

REALISTIC[®]

Service Manual

21-1513

CB 40-CHANNEL TRANSCEIVER TRC-423

Catalog Number: 21-1513



CUSTOM MANUFACTURED FOR RADIO SHACK, A DIVISION OF TANDY CORPORATION

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SPECIFICATIONS

GENERAL

Description

Transmitter	Crystal controlled PLL synthesizer, amplitude modulation
Receiver	Crystal controlled double conversion, superheterodyne system
Communicating frequencies	40 CB channels (26.965 to 27.405 MHz)
Voltage operation	12 – 16V DC (negative only ground)
Temperature and Humidity range	– 22°C ~ + 140°F (– 30°C ~ + 60°C) and 10% ~ 90%
Transmitter/Receiver switching	Electrical

STANDARD TEST CONDITIONS

Battery supply voltage	13.8V DC
Modulation	1000 Hz, 30%
Receiver output power	500mW at external SP
Receiver output impedance	8 ohms, non-inductive
Ant. load impedance of transmitter	50 ohms, non-inductive
Ambient conditions	
Temperature	63°F ~ 73°F (17°C ~ 23°C)
Humidity	40% ~ 70%

TRANSMITTER

Description	Nominal	Limit
RF power output	4.0 watts	3.6 ~ 4.4 watts
Antenna spurious emission	70	50
Modulation capability (positive/negative)	+90%/–90%	+80%/–80%
AMC Range at 1 kHz	40 dB	30dB
Frequency accuracy	0.002%	0.005%
Spurious radiation & Harmonic		
Signal radiation ratio from fundamental	–65dB	–60dB
Current consumption		
at no modulation,	1000 mA	1200 mA
at 80% modulation	1500 mA	1700 mA
Envelope distortion	10% max. 1000 Hz, 50% mod.	
Stability against variation of antenna impedance	Satisfactory when dummy antenna is varied from 40 ohms to 200 ohms.	

RECEIVER

Description	Nominal	Limit
Intermediate frequency		
1st IF	10.695 MHz	
2nd IF	455 kHz	
Sensitivity for 500 mW output	0.3 μ V	1 μ V
Sensitivity at 10dB (S+N)/N	0.7 μ V	1.0 μ V
Adjacent channel rejection	65dB	55dB
Image rejection (1st IF/2nd IF)	70dB	60dB
IF rejection ratio (1st IF/2nd IF)	60dB	45dB
Signal-to-Noise ratio		
at 1 mV input	40dB	35dB
Distortion at 1 mV input,		
30% mod. (500 mW out)	3%	5%
AGC Figure of merit at 50mV input	80dB	70dB
Power output at 1mV input		
Undistorted (10% THD)	4.5W	4.0W
Maximum	5.0W	4.5W
Electrical fidelity compared to 1000 Hz	5.0	4.5
450 Hz	-6dB	-6 \pm 3dB
2500 Hz	-6dB	-6 \pm 3dB
Cross modulation	50dB	40dB
Squelch	60dB	60 \pm 6dB
Current consumption (no signal)	250 mA	300 mA
"S" meter sensitivity to light 3th LED	40dB	40 \pm 6dB
Noise Blanker	20dB	16dB
Automatic noise limiter	16dB	12dB

PUBLIC ADDRESS

Description	Nominal	Limit
10% THD output power	4W	3.5W
Microphone sensitivity for 4W	5mV	10mV
Current drain at 10% THD power	1000mA	1200mA

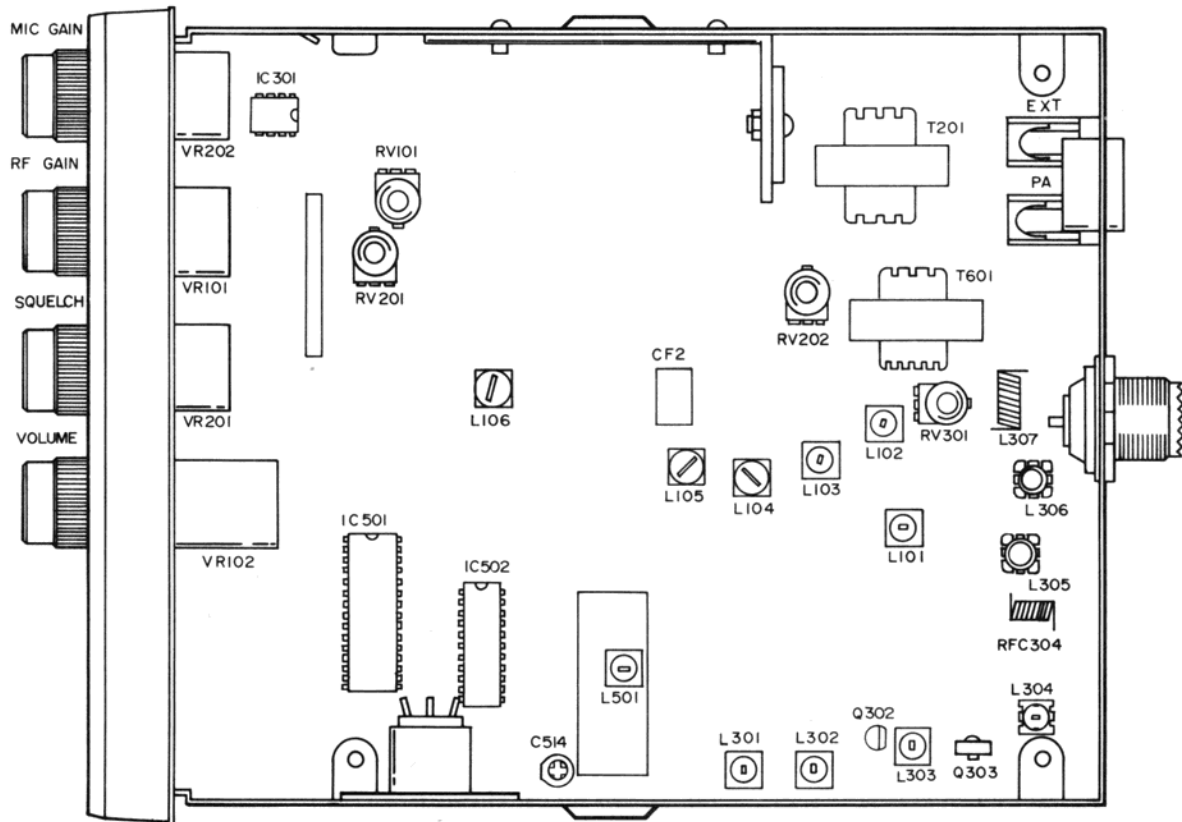
OTHER ITEMS

Fuse	WHT wire: 1 Amp. RED wire: 2 Amp.
General power requirement	12-16V DC
Dimensions	2 lbs 4 ozs (1.03kg)
Weight	(W) 57 $\frac{7}{8}$ " (148mm) \times (H) 11 $\frac{10}{13}$ " (45mm) \times (D) 8 $\frac{1}{4}$ " (210mm)

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 that still might be considered acceptable; in no case should a unit perform to less than within any limit spec.

ALIGNMENT INSTRUCTIONS

A. ALIGNMENT TEST POINTS AND PARTS LOCATION



B. PHASE LOCKED LOOP AND CPU SECTION

1. Test Equipment Required

- a. Frequency Counter
- b. DC Power Supply (13.8Volt. 3 Amp.)
- c. DC Voltmeter
- d. Oscilloscope

2. Alignment Procedure

STEP	SETTING	CONNECTION	ADJUST	ADJUST FOR
1	Frequency adjustment; MIC: Receive Volume: Optional Squelch: Optional CH Selector: Optional RF Gain: Optional MIC Gain: Optional PA, ANL, NB, CH9: OFF	Frequency counter to output pin 12 of IC502 (Figure 1).	C514	10.240MHz ± 100Hz
2	RX VCO voltage adjustment; MIC: Receive Volume: Optional Squelch: Optional CH Selector:1 RF Gain: Optional MIC Gain: Optional PA, ANL, NB, CH9: OFF	Connect DC voltmeter between R533 and R534 (Figure 2).	L501	1.5V
3	TX VCO voltage adjustment; MIC: Transmit Volume: Optional Squelch: Optional CH Selector: 1 RF Gain: Optional MIC Gain: Optional PA, ANL, NB, CH9: OFF	Connect DC voltmeter between R533 and R534 (Figure 2).	L501	Indication on DC voltmeter must be 1.0-2.0 Volt. If DC voltmeter does not indicate 1.0-2.0 volt, readjust L501.
4	CPU IC Voltage check; MIC: Receive Volume: Optional Squelch: Optional CH Selector: Optional RF Gain: Optional MIC Gain: Optional PA, ANL, NB, CH9: OFF	Connect DC voltmeter to pin 2 of IC501.		Indication on DC voltmeter must be 4-5.5 volt.
5	CPU frequency check; MIC: Receive Volume: Optional Squelch: Optional CH Selector: Optional RF Gain: Optional MIC Gain: Optional PA, ANL, NB, CH9: OFF	Connect oscilloscope to pin 16 of IC501 (Figure 3).		Check for 300-400kHz of triangle waveform as Figure 4.

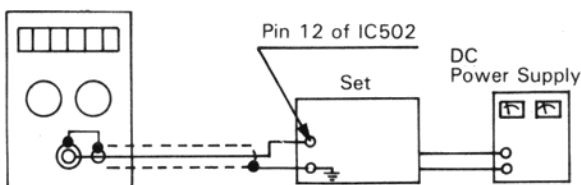


Figure 1

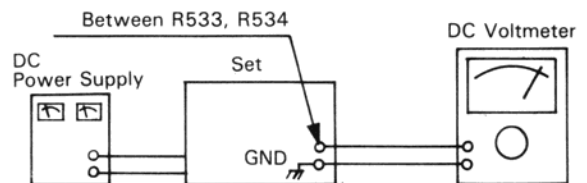


Figure 2

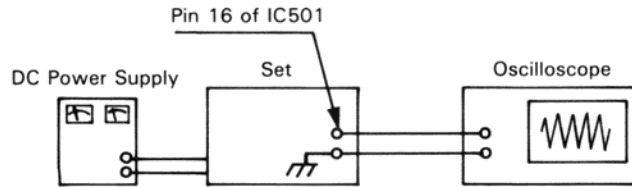


Figure 3

C. TRANSMITTER SECTION

1. Test Equipment Required

- | | |
|--------------------------------|--|
| a. RF Powermeter (RF SSVM) | f. DC Power supply (13.8 Volt, 3 Amp.) |
| b. 50 ohm load (non-inductive) | g. Spectrum Analyzer |
| c. RF Attenuator | h. Frequency Counter |
| d. Oscilloscope | i. Coupler |
| e. Audio Generator | |

2. Alignment procedure

STEP	SETTING	CONNECTION	ADJUST	ADJUST FOR
1	RF Driver stage; MIC: Transmit Volume: Optional Squelch: Optional CH Selector: 19 RF Gain: Optional MIC Gain: Turn to counter-clockwise PA, ANL, NB, CH9: OFF	Connect RF Powermeter to base of Q302 (Figure 4).	L301 L302	Adjust for maximum indication on the RF Powermeter.
2	RF Power stage ; MIC: Transmit Squelch: Optional Volume: Optional CH Selector: 19 RF Gain: Optional MIC Gain: Turn to counter-clockwise PA, ANL, NB, CH9: OFF	Connect dummy load and RF power meter to the EXT-ANT. Jack on the set (Figure 5).	L303 L304 L305 L306	Adjust for maximum indication on the RF power-meter (4 watts). If indication is not in 4 watts range, go back to step 1 and readjust L303, L304, L305, L306
3	Modulation adjustment ; MIC: Transmit Volume: Optional Squelch: Optional CH Selector: 19 RF Gain: Optional MIC Gain: Fully clockwise PA, ANL, NB, CH9: OFF	Connect audio generator (1kHz) to pin 4 of microphone connector (Figure 6). Connect dummy load and oscilloscope through coupler to RF powermeter. Connect RF powermeter to EXT-ANT jack on the set. Adjust audio signal level to obtain 80%-90% modulation level.	RV202	Check for proper modulation pattern on the oscilloscope.

STEP	SETTING	CONNECTION	ADJUST	ADJUST FOR
4	Second harmonic check; MIC: Transmit Volume: Optional Squelch: Optional CH Selector: 19 RF Gain: Optional MIC Gain: Turn to counter- PA, ANL, NB, CH9: OFF	Connect RF powermeter with dummy load to spectrum analyzer through coupler/-40dB attenuator to EXT-ANT. Jack on the set (Figure 7).		At no modulation compare the level of fundamental frequency to the level of harmonic frequency. Suppression of the 2nd harmonic frequency level must be lower than -60dB. Check for the other channels.
5	Frequency check; MIC: Transmit Volume: Optional Squelch: Optional Channel selector: 19 RF Gain: Optional MIC Gain: Turn to counter- clockwise PA, ANL NB, CH9: OFF	Connect dummy load and frequency counter through coupler to RF powermeter. Connect RF powermeter to EXT-ANT. Jack on the set. (Figure 8).	C514	Make sure that the indication of the transmitter frequency is $27.185\text{MHz} \pm 300\text{Hz}$ on the frequency counter.
6	TX Power LED adjustment; MIC: Transmit Volume: Optional Squelch: Optional Channel Selector: 1 RF Gain: Optional MIC Gain: Turn to counter- clockwise PA, ANL, NB, CH9: OFF	Connect dummy load and frequency counter through coupler to RF power meter. Connect RF power meter to EXT-ANT jack on the set (Figure 6).	RV301	Adjust so that 3rd LED light up at 4 watts RF output power.

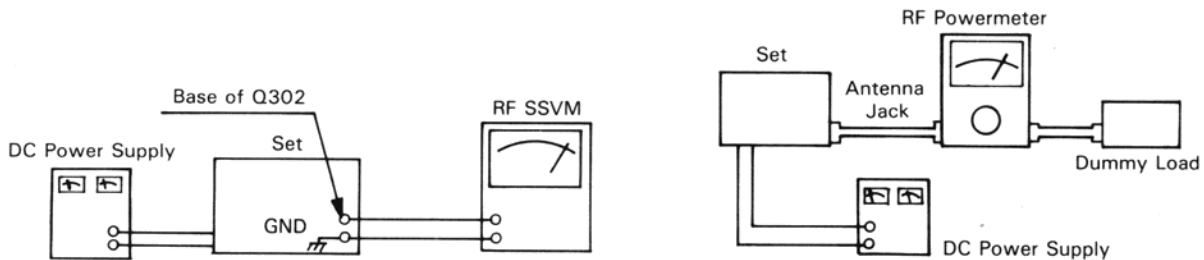


Figure 4

Figure 5

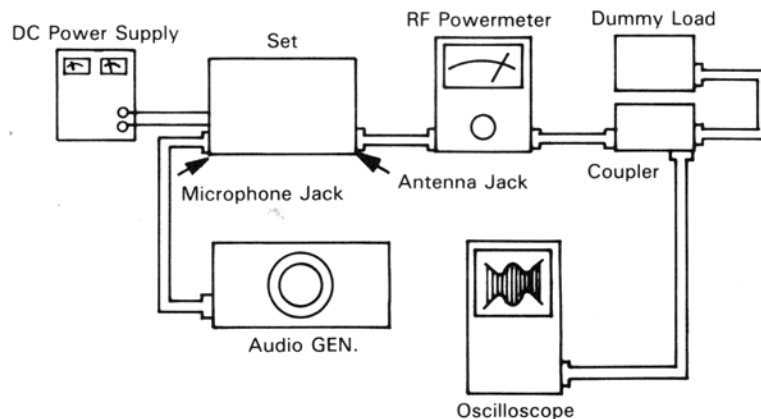


Figure 6

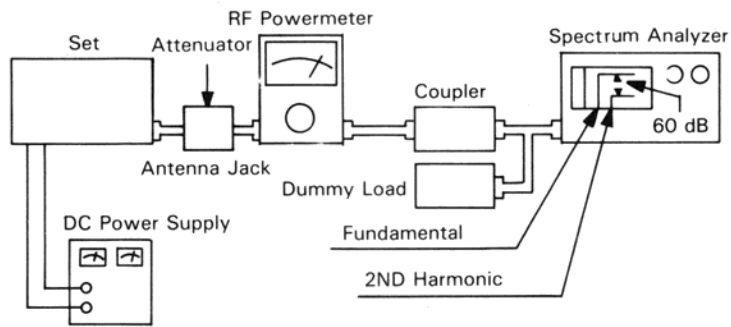


Figure 7

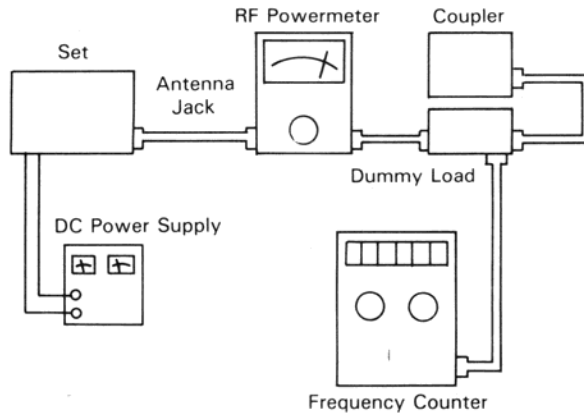


Figure 8

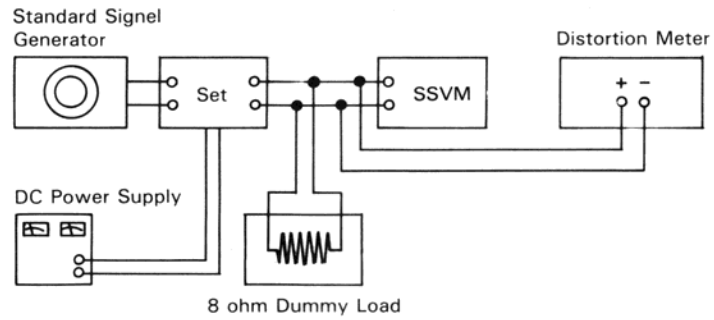


Figure 9

CHANNEL FREQUENCY GENERATION TABLE

RECEIVE

VCO FREQUENCY = N x 5 (kHz)

TRANSMIT

VCO FREQUENCY = N x 2.5 (kHz)

TRANSMIT FREQUENCY = VCO FREQUENCY x 2

CHANNEL	BCD INPUT TO IC-1								RECEIVE		TRANSMIT		
	D1 (1F)	D2 (1A)	D3 (1G)	D4 (1E)	D5 (1B)	D6 (2C)	D7 (2N)	D8 (2F)	N	VCO FREQUENCY (MHz)	N	VCO FREQUENCY (MHz)	TRANSMIT FREQUENCY (MHz)
1	1	1	1	1	0	1	1	1	3254	16.27	5393	13.4825	26.965
2	1	0	0	0	0	1	1	1	3256	16.28	5395	13.4875	26.975
3	1	0	0	1	0	1	1	1	3258	16.29	5397	13.4925	26.985
4	0	1	0	1	0	1	1	1	3262	16.31	5401	13.5025	27.005
5	0	0	0	1	1	1	1	1	3264	16.32	5403	13.5075	27.015
6	0	0	0	0	1	1	1	1	3266	16.33	5405	13.5125	27.025
7	—	0	1	1	0	1	1	1	3268	16.34	5407	13.5175	27.035
8	0	0	0	0	0	1	1	1	3272	16.36	5411	13.5275	27.055
9	0	0	0	1	0	1	1	1	3274	16.37	5413	13.5325	27.065
10	0	0	1	0	0	0	1	1	3276	16.38	5415	13.5375	27.075
11	1	1	1	1	0	0	1	1	3278	16.39	5417	13.5425	27.085
12	1	0	0	0	0	0	1	1	3282	16.41	5421	13.5525	27.015
13	1	0	0	1	0	0	1	1	3284	16.42	5423	13.5575	27.115
14	0	1	0	1	0	0	1	1	3286	16.43	5425	13.5625	27.125
15	0	0	0	1	1	0	1	1	3288	16.44	5427	13.5675	27.135
16	0	0	0	0	1	0	1	1	3292	16.46	5431	13.5775	27.155
17	—	0	1	1	0	0	1	1	3294	16.47	5433	13.5825	27.165
18	0	0	0	0	0	0	1	1	3296	16.48	5435	13.5875	27.175
19	0	0	0	1	0	0	1	1	3298	16.49	5437	13.5925	27.185
20	0	0	1	0	0	1	0	1	3302	16.51	5441	13.6025	27.205
21	1	1	1	1	0	1	0	1	3304	16.52	5443	13.6075	27.215
22	1	0	0	0	0	1	0	1	3306	16.53	5445	13.6125	27.225
23	1	0	0	1	0	1	0	1	3312	16.56	5451	13.6275	27.255
24	0	1	0	1	0	1	0	1	3308	16.54	5447	13.6175	27.235
25	0	0	0	1	1	1	0	1	3310	16.55	5449	13.5225	27.245
26	0	0	0	0	1	1	0	1	3314	16.57	5453	13.6325	27.265
27	—	0	1	1	0	1	0	1	3316	16.58	5455	13.6375	27.275
28	0	0	0	0	0	1	0	1	3318	16.59	5457	13.6425	27.285
29	0	0	0	1	0	1	0	1	3320	16.60	5459	13.6475	27.295
30	0	0	1	0	0	0	0	1	3322	16.61	5461	13.6525	27.305
31	1	1	1	1	0	0	0	1	3324	16.62	5463	13.6575	27.315
32	1	0	0	0	0	0	0	1	3326	16.63	5465	13.6625	27.325
33	1	0	0	1	0	0	0	1	3328	16.64	5467	13.6675	27.335
34	0	1	0	1	0	0	0	1	3330	16.65	5469	13.6725	27.345
35	0	0	0	1	1	0	0	1	3332	16.66	5471	13.6775	27.355
36	0	0	0	0	1	0	0	1	3334	16.67	5473	13.6825	27.365
37	—	0	1	1	0	0	0	1	3336	16.68	5475	13.6875	27.375
38	0	0	0	0	0	0	0	1	3338	16.69	5477	13.6925	27.385
39	0	0	0	1	0	0	0	1	3340	16.70	5479	13.6975	27.395
40	0	0	1	0	0	0	1	0	3342	16.71	5481	13.7025	27.405

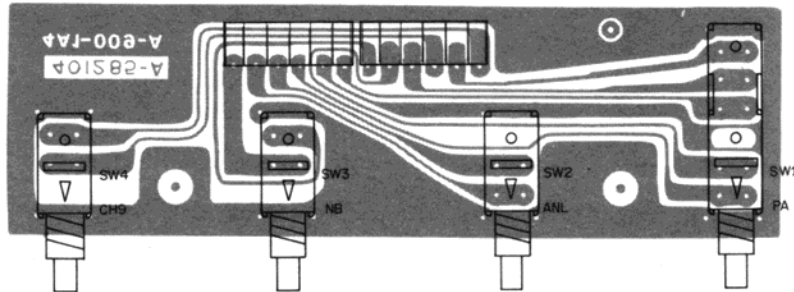
TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	REMEDY
Unit does not work at all	<ol style="list-style-type: none"> 1. Defective power switch VR102 2. Blown fuse 3. Broken DC power cord 4. Defective IC501 or IC502 	<ol style="list-style-type: none"> 1. Replace 2. Replace 3. Replace 4. Replace
No output from speaker at all	<ol style="list-style-type: none"> 1. Defective external speaker Jack 2. Poor connection on microphone connector 3. Defective push switch on microphone 4. Defective internal speaker 5. Defective D112, VR101, VR102, RV201 IC201 or other components 	<ol style="list-style-type: none"> 1. Repair or Replace 2. Repair or Replace 3. Repair or Replace 4. Replace 5. Replace the defective components
No noise on speaker	<ol style="list-style-type: none"> 1. Measure all the voltage of Q100, Q101, Q102, Q103, Q104, 105, 106, 107, 108, Q109, 110, 111, and IC201 with voltage chart on the page 20 2. Defective squelch circuit components (RV201, VR201, IC201, Q203, Q204, Q205, Q510, Q511) 	<ol style="list-style-type: none"> 1. Replace 2. Replace
Squelch does not work	<ol style="list-style-type: none"> 1. Defective VR201, RV201, Q203, Q204, Q205, Q510, Q511 2. Improperly adjusted RV201 	<ol style="list-style-type: none"> 1. Replace defective components 2. Readjust
No modulation	<ol style="list-style-type: none"> 1. Defective microphone 2. Poor Audio output and defective modulation microphone amplifier components (Q201, Q202, IC201, VR202) 3. Defective microphone connector component 4. Defective ALC Circuit (Q206, Q207, Q208, D205, D206) 	<ol style="list-style-type: none"> 1. Replace 2. Replace the defective component(s) 3. Replace 4. Replace the defective component(s)
LED meter does not work	<ol style="list-style-type: none"> 1. Defective D303, D304, D305, D306 2. Defective IC301 3. Defective D111, D302, RV101, RV301 	<ol style="list-style-type: none"> 1. Replace 2. Replace 3. Replace
LED Display does not work	<ol style="list-style-type: none"> 1. Defective orange wire fuse 2. Defective LED501, IC501, IC502 	<ol style="list-style-type: none"> 1. Replace 2. Replace
P.A does not work	<ol style="list-style-type: none"> 1. Defective VR202, SW1 2. Defective Q201, Q202, Q203, Q204, Q205, Q501, D504, IC501, IC502 	<ol style="list-style-type: none"> 1. Replace 2. Replace
Channel selector does not work	Defective IC501, SW5, SW6, SW7, SW8	Replace
RF gain does not work	Defective VR101, D101, D102, D103, D105, D106	Replace
ANL does not work	<ol style="list-style-type: none"> 1. Defective SW2 2. Defactive D110 	<ol style="list-style-type: none"> 1. Replace 2. Replace
NB does not work	<ol style="list-style-type: none"> 1. Defective SW3 2. Defective D112, D113, Q108, Q109, Q110, Q111 	<ol style="list-style-type: none"> 1. Replace 2. Replace
CH9 does not work	<ol style="list-style-type: none"> 1. Defective SW4 2. Defective D502, Q501, IC501, IC502 	<ol style="list-style-type: none"> 1. Replace 2. Replace

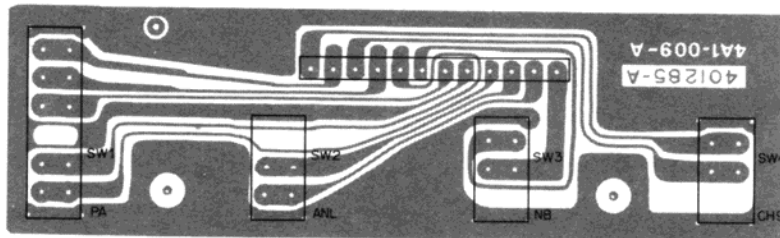
PRINTED CIRCUIT BOARD (TOP/BOTTOM VIEWS)

LED DISPLAY PCB

Top View

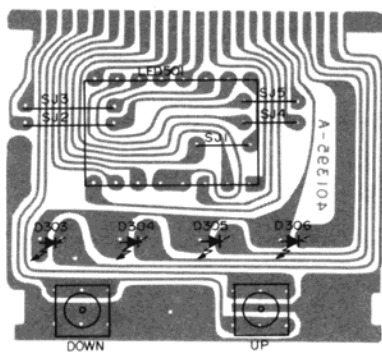


Bottom View

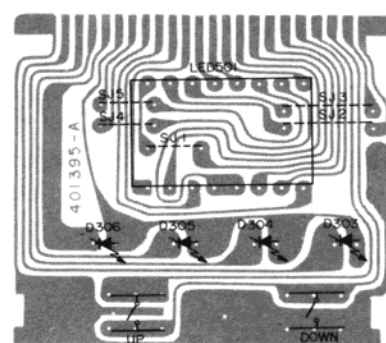


SWITCH PCB

Top View

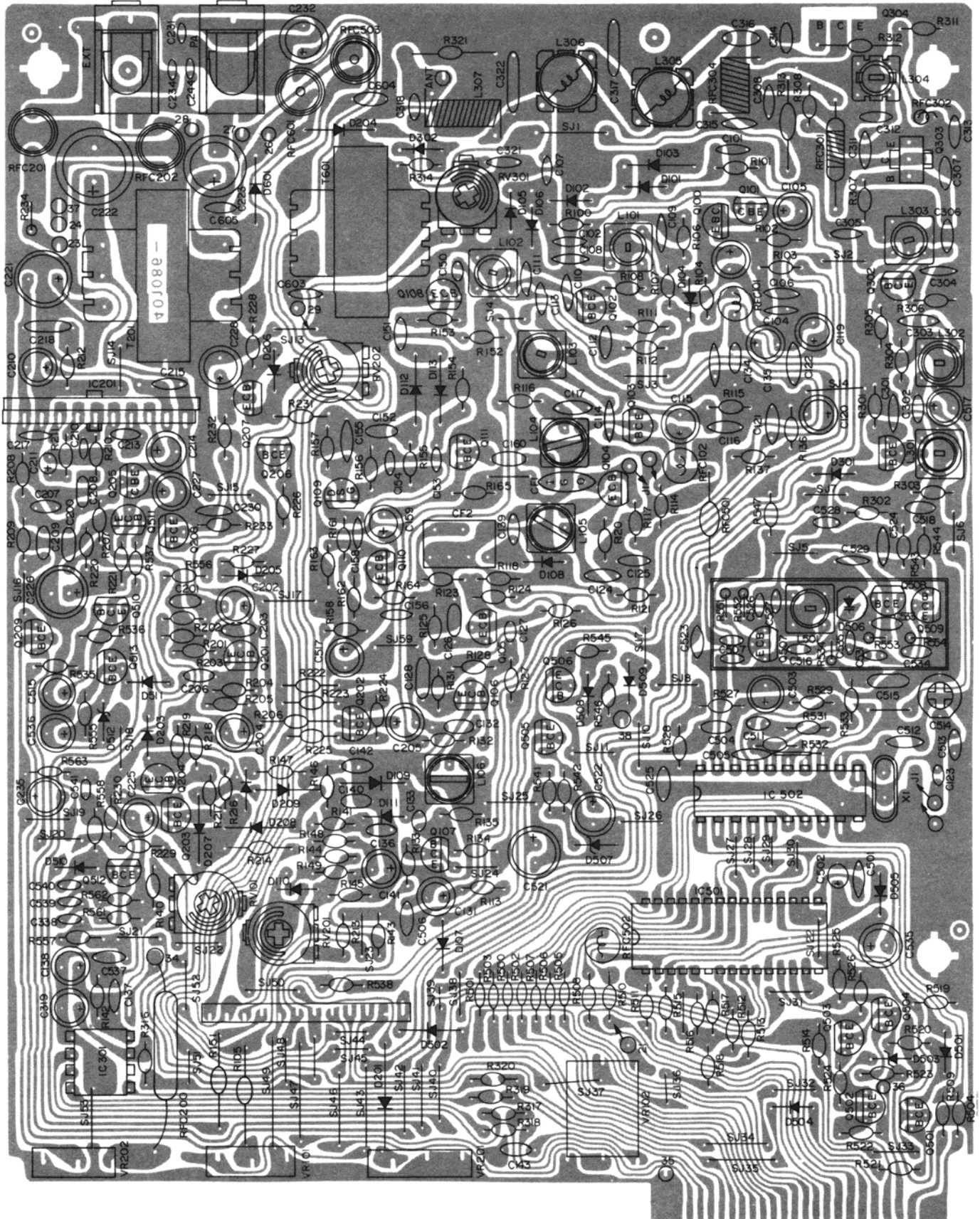


Bottom View

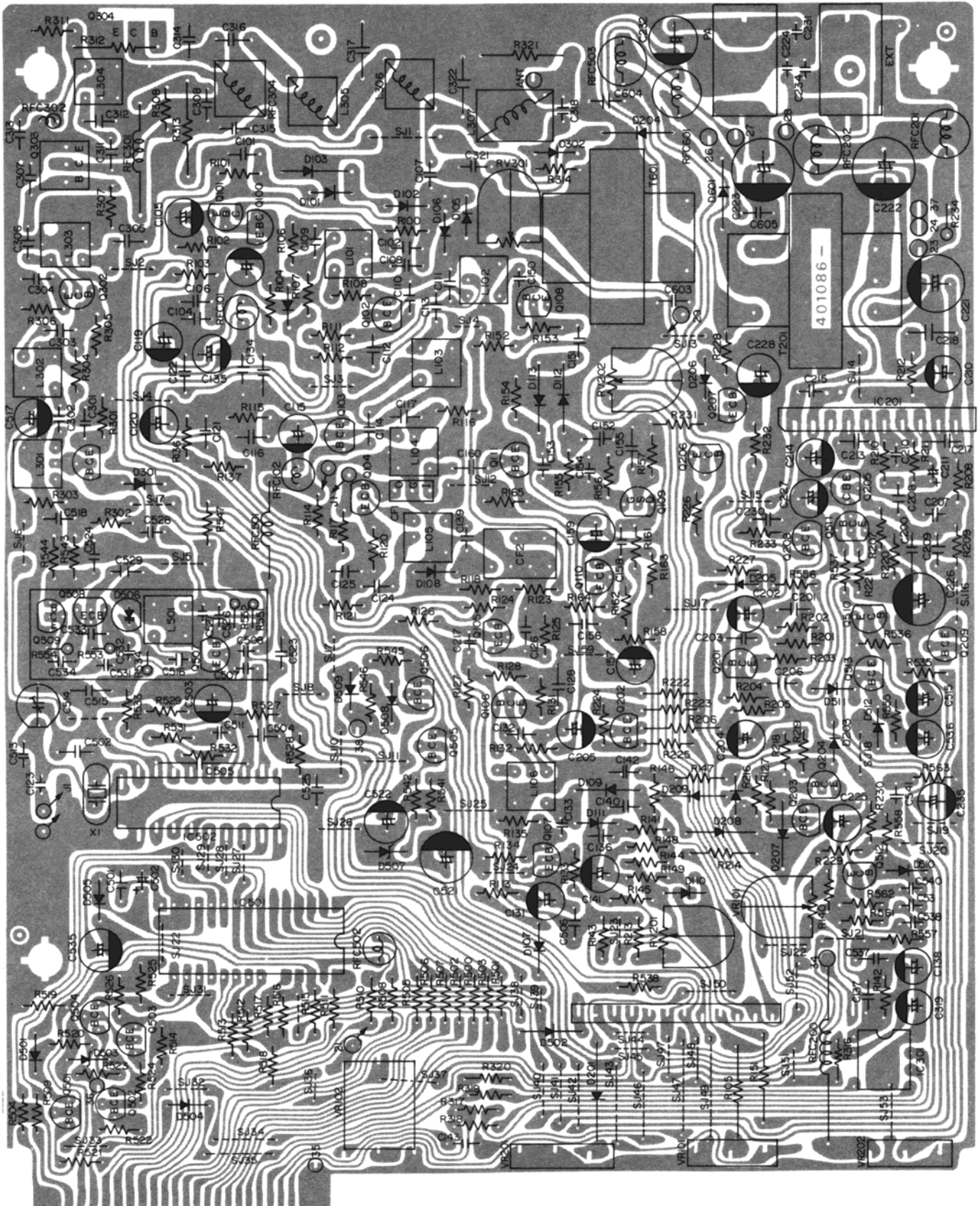


Top View

MAIN PCB

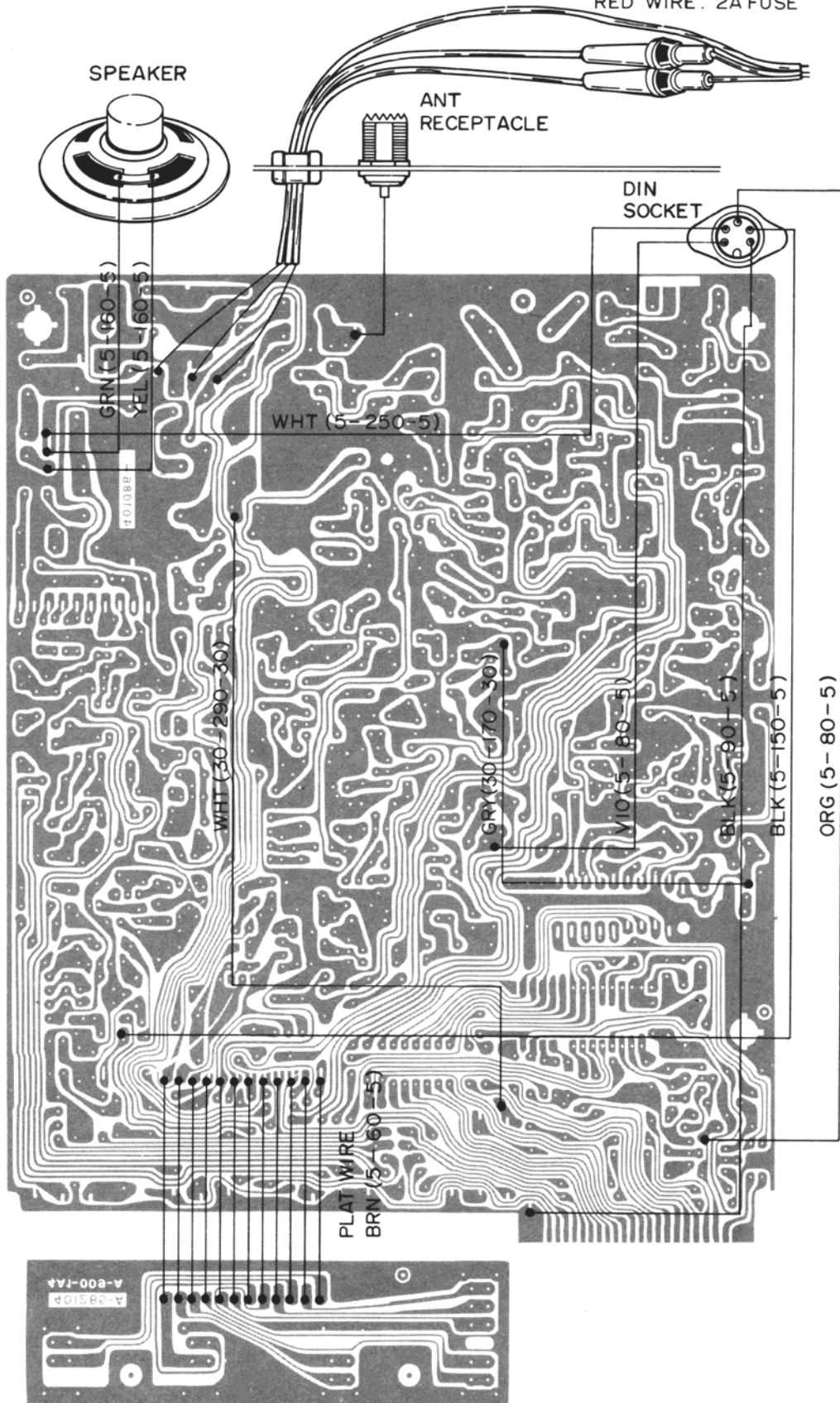


Bottom View

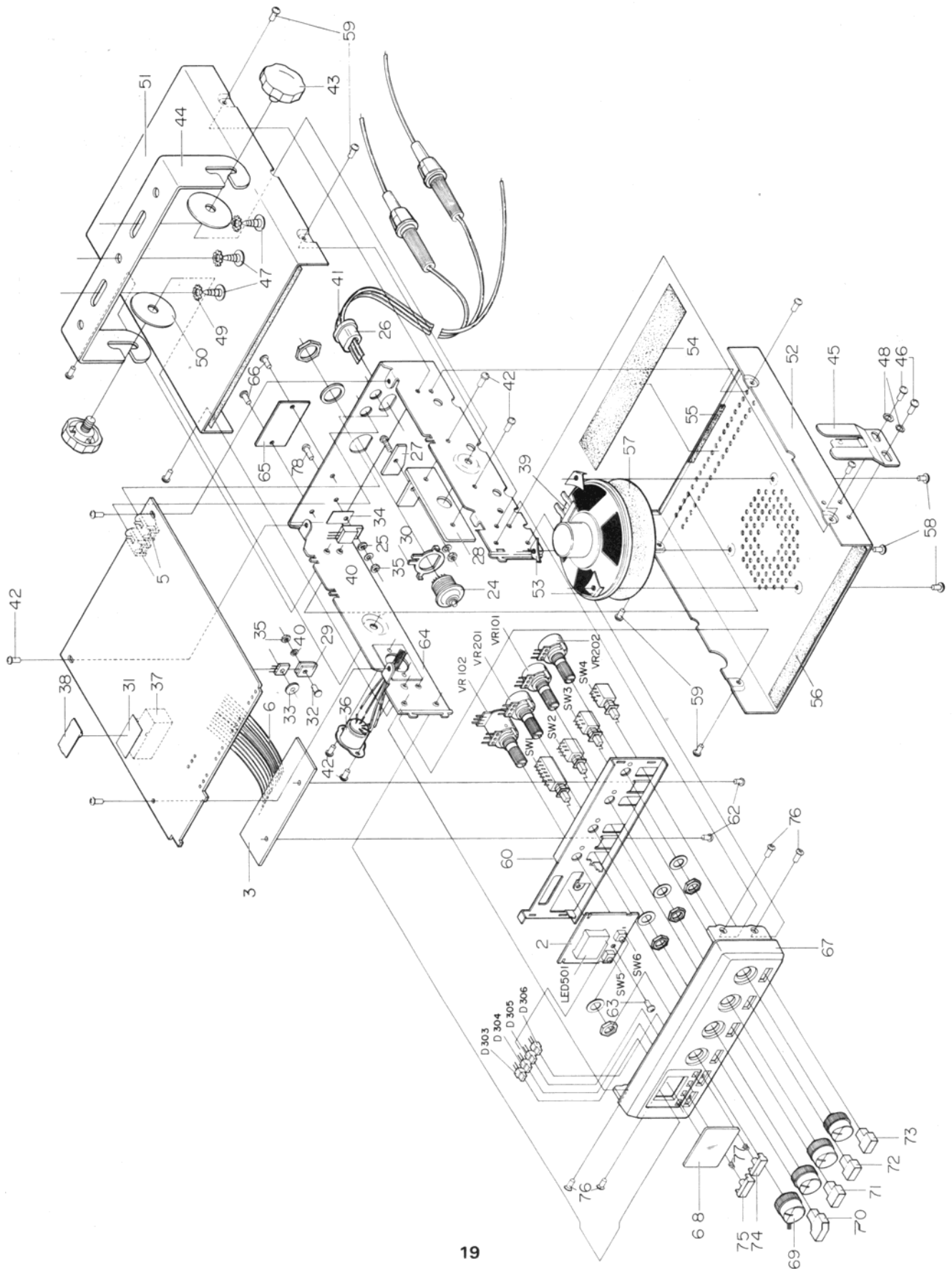


WIRING DIAGRAM

DC POWER CORD
 BLK WIRE : GROUND
 WHT WIRE : 1A FUSE
 RED WIRE : 2A FUSE



EXPLODED VIEW/DISASSEMBLY



EXPLODED VIEW PART LIST

Ref. No.	Description	RS Part No.	Mfr's Part No.
2	PCB, LED Display		401-395-B
3	PCB Switch		401-285-A
5	Jack Earphone HSJ 0615-01-0100		420-707-6
6	Plat Wire 6Pin		429-110-1
24	Receptacle-ANT, W/Nut Washer		421-046-7
25	Bushing-TR2078		441-004-5
26	Stopper-Cord		750-765
27	Heatsink, ALP 30 × 18 × T2, IC MTG		760-704
28	Heatsink, ALP 95 × 22 × T2, IC MTG		761-500
29	Heatsink-2314 TR MTG		760-430
30	Holder-ANT. MTG		732-560
31	Insulation Plate 26 × 134 × T3		902-050
32	(+) Screw Machine B.H M3 × 10, Zn-Plate		613-332
33	Mica-TR2314		440-005-1
34	Mica-TR2078		440-004-1
35	NUT, SS41, M3-1S, Zn-Plate		651-024
36	5Pin Socket, Din Lock Type		421-529-7
37	Shield Plate, 90 × 25 × T0.3		770-336
38	Shield Plate, 26 × 17 × T0.3		770-390
39	Speaker, 3" 8 ohm 3W		420-102-9
40	Spring Washer, M3, Zn-Plate		662-305
41	Power Cord, RED/WHT/BLK		504-299
42	(+) Tapping Screw (B.H) T3 × 6-2S, Zn-Plate		623-043
43	Securing Screw		600-051
44	Bracket-STE, BLK		723-661
45	Bracket-MIC, BLK		720-095
46	(+) Tapping Screw (B.H) 3.5 × 6-2S, Ni-Plate		620-084
47	(+) Tapping Screw (B.H) 5 × 12-1S, An-Plate		625-007
48	Washer M3.5, Lock "B" Type		664-000
49	Washer M5, Lock "B" Type		664-518
50	Washer-Rubber, BLK		660-138
51	Upper Cover, BLK		717-150
52	Bottom Cover, BLK		717-155
53	Holder-SD MTG		730-015
54	Felt Strip-Cover		905-360
55	Sponge BLK 50 × 5 × T2.5		893-825
56	Felt Strip-Cover		900-203
57	Felt-SPK		901-420
58	(+) Tapping Screw (B.H) 3 × 10-2S BLK		623-405
59	(+) TAP Tite Screw (P.H) 3 × 4 BLK		633-082
60	Front Body		701-920
62	(+) TAP Tite Screw (P.H) 3 × 6		633-019
63	(+) Machine Screw (B.H) M2.5 × 6		611-138
64	Main Body		701-925
65	Name Plate		794-435
66	Blind Rivet		670-025
67	Escutcheon		801-111
68	Lens		813-435
69	Knob, Control		824-990
70	Knob, Push, PA		824-995
71	Knob, Push, ANL		824-996
72	Knob, Push, NB		824-997
73	Knob, Push, CH9		824-998
74	Knob, CH, Up		824-985
75	Knob, CH, Down		824-986

Ref. No.	Description	RS Part No.	Mfr's Part No.
76	(+) Machine Screw (F.H) M3 × 5, Zn-Plate		613-550
77	Spring		881-335
78	(+) Machine Screw (P.H) M3 × 10, Zn-Plate		613-077
D303-D305	LED Lamp, GRN		251-029-9
D306	LED Lamp, RED		251-016-7
LED501	LED Display, GRN		252-014-0
SW1	Push Switch 2P-4C		432-019-1
SW2-SW4	Push Switch 2P-2C		432-036-3
SW5-SW6	Touch SW EV1-OSR-05k		434-003-6
	Variable Resistors		
VR101	50kB WO/SW ± 20%, RF Gain		450-621-0
VR102	50kA W/OFF-ON SW ± 20%, Volume		450-622-1
VR201	10kB WO/SW ± 20%, Squelch		450-424-9
VR202	10kC WO/SW ± 20%, MIC Gain		450-428-3

ELECTRICAL PARTS LIST

Ref. No.	Description	RS Part No.	Mfr's Part No.
MAIN PCB ASS'Y			510-68M-P
CAPACITORS			
C101	Ceramic 0.01 μ F 50WV +8%/-20%		130-102-9
C102	Ceramic 0.022 μ F 50WV +80%/-20%		130-207-1
C103	Elect 22 μ F 25WV \pm 20%		102-211-5
C104	Ceramic 0.0047 μ F 50WV +80%/-20%		130-402-0
C105	Elect 22 μ F 16WV \pm 20%		102-210-4
C106	Ceramic 0.01 μ F 50WV SL +80%/-20%		130-102-9
C107	Ceramic 22pF 50WV \pm 10%		132-201-5
C108-C111	Ceramic 0.01 μ F 50WV +80%/-20%		130-102-9
C112	Ceramic 0.022 μ F 50WV +80%/-20%		130-207-1
C113	Ceramic 1pF 50WV \pm 10%		131-001-6
C114	Ceramic 0.047 μ F 50WV \pm 20%		130-405-3
C115	Elect 0.47 μ F 50WV \pm 20%		100-405-4
C116-C117	Ceramic 0.01 μ F 50WV +80%/-20%		130-102-9
C118	Ceramic 0.047 μ F 50WV \pm 20%		130-405-3
C119-C120	Elect 10 μ F 16WV \pm 20%		101-012-7
C121	Ceramic 0.047 μ F 50WV +80%/-20%		130-405-3
C122	Ceramic 0.022 μ F 50WV +80%/-20%		130-207-1
C123	Ceramic 8pF 50WV \pm 10%		138-001-1
C124	Ceramic 0.022 μ F 50WV +80%/-20%		130-207-1
C125	Ceramic 0.01 μ F 50WV +80%/-20%		130-102-9
C126	M.P 0.047 μ F 50WV \pm 5%		194-702-9
C127	Ceramic 0.001 μ F 50WV +80%/-20%		130-101-8
C128	M.P 0.047 μ F 50WV \pm 5%		194-702-9
C131	Elect 0.47 μ F 50WV \pm 20%		100-405-4
C132	M.P 0.047 μ F 50WV \pm 5%		194-702-9
C133	Ceramic 5pF 50WV \pm 10%		135-005-0
C134	M.P 0.047 μ F 50WV \pm 5%		194-702-9
C135	Elect 22 μ F 16WV \pm 20%		132-210-4
C136	M.P 0.01 μ F 16WV \pm 80%/ \pm 20%		191-004-7
C137	Ceramic 0.01 μ F 50WV +80%/-20%		130-102-9
C138	Elect 4.7 μ F 50WV +80%/-20%		104-707-7
C139	Ceramic 56pF (NPO) 50WV \pm 10%		135-605-2
C140	M.P 0.0082 μ F 50WV \pm 5%		198-201-3
C141	Elect 1 μ F 50WV \pm 20%		101-006-2
C142	Elect 33 μ F 16WV \pm 20%		103-313-9
C143	M.P 0.022 μ F 50WV \pm 5%		192-203-5
C150	Ceramic 30pF 50WV \pm 10%		133-003-8
C151	Ceramic 220pF 50WV \pm 10%		132-204-8
C152	M.P 0.0047 μ F 50WV \pm 5%		194-701-8
C153	M.P 0.001 μ F 50WV \pm 5%		191-002-5
C155	M.P 0.033 μ F 50WV \pm 5%		193-302-6
C156	Ceramic 0.01 μ F 50WV +80%/-20%		130-102-9
C157	Elect 47 μ F 16WV \pm 20%		104-712-1
C158	M.P 0.004 μ F 50WV \pm 5%		194-701-8
C159	Elect 0.47 μ F 50WV \pm 20%		100-405-4
C160	M.P 0.0022 μ F 50WV \pm 5%		192-201-3
C200	M.P 0.022 μ F 50WV \pm 5%		192-203-5
C201	M.P 0.0047 μ F 50WV \pm 5%		194-701-8
C202	Elect 1 μ F 50WV \pm 20%		101-006-2

Ref. Nos not used: C129/C130/C144-C149/C154

Ref. No.	Description	RS Part No.	Mfr's Part No.
C203	M.P 0.015 μ F 50WV \pm 5%		191-504-2
C204-C205	Elect 47 μ F 16WV \pm 20%		104-712-1
C206	M.P 0.033 μ F 50WV \pm 5%		193-302-6
C207	M.P 0.0001 μ F 50WV \pm 5%		191-002-5
C208	M.P 0.015 μ F 50WV \pm 5%		191-504-2
C209	M.P 0.033 μ F 50WV \pm 5%		193-302-6
C210	M.P 0.0022 μ F 50WV \pm 5%		192-201-3
C211	Tantalum 2.2 μ F 16WV \pm 20%		142-201-8
C213	Ceramic 150pF 50WV \pm 10%		132-204-8
C214	Elect 47 μ F 10WV \pm 20%		104-711-0
C215	M.P 0.068 μ F 50WV \pm 10%		196-803-7
C216	Elect 47 μ F 16WV \pm 20%		104-712-1
C217	Ceramic 220pF 50WV \pm 10%		132-204-8
C218	M.P 0.068 μ F 50WV \pm 10%		196-803-7
C221	Elect 220 μ F 16WV \pm 10%		102-242-3
C222	Elect 1000 μ F 16WV \pm 20%		101-047-9
C223	Elect 100 μ F 16WV \pm 20%		101-022-6
C224	Ceramic 0.001 μ F 50WV + 80% / - 20%		130-101-8
C225	Elect 33 μ F 16WV \pm 20%		103-313-9
C226	Elect 47 μ F 16WV \pm 20%		104-712-1
C227	Elect 220 μ F 16WV \pm 20%		102-242-3
C228	Elect 47 μ F 16WV \pm 20%		104-712-1
C229	Elect 10 μ F 16WV \pm 20%		101-012-7
C230	Ceramic 0.047 μ F 50WV \pm 20%		130-405-3
C231	Ceramic 0.001 μ F 50WV + 80 / - 20%		130-101-3
C232	Elect 100 μ F 16WV \pm 20%		101-022-6
C233-C234	Ceramic 0.001 μ F 50WV + 80% / - 20%		130-101-8
C235	Elect 1 μ F 50WV \pm 20%		101-006-2
C301	Ceramic 0.01 μ F 50WV + 80% / - 20%		130-102-9
C302	Ceramic 4pF (NPO) 50WV \pm 10%		134-006-6
C303	Ceramic 100pF (NPO) 50WV \pm 10%		131-015-9
C304	Ceramic 0.01 μ F 50WV + 80% / - 20%		130-102-9
C305	Ceramic 0.047 μ F 50WV + 80% / - 20%		130-405-3
C306	Ceramic 100pF (NPO) 50WV \pm 10%		131-015-9
C307	Ceramic 330pF 50WV \pm 10%		133-302-8
C308	Ceramic 0.01 μ F 50WV + 80% / - 20%		130-102-9
C311	Ceramic 82pF (NPO) 50WV \pm 10%		138-204-8
C312	Ceramic 220pF (NPO) 50WV \pm 10%		132-214-7
C313	Mica 180pF 50WV \pm 5%		161-803-3
C314	Mica 47pF 50WV \pm 5%		164-701-9
C315	Ceramic 0.01 μ F 50WV + 80% / - 20%		130-102-9
C316	Mica 100pF 50WV \pm 10%		161-005-9
C317	Mica 220pF 50WV \pm 10%		162-203-6
C318	Ceramic 1.5pF 50WV \pm 10%		131-506-6
C319	Elect 10 μ F 16WV \pm 20%		101-012-7
C321	Ceramic 0.047 μ F 50WV \pm 20%		130-405-3
C322	Mica 270pF 50WV \pm 10%		162-702-0
C501	Ceramic 180pF 50WV \pm 10%		131-802-3
C502	Tantal 0.1 μ F 50WV \pm 20%		140-106-6
C503	Elect 33 μ F 16WV \pm 20%		103-313-9
C504	Ceramic 0.01 μ F 50WV + 80% / - 20%		130-102-9

Ref. Nos not used: C212/C219/C220/C309/C310/320

Ref. No.	Description	RS Part No.	Mfr's Part No.
C505	Ceramic 0.047 μ F 50WV \pm 20%		130-405-3
C506	Ceramic 0.01 μ F 50WV +80%/- 20%		130-102-9
C507	Ceramic 15pF 50WV +80%/- 20%		131-501-1
C508	Ceramic 8pF 50WV \pm 10%		138-001-1
C511	Tantal 1 μ F 16WV \pm 20%		141-008-6
C512	Mica 56pF 50WV \pm 5%		165-601-7
C513	Mica 27pF 50WV \pm 5%		162-701-9
C514	Trimmer 20pF TZ03R200E		172-002-4
C515	M.P 0.047 μ F 50WV \pm 5%		194-701-8
C516	Mica 35pF 50WV \pm 5%		163-501-0
C517	Elect 2.2 μ F 50WV \pm 20%		102-207-2
C518	Ceramic 0.01 μ F 50WV \pm 20%		130-102-9
C521	Elect 220 μ F 16WV \pm 20%		102-223-6
C522	Elect 47 μ F 16WV \pm 20%		104-712-1
C523-C524	Ceramic 0.01 μ F 50WV +80%/- 20%		130-102-9
C525	Ceramic 0.047 μ F 50WV \pm 20%		130-405-3
C526	Ceramic 18pF 50WV \pm 10%		131-801-2
C527	Ceramic 22pF 50WV \pm 10%		132-201-5
C528	Ceramic 39pF 50WV \pm 10%		133-901-9
C529	Ceramic 0.01 μ F 50WV +80%/- 20%		130-102-9
C531	Mica 27pF 50WV \pm 5%		162-701-9
C532	Ceramic 33pF 50WV \pm 10%		133-301-7
C533	Ceramic 220pF 50WV \pm 10%		132-204-8
C534	Ceramic 120pF 50WV \pm 10%		131-202-1
C535	Elect 100 μ F 10WV \pm 20%		101-053-4
C536	Elect 10 μ F 16WV \pm 20%		101-012-7
C537	Ceramic 0.01 μ F 50WV +80%/- 20%		130-102-9
C538-C541	M.P 0.0022 μ F 50WV \pm 5%		192-201-3
C603-C605	Ceramic 0.01 μ F 50WV +80%/- 20%		130-102-9
COILS			
L101	27MHz, RX ANT		320-380-2
L102-L103	27MHz, RF AMP(RX)		320-315-4
L104	10.6MHz, RF 1st Mixer (RX)		320-316-5
L105	IFT 455KHz-A		320-154-5
L106	IFT 455KHz-B		320-155-6
L301-L302	27MHz, RF PRE AMP A (TX)		320-318-7
L303	27MHz, RF PRE AMP B (TX)		320-319-8
L304	27MHz, RF-C (TX)		320-320-8
L305	AM, TX ANT, 27MHz B		320-033-9
L306	AM, IFT 27MHz, TX ANT		302-142-4
L307	AM, TX ANT, 27MHz A		320-032-8
L501	VCO		320-317-6
RFC101	Choke 100 μ H Mold Type		310-096-3
RFC102	Inductor 200 μ H PC Type		310-136-6

Ref. Nos not used: C509/C510/C519/C520/C530

Ref. No.	Description	RS Part No.	Mfr's Part No.
RFC200 RFC201-RFC202	RF Choke 20 μ H Core RF Choke 0.8 μ H Spring		310-038-1 310-072-1
RFC301 RFC302 RFC303 RFC304	Choke 1 μ H Bobbin Inductor 6.8 μ H Resistor Type Not Used RF Choke 0.5 μ H Spring		310-025-9 310-121-2 310-065-5
RFC501 RFC502 RFC503	Inductor 6.8 μ H Resistor Type Choke 100 μ H Mold Type RF Choke 20 μ H Core		310-121-2 310-096-3 310-034-7
RFC601	RF Choke 20 μ H Core		310-034-7
CRYSTAL			
X1	10.240MHz HC-18/U		260-003-3
DIODES			
D101 D103 D104-D108 D109 D110-D111 D112-D113	1S2473 Silicon GE 0A90 Silicon 1S 2473 Silicon GE 0A90 Silicon 1S2473 Silicon GE0A90 Silicon		243-004-3 244-003-7 243-004-3 244-003-7 243-004-3 244-003-7
D201-D203 D204 D205-D206 D207-D209	1S2473 Silicon 1N4002 Silicon 1S2473 GE 0A90 Silicon		243-004-3 245-001-0 243-004-3 244-003-7
D301-D302	1S2473 Silicon		243-004-3
D501-D502 D503 D504-D505 D506 D507 D508-D511 D512	1S2473 Silicon Zener UZ7.5B 1S2473 Silicon Varicap MV2209 Zener UZ9.1B 1S2473 Silicon Zener UZ5.1B (500mW)		243-004-3 241-003-2 243-004-3 242-002-6 241-020-7 243-004-3 241-046-1
D601	1N 4002 Silicon		245-001-0
FILTERS			
CF1 CF2	Ceramic 10.7MJ Ceramic CFW 455HT Ceramic CFU 455HT		270-010-2 270-007-0 270-006-8

INTEGRATED CIRCUITS			
Ref. No.	Description	RS Part No.	Mfr's Part No.
IC201	KIA7217AP, Audio		222-006-4
IC301	TL489CP, LED Driver		235-001-7
IC501	LC6526C-3220 CPU		224-060-2
IC502	LC7132, PLL		224-021-7
RESISTORS		Unless otherwise specified, all resistors are carbonfilm 1/16W, $\pm 5\%$.	
R100	8.2k ohm		002-822-6
R101	330 ohm		002-331-9
R102	820 ohm		002-821-5
R103	1.2k ohm		002-122-7
R104	1k ohm		002-102-9
R105	4.7k ohm		002-472-3
R106	270 ohm		002-271-8
R107	33k ohm		002-333-1
R108	18 ohm		002-180-9
R111	18k ohm		002-183-2
R112	100 ohm		002-101-8
R113	10k ohm		002-103-0
R114	20k ohm		002-203-7
R115	220 ohm		002-221-3
R116	470 ohm		002-471-2
R117	180k ohm		002-184-3
R118	100K ohm		002-104-1
R120	100 ohm		002-101-8
R121	470 ohm		002-411-2
R123	1k ohm		002-102-9
R124	4.7k ohm		002-472-3
R125	470 ohm		002-471-2
R126	1k ohm		002-102-9
R127	10k ohm		002-103-0
R128	2.7k ohm		002-272-9
R131	100 ohm		002-101-8
R132	47 ohm		002-470-1
R133	8.2k ohm		002-822-6
R134	1M ohm		002-105-2
R135	68k ohm		002-683-7
R136	120k ohm		002-124-9
R137	100k ohm		002-104-1
R140	10k ohm		002-103-0
R141	12k ohm		002-123-8
R142	8.2k ohm		002-822-6
R143	470k ohm		002-474-5
R144	39k ohm		002-393-5
R145	68k ohm		002-683-7
R146	22k ohm		002-223-5
R147	4.7k ohm		002-472-3
R148	33k ohm		002-333-1
R149	47k ohm		002-473-4
R151-R152	1k ohm		002-102-9

Ref. Nos not used: R109/R110/R119/R122/R129/R130/R138/R139/R150

Ref. No.	Description	RS Part No.	Mfr's Part No.
R153	100k ohm		002-104-1
R154	10k ohm		002-103-0
R155	470k ohm		002-474-5
R156	4.7k ohm		002-472-3
R157	5.6k ohm		002-562-1
R158	100 ohm		002-101-8
R161	5.6k ohm		002-562-1
R162	100k ohm		002-104-1
R163	1M ohm		002-105-2
R164	10k ohm		002-103-0
R165	5.6K ohm		002-562-1
R201	3.3k ohm		002-332-0
R202	1k ohm		002-102-9
R203	150 ohm		002-151-3
R204	820k ohm		002-824-8
R205	3.3k ohm		002-332-0
R206	1k ohm		002-102-9
R207-R208	8.2k ohm		002-822-6
R209	100k ohm		002-104-1
R210	5.6k ohm		002-562-1
R211	68 ohm		002-680-4
R212	1 ohm		002-109-6
R213	27k ohm		002-273-0
R214	1.8k ohm		002-182-1
R216	470k ohm		002-474-5
R217	2.7k ohm		002-272-9
R218	100k ohm		002-104-1
R219	3.9k ohm		002-392-9
R220-R221	1k ohm		002-102-9
R222	47 ohm		002-470-1
R223	220 ohm		002-221-3
R224	4.7k ohm		002-472-3
R225	10k ohm		002-103-0
R226	4.7k ohm		002-472-3
R227	8.2k ohm		002-822-6
R228	10k ohm		002-103-0
R229	470k ohm		002-474-5
R230	100k ohm		002-104-1
R231	330 ohm		002-331-9
R232	2.2k ohm		002-222-4
R233	22k ohm		002-223-5
R234	Metaloxide 22 ohm 2W ± 5%		019-220-0
R235	100 ohm		002-101-8
R236	10 ohm		002-100-7
R301	390 ohm		002-391-3
R302	150k ohm		002-154-6
R303-R305	4.7k ohm		002-472-3
R306	68 ohm		002-680-4
R307	100 ohm		002-101-8
R308	1k ohm		002-102-9
R311	100 ohm		002-101-8
R312	4.7 ohm		002-479-0

Ref. Nos not used: R159/R160/R309/R310

Ref. No.	Description	RS Part No.	Mfr's Part No.
R313	10 ohm 1W $\pm 5\%$		018-100-0
R314	820 ohm		022-821-5
R316	150 ohm		002-151-3
R317-R320	1.5k ohm		002-152-4
R321	4.7k ohm		002-472-6
R500-R513	2.2k ohm		002-222-4
R514	10k ohm		002-103-0
R515-R517	15k ohm		002-153-5
R518	1k ohm		002-102-9
R519	56k ohm		002-563-2
R520	100k ohm		002-104-1
R521-R522	10k ohm		002-103-0
R523	1M ohm		002-105-2
R524	2.2M ohm		002-225-7
R525-R526	56k ohm		002-563-2
R527	22 ohm		002-220-2
R528	470 ohm		002-471-2
R529	10k ohm		002-103-0
R531	33k ohm		002-333-1
R532	2.2k ohm		002-222-4
R533	82k ohm		002-823-7
R534	22k ohm		002-223-5
R535-R537	10k ohm		002-103-0
R538	22 ohm		002-220-2
R541	470 ohm		002-471-2
R542	100 ohm		002-101-8
R543-R544	10k ohm		002-103-0
R545	4.7k ohm		002-472-3
R546	10k ohm		002-103-0
R547	47 ohm		002-470-1
R551	820 ohm		002-821-5
R552	100k ohm		002-104-1
R553	220k ohm		002-224-6
R554-R555	2.7k ohm		002-272-9
R556	33 ohm		002-330-8
R557	18k ohm		002-183-2
R558	1M ohm		002-105-2
R561-R562	18k ohm		002-183-2
R563	1.5M ohm		002-155-7
VARIABLE RESISTORS			
RV101	Semifixed 10kB ohm $\phi 8 \pm 25\%$		061-103-1
RV201	Semifixed 20kB ohm $\phi 8 \pm 25\%$		061-203-1
RV202	Semifixed 2kB ohm $\phi 8 \pm 25\%$		061-202-0
RV301	Semifixed 20kB ohm $\phi 8 \pm 25\%$		061-203-1
TRANSFORMERS			
T201	Output		300-115-402 or 300-002-3
T601	Choke		300-045-4

Ref. Nos not used: R315/R530/R539/R540/R548-R550/R559/R560

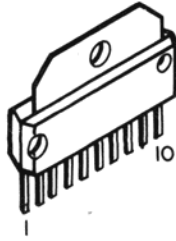
Ref. No.	Description	RS Part No.	Mfr's Part No.
TRANSISTORS			
Q100-Q101	KTA562TM(Y) or MPS9468A(T)		202-054-2 or 203-041-4
Q102-Q104	KTC1923(O) or MPS9426(C)		202-017-8 or 203-005-2
Q105	KTC1923(Y) or MPS9623(I)		202-060-7 or 203-012-8
Q106	KTC1923(Y) or MPS9623(H)		202-060-7 or 203-011-7
Q107	KTC1815(GR) or MPS9623(I)		202-023-3 or 203-012-8
Q108	KTC1923(O) or MPS9426(C)		202-017-8 or 203-005-2
Q109	JF1033S		203-027-2
Q110	KTA1015(GR) or MPS9681(T)		202-036-5 or 203-009-6
Q111	KTC1815(GR) or MPS9634(C)		202-023-3 203-002-9
Q201	KTC1815(GR) or MPS9631(T)		202-023-3 or 203-014-0
Q202	KTA1015(Y) or MPS9631(T)		202-012-3 or 203-009-6
Q203-Q205	KTC1815(GR) or MPS9634(C)		202-023-3 or 202-002-9
Q206-Q207	KTA1015(GR) or MPS9681(T)		202-012-3 or 203-009-6
Q208-Q209	KTC1815(GR) or MPS9634(C)		202-023-3 or 203-002-9
Q301-Q302	KTC1923(O) or MPS9426(C)		202-017-8 or 203-005-2
Q303	KTC2036A or 2SC2314(E)		202-058-6 or 204-016-7
Q304	KTC2075 or 2SC2078(D)		202-057-5 or 203-009-1
Q501-Q502	KTA1015(GR) or MPS9681(T)		202-036-5 or 203-009-6
Q503-Q504	KTC1815(GR) or MPS9634(C)		202-023-3 or 203-002-9
Q505	KTC1959(O) or MPS9418(T)		202-056-4 or 203-010-6
Q506	KTA1015(GR) or MPS9681(T)		202-036-5 or 203-009-6
Q507-Q508	KTC1923(O) or MPS9426(C)		202-017-8 or 203-005-2
Q509	KTC1815(GR) or MPS9634(C)		202-023-3 or 203-002-9
Q510	KTA1015(GR) or MPS9681(T)		202-036-5 or 203-009-6
Q511	KTC1815(GR) or MPS9634(C)		202-023-3 or 203-002-9
Q512	KTC1815(O) or MPS9631(T)		202-020-0 203-014-0
Q513	KTC1815(GR) or MPS9418(T)		202-023-3 or 203-010-6

Ref. No.	Description	RS Part No.	Mfr's Part No.
LED DISPLAY PCB ASS'Y			593-011
LED501 D303-D305 D306 SW5-SW6	LED Display (GRN) LED Lamp SLB26GG3HL (GRN) LED Lamp SLB26UR3HL (RED) Touch SW ESQ-QSR-0 5K		252-014-0 251-029-9 251-016-7 436-017-9
SWITCH PCB ASSY'S			593-010
SW1 SW2-SW4	Push Switch 2P-4C Push Switch 2P-2C Plat Wire 6 Pin		432-019-1 432-036-3 429-110-1
MIC ASS'Y			510-68M-A
R601 7 8 9 10 11 SW 7-SW 8 12 13 14 15 16 17 18 19 20 21 22 23	Carbonfilm 10k ohm 1/16W ±5% P C B Mic Cartridge Curl cord Plug 5 Pin Push Switch Tack Switch Upper Cover (MIC) ABS 94HB BLK Bottom Cover (MIC) ABS 94HB BLK Knob Up (MIC) ABS 94HB BLK WHT SILK Knob Down (MIC) ABS 94HB BLK WHT SILK Lever (MIC) ABS 94HB BLK Holder (MIC) ABS 94HB BLK Mic Name Plate P.V.C 30 × 5.5 × T0.4 Rubber Sponge φ28 × T5 Rubber Ring (+) Screw Tapping P.H M3 × 6-2S Zn-Plate (+) Screw Tapping O.H M3 × 16 × 2S Ni-Plate Shield Plate SPT 23.5 × 8 × T0.2		002-103-0 411-212-A 420-233-5 420-325-4 421-025-8 432-034-1 436-017-9 716-646 716-636 824-975 824-980 740-481 731-940 794-480 890-050 893-190 623-043 623-830 771-250
MISCELLANEOUS			
C323 C601-C602	Capacitor Mica 220pF 50WV ±10% Capacitor Ceramic 0.001μF 50WV ±8% 1-20%		162-203-6 130-101-3

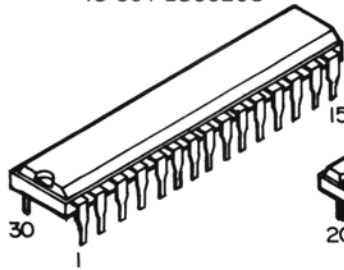
SEMICONDUCTOR LEAD IDENTIFICATION AND IC INTERNAL DIAGRAM

INTEGRATED CIRCUITS

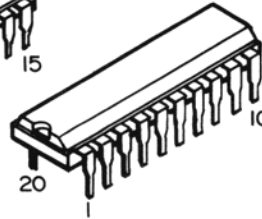
IC 201 KIA7217AP



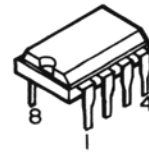
IC 501 LC6526C



IC 502 LC7132



IC 301 TL489CP



TRANSISTORS

- MPS 9623
- MPS 9631
- MPS 9634
- MPS 9681
- MPS 9418
- MPS 9468



- KTA 5621
- KTA 1015
- KTC 1815
- KTC 1959



- MPS 9426
- KTC 1923



- 2SC2314
- KTC 2036



- 2SC2078
- KTC 2075

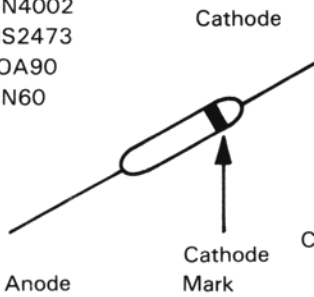


- MJF1033S

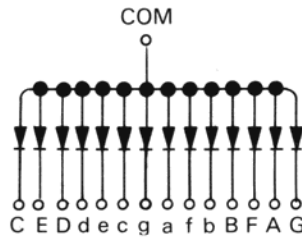
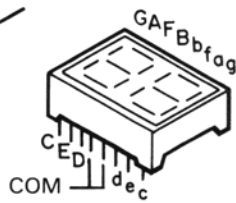


DIODES

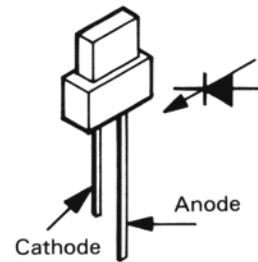
- IN4002
- IS2473
- OA90
- IN60



LED Display



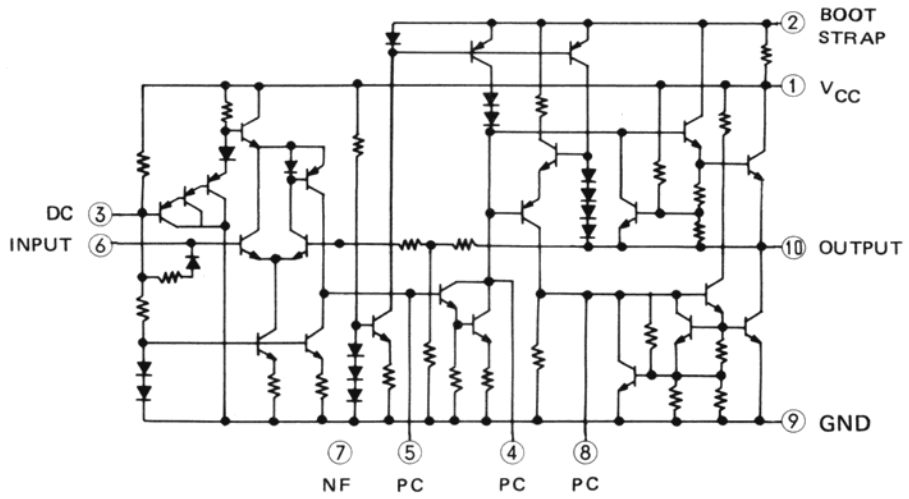
LED Lamp
SLB26UR3HL



- MV2209

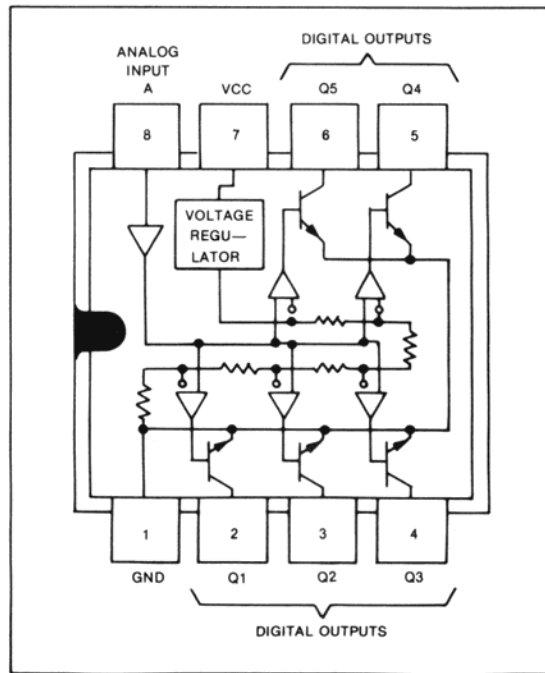


IC201 KIA7217AP

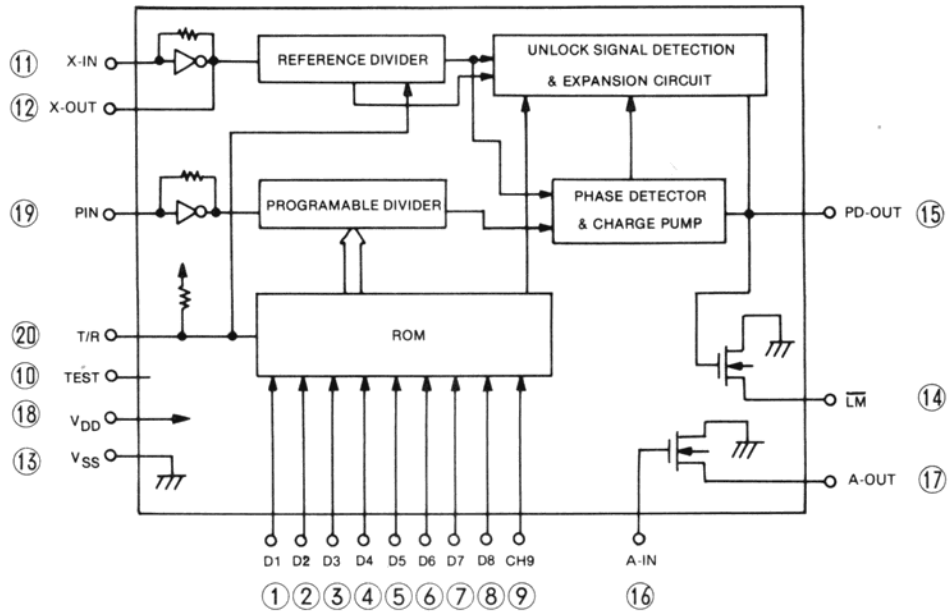


DC: Decoupling
 PC: Phase compensation
 NF: Negative feedback

IC301 TL489CP

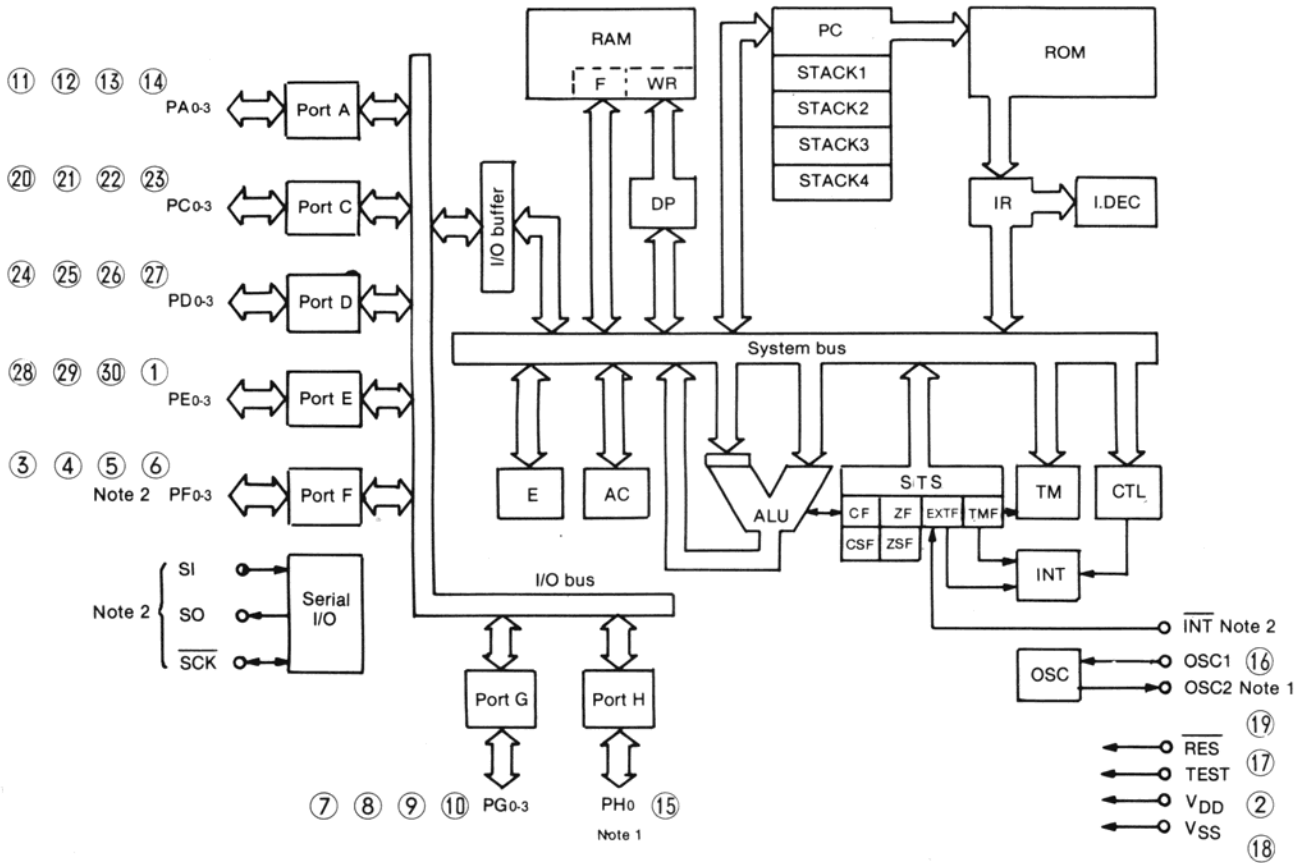


IC502 LC7132



- D1 to D8 : Program input (7 segment code)
- X_{IN}, X_{OUT} : Amplifier for crystal oscillator
- V_{DD}, V_{SS} : Power Supply
- LM : Lock monitor output, Lock = open or 1, Unlock = "0"
- PD_{OUT} : Charge dump output
- A_{IN}, A_{OUT} : Amplifier for low-pass filter
- P_{IN} : Programable divider input
- T/R : Transmission/reception change over input
 $\bar{T}/R = "0"$ – Transmission, $\bar{T}/R = "1"$ –reception
- CH9 : Channel 9 select input
- TEST : LSI test pin (Connected to V_{SS} or open)

IC501 LC6526C



- | | |
|---------------------------------|--|
| RAM : Data memory | ROM : Program memory |
| F : Flag | PC : Program counter |
| WR : Working register | INT : Interrupt control |
| AC : Accumulator | IR : Instruction register |
| ALU : Arithmetic and logic unit | I.DEC : Instruction decoder |
| DP : Data pointer | CF,CSF : Carry flag, carry save flag |
| E : E register | ZF,ZSF : Zero flag, zero save flag |
| CTL : Control register | EXTF : External interrupt request flag |
| OSC : Oscillator | TMF : Internal interrupt request flag |
| TM : Timer | |
| STS : Status register | |

SEMICONDUCTOR VOLTAGE CHART

MEASURED AT:

1. 19CH
2. No Signal
3. No Modulation

TRANSISTORS

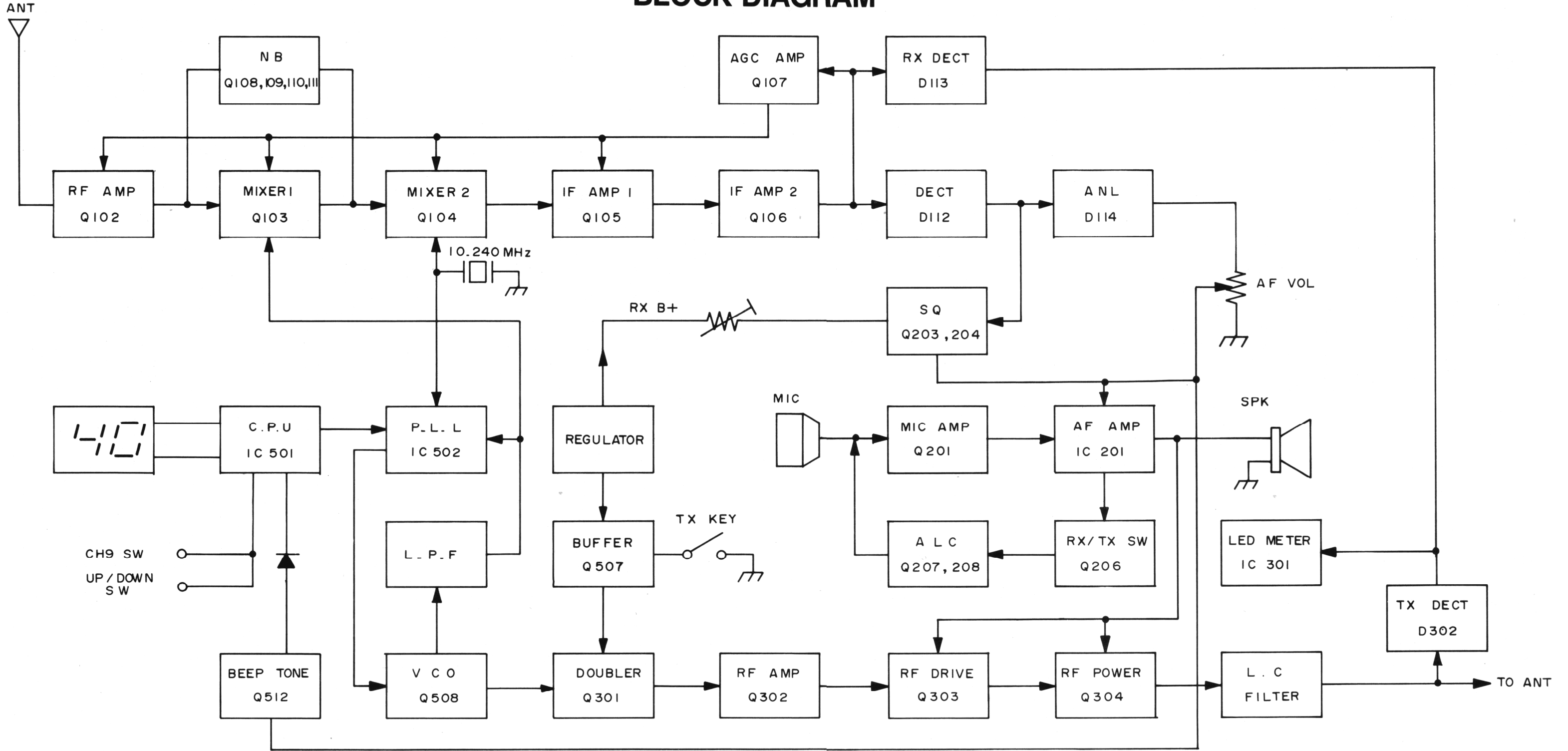
TR \ PIN	EMITTER		BASE		COLLECTOR	
	RECEIVER	TRANSMIT	RECEIVER	TRANSMIT	RECEIVER	TRANSMIT
Q100	3.8	2.2	5.6	1.5	5.6	1.5
Q101	3.8	2.2	5.6	1.5	0.6	2.2
Q102	0.1	0	0.8	0.45	6.4	0.82
Q103	0.17	0	0.85	0	13.2	12.66
Q104	0.18	0	0.8	0.5	5.54	0.6
Q105	0.23	0	0.92	0.41	5.76	0.82
Q106	0.58	0	1.3	0.16	13.47	12.68
Q107	0	0	0.32	1.47	0.35	6.4
Q108	0	0	0.74	0.62	7.13	6.69
Q109	3.41	3.38	0	0	4.99	4.92
Q110	8.36	830	7.72	7.75	3.8	3.84
Q111	0	0	0	0	0	0
Q201	0	0.82	0.32	1.47	0.35	6.4
Q202	13.76	12.8	13.7	12.08	0.32	12.77
Q203	0	0	0.5	0.37	0.65	0.65
Q204	0	0	0.66	0.66	0.05	0.05
Q205	0	0	0	0	0	0
Q206	13.72	13.45	13.72	12.7	0.4	13.4
Q207	0.41	4.1	1.02	4.68	0	0
Q208	0	0	0	0	0	0
Q209	1.1	0.04	1.64	0.2	1.15	0.47
Q301	0	1.24	0	1.87	0	8.36
Q302	0	1.13	0	1.85	13.57	12.86
Q303	0	0	0	0	13.8	11.8
Q304	0	0	0	0	13.8	11.8
Q501	3.24	3.22	4.6	4.56	0	0
Q502	7.3	7.3	6.8	6.84	7.36	7.38
Q503	0.35	0.35	0.85	0.85	0.36	0.35
Q504	0.35	0.35	0.88	0.97	0.36	0.16
Q505	8.46	8.39	9.2	9.15	12.85	12.14
Q506	8.46	8.39	8.45	7.7	0	8.35
Q507	0	0	0	0.76	2.85	2.78
Q508	3.69	0.16	4.26	4.24	8.09	8.03
Q509	0	0	0	0.68	0.12	0

TR \ PIN	EMITTER		BASE		COLLECTOR	
	RECEIVER	TRANSMIT	RECEIVER	TRANSMIT	RECEIVER	TRANSMIT
Q510	4.28	4.35	4.26	4.28	0.34	0.31
Q511	0	0	0.5	0.36	0.0	0
Q512	0	0	0.37	0.32	8.31	8.20
Q513	4.28	4.35	4.86	4.86	12.98	12.90

ICs

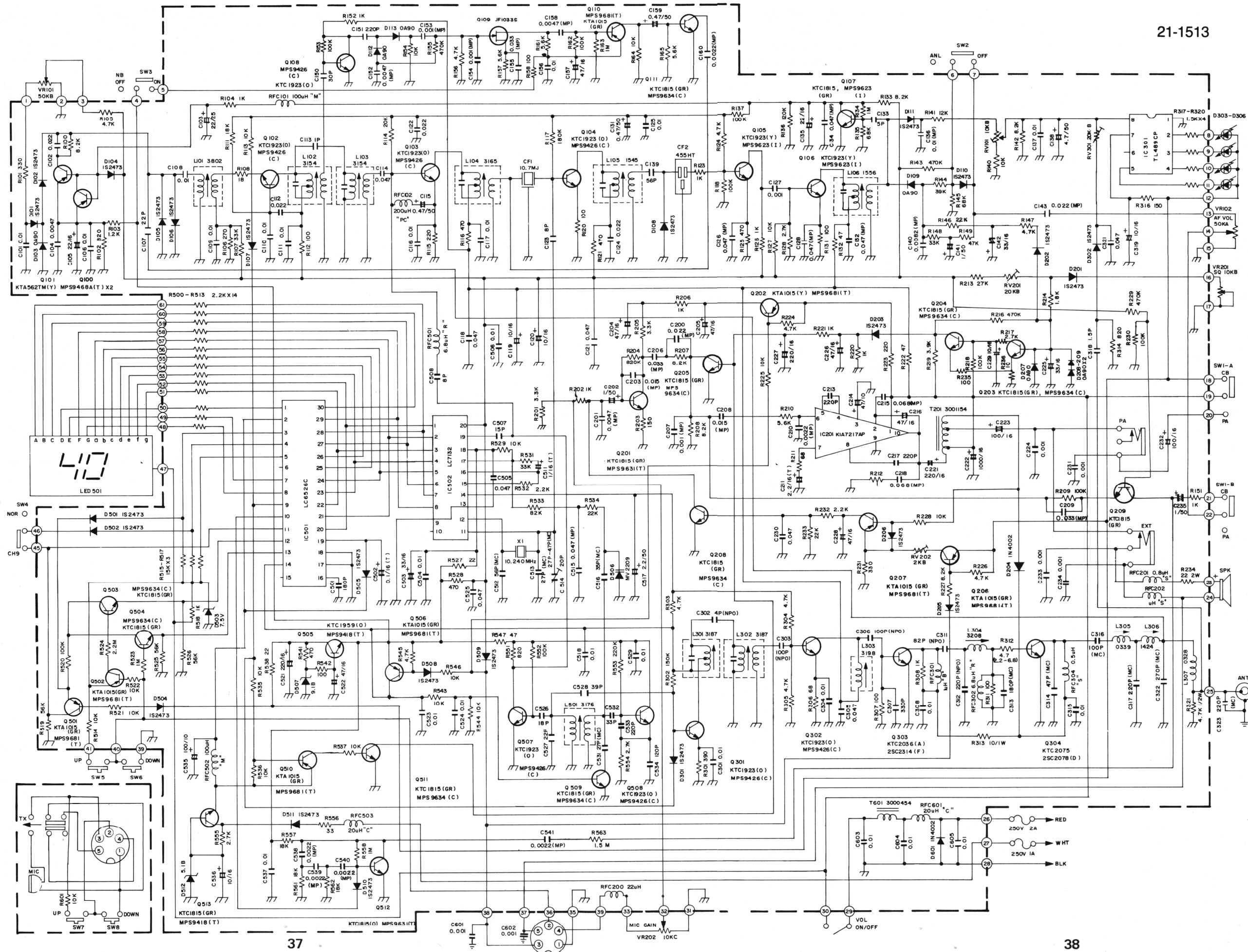
IC	PIN No.	VOLTAGE		IC	PIN No.	VOLTAGE		IC	PIN No.	VOLTAGE	
		RX	TX			RX	TX			RX	TX
IC 201	1	13.72	13.43	IC 502	1	0.25	0.24	IC 501	1	12.38	11.88
	2	12.54	12.25		2	0.25	0.24		2	4.27	4.27
	3	3.94	3.85		3	0.26	0.25		3	0.35	0.5
	4	8.12	7.98		4	12.5	12.20		4	0.52	0.5
	5	1.47	1.45		5	0.27	0.26		5	0.51	0.5
	6	3.36	3.17		6	0.28	0.27		6	0.52	0.5
	7	3.38	3.33		7	12.49	12.20		7	12.28	11.83
	8	1.25	1.13		8	12.49	12.21		8	12.30	11.85
	9	0	0		9	0	0		9	4.24	4.26
	10	6.85	6.72		10	0	0		10	0	0
IC 301	PIN No.	VOLTAGE		IC 502	11	3.64	3.61	IC 501	11	0.03	0
		RX	TX		12	3.85	3.82		12	0.03	0.03
	1	0	0		13	0	0		13	0.03	0.02
	2	12.32	0.04		14	0	5.11		14	0	8.35
	3	12.35	0.03		15	1.57	1.6		15	0.17	0.23
	4	12.35	11.85		16	1.57	1.6		16	1.99	1.97
	5	12.32	11.85		17	2.15	1.62		17	0	0
	6	0.3	0.7		18	8.26	8.2		18	0	0
	7	12.72	12.01		19	3.95	3.91		19	2.9	2.7
	8	0	0.48		20	6.27	0.81		20	0.25	0.24
									21	0.25	0.24
									22	0.26	0.25
									23	12.27	11.95
									24	0.27	0.26
									25	0.28	0.27
									26	0.28	0.27
						27	0.28	0.27			
						28	12.25	12.18			
						29	12.21	12.0			
						30	0.29	0.28			

BLOCK DIAGRAM



SCHEMATIC DIAGRAM

21-1513



NOTE:
 1. RESISTANCE VALUES ARE INDICATED IN OHMS UNLESS OTHERWISE SPECIFIED. (K=1000, M=1000000)
 2. CAPACITANCE VALUES ARE SHOWN IN MICROFARADS UNLESS OTHERWISE NOTED. (P=10⁻¹², U=10⁻⁶)
 3. COMPONENT VALUES ARE SUBJECT TO CHANGE WITHOUT NOTICE.
 4. ALL VOLTAGES ARE REFERENCED TO GROUND UNDER THE FOLLOWING CONDITIONS DC: NO SIGNAL EXCEPT WHERE INDICATED.