

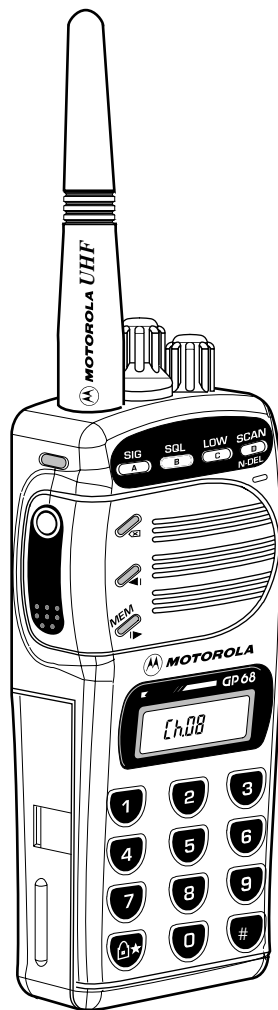


**MOTOROLA**

# GP68 Portable Radios

Service Manual - Part II

---



6881086C09-O

March, 1997



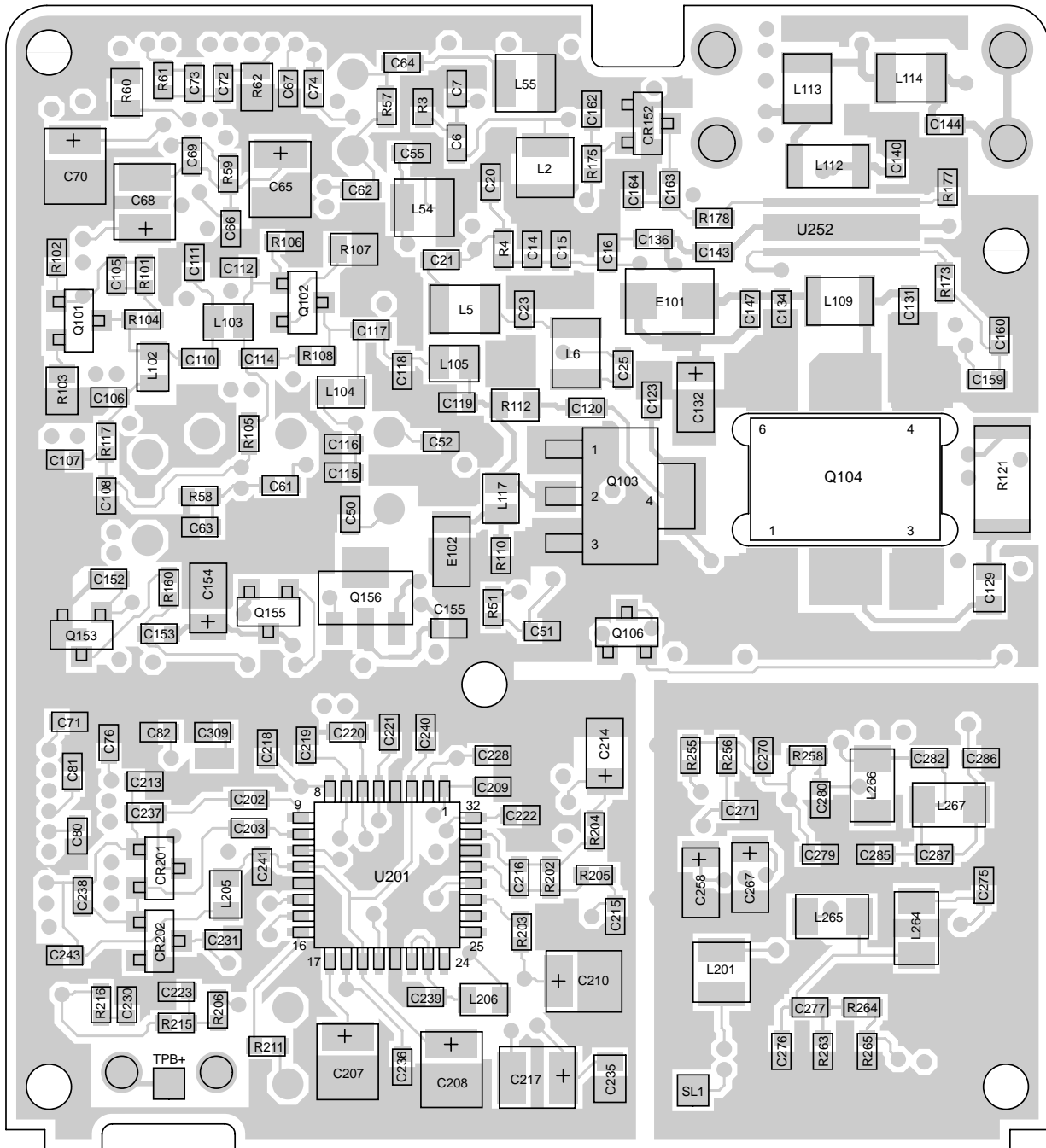
**6881086C09-O**

Motorola  
8000 W. Sunrise Blvd.  
Ft. Lauderdale, FL 33322

## **Computer Software Copyrights**

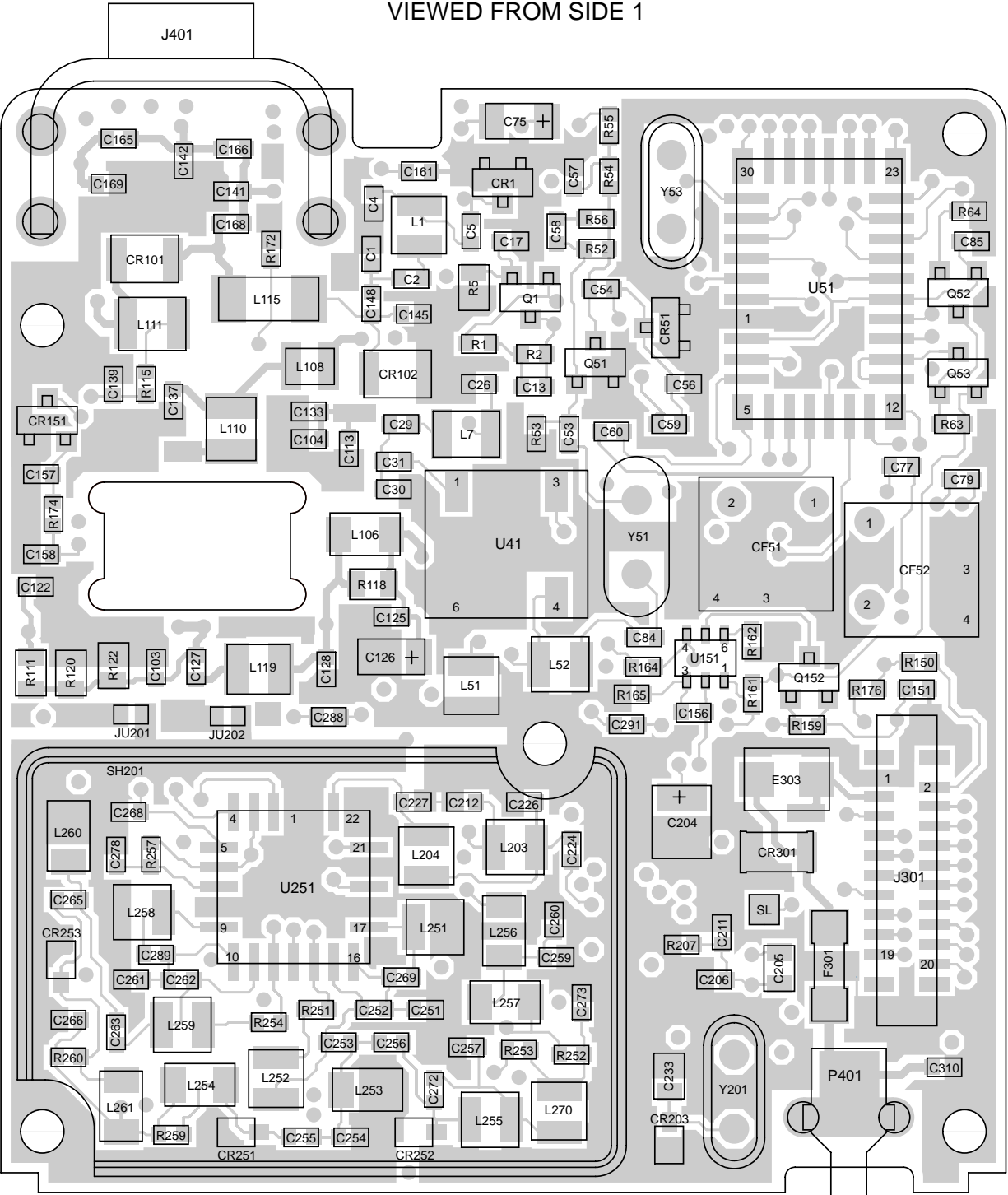
The Motorola products described in this manual may include copyrighted Motorola computer programs stored in semiconductor memories or other media. Laws in the United States and other countries preserve for Motorola certain exclusive rights for copyrighted computer programs, including the exclusive right to copy or reproduce in any form, the copyrighted computer program. Accordingly, any copyrighted Motorola computer programs contained in the Motorola products described in this manual may not be copied or reproduced in any manner without the express written permission of Motorola. Furthermore, the purchase of Motorola products shall not be deemed to grant, either directly or by implication, estoppel or otherwise, any license under the copyrights, patents or patent applications of Motorola, except for the normal non-exclusive royalty-free license to use that arises by operation of law in the sale of a product.

VIEWED FROM SIDE 2



MAEPF-25976-O

VIEWED FROM SIDE 1



MAEPF-25977-O

Parts List PMLD4036A, VHF RF Board, 20/25 KHz PMLD4037A, VHF RF Board, 12.5 KHz		
REFERENCE SYMBOL	MOTOROLA PART NO	DESCRIPTION
		<b>CAPACITOR, Fixed:pF +-5% 50V unless stated</b>
C1	2113740F37	27
C2	2113740F47	68
C4	2113740F43	47
C5	2113740F30	13
C6	2113740F24	7.5
C7	-----	Not Placed
C13	2113741F25	.001uF
C14	2113741F25	.001uF
C15	2113743K15	0.1uF
C16	2113741F49	.01uF
C17	2113741F25	.001uF
C20	2113740F42	43
C21	2113740F57	180
C23	2113740F53	120
C25	2113740F46	62
C26	2113740F52	110
C29	2113740F57	180
C30	2113740F44	51
C31	2113741F25	.001uF
C50	2113740F34	20
C51	2113740F39	33
C52	-----	Not Placed
C53	2113740F40	36
C54	2113740F38	30
C55	2113740F36	24
C56	-----	Not Placed
C57	2113743K15	0.1uF
C58	2113743K15	0.1uF
C59	2113743K15	0.1uF
C60	2113743K15	0.1uF
C61	2113740F17	3.9 +-0.25pF
C62	2113740F30	13
C63	2113740F40	36
C64	2113740F32	16
C65	2311049J11	4.7uF; 16V
C66	2113743K15	0.1uF
C67	2113743K15	0.1uF
C68	2311049J07	3.3uF; 20V
C69	2113743E11	.039uF
C70	2311049J11	4.7uF; 16V
C71	2113743K15	0.1uF
C72	2113741F49	.01uF
C73	2113741F18	510 (20/25 KHz)
	2113741F25	.001uF (12.5 KHz)
C74	2113741F29	.0015uF
C75	2311049A05	0.47uF; 25V
C76	2113741F25	.001uF
C77	2113743K15	0.1uF
C79	2113740F44	51 (20/25 KHz)
	2113740F52	110 (12.5 KHz)
C80	2113741F25	.001uF
C81	2113741F25	.001uF
C82	2113741F25	.001uF
C84	2113741F15	390
C85	2113743K15	0.1uF
C103	2113740F55	150
C104	2113740F51	100
C105	2113741F25	.001uF
C106	2113741F25	.001uF

Parts List for PMLD4036A/  
PMLD4037A VHF RF  
Board, 20/25/12.5 KHz

REFERENCE SYMBOL	MOTOROLA PART NO	DESCRIPTION
C107	2113741F25	.001uF
C108	2113743K15	0.1uF
C110	2113741F25	.001uF
C111	2113740F29	12
C112	2113740F31	15
C113	2113743K15	0.1uF
C114	2113741F25	.001uF
C115	2113741F25	.001uF
C116	2113743K15	0.1uF
C117	2113741F25	.001uF
C118	2113740F38	30
C119	2113740F38	30
C120	2113741F25	.001uF
C122	2113741F25	.001uF
C123	-----	Not Placed
C125	2113741F25	.001uF
C126	2311049A07	1uF; 16V
C127	2113741F21	680
C128	2113740F58	200
C129	2113743A19	0.1uF
C131	2113740F43	47
C132	2311049A07	1uF; 16V
C133	2113741F25	.001uF
C134	2113743K07	.047uF
C136	2113740F40	39
C137	2113740F49	82
C139	2113741F25	.001uF
C140	2113740F37	27
C141	2113740F35	22
C142	2113740F29	12
C143	2113741F25	.001uF
C144	2113741F25	.001uF
C145	2113740F30	13
C147	-----	Not Placed
C148	2113740F34	20
C151	2113743K15	0.1uF
C152	2113741F25	.001uF
C153	2113743K15	0.1uF
C154	2311049A54	3.3uF; 16V
C155	2113743K15	0.1uF
C156	2113741F17	470
C157	2113741F25	.001uF
C158	2113741F25	.001uF
C159	2113741F25	.001uF
C160	-----	Not Placed
C161	-----	Not Placed
C162	2113741F25	.001uF
C163	2113741F25	.001uF
C164	2113740F10	2.0 +-0.25pF
C165	2113740F24	7.5 +-0.25pF
C166	2113740F28	11
C168	2113740F25	8.2 +-0.25pF
C169	2113740F23	6.8 +-0.25pF
C202	2113741F49	.01uF
C203	2113741F49	.01uF
C204	2311049J11	4.7uF; 16V
C205	2113740A65	270
C206	2113740F43	47
C207	2311049J11	4.7uF; 16V
C208	2311049J11	4.7uF; 16V
C209	2113741F25	.001uF
C210	2311049J11	4.7uF; 16V
C211	-----	Not Placed
C212	2113741F25	.001uF
C213	2113743K15	0.1uF

REFERENCE SYMBOL	MOTOROLA PART NO	DESCRIPTION
C214	2311049A07	1uF; 16V
C215	2113741F43	.0056uF
C216	2113743K15	0.1uF
C217	2311049J11	4.7uF; 16V
C218	2113741F25	.001uF
C219	2113740F55	150
C220	2113740F55	150
C221	2113740F55	150
C222	2113741F25	.001uF
C223	2113740F39	33
C224	2113741F25	.001uF
C226	2113740F10	2.0 +-0.25pF
C227	2113740F33	18
C228	2113740F55	150
C230	2113743K15	0.1uF
C231	2113743K15	0.1uF
C233	2113740G19	4.7 +-0.1pF
C235	2113741A51	.018uF
C236	2113741F25	.001uF
C237	2113740F51	100
C238	2113740F51	100
C239	2113743K15	0.1uF
C240	2113743K15	0.1uF
C241	2113743K15	0.1uF
C243	2113743K15	0.1uF
C251	2113740F24	7.5 +-0.25pF
C252	2113740F21	5.6 +-0.25pF
C253	2113740F33	18
C254	-----	Not Placed
C255	2113740F44	51
C256	2113740F10	2.0 +-0.25pF
C257	2113741F25	.001uF
C258	2311049A03	0.22uF; 35V
C259	2113741F25	.001uF
C260	2113743K15	0.1uF
C261	2113740F23	6.8+-0.25pF
C262	2113740F26	9.1 +-0.25pF
C263	2113740F41	39
C265	2113740F42	43
C266	2113741F25	.001uF
C267	2311049A03	0.22uF; 35V
C268	2113741F25	.001uF
C269	2113741F25	.001uF
C270	2113741F25	.001uF
C271	2113741F25	.001uF
C272	2113740F31	15
C273	2113741F25	.001uF
C275	2113740F26	9.1 +-0.25pF
C276	2113740F26	9.1 +-0.25pF
C277	2113741F25	.001uF
C278	2113741F25	.001uF
C279	2113743K15	0.1uF
C280	2113741F25	.001uF
C282	2113740F21	5.6 +-0.25pF
C285	2113740F27	10
C286	2113740F27	10
C287	2113740F20	5.1 +-0.25pF
C288	2113740F32	16
C289	2113741F25	.001uF
C291	2113741F25	.001uF
C309	2113741F25	.001uF
C310	2113741F25	.001uF
		<b>CERAMIC FILTER:</b>
CF51	9104830J06	4 Pole; 455kHz (20/25kHz)

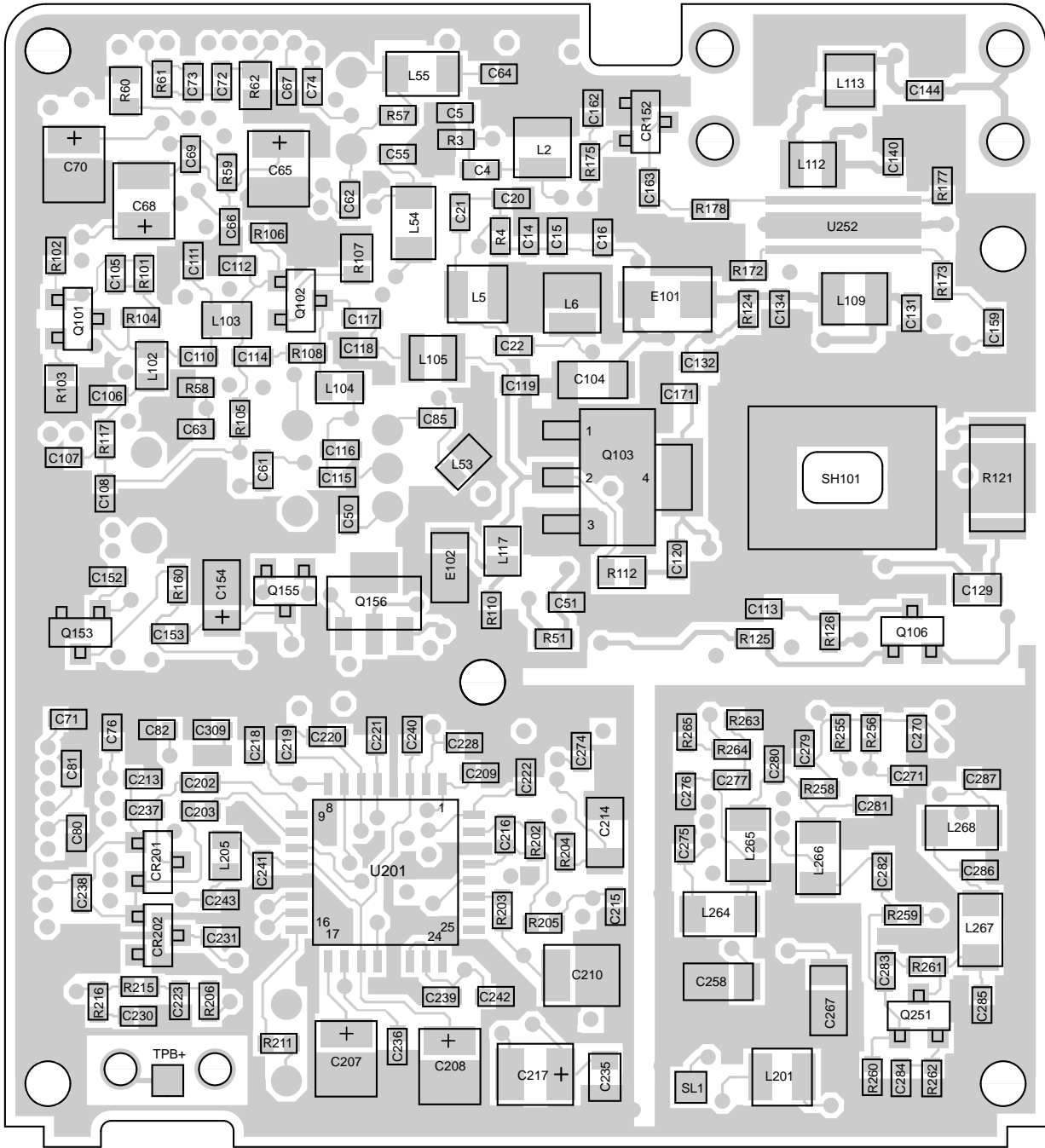
REFERENCE SYMBOL	MOTOROLA PART NO	DESCRIPTION
CF52	9180453B03 9104830J06 9180453B03	4 Pole; 455kHz (12.5 KHz) 4 Pole; 455kHz (20/25kHz) 4 Pole; 455kHz (12.5 KHz)
CR1	4880154K03	<b>DIODE:</b>
CR51	4880154K03	Dual
CR101	4880973Z02	Dual
CR102	4880973Z02	PIN
CR102	4880973Z02	PIN
CR151	4880154K03	PIN
CR152	4880154K03	Dual
CR201	4813833C07	Dual
CR202	4813833C07	Dual
CR203	4862824C03	Varactor
CR251	4862824C03	Varactor
CR252	4862824C03	Varactor
CR253	4862824C03	Varactor
CR301	4880107R01	Rectifier
E101	2484657R01	Bead
E102	2404277J01	Bead
E303	2484657R01	Bead
F301	6580561D02	<b>FUSE:</b> 3.5-Amp
J301	0904658J01	<b>CONNECTOR/JUMPER:</b> RF Connector
J401	0280689C01	Nut, Antenna
JU201	2113741F13	330
JU202	2113741F18	510
L1	2462587N50	<b>COIL, RF:</b> .056uH
L2	2462587N50	.056uH
L5	2460591E64	30.51nH
L6	2460591E64	30.51nH
L7	2460591E64	30.51nH
L51	2462587N60	0.39uH
L52	2462587N62	0.56uH
L54	2462587N60	0.39uH
L55	2462587N69	1.2uH
L102	2462587Q44	0.56uH
L103	2462587V33	.082uH
L104	2462587Q44	0.56uH
L105	2462587V27	.027uH
L106	2462587T40	.033uH
L108	2460591C04	13.9nH
L109	2460591E60	27.39nH
L110	2460591A01	4.22nH
L111	2411087B24	.068uH, molded coil
L112	2460591G24	33.47nH
L113	2460591E64	30.51nH
L114	2460591E64	30.51nH
L115	2460591K40	59.71nH
L117	2462587V23	.012uH
L119	2460591A01	4.22nH
L201	2462587N69	1.2uH
L203	2462587N69	1.2uH
L204	2462587N55	0.15uH
L205	2462587Q44	0.56uH
L206	2462587Q44	0.56uH
L251	2462587N69	1.2uH
L252	2462587N69	1.2uH
L253	2462587T13	.068uH

REFERENCE SYMBOL	MOTOROLA PART NO	DESCRIPTION
L254	2462587T16	0.12uH
L255	2462587N52	.082uH
L256	2462587T31	1.2uH
L257	2462587T31	1.2uH
L258	2462587N69	1.2uH
L259	2462587N69	1.2uH
L260	2462587T41	.039uH
L261	2462587T15	0.1uH
L264	2462587T15	0.1uH
L265	2462587T31	1.2uH
L266	2462587T15	0.1uH
L267	2462587T40	.033uH
L270	2462587N69	1.2uH
P401	3904656J01	B+ Battery Contact
Q1	4813827A07	<b>TRANSISTOR:</b> NPN
Q51	4813827A07	NPN
Q52	4880214G02	NPN
Q53	4805128M67	PNP
Q101	4880173R01	NPN
Q102	4880173R01	NPN
Q103	4880502D01	NPN
Q104	4882233P54	NPN
Q106	4880214G02	NPN
Q152	4805128M67	PNP
Q153	4880214G02	NPN
Q155	4880141L03	PNP
Q156	4805128M10	PNP
		<b>RESISTOR, Fixed: ohm +-5% .0625W unless stated</b>
R1	0662057A55	1.8k
R2	0662057A70	7.5k
R3	0662057A65	4.7k
R4	0662057A37	330
R5	0662057C19	4.7
R51	0662057A18	51
R52	0662057A85	33k
R53	0662057A75	12k
R54	0662057A56	2k
R55	0662057A25	100
R56	0662057A46	750
R57	0662057A47	820
R58	0662057A67	5.6k
R59	0662057A97	100k
R60	0662057D03	13k
R61	0662057A93	68k (20/25 KHz)
	0662057A95	82k (12.5 KHz)
R62	0662057C96	7.5k (20/25 KHz)
	0662057C99	10k (12.5 KHz)
R63	0662057A73	10k
R64	0662057A73	10k
R101	0662057A51	1.2k
R102	0662057A49	1k
R103	0662057C19	4.7
R104	0662057A40	430
R105	0662057A65	4.7k
R106	0662057A49	1k
R107	0662057C19	4.7
R108	0662057A39	390
R110	0662057A01	10
R111	0662057C50	91
R112	0662057C53	120

REFERENCE SYMBOL	MOTOROLA PART NO	DESCRIPTION
R115	0662057A39	390
R117	0662057A31	180
R118	0662057C41	39
R120	0662057C31	15
R121	0680195M18	51
R122	-----	Not Placed
R150	0662057A49	1K
R159	0662057A73	10k
R160	0662057A49	1k
R161	0662057A49	1k
R162	0662057A49	1k
R164	0662057A45	680
R165	0662057A20	62
R172	0662057A29	150
R173	0662057A21	68
R174	0662057A49	1k
R175	0662057A49	1k
R176	0662057A79	18k
R177	0662057A29	150
R178	0662057A29	150
R202	0662057A49	1k
R203	0662057B03	160k
R204	0662057A18	51
R205	0662057A57	2.

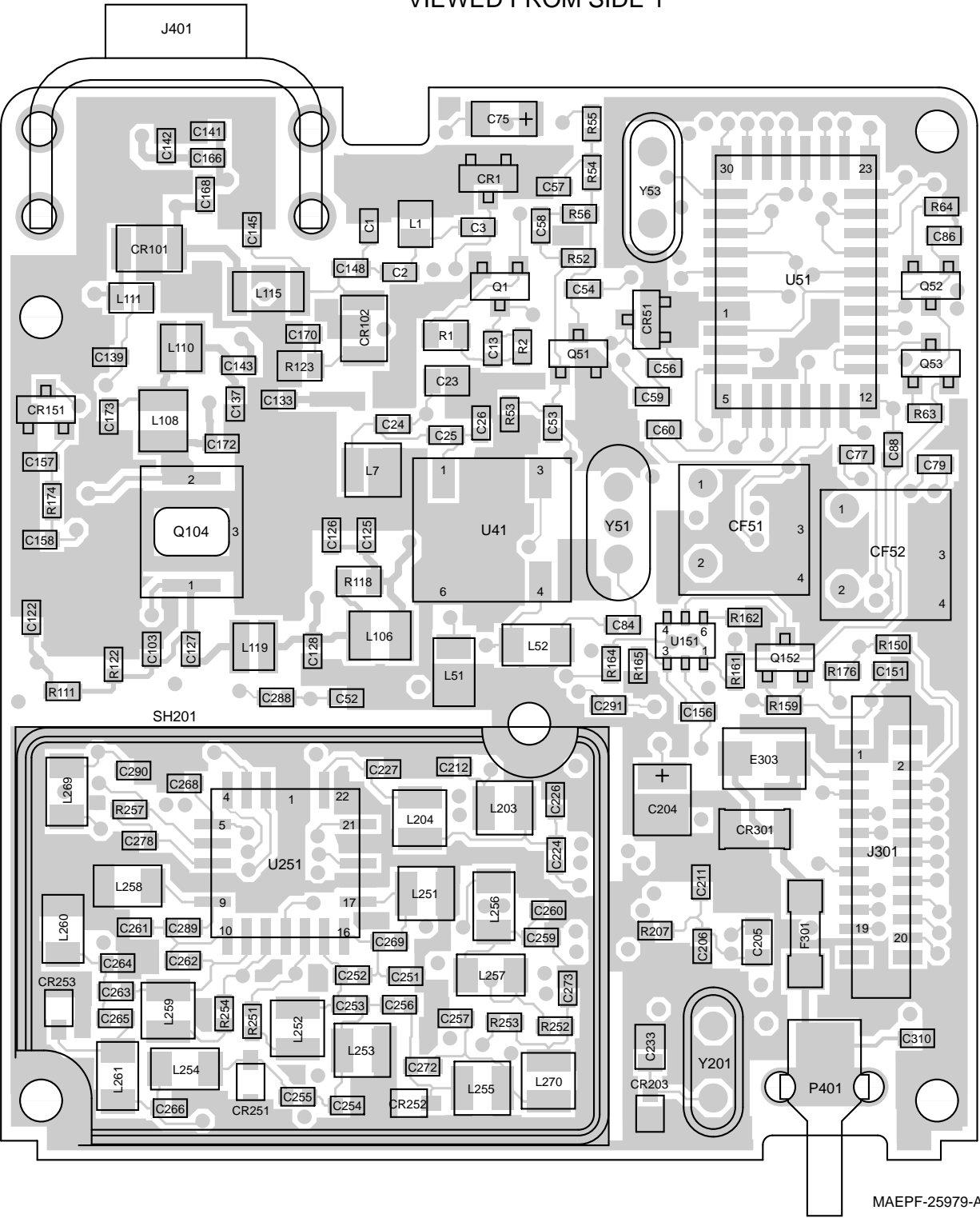


VIEWED FORM SIDE 2



MAEPF-25978-A

VIEWED FROM SIDE 1



MAEPF-25979-A

Parts List  
PMLE4023B, UHF RF Board, 20/25 kHz  
PMLE4024B, UHF RF Board, 12.5 kHz

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C1	2113740F27	<b>CAPACITOR,Fixed:±5% 50V unless stated</b>
C2	2113740F30	
C3	2113740F09	
C4	2113740F26	
C5	-----	
C13	-----	
C14	2113740F55	
C15	2113743K15	
C16	2113741F49	
C20	2113740F22	
C21	2113740F29	
C22	2113740F07	
C23	2113740G20	
C24	2113740F06	
C25	2113740F27	
C26	2113740F28	
C50	2113740F15	
C51	2113740F38	
C52	2113740F09	
C53	2113740F40	
C54	2113740F44	
C55	2113740F27	
C56	-----	
C57	2113743K15	
C58	2113743K15	
C59	2113741F49	
C60	2113743K15	
C61	2113740F12	
C62	2113740F24	
C63	2113740F22	
C64	2113740F31	
C65	2311049J11	
C66	2113743K15	
C67	2113743K15	
C68	2311049J07	
C69	2113743E11	
C70	2311049J11	
C71	2113743K15	
C72	2113741F49	
C73	2113741F18	
	2113741F25	
C74	2113741F29	
C75	2311049A05	
C76	-----	
C77	2113743K15	
C79	2113740F44	
	2113740F53	
C80	-----	
C81	-----	
C82	-----	
C84	2113740F48	
C85	2113741F21	
C86	2113743K15	
C103	2113740F38	
C104	2311049A07	
C105	2113740F55	
C106	2113740F55	
C107	2113740F55	
C108	2113741F49	

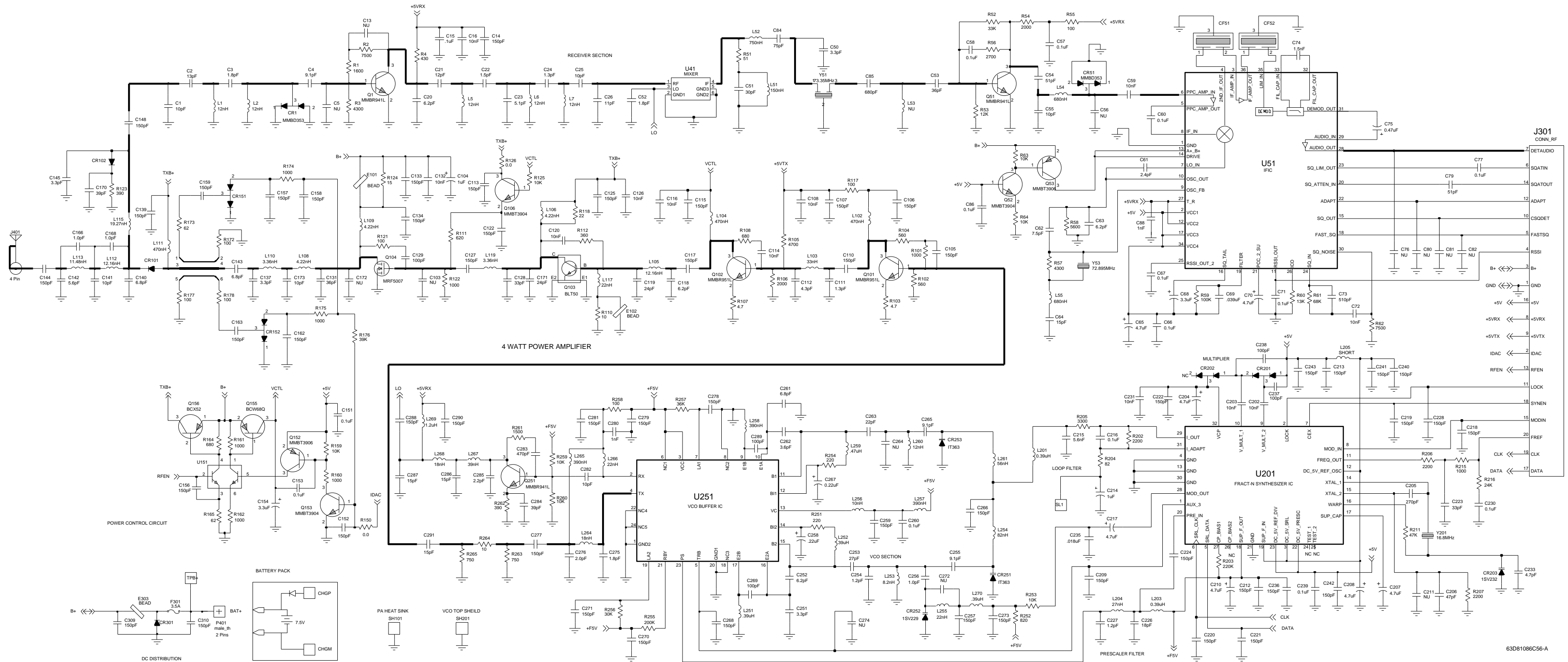
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C110	2113740F55	150
C111	2113740F06	1.3 +- 0.25pF
C112	2113740F18	4.3 +- 0.25pF
C113	2113740F55	150
C114	2113741F49	.01uF
C115	2113740F55	150
C116	2113741F49	.01uF
C117	2113740F55	150
C118	2113740F22	6.2 +- 0.25pF
C119	2113740F38	30
C120	2113741F49	.01uF
C122	2113740F55	150
C125	2113740F55	150
C126	2113741F49	.01uF
C127	2113740F42	43
C128	2113740F10	2
C129	2113743A19	0.1uF
C131	-----	Not Placed
C132	2113741F49	.01uF
C133	2113740F55	150
C134	2113740F55	150
C137	2113740F13	2.7 +- 0.25pF
C139	2113740F55	150
C140	2113740F23	6.8 +- 0.25pF
C141	2113740F27	10
C142	2113740F19	4.7 +- 0.25pF
C143	2113740F19	4.7 +- 0.25pF
C144	2113740F55	150
C145	2113740F15	3.3 +- 0.25pF
C148	2113740F55	150
C151	2113743K15	0.1uF
C152	2113740F55	150
C153	2113743K15	0.1uF
C154	2311049A54	3.3uF;16V
C156	2113740F55	150
C157	2113740F55	150
C158	2113740F55	150
C159	2113740F55	150
C162	2113740F55	150
C163	2113740F55	150
C166	2113740F03	1.0 +- 0.25pF
C168	2113740F03	1.0 +- 0.25pF
C170	2113740F41	39
C171	2113740F37	27
C172	2113740F37	27
C173	2113740F27	10
C174	-----	Not Placed
C175	-----	Not Placed
C202	2113741F49	.01uF
C203	2113741F49	.01uF
C204	2311049J11	4.7uF;16V
C205	2113740A63	220
C206	2113740F43	47
C207	2311049J11	4.7uF;16V
C208	2311049J11	4.7uF;16V
C209	2113740F55	150
C210	2311049J11	4.7uF;16V
C211	-----	Not Placed
C212	2113740F55	150
C213	2113740F55	150
C214	2311049A07	1.0uF;10V
C215	2113741F43	.0056uF
C216	2113743K15	0.1uF
C217	2311049J11	4.7uF;16V
C218	2113740F55	150
C219	2113740F55	150

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C220	2113740F55	150
C221	2113740F55	150
C222	2113740F55	150
C223	2113740F39	33
C224	2113740F55	150
C226	2113740F33	18
C227	2113740F05	1.2 +- 0.25pF
C228	2113740F55	150
C230	2113743K15	0.1uF
C231	2113741F49	.01uF
C233	2113740G28	9.1
C235	2113741A51	.018uF
C236	2113740F55	150
C237	2113740F51	100
C238	2113740F51	100
C239	2113743K15	0.1uF
C240	2113740F55	150
C241	2113740F55	150
C242	2113740F55	150
C243	2113740F55	150
C251	2113740F16	3.6 +- 0.25pF
C252	2113740F22	6.2 +- 0.25pF
C253	2113740F39	33
C254	2113740F01	0.5 +- 0.25pF
C255	2113740F27	10 +- 0.25pF
C256	2113740F03	1.0 +- 0.25pF
C257	2113740F55	150
C258	2311049A03	0.22uF;35V
C259	2113740F55	150
C260	2113743K15	0.1uF
C261	2113740F23	6.8 +- 0.25pF
C262	2113740F16	3.6 +- 0.25pF
C263	2113740F35	22
C264	-----	Not Placed
C265	2113740F26	9.1 +- 0.25pF
C266	2113740F55	150
C267	2311049A03	0.22uF;35V
C268	2113740F55	150
C269	2113743K15	0.1uF
C270	2113740F55	150
C271	2113740F55	150
C272	-----	Not Placed
C273	2113740F55	150
C274	-----	Not Placed
C275	2113740F09	1.8 +- 0.25pF
C276	2113740F10	2.0 +- 0.25pF
C277	2113740F55	150
C278	2113740F55	150
C279	2113740F55	150
C280	2113741F25	.001uF
C281	2113740F55	150
C282	2113740F27	10
C283	2113741F17	470
C284	2113740F41	39
C285	2113740F11	2.2 +- 0.25pF
C286	2113740F31	15
C287	2113740F31	15
C288	2113740F55	150
C289	2113740F51	100
C290	2113740F55	150
C291	2113740F31	15
C309	2113740F55	150
C310	2113740F55	150
CF51	9180453B06	<b>CERAMIC FILTER:</b> 4 Pole;455kHz (20/25 kHz)

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
CF52	9180453B03	4 Pole;455kHz (12.5 kHz)
	9180453B06	4 Pole;455kHz (20/25 kHz)
	9180453B03	4 Pole;455kHz (12.5 kHz)
CR1	4880154K03	DIODE: Dual
CR51	4880154K03	Dual
CR101	4880973Z02	PIN
CR102	4880973Z02	PIN
CR131	-----	Not Placed
CR151	4880154K03	Dual
CR152	4880154K03	Dual
CR201	4813833C07	Dual
CR202	4813833C07	Dual
CR203	4802245J22	Varactor
CR251	4802245J22	Varactor
CR252	4862824C01	Varactor
CR253	4802245J22	Varactor
CR301	4880107R01	Rectifier
E101	2484657R01	Bead
E102	2404277J01	Bead
E303	2484657R01	Bead
F301	6580561D02	FUSE: 3.5-Amp
J301	0904658J01	JACK: RF Connector
J401	0204852J01	Nut,Antenna

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
L258	2462587T22	0.39uH
L259	2462587N61	0.47uH
L260	2462587T35	.012uH
L261	2462587T12	.056uH
L264	2462587T37	.018uH
L265	2462587T22	0.39uH
L266	2462587T38	.022uH
L267	2462587T41	.039uH
L268	2462587T37	.018uH
L269	2462587T31	1.2uH
L270	2462587N60	0.39uH
P401	3904656J01	B+ Battery Contact
Q1	4813827A07	NPN
Q51	4813827A07	NPN
Q52	4880214G02	NPN
Q53	4805128M67	PNP
Q101	4880173R01	NPN
Q102	4880173R01	NPN
Q103	4880502D01	NPN
Q104	4802245J31	MOSFET
Q106	4880214G02	NPN
Q152	4805128M67	PNP
Q153	4880214G02	NPN
Q155	4880141L03	PNP
Q156	4805128M10	PNP
Q251	4813827A07	NPN





Schematic Diagram for  
PMLE4023B/PMLE4024B UHF  
RF Board, 20/25/12.5 KHz  
(For the 12.5 KHz RF Board  
component values, please refer  
to the parts list.)



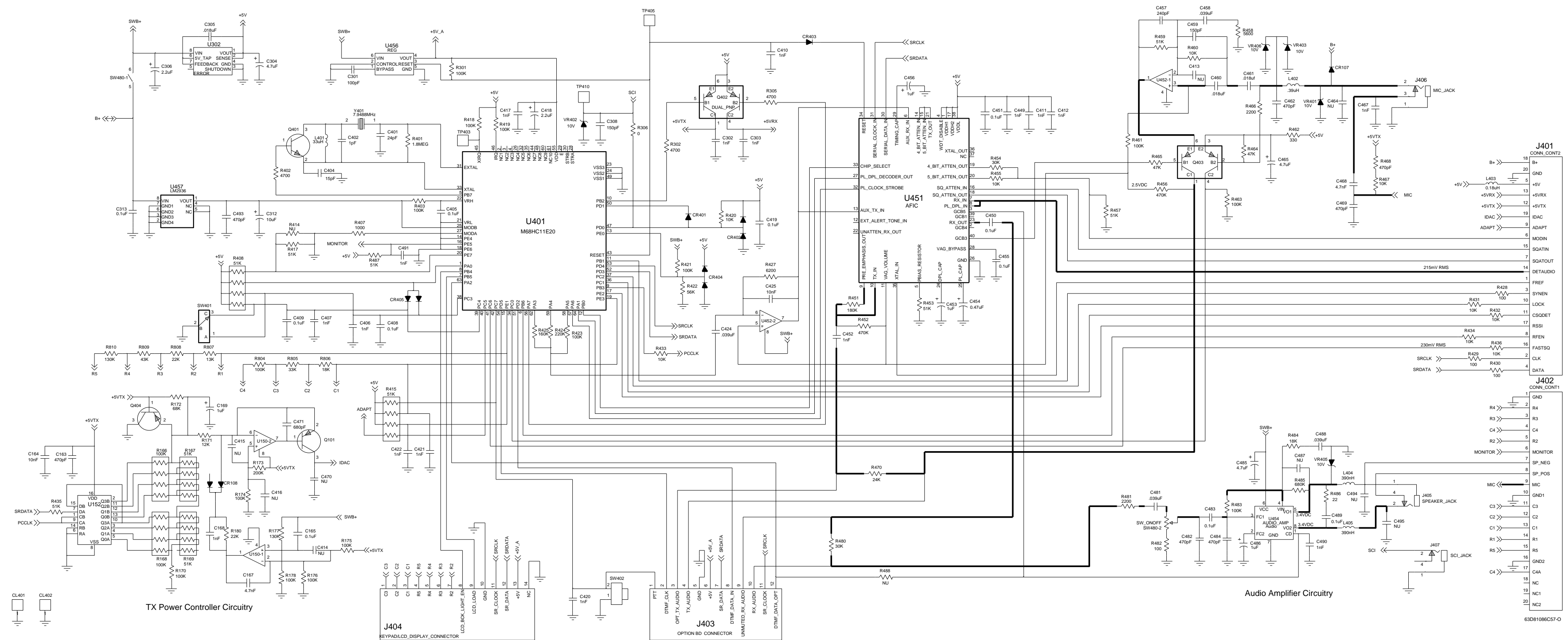
Parts List  
PMLN4059A, Controller Board, VHF 12.5/20/25 KHz

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		<b>CAPACITOR, Fixed:pF +-5%; 50V unless stated</b>
C163	2113741F17	470
C164	2113741F49	.01uF
C165	2113743K15	0.1uF
C167	2113741F41	.0047uF
C168	2113741F25	.001uF
C169	2311049A07	1uF; 16V
C301	2113740F51	100
C302	2113741F25	.001uF
C303	2113741F25	.001uF
C304	2311049J11	4.7uF;16V
C305	2113741A51	.018uF
C306	2311049A40	2.2uF; 10V
C308	2113740F55	150
C312	2311049A57	10uF; 16V
C313	2113743K15	0.1uF
C401	2113740F36	24
C402	2113740F03	1.0 +-0.25pF
C404	2113740F31	15
C405	2113743K15	0.1uF
C406	2113741F25	.001uF
C407	2113741F25	.001uF
C408	2113743K15	0.1uF
C409	2113743K15	0.1uF
C410	2113741F25	.001uF
C411	2113741F25	.001uF
C412	2113741F25	.001uF
C413	-----	Not Placed
C414	-----	Not Placed
C415	-----	Not Placed
C416	-----	Not Placed
C417	2113741F25	.001uF
C418	2311049A40	2.2uF; 10V
C419	2113743K15	0.1uF
C420	2113741F25	.001uF
C421	2113741F25	.001uF
C422	2113741F25	.001uF
C424	2113743E11	.039uF
C425	2113741F49	.01uF
C449	2113741F25	.001uF
C450	2113743K15	0.1uF
C451	2113743K15	0.1uF
C452	2113741F25	.001uF
C453	2311049A07	1uF; 16V
C454	2311049A05	0.47uF; 25V
C455	2113743K15	0.1uF
C456	2311049A07	1uF; 16V
C457	2113741F10	240
C458	2113743E11	.039uF
C459	2113740F55	150
C460	2113741A51	.018uF
C461	2113741A51	.018uF

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C462	2113741F17	470
C464	-----	Not Placed
C465	2311049J11	4.7uF;16V
C467	2113741F25	.001uF
C468	2113741F41	.0047uF
C469	2113741F17	470
C470	-----	Not Placed
C471	2113741F21	680
C481	2113743E11	.039uF
C482	2113741F17	470
C483	2113743K15	0.1uF
C484	2113741F17	470
C485	2311049J11	4.7uF;16V
C486	2311049A07	1uF; 16V
C487	-----	Not Placed
C488	2113743E11	.039uF
C489	2113743K15	0.1uF
C490	2113741F25	.001uF
C491	2113741F25	.001uF
C493	2113741F17	470
C494	-----	Not Placed
C495	-----	Not Placed
CL401	-----	<b>CLIP:</b> Not Placed
CL402	3904754J01	Contact, Ground
CR107	4880107R01	<b>DIODE:</b> Rectifier
CR108	4805218N57	Dual
CR401	4805129M76	Dual
CR402	4813833C07	Dual
CR403	4805129M76	Dual
CR404	4813833C07	Dual
CR405	4805129M24	Dual
J401	0904658J01	<b>JACK:</b> Connector, 20 Pos. Zif
J402	0904658J01	Connector, 20 Pos. Zif
J403	0904654J01	Conn. Receptacle, 12Pos
J404	0904655J01	Conn. Header, 14Pos
J405	0904659J01	Connector, Jack 3.5MM
J406	0904660J01	Connector, Jack 2.5MM
J407	0904659J01	Connector, Jack 3.5MM
L401	2460578C43	<b>COIL, RF:</b> 33uH
L402	2462587N60	0.39uH
L403	2462587N56	0.18uH
Q101	4805128M67	<b>TRANSISTOR:</b> PNP
Q401	4880214G02	NPN
Q402	5180159R03	PNP
Q403	5180159R03	PNP
Q404	4805128M67	PNP

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R166	5180682C03	<b>RESISTOR, Fixed: ohm+-5% .0625W unless stated</b> 100k, array
R167	5180682C02	51k, array
R168	5180682C03	100k, array
R169	5180682C02	51k, array
R170	0662057A97	100k
R171	0662057A75	12k
R172	0662057A93	68k
R173	0662057B05	200k
R174	0662057A97	100k
R175	0660076F01	100k
R176	0660076F01	100k
R177	0660076F04	130k
R178	0660076F01	100k
R180	0662057A81	22k
R301	0662057A97	100k
R302	0662057A65	4.7k
R305	0662057A65	4.7k
R306	0662057B47	0
R401	0662057D54	1.8M
R402	0662057A65	4.7k
R403	0660076F01	100k
R407	0662057A49	1k
R408	5180682C02	51k, array
R414	-----	Not Placed
R415	5180682C02	51k, array
R417	0662057A90	51k
R418	0662057A97	100k
R419	0662057A97	100k
R420	0662057C99	10k
R421	0660076F01	100k
R422	0660076E91	56k
R423	0662057A97	100k
R424	0662057B06	220k
R425	0662057B03	160k
R427	0662057A68	6.2k
R428	0662057A25	100
R429	0662057A25	100
R430	0662057A25	100
R431	0662057A73	10k
R432	0662057A73	10k
R433	0662057A73	10k
R434	0662057A73	10k
R435	0662057A90	51k
R436	0662057A73	10k
R451	0662057B04	180k
R452	0662057B14	470k
R453	0662057A90	51k
R454	0662057A84	30k
R455	0662057A73	10k
R456	0662057B14	470k
R457	0662057A90	51k
R458	0662057A67	5.6k
R459	0662057A90	51k

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R460	0662057A73	10k
R461	0662057A97	100k
R462	0662057A37	330
R463	0662057A97	100k
R464	0662057A89	47k
R465	0662057A89	47k
R466	0662057A97	2.2k
R467	0662057A73	10k
R468	0662057B47	0
R470	0662057A82	24k
R480	0662057A84	30k
R481	0662057C83	2.2k
R482	0662057A25	100
R483	0662057A97	100k
R484	0662057A79	18k
R485	0662057D44	680k
R486	0662057A09	22
R487	0662057A90	51k
R488	-----	Not Placed
R804	0662057A97	100k
R805	0662057A85	33k
R806	0662057A79	18k
R807	0662057A76	13k
R808	0662057A81	22k
R809	0662057A88	43k
R810	0662057B01	130k
SW401	4080551B01	<b>SWITCH:</b> Switch, 20 position
SW402	4080485C04	Switch Tactile
SW480	1880143S01	Switch, On-off/Volume
U150	5180932W01	<b>MODULE:</b> Dual Op-amp
U152	5113806A54	Shift Register
U302	5105469E65	Voltage Regulator
U401	Irreplaceable	Microcontroller
U451	5105165R77	Audio Filter
U452	5180932W01	Dual Op-amp
U454	5105469E51	Audio Amplifier
U456	5180633C01	5V Regulator
U457	5102463J15	5V Regulator
VR401	4880140L15	<b>ZENER:</b> 10V Zener
VR402	4880140L15	10V Zener
VR403	4880140L15	10V Zener
VR405	4880140L15	10V Zener
VR406	4880140L15	10V Zener
Y401	4880113R06	<b>CRYSTAL:</b> Oscillator, 7.9488MHz



Schematic Diagram for PMLN4059A & PMCD4001A Controller Board, VHF 12.5/20/25KHz

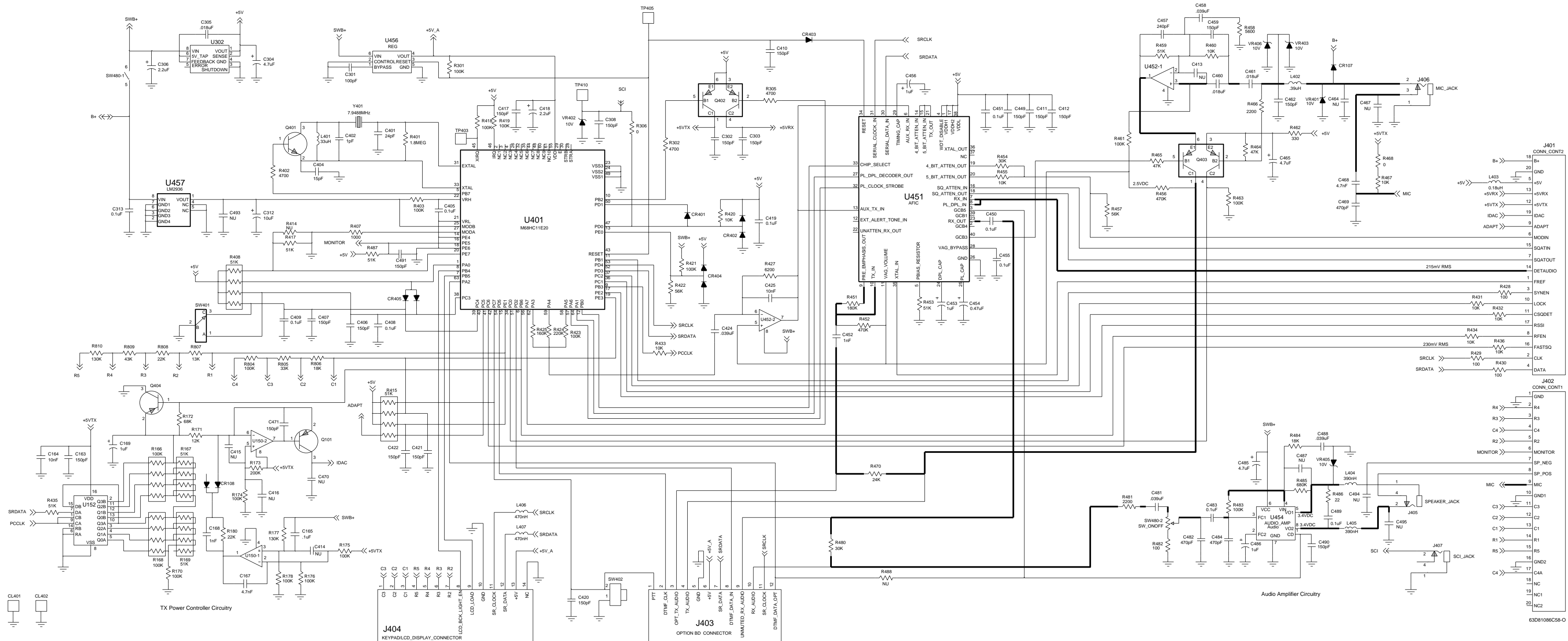


REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		<b>CAPACITOR,Fixed:pF+-5%; 50V unless stated</b>
C163	2113740F55	150pF
C164	2113741F49	.01uF
C165	2113743K15	0.1uF
C167	2113741F41	.0047uF
C168	2113741F25	.001uF
C169	-----	Not Placed
C301	2113740F51	100pF
C302	2113740F55	150pF
C303	2113740F55	150pF
C304	2311049J11	4.7uF;16V
C305	2113741A51	.018uF
C306	2311049A40	2.2uF;10V
C308	2113740F55	150pF
C312	2311049A57	10uF;16V
C313	2113743K15	0.1uF
C401	2113740F36	24pF
C402	2113740F03	1.0pF+-0.25pF
C404	2113740F31	15pF
C405	2113743K15	0.1uF
C406	2113740F55	150pF
C407	2113740F55	150pF
C408	2113743K15	0.1uF
C409	2113743K15	0.1uF
C410	2113740F55	150pF
C411	2113740F55	150pF
C412	2113740F55	150pF
C413	-----	Not Placed
C414	-----	Not Placed
C415	-----	Not Placed
C416	-----	Not Placed
C417	2113740F55	150pF
C418	2311049A40	2.2uF;10V
C419	2113743K15	0.1uF
C420	2113740F55	150pF
C421	2113740F55	150pF
C422	2113740F55	150pF
C424	2113743E11	.039uF
C425	2113741F49	.01uF
C449	2113740F55	150pF
C450	2113743K15	0.1uF
C451	2113743K15	0.1uF
C452	2113741F25	.001uF
C453	2311049A07	1uF;16V
C454	2311049A05	0.47uF;25V
C455	2113743K15	0.1uF
C456	2311049A07	1uF;16V
C457	2113741F10	240pF
C458	2113743E11	.039uF
C459	2113740F55	150pF
C460	2113741A51	.018uF
C461	2113741A51	.018uF

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
C462	2113740F55	150pF
C464	2113740F55	150pF
C465	2311049J11	4.7uF;16V
C467	-----	Not Placed
C468	2113741F41	.0047uF
C469	2113741F17	470pF
C470	-----	Not Placed
C471	2113740F55	150pF
C481	2113743E11	.039uF
C482	2113741F17	470pF
C483	2113743K15	0.1uF
C484	2113741F17	470pF
C485	2311049J11	4.7uF;16V
C486	2311049A07	1uF;16V
C487	-----	Not Placed
C488	2113743E11	.039uF
C489	2113743K15	0.1uF
C490	2113740F55	150pF
C491	2113740F55	150pF
C493	-----	Not Placed
C494	-----	Not Placed
C495	-----	Not Placed
CL401	3905643V01	<b>CLIP:</b> Contact,Ground
CL402	3904754J01	Contact,Ground
CR107	4880107R01	<b>DIODE:</b> Rectifier
CR108	4805218N57	Dual
CR401	4805129M76	Dual
CR402	4813833C07	Dual
CR403	4805129M76	Dual
CR404	4813833C07	Dual
CR405	4805129M24	Dual
J401	0904658J01	<b>JACK:</b> Connector,20Pos.Zif
J402	0904658J01	Connector,20Pos.Zif
J403	0904654J01	Conn.Receptable,12Pos
J404	0904655J01	Conn.Receptable,14Pos
J405	0904659J01	Connector,Jack3.5mm
J406	0904660J01	Connector,Jack2.5mm
J407	0904659J01	Connector,Jack3.5mm
L401	2460578C43	<b>COIL,RF:</b> 33uH
L402	2462587N60	0.39uH
L403	2462587N56	0.18uH
L406	2462587Q44	0.56uH
L407	2462587Q44	0.56uH
Q101	4805128M67	<b>TRANSISTOR:</b> PNP
Q401	4880214G02	NPN
Q402	5180159R03	PNP
Q403	5180159R03	PNP

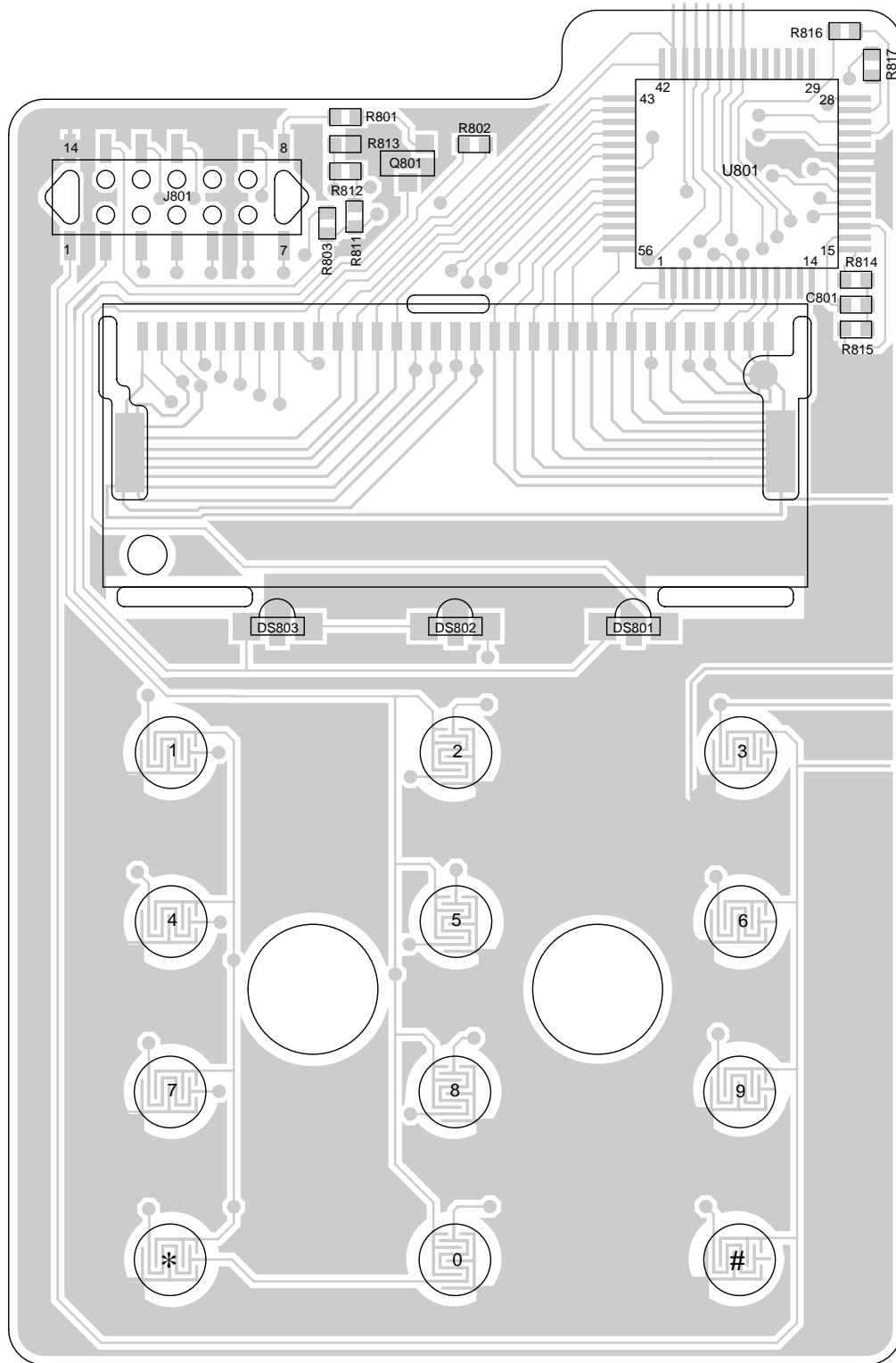
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
Q404	4805128M67	PNP  <b>RESISTOR,Fixed:ohm+-5% .0625W unless stated</b>
R166	5180682C03	100k,array
R167	5180682C02	51k,array
R168	5180682C03	100k,array
R169	5180682C02	51k,array
R170	0662057A97	100k
R171	0662057A75	12k
R172	0662057A93	68k
R173	0662057B05	200k
R174	0662057A97	100k
R175	0660076F01	100k,1%
R176	0660076F01	100k,1%
R177	0660076F04	130k,1%
R178	0660076F01	100k,1%
R180	0662057A81	22k
R301	0662057A97	100k
R302	0662057A65	4.7k
R305	0662057A65	4.7k
R306	0662057B47	0
R401	0662057D54	1.8M
R402	0662057A65	4.7k
R403	0660076F01	100k,1%
R407	0662057A49	1k
R408	5180682C02	51k,array
R414	-----	Not Placed
R415	5180682C02	51k,array
R417	0662057A90	51k
R418	0662057A97	100k
R419	0662057A97	100k
R420	0662057C99	10k
R421	0660076F01	100k,1%
R422	0660076E91	56k,1%
R423	0662057A97	100k
R424	0662057B06	220k
R425	0662057B03	160k
R427	0662057A68	6.2k
R428	0662057A25	100
R429	0662057A25	100
R430	0662057A25	100
R431	0662057A73	10k
R432	0662057A73	10k
R433	0662057A73	10k
R434	0662057A73	10k
R435	0662057A90	51k
R436	0662057A73	10k
R451	0662057B04	180k
R452	0662057B14	470k
R453	0662057A90	51k
R454	0662057A84	30k
R455	0662057A73	10k
R456	0662057B14	470k
R457	0662057A91	56k
R458	0662057A67	5.6k

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R459	0662057A90	51k
R460	0662057A73	10k
R461	0662057A97	100k
R462	0662057A37	330
R463	0662057A97	100k
R464	0662057A89	47k
R465	0662057A89	47k
R466	0662057A57	2.2k
R467	0662057A73	10k
R468	0662057B47	0
R470	0662057A82	24k
R480	0662057A84	30k
R481	0662057C83	2.2k
R482	0662057A25	100
R483	0662057A97	100k
R484	0662057A79	18k
R485	0662057D44	680k
R486	0662057A09	22
R487	0662057A90	51k
R488	-----	Not Placed
R804	0662057A97	100k
R805	0662057A85	33k
R806	0662057A79	18k
R807	0662057A76	13k
R808	0662057A81	22k
R809	0662057A88	43k
R810	0662057B01	130k
SW401	4080551B01	<b>SWITCH:</b> Switch, 20 position
SW402	4080485C04	Switch Tactile
SW480	1880143S01	Switch, On-off/Volume
U150	5180932W01	<b>MODULE:</b> Dual Op-amp
U152	5113806A54	Shift Register
U302	5105469E65	Voltage Regulator
U401	Irreplaceable	Microcontroller
U451	5105165R77	Audio Filter
U452	5180932W01	Dual Op-amp
U454	5105469E51	Audio Amplifier
U456	5180633C01	5V Regulator
U457	5102463J15	5V Regulator
VR401	4880140L15	<b>ZENER:</b> 10V Zener
VR402	4880140L15	10V Zener
VR403	4880140L15	10V Zener
VR405	4880140L15	10V Zener
VR406	4880140L15	10V Zener
Y401	4880113R06	<b>CRYSTAL:</b> Oscillator,7.9488MHz



Schematic Diagram for PMCE4000A & PMCE4002A  
Controller Board, UHF 12.5/20/25KHz

VIEWS FROM SIDE 1



MAEPF-25984-O

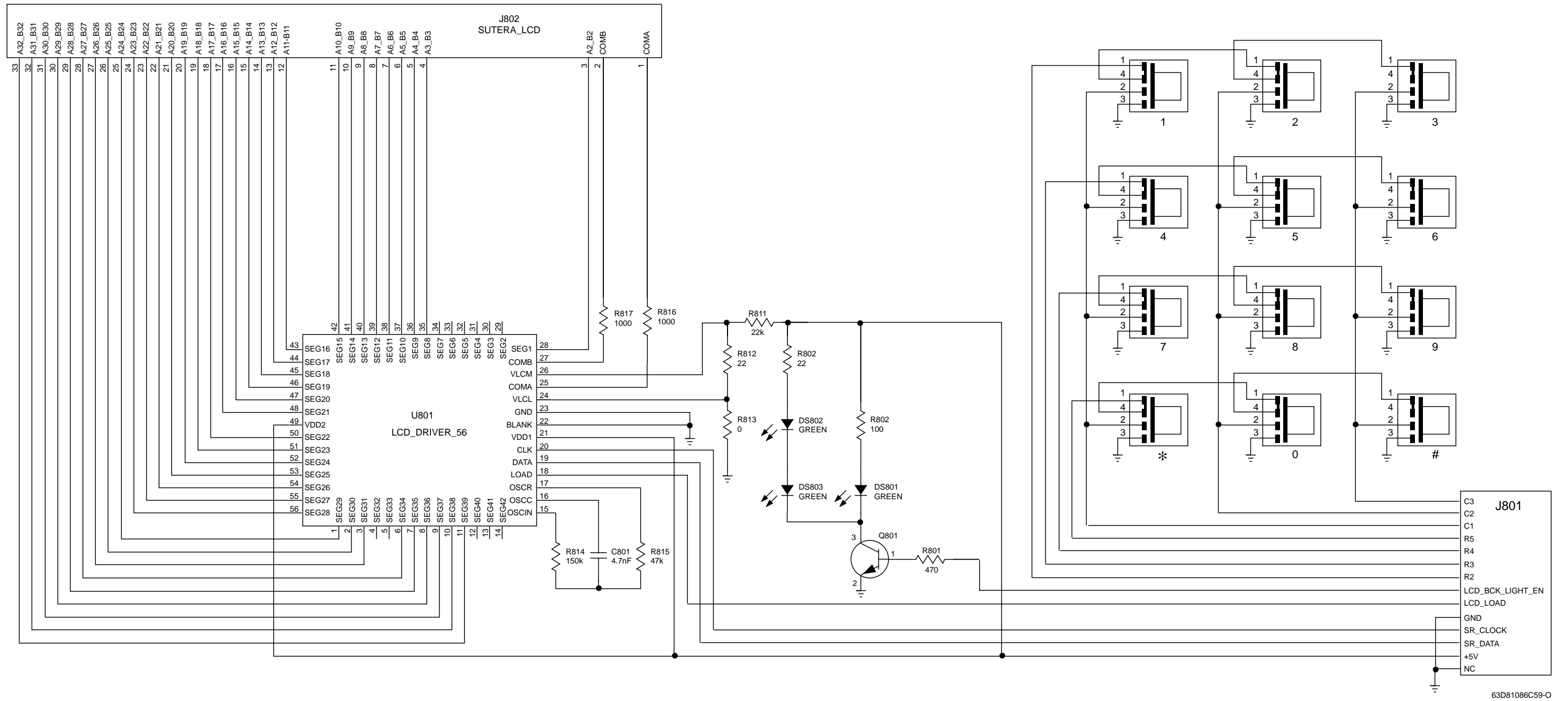
*Circuit Board Details for  
PMLN4061 Display Board*



Parts List  
PMLN4061A, Display Board 20/25 KHz

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R803	0662057A09	<b>RESISTOR, Fixed: ohm+-5% .0625W unless stated</b>
R802	0662057A25	22
R801	0662057A41	100
R816	0662057A49	470
R817	0662057A49	1k
R811	0662057A81	1k
R812	0662057A81	22k
R815	0662057A89	22k
R814	0662057B02	47k
R813	0662057B47	150k
		0
J801	0904655J01	<b>JACK:</b> Connector, Header 14 position
C801	2113741F41	<b>CAPACITOR, Fixed:pF +-5% 50V unless stated</b> .0047uF
DS801	4805729G90	<b>LED:</b> LED
DS802	4805729G90	LED
DS803	4805729G90	LED
Q801	4880214G02	<b>TRANSISTOR:</b> NPN
U801	5102463J14	<b>MODULE:</b> LCD Driver, 84 Segment
	1304695J01	<b>LCD ASSEMBLY:</b> Bezel
	3904700J01	Zebra Connector
	6104703J01	Lightpipe

*Parts List for  
PMLN4061 Display*



Schematic Diagram for  
PMLN4061 Display Board

Parts List  
GP68 Exploded View

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
1	8504762J01	Antenna
2	3604455J01	Knob, Frequency
3	3604454J01	Knob, Volume
4	1304705J01	Escutcheon
5	3280511D01	Seal, Control Shaft
6	3980514D03	Contact, RF Ground
7	3304710J01	Label, Key
8	6104704J01	Lens
9	4504708J01	Lever, PTT
10	3880502C04	Actuator
11	3804706J01	Cap, Dust-Long
12	3804707J01	Cap, Dust-Short
13	1504702J01	Housing, Front (Keypad)
	1504702J02	Housing, Front (Non-Keypad)
14	3504463J01	Felt, Speaker
15	5005256W01	Speaker
16	7504698J01	Keypad, Top Control
17	1480577C01	Boot, Microphone
18	5013920A04	Microphone Mini Electret
19	0104780J03	Mic Flex Assembly
20	7504697J01	Keypad, Main
	7509717J01	Pad, No Keys
21	PMLN4059A	GP68 Contr Board
22	PMLN4061A	GP68 Display Board
23	4304711J01	Spacer, Jack
24	0304726J01	Screw, Torx T-6
25	PMLD4036A	GP68 VHF RF Board 20/25 KHz
26	8404721J02	Board, Flexible Interconnect
27	7504724J01	Pad, Heat Conductive
28	3204693J01	Gasket, Main
29	3204701J01	Gasket, B+ Contact
30	2704692J01	Chassis
31	HLN8240A	Belt Clip Business
32	3304791J01	Label, FCC
33	0304725J02	Screw, Machine Metric
34	0304786J01	Screw, Self-Tapping M2 X 4 MM

Exploded View Parts List  
for GP68 Radio

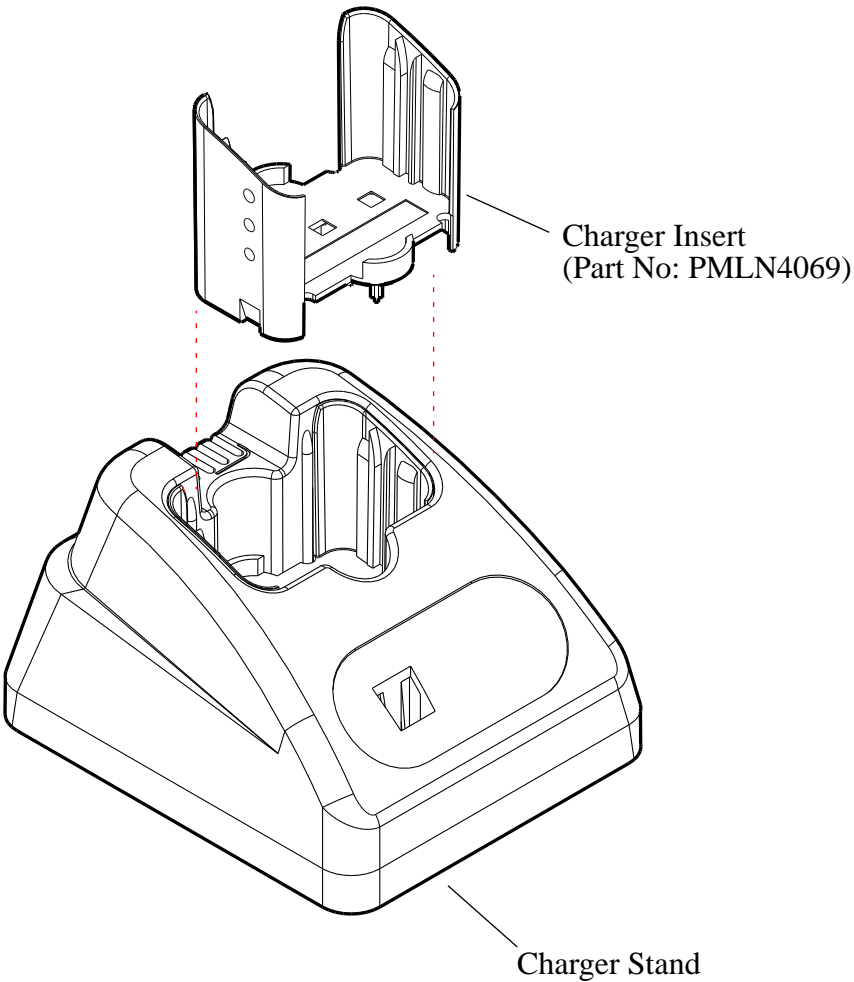
*Exploded View from manual number 6804370J41-B, Page 17*

Parts List

GP68 10 Hour (Standard) Battery Charger, Mechanical PL-941031-O

REFERENCE DESIGNATOR	MOTOROLA PART NO.	DESCRIPTION
1	1580551D02	HOUSING, standard charger
2	1380555D01	ESCUTCHEON, standard charger
3	3180554D01	HEADER, charger
5	3980553D03	CONTACT, radio position 3
6	3980553D02	CONTACT, radio position 2
7	3980553D01	CONTACT, radio position 1
8	0180707Y59	PCBA, standard charger
9	3980552D03	CONTACT, battery position 3
10	3980552D02	CONTACT, battery position 2
11	3980552D01	CONTACT, battery position 1
12	6480951Z01	BASE, charger
13	7580530C01	FEET charger; 4 used
14	3380609D04	LABEL, charger, 230 V
15	3380609D01	LABEL, charger, 120 V
16	3380609D06	LABEL, charger, 240 V
20	6180996Z01	LIGHT PIPE

Charger Exploded View from manual 6804370J41-B, Page 18



NOTE: The GP68 Radio requires the above Charger Insert (PMLN4069) during battery charging operation.

Circuit Board and Schematic drawings RPD-94127-O from manual 6804370J41-B, page 19

Parts List

GP68 10 Hour (Standard) Battery Charger, Electrical PL-941036-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
resistor, fixed:		
R201	0660076A23	82
R202	0660076A57	2.2k
R203 thru 205	0660076A27	120
R206	0660076A89	47k
R207	0660076B01	100k
R208, 209	0660076A22	75
R210	0660076A89	47k
R211	0660076B01	100k
R212	0660076A42	510
light emitting diode:		
DS201	4805729G44	red
connector, receptacle:		
J201	0980422B01	power jack
transistor:		
Q201	4805128M16	PNP
Q202	4813822A10	PNP
Q203	4880214G02	NPN
Q204	4813822A10	PNP
Q205	4805128M16	PNP
voltage regulator:		
VR201,202	4880140L05	4.7 V
VR203	4811058B05	30V

Battery Charger Standard Rate (10 Hour)  
Circuit Board, Schematic Diagram and  
Parts List



## SERVICE MANUAL QUESTIONNAIRE

We believe that reports from users provide valuable information for producing quality manuals. By taking a few moments to answer the following questions as they relate to this specific manual, you can take an active role in the continuing effort to ensure that our manuals contain the most accurate and complete information of benefit to you. Thank you for your cooperation.

**In reference to Manual Number: 6881086C09-O**

### GP68 Portable Radio

1. Please check all the appropriate boxes:

	Complete	Incomplete	Correct	Incorrect	Clear	Confusing	Size Adequate	Size Too Small	Not Covered in This Manual
Disassembly Procedures									
Alignment Procedures									
Exploded Views									
Schematic Diagrams									
Circuit Board Details									
Electrical Parts Lists									
Exploded View Parts List									

2. How would you rate the overall organization of this manual?

☐ excellent    ☐ very good    ☐ good    ☐ fair    ☐ poor

3. Did this Service manual provide you with the information necessary to service and maintain the specific equipment?

☐ very much so    ☐ generally yes    ☐ to some extent    ☐ no

4. How do you rate this particular Service Manual?

☐ excellent    ☐ very good    ☐ good    ☐ fair    ☐ poor

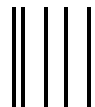
5. We would appreciate any corrections or recommendations for improving this manual. Please include the specific page number(s) of the diagram or procedure in question.

a. Disassembly Procedures:(Page No. \_\_\_\_\_ )

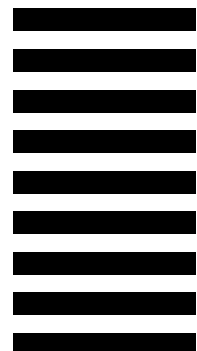
b. Alignment Procedures:(Page No. \_\_\_\_\_ )

c. Exploded Views:(Page No. \_\_\_\_\_ )





NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**  
FIRST CLASS MAIL PERMIT NO 9040 FT. LAUDERDALE, FL

POSTAGE WILL BE PAID BY ADDRESSEE



Attention: Media and Communication  
8000 W. Sunrise Boulevard  
Ft. Lauderdale, FL 33322



FOLD

FOLD

(Continued)

Please specify the page number along with any corrections or recommendations for improvement.

- d. Schematic Diagrams: (Page No. \_\_\_\_\_ )
- e. Component Location Details: (Page No. \_\_\_\_\_ )
- f. Electrical Parts List: (Page No. \_\_\_\_\_ )
- g. Exploded View Parts List: (Page No. \_\_\_\_\_ )

6. General comments/suggestions:

Name:.....

Company:.....

☐Customer      ☐COSC      ☐MSS      ☐FTR      ☐Other

Address: .....

City/State/Zip:.....

Phone Number (Please include Area Code): .....

PLEASE USE TAPE TO SEAL

POSTAL REGULATIONS PROHIBIT USE OF STAPLES