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Clear Channel Ranger AR3300 Service Manual

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**RANGER AR3300
TECHNICAL MANUAL**

INTRODUCTION

The purpose of this manual is to provide you with all the information required to troubleshoot and service the RANGER AR-3300 transceiver. There is also a section devoted to updates and modifications to customize the radio to meet your particular requirements. This manual is as current as possible, but we are constantly enhancing and upgrading the product. As a result the RANGER is constantly going through an evolution. To keep you informed all addendum will be sent to your current address at no additional charge for a period of 1 year. We will offer renewal subscriptions for a nominal fee.

We are concerned with your satisfaction with our product and ask for your feedback. We have technicians available to answer your questions Monday thru Thursday between the hours of 7AM and 6PM pacific time. Our staff is dedicated to your satisfaction.

**CLEAR CHANNEL CORPORATION
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AR-3300 TECHNICAL BULLETIN #1

APRIL 4, 1986

SYMPTOM: First word clipped off.

CAUSE: Modulation amplifier slow turning on (.25 to .5 sec.)

REMEDY: Change R139 to 4.7 Kohm. Move the cathode of D61 to the base of Q43 (See point D for location). Add 220 mfd @ 16V + side to anode D61 (see point C for location) — side to ground. (Diode should be placed on bottom (solder side) of PCB for best results.

NOTES: This will completely eliminate this problem. All radios received for service should be modified with this change. This change incorporated at the factory beginning with serial #86020801.

AR-3300 TECHNICAL BULLETIN #2

NOISE BLANKER SWITCH

To turn off the noise-blanker cut the trace marked point H. A SPST switch can be installed at the cut for a control.

AR-3300 TECHNICAL BULLETIN #3

APRIL 23, 1986

SYMPTOMS: Warble (frequency shift) on SSB. Squeal (audio oscillation) on AM.

CAUSE: Ground loop and by-pass problems on PCB.

REMEDY: Connect open in ground plane on PCB near audio ICB (location at points A and B) with a small jumper.

Install a by-pass capacitor (.01) between points F and G.

Install by-pass capacitors (.01) between mounting screws of Q28, Q29 and the RF shield around the power amplifier area.

Install a by-pass capacitor from the RF shield and the ground lug of the SO-239 antenna connector.

Tighten screws that hold PCB to chassis.

Scrape the inside of covers by mounting screws to improve connection to chassis when covers are on.

NOTES: This will completely eliminate this problem. All radios received for service should be modified with this change.

PLEASE SEE PCB PHOTO PAGE FOR PARTS LOCATIONS.

SUBJECT: BATTERY BACK-UP

- To install a battery back-up obtain the following:
 - 9 Volt Battery
 - 9 Volt Battery Plug with leads
 - 1N4001 Diode (or equivalent)
- Connect the negative lead to ground.
- Connect the positive lead to the anode of a 1N4001 diode.
- Connect the cathode (stripe end) to point E.

AR-3300 TECHNICAL BULLETIN #5**JUNE 25, 1986****SUBJECT: 2.7Kc SSB FILTER**

To change from 4.7Kc to 2.7Kc do the following:

1. Replace MCF (4.7) with 2.7 filter.
2. Replace coil T-16 (56-14) with 56-07 coil.
3. Replace D44 (IS1588) with IS585 diode.
4. Replace C-86 (330pF) with 56pF capacitor.
5. Replace R-24 (2.2K) with 1.5K resistor.

Realign radio as follows:

1. Connect frequency counter to TP-3 with high-impedance probe.
 - a. Set radio to USB mode. Adjust T-16 for 10.6935Mhz.
 - b. Set radio to LSB mode. Adjust T-17 for 10.6965Mhz.
 - c. Set radio to CW mode. Adjust T-15 for 10.6943Mhz.
2. Connect frequency counter to TP-2. (Rx frequency 28.0000Mhz)
 - a. Set radio to AM mode. Adjust VR-3 for 17-305Mhz.
 - b. Set radio to USB mode. Adjust VR-1 for 17.3065Mhz.
 - c. Set radio to LSB mode. Adjust VR-2 for 17.3035Mhz.
3. Connect frequency counter to RF output.
 - a. Set radio to FM (Tx) mode. Adjust T-14 for 28.0000Mhz.

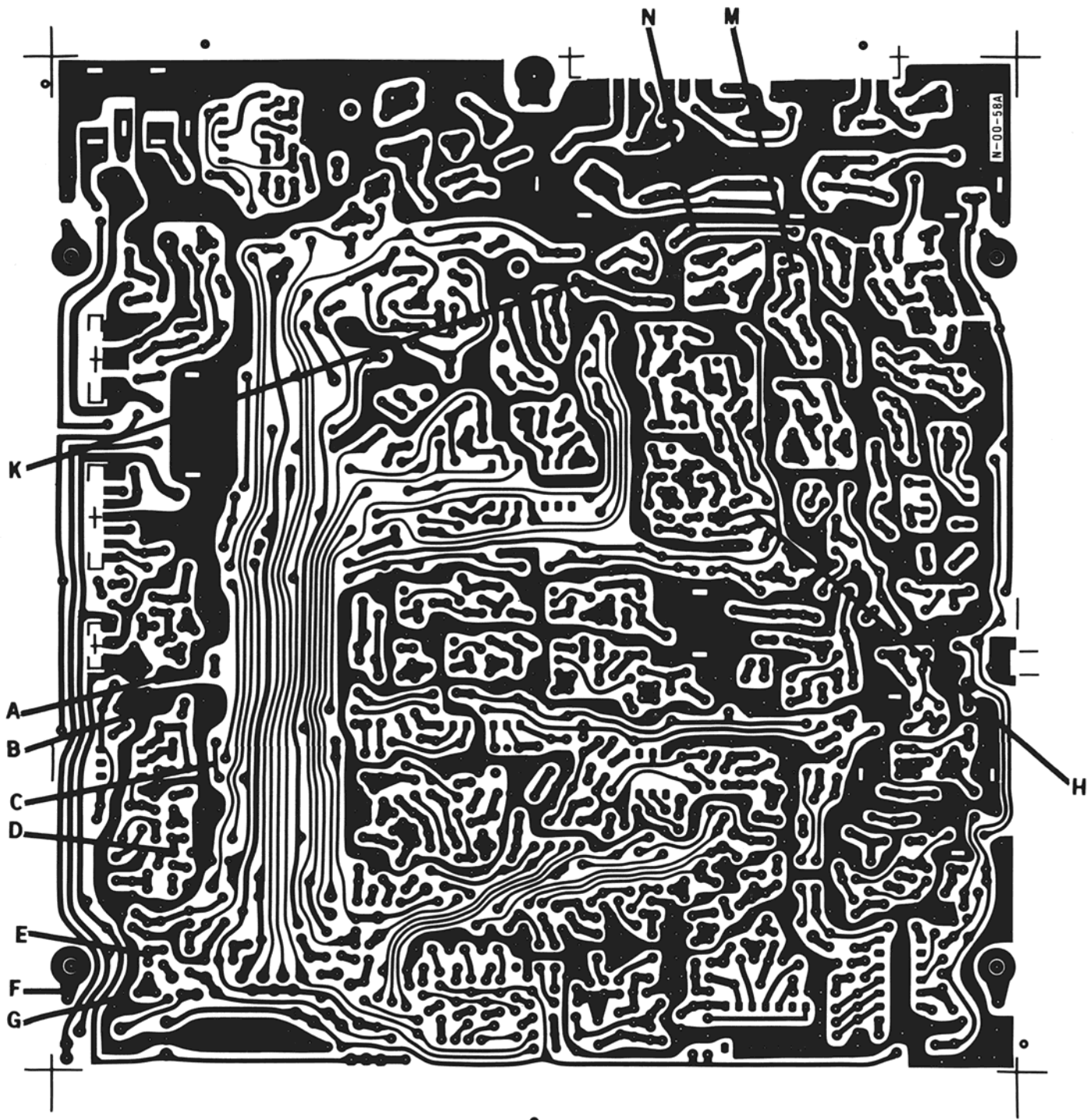
AR-3300 TECHNICAL BULLETIN #6**AUGUST 18, 1987****SUBJECT: ADJACENT CHANNEL REJECTION**

Improved performance will be gained by the following:

- Install a 1N60 diode cathode to ground anode to point K.
- Install a 1N60 diode cathode to ground anode to point M.
- Install a 47uFD electrolytic capacitor + lead to point N, - lead to ground.

Receiver should be realigned as per alignment instructions.

PLEASE SEE PCB PHOTO PAGE FOR PARTS LOCATIONS.



N-00-58A

K

A

B

C

D

E

F

G

N

M

H

Device #	RX Base	Emitter	Collector	TX Base	Emitter	Collector	AM	FM	LSB	USB	CW
Q-1	1.20	0.44	4.99	0.10	0.00	0.26	*	*	*	*	*
Q-2	0.73	0.07	5.54	0.07	0.00	0.26	*	*	*	*	*
Q-3	1.13	0.45	7.47	1.01	2.18	7.63			*	*	*
Q-4	0.74	0.00	2.52	0.67	0.00	1.51			*	*	*
Q-5	2.52	1.77	6.96	1.51	0.78	7.45			*	*	*
Q-6	1.56	0.89	5.74	1.78	2.17	6.43	*	*			
Q-7	1.60	0.90	6.93	1.66	1.48	7.07	*	*			
Q-8	0.98	0.26	6.76	0.98	0.26	6.80	*	*			
Q-9	0.07	0.00	0.11	0.08	0.00	0.04		*			
Q-10	0.03	0.00	0.11	0.03	0.00	0.11	*	*	*	*	*
Q-11	0.74	0.00	0.01	0.74	0.00	0.01	*	*			
Q-12	0.74	0.00	0.01	0.74	0.00	0.01			*	*	*
Q-13	0.36	0.62	4.44	0.36	0.62	4.44	*	*	*	*	*
Q-14	0.62	0.00	2.27	0.62	0.00	2.27	*	*	*	*	*
Q-15	1.27	0.55	2.61	1.27	0.55	2.61	*	*	*	*	*
Q-16	0.73	0.00	3.01	0.73	0.00	3.01	*	*	*	*	*
Q-17	0.64	0.00	3.36	0.64	0.00	3.36	*	*	*	*	*
Q-18	0.03	0.00	0.73	0.03	0.00	0.73	*	*	*	*	*
Q-19	2.52	1.91	6.44	2.52	1.91	6.44			*	*	*
Q-20	0.03	0.00	6.75	0.04	0.00	6.86	*	*			
Q-21	1.41	0.83	2.41	1.41	0.83	2.41	*	*	*	*	*
Q-22	0.00	0.00	0.00	0.71	0.00	0.00	*	*	*	*	*
Q-23	1.80	1.03	1.21	0.22	0.00	5.62	*	*	*	*	*
Q-24	0.00	0.00	0.06	0.00	0.00	2.72			*	*	*
Q-25	0.00	0.00	0.00	0.00	0.00	0.00	*	*	*	*	*
Q-26	0.70	0.10	4.85	0.70	0.10	4.85	*	*	*	*	*
Q-27	0.00	1.03	7.25	0.00	1.03	7.23	*	*	*	*	*
Q-28	0.00	0.00	13.80	0.00	0.57	13.80			*	*	*
Q-29	0.00	0.00	13.80	0.00	0.57	13.80			*	*	*
Q-30	0.00	0.00	13.80	0.00	0.64	13.80			*	*	*
Q-31	0.00	0.00	0.00	1.54	0.80	7.72			*	*	*
Q-32	0.00	0.00	0.00	1.35	0.60	5.85			*	*	*
Q-33	0.22	0.00	0.00	0.22	0.00	0.07	*				
Q-34	6.86	6.38	12.50	6.86	6.30	10.83	*	*			
Q-35	12.62	13.80	6.38	11.45	13.80	6.24	*	*			
Q-36	12.51	12.62	6.38	10.86	11.45	6.24	*	*			
Q-37	0.31	0.00	12.62	0.38	0.00	11.45	*	*			
Q-38	0.81	0.92	7.25	0.81	0.90	7.23	*				
Q-39	0.00	0.00	0.00	0.70	0.00	0.00					*
Q-40	0.00	0.00	7.86	0.60	0.00	0.00					*
Q-41	6.30	5.64	7.94	0.75	0.26	7.94	*	*	*	*	*
Q-42	7.93	7.94	0.00	7.08	7.94	7.62	*	*	*	*	*
Q-43	0.67	0.00	0.00	0.02	0.00	0.00	*	*	*	*	*
Q-400	0.81	0.20	5.52	0.19	0.15	0.40	*	*	*	*	*
Q-401	0.75	0.00	2.13	0.15	0.00	0.40	*	*	*	*	*
Q-402	2.13	1.37	5.27	0.40	0.16	0.40	*	*	*	*	*
Q-403	0.85	0.27	5.81	0.15	0.15	0.40	*	*	*	*	*
Q-404	0.43	0.93	5.23	0.15	0.15	0.05	*	*	*	*	*
Q-405	5.24	5.81	0.02	0.05	0.40	0.16	*	*	*	*	*
Q-406	0.03	0.00	0.01	0.16	0.00	0.02	*	*	*	*	*

CCC ORDER

NUMBER	PART NUMBER	DESCRIPTION	QTY/SET	SCHEMATIC SYMBOL
3300-0001	M 54408	IC	1	IC-1
3300-0002	uPC 1028H	IC	1	IC-3
3300-0003	uPC 1182H	IC	1	IC-8
3300-0004	SL 1640	IC	1	IC-5
3300-0005	CX 7925B	IC	1	IC-6
3300-0006	SO 42	IC	1	IC-7
3300-0007	TC 4001	IC	1	IC-9
3300-0008	NJM 2902N	IC	1	IC-2
3300-0009	NJM 4558D	IC	1	IC-4
3300-0010	78 M 05	IC	1	IC-10
3300-0011	78 L 05	IC	1	IC-12
3300-0012	78 L 02	IC	1	IC-13
3300-0013	7808	IC	1	IC-11
3300-0014	2SC 1923(O)	Transistor	4	Q-27, 400, 401, 402
3300-0015	2SC 1923(Y)	Transistor	10	Q-1,2,3,4,5,6,7,8, 16,19
3300-0016	2SC 1815(GR)	Transistor	11	Q-9,10,11,12,17,18,23,24,33,39,40
3300-0017	2SC 1959(Y)	Transistor	10	Q-14,21,22,26,34,38,43,403,404,406
3300-0018	2SC 387A	Transistor	2	Q-15,32
3300-0019	2SC 2458(GR)	Transistor	1	Q-20
3300-0020	2SC 496(O)	Transistor	2	Q-37,41
3300-0021	2SA 562(O)	Transistor	2	Q-25,405
3300-0022	2SA 473(Y)	Transistor	1	Q-36
3300-0023	2SA 496(O)	Transistor	1	Q-42
3300-0024	2SB 754(O)	Transistor	1	Q-35
3300-0025	2SC 2312(C-O)	Transistor	2	Q-28,29
3300-0026	2SC 2166(C-O)	Transistor	1	Q-30
3300-0027	2SC 1973	Transistor	1	Q-31
3300-0028	2SK 186C	Transistor	1	Q-13
3300-0029	SFE 10.7MS2	Ceramic Filter	1	CF-1
3300-0030	CFW 455HT	Ceramic Filter	1	CF-2
3300-0031	10M2.6D	Crystal Filter	1	MCF (10.695)
3300-0032	F, 1/4W 10 ohms	Fixed Resistor	3	R-77,180,200
3300-0033	F, 1/4W 22 ohms	Fixed Resistor	5	R-42,61,191,225,248
3300-0034	F, 1/4W 47 ohms	Fixed Resistor	3	R-35,204,410
3300-0035	F, 1/4W 68 ohms	Fixed Resistor	1	R-408
3300-0036	F, 1/4W 100 ohms	Fixed Resistor	10	R-9,13,16,19,56,59,60,107,135,169
3300-0037	F, 1/4W 150 ohms	Fixed Resistor	4	R-109,151,203,149
3300-0038	F, 1/4W 220 ohms	Fixed Resistor	7	R-12,31,37,140,166,209,404
3300-0039	F, 1/4W 330 ohms	Fixed Resistor	5	R-150,202,402,407,414
3300-0040	F, 1/4W 470 ohms	Fixed Resistor	8	R-106,136,162,164,176,214,219,30
3300-0041	F, 1/4W 560 ohms	Fixed Resistor	4	R-112,121,172,226
3300-0042	F, 1/4W 680 ohms	Fixed Resistor	2	R-73,403
3300-0043	F, 1/4W 1K	Fixed Resistor	15	R01,15,40,47,51,53,54,132,134,138,181,182,215,221,244
3300-0044	F, 1/4W 1.2K	Fixed Resistor	5	R-148,158,2001,205,417
3300-0045	F, 1/4W 1.5K	Fixed Resistor	3	R-25,36,49
3300-0046	F, 1/4W 1.8K	Fixed Resistor	1	R-5
3300-0047	F, 1/4W 2.2K	Fixed Resistor	5	R48,115,128,167,247
3300-0048	F, 1/4W 2.7K	Fixed Resistor	2	R-46,406
3300-0049	F, 1/4W 3.3K	Fixed Resistor	5	R-41,88,114,116,416
3300-0050	F, 1/4W 3.9K	Fixed Resistor	4	R-70,161,179,101
3300-0051	F, 1/4W 4.7K	Fixed Resistor	5	R-2,21,58,145,159
3300-0052	F, 1/4W 5.6K	Fixed Resistor	8	R-20,28,103,126,154,223,238,400

CCC ORDER

NUMBER	PART NUMBER	DESCRIPTION	QTY/SET	SCHEMATIC SYMBOL
3300-0053	F, 1/4W 6.8K	Fixed Resistor	3	R-27,113,412
3300-0054	F, 1/4W 10K	Fixed Resistor	22	R-4,17,23,52,110,119,129,142,143,146,155,156,184,165,1
3300-0055	F, 1/4W 12K	Fixed Resistor	1	R-144
3300-0056	F, 1/4W 15K	Fixed Resistor	3	R-45,67,152
3300-0057	F, 1/4W 18K	Fixed Resistor	1	R-217
3300-0058	F, 1/4W 22K	Fixed Resistor	5	R-6,29,118,160,187
3300-0059	F, 1/4W 27K	Fixed Resistor	2	R-57,130
3300-0060	F, 1/4W 33K	Fixed Resistor	3	R-43,50,401
3300-0061	F, 1/4W 39K	Fixed Resistor	2	R-7,44
3300-0062	F, 1/4W 47K	Fixed Resistor	7	R-34,81,105,124,137,239,405
3300-0063	F, 1/4W 56K	Fixed Resistor	2	R-74,82
3300-0064	F, 1/4W 62K	Fixed Resistor	1	R-18
3300-0065	F, 1/4W 68K	Fixed Resistor	2	R-66,69
3300-0066	F, 1/4W 82K	Fixed Resistor	1	R-83
3300-0067	F, 1/4W 100K	Fixed Resistor	25	R-3,11,64,65,68,72,84,85,93,95,10,97,139,153,185,207,2
3300-0068	F, 1/4W 150K	Fixed Resistor	1	R-55
3300-0069	F, 1/4W 220K	Fixed Resistor	2	R-80,125
3300-0070	F, 1/4W 270K	Fixed Resistor	2	R-90,91
3300-0071	F, 1/4W 330K	Fixed Resistor	1	R-177
3300-0072	F, 1/4W 470K	Fixed Resistor	2	R-183,413
3300-0073	F, 1/4W 560K	Fixed Resistor	1	R-141
3300-0074	F, 1/4W 680K	Fixed Resistor	1	R-133
3300-0075	F, 1/4W 1M ohms	Fixed Resistor	3	R-94,98,189
3300-0076	P, 1/4W 10 ohms	Fixed Resistor	2	R-102,108
3300-0077	P, 1/4W 22 ohms	Fixed Resistor	4	R-8,190,194,198
3300-0078	P, 1/4W 47 ohms	Fixed Resistor	4	R-14,111,193,195
3300-0079	P, 1/4W 100 ohms	Fixed Resistor	8	R-38,75,104,122,211,212,218,230
3300-0080	P, 1/4W 220 ohms	Fixed Resistor	4	R-33,86,120,213
3300-0081	P, 1/4W 270 ohms	Fixed Resistor	1	R-206
3300-0082	P, 1/4W 330 ohms	Fixed Resistor	1	R-99
3300-0083	P, 1/4W 470 ohms	Fixed Resistor	3	R-87,92,216
3300-0084	P, 1/4W 560 ohms	Fixed Resistor	2	R-26,233
3300-0085	P, 1/4W 680 ohms	Fixed Resistor	1	R-32
3300-0086	P, 1/4W 1K	Fixed Resistor	3	R-76,117,127
3300-0087	P, 1/4W 1.5K	Fixed Resistor	1	R-100
3300-0088	P, 1/4W 2.2K	Fixed Resistor	3	R-131,178,229
3300-0089	P, 1/4W 3.3K	Fixed Resistor	2	R-89,249
3300-0090	P, 1/4W 4.7K	Fixed Resistor	1	R-22
3300-0091	P, 1/4W 5.6K	Fixed Resistor	3	R-63,157,224
3300-0092	P, 1/4W 8.2K	Fixed Resistor	1	R-231
3300-0093	P, 1/4W 10K	Fixed Resistor	5	R-62,147,222,235,237
3300-0094	P, 1/4W 33K	Fixed Resistor	1	R-243
3300-0095	P, 1/4W 100K	Fixed Resistor	1	R-78
3300-0096	P, 1/4W 220K	Fixed Resistor	1	R-170
3300-0097	P, 1/4W 270K	Fixed Resistor	1	R-71
3300-0098	P, 1/4W 330K	Fixed Resistor	1	R-79
3300-0099	P, 1/4W 680K	Fixed Resistor	1	R-123
3300-0100	P, 1/4W 1M ohms	Fixed Resistor	1	R-246
3300-0101	P, 1/16W 10K	Fixed Resistor	4	R-168,171,163,173
3300-0102	P, 1/2W 150 ohms	Fixed Resistor	2	R-192,196
3300-0103	F, 1/2W 150 ohms	Fixed Resistor	1	R-199
3300-0104	F, 1/2W 10K	Fixed Resistor	1	R-188

CCC ORDER

NUMBER	PART NUMBER	DESCRIPTION	QTY/SET	SCHEMATIC SYMBOL
3300-0105	F, 1W 47 ohms	Fixed Resistor	1	R-228
3300-0106	DD-104 CH 50V 0.5pf	Ceramic Capacitor	1	C-172
3300-0107	DD-104 CH 50V 2pf	Ceramic Capacitor	2	C-12,VCO
3300-0108	DD-104 CH 50V 3pf	Ceramic Capacitor	2	C-20,204
3300-0109	DD-104 CH 50V 5pf	Ceramic Capacitor	1	C-168
3300-0110	DD-104 CH 50V 10pf	Ceramic Capacitor	4	C-145,163,203,400
3300-0111	DD-104 CH 50V 12pf	Ceramic Capacitor	1	C-40
3300-0112	DD-104 CH 50V 15pf	Ceramic Capacitor	2	C-87,94
3300-0113	DD-10f CH 50V 18pf	Ceramic Capacitor	3	C-36,130,167
3300-0114	DD-104 CH 50V 22pf	Ceramic Capacitor	2	C-97,210
3300-0115	DD-105 CH 50V 27pf	Ceramic Capacitor	2	C-10,202
3300-0116	DD-105 CH 50V 33pf	Ceramic Capacitor	3	C-14,34,82
3300-0117	DD-106 CH 50V 47pf	Ceramic Capacitor	3	C-109,205,83
3300-0118	DD-106 CH 50V 56pf	Ceramic Capacitor	3	C-72,86,148
3300-0119	DD-107 CH 50V 68pf	Ceramic Capacitor	2	C-19,21
3300-0120	DD-107 CH 50V 82pf	Ceramic Capacitor	4	C-73,206,212,410
3300-0121	DD-107 CH 50V 100pf	Ceramic Capacitor	3	C-13,406
3300-0122	DD-109 CH 50V 150pf	Ceramic Capacitor	3	C-11,80,209
3300-0123	DD-110 CH 50V 180pf	Ceramic Capacitor	4	C-3,17,140,146
3300-0124	DD-111 CH 50V 220pf	Ceramic Capacitor	1	C-129
3300-0125	DD-107 SL 50V 330pf	Ceramic Capacitor	2	C-35,55
3300-0126	DD-104 B 100pf	Ceramic Capacitor	8	C-30,53,152,153,161,169,194,404
3300-0127	DD-104 B 220pf	Ceramic Capacitor	2	C-119,71
3300-0128	DD-104 B 390pf	Ceramic Capacitor	2	C-98,108
3300-0129	DD-104 B 560pf	Ceramic Capacitor	1	C-56
3300-0130	DD-104 B 50V 0.001	Ceramic Capacitor	22	C-1,2,4,8,16,24,38,39,48,67,70,79,112,150,158,159,160,
3300-0131	DD-104 F 50V 0.0047	Ceramic Capacitor	14	C-27,41,65,75,76,84,85,89,142,155,157,164,409
3300-0132	DD-107 F 50V 0.01	Ceramic Capacitor	29	C-5,6,7,9,25,29,43,44,52,77,110,117,144,147,154,170,19
3300-0133	DD-109 F 50V 0.022	Ceramic Capacitor	13	C-15,18,23,28,33,45,47,51,66,200,238,249,417
3300-0134	CC-109 F 50V 0.047	Ceramic Capacitor	3	C-216
3300-0135	Z 500V 0.01	Ceramic Capacitor	14	C-181,185,186,197,217,244,245,246,250,255
3300-0136	Z 500V 0.047	Ceramic Capacitor	3	C-180,243,
3300-0137	50V 1 mfd 4	Electrolytic Capacitor	11	C-22,58,68,78,106,114,118,127,162,224,237
3300-0138	6V 10 mfd 4	Electrolytic Capacitor	4	C-74,107,126,128
3300-0139	6V 47 mfd 5	Electrolytic Capacitor	2	C-63,141
3300-0140	6V 100 mfd 6	Electrolytic Capacitor	2	C-122,143
3300-0141	10V 4.7 mfd 5	Electrolytic Capacitor	1	C-231
3300-0142	10V 10 mfd 4	Electrolytic Capacitor	9	C-62,9,102,103,105,111,123,236,247
3300-0143	10V 47 mfd 5	Electrolytic Capacitor	5	C-92,232,233,234,64
3300-0144	10V 100 mfd 6	Electrolytic Capacitor	3	C-90,156,221
3300-0145	10V 220 mfd 6	Electrolytic Capacitor	2	C-116,165
3300-0146	10V 1000 mfd 10	Electrolytic Capacitor	1	C-235
3300-0147	16V 10 mfd 5	Electrolytic Capacitor	2	C-195,222
3300-0148	16V 47 mfd 5	Electrolytic Capacitor	1	C-227
3300-0149	16V 220 mfd 8	Electrolytic Capacitor	1	C-240
3300-0150	16V 470 mfd 10	Electrolytic Capacitor	1	C-228
3300-0151	16V 100 mfd 13	Electrolytic Capacitor	1	C-239
3300-0152	25V 4.7 mfd 5	Electrolytic Capacitor	1	C-198
3300-0153	25V 2.2 mfd	Electrolytic Capacitor	1	C-121
3300-0154	HR-0612 330pf 50V	Dipped Mylar Capacitors	4	C-81,208,413,415
3300-0155	HR-06 100pf 500V	Dipped Mylar Capacitors	1	C-166
3300-0156	HR-06 120pf 500V	Dipped Mylar Capacitors	1	C-173

CCC ORDER

NUMBER	PART NUMBER	DESCRIPTION	QTY/SET	SCHEMATIC SYMBOL
3300-0157	HR-07 180pf 500V	Dipped Mylar Capacitors	2	C-171,175
3300-0158	HR-08 270pf 500V	Dipped Mylar Capacitors	2	C-177,184
3300-0159	HR-09 330pf 500V	Dipped Mylar Capacitors	2	C-188,192
3300-0160	HR-11 470pf 500V	Dipped Mylar Capacitors	1	C-174
3300-0161	HR-11 560pf 500V	Dipped Mylar Capacitors	1	C-214
3300-0162	HR-13 680pf 500V	Dipped Mylar Capacitors	2	C-176,182
3300-0163	50V 0.001 mfd	Mylar Capacitor	2	C-61,220
3300-0164	50V 0.0015 mfd	Mylar Capacitor	1	C-100
3300-0165	50V 0.0022 mfd	Mylar Capacitor	2	C-60,414
3300-0166	50V 0.0047 mfd	Mylar Capacitor	1	C-56
3300-0167	50V 50V 0.01 mfd	Mylar Capacitor	3	C-149,225,226
3300-0168	50V 0.022 mfd	Mylar Capacitor	5	C-95,120,131,230,242
3300-0169	50V 0.033 mfd	Mylar Capacitor	2	C-101,405
3300-0170	50V 0.047 mfd	Mylar Capacitor	9	C-31,49,54,91,96,191,218,219,229
3300-0171	50V 0.1 mfd	Mylar Capacitor	4	C-57,104,115,241
3300-0172	16V 0.1 mfd	Tantalum Capacitor	5	C-113,151,215,37,179
3300-0173	16V 0.47 mfd	Tantalum Capacitor	1	C-412
3300-0174	16V 2.2 mfd	Tantalum Capacitor	2	C-124,125
3300-0175	N-00-58A	PCB	1	
3300-0176	Shield case	Shielding Case	1	
3300-0177	Shield A	Shielding Plate A	1	
3300-0178	Shield B	Shielding Plate B	2	
3300-0179	56-01	Transformer	1	T-9
3300-0180	56-02	Transformer	2	T-8,10
3300-0181	56-03	Transformer	2	T-1,3
3300-0182	56-04	Transformer	1	T-2
3300-0183	56-05	Transformer	2	T-4,5
3300-0184	56-06	Transformer	1	T-11
3300-0185	56-07	Transformer	4	T-14,15,16,17
3300-0186	56-08	Transformer	1	T-13
3300-0187	56-09	Transformer	1	T-12
3300-0188	56-10	Transformer	1	T-21
3300-0189	56-11	Transformer	1	T-22
3300-0190	56-12	Transformer	1	T-20
3300-0191	56-13	Transformer	1	T-19
3300-0192	56-14	Transformer	1	T-16
3300-0193	SR 361	Transformer	4	T-6,7,400,401
3300-0194	779-05	Transformer	1	T-18
3300-0195	E1-19	Coil	1	L-1
3300-0196	LAL03NA101K	Coil	2	L-2,3
3300-0197	LAL04NA100M	Coil	1	L-4
3300-0198	56-15	Coil	1	L-5
3300-0199	56-16	Coil	1	L-6
3300-0200	56-17	Coil	1	L-7
3300-0201	56-18	Coil	1	L-8
3300-0202	56-19	Coil	1	L-9
3300-0203	56-20	Coil	2	L-10,11
3300-0204	56-21	Coil	1	L-12
3300-0205	BL02RN2-R62 3 5mm	Ferrite Beads Core	2	FB-5,8
3300-0206	3@ 5mm	Ferrite Beads Core	7	FB-1,2,3,4,6,7,9
3300-0207	N-60-13	Crystal	1	X-1 (10.24)
3300-0208	N-60-14	Crystal	1	X-2 (10.6975)

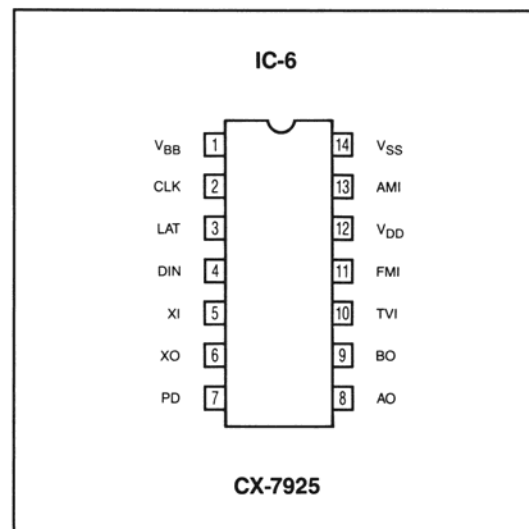
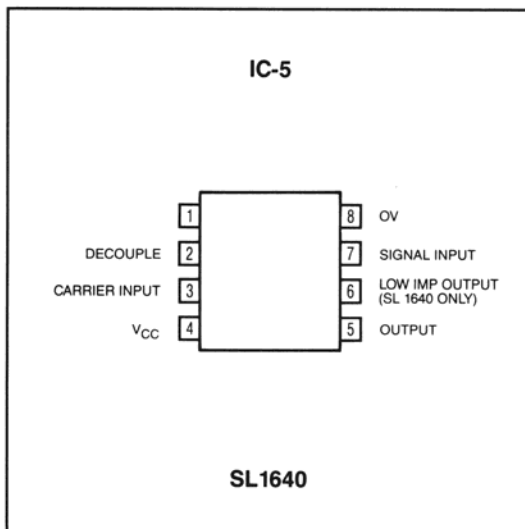
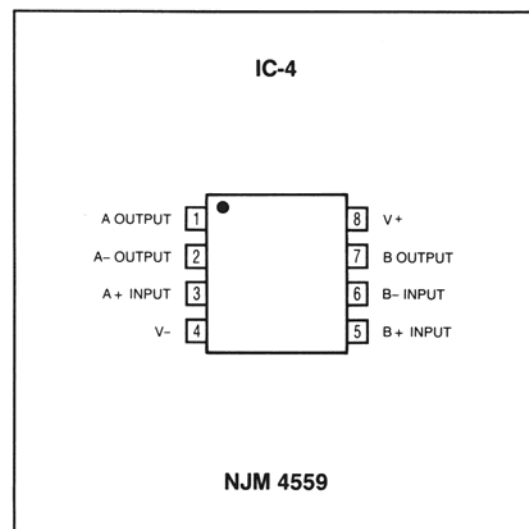
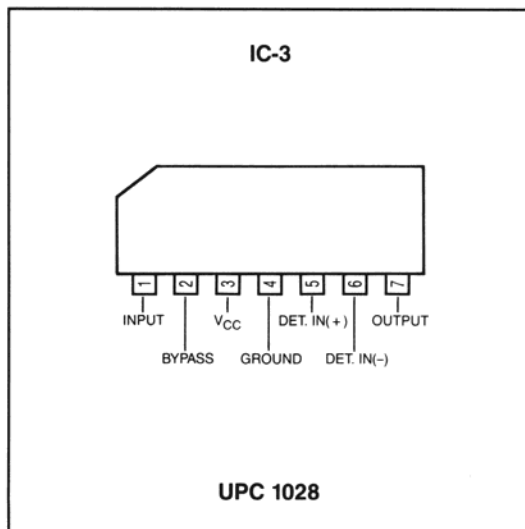
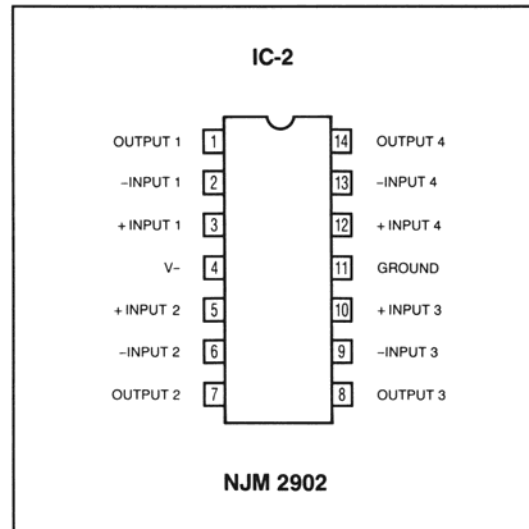
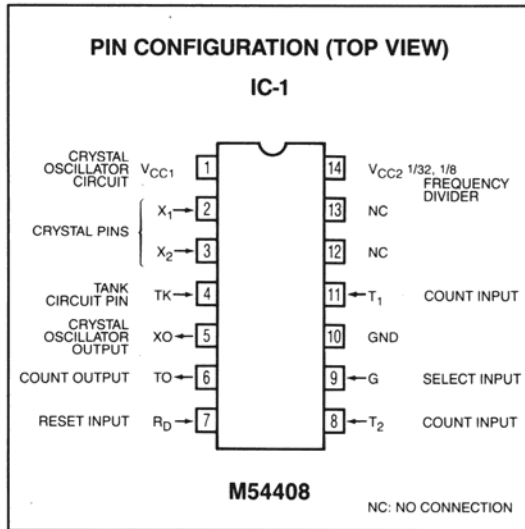
CCC ORDER

NUMBER	PART NUMBER	DESCRIPTION	QTY/SET	SCHEMATIC SYMBOL
3300-0209	HSJ0615-01	Jack	2	J-1,2
3300-0210	1S 1588	Diode	46	D-3,4,8,9,10,11,12,13,14,15,16,17,22,23,25,26,27,29,30
3300-0211	1N060	Diode	8	D-18,19,20,21,24,28,400,401
3300-0212	SVC 201 SP	Diode	6	D-32,34,35,64,65,66
3300-0213	M1-301	Diode	2	D-1,2
3300-0214	BB-329	Diode	3	D-5,6,7
3300-0215	ISS85	Diode	5	D-42,43,44,45,77
3300-0216	FC-54	Diode	1	D-53
3300-0217	1N-4002	Diode	3	D-60,63,67
3300-0218	WZ-60	Diode	2	D-38,68
3300-0219	MV-IY	Diode	3	D-62,72,76
3300-0220	100K	Variable Resistor	3	VR-1,2,3
3300-0221	50K	Variable Resistor	2	VR-9,10
3300-0222	10K	Variable Resistor	1	VR-4
3300-0223	100K	Variable Resistor	1	VR-11
3300-0224	10K	Variable Resistor	2	VR-7,8
3300-0225	5K	Variable Resistor	2	VR-15,16
3300-0226	1K	Variable Resistor	2	VR-14,17
3300-0227	100 ohms	Variable Resistor	2	VR-12,13
3300-0228	50K	Variable Resistor	1	R-39
3300-0229	0.5 plated	Jumper Wire	53	
3300-0230	1 male	Connection Pin (stud)	52	
3300-0231	uPD 7538	IC	1	IC-300
3300-0232	TC-4511	IC	6	IC-301,302,303,304,305,306
3300-0233	TC-4028	IC	1	IC-307
3300-0234	M-51903	IC	1	IC-308
3300-0235	2SC-2458	TRANSISTOR	1	Q-300
3300-0236	B 100pf	Ceramic Capacitor	2	C-302,303
3300-0237	B 0.001	Ceramic Capacitor	7	C-304,305,307,308,309,310,311
3300-0238	B 0.01	Ceramic Capacitor	1	C-301
3300-0239	0.1 mfd	Chip Capacitor	1	C-300
3300-0240	47 mfd @ 6V	Electrolytic Capacitor	1	C-306
3300-0241	P 1/16W 470 ohm	Resistor	9	R-355,356,376-380,391,392
3300-0242	P 1/16W 100 ohm	Resistor	10	R-381,382-390
3300-0243	P 1/16W 47 K	Resistor	7	R-301,302,304,369,370,374
3300-0244	P 1/16W 100 K	Resistor	1	R-300
3300-0245	F 1/16W 390 ohm	Resistor	42	R-313,314-354
3300-0246	F 1/16W 470 ohm	Resistor	3	R-393,394,397
3300-0247	F 1/16W 1.5 K	Resistor	1	R-398
3300-0248	F 1/16W 4.7 K	Resistor	1	R-396
3300-0249	F 1/16W 10 K	Resistor	1	R-305
3300-0250	F 1/16W 22 K	Resistor	1	R-395
3300-0251	F 1/16W 47 K	Resistor	22	R-306,307-312,357,358,360-368,371-373,375
3300-0252	1/16W F type 100K	Resistor	1	R-359
3300-0253	CSB 400P	Ceramic Oscillator	1	
3300-0254	TLS 164	LED	8	LE-306,307,308,309,310,311,312,313
3300-0255	TLG 164	LED	1	LE-314
3300-0256	LA 301 ML	LED	6	LE-300,301,302,303,304,305
3300-0257	LT 300 IN	LED	2	LE-315,316
3300-0258	RK 9A11 50KB	Potentiometer	1	VR-301
3300-0259	RK 9A10 20KB	Potentiometer	1	VR-302
3300-0260	RK 9A10 1KB	Potentiometer	2	VR-303,304

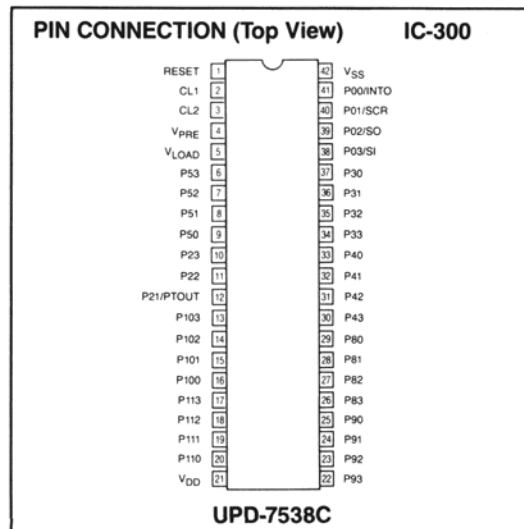
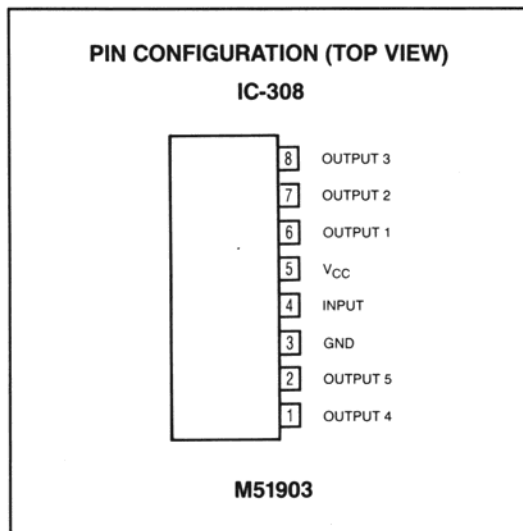
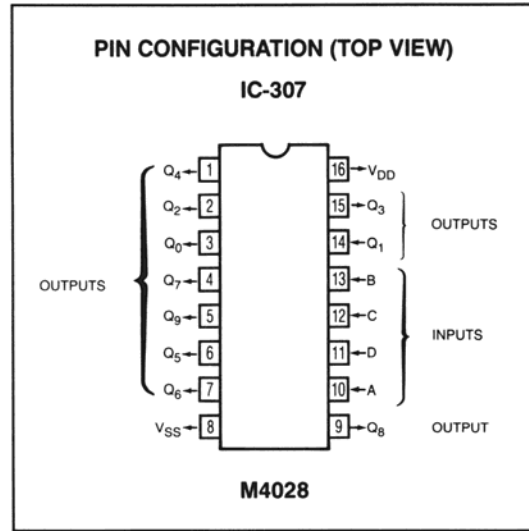
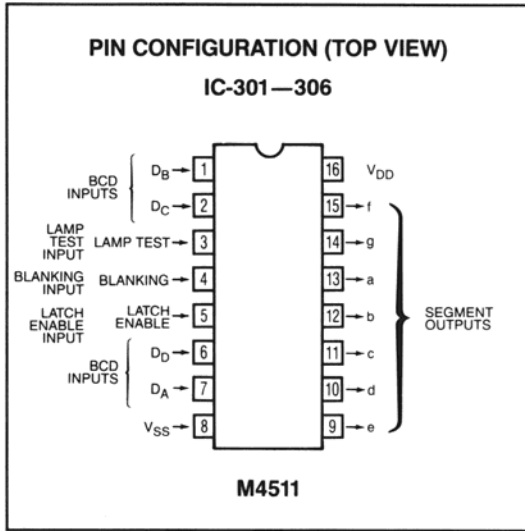
CCC ORDER

NUMBER	PART NUMBER	DESCRIPTION	QTY/SET	SCHEMATIC SYMBOL
3300-0261	PRP 124S65 205KB50	Potentiometer	1	VR-300
3300-0262	B3F-1050	Tact Switch	5	SW-306,307,308,309,310
3300-0263	518N	Switch	3	SW-311,312,313
3300-0264	AL-1G	Switch	6	SW-300,301,302,303,304,305
3300-0265	1S11588	Diode	13	D-300,302,303,304,305,306,307,308,312,313,314,315
3300-0266	IN 4001	Diode	1	D-301
3300-0267	SRBU 4P5P	Rotary Switch	1	
3300-0268	N-00-42A	PCB	1	
3300-0269	N-00-43A	PCB	1	
3300-0270	Screw	Screw	1 (set)	
3300-0271	A-E	Pin (stud)	1 (set)	
3300-0272	Lead Wire (wire harness)	Lead Wire	1 (set)	
3300-0273	Chassis	Chassis	1	
3300-0274	Heatsink (plate)	Heatsink (plate)	1	
3300-0275	Heatsink (fin)	Heatsink (fin)	1	
3300-0276	Cabinet (top & bottom)	Cabinet (top & bottom)	1 (set)	
3300-0277	Front Bezel	Front bezel	1	
3300-0278	Front Overlay Panel	Front Overlay Panel	1	
3300-0279	Speaker 66 8 ohms	Speaker 66 8 ohms	1	
3300-0280	Speaker Net	Speaker Net	1	
3300-0281	Mtype with lug	Antenna terminal	1	
3300-0282	150AL	Mike Connector (male)	1	
3300-0283	Power Socket w/cord	Power Socket	1	
3300-0284	Power Cord w/fuse	Power Cord	1	
3300-0285	30mm x 6	Vinyl Tube	6	
3300-0286	3 Lug Terminal	Lug Terminal	4	
3300-0287	Rubber LED Cushion	Rubber Cushion	1	
3300-0288	Rear Plate	Rear Plate	1	
3300-0289	3 x 10	Flathead Screw	3	Q-28,29,30
3300-0290	3 x 8	Flathead Screw	3	Q-35
3300-0291	3 x 6	Flathead Screw	5	
3300-0292	2.6 x 8	Flathead Screw	3	D-60,61,62
3300-0293	3 x 5	Self-tapping Flathead Screw	4	
3300-0294	2.6 x 8	Self-tapping Roundhead Screw	2	
3300-0295	3 x 8	Self-tapping Roundhead Screw	8	
3300-0296	3 x 5 (black)	Self-tapping Roundhead Screw	8	
3300-0297	3 mm	Spring Washer	8	
3300-0298	2.6 mm	Spring Washer	3	
3300-0299	3 mm (black)	Flat Washer	10	
3300-0300	3 mm nut	Nut	5	
3300-0301	3 mm washer	Internal Tooth Lock Washer	4	
3300-0302	Dress Box	Dress Box	1	
3300-0303	Styrofoam	Styrofoam	1	
3300-0304	Wire Harness	Wire Harness		

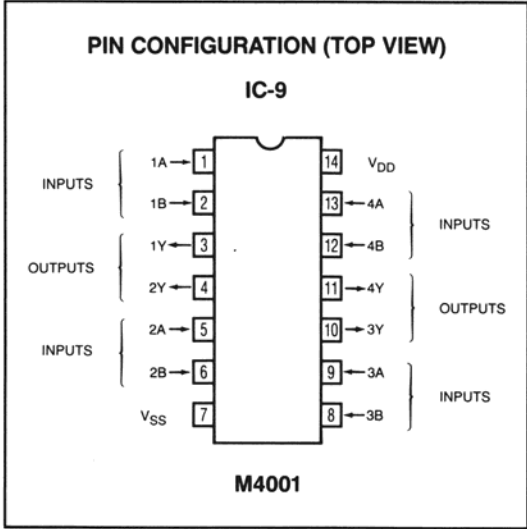
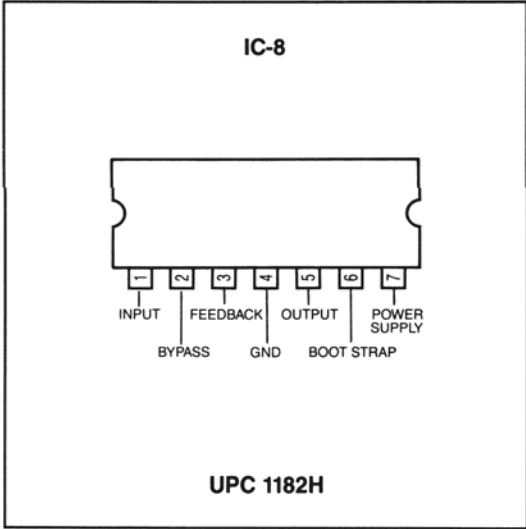
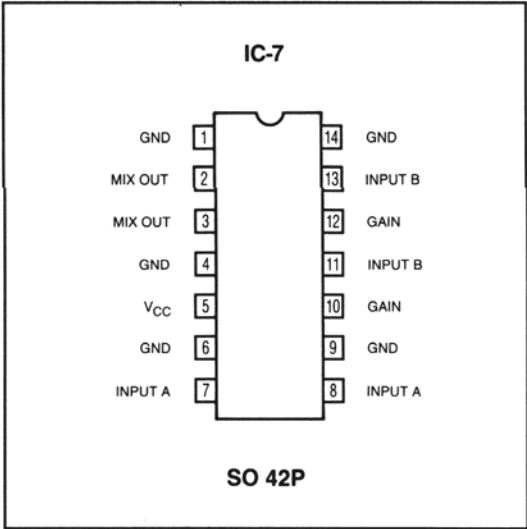
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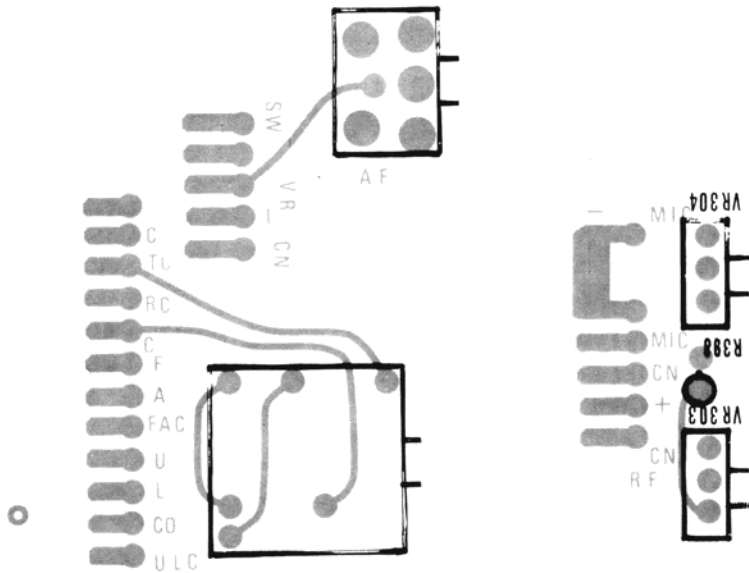
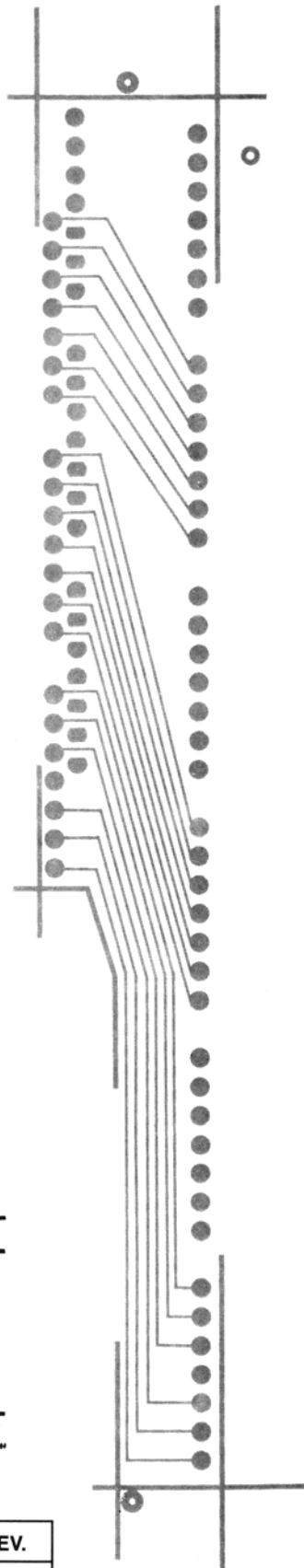
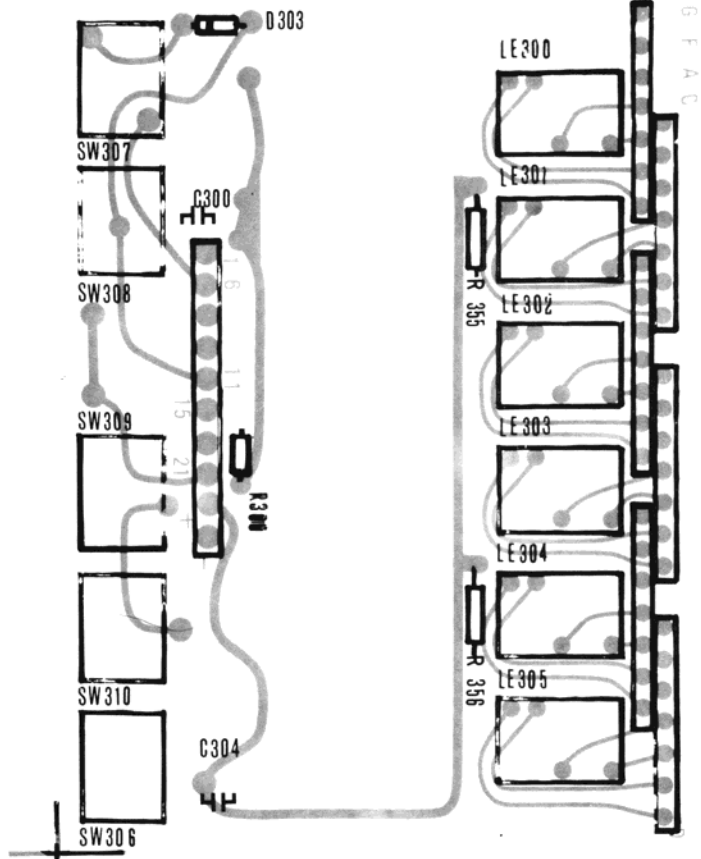


IC PIN-OUTS



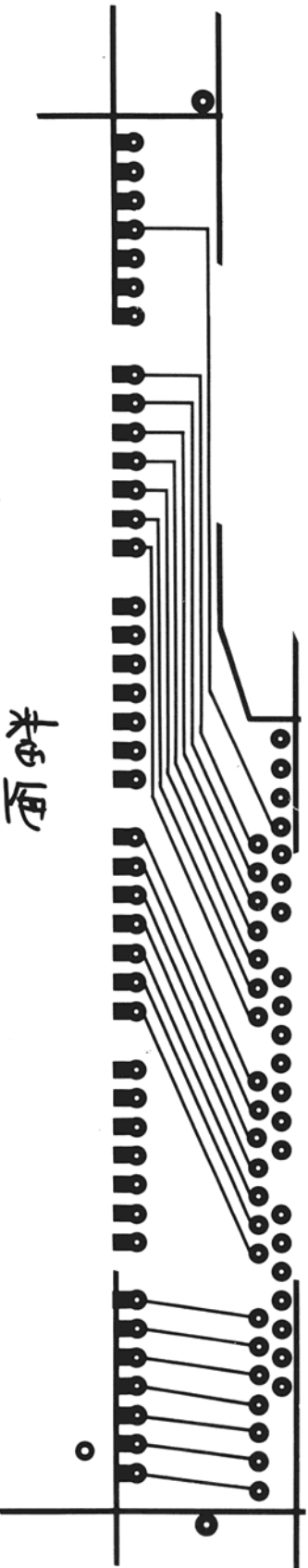
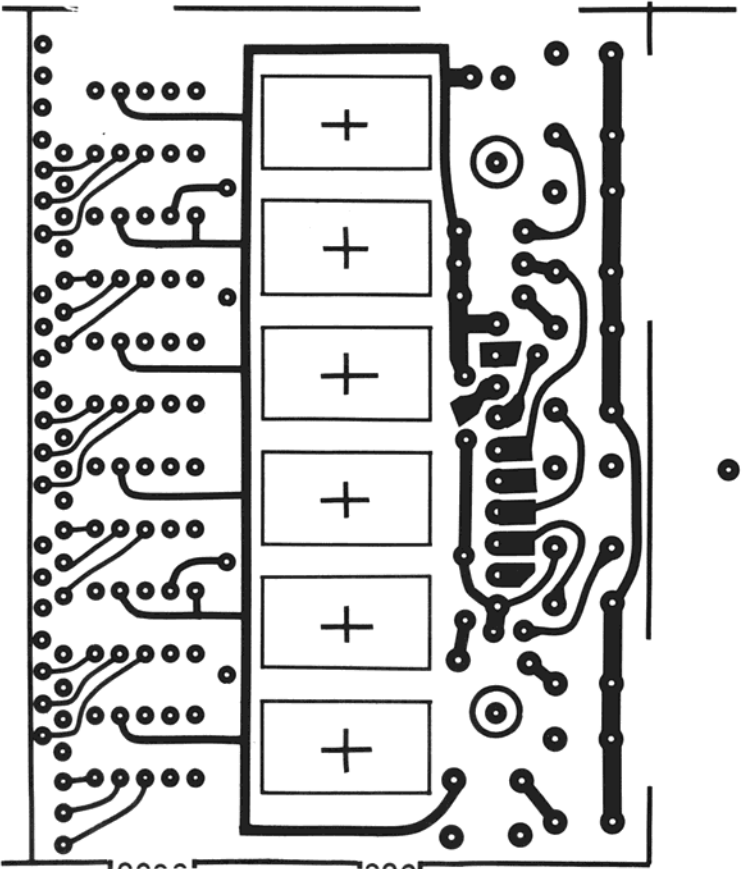
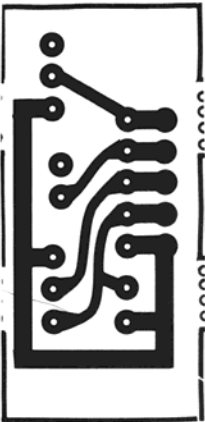
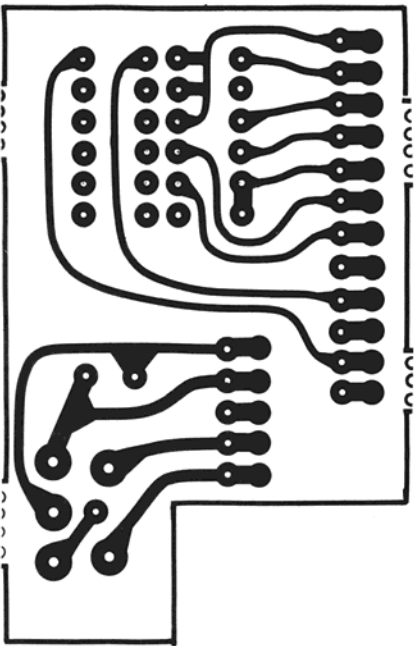
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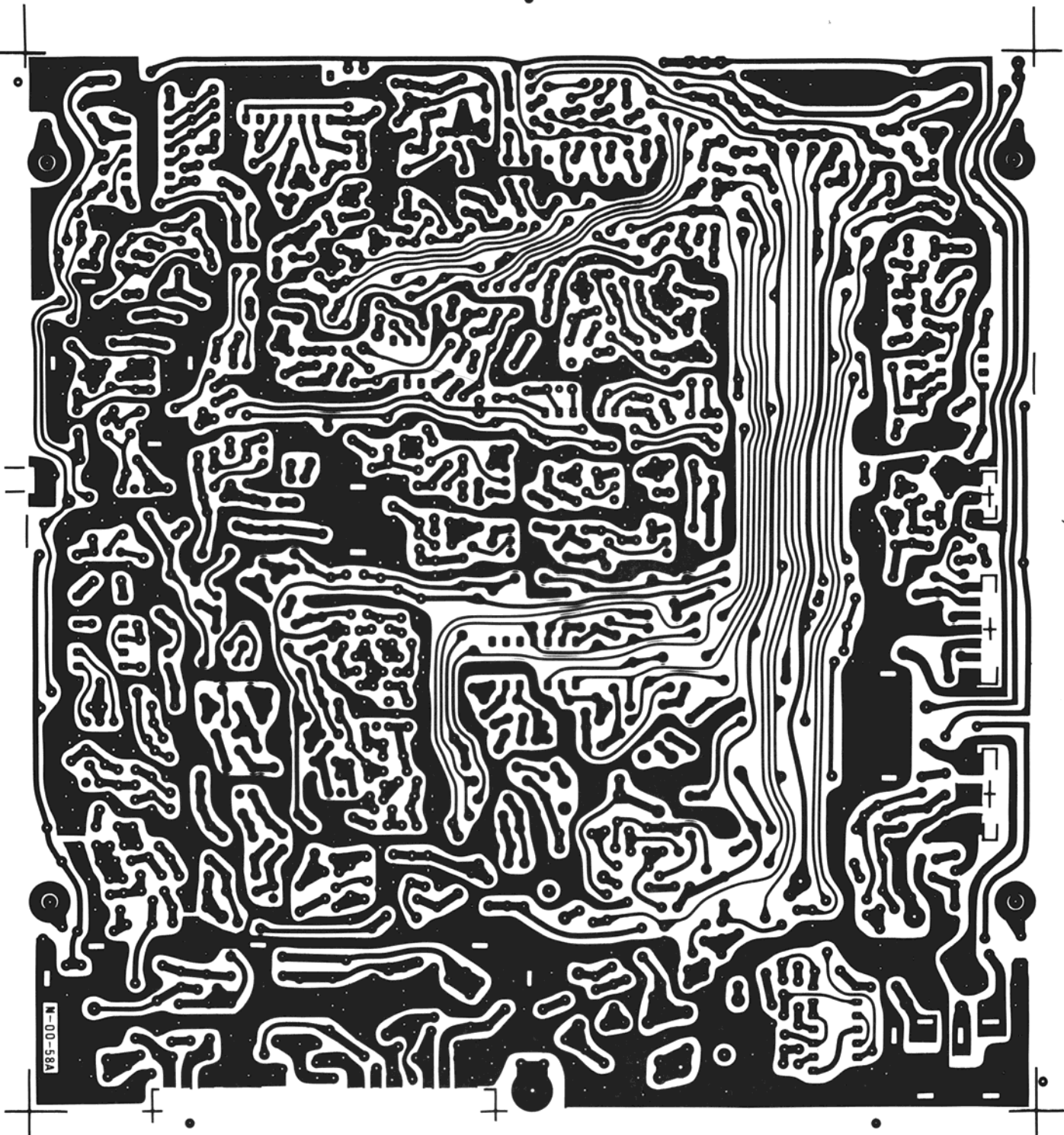


DRAWING #	DRAWING NAME, MODEL #	REV.
PLO-3	CONTROL & LED LAY-OUT AR-3300	A

DRAWING #	DRAWING NAME, MODEL #	REV.
PCB-3	CONTROL & LED PCB AR-3300	A



未処理



AR-3300 (before modification)

N-00-58A

DRAWING #	DRAWING NAME, MODEL #	REV.
PCB-1	MAIN PCB AR-3300	A

AR-3300 ALIGNMENT PROCEDURES

SYNTHESIZER

PLL-VCO

Allow 1/2 hour warm-up with cases installed before alignment.

1. Set the radio to 29.9000MHz FM mode.
2. Connect DVM to TP-1 and adjust T-13 for 3.8 VDC.
3. Set the radio to 28.0000MHz. (Clarifier at mid-point.)
4. Connect oscilloscope to TP-2. Adjust T-12 for maximum in AM mode.
5. Connect oscilloscope to cathode of D-77. Adjust T-11 for maximum in AM mode.

NOTE: Step 2 of SSB Transmitter alignment should be done at this time as it affects 10.695MHz oscillator adjustment.

Please note that radios with the optional 2.6KHz SSB filter use different offset frequency adjustments. The filter can be identified by the markings on the top. (10M2.6D is the 2.6 filter.)

6. Connect frequency counter to TP-3 (high impedance probe).

4.2KHz	2.6KHz
--------	--------

 - a. Adjust T-16 for 10.6925MHz or 10.6935MHz in USB mode.
 - b. Adjust T-17 for 10.6975MHz or 10.6965MHz in LSB mode.
 - c. Adjust T-15 for 10.6943MHz or 10.6943MHz in CW mode.
 - d. Adjust T-14 for 10.9650MHz or 10.6950MHz in AM TX mode.
7. Connect frequency counter to TP-2.
 - a. Adjust VR-3 for 17.3050MHz or 17.3050MHz in FM mode.
 - b. Adjust VR-1 for 17.3075MHz or 17.3065MHz in USB mode.
 - c. Adjust VR-2 for 17.3025MHz or 17.3035MHz in LSB mode.
8. Adjust T-14 for output frequency of 28.0000MHz FM mode.

RECEIVER

IF (10.695MHz)

1. Set radio to AM mode. Apply a 10.695MHz (Am modulated at 60%) signal from signal generator through a 10 to 1 probe to the emitter of Q-2. (Output of signal generator should be just enough to produce output at speaker, about 12db Sinad.)
2. Adjust T-4, T-5, T-8, T-9 and T-10 for maximum AF output.

NOTE: Any excessive signal generator output will activate AGC and cause a false alignment.

3. Set the radio to CW mode, signal generator to 0% modulation. Adjust T-6 and T-7 for maximum audio output.

NOISE BLANKER

1. Connect a noise generator (Sencore NL 204 or equivalent) in series with signal generator output. Connect oscilloscope to TP-4. Set signal generator for 20 uV output. Adjust T-400 and T-401 for maximum peaks.

HIGH FREQUENCY

1. Set the radio to 28.0000MHz on AM mode.
2. Apply a 28.0000MHz (AM modulated at 60%) signal to antenna terminal.
3. Adjust T-1, T-2, and T-3 for maximum AF output. (Output of signal generator should be about 12db Sinad.)

IF NOISE

1. Set the radio to LSB mode and disconnect any input to antenna terminal.
2. Adjust R-39 (IF GAIN) for an AF output of 0.2 VRMS with "AF GAIN" at maximum.

S METER

1. Set the radio to 28.0000MHz on FM mode.
2. Apply a 28.0000MHz signal to antenna terminal at 50uV.
3. Adjust VR-7 so that four LED bars are lit.
4. Set the radio to USB mode.
5. Adjust VR-8 so that four LED bars are lit.

FM QUADRATURE

1. Set the radio to FM mode. Inject a 28.0000MHz FM deviation at 5KHz, 1KHz tone signal from signal generator to antenna jack. Connect oscilloscope to the junction of R-123 & C-96.
2. Adjust T-18 for maximum sine wave with minimum distortion.

TRANSMITTER

SSB MODE

1. Set the radio to 28.0000MHz USB mode.
2. Set "MIKE GAIN" to minimum and adjust VR-9 and VR-10 (BALANCED MODULATOR) for minimum RF output. These controls should be balanced for even output on LSB and USB. **If adjustment is required at this step then repeat step 6 of PLL-VCO alignment.**
3. Set "MIKE GAIN" to minimum, mode to LSB transmit. Connect DVM to ferrite bead side of R-198 and ground. Adjust VR-14 for 0.68VDC. Move DVM to ferrite bead side of R-190, adjust VR-12 for 0.68VDC. Move DVM to ferrite bead side of R-194, adjust VR-13 for 0.68VDC. (Final amplifier bias.)
 - * 100 Watt bias adjustment
Remove red power lead of amplifier at main power jack. Insert amp meter in series with removed red wire and positive pin of power jack. Adjust VR-101 for 150 milliamperes.
4. Set "MIKE GAIN" to maximum and apply 1,000Hz tone to microphone. Adjust VR-15 for maximum RF power output.

5. Adjust T-22, T-21, T-20 and T-19 for maximum RF output power.
6. Balance RF output between lowest and highest frequency with L-6, L-7 and L-9.
7. Readjust VR-15 (ALC) so that output power just starts to drop (about 2 watts).

AM MODE

1. Set radio to 28.0000MHz AM mode, Mic gain to maximum.
2. Adjust VR-16 (AM PWR) for 7 watts output power (30 watts for 100W model).
3. Apply 1,000Hz tone to microphone. Adjust VR-17 (AMC) for 95% modulation.

FM MODE

1. Set radio to 28.0000MHz FM mode, Mic gain to maximum.
2. Apply 1,000Hz tone to microphone and adjust VR-4 (FM DEV) for a maximum deviation of 5KHz.

RF OUTPUT METER

1. Set radio to 28.0000MHz FM mode.
2. Adjust VR-11 so that two LED bars are lit with 7 watts output power.

CCC ORDER #	PART #	DESCRIPTION	QUAN/SET SCHEMATIC DESIGNATION
3300-0501	AR-3300DX	PCB	1 PCB-1
3300-0502		INPUT RF TRANSFORMER	1 T-501
3300-0503		OUTPUT RF TRANSFORMER	1 T-502
3300-0504	VK-200	15uH CHOKE	1 L-502
3300-0505		17uH CHOKE	1 L-501
3300-0506		6 TURN LPF CHOKE	2 L-503,504
3300-0507		10 ohm 1/4 Watt	2 R-501,502
3300-0508		51 ohm 2 Watt	2 R-504,505
3300-0509		470 ohm 1/4 Watt	1 R-506
3300-0510		500 ohm 1/2 Watt Pot	1 R-503
3300-0511		1pf @ 50V Ceramic Capacitor	1 C-531
3300-0512		68pf @ 50V Ceramic Capacitor	1 C-503
3300-0513		100pf DM15 Capacitor	1 C-518
3300-0514		180pf DM15 Capacitor	2 C-519,520
3300-0515		270pf DM15 Capacitor	2 C-509,510
3300-0516		390pf DM15 Capacitor	1 C-506
3300-0517		560pf DM19 Capacitor	1 C-511
3300-0518		.001mfd @ 50V Ceramic Capacitor	1 C-505
3300-0519		.01mfd @ 50V Ceramic Capacitor	8 C-504,507,514,523,524,527,528,530
3300-0520		.01mfd @ 1KV Ceramic Capacitor	1 C-522
3300-0521		.1mfd @ 50V Ceramic Capacitor	9 C-502,512,513,515,516,520,525,526,528
3300-0522		10ufd @ 16V Electrolytic Cap	2 C-501,508
3300-0523		220ufd @ 16V Electrolytic Cap	1 C-517
3300-0524	1N4148	Diode	3 CR-503,504,505
3300-0525	1N4001	Diode	2 CR-501,502
3300-0526	TIP-31A	Transistor	1 Q-501
3300-0527	7805	IC	1 IC-501
3300-0528	2SC2290	RF Transistor	2 Q-502,503
3300-0529	HB-2DC12V	DPDT Relay	1 RL-501
3300-0530		440 X 1/4 Machine Screw	4
3300-0531		440 X 1/2 Machine Screw	2
3300-0532		440 X 5/16 Machine Screw	4
3300-0533		440 Hex Nut	2
3300-0534		#4 Internal Tooth Lock Washer	7
3300-0535		#4 X 3/8 SM Screw	4
3300-0536		#4 X 1/4 SM Screw BO	8
3300-0537		440 X 1/4 Cap Screw	3
3300-0538		1/8" Nylon Spacer	4
3300-0539		2" X 1/4" Braid	1
3300-0540		9" X 22awg Wire (BLUE)	1
3300-0541		10" X 22awg Wire (BLACK)	1
3300-0542		9" X 14awg Wire (BLACK)	1
3300-0543		9" X 14awg Wire (RED)	1
3300-0544		18" 20awg PTFE	1
3300-0545	R6316	8" COAX	3
3300-0546		Inspection Plate	2
3300-0547		Heat Sink	1