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Teaberry Racer "T" Service Manual

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SERVICE MANUAL

FOR

RACER T

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SPECTRIC PHONE

GENERAL:

Channels	23 Channels for amplitude modulation (AM), utilizing Phase Lock Loop circuitry.
Frequency Control Frequency Range	Phase Lock Loop Synthesizer 26.965 MHz to 27.255 MHz
Components Parts	26 transistors; 1 FET; 21 Diodes; 2 Varactor Diode; 1 pc Resistor Network; 1 LED; 4 IC; 2 Crystals; 2 Ceramic Filter
Microphone	4 pin dynamic, 600 ohm
Antenna	50 Ohm output
Jacks and Connectors	Microphone (4P), DC Power, External Speaker, PA Speaker and Antenna
Control and Switches	ON-OFF volume, Squelch, Delta tune, PA/CB, ANL/ OFF, Channel Selector,
Indicators	S/RF Meter, Modulation Lamp
Power Supply	13.8 VDC
Accessories	DC Power Cord, Microphone and Microphone Hanger, Mounting Bracket, Mounting Knobs, Sheet metal screws - "
Size	6-1/2"(W)x9-1/4 (D)x 2-3/16"(H)
Weight	4.1oz.

RECEIVER:

Receiving System	Double Conversion
Delta Tune +/-	1.4 Khz
Frequency tolerance	0.003%
Sensitivity at 10db S+N/N	0.5uV
Image Rejection Ratio	50dB
AGC Figure of Merit	70dB
Squelch Sensitivity at Threshold	0.25uV
Adjacent Channel Selectivity	55dB
Audio Output Power	3.8W
Battery Drain at no signal	350mA
S-Meter Sensitivity for S-9	50uV
P.A. Output	3.8W

TRANSMITTER:

RF Output Power	4.0W Max.
Spurious Emission	-50dB
Battery Drain at no Modulation	1100mA

ALIGNMENT PROCEDURE: PLL UNIT

STEP	CONNECT OUTPUT METER	ADJUST	ADJUST FOR
1	Oscilloscope, Frequency counter and Electric volt meter to L801 secondary	L801	10.238MHz* reading on Frequency counter, Maximum output.
2	On transmitting, set to CH.1, Volt-Ampere meter to (11) terminal of IC-802.	L803	1.5V [±] 0.1V reading on Volt-Ampere meter
3	On transmitting, set to CH.1 Frequency counter and Oscilloscope to L805 secondary.	L809	26.965MHz reading on Frequency counter
4	On transmitting, set to CH.13, Frequency counter, Oscilloscope and Electronic volt meter to L805 secondary.	L804 L805	Maximum output (27MHz alignment)
5	On receiving, set to CH.13, Frequency counter, Oscilloscope and Electronic volt meter to L807 secondary.	L806 L807	Maximum output (37MHz alignment)

* Nominal Frequency----10.240MHz
 Actual Frequency----10.238MHz

ALIGNMENT INSTRUCTIONS

RECEIVER ALIGNMENT

Test Equipment Required

- a. Signal generator (27 MHz, 50 ohm output impedance, 1000 Hz, 30 % modulation)
- b. V.T.V.M.
- c. Oscilloscope
- d. Distortion Meter
- e. Voltmeter (5 V.)
- f. 8 ohm Dummy load
- g. Mic plug for test (See figure 2)
- h. DC Power Supply (13.8 V/2 A.)

Notes:

1. Allow test equipment and set at least fifteen (15) minutes to warm up before starting the alignment.
2. Signal input must be kept as low as possible to avoid overload and clipping. (Use highest possible sensitivity for output indication.)
3. Output level of test set should be kept under two (2) volts.
4. A non-metallic tool must be used for all the alignment.
5. Connection of the test equipment is shown in RECEIVER TEST EQUIPMENT SET-UP DIAGRAM. (See Figure 4.)

ALIGNMENT PROCEDURE

Step	Connect SG	Set Condition	Connect Output Meter	Adjust	Adjust For
1	No Signal input.	VOLUME: Maximum SQUELCH: Max. ANL: Off PA-CB: CB CH-SEL: 13 CH. DELTA TUNE: 0	VOLTMETER connected between TP1 and ground.	VR1	1.45 V. reading on VOLT_METER.
2	To antenna connector.	Same as STEP 1	V.T.V.M. and Oscilloscope connected to Ext. Sp. Jack.	L101 L102 T301 T302 T303 T304 L801 L806 L807	Maximum Audio Output.
3	To antenna connector, 200 uV signal input.	Same as STEP 1	Same as STEP 2	VR4	"S9" reading on the S meter scale with 200 uV signal input (S meter adjustment)
	Same as STEP 2 316 uV signal input.	Same as STEP 1	Same as STEP 2	VR3	Squelch open with 316 uV signal input (Squelch adjustment)

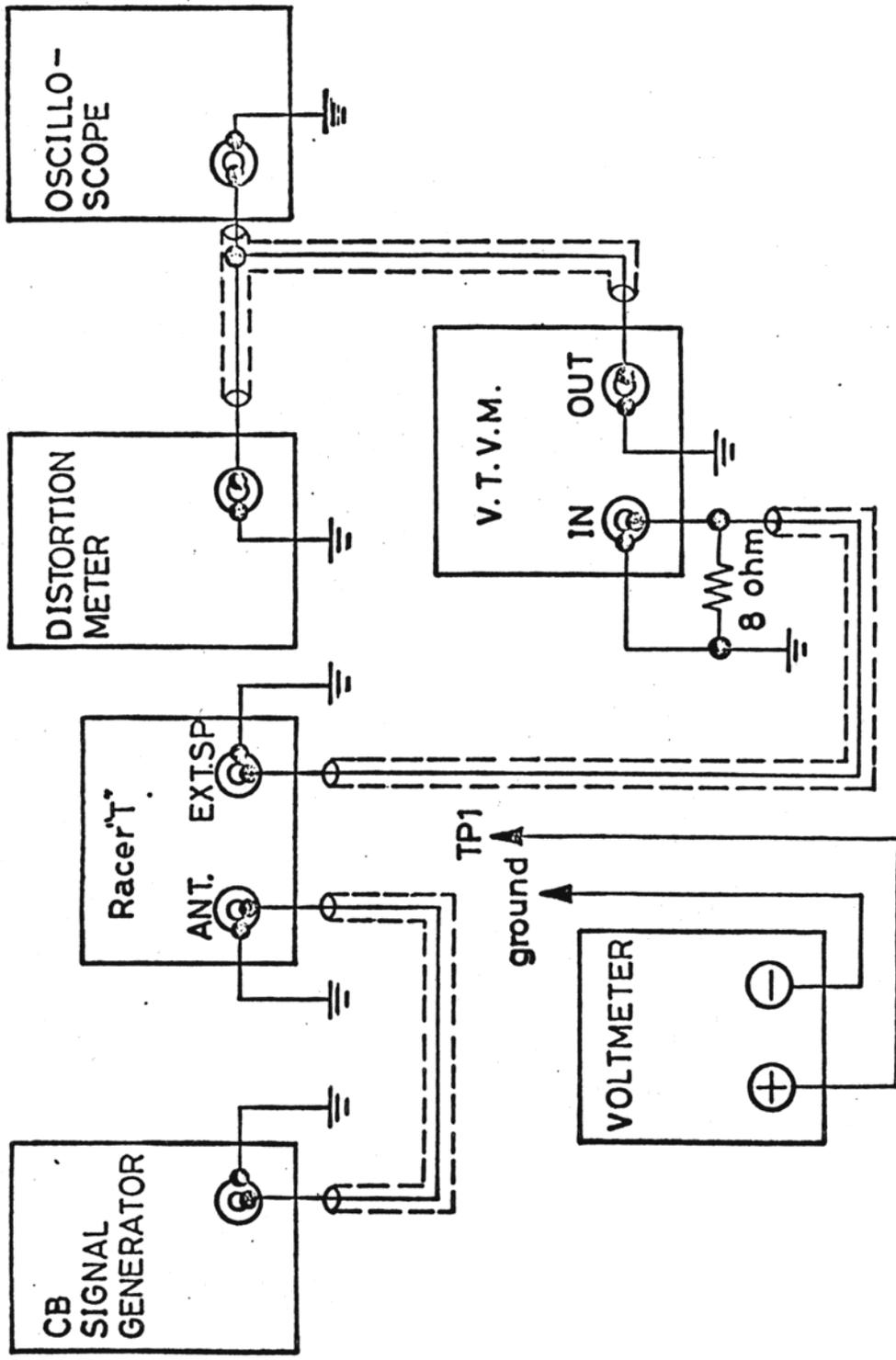


Figure 4

ALIGNMENT INSTRUCTIONS

Transmitter Alignment

Test Equipment Required

- a. V.T.V.M. (15 mV)
- b. RF Power Meter
- c. Frequency Counter
- d. Oscilloscope (50 MHz)
- e. Audio Signal Generator (1000 Hz)
- f. CM Coupler
- g. Mic Plug for test (See figure # 2.)
- h. DC power supply (13.8 V/2 A.)

Notes:

1. The transceiver meets all requirements of FCC Rules and Regulations, Part 95. Only these persons properly licensed by the FCC are permitted to repair or adjust any malfunctioning unit found to be transmitting illegally. (Refer to FCC Rules and Regulations, Part 95, Sub part D, Section 95.)
2. Allow test equipment and set at least fifteen (15) minutes to warm up before starting the alignment.
3. RF POWER METER or 50 ohm dummy load must be connected to the antenna connector.
4. A non-metallic tool must be used for all alignment.
5. Connection of test equipment is shown in TRANSMITTER TEST EQUIPMENT SET-UP DIAGRAM. (See Figure 1.)

ALIGNMENT PROCEDURE

S ^r	Set Condition	Connect	Adjust	Adjust For
1	Key transmitter by using Mic Plug for test. CH. SEL: 13 PA-CB: CB.	Power connected and "ON". RF POWER METER and OSCILLOSCOPE to antenna connector.	L906 L903 L901 L804 L805	Maximum reading (4.5 - 5.0 W.) on RF POWER METER. Then, turn L903 clockwise (180-360°).
2	Same as STEP 1	Same as STEP 1	L906	Turn L906 counterclockwise to obtain 3.75 W reading on RF POWER METER.
3	Same as STEP 1	Same as STEP 1	VR9	RF Meter reading as shown in Fig. #3. (RF Meter adjustment)
4	Same as STEP 1	Same as STEP 1 AUDIO SIGNAL GENERATOR connected to Pin 2 (hot) and Pin 4 (ground) of Mic Plug for test. Pin numbers are shown on Mic plug.	VR7	95 % modulation with 15 mV, 1000 Hz signal input From AUDIO SIGNAL GENERATOR.

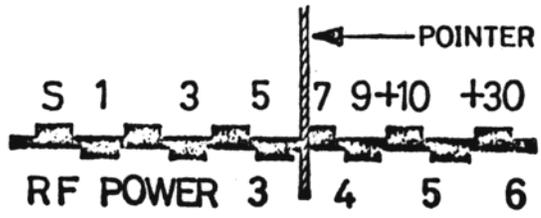


Figure 3

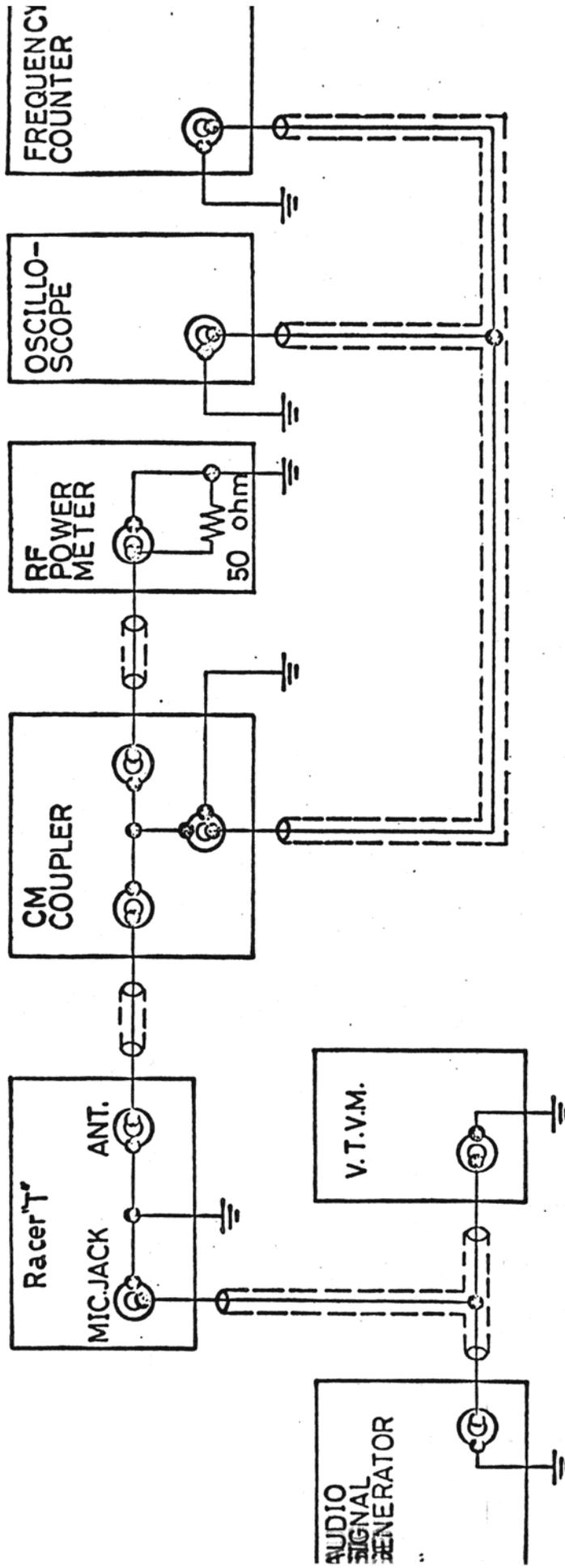


Figure 1

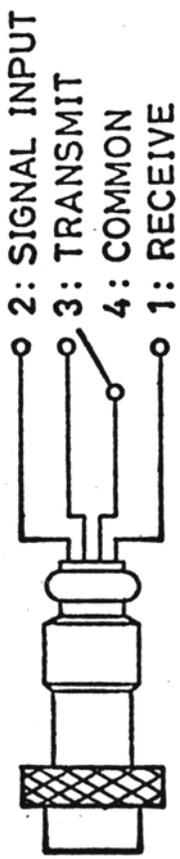
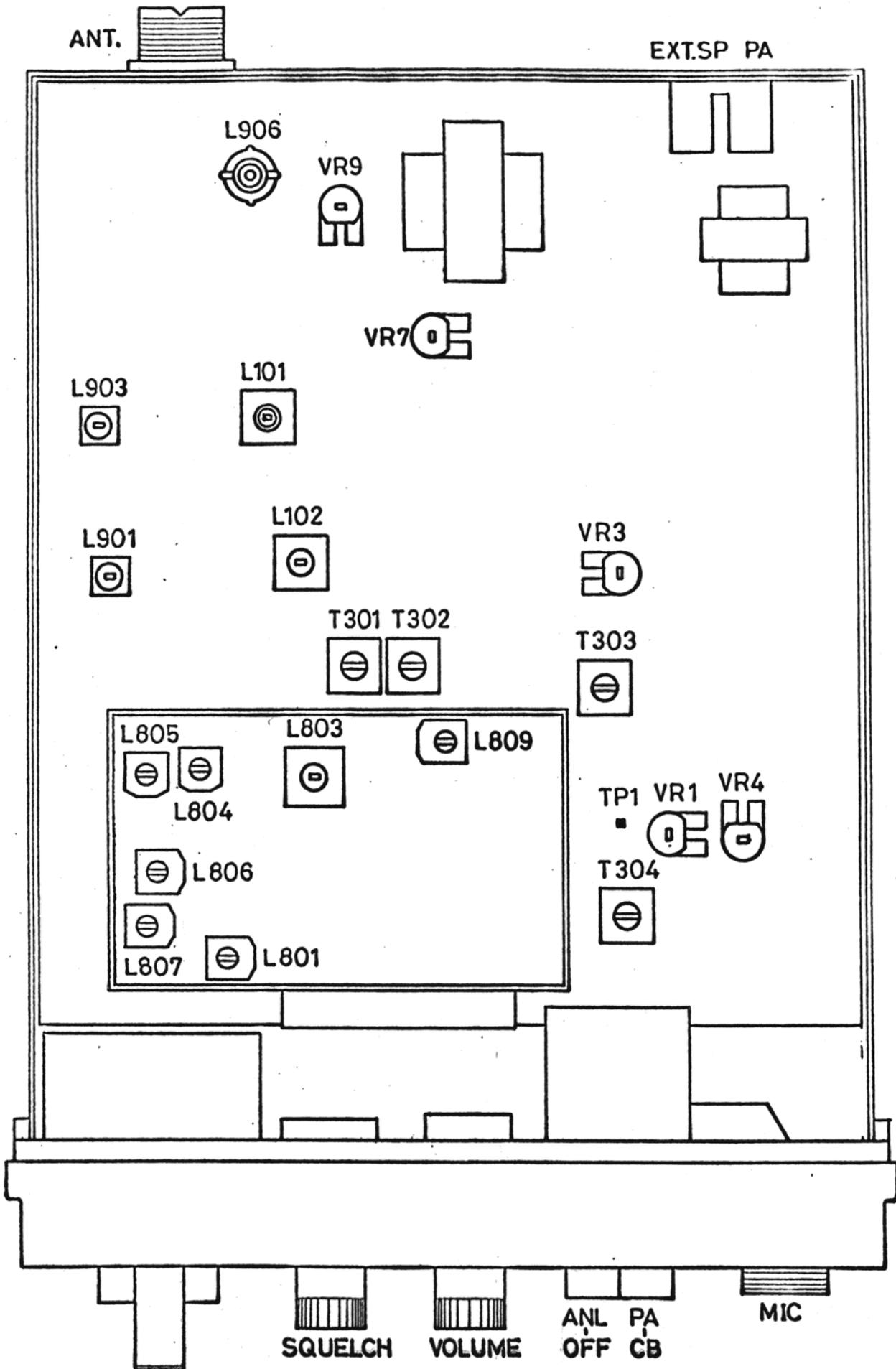


Figure 2

The pin numbers are shown on the MIC PLUG itself.



VOLTAGE CHART

Transistors			Transistors		
	RX	TX		RX	TX
B	1.1	----	B	0	0
Q101 C	7.0	----	Q602 C	7.8	0.8
E	0.5	----	E	0	0
B	1.2	----	B	7.6	7.6
Q102 C	7.0	----	Q603 C	13.5	13.5
E	0.6	----	E	7.0	7.0
B	1.2	----	B	7.8	0.8
Q301 C	6.4	----	Q604 C	7.2	0
E	0.6	----	E	7.2	0
B	7.0	----	B	1.6	0
Q501 C	0	----	Q701 C	2.8	0
E	7.0	----	E	1.1	0
B	0	----	B	2.0	1.9
Q502 C	6.8	----	Q702 C	13.5	8.7
E	0	----	E	7.2	1.3
B	0	0	B	----	1.5
Q503 C	0	0	Q901 C	----	13.5
E	0	0	E	----	1.0
B	2.0	1.8	B	----	----
Q504 C	13.5	8.6	Q902 C	----	10.0
E	7.0	1.2	E	----	0
B	0.7	0	B	----	----
Q601 C	0	0	Q903 C	----	11.4
E	0	0	E	----	0

IC 301

Terminal No.	RX	TX
1	1.5	-----
2	1.5	-----
3	2.8	-----
4	0	-----
5	1.7	-----
6	4.8	-----
7	4.8	-----

Terminal No.	RX	TX
1	13.5	13.5
2	12.5	12.1
3	8.2	8.0
4	1.4	1.4
5	6.8	6.8
6	6.8	6.8
7	0	0
8	6.7	6.6
9	1.4	1.4
10	0	0
11	0	0
12	6.9	6.8

1. Power supply voltage = 13.8 V.
2. All voltage measurements are with no signal input.
3. All voltage are measured under unsquelched condition.
4. Measured with V.T.V.M.

LOGIC DECODING

Pin 4 - IC 802	Channel
1.470 MHz	1
1.480 MHz	2
1.490 MHz	3
1.510 MHz	4
1.520 MHz	5
1.530 MHz	6
1.540 MHz	7
1.560 MHz	8
1.570 MHz	9
1.580 MHz	10
1.590 MHz	11
1.619 MHz	12
1.620 MHz	13
1.630 MHz	14
1.640 MHz	15
1.660 MHz	16
1.670 MHz	17
1.680 MHz	18
1.690 MHz	19
1.710 MHz	20
1.720 MHz	21
1.730 MHz	22
1.760 MHz	23