

Chapter 7 Schematics, Component Location Diagrams, and Parts Lists

The following table lists the schematics and diagrams contained in this chapter.

Figure Title	Page	Figure Title	Page	Figure Title	Page
ASTRO Spectra Radio Interconnection	7-4	HLN6458E VOCON Board Schematic (Sheet 2 of 2)	7-33	HLD4342B and HLD4343B VHF VCO Carrier Schematic Diagram	7-64
HRN4009B/HRN6014A VHF RF Board; HRN4010B/HRN6020A UHF RF Board; and HRN6019A 800 MHz RF Board Schematic	7-5	HLN6458E VOCON Board Component Location Diagrams (Sheet 1 of 2)	7-34	HLD4342D and HLD4343D VHF VCO Carrier Schematic Diagram	7-65
HRN4009B/HRN6014A VHF RF Board, HRN4010B/HRN6020A UHF RF Board, and HRN6019A 800 MHz RF Board Component Location Diagrams	7-6	HLN6458E VOCON Board Component Location Diagrams (Sheet 2 of 2)	7-35	HLD4342B/HLD4343B VHF VCO Carrier Component Location Diagram	7-66
HRN4009C/HRN6014C VHF RF Board Schematic Diagram	7-9	HLN6458F/G VOCON Board Schematic (Sheet 1 of 2)	7-38	HLD4342D/HLD4343D VHF VCO Carrier Component Location Diagram	7-67
HRN4009C/HRN6014C VHF RF Board Component Location Diagrams	7-10	HLN6458F/G VOCON Board Schematic (Sheet 2 of 2)	7-39	UHF VCO Ranges 1, 2, 3, and 4 Hybrid Schematic	7-70
HRN4009E and HRN6014D VHF RF Board; HRN4010D and HRN6020C UHF RF Board; and HRN6019C 800 MHz RF Board Schematic Diagram (Sheet 1 of 2)	7-12	HLN6458F/G VOCON Board Component Location Diagrams (Sheet 1 of 2)	7-40	HLE6101A UHF VCO Range 1 Hybrid and HLE6102A Range 2 Hybrid Component Location Diagram	7-71
HRN4009E and HRN6014D VHF RF Board; HRN4010D and HRN6020C UHF RF Board; and HRN6019C 800 MHz RF Board Schematic Diagram (Sheet 2 of 2)	7-13	HLN6458F/G VOCON Board Component Location Diagrams (Sheet 2 of 2)	7-41	HLE6103B UHF VCO Range 3 Hybrid and HLE6104B Range 4 Hybrid Component Location Diagram	7-73
HRN4009E and HRN6014D VHF RF Board; HRN4010D and HRN6020C UHF RF Board; and HRN6019C 800 MHz RF Component Location Diagram	7-14	HLN6458H VOCON Board Schematic (Sheet 1 of 2)	7-44	UHF VCO Ranges 1, 2, 3, and 4 Schematic Diagram	7-75
HLN5558E/F/G, HLN6529C/D/E/F/G, HLN6560C/D/E/F/G/H and HLN6562C/D/E/F/G/H Command Board Schematic Diagram	7-17	HLN6458H VOCON Board Schematic (Sheet 2 of 2)	7-45	HLE6045B Range 1 and HLE6046B Range 2 UHF VCO Component Location Diagram	7-76
HLN5558E/F/G, HLN6529C/D/E, HLN6560C/D/E/F/G/H, and HLN6562C/D/E/F/G/H Command Board Component Location Diagrams	7-18	HLN6458H VOCON Board Component Location Diagrams	7-46	HLE6000D Range 3 and HLE6041D Range 4 UHF VCO Component Location Diagrams	7-77
HLN5558H/J, HLN6529H, HLN6560J and HLN6562J Command Board Schematic Diagram	7-21	ASTRO Spectra Plus Top Level Schematic (Sheet 1 of 2)	7-49	HLF6080B 800 MHz VCO Schematic Diagram	7-79
HLN5558H/J, HLN6529H, HLN6560J and HLN6562J Component Location Diagram	7-22	ASTRO Spectra Plus Top Level Schematic (Sheet 2 of 2)	7-50	HLF6080B 800 MHz VCO Component Location Diagram	7-80
HLN6458D VOCON Board Schematic (Sheet 1 of 2)	7-26	ASTRO Spectra Plus RF Interface Schematic (Sheet 1 of 2)	7-51	HRD6001E/6002E/6011E/6012E VHF Receiver Front-End Schematic	7-82
HLN6458D VOCON Board Schematic (Sheet 2 of 2)	7-27	ASTRO Spectra Plus RF Interface Schematic (Sheet 2 of 2)	7-52	HRD6001E/6002E/6011E/6012E VHF Component Location Diagram	7-83
HLN6458D VOCON Board Component Location Diagrams (Sheet 1 of 2)	7-28	ASTRO Spectra Plus Digital/USB Schematic (Sheet 1 of 2)	7-53	HRD6001G/6002G/6011G/6012G VHF Receiver Front-End Schematic	7-87
HLN6458D VOCON Board Component Location Diagrams (Sheet 2 of 2)	7-29	ASTRO Spectra Plus Digital/USB Schematic (Sheet 2 of 2)	7-54	HRD6001G/6002G/6011G/6012G VHF Receiver Front-End Component Location Diagram	7-88
HLN6458E VOCON Board Schematic (Sheet 1 of 2)	7-32	ASTRO Spectra Plus Audio/DC Schematic	7-55	HRE6001B/6002C/6003B/6004B/6011B/6012B/6014B UHF Receiver Front-End Preamp and Standard Schematics	7-90
		ASTRO Spectra Plus Voltage Conversion Schematic	7-56	HRE6001B/6002C/6003B/6004B/6011B/6012B/6014B UHF Receiver Front-End Hybrid Component Location Diagram	7-91
		ASTRO Spectra Plus Secure Interface Schematic	7-57	HRF6004B/C 800 MHz Receiver Front-End Schematic Diagram	7-94
		ASTRO Spectra Plus VOCON Component Location Diagram, Top View	7-58	HRF6004B/C 800 MHz Receiver Front-End Component Location Diagram	7-95
		ASTRO Spectra Plus VOCON Component Location Diagram, Bottom View	7-59		
		HLD6061D and HLD6062D VHF VCO Hybrid Schematic	7-62		
		HLD6061D and HLD6062D VHF VCO Hybrid Component Location Diagram	7-63		
				HLD6022C VHF 50 Watt PA Schematic	7-97
				HLD6022C VHF 50-Watt PA Component Location Diagram, Side 1	7-98
				HLD6022C VHF 50-Watt PA Component Location Diagram, Side 2	7-99
				HLD6064C VHF 100-Watt PA Schematic	7-101
				HLD6064C VHF 100-Watt PA Component Location Diagram, Side 1	7-102
				HLD6064C VHF 100-Watt PA Component Location Diagram, Side 2	7-103
				HLD6032B/HLD6066B VHF 25-Watt PA Schematic	7-105
				HLD6032B/HLD6066B VHF 25-Watt PA Component Location Diagram, Side 1	7-106
				HLD6032B/HLD6066B VHF 25-Watt PA Component Location Diagram, Side 2	7-107
				HLE6062B and HLE6071B UHF 25-Watt PA Schematic	7-110
				HLE6062B UHF 25-Watt PA Component Location Diagram, Side 1	7-111
				HLE6062B UHF 25-Watt PA Component Location Diagram, Side 2	7-112
				HLE6043C, HLE6044C, and HLE6049B UHF 40-Watt PA Schematic	7-114
				HLE6043C, HLE6044C, and HLE6049B UHF 40-Watt PA Component Location Diagram, Side 1	7-115
				HLE6043C, HLE6044C, and HLE6049B UHF 40-Watt PA Component Location Diagram, Side 2	7-116
				HLE6039C, HLE6040C, and HLE6051C UHF 100-Watt PA Schematic	7-120
				HLE6039C, HLE6040C, and HLE6051C UHF 100-Watt PA Component Location Diagram, Side 1	7-121
				HLE6039C, HLE6040C, and HLE6051C UHF 100-Watt PA Component Location Diagram, Side 2	7-122
				HLF6078B 800 MHz 15-Watt PA Schematic	7-127
				HLF6078B 800 MHz 15-Watt PA Component Location Diagram, Side 1	7-128
				HLF6078B 800 MHz 15-Watt PA Component Location Diagram, Side 2	7-129
				HLF6077D 800 MHz 35-Watt PA Schematic	7-131

Figure Title	Page
HLF6077D 800 MHz 35-Watt PA Component Location Diagram, Side 1	7-132
HLF6077D 800 MHz 35-Watt PA Component Location Diagram, Side 2	7-133

7.1 RF Section

Table 7-1: J500 Command Board to RF Board

J500 Pin #	Description	To RF Board
1	SW +5V	J500B-1
2	REF TUNE	J500B-2
3	DOUT*	J500B-3
4	DOUT	J500B-4
5	SBI	J500B-5
6	N/C	J500B-6
7	ODC	J500B-7
8	GND	J500B-8
9	GND	J500B-9
10	SW +9.6V	J500B-10
11	MOD OUT	J500B-11
12	A+	J500B-12
13	GND	J500B-13
14	LOCK DET*	J500B-14
15	KEYED +9.4V	J500B-15
16	ROSC/PSC_CE*	J500B-16
17	REF MOD	J500B-17
18	MOSI	J500B-18
19	SCLK	J500B-19
20	SYN SEL*	J500B-20
21	N/C	J500B-21
22	GND	J500B-22
23	GND	J500B-23
24	GND	J500B-24

Table 7-2: P502 Command Board to Control Head Interconnect Board

P502 Pin #	Description	To Intcon Board
1	SW +9.6V	N/C

Table 7-2: P502 Command Board to Control Head Interconnect Board

P502 Pin #	Description	To Intcon Board
2	PTT*/P RESET	N/C
3	EMERGENCY	N/C
4	SPARE 2	N/C
5	DISC AUDIO 2	N/C
6	N/C	J103-27
7	GND	J103-3
8	VRS RX AUDIO	N/C
9	BUSY	J103-25
10	GND	N/C
11	LH RESET	J103-23
12	VRS TX AUDIO	N/C
13	DISC AUDIO	N/C
14	VIP OUT 1	J103-8
15	P RS DATA	J103-21
16	BOOT/VPP	J103-20
17	VO 2	J103-19
18	VO 1	J103-18
19	RX/RS232	N/C
20	TX/RS232	N/C
21	IGN SW B+	J103-11
22	BUS-	J103-10
23	KEYFAIL*/TX	J103-9
24	PTTB/VIP IN 1	N/C
25	BUS+	J103-22
26	CTS/RS232	N/C
27	VIP OUT 2	J103-7
28	GND	J103-6
29	HUB/BUSY	N/C
30	A+	J103-5
31	SW B+	J103-4
32	KEYED SLOT	—
33	RTS/RS232	N/C
34	SPEAKER LOW	N/C
35	SPEAKER HIGH	N/C
36	UNSW +5V	N/C
37	SW +5V	N/C

Table 7-2: P502 Command Board to Control Head Interconnect Board

P502 Pin #	Description	To Intcon Board
38	VIP IN 2	N/C

Table 7-3: P503 Command Board to RF Power Amplifier Board

P503 Pin #	Description	To RF PA Board
1	CONT VOLT LIMIT	P853-2
2	CONT VOLT DRIVE	P853-3
3	CURRENT SENSE +	P853-4
4	KEYED +9.4V	P853-5
5	A+	P853-6
6	TEMP SENSE	P853-7
7	KEYED SLOT	P853-8
8	FWD DET VOLT	P853-9
9	A+	P853-10
10	SW +9.6V	P853-11
11	CURRENT SENSE-	P853-12
12	GND	J2-8
13	MIC HI/RESET/RTS RS232	J2-15
14	SPEAKER LOW	J2-7
15	BUS+	J2-14
16	SPEAKER HIGH	J2-6
17	PTT*/TX RS232	J2-13
18	IGN/SW B+	J2-5
19	V_OUT 1	J2-12
20	SW B+	J2-4
21	DISC AUD/RX RS232	J2-11
22	V_OUT 2	J2-3
23	BUS-	J2-10
24	EMERGENCY	J2-2
25	BUSY	J2-9

Table 7-4: Configuring Command Board Jumpers for Non-RS232 Operation

Jumper	Function			
	MIC HI	PTT	DISC AUD	VRS TX
JU518		OUT		
JU519			OUT	
JU520				OUT
JU521	OUT			
JU513	IN			
JU500		IN		
JU528			IN	
JU515				IN

Table 7-5: J501 Command Board to VOCON Board

J501 Pin #	Description	Command Board	VOCON Board
1	DOUT*	J500-3	U406-H3
2	DOUT	J500-4	U406-K3
3	GROUND	P503-12	GROUND
4	GROUND	P503-12	GROUND
5	CTSOUT*	U526-13	CTSOUT*
6	SBI	J500-5	U406-J3
7	DOC	J500-7	U406-F3
8	SPI SCK	J500-19	U204-G5
9	MOSI	J500-18	U204-J6
10	LOCK DET*	J500-14	U206-K2
11	SYN SEL*	J500-20	U204-H7
12	ROSC/PSC CE*	J500-16	U204-F6
13	DA SEL*	U502-25	U204-H5
14	TXPA EN*	U500-33	U206-G9
15	5V EN*	CR401	U206-F8
16	EMERG	Q507	U204-A3
17	BOOT DATA IN	U525-14	U206-J2/ U204-J7
18	BOOT DATA OUT	U522-19	U204-G6
19	BUSY OUT	U522-13	U206-K8
20	SB9600 BUSY	U522-11	U204-J3
21	KEYFAIL*	U525-1	U206-J8/J801-15
22	VIP OUT1	P502-14	U206-E7
23	VIP OUT2	P502-27	U206-J3
24	VIP IN1	Q512	U206-A7
25	VIP IN2	A513	U206-D5
26	MOB IRQ*	U522-24	U206-B4
27	LHRST0*	U522-8	U206-B7
28	LHRST1	Q511	U206-A8
29	POR*	U522-40	U206-C9/ U409-2
30	INT PTT*	U522-38	U206-H2
31	OPTB+/BOOT SEL/ VPP	P502-16	CR201
32	TAMPER	GND	J801-6
33	+5V	Q502	+5V

Table 7-5: J501 Command Board to VOCON Board

J501 Pin #	Description	Command Board	VOCON Board
34	+5V	Q502	+5V
35	B+ SENSE	P502-31	B+ SENSE
36	KG BACKUP	JU527	J801-23
37	+5VA	U500-14	+5VA
38	UNSW B+	Q508	UNSW B+
39	MAI	U524	U406-C1
40	SDO	U524-1	U406-B5
41	LATCH SEL*	U530-12	U206-G8
42	RTSIN*	U526-14	U206-J8
43	RS232 DATA OUT	U526-15	U206-A5
44	SPKREN	Q401	U206-G4
45	MICEN	Q404	U206-G7
46	GROUND	P503-12	GROUND
47	GROUND DIGITAL	P503-12	GRD DIGITAL
48	REFMOD	U401-5	U406-B1
49	MODIN	U401-3/ JU530	U406-B2
50	RS232 DATA IN	U526-16	U206-B2

Table 7-6: J801 VOCON Board to Encryption Board

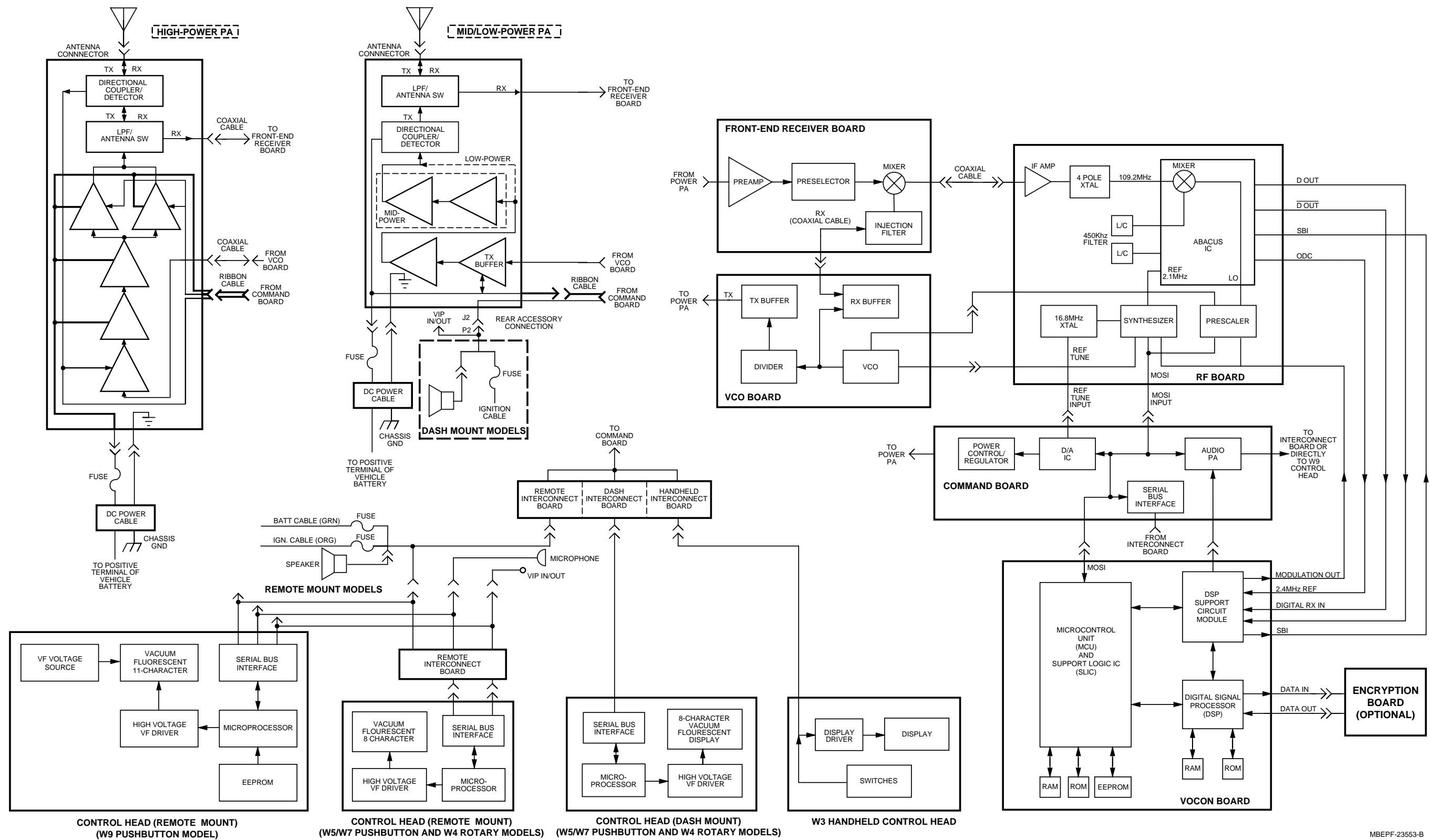
J801 Pin #	Description	To Encryption Board
1	SW B+	J401-17
2	SW B+	J401-17
3	EMC RXO	U405-B7
4	EMC TXO	U405-A7
5	N/C	
6	GROUND	
7	MISO	U204-H6
8	MOSI	U204-J6 J601-1
9	SPI SCK	U204-G5 J601-2
10	EMC EN*	U206-D6
11	EMC REQ*	U206-H3
12	EMC MAKEUP*	U206-K7
13	N/C	

Table 7-6: J801 VOCON Board to Encryption Board

J801 Pin #	Description	To Encryption Board
14	N/C	
15	KEYFAIL*/RTSIN*	U206-J8
16	N/C	
17	N/C	
18	N/C	
19	N/C	
20	UNSW B+	J401-19
21	GROUND	
22	GROUND	
23	N/C	
24	N/C	
25	N/C	

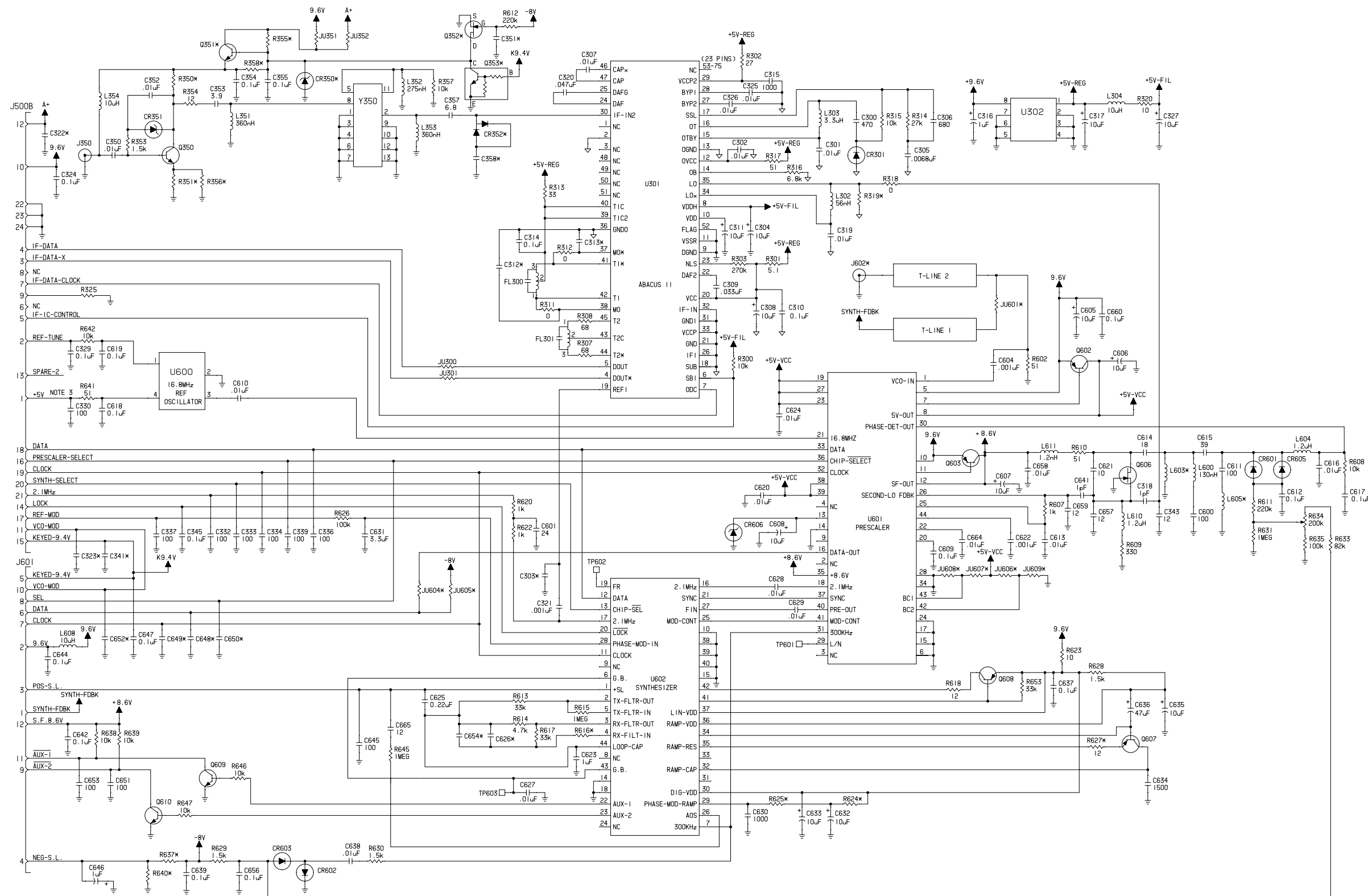
Table 7-7: J601 RF Board to VCO Board

J601 Pin #	Description	To VCO Board
1	SYNTH-FDBK	P601-1
2	+9.6V	P601-2
3	POS-S.L.	P601-3
4	NEG-S.L.	P601-4
5	KEYED-9.4V	P601-5
6	DATA	P601-6
7	CLOCK	P601-7
8	SEL	P601-8
9	AUX-2	P601-9
10	VCO-MOD	P601-10
11	AUX-1	P601-11
12	S.F.8.6V	P601-12

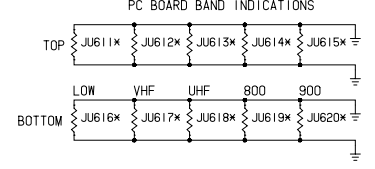


MBEPF-23553-B

ASTRO Spectra Radio Interconnection



- NOTES:
- 1) ALL RESISTANCE IN OHMS, ALL CAPACITANCE IN PICOFARADS UNLESS NOTED OTHERWISE.
 - 2) * DENOTES BAND DEPENDENT PART. (SEE TABLE AND PARTS LIST.)
 - 3) THIS 5V SOURCE ORIGINATES ON THE COMMAND BOARD. IT IS NOT COMMON TO ANY OTHER 5V SOURCE ON THIS BOARD.
 - 4) A NUMBER OF PARTS ON THIS BOARD WERE DESIGNED IN AS CONTINGENCIES FOR ENHANCEMENT. IF A PART IS MARKED WITH AN ASTERISK, BUT DOES NOT HAVE AN ENTRY IN THE TABLE OR IN THE KIT PARTS LIST, IT IS ONE OF THESE CONTINGENCY PARTS.

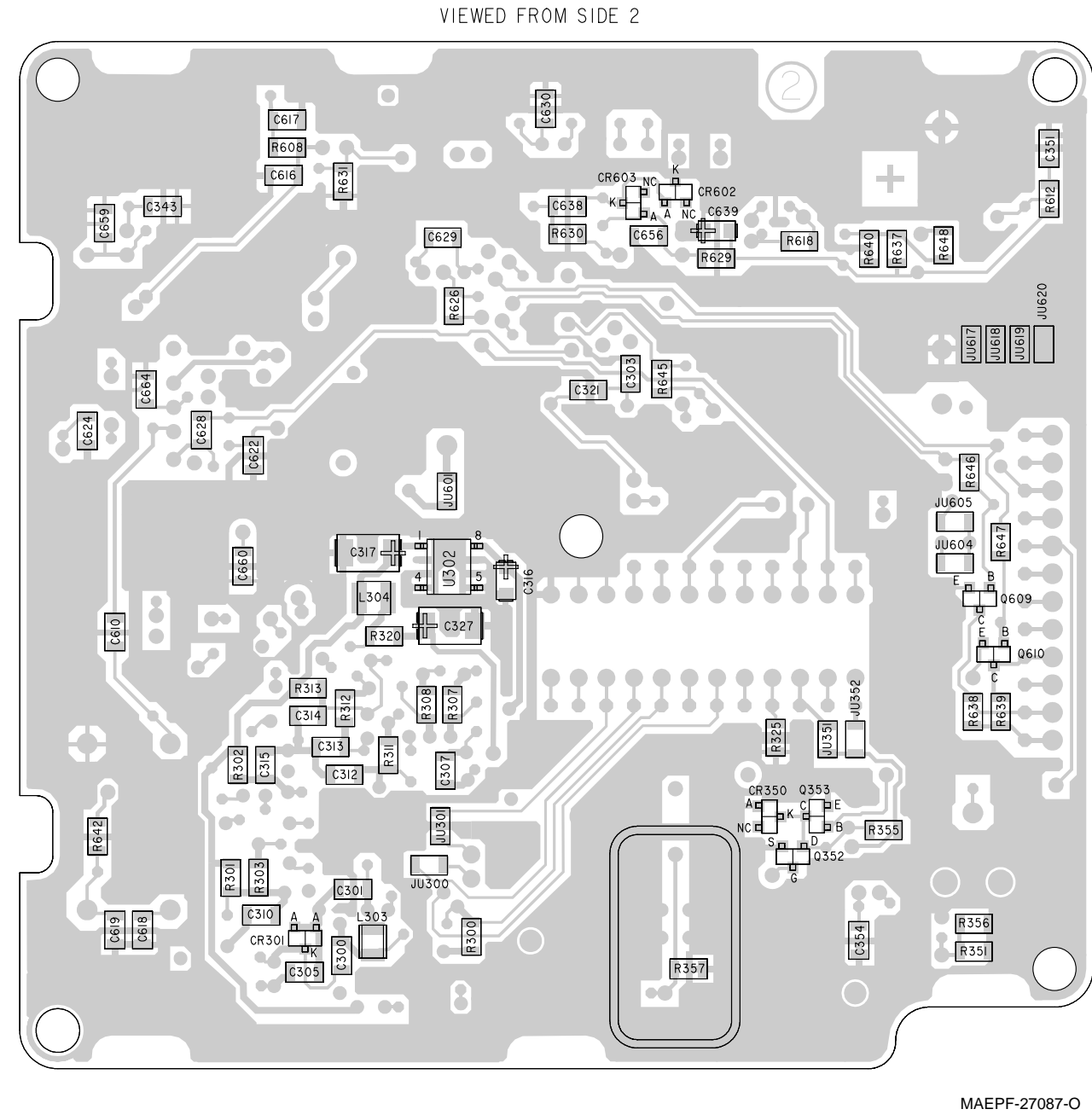
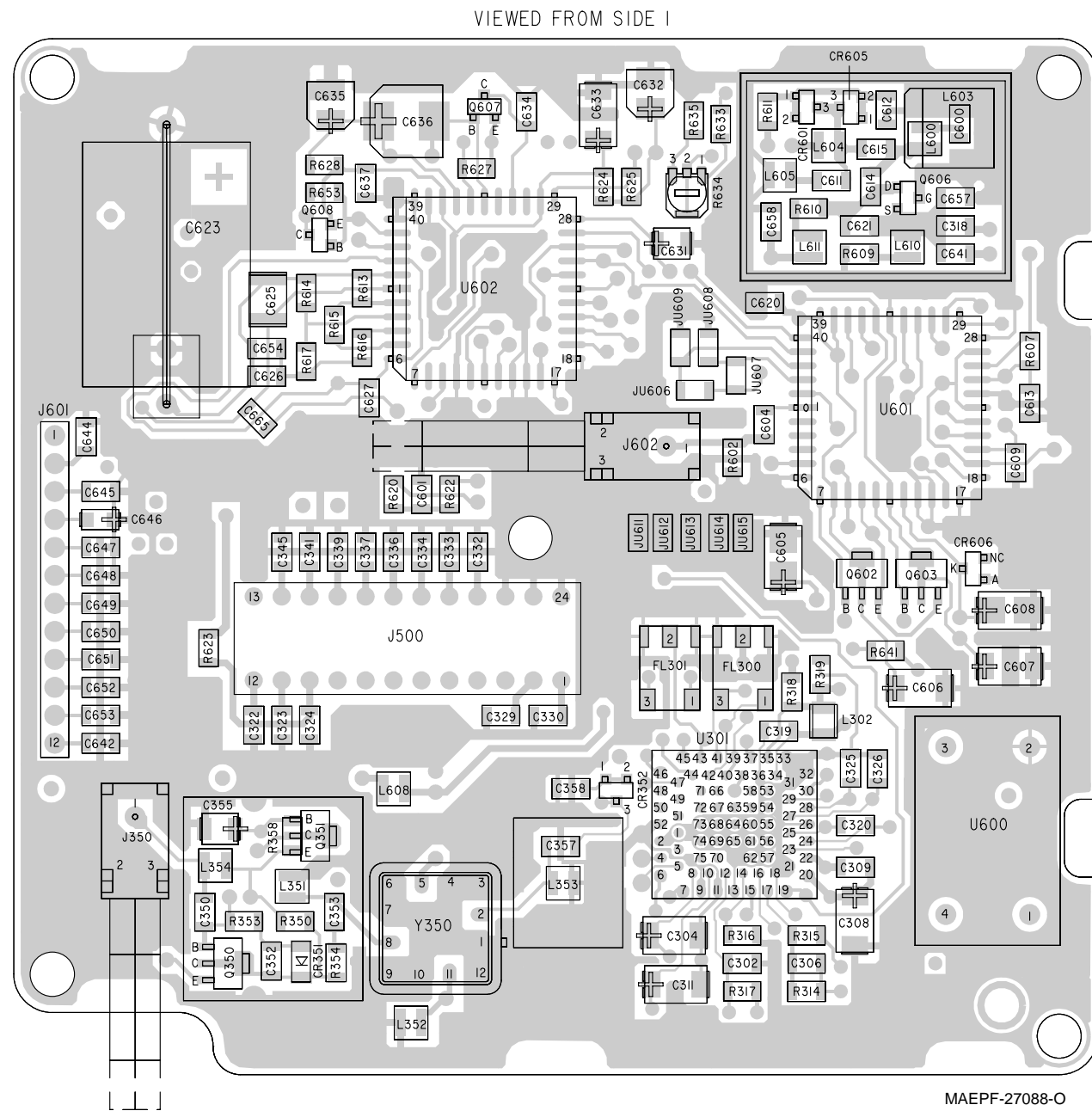


COMPONENT VALUE TABLE FOR BAND DEPENDENT PARTS

PART DESC.	VHF VALUE	UHF VALUE	800 VALUE
JU605	OUT	IN (O)	IN (O)
JU606	OUT	IN (O)	OUT
JU607	IN (O)	OUT	IN (O)
JU608	OUT	IN (O)	OUT
JU609	IN (O)	OUT	IN (O)
R624	10k	4.7k	4.7k
R625	22k	6.8k	1.5k
R627	4.7k	2.2k	1.8k
R616	22k	12k	10k
C654	1500	UNUSED	1500
C626	1500	1500	1500
JU351	IN	OUT	IN
JU352	OUT	IN	OUT
R350	120	220	120
R351	18	27	18
R355	0	10k	0
R356			120
R358	2.2		2.2
C350		15V	
C351		0.1	
C355	0.1	2.2	0.1
R612		220k	
Q351		NPN	
Q352		J310	
Q353		NPN	
R637	220k	220k	1M
R640	220k	220k	1M
JU601	IN	IN	IN
C341	100		

MAEPF-27086-0

HRN4009B/HRN6014A VHF RF Board; HRN4010B/HRN6020A UHF RF Board; and HRN6019A 800 MHz RF Board Schematic



HRN4009B/HRN6014A VHF RF Board, HRN4010B/HRN6020A UHF RF Board, and HRN6019A 800 MHz RF Board Component Location Diagrams

HRN4009B, HRN6014A VHF RF Board
 HRN4010B, HRN6020A UHF RF Board
 HRN6019A 800 MHz RF Board
 Electrical Parts List

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
		CAPACITOR, Fixed: unless otherwise stated
C300	2113740B65	470pF
C301, 302	2113741N45	.01μF
C303	-----	Not Placed
C304	2311049J26	10pF
C305	2113741B41	6800pF
C306	2113740B69	680pF
C307	2113741N45	.01μF
C308	2311049J26	10pF
C309	2113741N57	.033μF
C310	2113741N69	0.1μF
C311	2311049J26	10pF
C312, 313	-----	Not Placed
C314	2113741N69	0.1μF
C315	2113740B73	1000pF
C316	2113743G21	1.0μF (VHF Bd)
	or 2311049A37	1.0μF (UHF and 800MHz Bds)
C317	2311049J26	10pF
C318	2113740B31	18pF
C319	2113741N45	.01μF
C320	2113741N61	.047μF
C321	2113741N21	1000pF
C322	2113741N69	0.1μF (Placed on UHF Bd Only)
C323	-----	Not Placed
C324	2113741N69	0.1μF
C325, 326	2113741N45	.01μF
C327	2311049J26	10pF
C328	-----	Not Placed
C329	2113741N69	0.1μF
C330	2113740B49	100pF
C332 thru 334	2113740B49	100pF
C336, 337	2113740B49	100pF
C339	2113740B49	100pF
C341	2113740B49	100pF (Placed on VHF Bd Only)
C343	2113740B27	12pF
C345	2113741N69	0.1μF
C350	2113741N45	.01μF
C351	2113741N69	0.1μF (Placed on UHF Bd Only)
C352	2113741N45	.01μF
C353	2113740B15	3.9pF (VHF Bd)
	or 2113740B13	3.3pF (UHF Bd)
	or 2113740B19	5.6pF (800MHz Bd)
C354	2113741N69	0.1μF
C355	2113741N69	0.1μF (VHF and 800MHz Bds)
	or 2311049J04	2.2μF (UHF Bd)
C357	2113740B17	4.7pF (VHF Bd))

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
	or 2113740B13	3.3pF (UHF and 800 MHz Bds)
C358	2113741N69	0.1μF (Placed on VHF Bd Only)
C600	2113740B49	100pF
C601	2113740B34	24pF
C604	2113741N21	1000pF
C605	2380090M06	10pF
C606, 607	2311049J26	10pF
C608	2380090M06	10pF
C609	2113741N69	0.1μF
C610	2113741N45	.01μF
C611	-----	Not Placed
C612	2113741N69	0.1μF
C613	2113741N45	.01μF
C614	2113740B31	18pF
C615	2113740B39	39pF
C616	2113741N45	.01μF
C617 thru 619	2113741N69	0.1μF
C620	2113741N45	.01μF
C621	2113740B25	10pF
C622	2113741N21	1000pF
C623	0880027B09	100pF
C624	2113741N45	.01μF
C625	2113741D28	0.22μF
C626	2113740B76	1500pF (VHF and UHF Bds)
	or 2113741N45	.01μF (800MHz Bd)
C627 thru 629	2113741N45	.01μF
C630	2113740B73	1000pF (VHF Bd)
	or -----	Not Placed (UHF Bd)
	or 2113740B76	1500pF (800MHz Bd)
C631	2311049J07	3.3pF
C632	2380090M06	10pF
C633	2311049J26	10pF
C634	2113740B76	1500pF
C635	2380090M06	10pF
C636	2380090M07	47pF
C637	2113741N69	0.1μF
C638	2113741N45	.01μF
C639	2113741N69	0.1μF
C641	2113740B01	1.0pF
C642	2113741N69	0.1μF
C644	2113741N69	0.1μF
C645	2113740B49	100pF (VHF and UHF Bds)
	or 2113741N45	.01μF (800MHz Bd)
C646	2113743G21	1.0μF (VHF Bd)
	or 2311049A37	1.0μF (UHF and 800MHz Bds)
C647	2113741N69	0.1μF
C648 thru 650	-----	Not Placed
C651	2113740B49	100pF
C652	2113740B49	100pF (Placed on UHF Bd Only)
C653	2113740B49	100pF
C654	2113740B76	1500pF (VHF Bd)

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
	or -----	Not Placed (UHF Bd)
	or 2113741N45	.01μF (800MHz Bd)
C656	2113741N69	0.1μF
C657	2113740B27	12pF
C658	2113741N45	.01μF
C659	2113740B27	12pF
C660	2113741N69	0.1μF
C664	2113741N45	.01μF
C665	2113740B27	12pF
CR301	4880006E09	Varactor
CR350	-----	Not Placed (VHF and 800MHz Bds)
	or 4813830A28	(UHF Bd)
CR351	4882958R39	(VHF and 800MHz Bds)
	or 4882958R78	(UHF Bd)
CR352	4880154K03	Dual; Schottky (VHF Bd)
	or -----	Not Placed (UHF and 800MHz Bds)
CR601	4880006E09	Varactor
CR602, 603	4811058B11	
CR605	-----	Not Placed
CR606	4813830A28	
E301	2680003M03	Ferrite Bead
E302	2680004M03	Ferrite Bead
E602	2680006M02	Ferrite Bead
FL300, 301	9185128U02	FILTER: See Note 2. LC; 450kHz
J350	0980110M01	Receptacle, Coaxial
J500	0980104M02	Receptacle, Bottom-Entry
J601	0980103N02	Sockets, 12-Position
J602	-----	Not Placed
JU300, 301	0611077A01	0W
JU351	0611077A01	0W (Placed on UHF and 800MHz Bds Only)
JU352	0611077A01	0W (Placed on UHF Bd Only)
JU601	0611077A01	0W
JU604	-----	Not Placed
JU605	0611077A01	0W (Placed on VHF and 800MHz Bds Only)
JU606	0611077A01	0W (Placed on UHF Bd Only)
JU607	0611077A01	0W (Placed on VHF and 800MHz Bds Only)
JU608	0611077A01	0W (Placed on UHF Bd Only)
JU609	0611077A01	0W (Placed on VHF and 800MHz Bds Only)

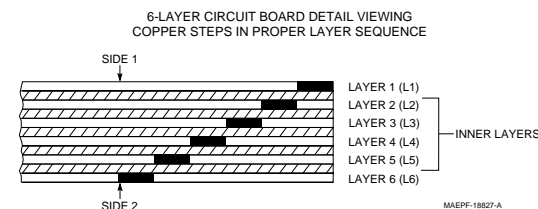
ITEM	MOTOROLA PART NUMBER	DESCRIPTION
JU611	-----	Not Placed
JU612	0611077A01	0W (Placed on VHF Bd Only)
JU613	0611077A01	0W (Placed on UHF Bd Only)
JU614	0611077A01	0W (Placed on 800MHz Bd Only)
JU615, 616	-----	Not Placed
JU617	0611077A01	0W (Placed on VHF Bd Only)
JU618	0611077A01	0W (Placed on UHF Bd Only)
JU619	0611077A01	0W (Placed on 800MHz Bd Only)
JU620	-----	Not Placed
L302	2411087A11	COIL, RF: unless otherwise stated
L303	2411087A32	.056μH (Placed on UHF Bd Only)
L304	2480140E16	10μH
L351	2480140E11	360nH (VHF and UHF Bds)
	or 2405452C78	295nH (800MHz Bd)
L352	2405452C78	295nH (VHF Bd)
	or 2480140E15	275nH (UHF and 800MHz Bds)
L353	2405452C78	295nH (VHF Bd)
	or 2405452C90	400nH (UHF and 800MHz Bds)
L354	2480140E16	10μH
L600	2480140E06	130nH
L603	-----	Not Placed
L604	2480140E01	1.2μH
L605	-----	Not Placed
L608	2480140E16	10μH
L610, 611	2480140E01	1.2μH
Q350	4802000P02	TRANSISTOR: See Note 1. NPN
Q351	4880052M01	NPN; Darlington (Placed on UHF Bd Only)
Q352	4884235R02	SOT (Placed on UHF Bd Only)
Q353	4880048M01	NPN (Placed on UHF Bd Only)
Q602, 603	4805128M27	SOT89
Q606	4884235R02	SOT
Q607	4880182D48	PNP
Q608	4880141L01	PNP; SOT23
Q609, 610	4880141L02	NPN; SOT23
R300	0611077A98	RESISTOR: Ohms ±5%; 1/8W unless otherwise stated
R301	0611077A19	10k
R302	0611077A36	5.1
R303	0611077B33	27
R307, 308	0611077A46	270k
R311, R312	0611077A01	68
R313	0611077A38	0
R314	0611077B09	33
R315	0611077A98	27k
		10k

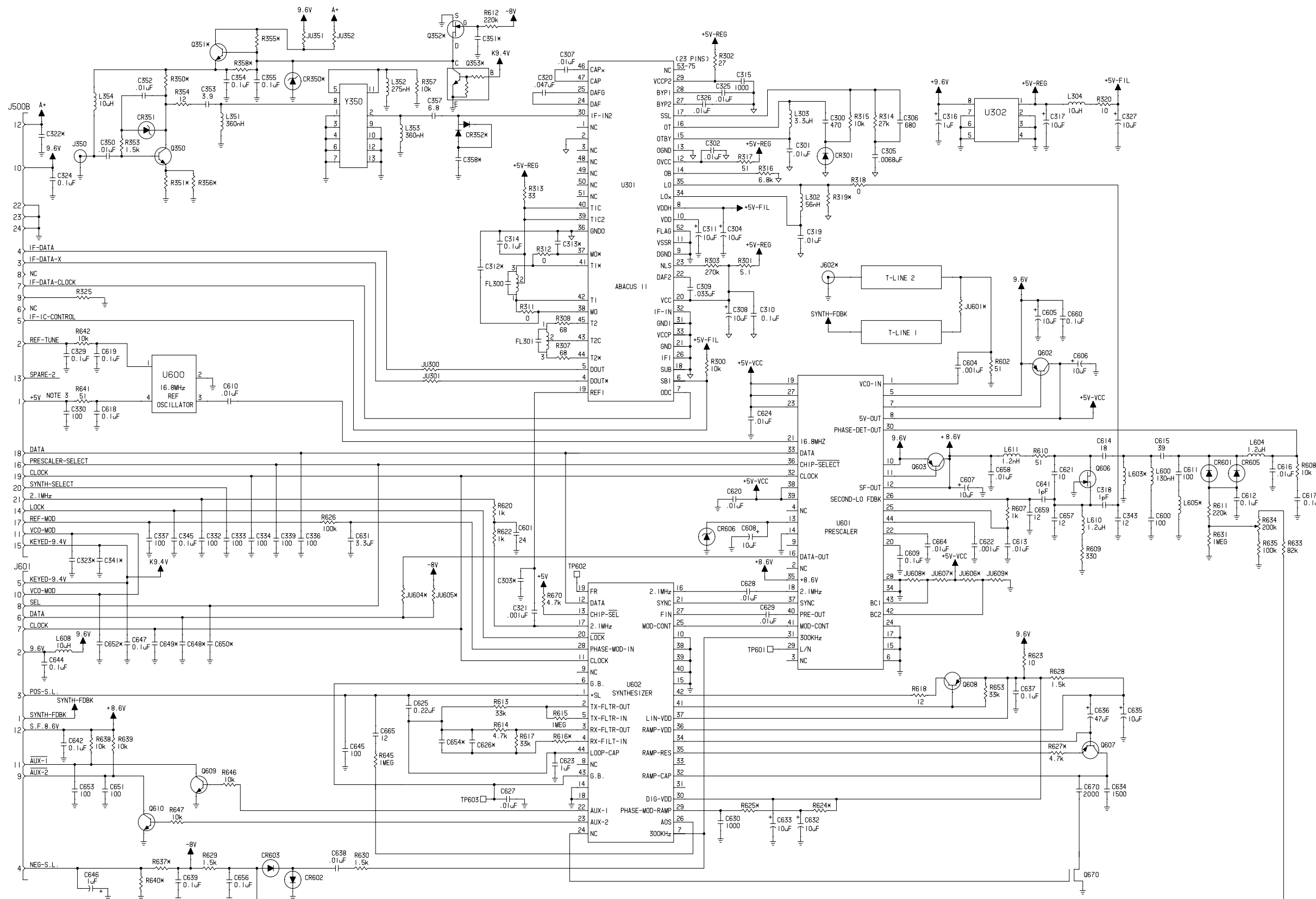
ITEM	MOTOROLA PART NUMBER	DESCRIPTION
R316	0611077A94	6.8k
R317	0611077A43	51
R318	0611077A01	0
R319	-----	Not Placed
R320	0611077A26	10
R325	-----	Not Placed
R350	0611077A58 or 0611077A58	220 (VHF and 800MHz Bds) 120 (UHF Bd)
R351	0611077A26 or 0611077A36	10 (VHF and 800MHz Bds) 27 (UHF Bd)
R353	0611077A78	1.5k
R354	0611077A28	12
R355	0611077A01 or 0611077A98	0 (VHF and 800MHz Bds) 10k (UHF Bd)
R356	0611077A38 or 0611077A52	33 (VHF and 800MHz Bds) 120 (UHF Bd)
R357	0611077A98	10k
R358	0611077A10	2.2 (Placed on VHF and 800MHz Bds Only)
R602	0611077A43	51
R607	0611077A74	1k
R608	0611077A98	10k
R609	0611077A62	330
R610	0611077A43	51
R611	0611077B31	220k
R612	0611077B31	220k (Placed on UHF Bd only)
R613	0611077B11	33k
R614	0611077A90	4.7k
R615	0611077B47	1M
R616	0611077B07 or 0611077B01 or 0611077A98	22k (VHF Bd) 12k (UHF Bd) 10k (800MHz Bd)
R617	0611077B11	33k
R618	0611077A28	12
R620	0611077A74	1k
R622	0611077A74	1k
R623	0611077A26	10
R624	0611077A98 or 0611077A90	10k (VHF Bd) 4.7k (UHF and 800MHz Bds)
R625	0611077B07 or 0611077A96 or 0611077A78	22k (VHF Bd) 8.2k (UHF Bd) 1.5k (800MHz Bd)
R626	0611077B23	100k
R627	0611077A90 or 0611077A82 or 0611077A80	4.7k (VHF Bd) 2.2k (UHF Bd) 1.8k (800MHz Bd)
R628 thru 630	0611077A78	1.5k
R631	0611077B47	1M
R633	0611077B21	82k
R634	1880273N01	Potentiometer
R635	0611077B23	100k

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
R637	0611077B31 or 0611077B47	220k (VHF and UHF Bds) 1M (800MHz Bd)
R638, 639	0611077A98	10k
R640	0611077B31 or 0611077B47	220k (VHF and UHF Bds) 1M (800MHz Bd)
R641	0611077A43	51
R642	0611077A98	10k
R645	0611077B47	1M
R646, 647	0611077A98	10k
R648	-----	Not Placed
R653	0611077B11	33k
INTEGRATED CIRCUIT MODULE: See Note 1.		
U301	5105835U90	Hybrid, ABACUS (800MHz Bd)
U302	5105469E90	5V Regulator
U600	5180291B09 or 5180291B11	Reference Oscillator; 16.8MHz (VHF and UHF Bds) Reference Oscillator; 16.8MHz (800MHz Bd)
U601	5180057S09	Prescaler
U602	5180057S10	Synthesizer
CRYSTAL: See Note 1.		
Y350	9180084M01	109.65MHz
MISCELLANEOUS:		
	2605256X01	Shield, Filter
	7580094M06	Pad, VF Shock
	8405884V02	Circuit Board

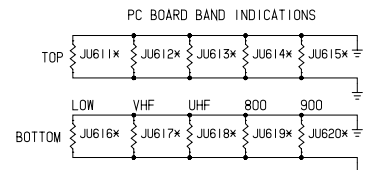
Notes:

- For optimum performance, order replacement diodes, transistors, and circuit modules by Motorola part number only.
- When ordering crystals, specify carrier frequency, crystal type number, and Motorola part number.
- Part value notations:
 $p=10^{-12}$
 $n=10^{-9}$
 $\mu=10^{-6}$
 $m=10^{-3}$
 $k=10^3$
 $M=10^6$
- ITEM refers to the component reference designator.
- The RF Board Kits use a 6-layer printed circuit board.





- NOTES:
- 1) ALL RESISTANCE IN OHMS, ALL CAPACITANCE IN PICOFARADS UNLESS NOTED OTHERWISE.
 - 2) * DENOTES BAND DEPENDENT PART. (SEE TABLE AND PARTS LIST.)
 - 3) THIS 5V SOURCE ORIGINATES ON THE COMMAND BOARD. IT IS NOT COMMON TO ANY OTHER 5V SOURCE ON THIS BOARD.
 - 4) A NUMBER OF PARTS ON THIS BOARD WERE DESIGNED IN AS CONTINGENCIES FOR ENHANCEMENT. IF A PART IS MARKED WITH AN ASTERISK, BUT DOES NOT HAVE AN ENTRY IN THE TABLE OR IN THE KIT PARTS LIST, IT IS ONE OF THESE CONTINGENCY PARTS.

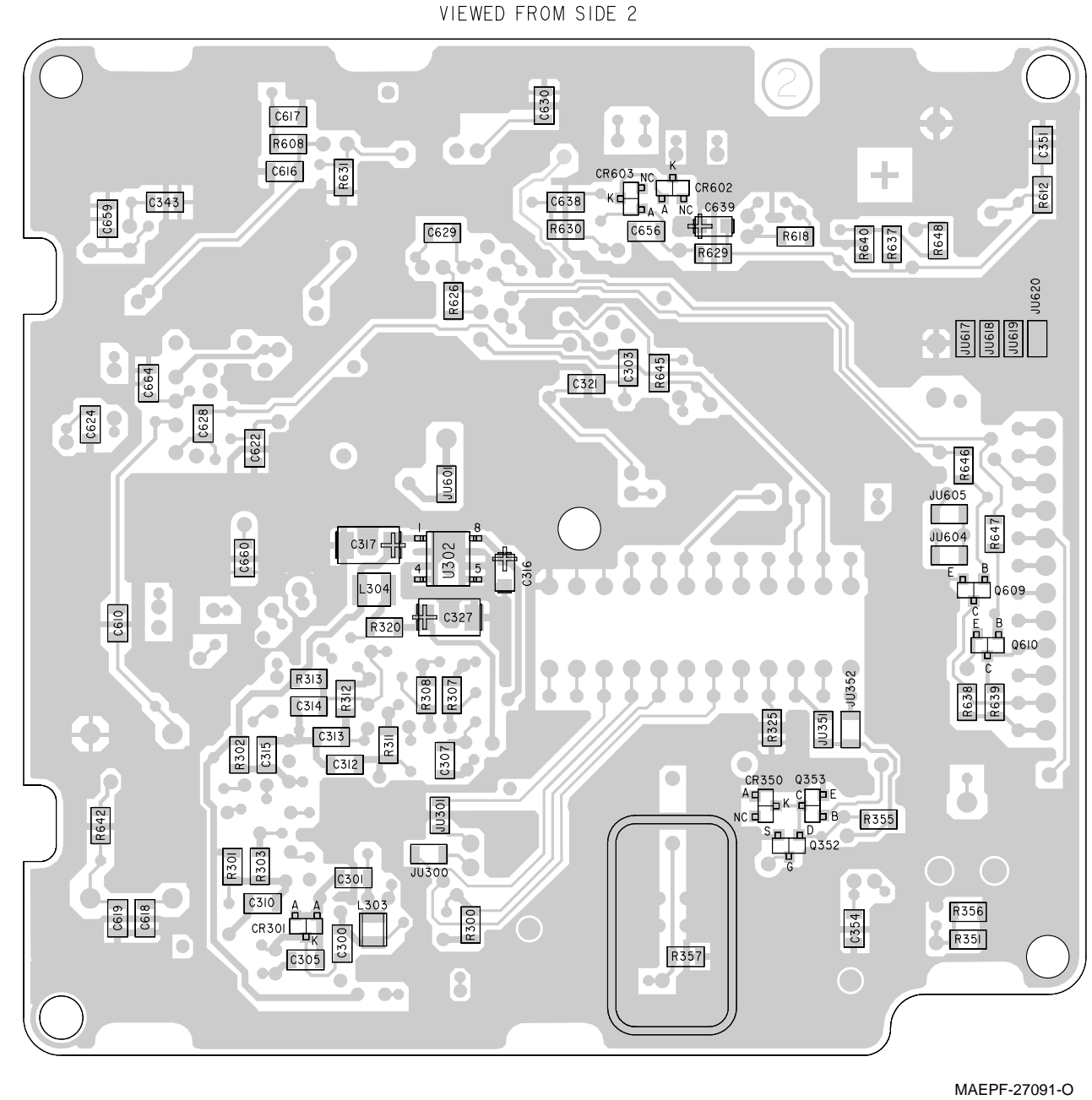
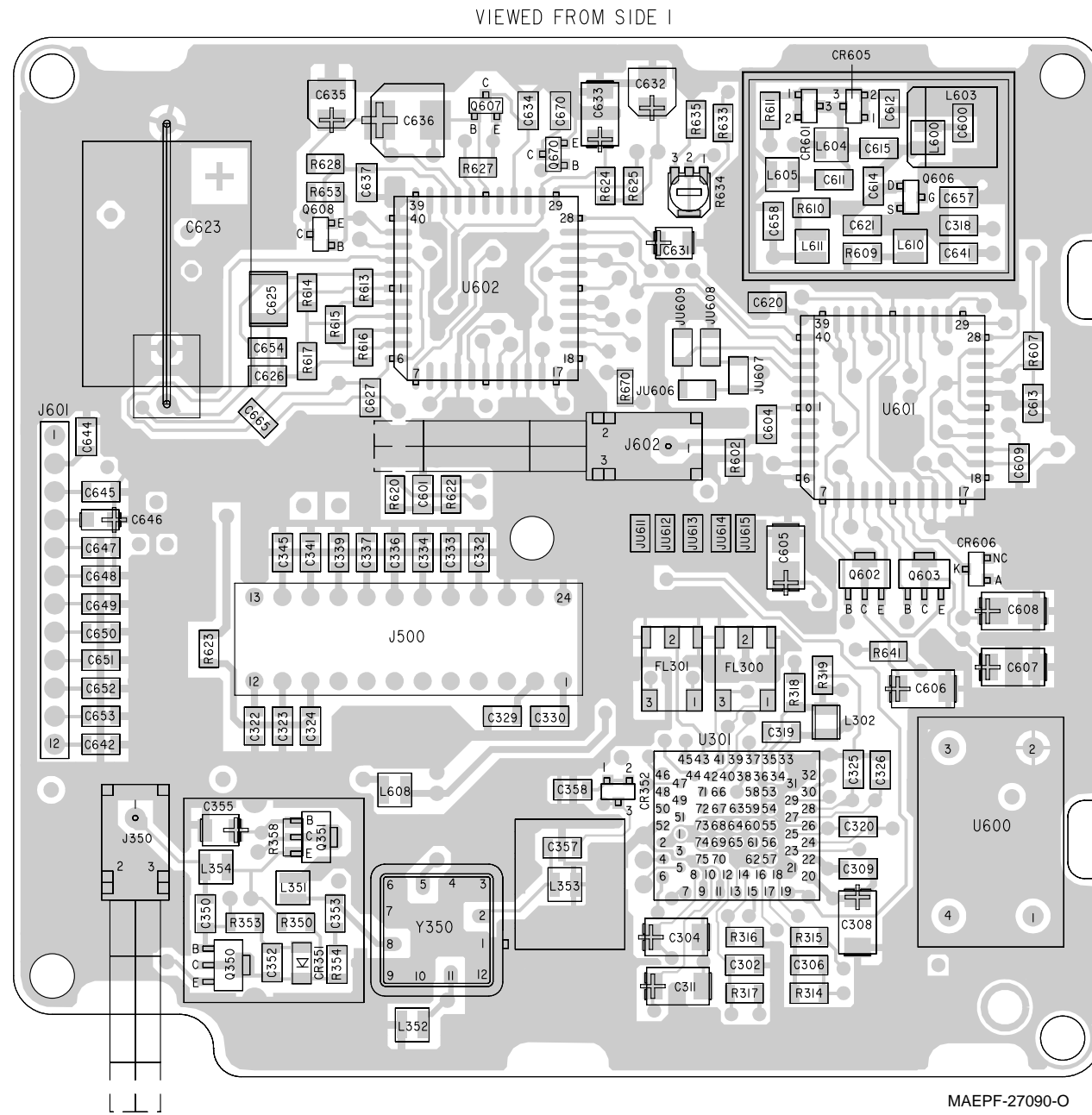


COMPONENT VALUE TABLE FOR BAND DEPENDENT PARTS

PART DESC.	VHF VALUE	UHF VALUE	800 VALUE	900 VALUE
JU605	OUT	IN (O)	OUT	IN (O)
JU606	OUT	IN (O)	OUT	IN (O)
JU607	IN (O)	OUT	IN (O)	OUT
JU608	OUT	IN (O)	OUT	IN (O)
JU609	IN (O)	OUT	IN (O)	OUT
R624	10k	4.7k	4.7k	
R625	22k	6.8k	1.5k	
R627	4.7k	2.2k	1.8k	
R616	22k	12k	10k	
C654	1500	UNUSED	1500	
C626	1500	1500	1500	
JU351	IN	OUT	IN	
JU352	OUT	IN	OUT	
R350	120	220	120	
R351	18	27	18	
R355	0	10k	0	
R356	0	120	0	
R358	2.2		2.2	
CR350		15V		
C351		0.1		
C355	0.1	2.2	0.1	
R612		220k		
Q351		NPN		
Q352		J310		
Q353		NPN		
R637	220k	220k	1M	
R640	220k	220k	1M	
JU601	IN	IN		
C341	100			

MAEPF-27089-O

HRN4009C/HRN6014C VHF RF Board Schematic Diagram



HRN4009C/HRN6014C VHF RF Board Component Location Diagrams

HRN409C/HRN6014C VHF RF Board Electrical Parts List

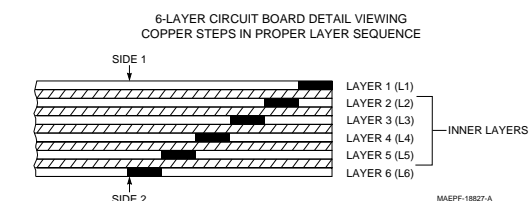
ITEM	MOTOROLA PART NUMBER	DESCRIPTION
		CAPACITOR, Fixed: unless otherwise stated
C300	2113740B65	470pF
C301, 302	2113741N45	.01μF
C303	-----	Not Placed
C304	2311049J26	10pF
C305	2113741B41	6800pF
C306	2113740B69	680pF
C307	2113741N45	.01μF
C308	2311049J26	10pF
C309	2113741N57	.033μF
C310	2113741N69	0.1μF
C311	2311049J26	10pF
C312	-----	Not Placed
C313	2113740B65	470pF
C314	2113741N69	0.1μF
C315	2113740B73	1000pF
C316	2113743G21	1.0μF
C317	2311049J26	10pF
C318	2113740B31	18pF
C319	2113741N45	.01μF
C320	2113741N61	.047μF
C321	2113741N21	1000pF
C322, 323	-----	Not Placed
C324	2113741N69	0.1μF
C325, 326	2113741N45	.01μF
C327	2311049J26	10pF
C329	2113741N69	0.1μF
C330	2113740B49	100pF
C332 thru 334	2113740B49	100pF
C336, 337	2113740B49	100pF
C339	2113740B49	100pF
C341	2113740B49	100pF
C343	2113740B27	12pF
C345	2113741N69	0.1μF
C350	2113741N45	.01μF
C351	-----	Not Placed
C352	2113741N45	.01μF
C353	2113740B15	3.9pF
C354, 355	2113741N69	0.1μF
C357	2113740B17	4.7pF
C358	2113741N69	0.1μF
C600	2113740B49	100pF
C601	2113740B34	24pF
C604	2113741N21	1000pF
C605	2380090M06	10pF
C606, 607	2311049J26	10pF
C608	2380090M06	10pF
C609	2113741N69	0.1μF
C610	2113741N45	.01μF
C611	-----	Not Placed
C612	2113741N69	0.1μF
C613	2113741N45	.01μF
C614	2113740B31	18pF
C615	2113740B39	39pF
C616	2113741N45	.01μF
C617 thru 619	2113741N69	0.1μF
C620	2113741N45	.01μF
C621	2113740B25	10pF
C622	2113741N21	1000pF

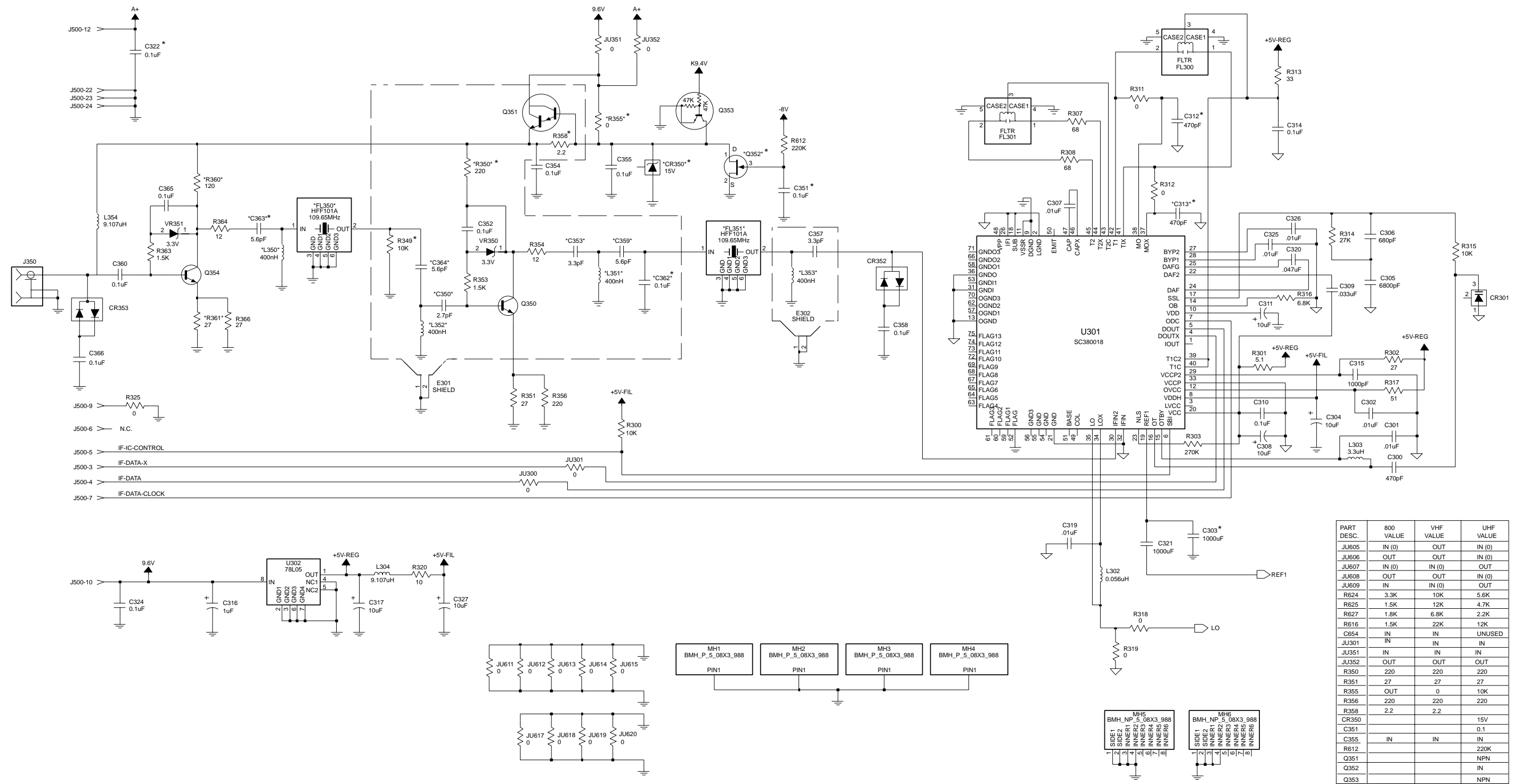
ITEM	MOTOROLA PART NUMBER	DESCRIPTION
C623	0880027B09	100pF
C624	2113741N45	.01μF
C625	2113741D28	0.22μF
C626	2113740B76	1500pF
C627 thru 629	2113741N45	.01μF
C630	211374 0B73	1000pF
C631	2311049J07	3.3pF
C632	2380090M06	10pF
C633	2311049J26	10pF
C634	2113740B76	1500pF
C635	2380090M06	10pF
C636	2380090M07	47pF
C637	2113741N69	0.1μF
C638	2113741N45	.01μF
C639	2113741N69	0.1μF
C641	2113740B01	1.0pF
C642	2113741N69	0.1μF
C644	2113741N69	0.1μF
C645	2113740B49	100pF
C646	2113743G21	1.0μF
C647	2113741N69	0.1μF
C648 thru 650	-----	Not Placed
C651	2113740B49	100pF
C652	-----	Not Placed
C653	2113740B49	100pF
C654	2113740B76	1500pF
C656	2113741N69	0.1μF
C657	2113740B27	12pF
C658	2113741N45	.01μF
C659	2113740B27	12pF
C660	2113741N69	0.1μF
C664	2113741N45	.01μF
C665	2113740B27	12pF
C670	2113740B79	2000pF
CR301	4880006E09	Varactor
CR350	-----	Not Placed
CR351	4882958R39	3.3V
CR352	4880154K03	Dual; Schottky
CR601	4880006E09	Varactor
CR602, 603	4811058B11	
CR605	-----	Not Placed
CR606	4813830A28	
E301	2680003M03	Ferrite Bead
E302	2680004M03	Ferrite Bead
E602	2680006M02	Ferrite Bead
FL300, 301	9185128U02	FILTER: See Note 2. LC; 450kHz
J350	0980110M01	JACK: Receptacle, Coaxial
J500	0980104M02	Receptacle, Bottom-Entry
J601	0980103N02	Sockets, 12-Position
J602	-----	Not Placed
JU300, 301	0611077A01	JUMPER: 0W
JU351	0611077A01	0W
JU352	-----	Not Placed
JU601	0611077A01	0W

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
JU604 thru 606	-----	Not Placed
JU607	0611077A01	0W
JU608	-----	Not Placed
JU609	0611077A01	0W
JU611	-----	Not Placed
JU612	0611077A01	0W
JU613 thru 615	-----	Not Placed
JU617	0611077A01	0W
JU618 thru 620	-----	Not Placed
		COIL, RF: unless otherwise stated
L302	-----	Not Placed
L303	2411087A32	3.3μH
L304	2480140E16	10μH
L351	2480140E11	360nH
L352, 353	2405452C78	295nH
L354	2480140E16	10μH
L600	2480140E06	130nH
L603	-----	Not Placed
L604	2480140E01	1.2μH
L605	-----	Not Placed
L608	2480140E16	10μH
L610, 611	2480140E01	1.2μH
		TRANSISTOR: See Note 1.
Q350	4802000P02	NPN
Q351 thru 353	-----	Not Placed
Q602, 603	4805128M27	SOT89
Q606	4884235R02	SOT
Q607	4880182D48	PNP
Q608	4880141L01	PNP; SOT23
Q609, 610	4880141L02	NPN; SOT23
Q670	4805218N11	SOT
		RESISTOR: Ohms ±5%; 1/8W unless otherwise stated
R300	0611077A98	10k
R301	0611077A19	5.1
R302	0611077A36	27
R303	0611077B33	270k
R307, 308	0611077A46	68
R311, R312	0611077A01	0
R313	0611077A38	33
R314	0611077B09	27k
R315	0611077A98	10k
R316	0611077A94	6.8k
R317	0611077A43	51
R318	0611077A01	0
R319	-----	Not Placed
R320	0611077A26	10
R325	-----	Not Placed
R350	0611077A52	120
R351	0611077A26	10
R353	0611077A78	1.5k
R354	0611077A28	12
R355	0611077A01	0
R356	0611077A38	33
R357	0611077A98	10k
R358	0611077A10	2.2
R602	0611077A43	51
R607	0611077A74	1k
R608	0611077A98	10k
R609	0611077A62	330
R610	0611077A43	51

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
R611	0611077B31	220k
R612	-----	Not Placed
R613	0611077B11	33k
R614	0611077A90	4.7k
R615	0611077B47	1M
R616	0611077B07	22k
R617	0611077B11	33k
R618	0611077A28	12
R620	0611077A74	1k
R622	0611077A74	1k
R623	0611077A26	10
R624	0611077A98	10k
R625	0611077B07	22k
R626	0611077B23	100k
R627	0611077A90	4.7k
R628 thru 630	0611077A78	1.5k
R631	0611077B47	1M
R633	0611077B21	82k
R634	1880273N01	Potentiometer
R635	0611077B23	100k
R637	0611077B31	220k
R638, 639	0611077A98	10k
R640	0611077B31	220k
R641	0611077A43	51
R642	0611077A98	10k
R645	0611077B47	1M
R646, 647	0611077A98	10k
R653	0611077B11	33k
R670	0611077A90	4.7k
		INTEGRATED CIRCUIT MODULE: See Note 1.
U301	5105835U90	Hybrid, ABACUS
U302	5105469E90	5V Regulator
U600	5180291B09	Reference Oscillator
U601	5180057S09	Prescaler
U602	5180057S10	Synthesizer
		CRYSTAL: See Note 2.
Y350	9180084M01	109.65MHz
		MISCELLANEOUS:
	2605256X01	Shield, Filter
	7580094M06	Pad, VF Shock
	8485865B01	Circuit Board

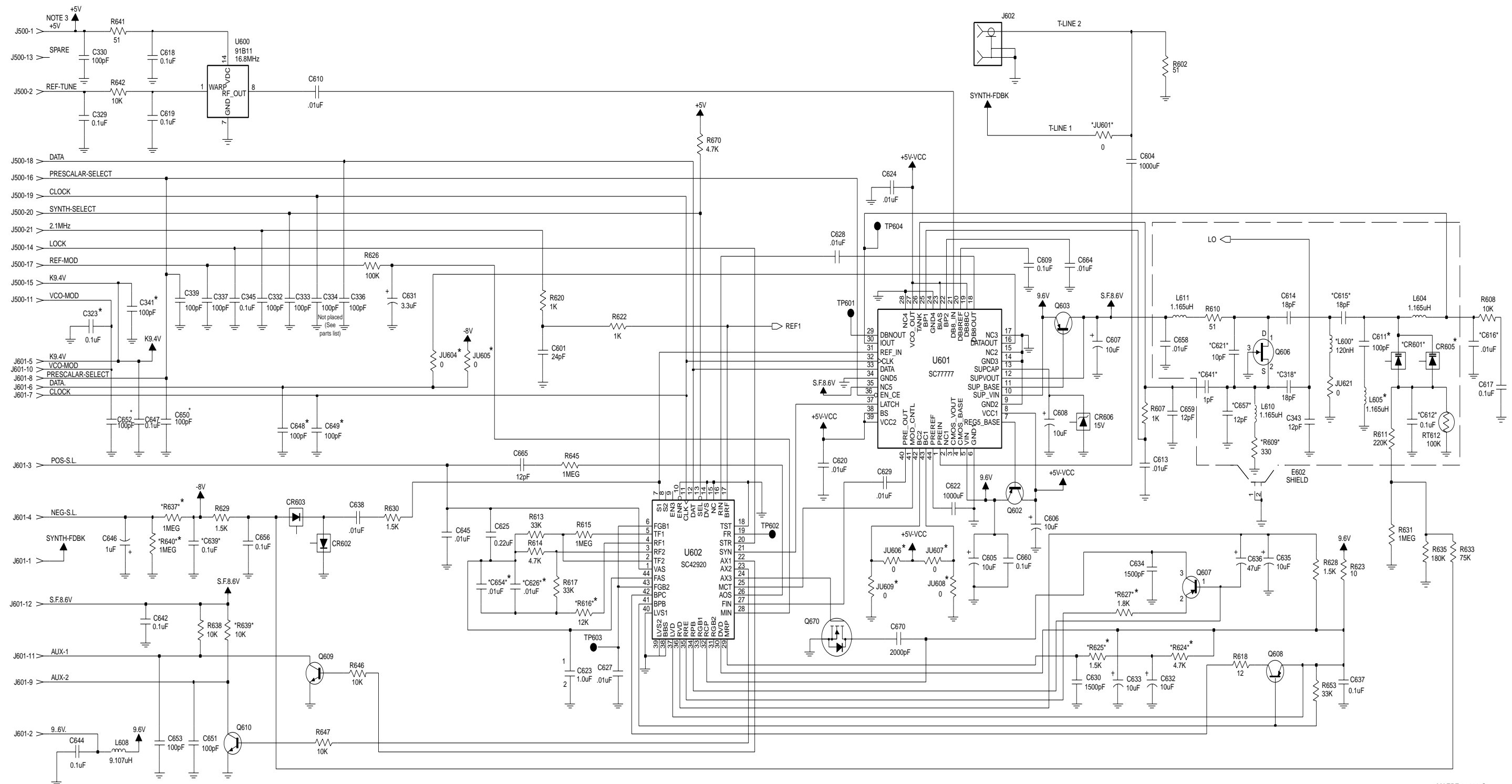
- For optimum performance, order replacement diodes, transistors, and circuit modules by Motorola part number only.
- When ordering crystals, specify carrier frequency, crystal frequency, crystal type number, and Motorola part number.
- Part value notations:
 $p=10^{-12}$ $m=10^{-3}$
 $n=10^{-9}$ $k=10^3$
 $\mu=10^{-6}$ $M=10^6$
- ITEM refers to the component reference designator.
- The RF Board Kits use a 6-layer printed circuit board.





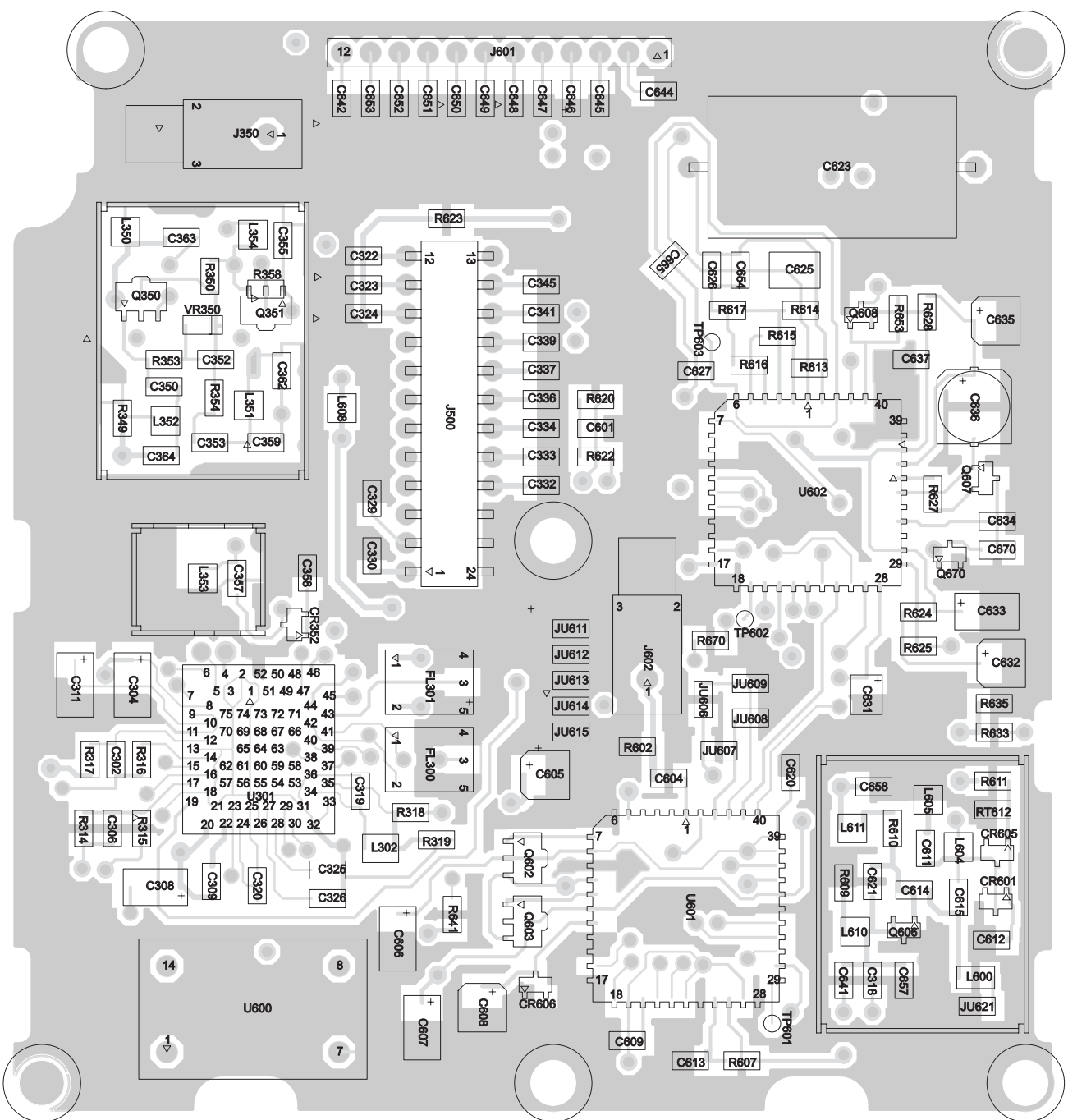
PART DESC.	800 VALUE	VHF VALUE	UHF VALUE
JU605	IN (0)	OUT	IN (0)
JU606	OUT	OUT	IN (0)
JU607	IN (0)	IN (0)	OUT
JU608	OUT	OUT	IN (0)
JU609	IN	IN (0)	OUT
R624	3.3K	10K	5.6K
R625	1.5K	12K	4.7K
R627	1.8K	6.8K	2.2K
R616	1.5K	22K	12K
C654	IN	IN	UNUSED
JU301	IN	IN	IN
JU351	IN	IN	IN
JU352	OUT	OUT	OUT
R350	220	220	220
R351	27	27	27
R355	OUT	0	10K
R356	220	220	220
R358	2.2	2.2	
CR350			15V
C351			0.1
C355	IN	IN	IN
R612			220K
Q351			NPN
Q352			IN
Q353			NPN

HRN4009E and HRN6014D VHF RF Board; HRN4010D and HRN6020C UHF RF Board; and HRN6019C 800 MHz RF Board Schematic Diagram (Sheet 1 of 2)

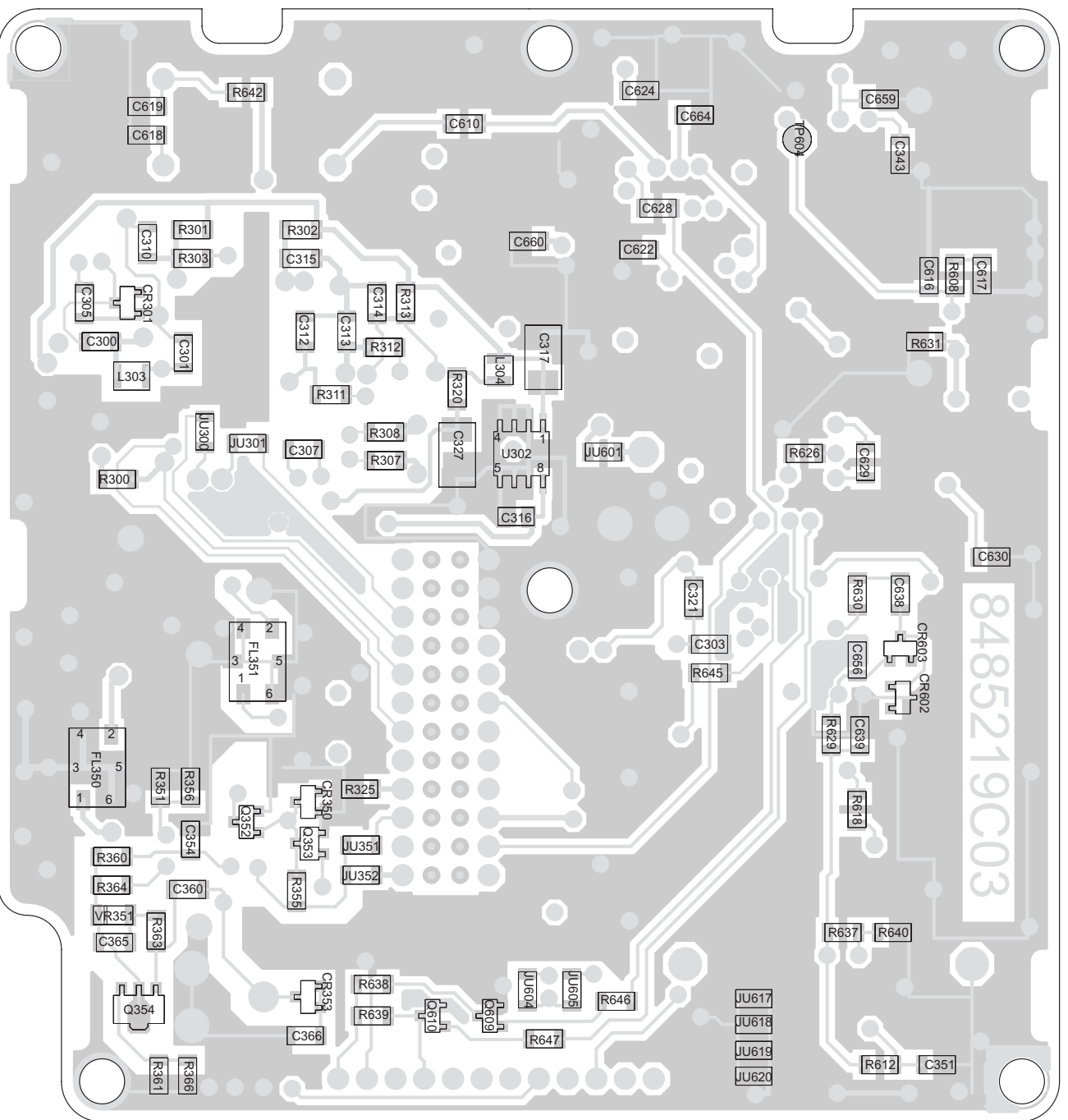


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SHEET 2

HRN4009E and HRN6014D VHF RF Board; HRN4010D and HRN6020C UHF RF Board; and HRN6019C 800 MHz RF Board Schematic Diagram (Sheet 2 of 2)



Side 1



Side 2

HRN4009E and HRN6014D VHF RF Board; HRN4010D and HRN6020C UHF RF Board; and HRN6019C 800 MHz RF Component Location Diagram

**HRN4009E and HRN6014D VHF RF Board, HRN6010D
and HRN6020C UHF RF Board, and HRN6019C 800
MHz RF Board Parts Lists**

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
		CAPACITOR, Fixed: unless otherwise stated
C300	2113740B65	470pF
C301, 302	2113741N45	.01μF
C303	-----	Not Placed
C304	2311049J26	10pF
C305	2113741B41	6800pF
C306	2113740B69	680pF
C307	2113741N45	.01μF
C308	2311049J26	10pF
C309	2113741N57	.033μF
C310	2113741N69	0.1μF
C311	2311049J26	10pF
C312, 313	-----	Not Placed
C314	2113741N69	0.1μF
C315	2113740B73	1000pF
C316	2311049A37	1.0μF
C317	2311049J26	10pF
C318	2113740B31	18pF
C319	2113741N45	.01μF
C320	2113741N61	.047μF
C321	2113741N21	1000pF
C322, 323	2113741N69	0.1μF (Placed on UHF Bd Only)
C324	2113741N69	0.1μF
C325, 326	2113741N45	.01μF
C327	2311049J26	10pF
C329	2113741N69	0.1μF
C330	2113740B49	100pF
C332, 333	2113740B49	100pF
C334	2113740B49	100pF/Not Placed (see Note 6)
C336, 337	2113740B49	100pF
C339	2113740B49	100pF
C341	2113740B49	100pF (Placed on VHF Bd Only)
C343	2113740B27	12pF
C345	2113741N69	0.1μF
C350	2113740B09	2.2pF
C351	2113741N69	0.1μF (Placed on UHF Bd Only)
C352	2113741N69	0.1μF
C353	2113740B13	3.3pF
C354, 355	2113741N69	0.1μF
C357	2113740B13	3.3pF
C358	2113741N69	0.1μF
C359	2113740B19	5.6pF
C360	2113741N69	0.1μF
C361, 362	-----	Not Placed
C363	2113740B07	1.8pF (Placed on VHF and 800MHz Bds Only)
C364	2113740B11 or 2113740B19	2.7pF (VHF Bd) 5.6pF (UHF and 800MHz Bds)
C365, 366	2113741N69	0.1μF
C600	2113740B49	100pF
C601	2113740B34	24pF
C604	2113741N21	1000pF
C605	2380090M06	10pF
C606, 607	2311049J26	10pF
C608	2380090M06	10pF
C609	2113741N69	0.1μF

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
C610	2113741N45	.01μF
C611	-----	Not Placed
C612	2113741N69	0.1μF
C613	2113741N45	.01μF
C614	2113740B31	18pF
C615	2113740B39	39pF
C616	2113741N45	.01μF
C617 thru 619	2113741N69	0.1μF
C620	2113741N45	.01μF
C621	2113740B25	10pF
C622	2113741N21	1000pF
C623	0880027B09	100pF
C624	2113741N45	.01μF
C625	2113741D28	0.22μF
C626	2113741N45	.01μF (Placed on UHF Bd Only)
C627 thru 629	2113741N45	.01μF
C630	2113740B76	1500pF
C631	2311049J07	3.3pF
C632	2380090M06	10pF
C633	2311049J26	10pF
C634	2113740B76	1500pF
C635	2380090M06	10pF
C636	2380090M07	47pF
C637	2113741N69	0.1μF
C638	2113741N45	.01μF
C639	2113741N69	0.1μF
C641	2113740B01	1.0pF
C642	2113741N69	0.1μF
C644	2113741N69	0.1μF
C645	2113741N45	.01μF
C646	2311049A37	1.0μF
C647	2113741N69	0.1μF
C648 thru 650	-----	Not Placed
C651	2113740B49	100pF
C652	2113740B49	100pF (Placed on UHF Bd Only)
C653	2113740B49	100pF
C654	2113741N45 or -----	.01μF (VHF and 800MHz Bds) Not Placed (UHF Bd)
C656	2113741N69	0.1μF
C657	2113740B27	12pF
C658	2113741N45	.01μF
C659	2113740B27	12pF
C660	2113741N69	0.1μF
C664	2113741N45	.01μF
C665	2113740B27	12pF
C670	2113740B79	2000pF (Placed on VHF Bd Only)
CR301	4880006E09	DIODE: See Note 1. Varactor
CR350	4880140L20	(Placed on UHF Bd Only)
CR352	4880154K03	Dual; Schottky (Placed on VHF Bd Only)
CR353	4880154K03	Dual; Schottky
CR601	4880006E09	Varactor
CR602, 603	4811058B11	
CR605	-----	Not Placed
CR606	4813830A28	
E301	2680006M02	CORE: Ferrite Bead
E302	2680004M03	Ferrite Bead

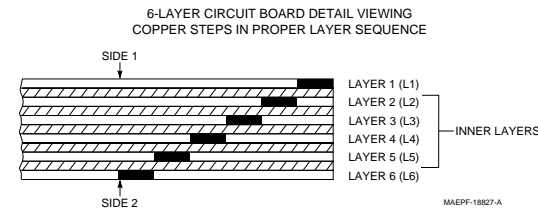
ITEM	MOTOROLA PART NUMBER	DESCRIPTION
E303	2605261V01	Ferrite Bead (Placed on 800MHz Bd Only)
E602	2680006M02	Ferrite Bead
FL300, 301 FL350, 351	9185128U02 4885230C01 or 4805736Y03	FILTER: See Note 2. LC; 450kHz 109.65MHz (VHF Bd) Crystal; 109.65MHz (UHF and 800MHz Bds)
J350	0980110M01	JACK: Receptacle, Coaxial
J500	0980104M02	Receptacle, Bottom-Entry
J601	0980103N02	Sockets, 12-Position
J602	-----	Not Placed
JU300, 301 JU351	0611077A01 0611077A01	JUMPER: 0Ω 0Ω (Placed on VHF and 800MHz Bds Only)
JU352	0611077A01	0Ω (Placed on UHF Bd Only)
JU601	0611077A01	0Ω
JU604	-----	Not Placed
JU605	0611077A01	0Ω (Placed on UHF and 800MHz Bds Only)
JU606	0611077A01	0Ω (Placed on UHF Bd Only)
JU607	0611077A01	0Ω (Placed on VHF and 800MHz Bds Only)
JU608	0611077A01	0Ω (Placed on UHF Bd Only)
JU609	0611077A01	0Ω (Placed on VHF and 800MHz Bds Only)
JU611	-----	Not Placed
JU612	0611077A01	0Ω (Placed on VHF Bd Only)
JU613	0611077A01	0Ω (Placed on UHF Bd Only)
JU614	0611077A01	0Ω (Placed on 800MHz Bd Only)
JU615	-----	Not Placed
JU617	0611077A01	0Ω (Placed on VHF Bd Only)
JU618	0611077A01	0Ω (Placed on UHF Bd Only)
JU619	0611077A01	0Ω (Placed on 800MHz Bd Only)
JU620	-----	Not Placed
L302	-----	COIL, RF: unless otherwise stated Not Placed
L303	2411087A32	3.3μH
L304	2480140E16	10μH
L350	2405423A12	470nH
L351	2405423A11 or 2405452C90	390nH (VHF and UHF Bds) 400nH (800MHz Bd)
L352	2405423A12	470nH
L353	2405423A11 or 2405423A12	390nH (VHF Bd) 470nH (UHF and 800MHz Bds)
L354	2480140E16	10μH
L600	2480140E06	130nH
L603	-----	Not Placed
L604	2480140E01	1.2μH
L605	-----	Not Placed
L608	2480140E16	10μH
L610, 611	2480140E01	1.2μH
Q350	4802000P02	TRANSISTOR: See Note 1. NPN

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
Q351	4880052M01	NPN; Darlington (Placed on UHF Bd Only)
Q352	4884235R02	SOT (Placed on UHF Bd Only)
Q353	4880048M01	NPN (Placed on UHF Bd Only)
Q354	4802000P02	NPN
Q602, 603	4805128M27	SOT89
Q606	4884235R02	SOT
Q607	4880182D48	PNP
Q608	4880141L01	PNP; SOT23
Q609, 610	4880141L02	NPN; SOT23
Q670	4805218N11	SOT (Placed on VHF Bd Only)
R300	0611077A98	RESISTOR: Ohms ±5%; 1/8W unless otherwise stated 10k
R301	0611077A19	5.1
R302	0611077A36	27
R303	0611077B33	270k
R307, 308	0611077A46	68
R311	0611077A01	0
R312	0611077A01	0 (Placed on UHF and 800MHz Bds Only)
R313	0611077A38 or 0611077A74	33 (VHF Bd) 1k (UHF and 800MHz Bds)
R314	0611077B09	27k
R315	0611077A98	10k
R316	0611077A94	6.8k
R317	0611077A43	51
R318	0611077A01	0
R319	-----	Not Placed
R320	0611077A26	10
R325	-----	Not Placed
R350	0611077A58	220
R351	0611077A36	27
R353	0611077A78	1.5k
R354	0611077A28	12
R355	0611077A01 or 0611077A98	0 (VHF and 800MHz Bds) 10k (UHF Bd)
R356	0611077A58	220
R357	0611077A98	10k (Placed on VHF Bd Only)
R358	0611077A10	2.2 (Placed on VHF and 800MHz Bds Only)
R360	0611077A58 or 0611077A52	220 (VHF Bd) 120 (UHF and 800MHz Bds)
R361	0611077A32 or 0611077A36	18 (VHF Bd) 27 (UHF and 800MHz Bds)
R363	0611077A78	1.5k
R364	0611077A28	12
R366	0611077A36	27
R602	0611077A43	51
R607	0611077A74	1k
R608	0611077A98	10k
R609	0611077A62	330
R610	0611077A43	51
R611	0611077B31	220k
R612	0611077B31	220k (Placed on UHF Bd only)
R613	0611077B11	33k
R614	0611077A90	4.7k
R615	0611077B47	1M
R616	0611077B07 or 0611077A98	22k (VHF Bd) 10k (UHF and 800MHz Bds)
R617	0611077B11	33k

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
R618	0611077A28	12
R620	0611077A74	1k
R622	0611077A74	1k
R623	0611077A26	10
R624	0611077A98	10k (VHF Bd)
	or 0611077A90	4.7k (UHF and 800MHz Bds)
R625	0611077B01	12k (VHF Bd)
	or 0611077A78	1.5k (UHF and 800MHz Bds)
R626	0611077B23	100k
R627	0611077A94	6.8k (VHF Bd)
	or 0611077A80	1.8 (UHF and 800MHz Bds)
R628 thru 630	0611077A78	1.5k
R631	0611077B47	1M
R633	0611077B21	82k
R634	1880273N01	Potentiometer
R635	0611077B23	100k
R637	0611077B47	1M
R638, 639	0611077A98	10k
R640	0611077B47	1M (Placed on VHF and 800MHz Bds Only)
R641	0611077A43	51
R642	0611077A98	10k
R645	0611077B47	1M
R646, 647	0611077A98	10k
R653	0611077B11	33k
R670	0611077A90	4.7k (Placed on VHF Bd Only)
		:
		:
RT612	0680149M02	THERMISTOR: 100k (Placed on UHF and 800MHz Bds Only)
		INTEGRATED CIRCUIT MODULE: See Note 1.
U301	5105835U90	Hybrid, ABACUS (VHF and 800MHz Bds)
U302	5105469E90	5V Regulator
U600	5180291B11	Reference Oscillator; 16.8MHz
U601	5180057S09	Prescaler
U602	5180057S10	Synthesizer (Placed on VHF and 800MHz Bds Only)
		DIODE:
VR350, 351	4882958R39	Zener, 3.3V
		CRYSTAL: See Note 2.
Y350	9180084M01	109.65MHz
		MISCELLANEOUS:
	2605256X01	Shield, Filter
	7580094M06	Pad, VF Shock
	8485219C02	Circuit Board

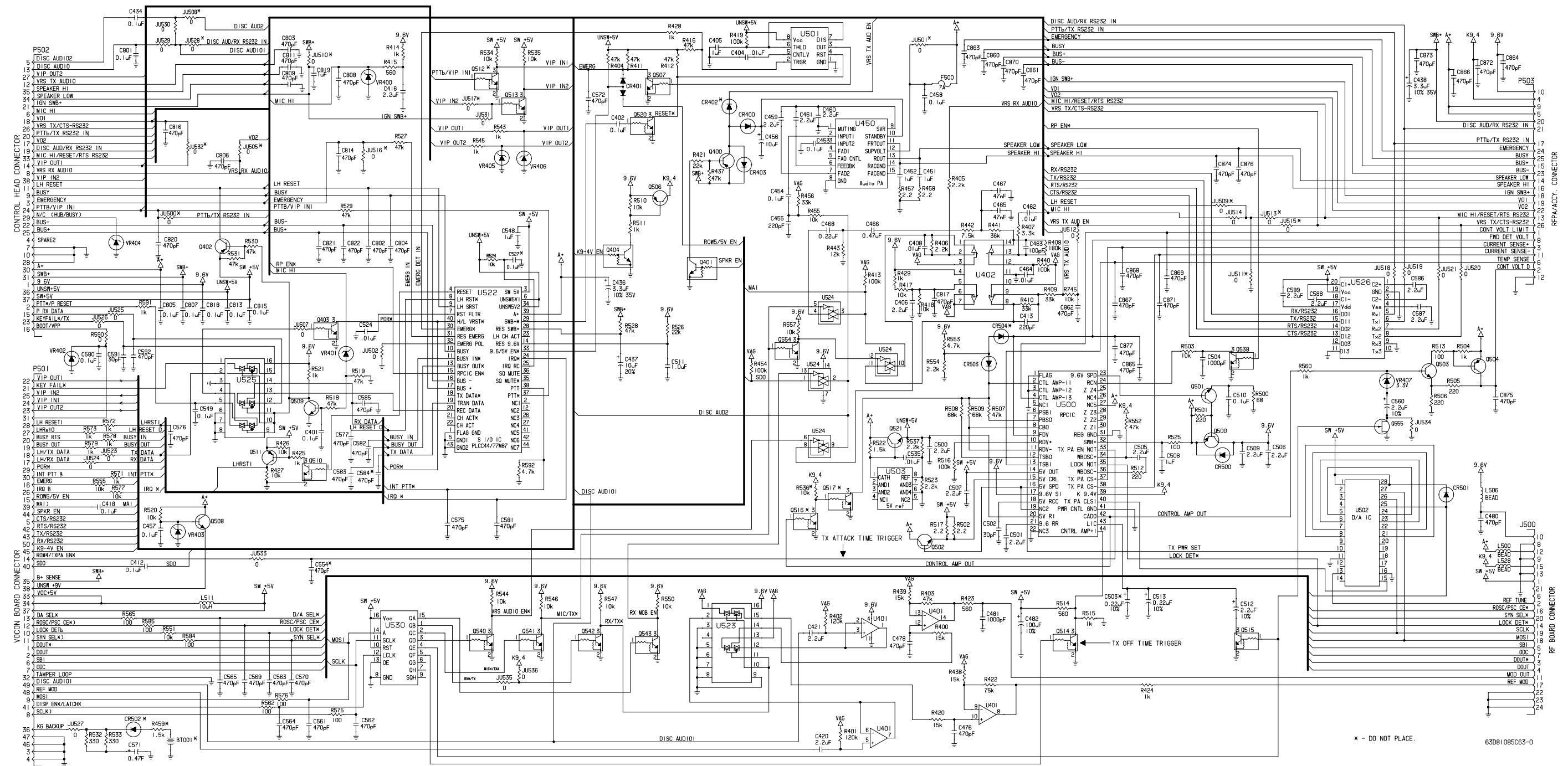
Notes:

- For optimum performance, order replacement diodes, transistors, and circuit modules by Motorola part number only.
- When ordering crystals, specify carrier frequency, crystal frequency, crystal type number, and Motorola part number.
- Part value notations:
 $p=10^{-12}$ $m=10^{-3}$
 $n=10^{-9}$ $k=10^3$
 $\mu=10^{-6}$ $M=10^6$
- ITEM refers to the component reference designator.
- The RF Board Kits use a 6-layer printed circuit board.



- C334 is Not Placed in the following kits. Earlier kits contain the 100pF capacitor.
 HRN4009F,G
 HRN6014E-G
 HRN4010E,F
 HRN6020D-F
 HRN6019D-F.

7.2 Command Board Section



HLN5558E/F/G, HLN6529C/D/E/F/G, HLN6560C/D/E/F/G/H and HLN6562C/D/E/F/G/H Command Board Schematic Diagram

Command Boards Reference Designator and Part Number Comparison Chart

The following table lists those reference designators common to the various command board kits and the part numbers assigned to those designators for each kit and version.

Ref Des	HLN5558G Part Number	HLN6529G Part Number	HLN6560H Part Number	HLN6562H Part Number
C512	2311049A40	2311049A40	2311049A54	2311049A40
C562	2113740B65	2113740B65	NOTPLACED	NOTPLACED
C571	2105285X01	NOTPLACED	2105285X01	2105285X01
JU500	NOTPLACED	NOTPLACED	0611077A01	0611077A01
JU513	NOTPLACED	NOTPLACED	0611077A01	0611077A01
JU518	0611077A01	0611077A01	NOTPLACED	NOTPLACED
JU519	0611077A01	0611077A01	NOTPLACED	0611077A01
JU521	0611077A01	0611077A01	NOTPLACED	NOTPLACED
JU528	NOTPLACED	NOTPLACED	0611077A01	NOTPLACED
JU532	NOTPLACED	NOTPLACED	NOTPLACED	0611077A01
R561	0611077B29	NOTPLACED	0611077B29	NOTPLACED

HLN5558E/F/G, HLN6529C/D/E, HLN6560C/D/E/F/G/H, and HLN6562C/D/E/F/G/H Parts List

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
		CAPACITOR, Fixed: unless otherwise stated
C401, 402	2113741N69	0.1µF
C404	2113741N45	.01µF
C405	2113743G21	1µF
C406	2113743G24	2.2µF
C408	2113741N45	.01µF
C412	2113741N69	0.1µF
C413	2113740B57	220pF
C416	2113743G24	2.2µF
C418	2113741N69	0.1µF
C420, 421	2113743G24	2.2µF
C434	2113741N69	0.1µF
C436	2311049J09	3.3µF
C437	2311049J26	10µF
C438	2311049J09	3.3µF
C451, 452	2113743G21	1µF
C453, 454	2113741N69	0.1µF
C455	2113740B57	220pF
C456	2380090M24	10µF
C457, 458	2113741N69	0.1µF
C459 thru 461	2113743G24	2.2µF
C462	2113741B51	.018µF (HLN5558F/G and HLN6529D/E)
	or 2113741N45	.01µF (HLN5558E and HLN6529C)
C463	2113740B49	100pF (HLN5558E and HLN6529C)

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
	or 2113740B59	270pF (HLN5558F/G and HLN6529D/E)
C464	2113741N45	.01µF
C465	2113741B61	.047µF (not placed on HLN5558F/G and HLN6529D/E)
C466	2113743F14	0.47µF
C467	2113741B61	.047µF (Not placed on HLN5558F/G and HLN6529D/E)
C468	2113743F08	0.22µF
C476	2113740B65	470pF
C478	2113740B65	470pF
C480	2113740B65	470pF
C481	2113741N21	1000pF
C482	2311049C07	100µF
C500, 501	2113743G24	2.2µF
C502	2113740B36	30pF
C503	2113743G21	1µF (Not placed on HLN5558F/G and HLN6529E)
C504	2113741N21	1000pF
C505	2311049A40	3.3µF
C506, 507	2113743G24	2.2µF
C508	2113743G21	1µF
C509	2113743G24	2.2µF
C510	2113741N69	0.1µF
C511	2113743F16	1µF
C512	2311049A40	3.3µF
C513	2311049A03	0.22µF
C524	2113741N45	.01µF
C527	2113741N69	0.1µF
C535	2113741N45	.01µF
C548	2113743G21	1µF

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
C549	2113741N69	0.1µF
C554	2113740B65	470pF
C560	2311049A40	2.2µF
C561 thru 565	2113740B65	470pF
C569, 570	2113740B65	470pF
C571	2105285X01	0.47F (Not placed on HLN6529C/D/E)
C572	2113740B65	470pF
C575 thru 577	2113740B65	470pF
C580	2113741N69	0.1µF
C581 thru 583	2113740B65	470pF
C584	-----	Not Placed
C585	2113740B65	470pF
C586 thru 589	2113743G24	2.2µF
C591	2113740B36	30pF
C592	2113740B65	470pF
C801	2113741N69	0.1µF
C802 thru 804	2113740B65	470pF
C805	2113741N69	0.1µF
C806	2113740B65	470pF
C807	2113741N69	0.1µF
C808, 809	2113740B65	470pF
C811	2113740B65	470pF
C813	2113741N69	0.1µF
C814	2113740B65	470pF
C815	2113741N69	0.1µF
C816, 817	2113740B65	470pF
C818	2113741N69	0.1µF
C819	2113743G21	1µF
C820 thru 822	2113740B65	470pF
C860 thru 877	2113740B65	470pF

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
CR400	4813833C10	DIODE: See Note 1. Dual
CR401	4813833C03	
CR402	-----	
CR403	4813833C10	
CR500, 501	4813833C10	
CR502	-----	Not Placed
CR503	4813833C10	Not Placed
CR504	-----	
		FUSE:
F500	6505663R06	7A
		JACK:
J500	0980104M02	Receptacle, Bottom Entry
		JUMPER:
JU500, 501	-----	Not Placed
JU505	-----	Not Placed
JU508 thru 511	-----	Not Placed
JU512	0611077A01	0Ω
JU513	-----	Not Placed
JU514	0611077A01	0Ω
JU515 thru 517	-----	Not Placed
JU518 thru 521	0611077A01	0Ω
JU523 thru 527	0611077A01	0Ω
JU528	-----	Not Placed
JU529 thru 531	0611077A01	0Ω
JU532	-----	Not Placed
JU533	0611077A01	0Ω

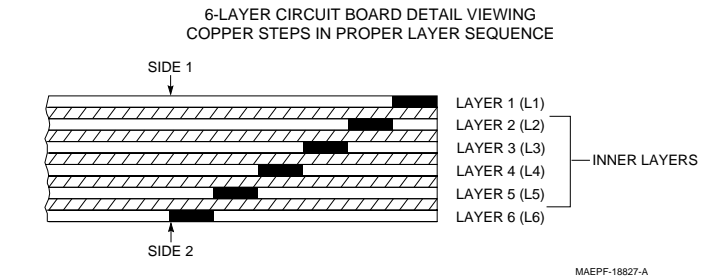
ITEM	MOTOROLA PART NUMBER	DESCRIPTION
JU534, 535	-----	Not Placed
JU536	0611077A01	0 Ω
		COIL, RF: unless otherwise stated
L500	2480067M01	Bead
L506	2480067M01	Bead
L511	2413924A13	10 μ H
L528	2480067M01	Bead
		PLUG:
P501	2805515W01	Connector
P502	0980103M02	Receptacle, Right Angle
P503	2880267M01	Header, Right Angle
		TRANSISTOR: See Note 1.
Q400	4880141L01	PNP
Q401	4880048M01	NPN
Q402	4880141L01	PNP
Q403, 404	4880048M01	NPN
Q500	4813822D39	PNP
Q501	4880053M02	PNP
Q502	4880182D46	NPN
Q503	4880141L02	NPN
Q504	4805128M27	SOT89
Q506	4805128M27	SOT89
Q507	4880048M01	NPN
Q508, 509	4805128M12	SOT
Q510	4880048M01	NPN
Q511	4880141L01	NPN
Q512	-----	Not Placed
Q513 thru 515	4880048M01	NPN
Q516, 517	-----	Not Placed
Q520	4880048M01	NPN
Q521	4880182D46	NPN
Q538	4880048M01	NPN
Q540 thru 543	4880048M01	NPN
Q554	4880048M01	NPN
Q555	4805218N11	SOT
		RESISTOR, Fixed: Ω \neq 5%
R400	0611077B03	15k
R401, 402	0611077B25	120k
R403, 404	0611077B15	47k
R405, 406	0611077A82	2.2k
R407	0611077A86	3.3k (HLN5558E and HLN6529C)
	or 0611077B15	47k (HLN5558F/G and HLN6529D/E)
R408	0611077B15	47k (HLN5558F/G and HLN6529D/E)
	or 0611077B29	180k (HLN5558E and HLN6529C)
R409, 410	0611077B11	33k
R411, 412	0611077B15	47k
R413	0611077B23	100k
R414	0611077A74	1k
R415	0611077A68	560
R416	0611077B15	47k
R417, 418	0611077A98	10k
R419	0611077B23	100k
R420	0611077B03	15k
R421	0611077B07	22k

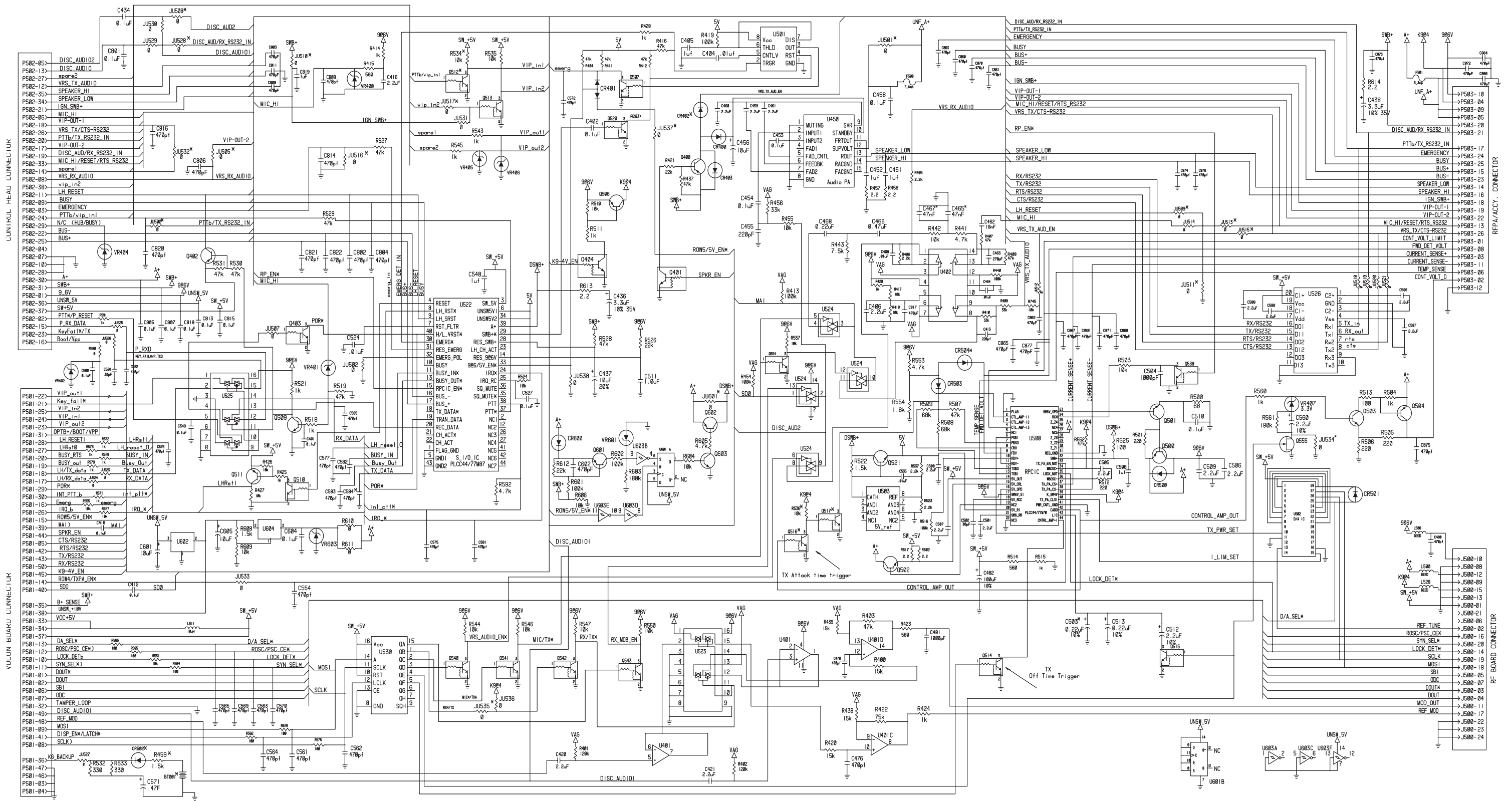
ITEM	MOTOROLA PART NUMBER	DESCRIPTION
R422	0611077B20	75k
R423	0611077A68	560
R424, 425	0611077A74	1k
R426, 427	0611077A98	10k
R428, 429	0611077A74	1k
R437	0611077B15	47k
R438, 439	0611077B03	15k
R440	0611077B23	100k
R441	0611077A90	4.7k (HLN5558F/G and HLN6529D/E)
	or 0611077B12	36k (HLN5558E and HLN6529C)
R442	0611077A95	7.5k (HLN5558E and HLN6529C)
	or 0611077A98	10k (HLN5558F/G and HLN6529D/E)
R443	0611077A95	7.5k (HLN5558F/G and HLN6529D/E)
	or 0611077B01	12k (HLN5558E and HLN6529C)
R454	0611077B23	100k
R455	0611077A98	10k
R456	0611077B11	33k
R457, 458	0611077A10	2.2
R459	-----	Not Placed
R500	0611077A46	68
R501	0611077A58	220
R502	0611077A10	2.2
R503	0611077A98	10k
R504	0611077A74	1k
R505, 506	0611077A58	220
R507	0611077B15	47k
R508, 509	0611077B19	68k
R510	0611077A98	10k
R511	0611077A74	1k
R512	0611077A58	220
R513	0611077A50	100
R514	0611077A68	560
R515	0611077A74	1k
R516	0611077B23	100k
R517	0611077A10	2.2
R518	0611077A74	1k
R519	0611077B15	47k
R520	0611077A74	1k (HLN5558G and HLN6529E)
	or 0611077A98	10k (HLN5558E/F and HLN6529C/D)
R521	0611077A74	1k
R522	0611077A78	1.5k
R523	0611077A82	2.2k
R524	0611077A98	10k
R525	0611077A50	100
R526	0611077B07	22k
R527 thru 531	0611077B15	47k
R532, 533	0611077A62	330
R534	-----	Not Placed
R535	0611077A98	10k
R536	-----	Not Placed
R537	0611077A82	2.2k
R543	0611077A74	1k
R544	0611077A98	10k
R545	0611077A74	1k
R546, 547	0611077A98	10k

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
R550, 551	0611077A98	10k
R552	0611077B15	47k
R553	0611077A90	4.7k
R554	0611077A80	1.8k
R555	0611077A98	10k
R557	0611077A98	10k
R560	0611077A74	1k
R561	0611077B29	180k (Not placed on HLN6529C/D/E)
R562	0611077A50	100
R565	0611077A50	100
R571 thru 573	0611077A74	1k
R575, 576	0611077A50	100
R577	0611077A98	10k
R578, 579	0611077A74	1k
R584, 585	0611077A50	100
R590	0611077A01	0
R591	0611077A74	1k
R592	0611077A90	4.7k
R745	0611077A98	10k
		INTEGRATED CIRCUIT MODULE: See Note 1.
U401, 402	5183222M49	Differential Amp
U450	5180065C19	Audio Amplifier
U500	5180057S01	Regulator/Power Control
U501	5113815G02	555 Timer
U502	5180057S02	D/A Converter
U503	5180056M02	Voltage Regulator
U522	5180057S04	Serial I/O
U523	5113806A20	MUX/DEMUX, Triple 2-Ch
U524	5182400T11	Analog Switch, Quad
U525	5113806A20	MUX/DEMUX, Triple 2-Ch
U526	5113811A11	RS232-C Driver
U530	5105492X76	8-Bit Shift Register
		DIODE: See Note 1.
VR400	4813830A28	Zener; 15V
VR401	4813830A24	Zener; 11V
VR402	4813830A28	Zener 15V
VR403	4813830A22	Zener; 9.1V (HLN5558E/F and HLN6529C/D)
	or 4813830A26	Zener; 13V (HLN5558G and HLN6529E)
VR404 thru 406	4813830A28	Zener 15V
VR407	4805129M27	
		MISCELLANEOUS:
	8405885V05	Command Board

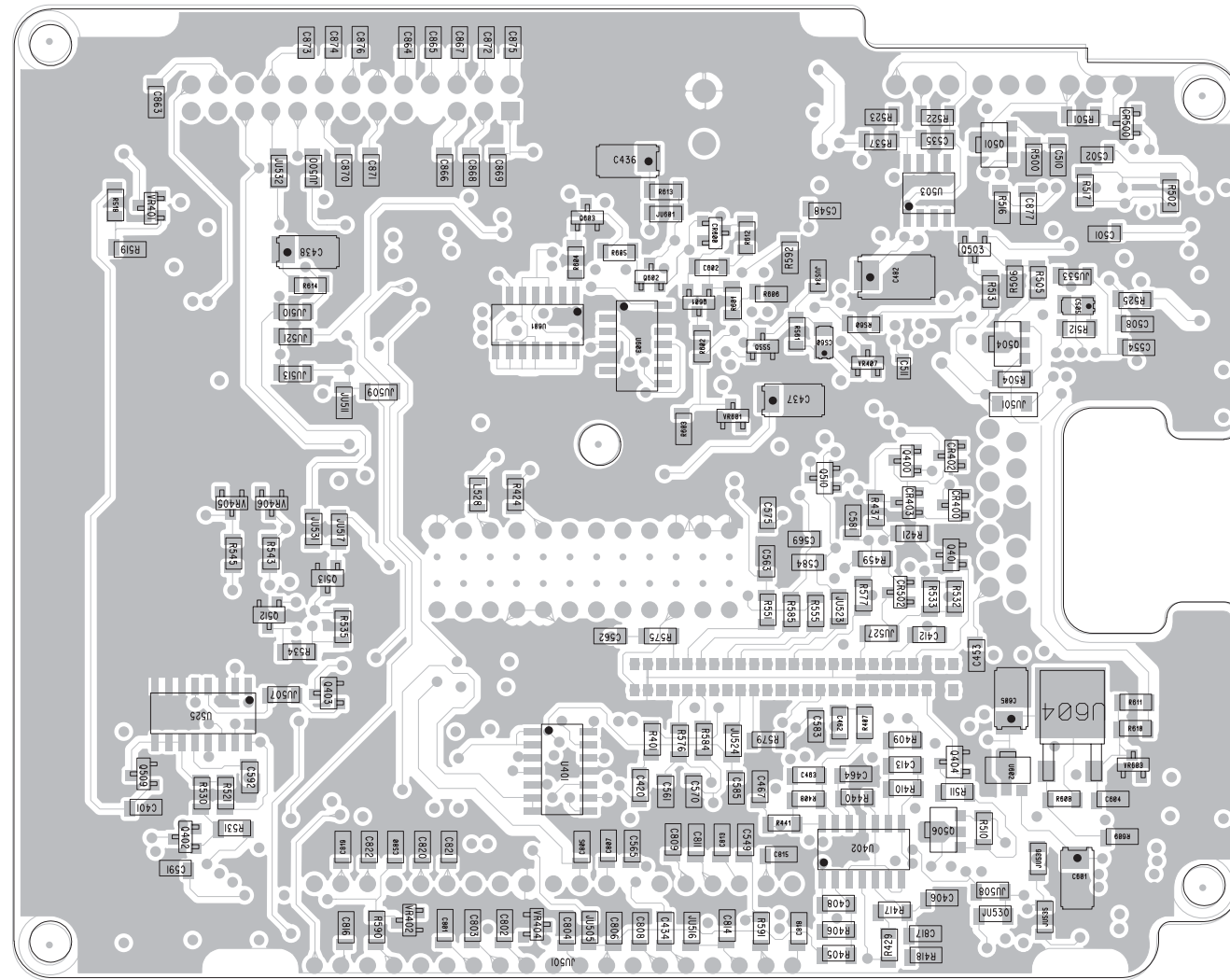
Notes:

- For optimum performance, order replacement diodes, transistors, and circuit modules by Motorola part number only.
- Part value notations:
 $p=10^{-12}$ $m=10^{-3}$
 $n=10^{-9}$ $k=10^3$
 $\mu=10^{-6}$ $M=10^6$
- ITEM refers to the component reference designator. SIDE refers to the location of the component on the board; S1=Side 1, S2=Side 2.
- Command boards use a 6-layer printed circuit board.

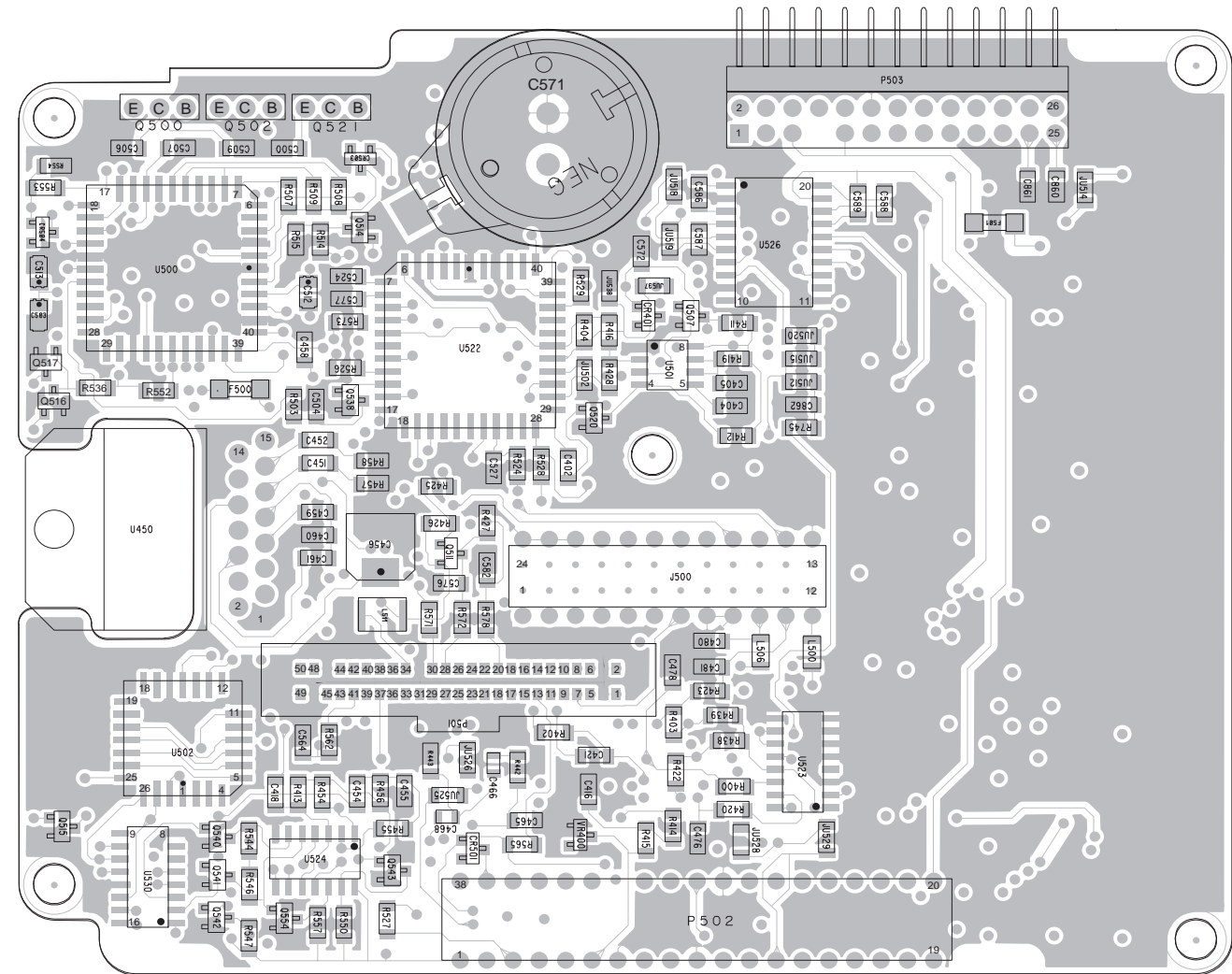




HLN5558H/J, HLN6529H, HLN6560J and HLN6562J Command Board Schematic Diagram



side 1



side 2

HLN5558H/J, HLN6529H, HLN6560J and HLN6562J Component Location Diagram

Command Boards Reference Designator and Part Number Comparison Chart

The following table lists those reference designators common to the various command board kits and the part numbers assigned to those designators for each kit and version.

Ref Des	HLN5558J Part Number	HLN6529H Part Number	HLN6560J Part Number	HLN6562J Part Number
C571	2105285X01	NOTPLACED	2105285X01	2105285X01
JU500	NOTPLACED	NOTPLACED	0611077A01	0611077A01
JU513	NOTPLACED	NOTPLACED	0611077A01	0611077A01
JU518	0611077A01	0611077A01	NOTPLACED	NOTPLACED
JU519	0611077A01	0611077A01	NOTPLACED	0611077A01
JU521	0611077A01	0611077A01	NOTPLACED	NOTPLACED
JU528	NOTPLACED	NOTPLACED	0611077A01	NOTPLACED
JU532	NOTPLACED	NOTPLACED	NOTPLACED	0611077A01

HLN5558H/J, HLN6529H, HLN6560J and HLN6562J Parts List

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
BT001	-----	NOTPLACED
C401	2113741N69	CAP CHIP CL2 X7R 10% 100000
C402	2113741N69	CAP CHIP CL2 X7R 10% 100000
C404	2113741N45	CAP CHIP CL2 X7R 10% 10000
C405	2113743G21	CER CHIP CAP 1.0 UF
C406	2113743G24	CAP CHIP 2.2 UF 16V +80- 20%
C408	2113741N45	CAP CHIP CL2 X7R 10% 10000
C412	2113741N69	CAP CHIP CL2 X7R 10% 100000
C413	2113740B57	CAP CHIP REEL CL1 +/-30 220
C416	2113743G24	CAP CHIP 2.2 UF 16V +80- 20%
C418	2113741N69	CAP CHIP CL2 X7R 10% 100000
C420	2113743G24	CAP CHIP 2.2 UF 16V +80- 20%
C421	2113743G24	CAP CHIP 2.2 UF 16V +80- 20%
C434	2113741N69	CAP CHIP CL2 X7R 10% 100000
C436	2311049J09	CAP TANT CHIP 3.3 10 35
C437	2311049J26	CAP TANT CHIP 10 20 16

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
C438	2311049J09	CAP TANT CHIP 3.3 10 35
C451 & C452	2113743G21	CER CHIP CAP 1.0 UF
C453	2113741N69	CAP CHIP CL2 X7R 10% 100000
C454	2113741N69	CAP CHIP CL2 X7R 10% 100000
C455	2113740B57	CAP CHIP REEL CL1 +/-30 220
C456	2380090M24	CAP ALU 10 20 50V SURF MT
C458	2113741N69	CAP CHIP CL2 X7R 10% 100000
C459 thru C461	2113743G24	CAP CHIP 2.2 UF 16V +80- 20%
C462	2113741B51	CAP CHIP CL2 X7R REEL 18000
C463	2113740B59	CAP CHIP REEL CL1 +/-30 270
C464	2113741N45	CAP CHIP CL2 X7R 10% 10000
C465	-----	NOTPLACED
C466	2113743F14	CAP CHIP .470UF +80 - 20% Y5V
C467	-----	NOTPLACED
C468	2113743F08	CER CHIP CAP .220UF
C476, C478 & C480	2113740B65	CAP CHIP REEL CL1 +/-30 470
C481	2113741N21	CAP CHIP CL2 X7R 10% 1000
C482	2311049A28	CAP TANT CHIP 100UF 6V

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
C500 & C501	2113743G24	CAP CHIP 2.2 UF 16V +80- 20%
C502	2113740B36	CAP CHIP REEL CL1 +/-30 30
C503	-----	NOTPLACED
C504	2113741N21	CAP CHIP CL2 X7R 10% 1000
C505	2311049A40	CAP TANT CHIP 2.2 10 10
C506 & C507	2113743G24	CAP CHIP 2.2 UF 16V +80- 20%
C508	2113743G21	CER CHIP CAP 1.0 UF
C509	2113743G24	CAP CHIP 2.2 UF 16V +80- 20%
C510	2113741N69	CAP CHIP CL2 X7R 10% 100000
C511	2113743F16	CAP CHIP 1.0 UF 16V +80- 20%
C512	2311049A40	CAP TANT CHIP 2.2 10 10
C513	2311049A03	CAP TANT CHIP A/P .22 10 35
C524	2113741N45	CAP CHIP CL2 X7R 10% 10000
C527	2113741N69	CAP CHIP CL2 X7R 10% 100000
C535	2113741N45	CAP CHIP CL2 X7R 10% 10000
C548	2113743G21	CER CHIP CAP 1.0 UF
C549	2113741N69	CAP CHIP CL2 X7R 10% 100000

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
C554	2113740B65	CAP CHIP REEL CL1 +/-30 470
C560	2311049A40	CAP TANT CHIP 2.2 10 10
C561	2113740B65	CAP CHIP REEL CL1 +/-30 470
C562	2113740B65	CAP CHIP REEL CL1 +/-30 470 ^{1 and 5} NOTPLACED ^{2, 3, and 4}
C563	2113740B65	CAP CHIP REEL CL1 +/-30 470
C564	2113740B65	CAP CHIP REEL CL1 +/-30 470
C565	2113740B65	CAP CHIP REEL CL1 +/-30 470
C569	2113740B65	CAP CHIP REEL CL1 +/-30 470
C570	2113740B65	CAP CHIP REEL CL1 +/-30 470
C571	2105285X01	CAP GOLD F SERIES (.47 FARAD) ^{1, 2, 4, and 5} NOT PLACED ³
C572	2113740B65	CAP CHIP REEL CL1 +/-30 470
C575	2113740B65	CAP CHIP REEL CL1 +/-30 470
C576	2113740B65	CAP CHIP REEL CL1 +/-30 470
C577	2113740B65	CAP CHIP REEL CL1 +/-30 470
C580	2113741N69	CAP CHIP CL2 X7R 10% 100000

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
C581	2113740B65	CAP CHIP REEL CL1 +/-30 470
C582	2113740B65	CAP CHIP REEL CL1 +/-30 470
C583	2113740B65	CAP CHIP REEL CL1 +/-30 470
C584	-----	NOTPLACED
C585	2113740B65	CAP CHIP REEL CL1 +/-30 470
C586 thru C589	2113743G24	CAP CHIP 2.2 UF 16V +80-20%
C591	2113740B36	CAP CHIP REEL CL1 +/-30 30
C592	2113740B65	CAP CHIP REEL CL1 +/-30 470
C601	2311049J26	CAP TANT CHIP 10 20 16 2, 3, 4, and 5
C602	2113740B65	CAP CHIP REEL CL1 +/-30 470
C604	2113741N69	CAP CHIP CL2 X7R 10% 100000
C605	2311049J26	CAP TANT CHIP 10 20 16 2, 3, 4, and 5
C801	2113741N69	CAP CHIP CL2 X7R 10% 100000
C802 thru C804	2113740B65	CAP CHIP REEL CL1 +/-30 470
C805	2113741N69	CAP CHIP CL2 X7R 10% 100000
C806	2113740B65	CAP CHIP REEL CL1 +/-30 470
C807	2113741N69	CAP CHIP CL2 X7R 10% 100000
C808, C809 & C811	2113740B65	CAP CHIP REEL CL1 +/-30 470
C813	2113741N69	CAP CHIP CL2 X7R 10% 100000
C814	2113740B65	CAP CHIP REEL CL1 +/-30 470
C815	2113741N69	CAP CHIP CL2 X7R 10% 100000
C816 & C817	2113740B65	CAP CHIP REEL CL1 +/-30 470
C818	2113741N69	CAP CHIP CL2 X7R 10% 100000
C819	2113743G21	CER CHIP CAP 1.0 UF
C820 thru C822	2113740B65	CAP CHIP REEL CL1 +/-30 470
C860 thru C877	2113740B65	CAP CHIP REEL CL1 +/-30 470
CR400	4813833C10	DIODE GEN PUR 70V MMBD6050

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
CR401	4813833C03	DIODE DUAL 70V 'A1X' BAW56LT1
CR402	-----	NOTPLACED
CR403, CR500 & CR501	4813833C10	DIODE GEN PUR 70V MMBD6050
CR502	-----	NOTPLACED
CR503	4813833C10	DIODE GEN PUR 70V MMBD6050
CR504	-----	NOTPLACED
CR600	4813833C10	DIODE GEN PUR 70V MMBD6050
F500	6505663R06	FUSE 7 AMP
F501	6505663R03	FUSE 5 AMP
J500	0980104M02	RECEPTACLE BOTTOM ENTRY
JU500	-----	NOTPLACED ^{1, 2, and 3}
	0611077A01	RES CHIP JUMPER ^{4 and 5}
JU501	-----	NOTPLACED
JU502	0611077A01	RES CHIP JUMPER
JU505	-----	NOTPLACED
JU507	0611077A01	RES CHIP JUMPER
JU508 thru JU511	-----	NOTPLACED
JU512	0611077A01	RES CHIP JUMPER
JU513	-----	NOTPLACED ^{1, 2, and 3}
	0611077A01	RES CHIP JUMPER ^{4 and 5}
JU514	0611077A01	RES CHIP JUMPER
JU515 thru JU517	-----	NOTPLACED
JU518	0611077A01	RES CHIP JUMPER ^{1, 2, and 3}
	-----	NOTPLACED ^{4 and 5}
JU519	0611077A01	RES CHIP JUMPER ^{1, 2, 3, and 5}
	-----	NOTPLACED ⁴
JU520	0611077A01	RES CHIP JUMPER
JU521	0611077A01	RES CHIP JUMPER ^{1, 2, and 3}
	-----	NOTPLACED ^{4 and 5}
JU523 thru JU527	0611077A01	RES CHIP JUMPER
JU528	-----	NOTPLACED ^{1, 2, 3, and 5}
	0611077A01	RES CHIP JUMPER ⁴
JU529 thru JU531	0611077A01	RES CHIP JUMPER
JU532	-----	NOTPLACED
JU533	0611077A01	RES CHIP JUMPER
JU534, JU535	-----	NOTPLACED
JU536	0611077A01	RES CHIP JUMPER
JU537	-----	NOTPLACED
JU538	0611077A01	RES CHIP JUMPER

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
JU601	-----	NOTPLACED
L500 & L506	2480067M01	CHK RF CHIP BEAD INDUCTOR 28MZ
L511	2413924A13	IND CHIP 10.0 UH 10%
L528	2480067M01	CHK RF CHIP BEAD INDUCTOR 28MZ
P501	2805515W01	CONN PLUG
P502	0980103M02	RECEPTACLE RIGHT ANGLE
P503	2880267M01	PLUG RIGHT ANGLE HDR 26 POS
Q400	4880141L01	TSTR PNP SOT23 LO PROFILE TAPE
Q401	4880048M01	TSTR NPN DIG 47K/47K
Q402	4880141L01	TSTR PNP SOT23 LO PROFILE TAPE
Q403 & Q404	4880048M01	TSTR NPN DIG 47K/47K
Q500	4813822D39	TSTR PNP 60V 7A 2N5194
Q501	4880053M02	TSTR NPN MXT2222A
Q502	4880182D46	TSTR NPN 2N5190
Q503	4880141L02	TSTR NPN SOT23 LO PROFILE TAPE
Q504 & Q506	4805128M27	TSTR SOT89 BSR33 LH
Q507	4880048M01	TSTR NPN DIG 47K/47K
Q508	4805218N50	TSTR SOT BCW 60B (RH)
Q509	4805128M12	TSTR SOT BCW 60B (RH)
Q510	4880048M01	TSTR NPN DIG 47K/47K
Q511	4880141L01	TSTR PNP SOT23 LO PROFILE TAPE
Q512	-----	NOTPLACED
Q513 thru Q515	4880048M01	TSTR NPN DIG 47K/47K
Q516 & Q517	-----	NOTPLACED
Q520	4880048M01	TSTR NPN DIG 47K/47K
Q521	4880182D46	TSTR NPN 2N5190
Q538	4880048M01	TSTR NPN DIG 47K/47K
Q540 thru Q543	4880048M01	TSTR NPN DIG 47K/47K
Q554	4880048M01	TSTR NPN DIG 47K/47K
Q555	4805218N11	XISTOR SOT RH BST82
Q601 & Q602	4880141L01	TSTR PNP SOT23 LO PROFILE TAPE
Q603	4805128M12	TSTR SOT BCW 60B (RH) 2, 3, 4, and 5
R400	0611077B03	RES CHIP 15K 5 1/8W
R401 & R402	0611077B25	RES CHIP 120K 5 1/8W
R403 & R404	0611077B15	RES CHIP 47K 5 1/8W
R405 & R406	0611077A82	RES CHIP 2200 5 1/8
R407 & R408	0611077B15	RES CHIP 47K 5 1/8W

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
R409 & R410	0611077B11	RES CHIP 33K 5 1/8W
R411 & R412	0611077B15	RES CHIP 47K 5 1/8W
R413	0611077B23	RES CHIP 100K 5 1/8W
R414	0611077A74	RES CHIP 1000 5 1/8
R415	0611077A68	RES CHIP 560 5 1/8W
R416	0611077B15	RES CHIP 47K 5 1/8W
R417 & R418	0611077A98	RES CHIP 10K 5 1/8W
R419	0611077B23	RES CHIP 100K 5 1/8W
R420	0611077B03	RES CHIP 15K 5 1/8W
R421	0611077B07	RES CHIP 22K 5 1/8W
R422	0611077B20	RES CHIP 75K 5 1/8W
R423	0611077A68	RES CHIP 560 5 1/8W
R424 & R425	0611077A74	RES CHIP 1000 5 1/8
R426 & R427	0611077A98	RES CHIP 10K 5 1/8W
R428 & R429	0611077A74	RES CHIP 1000 5 1/8
R437	0611077B15	RES CHIP 47K 5 1/8W
R438 & R439	0611077B03	RES CHIP 15K 5 1/8W
R440	0611077B23	RES CHIP 100K 5 1/8W
R441	0611077A90	RES CHIP 4700 5 1/8
R442	0611077A98	RES CHIP 10K 5 1/8W
R443	0611077A95	RES CHIP 7500 5 1/8
R454	0611077B23	RES CHIP 100K 5 1/8W
R455	0611077A98	RES CHIP 10K 5 1/8W
R456	0611077B11	RES CHIP 33K 5 1/8W
R457 & R458	0611077A10	RES CHIP 2.2 5 1/8W
R459	-----	NOTPLACED
R500	0611077A46	RES CHIP 68 5 1/8W
R501	0611077A58	RES CHIP 220 5 1/8W
R502	0611077A10	RES CHIP 2.2 5 1/8W
R503	0611077A98	RES CHIP 10K 5 1/8W
R504	0611077A74	RES CHIP 1000 5 1/8
R505 & R506	0611077A58	RES CHIP 220 5 1/8W
R507	0611077B15	RES CHIP 47K 5 1/8W
R508 & R509	0611077B19	RES CHIP 68K 5 1/8W
R510	0611077A98	RES CHIP 10K 5 1/8W
R511	0611077A74	RES CHIP 1000 5 1/8
R512	0611077A58	RES CHIP 220 5 1/8W
R513	0611077A50	RES CHIP 100 5 1/8W
R514	0611077A68	RES CHIP 560 5 1/8W
R515	0611077A74	RES CHIP 1000 5 1/8
R516	0611077B23	RES CHIP 100K 5 1/8W
R517	0611077A10	RES CHIP 2.2 5 1/8W
R518	0611077A74	RES CHIP 1000 5 1/8
R519	0611077B15	RES CHIP 47K 5 1/8W
R521	0611077A74	RES CHIP 1000 5 1/8
R522	0611077A78	RES CHIP 1500 5 1/8
R523	0611077A82	RES CHIP 2200 5 1/8
R524	0611077A98	RES CHIP 10K 5 1/8W
R525	0611077A50	RES CHIP 100 5 1/8W
R526	0611077B07	RES CHIP 22K 5 1/8W
R527	0611077B15	RES CHIP 47K 5 1/8W

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
R528 thru R531	0611077B15	RES CHIP 47K 5 1/8W
R532 & R533	0611077A62	RES CHIP 330 5 1/8W
R534	-----	NOTPLACED
R535	0611077A98	RES CHIP 10K 5 1/8W
R536	-----	NOTPLACED
R537	0611077A82	RES CHIP 2200 5 1/8
R543	0611077A74	RES CHIP 1000 5 1/8
R544	0611077A98	RES CHIP 10K 5 1/8W
R545	0611077A74	RES CHIP 1000 5 1/8
R546 & R547	0611077A98	RES CHIP 10K 5 1/8W
R550 & R551	0611077A98	RES CHIP 10K 5 1/8W
R552	0611077B15	RES CHIP 47K 5 1/8W
R553	0611077A90	RES CHIP 4700 5 1/8
R554	0611077A80	RES CHIP 1800 5 1/8
R555 & R557	0611077A98	RES CHIP 10K 5 1/8W
R560	0611077A74	RES CHIP 1000 5 1/8
R561	0611077B29	RES CHIP 180K 5 1/8W
R562 & R565	0611077A50	RES CHIP 100 5 1/8W
R571 thru R573	0611077A74	RES CHIP 1000 5 1/8
R575 & R576	0611077A50	RES CHIP 100 5 1/8W
R577	0611077A98	RES CHIP 10K 5 1/8W
R578 & R579	0611077A74	RES CHIP 1000 5 1/8
R584 & R585	0611077A50	RES CHIP 100 5 1/8W
R590	0611077A01	RES CHIP JUMPER
R591	0611077A74	RES CHIP 1000 5 1/8
R592	0611077A90	RES CHIP 4700 5 1/8
R601 & R602	0611077B23	RES CHIP 100K 5 1/8W
R603	0611077B29	RES CHIP 180K 5 1/8W
R604	0611077A98	RES CHIP 10K 5 1/8W
R605	0611077A90	RES CHIP 4700 5 1/8
R606	0611077A98	RES CHIP 10K 5 1/8W
R608	0611077A78	RES CHIP 1500 5 1/8
R609	0611077A98	RES CHIP 10K 5 1/8W
R610	-----	NOTPLACED
R611	0611077A01	RES CHIP JUMPER
R612	0611077B07	RES CHIP 22K 5 1/8W
R613 & R614	0611077A10	RES CHIP 2.2 5 1/8W
R745	0611077A98	RES CHIP 10K 5 1/8W
U401 & U402	5183222M49	IC AMP _3403_
U450	5180065C19	IC AUDIO PA 4.5 AMP 22W
U500	5180057S01	IC REG/PWR CONT 13" REEL
U501	5113815G02	IC TIMER 555 1455
U502	5180057S02	IC CMOS CUST DA CONV 13" REEL
U503	5180056M02	IC 2.5V PRGMBLE PREC REF SO 8
U522	5180057S04	IC CUST SER I/O 13" REEL

ITEM	MOTOROLA PART NUMBER	DESCRIPTION
U523	5113806A20	IC MUX/DEMUX,TRIPLE 2-CHNL
U524	5182400T11	IC HCMOS 04M52 QUAD SW
U525	5113806A20	IC MUX/DEMUX,TRIPLE 2-CHNL
U526	5113811A11	IC RS-232-C DVR/RCVR SNGL SUP
U530	5105492X76	IC 8 BIT SHIFT REGISTER
U601	5113806A05	IC FLIP-FLOP,DUAL D
U602	5105625U41	IC +5V REGULATOR
U603	5113806A37	IC SCHMITT TRIGGER,HEX
U604	5113816A19	IC ADJ LO DROPOUT POS REG .8A
VR400	4813830A28	DIODE 15V 5% 225MW MMBZ5245B_
VR401	4813830A24	DIODE 11V 5% 225MW MMBZ5241B_
VR402	4813830A28	DIODE 15V 5% 225MW MMBZ5245B_
VR404 thru VR406	4813830A28	DIODE 15V 5% 225MW MMBZ5245B_
VR407	4805129M27	DIODE MMBZ5226 RH
VR601	4813830A14	DIODE 5.1V 5% 225MW MMBZ5231B_
VR603	-----	NOTPLACED
	8485758A04	BD CKT COMMAND

Notes:

1. Valid in HLN6558H
2. Valid in HLN5558J
3. Valid in HLN6529J
4. Valid in HLN6560J
5. Valid in HLN6562J