 25 V		
C183	Ceramic 0.047 μF 50 WV		
C184	Ceramic 0.022 μF 50 WV		
C185	Not used		
C186	Ceramic 0.047 μF 50 WV		
C187	Not used		
C188	Not used		
C189	Not used		
C190	Ceramic 0.0033 μF 50 WV		
C191	Ceramic 0.0033 μF 50 WV		
C192	Ceramic Barrier 0.01 μF 25 V		
CERAMIC FILTERS			
CF1	Ceramic Filter SFE 10.7 MHz	C-0752	P-130047
CF2	Ceramic Filter CFU 455 kHz	C-0754	P-130050
CF3	Ceramic Filter CFU 455 kHz	C-0754	P-130050
TRIMMERS			
CT1	Trimmer	C-0751	P-160010
CT2	Trimmer	C-0751	P-160010

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
DIODES			
D1	Zener Diode RD5.1E or UZ5.1B (or RD5AN)		
D2	Varicap Diode ITT-310 or 1S2688		
D101	Not used		
D102	Diode WG713		
D103	Diode WG713		
D104	Germanium Diode 1N60P or 1S188FM-1		
D105	Not used		
D106	Not used		
D107	Germanium Diode 1N60P or 1S188FM-1		
D108	Germanium Diode 1N60P or 1S188FM-1		
D109	Zener Diode RD12EC or UZ13B (or WZ13B)		
D110	Diode WG713		
D111	Diode WG713		
D112	Not used		
D113	Not used		
D114	Zener Diode RD6.2EB or UZ6.2B (or WZ061 or AW01-06)		
D115	Diode WG713		
D116	Silicon Diode SR-1K (or 10D-1)		
D117	Not used		
D118	Silicon Diode SR-1K (or 10D-1)		
INTEGRATED CIRCUITS			
IC1	μPD 861C		
IC2	SN76514		
FUSE			
F1	Fuse (Tube Type) 250V2A (2—2.5A)	HB-1111	P-250061
JACKS			
J1	Antenna Connector	J-6470	P-190104 P-190116
J2	5P DIN Jack	J-6397	P-190090 P-190036 P-190117
J3	External Speaker Jack	J-0683	P-190047

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
COILS			
L1	RF Coil — 082	CA-3683	P-380081
L2	RF Coil — 082	CA-3584	P-380082
L3	OSC Coil — 083		P-380083
L4	RF Coil — 082	CA-3684	P-380082
L5	RF Coil — 082	CA-3684	P-380082
L6	RF Coil — 082	CA-3684	P-380082
L7	RF Coil — 084	CA-3685	P-380084
L8	RF Coil — 085	CA-3686	P-380085
L9	RF Choke Coil	CB-2319	P-360026
L10	RF Choke Coil	CB-2319	P-360026
L11	RF Choke Coil	CB-2319	P-360026
L101	Antenna Coil	CA-3687	P-380089
L102	Driver Coil	CA-3545	P-380046
L103	Choke Coil		P-380047
L104	Filter Coil	CA-3546	P-380045
L105	Choke Coil	CB-2284	P-380048
L106	Filter Coil	C-0755	P-380092
L107	Filter Coil	CA-3547	P-380044
L108	Filter Coil	CA-3548	P-380043
L109	Trap Coil	CA-3688	P-380086
L110	Antenna Coil	CA-3687	P-380089
L111	RF Choke Coil	CA-4725	P-380040
L112	Choke Coil	CB-2341	P-380104
L113	Choke Coil	CB-2341	P-380104
L114	Choke Coil	CB-2318	P-380098
L115	Choke Coil	CB-2283	P-380047
LAMPS			
PL1	Panel Lamp 4.2 14V 80mA	L-0021	P-240094
PL2	Panel Lamp 4.7 6V 35mA	L-0681	P-240073
TRANSISTORS			
Q1	2SA495(Y) or 2SA733(P) or (Q)		
Q2	2SC380(O) or (Y)		
Q3	2SC372(Y), 2SC945L(P) or (Q)		
Q4	2SC372(Y), 2SC945L(P) or (Q)		
Q5	Not used		
Q6	2SC373, 2SC945L(P) or (Q)		
Q7	2SC372(Y), 2SC945L(P) or (Q)		
Q8	2SC380(O) or (Y)		
Q9	2SK41(E)		
Q10	2SK41(E)		

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
Q101	2SC930(D) or (E)		
Q102	2SC1675(M) or (L)		
Q103	2SC1675(M) or (L)		
Q104	2SC1675(M) or (L)		
Q105	2SC930(D) or (E)		
Q106	2SC930(D) or (E)		
Q107	2SC536(D) or (E)		
Q108	2SC373		
Q109	2SC372(Y)		
Q110	2SC373		
Q111	2SC373		
Q112	2SC373		
Q113	2SC735(O) or (Y)		
Q114	2SD325(D) or (E)		
Q115	2SD325(D) or (E)		
Q116	2SC735(O) or (Y)		
Q117	Not used		
Q118	2SC945(P) or (Q)		
Q119	2SC1957(K)		
Q120	2SC1909(K)		
RESISTORS			
R1	Carbon UY 1 MΩ ¼W		
R2	Carbon UY 3.9 kΩ ¼W		
R3	Carbon UY 560 Ω ¼W		
R4	Carbon UY 10 kΩ ¼W		
R5	Carbon UY 10 kΩ ¼W		
R6	Carbon UY 10 kΩ ¼W		
R7	Carbon UY 10 kΩ ¼W		
R8	Carbon UY 10 kΩ ¼W		
R9	Carbon UY 10 kΩ ¼W		
R10	Carbon UY 10 kΩ ¼W		
R11	Carbon PY 33 Ω ½W		
R12	Carbon UY 5.6 kΩ ¼W		
R13	Carbon UY 10 kΩ ¼W		
R14	Carbon PY 1.2 kΩ ¼W		
R15	Carbon UY 3.9 kΩ ¼W		
R16	Carbon UY 10 kΩ ¼W		
R17	Carbon UY 10 kΩ ¼W		
R18	Carbon UY 10 kΩ ¼W		
R19	Carbon UY 4.7 kΩ ¼W		
R20	Carbon UY 680 Ω ¼W		

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
R21	Carbon UY 680 Ω ¼W		
R22	Not used		
R23	Carbon UY 18 kΩ ¼W		
R24	Carbon UY 6.8 kΩ ¼W		
R25	Carbon UY 680 Ω ¼W		
R26	Carbon UY 1 kΩ ¼W		
R27	Carbon UY 680 Ω ¼W		
R28	Carbon UY 100 kΩ ¼W		
R29	Carbon PY 220 Ω ½W		
R30	Carbon UY 100 kΩ ¼W		
R31	Carbon UY 2.2 kΩ ¼W		
R32	Carbon UY 8.2 kΩ ¼W		
R33	Carbon UY 4.7 kΩ ¼W		
R34	Carbon UY 1 kΩ ¼W		
R35	Not used		
R36	Not used		
R37	Carbon UY 4.7 k—10 kΩ ¼W		
R38	Carbon UY 3.3 kΩ ¼W		
R39	Carbon UY 220 Ω ¼W		
R40	Carbon UY 100 Ω ¼W		
R41	Carbon UY 100 Ω ¼W		
R42	Carbon UY 100 Ω ¼W		
R43	Carbon UY 100 Ω ¼W		
R44	Carbon UY 100 Ω ¼W		
R45	Carbon UY 1 MΩ ¼W		
R46	Carbon UY 100 Ω ¼W		
R47	Carbon UY 100 Ω ¼W		
R101	Carbon PY 1.5 kΩ ½W		
R102	Carbon UY 10 kΩ ¼W		
R103	Carbon UY 1 kΩ ¼W		
R104	Carbon UY 1 kΩ ¼W		
R105	Carbon UY 330 Ω ¼W		
R106	Carbon UY 10 kΩ ¼W		
R107	Carbon UY 150 k—390 kΩ ¼W		
R108	Carbon UY 220 Ω ¼W		
R109	Carbon UY 330 Ω ¼W		
R110	Carbon UY 330 Ω ¼W		
R111	Carbon UY 150 k—390 kΩ ¼W		
R112	Carbon UY 8.2 kΩ ¼W		
R113	Carbon UY 1 kΩ ¼W		
R114	Carbon UY 470 Ω ¼W		
R115	Carbon UY 5.6 kΩ ¼W		
R116	Carbon UY 6.8 kΩ ¼W		
R117	Carbon UY 270 kΩ ¼W		

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
R118	Carbon UY 2.2 kΩ ¼W		
R119	Carbon UY 150—1 kΩ ¼W		
R120	Carbon UY 470 Ω ¼W		
R121	Carbon UY 470 Ω ¼W		
R122	Carbon UY 33 kΩ ¼W		
R123	Carbon UY 10 kΩ ¼W		
R124	Carbon UY 470 Ω ¼W		
R125	Carbon UY 470 Ω ¼W		
R126	Not used		
R127	Carbon UY 27 kΩ ¼W		
R128	Not used		
R129	Carbon UY 47 kΩ ¼W		
R130	Carbon UY 68 kΩ ¼W		
R131	Carbon UY 47 kΩ ¼W		
R132	Carbon UY 33 kΩ ¼W		
R133	Carbon UY 10 kΩ ¼W		
R134	Carbon UY 6.8 kΩ ¼W		
R135	Carbon UY 22 k—100 kΩ ¼W		
R136	Carbon UY 22 kΩ ¼W		
R137	Carbon UY 5.6 kΩ ¼W		
R138	Carbon UY 18 Ω ¼W		
R139	Carbon UY 1.8 kΩ ¼W		
R140	Carbon UY 1 kΩ ¼W		
R141	Carbon UY 2.2 kΩ ¼W		
R142	Carbon UY 10 kΩ ¼W		
R143	Carbon UY 56 kΩ ¼W		
R144	Carbon UY 4.7 kΩ ¼W		
R145	Carbon UY 3.3 kΩ ¼W		
R146	Carbon UY 2.2 kΩ ¼W		
R147	Carbon UY 4.7 kΩ ¼W		
R148	Carbon UY 2.2 kΩ ¼W		
R149	Carbon UY 6.8 kΩ ¼W		
R150	Carbon UY 33 kΩ ¼W		
R151	Carbon UY 18 kΩ ¼W		
R152	Carbon UY 5.6 kΩ ¼W		
R153	Carbon PY 1 kΩ ¼W		
R154	Carbon UY 1.8 kΩ ¼W		
R155	Carbon UY 33 kΩ ¼W		
R156	Carbon UY 6.8 kΩ ¼W		
R157	Carbon UY 100 Ω ¼W		
R158	Carbon UY 220k—330k Ω ¼W		
R159	Carbon UY 220 Ω ¼W		
R160	Carbon PY 1.5 kΩ ½W		

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
R161	Carbon PY 82 Ω ½W		
R162	Metal Oxide 0.22 Ω 1W		
R163	Metal Oxide 0.22 Ω 1W		
R164	Metal Oxide 10—18 Ω 2W		
R165	Carbon PY 22 Ω ½W		
R166	Carbon UY 100 Ω ¼W		
R167	Metal Oxide 270 Ω 2W		
R168	Metal Oxide 10 Ω 1W		
R169	Carbon PY 33 Ω ¼W		
R170	Carbon UY 2.2 kΩ ¼W		
R171	Carbon UY 6.8 kΩ ¼W		
R172	Carbon UY 100 Ω ¼W		
R173	Carbon UY 39 k—68KΩ ¼W		
R174	Carbon UY 220 Ω ¼W		
R175	Carbon PY 15 Ω ½W		
R176	Carbon UY 56 kΩ ¼W		
R177	Carbon PY 560 Ω ¼W		
R178	Carbon UY 1 kΩ ¼W		
R179	Carbon PY 0—10 Ω ¼W		
R180	Metal Oxide 220 Ω 1W		
R181	Carbon PY 22 Ω ½W		
R182	Not used		
R183	Not used		
R184	Carbon PY 15 Ω ¼W		
SWITCHES			
S1	Power Switch (With VR-2)	P-1749	
S2	Channel Selector Switch	S-1272	
TRANSFORMERS			
T101	RF Coil 090	CA-3687	
T102	RF Coil 091	CA-4799	
T103	IFT 10.7 MHz 7F031	CA-7602	
T104	IFT 455 kHz 0A033	CA-7603	
T105	IFT 455 kHz 7A026	CA-7513	P-130026
T106	IFT 455 kHz 7A027	CA-7514	P-130027
T107	Audio Input Transformer	TN-0100	P-100346
T108	Audio Output/Modulation Transformer	TD-0139	P-100347
T109	Choke	TA-0561	P-100345

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
THERMISTOR			
TH1	Thermistor S5C-24RED (20 kΩ)		
VARIABLE RESISTORS			
VR-1	Semi-Fixed Resistor 500 Ω B	P-6353	P-170197
VR-2	VOLUME 5 kΩ (With S1)	P-1749	P-170239
VR-3	SQUELCH 10 kΩ	P-1750	P-170240
VR-4	Semi-Fixed Resistor 20 kΩ B	P-6409	P-170204
CRYSTALS			
X01	Crystal HC-18/U 10.240 MHz	MX-2295	P-390047
		MX-2297	P-390049
		MX-2298	P-390056
X02	Crystal HC-18/U 10.695 MHz	MX-2296	P-390048
		MX-2299	P-390050
		MX-2300	P-390057

ACCESSORY PARTS LIST

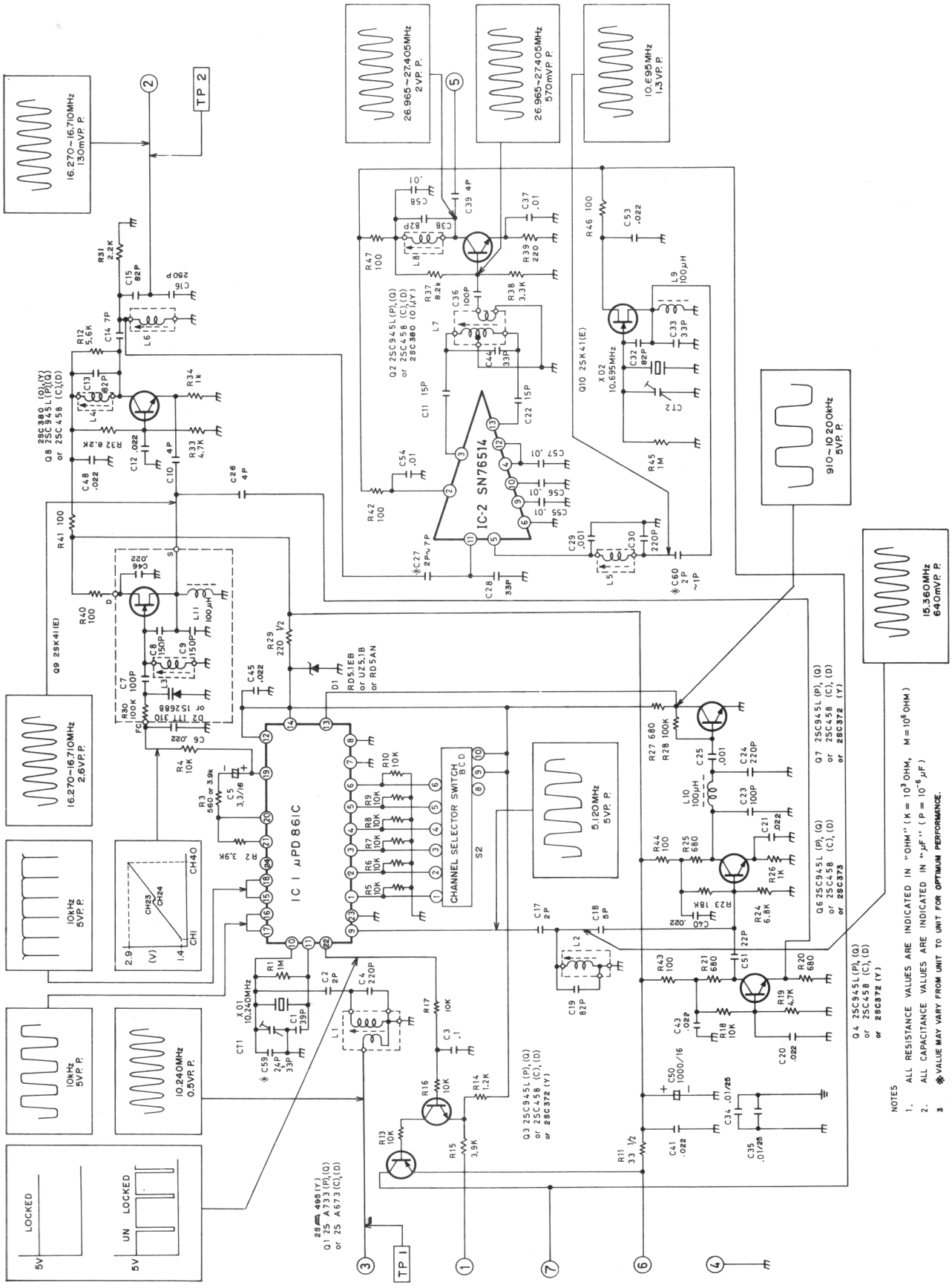
REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
S1	Tapping Screw (Black) 3 ϕ × 8PTII		
S2	Tapping Screw (Porr Wave Screw) 3 ϕ × 8PTII		
S3	Triple Screw 3 ϕ × 6P		
S4	Washer (Fiber)		
S5	Screw 3 ϕ × 8P (Black)		
S6	Screw 2 ϕ × 5F		
S7	Screw 3 ϕ × 6P		

IC & TRANSISTOR VOLTAGE CHART

TRANSISTOR VOLTAGE CHART

TRANSISTOR NUMBER	RECEIVER SECTION 〔V〕			TRANSMITTER SECTION 〔V〕		
	EMITTER (SOURCE)	COLLECTOR (DRAIN)	BASE (GATE)	EMITTER (SOURCE)	COLLECTOR (DRAIN)	BASE (GATE)
Q 1	13.7	0	13.1	13.1	13.0	12.4
Q 2	0	0	0	3.5	11.5	4.1
Q 3	5.7	13.1	5.1	4.5	6.9	5.1
Q 4	3.0	8.6	3.5	2.8	8.5	3.5
Q 5	Not used					
Q 6	2.6	10.3	3.2	2.4	9.9	3.0
Q 7	0	3.3	0.7	0	2.7	0.8
Q 8	3.6	11.8	4.2	3.5	10.1	4.0
Q 9	(0)	(11.0)	(—)	(0)	(11.0)	(—)
Q 10	(0)	(0)	(—)	(0)	(10.7)	(—)
Q101	0.3	7.3	0.9	0.5	0	0
Q102	0.4	7.2	1.1	0	0	0
Q103	0.6	7.3	1.2	0	0	0
Q104	0.6	7.3	1.2	0	0	0
Q105	0.5	7.1	1.1	0	0	0
Q106	0.9	6.7	1.6	0	0	0
Q107	0	0	0	0	0	0
Q108	2.4	13.8	2.0	1.2	8.1	1.8
Q109	0.1	4.7	0	0	0	0
Q110	0.1	5.9	0.8	0	0	0
Q111	0.1	0.1	0.8	0	0	0
Q112	1.0	4.4	1.6	0	0	0
Q113	1.2	11.4	1.9	1.1	10.8	1.5
Q114	0	13.8	0.6	0	13.0	0.6
Q115	0	13.6	0.6	0	13.0	0.5
Q116	0.3	13.7	0	1.2	12.0	1.6
Q117	0	7.6	0.5	0.2	0	0
Q118	7.6	13.8	4.5	2.4	11.0	2.9
Q119	0	13.4	0	1.2	10.9	0.2
Q120	0	13.3	0	0	10.3	0

SCHEMATIC DIAGRAM (PLL CIRCUIT)



EXPLODED VIEW PARTS LIST

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
1	Thumb Screw for Mounting Bracket	K-2181	P-650170
2	Rubber Washer		P-680114
3	Mounting Bracket	HB-6022	P-411128
4	Case Top	Z-3444	P-411119
5	Case Bottom	Z-3445	P-411120
6	In-line Fuse Holder	F-1120	P-260014
7	Heat Sink "A"	HH-0203	P-411052
8	Heat Sink "B"	HH-0215	P-411121
9	Chassis		P-400157
10	5P DIN Jack	J-6397	P-190090 or P-190117 or P-190036
11	EXT. SP. Jack	J-0683	P-190047
12	Strain Relief	HB-0598	P-480010
13	Antenna Connector	J-6470	P-190104 or P-190116 or
14	Rubber Cushion		P-660123
15	Front Panel	Z-3446	P-700213
16	Speaker Bracket		P-410765
17	Speaker 77 m/m 8 ohm	S-4645	P-270051 or P-270058
18	VOLUME Control (VR-2)	P-1749	P-170239
19	SQUELCH Control (VR-3)	P-1750	P-170240
20	Pilot Lamp 14 V 80 mA (PL1)	L-0021	P-240094
21	Pilot Lamp 6 V 35 mA (PL2)	L-0681	P-240073
22	Lamp Cover	HB-6017	P-710107
23	Pilot (Modulation Indicator)	L-0022	P-610468
24	Rubber Bushing	HB-5323	P-680137
25	Front Bracket (R)	Z-3447	P-610464
26	Front Bracket (L)	Z-3448	P-610463
27	Knob for VOLUME/SQUELCH	K-2533	P-650233
28	Knob for Channel Selector	K-2532	P-650232
29	Net for Bottom Case		P-820380
30	Main P.C.B.		P-200402
31	Channel Plate	HB-6019	P-610465
32	Channel Selector Switch (S2)	S-1272	P-180230
33	Insulator Plate		P-480158
34	Front Bracket		P-680146

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