

REALISTIC[®]

21-1552

Service Manual

TRC-438

CB 40-Channel Transceiver

Catalog Number: 21-1552

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SPECIFICATIONS

General

Description

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

Standard Test Conditions

Battery supply voltage	13.8V DC
Modulation	1000Hz, 30%
Receiver output power	500mW at external SP
Receiver output impedance	8 ohms, non-inductive
Ant. load impedance of transmitter	50 ohms, non-inductive
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%	+ 80% / - 80%
AMC Range at 1KHz	40dB	30dB
Frequency accuracy	0.002%	0.005%
Spurious radiation & harmonic		
signal radiation ratio from fundamental	- 65 dB	- 60 dB
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

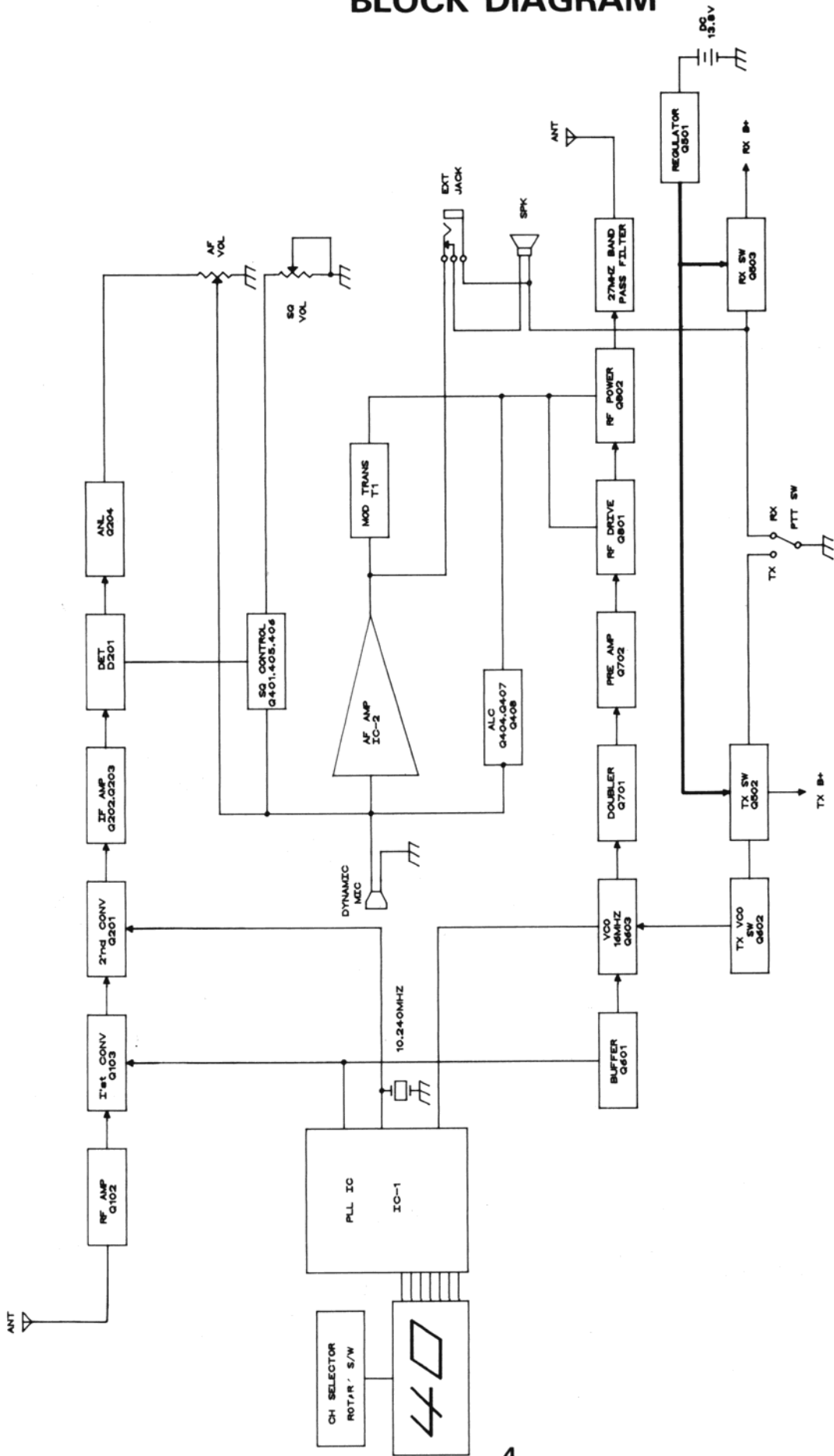
Description	Nominal	Limit
Intermediate frequency		
1st IF	10.695 MHz	
2nd IF	455 kHz	
Sensitivity for 500 mW output	0.3 μ V	1.0 μ V
Sensitivity at 10dB (S+N) /N	0.7 μ V	1.0 μ V
Adjacent channel rejection	65dB	55dB
Image rejection (1st IF/2nd IF)	70dB	60dB
IF rejection ratio (1st IF/2nd IF)	60dB	45dB
Signal-to-Noise ratio		
at 1 mV input	40dB	35dB
Distortion at 1mV input,		
30% mod. (500 mW output)	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		
450 Hz	-4dB	-4 \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 3rd LED	40dB	40 \pm 6dB

Other Items

Fuse	2 Amp
General power requirement	12-16V DC
Dimensions	(W)4 ⁷ / ₈ "(125mm) \times (H)1 ⁵ / ₈ "(40mm) \times (D)8 ¹ / ₈ "(207mm)
Weight	2 lbs 10 ozs (1.2kg)

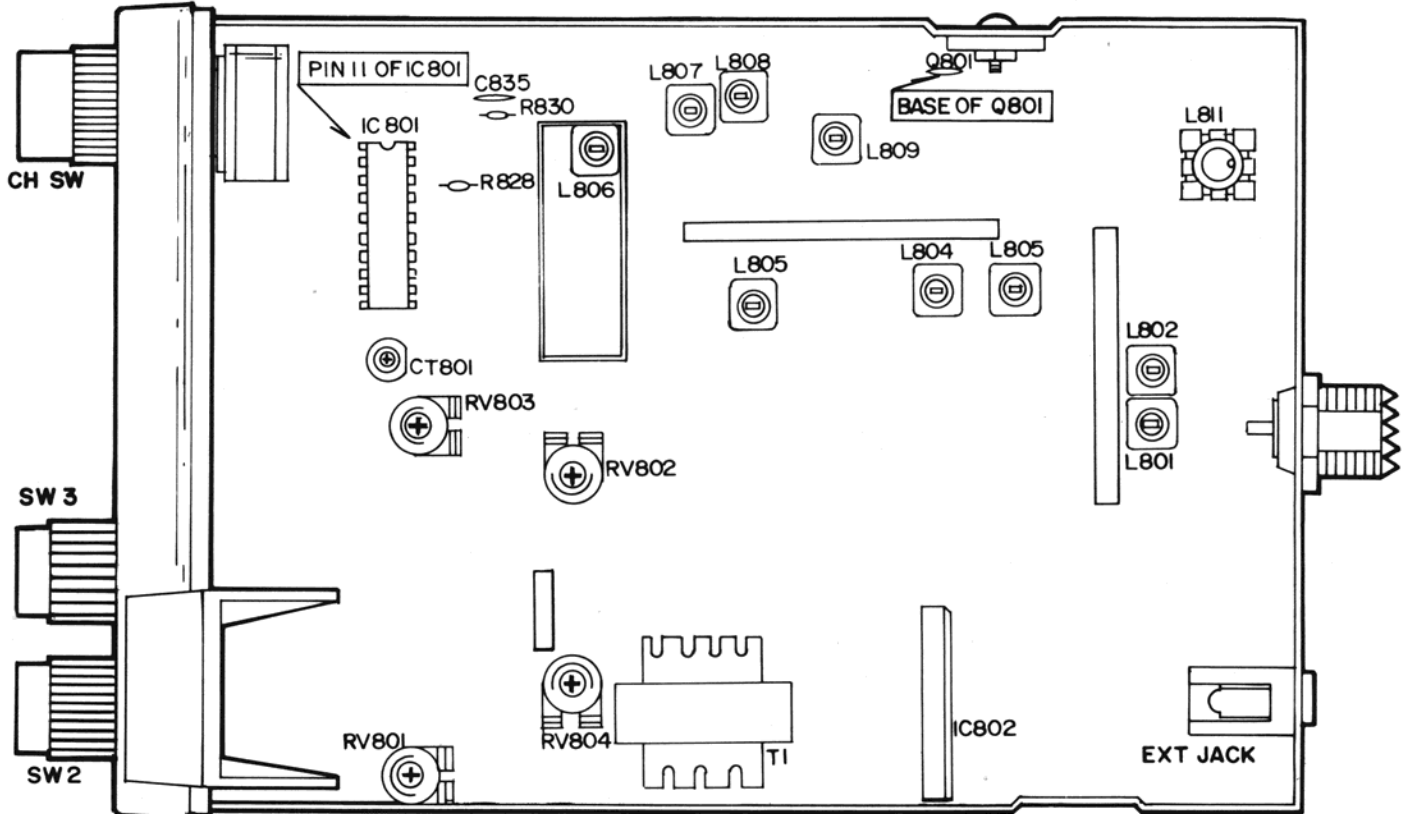
Note: Nominal specs represent the design specs. All units should be able to approximate these—some will exceed and some may drop slightly below these specs. Limit specs represent the absolute worst condition that still might be considered acceptable; in no case should a unit fail to meet Limit specs.

BLOCK DIAGRAM



ALIGNMENT AND ADJUSTMENT

1. Alignment Test Points and Parts Locations



2. Phase Locked Loop and CPU Section

A. Test Equipment Required

- a. Frequency Counter
- b. DC Power Supply
- c. DC Voltmeter
- d. Oscilloscope

B. Alignment Procedure

Step	Setting	Connection	Adjust	Adjust for
1	Frequency adjustment- MIC: Receive Volume: Optional Squelch: Optional CH Selector: Optional	Frequency counter to output pin 11 of IC 801 (Figure 1).	CT801	10.240MHz \pm 100Hz
2	TX VCO voltage adjustment- MIC: Receive Volume: Optional Squelch: Optional CH Selector: 1	Connect DC voltmeter between R828 and R830 (Figure 2).	L806	1.8V
3	RX VCO voltage adjustment- MIC: Transmit Volume: Optional Squelch: Turn Clockwise CH Selector: 1	Connect DC voltmeter between R828 and R830 (Figure 2).	L302	Indication on DC voltmeter must be 1.0-2.0 Volt. If DC voltmeter does not indicate 1.0-2.0 volt, readjust L806

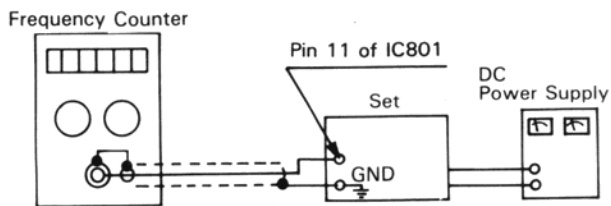


Figure 1

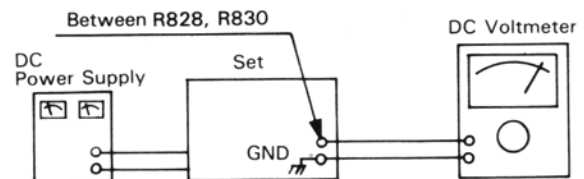


Figure 2

3. Transmitter Section

A. Test Equipment Required

- a. RF Power Meter (RF SSVM)
- b. 50 Ohm Load (non-inductive)
- c. RF Attenuator
- d. Oscilloscope
- e. Audio Generator
- f. DC Power Supply
- g. Spectrum Analyzer
- h. Frequency Counter
- i. Coupler

B. Alignment Procedure

Step	Setting	Connection	Adjust	Adjust for
1	RF driver stage- MIC: Transmit Volume: Optional Squelch: Optional CH Selector: 19	Connect RF power meter to base of Q801 (Figure 3).	L807 L808	Adjust for maximum indication on the RF power meter.
2	RF power stage- MIC: Transmit Squelch: Optional Volume: Optional CH Selector: 19	Connect dummy load and RF power meter to the EXT-ANT jack on the set (Figure 4).	L809 L811	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 L809 , L811.
3	Modulation adjustment- MIC: Transmit Volume: Optional Squelch: Optional CH Selector: 19	Connect audio generator (1kHz) to pin 4 of microphone connector (Figure 5). Connect dummy load and oscilloscope through coupler to RF power meter. Connect RF power meter to EXT-ANT jack on the set. Adjust audio signal level to obtain 80% ~ 90% of the modulation level.	RV804	Check for proper modulation pattern on the oscilloscope.
4	Second harmonic check- MIC: Transmit Volume: Optional Squelch: Optional CH Selector: 19	Connect RF power meter with dummy load to spectrum analyzer through coupler/ - 40dB attenuator to EXT-ANT jack on the set (Figure 6).		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.

Step	Setting	Connection	Adjust	Adjust for
5	Frequency check- MIC: Transmit Volume: Optional Squelch: Optional Channel Selector: 19	Connect dummy load and frequency counter through coupler to RF power meter. Connect RF power meter to EXT-ANT jack on the set (Figure 7).	CT801	Be sure that the indication of the transmitter frequency is 27.185MHz \pm 300Hz on the frequency counter.
6	TX power LED adjustment- MIC: Transmit Volume: Optional Squelch: Optional Channel Selector: 1	Connect dummy load and frequency counter through coupler to RF power meter. Connect RF power meter to EXT-ANT jack on the set (Figure 7).	RV803	Adjust so that 4th LED lights up at 4 watts RF output power.

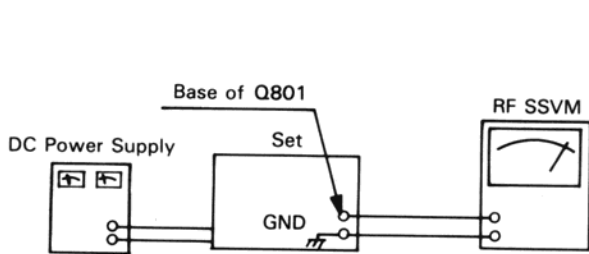


Figure 3

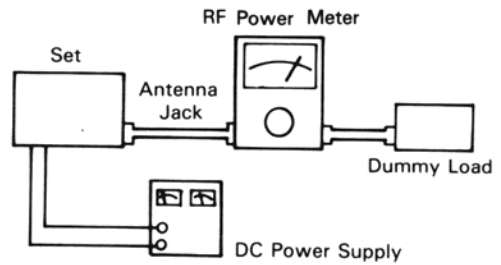


Figure 4

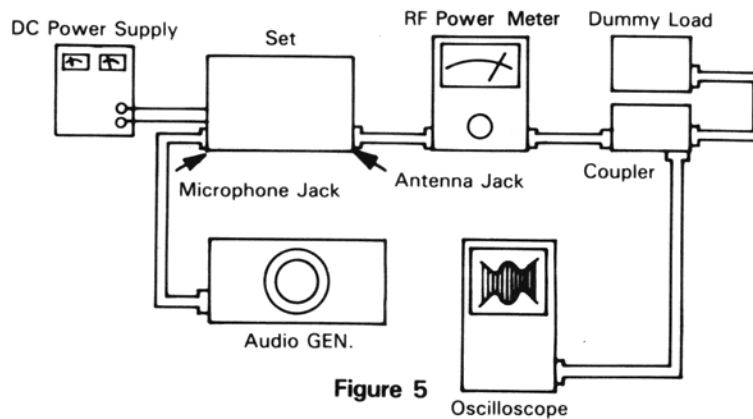


Figure 5

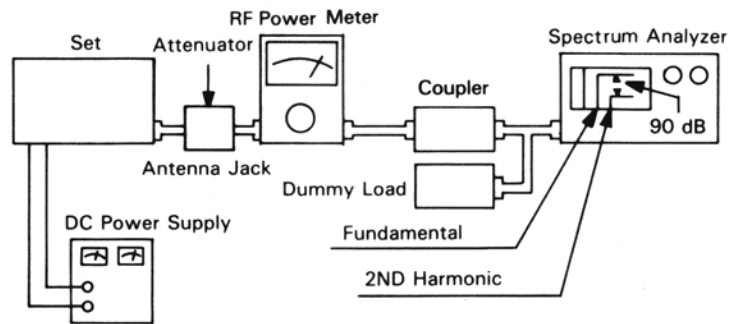


Figure 6

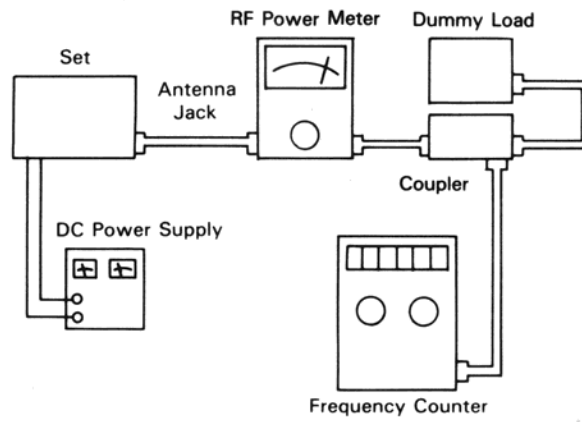


Figure 7

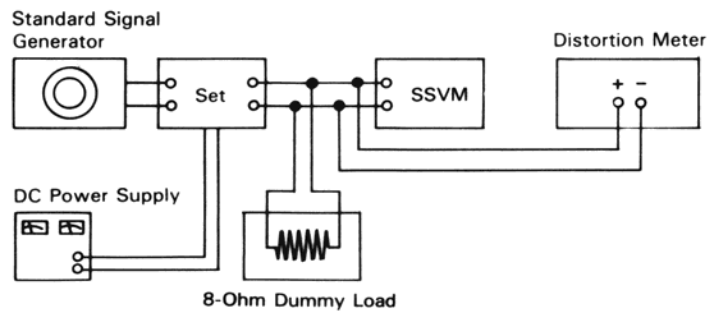


Figure 8

4. Receiver Section

A. Test Equipment Required

- a. RF Signal Generator
- b. SSVM
- c. Distortion Meter
- d. Power Supply

B. Alignment Procedure

Step	Setting	Connection	Adjust	Adjust for
1	MIC: Receive Volume: Fully clockwise Squelch: Turn to counterclockwise CH Selector: 19 SSG: 27.185MHz, 1kHz, 1 μ V 30% Mod.	Connect RF signal generator to EXT-ANT jack. Connect SSVM and distortion meter across EXT speaker jack with 8 Ohm dummy load (Figure 8).	L801 L802 L803 L804 L805	Adjust for maximum indication on SSVM. Reduce output from RF SG until the audio output becomes about 500mW (2V)
2	MIC: Receive SSG: 27.185MHz 1kHz 1mV 80% Mod. Squelch: Turn to counterclockwise CH Selector: 19 Volume: 500mW (2V)	Connect RF Signal generator to EXT-ANT jack. Connect SSVM and distortion meter across EXT speaker jack with 8 Ohm dummy load (Figure 8).	L801	Adjust for minimum indication on distortion meter.
3	Squelch adjustment MIC: Receive SSG: 27.185MHz, 1kHz, 1mV 30% Mod. Squelch: Clockwise CH Selector: 19 Volume: 500mW (2V)	Connect RF Signal generator to EXT-ANT jack. Connect SSVM and distortion meter across EXT speaker jack with 8 Ohm dummy load (Figure 8).	RV802	Adjust RV801 until the audio output just appears.
4	RF signal meter adjustment- MIC: Receive SSG: 27.185MHz, 1kHz 100 μ V 30% Mod. Squelch: Fully counter-clockwise Volume: 500mW (2V) ANL, CH9: OFF	Connect RF signal generator to EXT-ANT jack. Connect SSVM and distortion meter across the EXT speaker jack with 8 ohm dummy load (Figure 8).	RV801	Adjust so that the 3rd LED on the S/RF meter lights up.

CHANNEL FREQUENCY GENERATION TABLE

Receive

VCO Frequency = $N \times 5$ (kHz)

Transmit

VCO Frequency = $N \times 2.5$ (kHz)

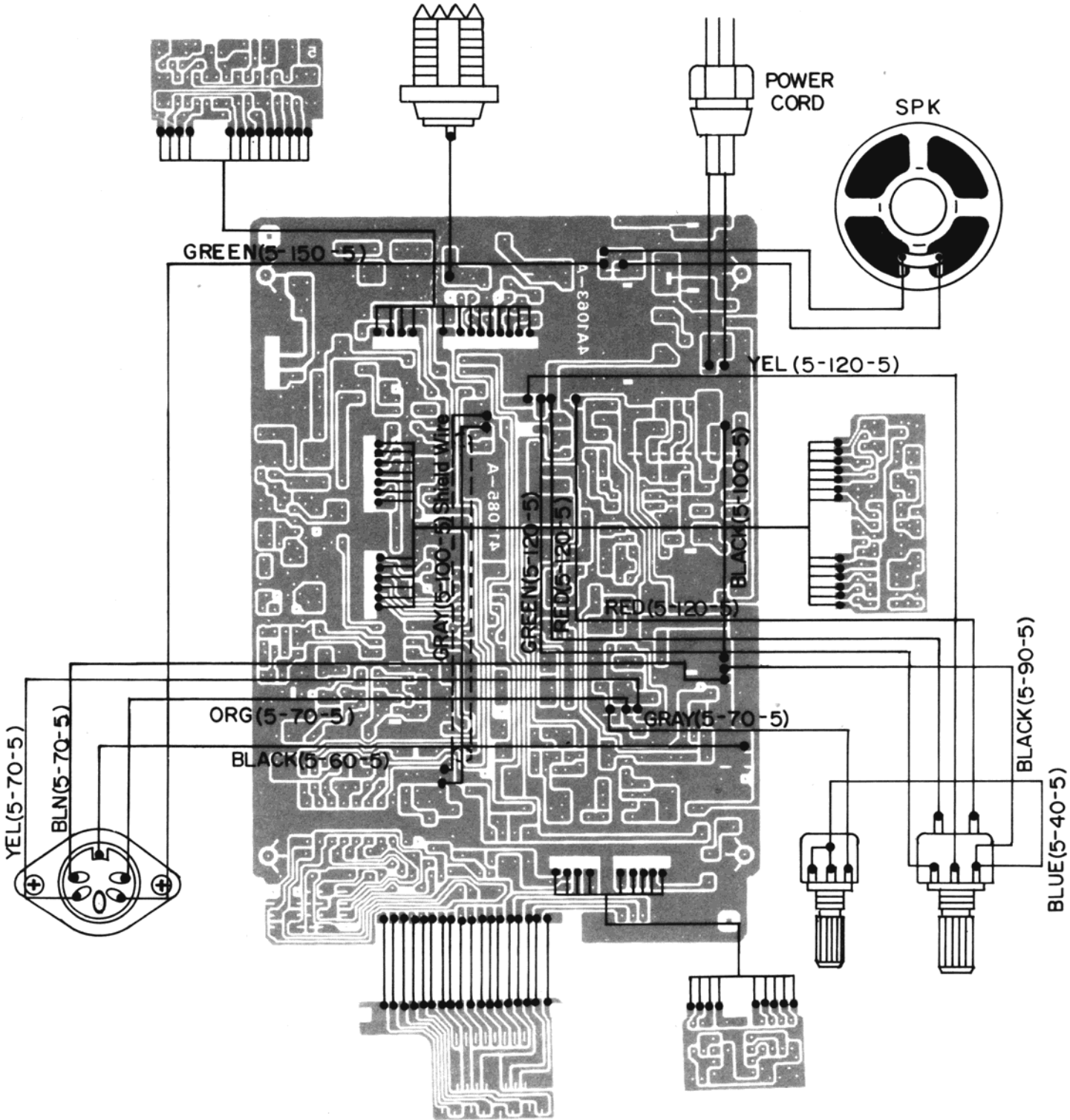
Transmit Frequency = VCO Frequency $\times 2$

Channel	BDC 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	27.105
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	13.5865	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	0	1	0	3318	16.59	5457	13.6425	27.285
29	0	0	0	1	0	1	0	1	3320	16.60	5459	13.6476	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

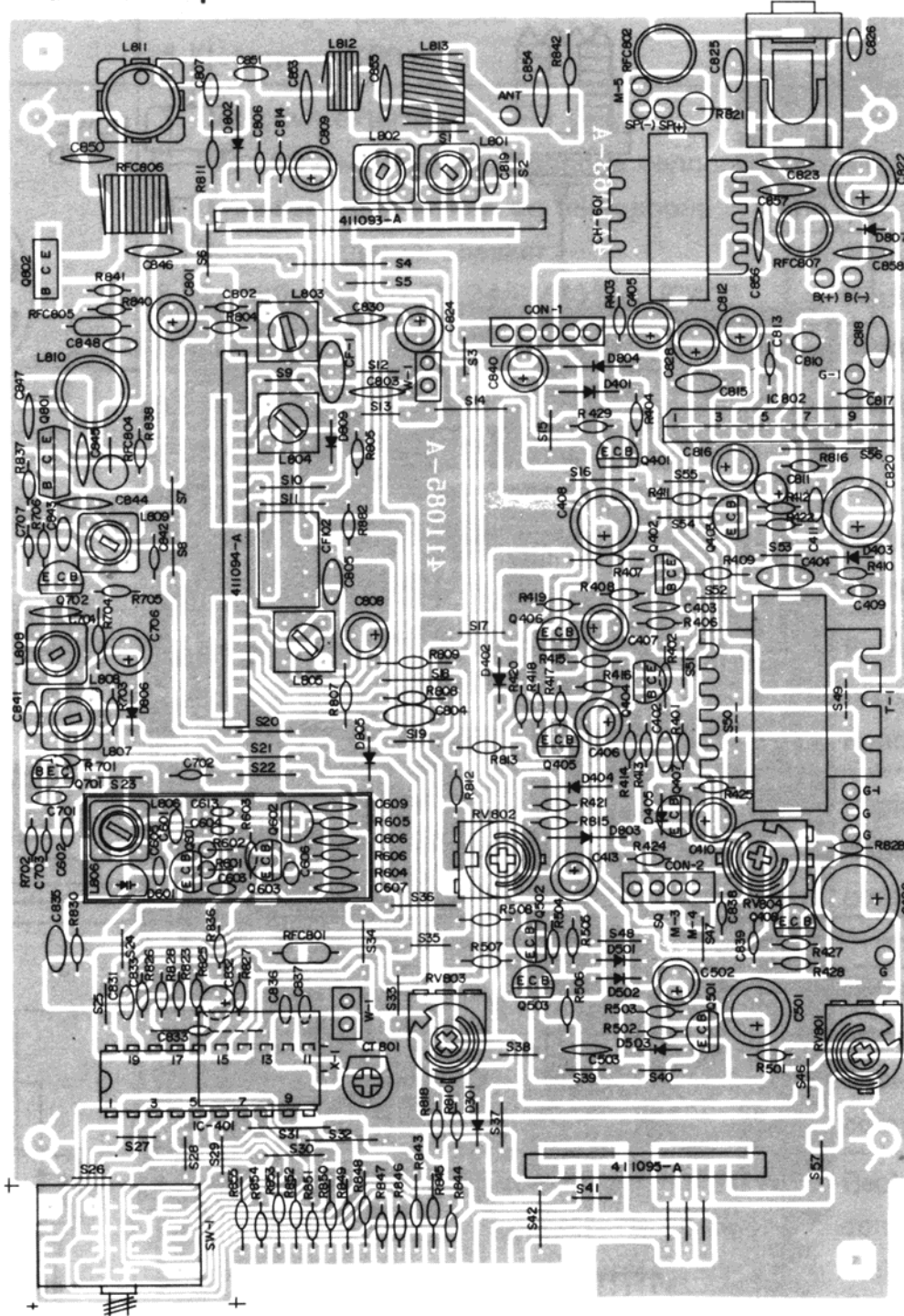
Symptom	Probable Cause	Remedy
Unit does not work at all	<ol style="list-style-type: none"> 1. Defective power switch SW2 2. Blown fuse 3. Broken DC power cord 4. Defective IC801 	<ol style="list-style-type: none"> 1. Replace 2. Replace 3. Replace 4. Replace
No output from speaker at all	<ol style="list-style-type: none"> 1. Defective external speaker jack 2. Poor connection on microphone connector 3. Defective push switch on microphone 4. Defective internal speaker 5. Defective D201/Q204/RV801 or IC802 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 component(s).
No noise on speaker	<ol style="list-style-type: none"> 1. Measure the voltages of Q102/Q103/Q201/Q203/Q204/Q403 and IC802. Refer to the voltage chart on pages 35-36. 2. Defective squelch circuit components (RV802/SW3/IC802/Q405/Q406/Q401) 	<ol style="list-style-type: none"> 1. Replace the defective component(s). 2. Replace the defective component(s).
Squelch does not work	<ol style="list-style-type: none"> 1. Defective RV802/SW3/Q405/Q406/Q401 2. Improperly adjusted RV802 	<ol style="list-style-type: none"> 1. Replace the defective component(s). 2. Readjust
No modulation	<ol style="list-style-type: none"> 1. Defective microphone 2. Poor Audio output and defective modulation microphone amplifier components (Q402/D402/IC802) 3. Defective microphone connector component 4. Defective ALC circuit (Q408/Q407/Q404/D405) 	<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 D2/D3/D4/D5 2. Defective IC301 3. Defective D301/D802/RV801/RV803 	<ol style="list-style-type: none"> 1. Replace the defective component(s). 2. Replace 3. Replace the defective component(s).
LED display does not work	<ol style="list-style-type: none"> 1. Defective Red wire fuse (2A) 2. Defective LED1/IC801 	<ol style="list-style-type: none"> 1. Replace 2. Replace the defective component(s).
Channel selector does not work	Defective IC801/SW1	Replace the defective component(s).

WIRING DIAGRAM

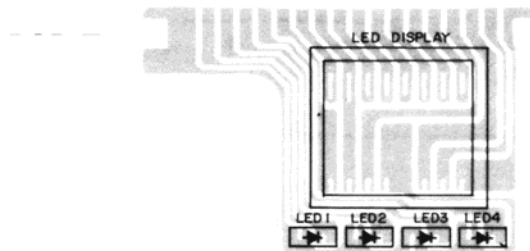


PRINTED CIRCUIT BOARDS

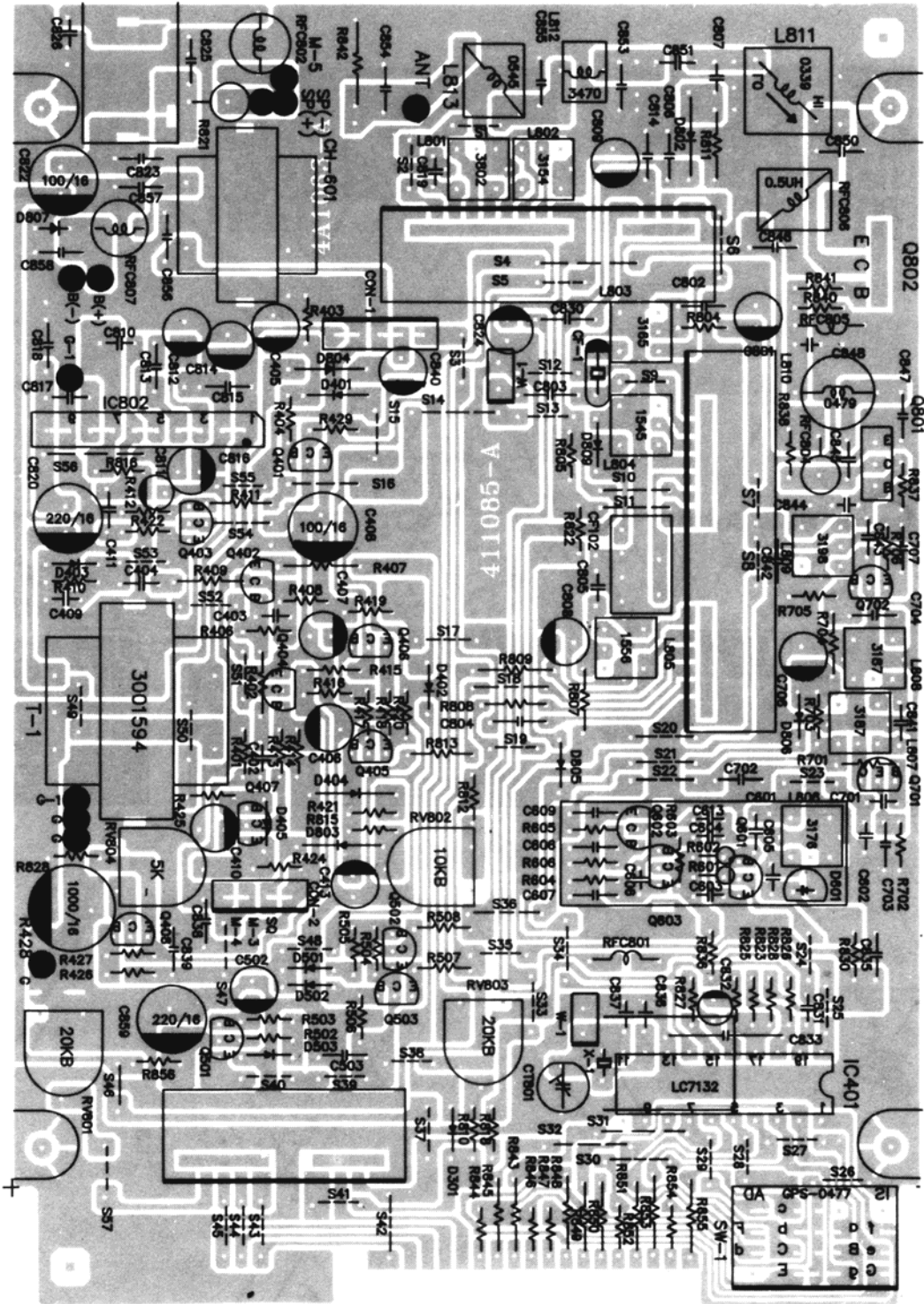
Main PCB-Top View



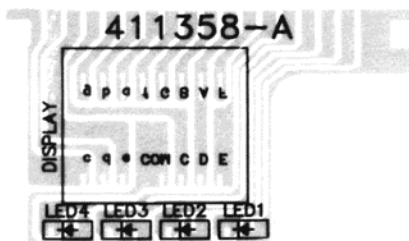
Display PCB-Top View



Main PCB-Bottom View

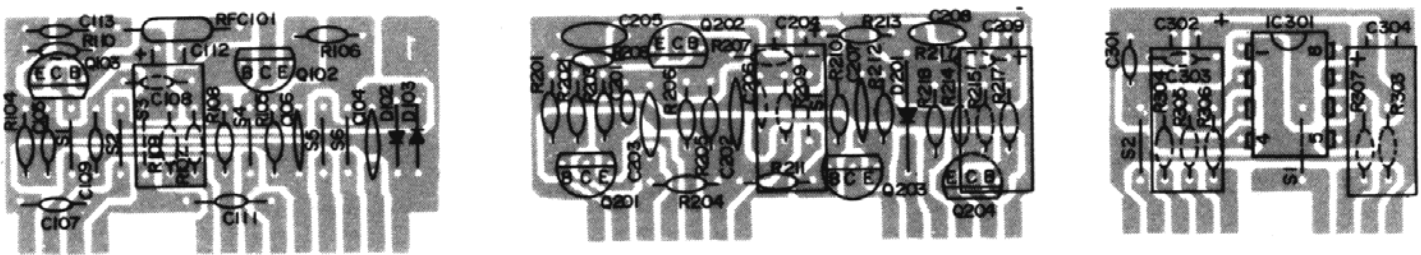


Display PCB-Bottom View

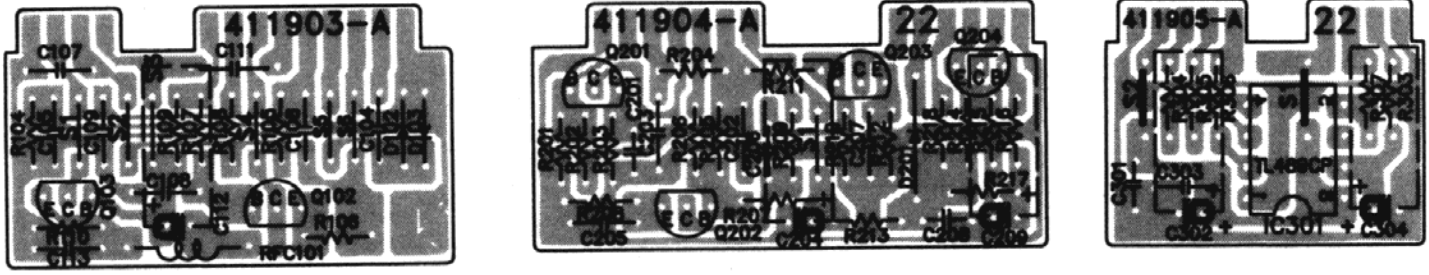


Module PCB Assembly

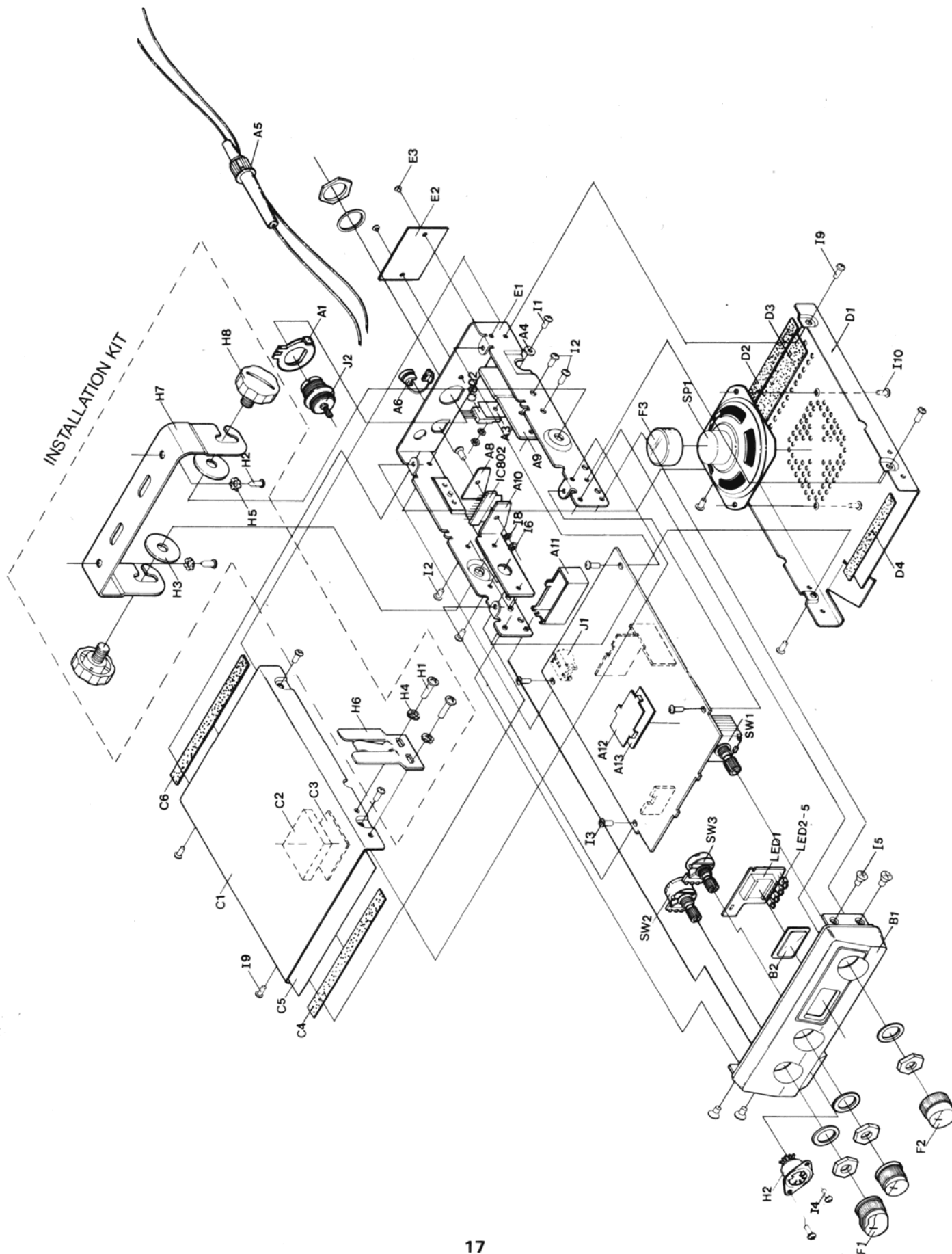
Module PCB-Top View



Module PCB-Bottom View



EXPLODED VIEW/DISASSEMBLY



EXPLODED VIEW PARTS LIST

Ref. No.	Description	RS Part No.	Mfr's Part No.
A-1	Holder, ANT Mounting		731-791
A-2	Socket 5Pin TCS 2250 01 1011		421-529-7
A-3	Mica For TR Q802		440-004-0
A-4	Bushing For TR Q802		441-004-5
A-5	Power Cord, W/Fuse 250V 2A		504-055
A-6	Cord Stopper		750-039
A-8	Heatsink, Small, ALP 30×18×t2, IC802		760-704
A-9	Heatsink, ALP t2, TR802		760-741
A-10	Heatsink, Large IC, ALP 92×25×t2, IC802		760-870
A-11	Shield Housing, VCO, Spte t0.3		771-525
A-12	Shield Plate, VCO, Spte t0.3		771-530
A-13	Insulation Plate, VCO, Fiber t0.3 Stic		905-685
B-1	Escutcheon ABS 94HB Lucky 380-S82276		801-267
B-2	Lens Acryl 27×18×4 Red		812-730
C-1	Cover, Upper Secc+PVC T=0.8 BLK		718-160
C-2	Cushion 25×25×t5 Rubb. SPO. BLK		891-590
C-3	Insulation Plate 30×30×t0.3 Vinyl		900-054
C-4	Felt, Sticker 6×110×t0.3 BLK		901-031
C-5	Insulation Plate 105×146×t0.8 Fiber		901-721
C-6	Felt, Sticker 10×110×t1 BLK		901-767
D-1	Cover, Bottom Secc+PVC T=0.8 BLK		718-159
D-2	Felt, Sticker 10×110×t1 BLK		901-767
D-3	Felt, Sticker 20×90×t0.3 BLK		902-320
D-4	Felt, Sticker 6×72×t0.3 BLK		903-370
E-1	Main Body SPC 325×42×t1		700-930
E-2	Name Plate ALP3 40×27×t0.4		795-487
E-3	Rivet Blind ALB φ 3.2		670-025
F-1	Knob, Control, ABS 94HB Lucky 380-S82276 BLK		825-967
F-2	Knob, Channel, ABS 94HB Lucky 380-S82276 BLK		825-968
F-3	Cap, Speaker, Nylon 0.2G/PC		830-043
G-1	Mic Cartridge, FDM-600M		420-233-5
G-2	Cord, Curled		420-349-6
G-3	Plug, 5Pin		421-025-8
G-4	Push Switch		432-034-1
G-5	Screw (+)Tapping (F.H) 3×6-2S BLK		623-682
G-6	Screw (+)Tapping (O.H) 3×16-2S Ni-Plat		623-830
G-7	Cover, Bottom, MIC BLK		716-630
G-8	Cover, Upper, MIC BLK		716-640-A
G-9	Holder, MIC		731-940
G-10	Lever, MIC		740-483-A
G-11	Name Plate, MIC		794-481
G-12	Back Plate, MIC		794-882

Ref. No.	Description	RS Part No.	Mfr's Part No.
G-13	Cushion		890-050
G-14	Bushing		893-190
H-1	Screw (+)Tapping (RH) 3×8–2S ZNY		623-496
H-2	Screw (+)Tapping (TH) 5×12–1S ZNY		625-007
H-3	Washer, Rubber. 7×φ25×t1.5 BLK		660-138
H-4	Washer, Lock "A" Type, M3 ZNY		664-305
H-5	Washer, Lock "B" Type, M5 ZNY		664-518
H-6	Bracket, MIC, SKD-5 Cr-Plat		720-095
H-7	Bracket, SET, SPC 227×30×t1.5 ZNY		722-080
H-8	Screw Securing M6×12(P: 1) BLK		660-060
I-1	Screw (+)Machine (B.H) 3×10 ZNY		613-332
I-2	Screw (+)Tapping (F.H) 3×6–2S ZNY		623-168
I-3	Screw (+)Tapping (B.H) 3×6–2S ZNY		623-265
I-4	Screw (+)Tapping (B.H) 2.6×8 Ni-Plat		610-080
I-5	Screw (+)Machine (F.H) 2.6×5 ZNY		611-095
I-6	Nut SS41 M3-1S ZNY		651-024
I-7	Washer Plat 3.2×8		660-457
I-8	Washer, Spring, M3 ZNY		662-305
I-9	Screw (+)Tap Tite (BH) 3×6 BLK		633-082
I-10	Screw (+)Tapping (FH) 3×6 2S BLK		623-682
LED1	LED Display UL-R231-P13		252-010-6A
LED2-LED5	LED Lamp SLB26UR3HL Red		251-016-7A
SW 1	Rotary SW, GPS-0712 15mm Shaft		430-069-6
SW 2	VR 50KA W/NUT, Washer ±20%, Volume		450-607-8
SW 3	VR 10KA W/NUT, Washer ±20%, Squelch		450-411-7
J-1	Jack, 3.5Dia. EXT.		420-705-1
J-2	Connector ANT ZNW		421-046-7
SP1	Speaker 8ohm 2W		420-134-8
IC802	KIA7217AP. Audio		222-006-4
Q802	2SC 2078(D)		204-009-1

ELECTRICAL PARTS LIST

Ref. No.	Description	RS Part No.	Mfr. Part No.
Assembly, PCB, RF AMP Module		514-34R-AM	
Capacitors			
C104	Ceramic 22pF(NPO) 50W V \pm 10%		132-202-6
C105	Ceramic 0.022 μ F 50W V +80% / -20% or Ceramic 0.022 μ F 16W V \pm 20%(AX)		130-207-1 130-227-9
C106	Ceramic 47pF 50W V \pm 10%		134-716-4
C107	Ceramic 0.047 μ F 50W V +80% / -20% or Ceramic 0.047 μ F 16W V \pm 20% (AX)		130-405-3 130-427-3
C108-C109	Ceramic 0.022 μ F 50W V +80% / -20% or Ceramic 0.022 μ F 16W V \pm 20% (AX)		130-207-1 130-227-9
C110	Not Used		
C111	Ceramic 0.047 μ F 50W V +80% / -20% or Ceramic 0.047 μ F 16W V \pm 20% (AX)		130-405-3 130-427-3
C112	Electrolytic 22 μ F 16W V \pm 20%		102-250-0
C113	Ceramic 0.022 μ F 50W V +80% / -20% or Ceramic 0.022 μ F 16W V \pm 20% (AX)		130-207-1 130-227-9
RFC101	Coil, Choke 100 μ H MO Type		310-292-3
D102-D103	Diode, 1S2473		243-004-3
Resistors, Metal Film			
R104	330 ohm 1/8W \pm 5%		002-331-9
R105	33K ohm 1/8W \pm 5%		002-333-1
R106	18 ohm 1/8W \pm 5%		002-180-9
R107	680 ohm 1/8W \pm 5%		002-681-5
R108	100 ohm 1/8W \pm 5%		002-101-8
R109	2.7K ohm 1/8W \pm 5%		002-272-9
R110	220 ohm 1/8W \pm 5%		002-221-3
Transistors			
Q102-Q103	KTC1923(Y) / KTC3194(Y) or MPS9426(C)		202-060-7 203-005-2
Assembly, PCB, IF AMP Module		514-341-AM	
Capacitors			
C201	Ceramic 100pF 50W V \pm 10%		131-004-9
C202	Ceramic 0.047 μ F 50W V +80% / -20% or Ceramic 0.047 μ F 16W V \pm 20% (AX)		130-405-3 130-427-3
C203	Ceramic 0.022 μ F 50W V +80% / -20% or Ceramic 0.022 μ F 16W V \pm 20% (AX)		130-207-1 130-227-9
C204	Electrolytic 10 μ F 16W V \pm 20%		101-042-4
C205	*Mylar 0.047 μ F 50W V \pm 10%		114-708-1
C206	Mylar 0.001 μ F 50W V \pm 5%		111-002-1

*Mylar is a registered trademark of E.I. DuPont de Nemours and Company.

Ref. No.	Description	RS Part No.	Mfr. Part No.
C207	Mylar 0.047 μ F 50W V \pm 10%		114-708-1
C208	Mylar 0.0068 μ F 50W V \pm 5%		116-806-6
C209	Electrolytic 1 μ F 50W V \pm 20%		101-007-3
D201	Diode, OA090 GE		244-003-7
Resistors, Metal Film			
R201	560ohm 1/8W \pm 5%		002-561-0
R202	3.9K ohm 1/8W \pm 5%		002-392-4
R203	100ohm 1/8W \pm 5%		002-101-8
R204	470ohm 1/8W \pm 5%		002-471-2
R205	150K ohm 1/8W \pm 5%		002-154-6
R206	1.8K ohm 1/8W \pm 5%		002-182-1
R207	10K ohm 1/8W \pm 5%		002-103-0
R208	470ohm 1/8W \pm 5%		002-471-2
R209	1K ohm 1/8W \pm 5%		002-102-9
R210	3.3K ohm 1/8W \pm 5%		002-332-0
R211	12K ohm 1/8W \pm 5%		002-123-8
R212	220ohm 1/8W \pm 5%		002-221-3
R213	22K ohm 1/8W \pm 5%		002-223-5
R214	47K ohm 1/8W \pm 5%		002-473-4
R215	82K ohm 1/8W \pm 5%		002-823-7
R216	47K ohm 1/8W \pm 5%		002-473-4
R217	33K ohm 1/8W \pm 5%		002-333-1
R218	15K ohm 1/8W \pm 5%		002-153-5
Transistors			
Q201-Q202	KTC1923(Y) / KTC3194(Y) or MPS9426(C)		202-060-7 203-005-2
Q203	KTC380(Y) / KTC3192(Y) or KTC1923(Y) / KTC3194(Y)		202-043-1 202-060-7
Q204	KTA1015(GR) / KTA1266(GR) or MPS9681(T)		202-036-5 203-009-6
Assembly, PCB, LED Driver Module			514-34L-DM
Capacitors			
C301	Mylar 0.01 μ F 50W V \pm 5%		111-004-3
C302	Electrolytic 0.47 μ F 50W V \pm 20%		100-415-3
C303	Ceramic 0.01 μ F 50W V +80% / -20% or Ceramic 0.01 μ F 16W V \pm 20% (AX)		130-102-9 130-188-8
C304	Electrolytic 10 μ F 16W V \pm 20%		101-042-4
D301	Diode, 1S2473		243-004-3
IC301	IC, TL489CP, LED Driver		235-001-7

Ref. No.	Description	RS Part No.	Mfr. Part No.
Resistors, Metal Film			
R303 R304-R307	150ohm 1/8W $\pm 5\%$ 1.5K ohm 1/8W $\pm 5\%$		002-151-3 002-152-4
Assembly, Regulator Module			514-34R-MA
Capacitors			
C502 C503	Electrolytic 47 μ F 16WV $\pm 20\%$ Ceramic 0.047 μ F 50WV +80% / -20%		104-712-1 130-405-3
Diodes			
D501-D502 D503	1S2473 Zener 9.1V, UZ 9.1B		243-004-3 241-020-7
Resistors, Metal Film			
R502 R503 R504 R505 R506 R507 R508	470ohm 1/8W $\pm 5\%$ 100ohm 1/8W $\pm 5\%$ 4.7K ohm 1/8W $\pm 5\%$ 10K ohm 1/8W $\pm 5\%$ 2.7K ohm 1/8W $\pm 5\%$ 180ohm 1/8W $\pm 5\%$ 100ohm 1/8W $\pm 5\%$		002-471-2 002-101-8 002-472-3 002-103-0 002-272-9 002-181-0 002-101-8
Transistors			
Q501 Q502 Q503	KTC1815(GR) / KTC3198(GR) or MPS9631(T) KTA1015(GR) / KTA1266(GR) or MPS9681(T) KTC1815(GR) / KTC3198(GR) or MPS9631(T)		202-023-3 203-014-0 202-036-5 203-009-6 202-023-3 203-014-0
Assembly, VCO Module			514-34V-MA
Capacitors			
C601 C602 C603 C604 C605 C606 C607	Ceramic 18pF(NPO) 50WV $\pm 10\%$ Ceramic 22pF(NPO) 50WV $\pm 10\%$ Ceramic 0.01 μ F 50WV +80% / -20% or Ceramic 0.01 μ F 16WV $\pm 20\%$ (AX) Ceramic 33pF(NPO) 50WV $\pm 10\%$ Mica 47pF(MC) 50WV $\pm 10\%$ Ceramic 220pF(NPO) 50WV $\pm 10\%$ or Ceramic 220pF 50WV $\pm 20\%$ (AX) Ceramic 120pF(NPO) 50WV $\pm 10\%$ or Ceramic 120pF 50WV $\pm 20\%$ (AX)		131-804-5 132-202-6 130-102-9 130-188-8 133-303-9 164-701-9 132-214-7 132-248-8 132-214-7 131-213-1

Ref. No.	Description	RS Part No.	Mfr. Part No.
C608-C609	Ceramic 0.01 μ F 50W V +80% / -20% or Ceramic 0.01 μ F 16W V \pm 20%(AX)		130-102-9 130-188-8
C610-C612	Not Used		
C613	Ceramic 27pF(NPO) 50W V \pm 10%		132-702-1
D601	Diode, Varicap MV 2209		242-002-6
Resistors, Metal Film			
R601	820ohm 1/8W \pm 5%		002-821-5
R602	120K ohm 1/8W \pm 5%		002-124-9
R603	220K ohm 1/8W \pm 5%		002-224-6
R604	2.7K ohm 1/8W \pm 5%		002-272-9
R605-R606	10K ohm 1/8W \pm 5%		002-103-0
Transistors			
Q601	KTC1923(Y) / KTC3194(Y) or MPS9426(C)		202-060-7 203-005-2
Q602	KTC1815(GR) / KTC3198(GR) or MPS9631(T)		202-023-3 203-014-0
Q603	KTC1923(Y) / KTC3194(Y) or MPS9426(C)		202-060-7 203-005-2
Assembly, Doubler PRE AMP Module			514-34D-PA
Capacitors			
C701	Ceramic 39pF 50W V \pm 10%		133-901-9
C702	Ceramic 0.047 μ F 50W V +80% / -20% or Ceramic 0.047 μ F 16W V \pm 20% (AX)		130-405-3 130-427-3
C703	Ceramic 0.022 μ F 50W V +80% / -20% or Ceramic 0.022 μ F 16W V \pm 20% (AX)		130-207-1 130-207-1
C704	Ceramic 100pF(NPO) 50W V \pm 10%		131-015-9
C705	Not Used		
C706	Electrolytic 2.2 μ F 50W V \pm 20%		102-251-1
C707	Ceramic 0.01 μ F 50W V +80% / -20% or Ceramic 0.01 μ F 16W V \pm 20% (AX)		130-102-9 130-188-8
Resistors, Metal Film			
R701	150K ohm 1/8W \pm 5%		002-154-6
R702	390ohm 1/8W \pm 5%		002-391-3
R703-R705	4.7K ohm 1/8W \pm 5%		002-472-3
R706	68ohm 1/8W \pm 5%		002-680-4
Transistors			
Q701-Q702	KTC1923(Y) / KTC3194(Y) or MPS9426(C)		202-060-7 203-005-2

Ref. No.	Description	RS Part No.	Mfr. Part No.
Capacitors			
C402	Mylar 0.01 μ F 50WV \pm 5%		191-001-4
C403	Mylar 0.001 μ F 50WV \pm 5%		111-002-1
C404	Mylar 0.015 μ F 50WV \pm 5%		191-504-2
C405	Electrolytic 47 μ F 16WV \pm 20%		104-771-4
C406	Electrolytic 0.1 μ F 50WV \pm 20%		100-102-0
C407	Electrolytic 10 μ F 16WV \pm 20%		101-042-4
C408	Electrolytic 100 μ F 16WV \pm 20%		101-022-6
C409	Mylar 0.001 μ F 50WV \pm 5%		111-002-1
C410	Electrolytic 47 μ F 16WV \pm 20%		104-771-4
C411	Mylar 0.01 μ F 50WV \pm 5%		191-001-4
C412	Not Used		
C413	Electrolytic 33 μ F 16WV \pm 20%		103-313-9
Diodes			
D401-D402	1S2473		243-004-3
D403	Not Used		
D404	OA90 GE		244-003-7
D405	1S2473		243-004-3
Resistors, Metal Film			
R401	1K ohm 1/8W \pm 5%		002-102-9
R402	3.3K ohm 1/8W \pm 5%		002-332-0
R403-R404	1K ohm 1/8W \pm 5%		002-102-9
R405	Not Used		002-824-8
R406	820K ohm 1/8W \pm 5%		
R407	470 ohm 1/8W \pm 5%		002-471-2
R408	33K ohm 1/8W \pm 5%		002-333-1
R409-R410	8.2K ohm 1/8W \pm 5%		002-822-6
R411	470K ohm 1/8W \pm 5%		002-474-5
R412	100K ohm 1/8W \pm 5%		002-104-1
R413	2.2K ohm 1/8W \pm 5%		002-222-4
R414	33K ohm 1/8W \pm 5%		002-333-1
R415	3.9K ohm 1/8W \pm 5%		002-392-4
R416	100K ohm 1/8W \pm 5%		002-104-1
R417	2.7K ohm 1/8W \pm 5%		002-272-9
R418	100 ohm 1/8W \pm 5%		002-101-8
R419	220 ohm 1/8W \pm 5%		002-221-3
R420	5.6 ohm 1/8W \pm 5%		002-569-8
R421	33K ohm 1/8W \pm 5%		002-333-1
R422	5.6K ohm 1/8W \pm 5%		002-562-1
R423	Not Used		
R424	470 ohm 1/8W \pm 5%		002-471-2

Ref. No.	Description	RS Part No.	Mfr. Part No.
R425	10K ohm 1/8W ±5%		002-103-0
R426	8.2K ohm 1/8W ±5%		002-822-6
R427	4.7K ohm 1/8W ±5%		002-472-3
R428	10 ohm 1/8W ±5%		002-100-7
R429	33K ohm 1/8W ±5%		002-333-1
Transistors			
Q401-Q406	KTC1815(GR) / KTC3198(GR) or MPS9631(T)		202-023-3 203-014-0
Q407-Q408	KTA1015(GR) / KTA1266(GR) or MPS9681(T)		202-036-5 203-009-6
Assembly, PCB, Main			514-34M-P
Capacitors			
C504	Ceramic 0.047 μ F 50W V +80% / -20%		130-405-3
C801	Electrolytic 10 μ F 16W V ±20%		101-042-4
C802	Ceramic 0.047 μ F 50W V +80% / -20% or Ceramic 0.047 μ F 16W V ±20% (AX)		130-405-3 130-427-3
C803	Ceramic 12pF(NPO) 50W V ±10%		131-204-3
C804	Mylar 0.033 μ F 50W V ±5%		193-304-8
C805	Mylar 0.047 μ F 50W V ±10%		114-708-1
C806	Ceramic 0.01 μ F 50W V +80% / -20% or Ceramic 0.01 μ F 16W V ±20% (AX)		130-102-9 130-188-8
C807	Ceramic 1pF(NPO) 50W V ±10%		131-010-4
C808	Electrolytic 22 μ F 16W V ±20%		102-250-0
C809	Electrolytic 10 μ F 16W V ±20%		101-042-4
C810	Mylar 0.001 μ F 50W V ±5%		111-002-1
C811	Tantalum 4.7 μ F 16W V ±10%		144-701-3
C812	Electrolytic 33 μ F 16W V ±20%		103-313-9
C813	Ceramic 330pF(NPO) 50W V ±10% or Ceramic 330pF 50W V ±20% (AX)		133-325-9 133-315-0
C814	Ceramic 0.047 μ F 50W V +80% / -20% or Ceramic 0.047 μ F 16W V ±20% (AX)		130-405-3 130-427-3
C815	Mylar 0.068 μ F 50W V ±10%		166-803-3
C816	Electrolytic 47 μ F 16W V ±20%		104-771-4
C817	Ceramic 220pF(NPO) 50W V ±10% or Ceramic 220pF 50W V ±20% (AX)		132-214-7 132-248-8
C818	Mylar 0.068 μ F 50W V ±10%		166-803-3
C819	Ceramic 15pF(NPO) 50W V ±10%		131-502-2
C820	Electrolytic 220 μ F 16W V ±20%		102-223-6
C821	Electrolytic 1000 μ F 16W V ±20%		101-047-9
C822	Electrolytic 100 μ F 16W V ±20%		101-022-6

Ref. No.	Description	RS Part No.	Mfr. Part No.
C823	Ceramic 0.01 μ F 50W V +80% / -20%		130-102-9
C824	Electrolytic 10 μ F 16W V \pm 20%		101-042-4
C825-C826	Ceramic 0.001 μ F 50W V +80% / -20%		130-101-8
C827	Ceramic 0.01 μ F 50W V +80% / -20% or Ceramic 0.01 μ F 16W V \pm 20% (AX)		130-102-9 130-188-8
C828	Electrolytic 10 μ F 16W V \pm 20%		101-042-4
C829	Not Used		
C830	Ceramic 22pF(NPO) 50W V \pm 10%		132-202-6
C831	Ceramic 15pF(NPO) 50W V \pm 10%		131-502-2
C832	Tantalum 1 μ F 16W V \pm 10%		141-001-9
C833	Ceramic 0.047 μ F 50W V +80% / -20% or Ceramic 0.047 μ F 16W V \pm 20% (AX)		130-405-3 130-427-3
C834	Not Used		
C835	Mylar 0.047 μ F 50W V \pm 10%		114-708-1
C836-C837	Mica 47pF 50W V \pm 10%		164-701-9
C838	Ceramic 0.022 μ F 50W V +80% / -20% or Ceramic 0.022 μ F 16W V \pm 20% (AX)		130-207-1 130-227-9
C839	Not Used		
C840	Electrolytic 10 μ F 16W V \pm 20%		101-042-4
C841	Ceramic 4pF(NPO) 50W V \pm 10%		134-004-4
C842	Ceramic 0.047 μ F 50W V +80% / -20% or Ceramic 0.047 μ F 16W V \pm 20% (AX)		130-405-3 130-427-3
C843	Ceramic 100pF(NPO) 50W V \pm 10%		131-015-9
C844	Ceramic 470pF 50W V \pm 10%		134-702-1
C845	Ceramic 82pF(NPO) 50W V \pm 10%		138-204-8
C846	Ceramic 0.022 μ F 50W V +80% / -20%		130-207-1
C847	Ceramic 220pF(NPO) 50W V \pm 10%		132-214-7
C848	Ceramic 470pF 50W V \pm 10%		134-702-1
C849	Not Used		
C850-C851	Ceramic 100pF(NPO) 50W V \pm 10%		131-015-9
C852	Not Used		
C853	Ceramic 390pF 50W V \pm 10%		133-904-2
C854	Ceramic 150pF(NPO) 50W V \pm 10%		131-510-9
C855	Ceramic 330pF(NPO) 50W V \pm 10%		133-311-0
C856-C857	Ceramic 0.01 μ F 50W V +80% / -20%		130-102-9
C858	Ceramic 0.01 μ F 50W V +80% / -20%		130-102-9
C501	Electrolytic 220 μ F 16W V \pm 20%		102-223-6
CT801	Trimmer 20pF TZ03R200E \pm 10%		172-015-6
X-1	Crystal, 10.240MHz HC-18/U		260-485-5

Ref. No.	Description	RS Part No.	Mfr. Part No.
Coils			
L801	27MHz RX ANT, 7mm Square		320-380-2
L802	27MHz RF AMP(RX), 7mm Square		320-315-4
L803	10.6MHz RF 1'st Mixer(RX), 7mm Can		320-316-5
L804	IFT 455KHz-A, 7mm Can		320-154-5
L805	IFT 455KHz-B, 7mm Can		320-155-6
L806	VCO, 7mm Square		320-317-6
L807-L808	27MHz RF PRE AMP(TX) A, 7mm Can		320-318-7
L809	27MHz RF PRE AMP(TX) B, 7mm Square		320-319-8
L810	Coil Choke 0.25 μ H Spring Type(7D \times 1D \times 5.5t)		310-047-9
L811	TX ANT 27MHz-B, Bobbin		320-033-9
L812	Coil Choke 0.22 μ H Spring Type(5.2D \times 0.7D \times 7t)		310-347-0
L813	Coil Choke 0.32 μ H Spring Type(5D \times 1D \times 9.5t)		320-032-8
RFC801	Inductor 6.8 μ H Resistor Type		310-291-2
RFC802	RF Choke 0.8 μ H Spring Type		310-072-1
RFC803	Not Used		
RFC804	Choke 1 μ H Bobbin Type		310-025-9
RFC805	Inductor 6.8 μ H Resistor Type		310-291-2
RFC806	RF Choke 0.5 μ H Spring Type		310-065-5
RFC807	RF Choke 20 μ H Core Type		310-034-7
Diode			
D802-D803	OA90 GE		244-003-7
D804	IN4002		245-004-3
D805-D806	1S2473		243-004-3
D807	IN4002		245-004-3
D808	Not Used		
D809	IS2473		243-004-3
Filters			
CF-1	Ceramic 10.7MJ		270-010-2
CF-2	Ceramic CFW 455HT or Ceramic CFU 455HT		270-007-0 270-006-9
Integrated Circuits			
IC801	LC7132, PLL		224-021-7
IC802	KIA7217AP, AUDIO		222-006-4
J-1	Jack, 3.5Dia. EXT		420-705-1
Resistors, Metal Film			
R804	470ohm 1/8W \pm 5%		002-471-2
R805	27K ohm 1/8W \pm 5%		002-273-0

Ref. No.	Description	RS Part No.	Mfr. Part No.
R806	Not Used		
R807	47ohm 1/8W ±5%		002-470-1
R808	330K ohm 1/8W ±5%		002-334-2
R809	10K ohm 1/8W ±5%		002-103-0
R810	1K ohm 1/8W ±5%		002-102-9
R811	220ohm 1/8W ±5%		002-221-3
R812	10K ohm 1/8W ±5%		002-103-0
R813	5.6K ohm 1/8W ±5%		002-562-1
R814	Not Used		
R815	1.8K ohm 1/8W ±5%		002-182-1
R816	68ohm 1/8W ±5%		002-680-4
R817	Not Used		
R818	47ohm 1/8W ±5%		002-470-1
R819-R820	Not Used		
R821	Metaloxide 15ohm 2W ±5%		019-150-0
R822	330ohm 1/8W ±5%		002-331-9
R823	10K ohm 1/8W ±5%		002-103-0
R824	Not Used		
R825	33K ohm 1/8W ±5%		002-333-1
R826	22ohm 1/8W ±5%		002-220-2
R827	2.2K ohm 1/8W ±5%		002-222-4
R828	82K ohm 1/8W ±5%		002-823-7
R829	Not Used		
R830	22K ohm 1/8W ±5%		002-223-5
R831-R835	Not Used		
R836	47ohm 1/8W ±5%		002-470-1
R837	100ohm 1/8W ±5%		002-101-8
R838	1K ohm 1/8W ±5%		002-102-9
R839	Not Used		
R840	100ohm 1/8W ±5%		002-101-8
R841	2.2ohm 1/8W ±5%		002-229-1
R842	Metaloxide 4.7K ohm 1/2W ±5%		030-472-2
R843	560ohm 1/8W ±5%		002-561-0
R844-R855	1K ohm 1/8W ±5%		002-102-9
R501	22ohm 1/8W ±5%		002-220-2
Variable Resistors, Semifixed			
RV801	20KB ohm 8Dia ±25%, H-Type		061-203-1
RV802	10KB ohm 8Dia ±25%, H-Type		061-103-1
RV803	20KB ohm 8Dia ±25%, H-Type		061-203-1
RV804	5KB ohm 8Dia ±25%, H-Type		061-502-1

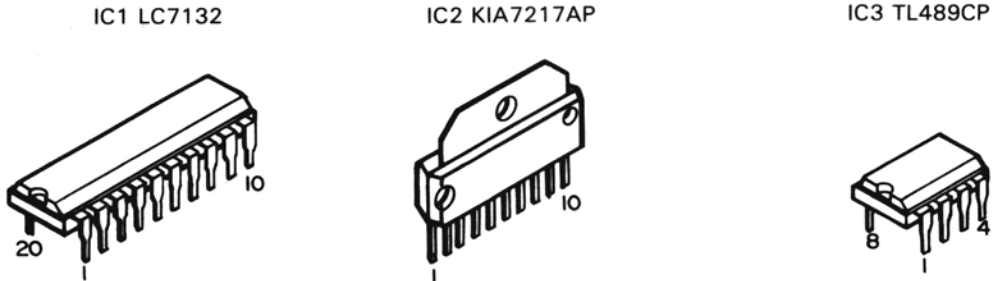
Ref. No.	Description	RS Part No.	Mfr. Part No.
Transformers			
T1 CH-1	Output EI-24 Choke, 520 μ H		300-159-4 300-116-5
Transistors			
Q801 Q802	2SC2314(E) or KTC1006 2SC 2078(D) or KTC2075		204-016-7 202-124-1 204-009-1 202-057-5
Assembly, PCB, LED Display			514-34D-PA
LED1 LED2-LED5	LED Display UL-R231-P13 LED Lamp SLB26UR3HL Red		252-010-6A 251-016-7A
Miscellaneous			
SW 1 SW 2 SW 3 J-2 A-1 A-2 A-3 A-4 A-5 A-6 A-7 A-8 A-9 A-10 A-11 A-12 A-13	Rotary SW, GPS-0712 15mm Shaft VR 50KA W/NUT, Washer \pm 20%, Volume VR 10KA W/NUT, Washer \pm 20%, Squelch Connector, ANT ZNW Holder, ANT Mounting Socket 5Pin TCS 2250 01 1011 Mica For TR Q802 Bushing For TR Q802 Power Cord, W/Fuse 250V 2A Cord Stopper Wire Clamp (Cord) Heatsink, Small, ALP 30 \times 18 \times t2, IC802 Heatsink, ALP t2, TR802 Heatsink, Large IC, ALP 92 \times 25 \times t2, IC802 Shield Housing, VCO, Spte t0.3 Shield Plate, VCO, Spte t0.3 Insulation Plate, VCO, Fiber t0.3 Stic		430-069-6 450-607-8 450-411-7 421-046-7 731-791 421-529-7 440-004-0 441-004-5 504-055 750-039 870-036 760-704 760-741 760-870 771-525 771-530 905-685
Assembly, Escutcheon			592-352
B-1 B-2	Escutcheon ABS 94HB Lucky 380-S82276 Lens Acryl 27 \times 18 \times 4 Red		801-267 812-730
Assembly, Cover, Upper			592-353
C-1 C-2 C-3 C-4 C-5	Cover, Upper Secc+PVC T=0.8 BLK Cushion 25 \times 25 \times t5 Rubb. SPO. BLK Insulation Plate 30 \times 30 \times t0.3 Vinyl Felt, Sticker. 6 \times 110 \times t0.3 BLK Insulation Plate 105 \times 146 \times t0.8 Fiber		718-160 891-590 900-054 901-031 901-721

Ref. No.	Description	RS Part No.	Mfr. Part No.
C-6	Felt, Sticker. 10×110×t1 BLK		901-767
Assembly, Cover, Bottom			592-354
D-1	Cover Bottom Secc+PVC T=0.8 BLK		718-159
D-2	Felt, Sticker 10×110×t1 BLK		901-767
D-3	Felt, Sticker 20×90×t0.3 BLK		902-320
D-4	Felt, Sticker 6×72×t0.3 BLK		903-370
Assembly, Main Body			592-355
E-1	Main Body SPC 325×42×t1		700-930
E-2	Name Plate ALP3 40×27×t0.4		795-487
E-3	Rivet Blind ALB ϕ 3.2		670-025
Parts, Individual			592-356
F-1	Knob, Control, ABS 94HB Lucky 380-S82276 BLK		825-967
F-2	Knob, Channel, ABS 94HB Lucky 380-S82276 BLK		825-968
F-3	Cap, Speaker, Nylon 0.2G/PC		830-043
SP1	Speaker 8 ohm 2W		420-134-8
Assembly, Microphone			592-357
G-1	Mic Cartridge, FDM-600M		420-233-5
G-2	Cord, Curled		420-349-6
G-3	Plug, 5Pin		421-025-8
G-4	Push Switch		432-034-1
G-5	Screw, (+) Tapping (F.H) 3×6–2S BLK		623-682
G-6	Screw, (+) Tapping (O.H) 3×16–2S Ni-Plat		623-830
G-7	Cover, Bottom, MIC BLK		716-630
G-8	Cover, Upper, MIC BLK		716-640-A
G-9	Holder, MIC		731-940
G-10	Lever, MIC		740-483-A
G-11	Name Plate, MIC		794-481
G-12	Back Plate, MIC		794-882
G-13	Cushion		890-050
G-14	Bushing		893-190
Installation Kit			592-358
H-1	Screw, (+) Tapping (RH) 3×8–2S ZNY		623-496
H-2	Screw, (+) Tapping (TH) 5×12–1S ZNY		625-007
H-3	Washer, Rubber 7×ϕ25×t1.5 BLK		660-138
H-4	Washer, Lock "A" Type, M3 ZNY		664-305
H-5	Washer, Lock "B" Type, M5 ZNY		664-518
H-6	Bracket, MIC, SKD-5 Cr-Plat		720-095

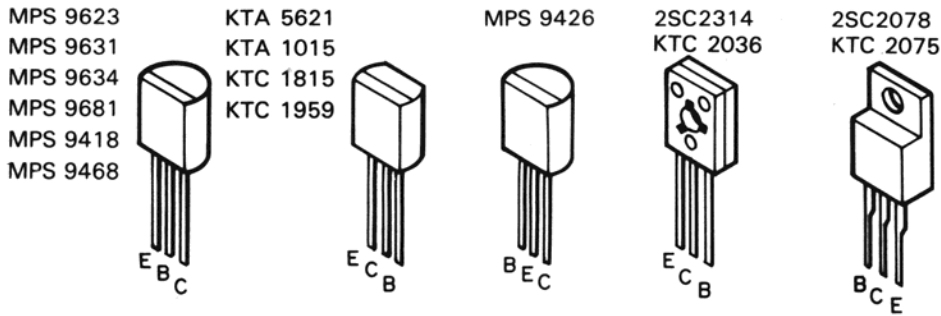
Ref. No.	Description	RS Part No.	Mfr. Part No.
H-7	Bracket, SET, SPC 227×30×t1.5 ZNY		722-080
H-8	Screw, Securing M6×12(P: 1) BLK		660-060
Hardware Kit			592-359
Internal Hardware			
I-1	Screw, (+) Machine (B.H) 3×10 ZNY		613-332
I-2	Screw, (+) Tapping (F.H) 3×6-2S ZNY		623-168
I-3	Screw, (+) Tapping (B.H) 3×6-2S ZNY		623-265
I-4	Screw, (+) Tapping (B.H) 2.6×8 Ni-Plat		610-080
I-5	Screw, (+) Machine (F.H) 2.6×5 ZNY		611-095
I-6	Nut SS41 M3-1S ZNY		651-024
I-7	Washer, Flat 3.2×8		660-457
I-8	Washer, Spring, M3 ZNY		662-305
External Hardware			
I-9	Screw, (+) Tap Tite (BH) 3×6 BLK		633-082
I-10	Screw, (+) Tapping (FH) 3×6 2S BLK		623-682

SEMICONDUCTOR LEAD IDENTIFICATION AND IC INTERNAL DIAGRAM

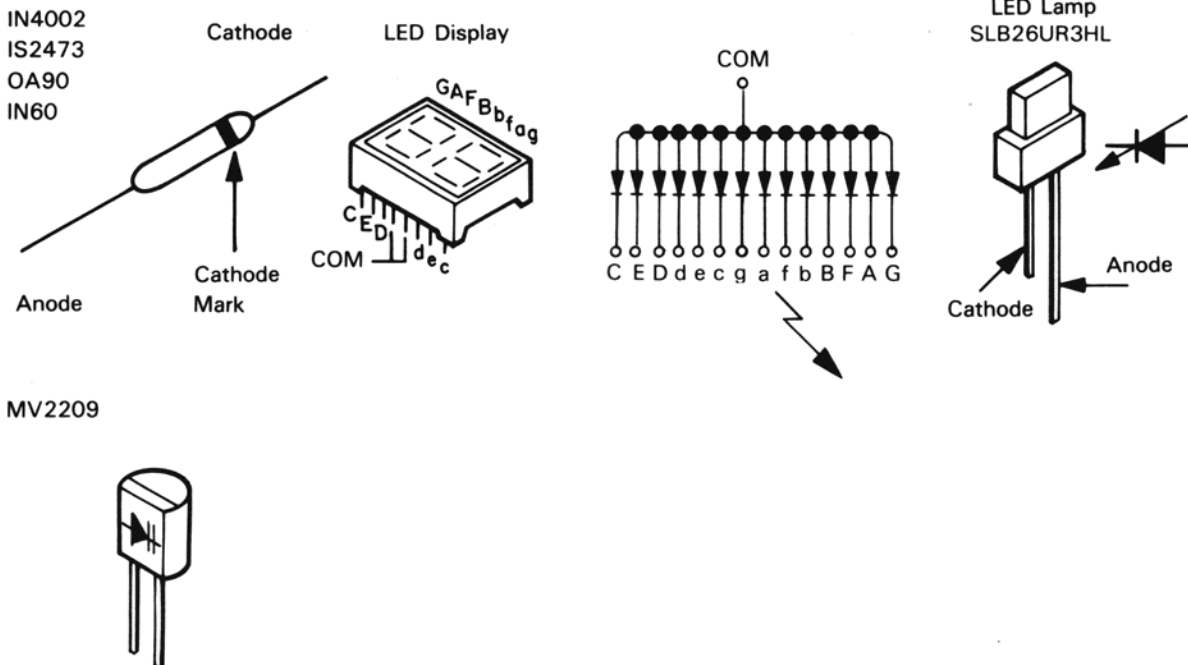
1. Integrated Circuits



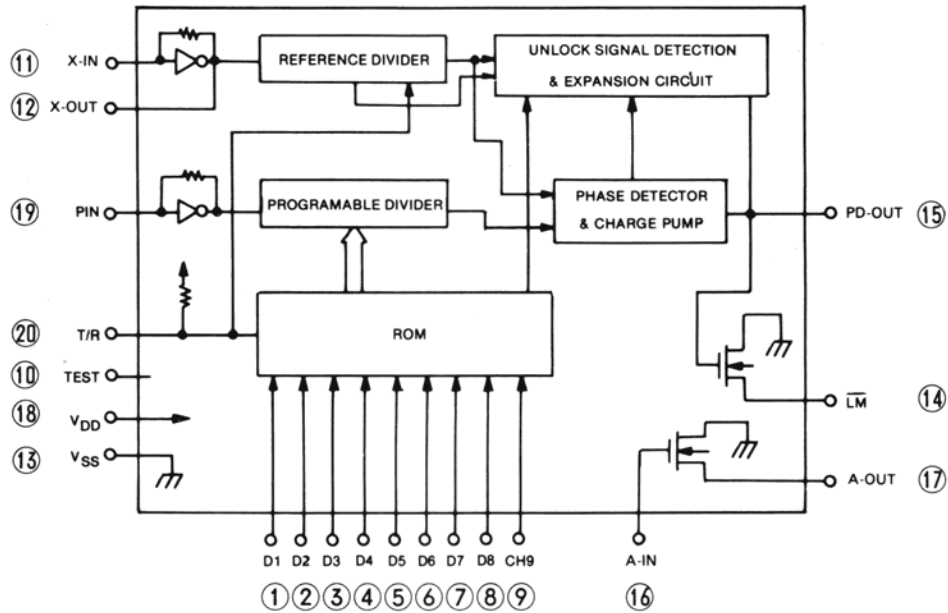
2. Transistors



3. Diodes

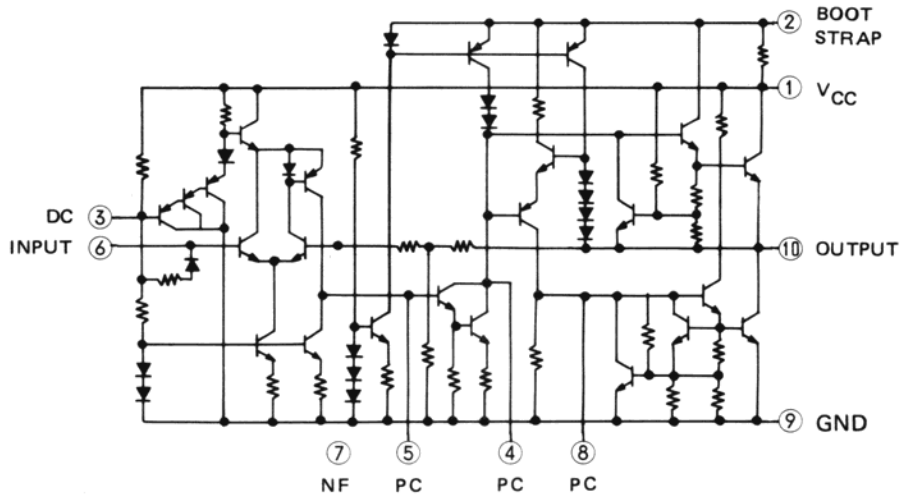


IC1 LC7132



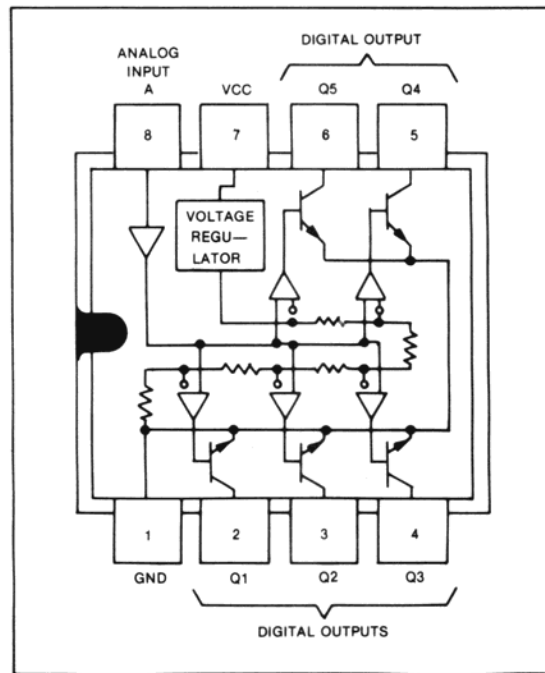
- D1 to D8 : Program input (7 segment code)
- XIN, XOUT : Amplifier for crystal oscillator
- VDD, VSS : Power Supply
- LM : Lock monitor output, Lock = open or 1, Unlock = "0"
- PDOUT : Charge pump output
- AIN, AOUT : Amplifier for low-pass filter
- PIN : Programmable
- T/R : Transmission/Reception change over input
 $\bar{T}/R = "0"$ – Transmission, $\bar{T}/R = "1"$ –reception
- CH9 : Channel 9 select input
- TEST : LSI test pin (Connected to VSS or open)

IC2 KIA7217AP



DC: Decoupling
 PC: Phase compensation
 NF: Negative feedback

IC3 TL489CP



SEMICONDUCTOR VOLTAGE CHART

RX: No Carrier
TX: No Signal
TEST CH: 19CH

1. Transistors

Pin TR'S	Emitter		Base		Collector	
	Receive	Transmit	Receive	Transmit	Receive	Transmit
Q102	1.25	0.01	1.98	0.44	5.50	0.83
Q103	1.17	0	1.89	0.44	10.80	12.13
Q201	0.24	0	0.85	0.10	5.07	0.86
Q202	1.32	0	2.04	0.44	3.00	0.84
Q203	0.48	0	1.20	0.18	13.26	12.38
Q204	0.54	0.10	0.13	0.07	0.54	0
Q401	0	0	0.01	0.01	0.05	0.05
Q402	0.08	0.61	0	1.17	0	1.62
Q403	0.04	0	0.55	0.14	0.05	0.05
Q404	0	0	0	0	0.04	0
Q405	0.02	0.01	0.17	0.08	1.02	1.00
Q406	0.36	0.34	1.02	1.00	0.41	0.40
Q407	0.59	4.17	1.20	4.76	0	0
Q408	13.66	13.07	13.65	12.34	0.59	13.04
Q501	8.39	8.37	9.08	9.06	12.94	12.50
Q502	8.40	8.38	8.39	7.67	0	8.34
Q503	7.61	0.84	8.30	0.66	8.40	8.38
Q601	0	0.84	0.74	0.74	3.30	3.28
Q602	0	0	0	0.68	0	0
Q603	4.57	4.57	5.24	5.24	8.04	8.03
Q701	0	1.67	0	2.36	0	7.76
Q702	0	1.24	0	2.06	13.34	12.86
Q801	0	0	0	-0.04	13.42	11.50
Q802	0	0	0	-0.04	13.41	11.34

2. ICs

ICs	Pin No.	Voltage		ICs	Pin No.	Voltage	
		RX	TX			RX	TX
IC801	1	0	0	IC802	20	5.85	0.85
	2	0	0		1	13.70	13.28
	3	0	0		2	12.47	12.05
	4	12.17	11.75		3	3.94	3.84
	5	0	0		4	8.12	7.92
	6	0	0		5	1.47	1.47
	7	13.20	12.77		6	3.40	3.30
	8	12.14	11.72		7	3.41	3.31
	9	0	0		8	1.24	1.23
	10	0.01	0.01		9	0	0
	11	4.08	4.08	10	6.87	6.67	
	12	4.09	4.08	IC803	1	0	0
	13	0	0		2	12.35	0.05
	14	1.82	4.64		3	12.34	0.05
	15	1.44	1.54		4	12.35	0.05
	16	1.44	1.54		5	12.34	0.05
	17	4.67	3.50		6	0	0.06
	18	8.18	8.17		7	12.60	11.10
	19	4.16	4.16		8	0	0.81

SCHEMATIC DIAGRAM

Cat. No.: 21-1552

Note

1. RESISTANCE VALUES ARE INDICATED IN OHMS UNLESS OTHERWISE SPECIFIED.
(K = 1,000, M = 1,000,000)
2. CAPACITANCE VALUES ARE SHOWN IN MICROFARADS UNLESS OTHERWISE NOTED.
(P = 10^{-12} , $\mu = 10^{-6}$)
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.

