

21-1521

REALISTIC[®]

Service Manual

TRC-452
CB TRANSCEIVER
Catalog Number: 21-1521



CUSTOM MANUFACTURED FOR RADIO SHACK  A DIVISION OF TANDY CORPORATION

TABLE OF CONTENTS

1. SPECIFICATIONS.....	3 - 4
2. DISASSEMBLY INSTRUCTIONS	5 - 6
3. BLOCK DIAGRAM	7
4. ALIGNMENT INSTRUCTIONS	8 - 13
5. TROUBLESHOOTING HINTS.....	14
6. PLL SUB-ASSEMBLY TROUBLESHOOTING HINTS.....	15
7. IC & TRANSISTOR LEAD IDENTIFICATIONS	16
8. PLL SUB-ASSEMBLY.....	17
9. MAIN BOARD (TOP VIEW).....	18
10. MAIN BOARD (BOTTOM VIEW)	19
11. ADDITIONAL PARTS ON THE BOTTOM	20
12. WIRING DIAGRAM	21
13. ELECTRICAL PARTS LIST	22 - 30
14. MECHANICAL PARTS LIST.....	31
15. PLL SUB-ASSEMBLY SCHEMATIC DIAGRAM	32
16. SCHEMATIC DIAGRAM	34
17. EXPLODED VIEW	35

1. SPECIFICATIONS

GENERAL SPECIFICATIONS

Transmitter/Receiver	Frequency synthesizing circuit with digital phase-locked loop
Communicating frequencies	26.965 MHz to 27.405 MHz (all 40 channels)
Operating voltage	11–16V DC (positive or negative ground)
Temperature and Humidity Range	–20° C to +60° C and 10% to 90%
Transmitter/Receiver switching	Electronic (diode switching)

STANDARD TEST CONDITIONS

Battery supply voltage	13.8V DC
Modulation	1000 Hz, 30%
Audio output power	500 mW
Audio output load	8 ohm
Antenna impedance	50 ohm (non-inductive load)
Ambient conditions	
Temperature	25° C ±5° C
Humidity	50% to 70%

TRANSMITTER SPECIFICATIONS

	NOMINAL	LIMIT
RF output power:	3.8 W	3.5–4.0W
Spurious ratio:	–65 dB	–60 dB
Frequency tolerance:	±0.003 %	±0.005 %
Microphone input sensitivity:		
(1 kHz, 50% modulation)	1 mV	2 mV
Current drain at no modulation:	1000 mA	1300 mA
Current drain at 80% modulation:	1500 mA	2000 mA

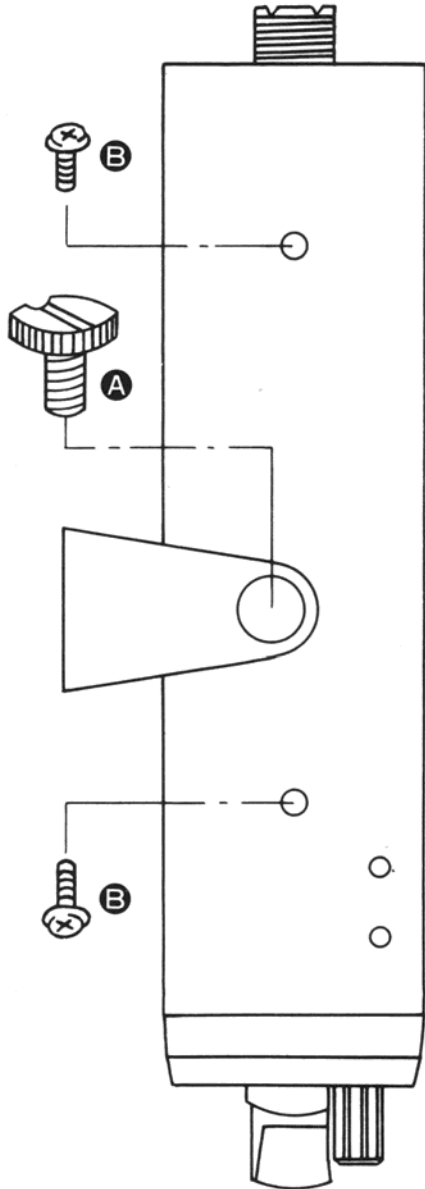
RECEIVER SPECIFICATIONS (ANL: OUT)

	NOMINAL	LIMIT
Maximum sensitivity:	0.4 μV	1 μV
Sensitivity at 10 dB S/N:	0.5 μV	1.0 μV
Image rejection ratio ($f_0 + 910$ kHz):	50 dB	40 dB
1st I.F. rejection ratio (9.785 MHz):	90 dB	80 dB
2nd I.F. rejection ratio (455 kHz):	100 dB	90 dB
Spurious rejection ratio:	40 dB	25 dB
RF GAIN control ratio (Max. control range):	40 dB	30 – 50 dB
Squelch sensitivity at threshold:	1 μV	2 μV
Squelch sensitivity at tight point:	500 μV	125 – 2000 μV
A.G.C. figure of merit		
(RF input 50 mV, AF 10 dB down):	90 dB	75 dB
I.F. bandwidth (-6 dB):	7 kHz	5 – 9 kHz
Adjacent channel selectivity:	60 dB	40 dB
Cross modulation:	50 dB	45 dB
Audio output power (RF input 1 mV)		
at maximum power:	4.0 W	3.0 W
at 10% distortion:	3.0 W	2.5 W
Audio distortion (RF input 1 mV)		
AF output 0.5 W:	4.5%	7.0%
Audio fidelity (RF input 1 mV)		
(1 kHz 0 dB reference) at 450 Hz:	-6 dB	-10 dB
at 2.5 kHz:	-6 dB	-10 dB
S-meter sensitivity (S-9):	100 μV	50 – 300 μV
Current drain at no signal:	500 mA	700 mA maximum
Current drain at maximum output:	1.5 A	1.8 A
Hum & Noise (RF input 1 mV) un-squelched:	45 dB	40 dB

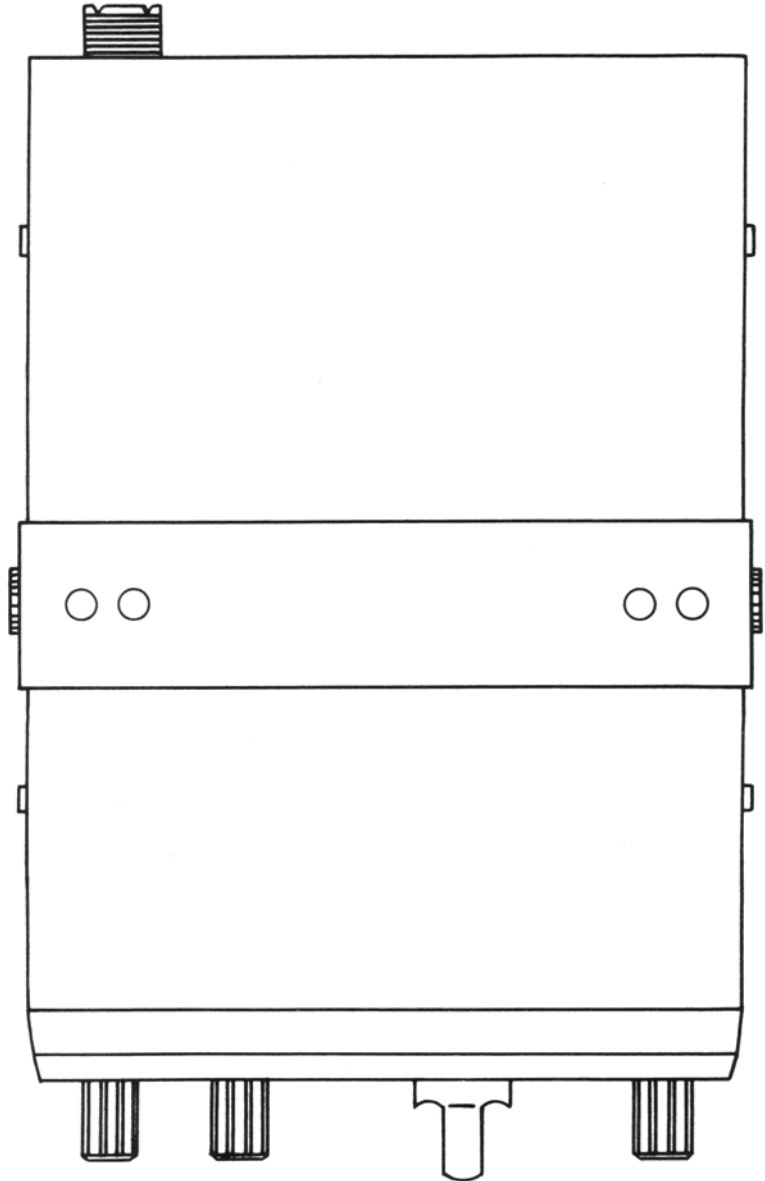
PA SPECIFICATIONS

Maximum output power (AF input 1 kHz, 10 mV):	5 W	4 W
10% distortion power (AF input 1 kHz, 10 mV):	4 W	3 W

2. DISASSEMBLY INSTRUCTIONS



SIDE VIEW



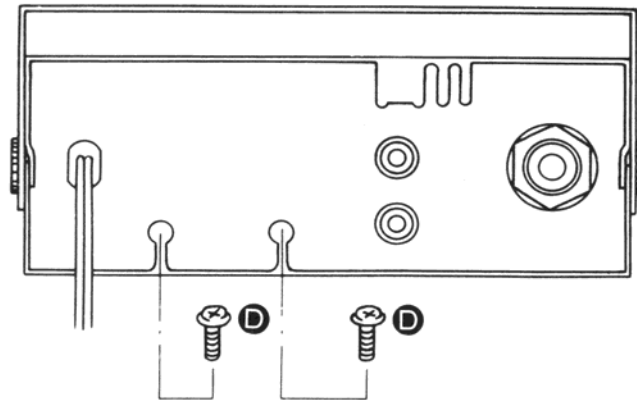
TOP VIEW

1. Remove 2 mounting bracket screws **A**
2. Remove 2 screws **B** from each side.

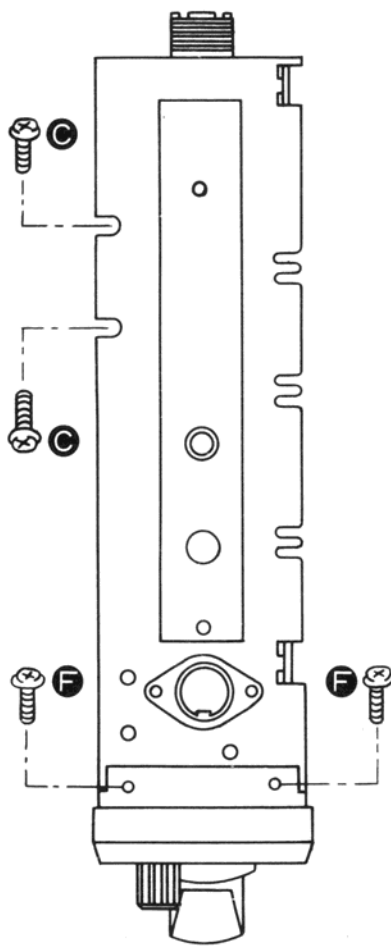
3. Remove top and bottom covers. Remember, the speaker is attached to the top cover so use care not to break the wires.

PRINTED CIRCUIT BOARD REMOVAL

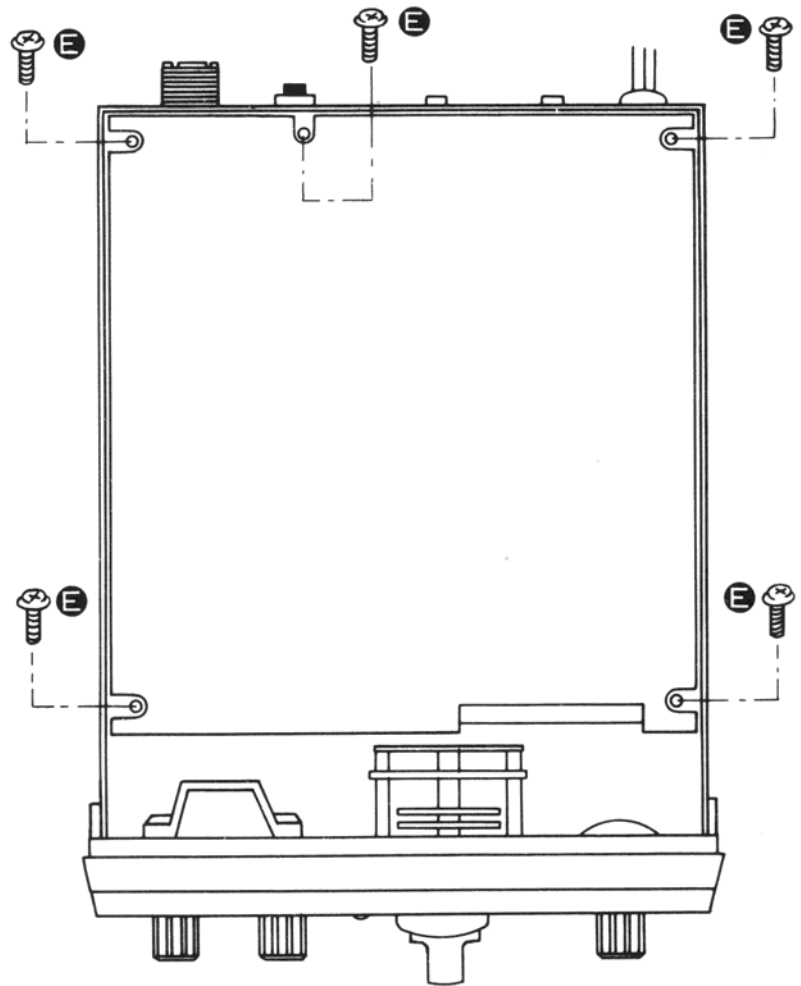
1. Remove 2 screws **C** holding heat sink to the side of the unit.
2. Remove 2 screws **D** holding heat sink to the rear of the unit.
3. Remove 5 screws **E** from Printed Circuit Board.
4. Remove 4 screws **F** from front panel.



REAR VIEW

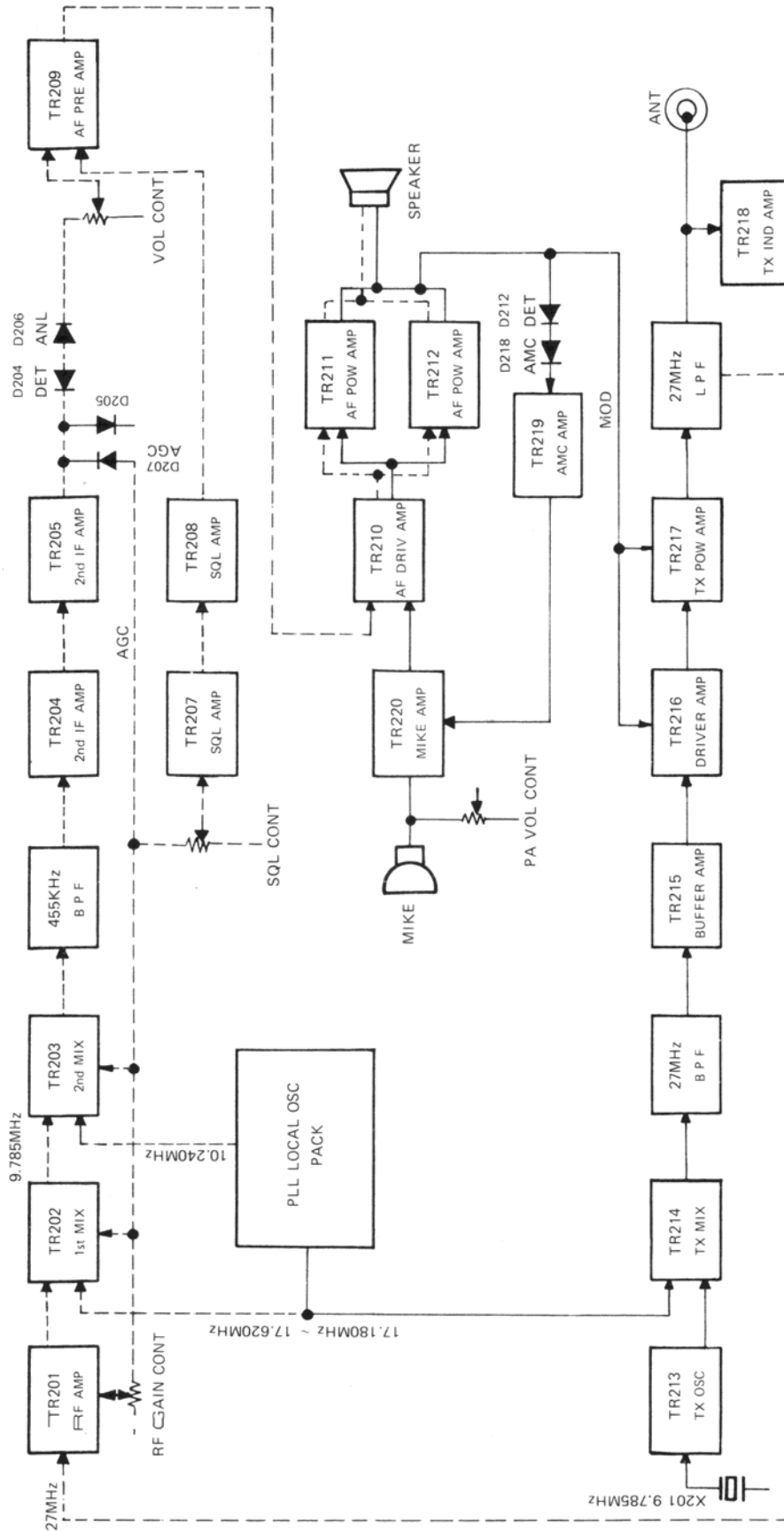


SIDE VIEW



TOP VIEW

3. BLOCK DIAGRAM

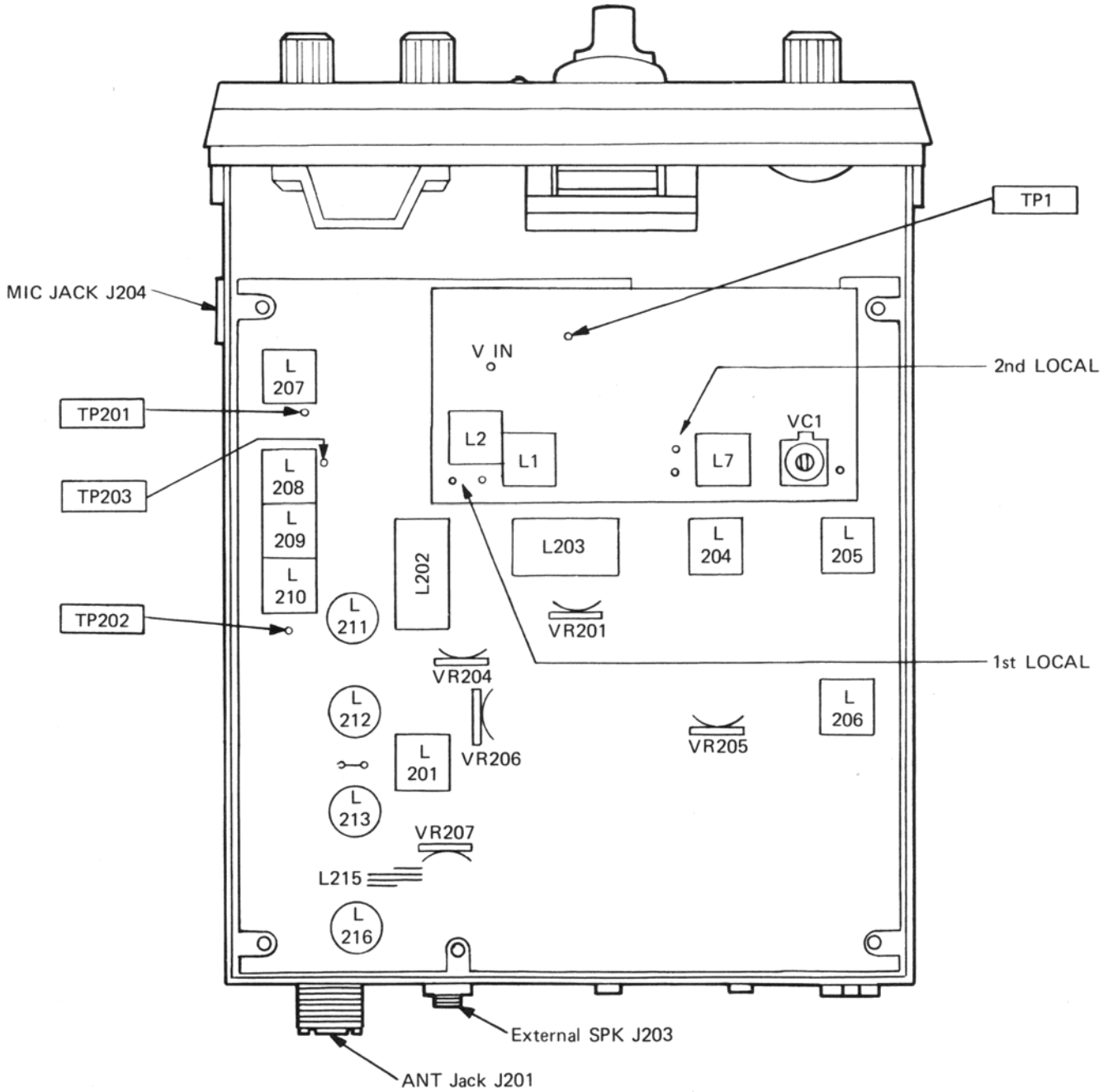


--- Shows receiving circuit

— Shows transmitting circuit

4. ALIGNMENT INSTRUCTIONS

CHASSIS LAYOUT-ALIGNMENT POINTS



ALIGNMENT OF PLL UNIT

1. Test equipment required:

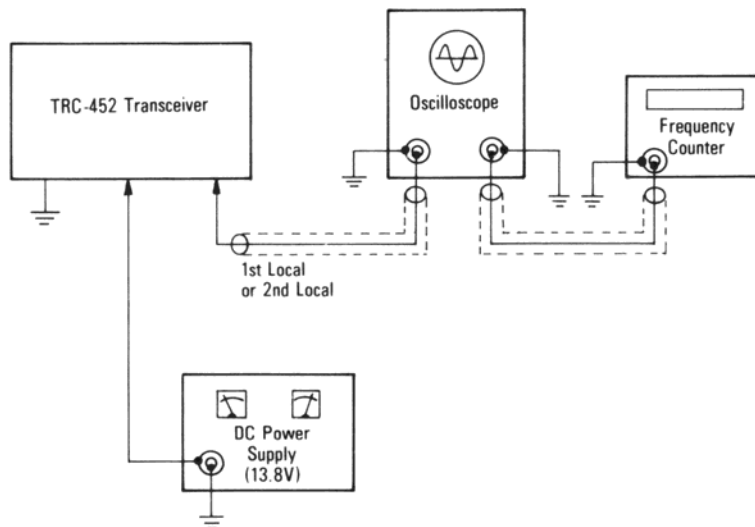
- a. Oscilloscope (0 – 30 MHz)
- b. Frequency counter (0 – 30 MHz)
- c. DC Power Supply (9.0V/100 mA)
- d. DC Volt Meter (10 Volt Maximum 100K ohm/V)

2. Alignment procedure

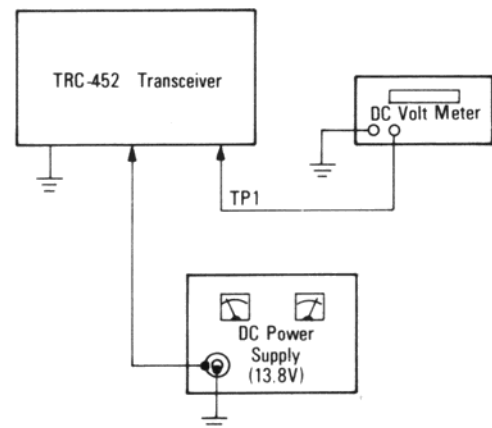
STEP	PRESET TO	CONNECTIONS	ADJUSTMENT	REMARKS
1	Channel 40	Oscilloscope to secondary of L7 (2nd Local)	L7	Adjust for max. 2nd Local Output (10.24 MHz OSC alignment).
2	Same as Step 1	DC Volt Meter to Pin No. 5 of IC 1 (TP-1)	L2	Adjust L2 for about 3.5 V (VCO OSC Alignment).
3	Channel 19	Oscilloscope to secondary of L1 (1st Local)	L1	Adjust for max. OSC output (17 MHz output alignment).
4	Same as Step 1	Same as Step 2	L2	Adjust L2 for 3.50 V (VCO OSC alignment).
5	Same as Step 1	Frequency Counter to Secondary of L1 (1st Local)	VC-1	Adjust VC1 for 17620 kHz (Frequency alignment).

To connect test equipment, see the following diagrams.

OSC Output Adjustment



VCO OSC Alignment



FREQUENCY CHART

CH	ANT. FREQ. (MHz)	VCO. FREQ. (MHz)	DIVIDE RATIO (N)	1A	1B	1C	1D	2A	2B	2D	3A	3B
1	26.965	17.180	182	0	1	0	0	0	0	1	0	0
2	26.975	17.190	183	1	1	0	0	0	0	1	0	0
3	26.985	17.200	184	0	0	1	0	0	0	1	0	0
4	27.005	17.220	186	0	1	1	0	0	0	1	0	0
5	27.015	17.230	187	1	1	1	0	0	0	1	0	0
6	27.025	17.240	188	0	0	0	1	0	0	1	0	0
7	27.035	17.250	189	1	0	0	1	0	0	1	0	0
8	27.055	17.270	191	1	0	0	0	1	0	1	0	0
9	27.065	17.280	192	0	1	0	0	1	0	1	0	0
10	27.075	17.290	193	1	1	0	0	1	0	1	0	0
11	27.085	17.300	194	0	0	1	0	1	0	1	0	0
12	27.105	17.320	196	0	1	1	0	1	0	1	0	0
13	27.115	17.330	197	1	1	1	0	1	0	1	0	0
14	27.125	17.340	198	0	0	0	1	1	0	1	0	0
15	27.135	17.350	199	1	0	0	1	1	0	1	0	0
16	27.155	17.370	201	1	0	0	0	0	0	0	0	1
17	27.165	17.380	202	0	1	0	0	0	0	0	0	1
18	27.175	17.390	203	1	1	0	0	0	0	0	0	1
19	27.185	17.400	204	0	0	1	0	0	0	0	0	1
20	27.205	17.420	206	0	1	1	0	0	0	0	0	1
21	27.215	17.430	207	1	1	1	0	0	0	0	0	1
22	27.225	17.440	208	0	0	0	1	0	0	0	0	1
23	27.255	17.470	211	1	0	0	0	1	0	0	0	1
24	27.235	17.450	209	1	0	0	1	0	0	0	0	1
25	27.245	17.460	210	0	0	0	0	1	0	0	0	1
26	27.265	17.480	212	0	1	0	0	1	0	0	0	1
27	27.275	17.490	213	1	1	0	0	1	0	0	0	1
28	27.285	17.500	214	0	0	1	0	1	0	0	0	1
29	27.295	17.510	215	1	0	1	0	1	0	0	0	1
30	27.305	17.520	216	0	1	1	0	1	0	0	0	1
31	27.315	17.530	217	1	1	1	0	1	0	0	0	1
32	27.325	17.540	218	0	0	0	1	1	0	0	0	1
33	27.335	17.550	219	1	0	0	1	1	0	0	0	0
34	27.345	17.560	220	0	0	0	0	0	1	0	0	1
35	27.355	17.570	221	1	0	0	0	0	1	0	0	1
36	27.365	17.580	222	0	1	0	0	0	1	0	0	1
37	27.375	17.590	223	1	1	0	0	0	1	0	0	1
38	27.385	17.600	224	0	0	1	0	0	1	0	0	1
39	27.395	17.610	225	1	0	1	0	0	1	0	0	1
40	27.405	17.620	226	0	1	1	0	0	1	0	0	1

SCOPE WAVE FORMS FOR LEVEL REFERENCE

