



Mar. 2010

# SERVICE MANUAL ADDENDUM

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## IC-718 IC-725B

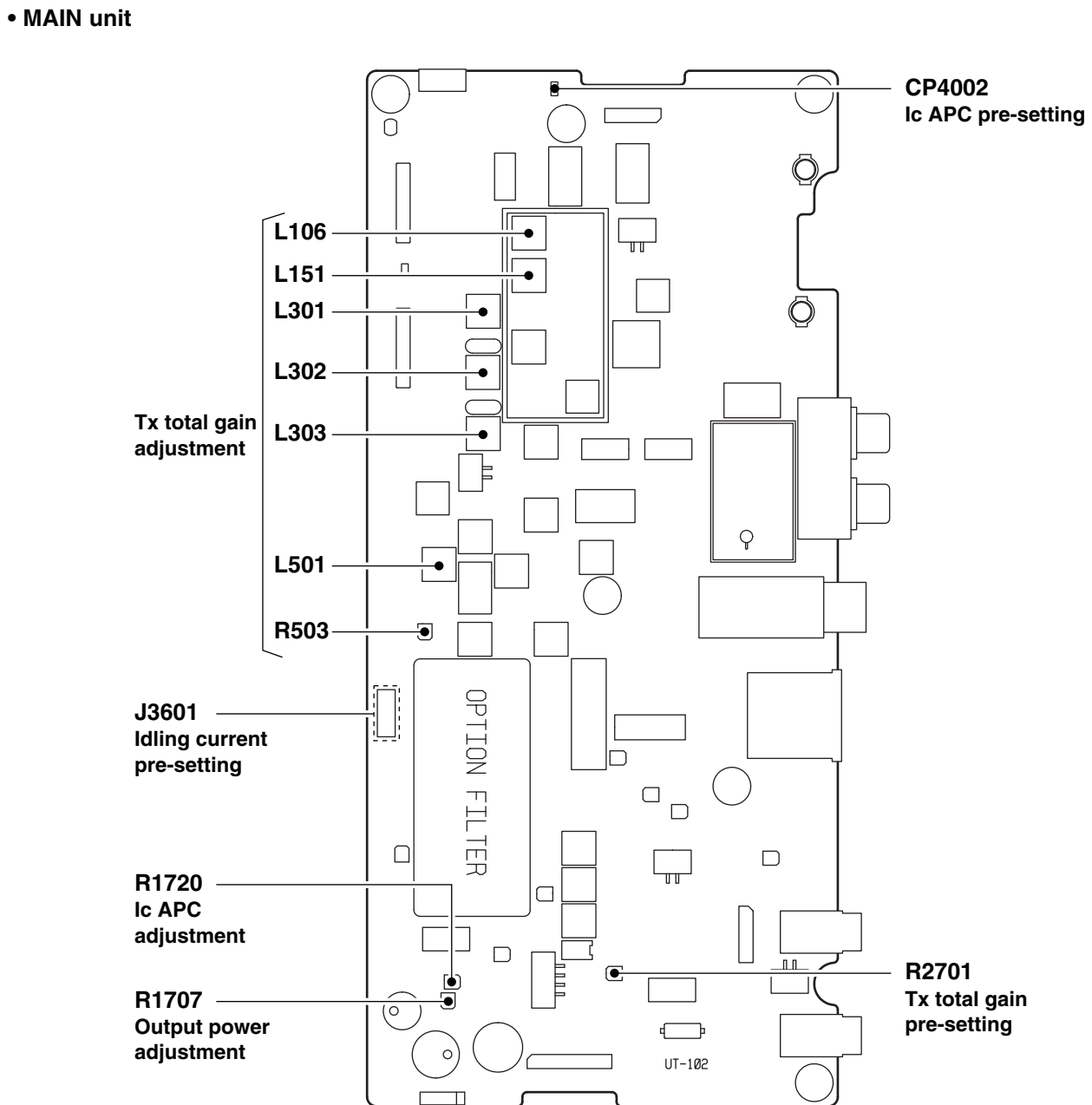
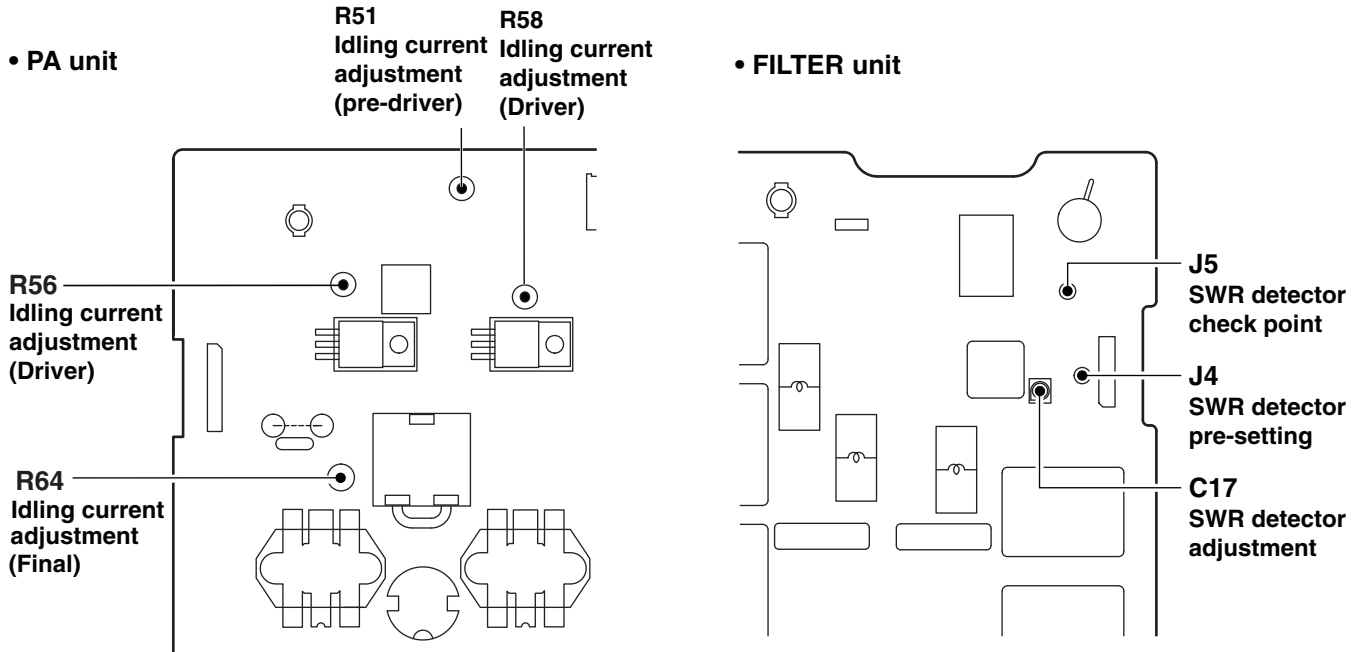
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**5-3 TRANSMITTER ADJUSTMENTS**

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT			
		UNIT	LOCATION		UNIT	ADJUST		
<b>IDLING CURRENT (for pre-driver)</b>	1	<ul style="list-style-type: none"> <li>• Display frequency : 14.10000 MHz</li> <li>• Mode : USB</li> <li>• RF power : Minimum (L)</li> <li>• Mic gain : Minimum (0)</li> <li>• Disconnect J3601 (MAIN unit) and preset R51, R56, R58, R64 (PA unit) to counterclockwise.</li> <li>• Transmitting</li> </ul>	PA	1) Connect a digital multimeter to the CP1. 2) Connect an ammeter (10 A) between the power supply and IC-718.	1) Set the voltage to 0.5 V. 2) Measure the idling current, and note it as the "initial value."	PA	R51	
	(for driver)	2	<ul style="list-style-type: none"> <li>• Transmitting</li> </ul>			+400 mA more than the initial value		R56
		3				+400 mA more than the step "2"		R58
	(for final amplifier)	4	<ul style="list-style-type: none"> <li>• Transmitting</li> </ul>			+2.0 A more than the step "3"		R64
After the "IDLING CURRENT" adjustment, recover the connection of J3601.								
<b>SWR DETECTOR</b>	1	<ul style="list-style-type: none"> <li>• Display frequency : 14.10000 MHz</li> <li>• Mode : USB</li> <li>• RF power : Maximum (H)</li> <li>• Connect J4 (FILTER unit) to GND.</li> <li>• Connect an audio generator to [MIC] connector and set as;                Frequency :1.5 kHz                Level :30 mVrms</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to [ANT] connector.	100 W	Front panel	Mic gain control in the "quick set mode."	
	2	<ul style="list-style-type: none"> <li>• Transmitting</li> </ul>	FILTER	Connect a digital multimeter to J5.	Minimum voltage	FILTER	C17	
After the "SWR DETECTOR" adjustment, recover the connection of J4.								
<b>TRANSMITTER TOTAL GAIN</b>	1	<ul style="list-style-type: none"> <li>• Display frequency : 14.10000 MHz</li> <li>• Mode : USB</li> <li>• RF power : Maximum (H)</li> <li>• R2701 (MAIN unit) : Center</li> <li>• Mic gain : Center (50)</li> <li>• Connect an audio generator to [MIC] connector and set as;                Frequency :1.5 kHz                Level :3 mVrms</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to [ANT] connector.	Maximum output power	MAIN	L106, L151, L301, L302, L303, L501	
	2	<ul style="list-style-type: none"> <li>• Transmitting</li> </ul>			50W		R503	
<b>OUTPUT POWER</b>	1	<ul style="list-style-type: none"> <li>• Display frequency : 14.10000 MHz</li> <li>• Mode : USB</li> <li>• RF power : Maximum (H)</li> <li>• Mic gain : Center (50)</li> <li>• Connect an audio generator to [MIC] connector and set as;                Frequency :1.5 kHz                Level :30 mVrms</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to [ANT] connector.	100 W	MAIN	R1707	
<b>Ic APC</b>	1	<ul style="list-style-type: none"> <li>• Display frequency : 3.55000 MHz</li> <li>• Mode : USB</li> <li>• RF power : Maximum (H)</li> <li>• Mic gain : Center (50)</li> <li>• Connect CP4002 (MAIN unit) to GND.</li> <li>• Connect an audio generator to [MIC] connector and set as;                Frequency :1.5 kHz                Level :30 mVrms</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an ammeter (30 A) between power supply and the IC-718.	22 A	MAIN	R1720	
After the "Ic APC" adjustment, recover the connection of CP4002.								















[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION
C3001	4030011600	S.CER C1608 JB 1E 104K-T
C3002	4030011600	S.CER C1608 JB 1E 104K-T
C3003	4030011600	S.CER C1608 JB 1E 104K-T
C3004	4030011600	S.CER C1608 JB 1E 104K-T
C3005	4030011600	S.CER C1608 JB 1E 104K-T
C3006	4510004591	ELE 16 ME 470 HC
C3007	4510004591	ELE 16 ME 470 HC
C3101	4030011600	S.CER C1608 JB 1E 104K-T
C3301	4030011600	S.CER C1608 JB 1E 104K-T
C3302	4030011600	S.CER C1608 JB 1E 104K-T
C3401	4510004990	ELE 16 ME 100 HC
C3402	4030011600	S.CER C1608 JB 1E 104K-T
C3403	4030011600	S.CER C1608 JB 1E 104K-T
C3404	4510004990	ELE 16 ME 100 HC
C3501	4510008520	S.ELE EEE1CA470SP
C3502	4030011600	S.CER C1608 JB 1E 104K-T
C3503	4510008570	S.ELE EEE1CA220SR
C3504	4030011600	S.CER C1608 JB 1E 104K-T
C3505	4030006880	S.CER C1608 JB 1H 472K-T
C3506	4030011600	S.CER C1608 JB 1E 104K-T
C3507	4510008520	S.ELE EEE1CA470SP
C3508	4510008520	S.ELE EEE1CA470SP
C3509	4030011600	S.CER C1608 JB 1E 104K-T
C3510	4510008540	S.ELE EEE1CA100SR
C3511	4030011600	S.CER C1608 JB 1E 104K-T
C3512	4510008520	S.ELE EEE1CA470SP
C3513	4030011600	S.CER C1608 JB 1E 104K-T
C3601	4510008540	S.ELE EEE1CA100SR
C3602	4030011600	S.CER C1608 JB 1E 104K-T
C3702	4550006390	S.TAN TEESVA 1C 335M8R
C3801	4030006880	S.CER C1608 JB 1H 472K-T
C4003	4030011600	S.CER C1608 JB 1E 104K-T
C4005	4030011600	S.CER C1608 JB 1E 104K-T
C4006	4030011600	S.CER C1608 JB 1E 104K-T
C4007	4030011600	S.CER C1608 JB 1E 104K-T
C4008	4030011600	S.CER C1608 JB 1E 104K-T
C4009	4030011600	S.CER C1608 JB 1E 104K-T
C4101	4030006880	S.CER C1608 JB 1H 472K-T
C4102	4030006880	S.CER C1608 JB 1H 472K-T
C4103	4030006880	S.CER C1608 JB 1H 472K-T
C4104	4030006880	S.CER C1608 JB 1H 472K-T
C4105	4030006880	S.CER C1608 JB 1H 472K-T
C4106	4030006880	S.CER C1608 JB 1H 472K-T
C4107	4030006880	S.CER C1608 JB 1H 472K-T
C4200	4030006880	S.CER C1608 JB 1H 472K-T
C4201	4030007090	S.CER C1608 CH 1H 470J-T
C4202	4030007090	S.CER C1608 CH 1H 470J-T
C4203	4030007090	S.CER C1608 CH 1H 470J-T
C4204	4030007090	S.CER C1608 CH 1H 470J-T
C4205	4030007090	S.CER C1608 CH 1H 470J-T
C4206	4030007090	S.CER C1608 CH 1H 470J-T
C4207	4030007090	S.CER C1608 CH 1H 470J-T
C4208	4030007090	S.CER C1608 CH 1H 470J-T
C4209	4030007090	S.CER C1608 CH 1H 470J-T
C4210	4030007090	S.CER C1608 CH 1H 470J-T
C4211	4030006880	S.CER C1608 JB 1H 472K-T
C4212	4030006880	S.CER C1608 JB 1H 472K-T
C4213	4030006880	S.CER C1608 JB 1H 472K-T
C4214	4030006880	S.CER C1608 JB 1H 472K-T
C4215	4030006880	S.CER C1608 JB 1H 472K-T
C4216	4030006880	S.CER C1608 JB 1H 472K-T
C4217	4030006880	S.CER C1608 JB 1H 472K-T
C4218	4030006880	S.CER C1608 JB 1H 472K-T
C4219	4030006880	S.CER C1608 JB 1H 472K-T
C4220	4030011600	S.CER C1608 JB 1E 104K-T
C4221	4030006880	S.CER C1608 JB 1H 472K-T
C4222	4030006880	S.CER C1608 JB 1H 472K-T
C4223	4030006880	S.CER C1608 JB 1H 472K-T
C4224	4030006880	S.CER C1608 JB 1H 472K-T
C4225	4030006880	S.CER C1608 JB 1H 472K-T
C4226	4030006880	S.CER C1608 JB 1H 472K-T
C4227	4030011600	S.CER C1608 JB 1E 104K-T
C4401	4030006880	S.CER C1608 JB 1H 472K-T
C4402	4030006880	S.CER C1608 JB 1H 472K-T
C4403	4030006880	S.CER C1608 JB 1H 472K-T
C4404	4030006880	S.CER C1608 JB 1H 472K-T
C4405	4030006880	S.CER C1608 JB 1H 472K-T
C4407	4030006880	S.CER C1608 JB 1H 472K-T
C4408	4030006880	S.CER C1608 JB 1H 472K-T
C4409	4030006880	S.CER C1608 JB 1H 472K-T
C4410	4030006880	S.CER C1608 JB 1H 472K-T
C4411	4030006880	S.CER C1608 JB 1H 472K-T
C4412	4030006880	S.CER C1608 JB 1H 472K-T
C4413	4030006880	S.CER C1608 JB 1H 472K-T
C4414	4030006880	S.CER C1608 JB 1H 472K-T
C4415	4030011600	S.CER C1608 JB 1E 104K-T
C4416	4030006880	S.CER C1608 JB 1H 472K-T
C4417	4030006880	S.CER C1608 JB 1H 102K-T
C4501	4030006880	S.CER C1608 JB 1H 472K-T
C4502	4030006860	S.CER C1608 JB 1H 102K-T
C4648	4030006880	S.CER C1608 JB 1H 472K-T
C4651	4030006880	S.CER C1608 JB 1H 472K-T
C4653	4030006880	S.CER C1608 JB 1H 472K-T
C4654	4030006880	S.CER C1608 JB 1H 472K-T
C4655	4030006880	S.CER C1608 JB 1H 472K-T
C4656	4030006880	S.CER C1608 JB 1H 472K-T
C4659	4030006880	S.CER C1608 JB 1H 472K-T
C4660	4030006880	S.CER C1608 JB 1H 472K-T
C4661	4030006880	S.CER C1608 JB 1H 472K-T
C4662	4030006880	S.CER C1608 JB 1H 472K-T
C4801	4030006880	S.CER C1608 JB 1H 472K-T
C4802	4030006880	S.CER C1608 JB 1H 472K-T
C4803	4030006880	S.CER C1608 JB 1H 472K-T
C5001	4030006860	S.CER C1608 JB 1H 102K-T

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION
C5101	4030006880	S.CER C1608 JB 1H 472K-T
C5102	4030006880	S.CER C1608 JB 1H 472K-T
RL4801	6330001320	REL AHY103
J1	6510007020	CON TMP-J01X-V6
J201	6510018961	S.CON B2B-PH-SM4-TB(LF)(SN)
J401	6510018961	S.CON B2B-PH-SM4-TB(LF)(SN)
J701	6510007020	CON TMP-J01X-V6
J2001	6510018961	S.CON B2B-PH-SM4-TB(LF)(SN)
J2501	6510019191	S.CON 52365-0871
J2602	6510018971	S.CON B4B-PH-SM4-TB(LF)(SN)
J2603	6510022621	S.CON 10FMN-BMTTR-A-TBT(LF)(SN)
J3601	6510003391	CON B03B-EH-S(LF)(SN)
J4001	6510022621	S.CON 10FMN-BMTTR-A-TBT(LF)(SN)
J4101	6510022611	S.CON 16FMN-BMTTR-A-TBT(LF)(SN)
J4201	6510021722	S.CON 30FLT-SM2-TB(LF)(SN)(M)
J4401	6510021722	S.CON 30FLT-SM2-TB(LF)(SN)(M)
J4501	6450000140	CON HSJ0807-01-010
J4502	6510018961	S.CON B2B-PH-SM4-TB(LF)(SN)
J4651	6510024661	CON TCS5072-1041577
J4801	6450000130	CON JPJ2042-01-110
J5001	6450000140	CON HSJ0807-01-010
J5101	64500001791	CON HLJ7000-016010
EP4801	6910012350	S.BEA MMZ1608Y 102BT

S.=Surface mount







[FILTER UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C51	4030014460	S.CER	GRM31M2C2H820JV01L(GRM42-6 CH)
C52	4030011550	S.CER	GRM31M2C2H680JV01L(GRM42-6 CH)
C53	4010005730	CER	HM60SJ SL 470J 500V
C54	4010005850	CER	HM95SJ SL 181J 500V
C55	4030011240	S.CER	GRM31M2C2H470JV01L(GRM42-6 CH)
C56	4010005770	CER	HM60SJ SL 820J 500V
C58	4030011240	S.CER	GRM31M2C2H470JV01L(GRM42-6 CH)
C60	4010005620	CER	HM60SJ SL 120J 500V
C61	4030014460	S.CER	GRM31M2C2H820JV01L(GRM42-6 CH)
C63	4030006870	S.CER	C1608 JB 1H 222K-T
C64	4010007590	CER	HM15SJ SL 681J 500V
C65	4010007590	CER	HM15SJ SL 681J 500V
C66	4010007590	CER	HM15SJ SL 681J 500V
C67	4010007590	CER	HM15SJ SL 681J 500V
C68	4010005930	CER	HM11SJ SL 391J 500V
C69	4010005930	CER	HM11SJ SL 391J 500V
C70	4030006880	S.CER	C1608 JB 1H 472K-T
C71	4030006880	S.CER	C1608 JB 1H 472K-T
C72	4030006880	S.CER	C1608 JB 1H 472K-T
C73	4030006880	S.CER	C1608 JB 1H 472K-T
C74	4030006880	S.CER	C1608 JB 1H 472K-T
C75	4030006880	S.CER	C1608 JB 1H 472K-T
C76	4030006880	S.CER	C1608 JB 1H 472K-T
C78	4030011730	S.CER	GRM31M2C2H101JV01L(GRM42-6 CH)
C80	4010005930	CER	HM11SJ SL 391J 500V
C81	4010005930	CER	HM11SJ SL 391J 500V
C101	4010005430	CER	HM60SJ CH 050C 500V
C103	4030011090	S.CER	GRM31M2C2H7R0DV01L(GRM42-6 CH)
C104	4030011550	S.CER	GRM31M2C2H680JV01L(GRM42-6 CH)
C107	4030011170	S.CER	GRM31M2C2H180JV01L(GRM42-6 CH)
C108	4030011510	S.CER	GRM31M2C2H560JV01L(GRM42-6 CH)
C110	4030011090	S.CER	GRM31M2C2H7R0DV01L(GRM42-6 CH)
RL1	6330001471	REL	AJS1311F-K2
RL2	6330001471	REL	AJS1311F-K2
RL3	6330001471	REL	AJS1311F-K2
RL4	6330001471	REL	AJS1311F-K2
RL5	6330001471	REL	AJS1311F-K2
RL6	6330001471	REL	AJS1311F-K2
RL7	6330001471	REL	AJS1311F-K2
RL8	6330001471	REL	AJS1311F-K2
RL9	6330001471	REL	AJS1311F-K2
RL10	6330001471	REL	AJS1311F-K2
RL11	6330001471	REL	AJS1311F-K2
RL12	6330001471	REL	AJS1311F-K2
RL13	6330001330	REL	AG 201344
J1	6510022631	CON	10FMN-BTRK-A(LF)(SN)
J2	6510007020	CON	TMP-J01X-V6
J3	6510007020	CON	TMP-J01X-V6
J4	6910001040	CON	IPS-1136
J5	6910001040	CON	IPS-1136
W2	9001502002	WIR	72/98/030/X98/X98 [USA]
	9001502002	WIR	72/98/030/X98/X98 [EUR]
	9037901027	JUM	73/98/030/X98/X98 [ITA]
	9001502002	WIR	72/98/030/X98/X98 [FRA]
	9001502002	WIR	72/98/030/X98/X98 [ESP]
	9037901027	JUM	73/98/030/X98/X98 [DEN]
	9001502002	WIR	72/98/030/X98/X98 [OTH]
	9037901027	JUM	73/98/030/X98/X98 [CHN]
	9037901027	JUM	73/98/030/X98/X98 [KOR]
	9037901027	JUM	73/98/030/X98/X98 [USA]
	9001502002	WIR	72/98/030/X98/X98 [CHN-01]
W3	6910001031	JUM	IPS-1041-4-PT
W4	6910001031	JUM	IPS-1041-4-PT

[FRONT UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
SP1	2510000671	SPE	VS-C50-0827
W3	8900014740	CAB	OPC-885A (P1,N10,L39) <TJM>
W4	8900014740	CAB	OPC-885A (P1,N10,L39) <TJM>
W5	8900014730	CAB	OPC-683A (P1,N10,L110) <TJM>
EP1	6910012480	E.O	RMS20-250-201-1R
EP2	6450001230	E.O	HLJ0999-01-4802



## [LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION
R160	7030003360	S.RES ERJ3GEYJ 221 V (220)
R161	7030003360	S.RES ERJ3GEYJ 221 V (220)
R162	7030003360	S.RES ERJ3GEYJ 221 V (220)
R163	7030003360	S.RES ERJ3GEYJ 221 V (220)
R164	7030003360	S.RES ERJ3GEYJ 221 V (220)
R165	7030003560	S.RES ERJ3GEYJ 103 V (10K)
R166	7030003360	S.RES ERJ3GEYJ 221 V (220)
R169	7030003360	S.RES ERJ3GEYJ 221 V (220)
R171	7030003360	S.RES ERJ3GEYJ 221 V (220)
R172	7030003360	S.RES ERJ3GEYJ 221 V (220)
R173	7030003360	S.RES ERJ3GEYJ 221 V (220)
R174	7030003360	S.RES ERJ3GEYJ 221 V (220)
R175	7030003360	S.RES ERJ3GEYJ 221 V (220)
R176	7030003360	S.RES ERJ3GEYJ 221 V (220)
R177	7030003360	S.RES ERJ3GEYJ 221 V (220)
R179	7030003640	S.RES ERJ3GEYJ 473 V (47K)
R180	7030003640	S.RES ERJ3GEYJ 473 V (47K)
R182	7030003640	S.RES ERJ3GEYJ 473 V (47K)
R185	7030003640	S.RES ERJ3GEYJ 473 V (47K)
R186	7030003360	S.RES ERJ3GEYJ 221 V (220)
R188	7030003520	S.RES ERJ3GEYJ 472 V (4.7K)
R190	7030003440	S.RES ERJ3GEYJ 102 V (1K)
R191	7030003440	S.RES ERJ3GEYJ 102 V (1K)
R193	7030003360	S.RES ERJ3GEYJ 221 V (220)
R195	7030003640	S.RES ERJ3GEYJ 473 V (47K)
R196	7030003640	S.RES ERJ3GEYJ 473 V (47K)
R197	7030003480	S.RES ERJ3GEYJ 222 V (2.2K)
R198	7030003480	S.RES ERJ3GEYJ 222 V (2.2K)
R199	7030003430	S.RES ERJ3GEYJ 821 V (820)
R201	7030003440	S.RES ERJ3GEYJ 102 V (1K)
R211	7030003640	S.RES ERJ3GEYJ 473 V (47K)
R212	7030003360	S.RES ERJ3GEYJ 221 V (220)
W1	7030003860	S.RES ERJ3GE JPW V
W70	7030003860	S.RES ERJ3GE JPW V
W101	7030003860	S.RES ERJ3GE JPW V
W102	7030003860	S.RES ERJ3GE JPW V
C1	4030007030	S.CER C1608 CH 1H 150J-T
C2	4030007030	S.CER C1608 CH 1H 150J-T
C3	4030006900	S.CER C1608 JB 1H 103K-T
C4	4030011600	S.CER C1608 JB 1E 104K-T
C5	4510008540	S.ELE EEE1CA100SR
C6	4030011600	S.CER C1608 JB 1E 104K-T
C7	4510008550	S.ELE EEE1HA010SR
C8	4030011600	S.CER C1608 JB 1E 104K-T
C9	4030006900	S.CER C1608 JB 1H 103K-T
C11	4030011600	S.CER C1608 JB 1E 104K-T
C12	4510008540	S.ELE EEE1CA100SR
C13	4510008540	S.ELE EEE1CA100SR
C14	4030011600	S.CER C1608 JB 1E 104K-T
C15	4030011600	S.CER C1608 JB 1E 104K-T
C16	4510008540	S.ELE EEE1CA100SR
C17	4510008540	S.ELE EEE1CA100SR
C18	4030011600	S.CER C1608 JB 1E 104K-T
C19	4510008540	S.ELE EEE1CA100SR
C20	4030011600	S.CER C1608 JB 1E 104K-T
C21	4030011600	S.CER C1608 JB 1E 104K-T
C22	4030011600	S.CER C1608 JB 1E 104K-T
C40	4030007130	S.CER C1608 CH 1H 101J-T
C41	4030007130	S.CER C1608 CH 1H 101J-T
C42	4030006880	S.CER C1608 JB 1H 472K-T
C43	4030006880	S.CER C1608 JB 1H 472K-T
C44	4030006880	S.CER C1608 JB 1H 472K-T
C45	4030006880	S.CER C1608 JB 1H 472K-T
C46	4030006880	S.CER C1608 JB 1H 472K-T
C47	4030006880	S.CER C1608 JB 1H 472K-T
C101	4030011600	S.CER C1608 JB 1E 104K-T
C102	4030006860	S.CER C1608 JB 1H 102K-T
C103	4030009110	S.CER C3216 JB 1C 474K-T
C111	4030011600	S.CER C1608 JB 1E 104K-T
C112	4030011600	S.CER C1608 JB 1E 104K-T
C113	4030011600	S.CER C1608 JB 1E 104K-T
C114	4030011600	S.CER C1608 JB 1E 104K-T
J1	6510020421	S.CON S4B-PH-SM4-TB(LF)(SN)
J3	6510022621	S.CON 10FMN-BMTTR-A-TBT(LF)(SN)
J4	6510022621	S.CON 10FMN-BMTTR-A-TBT(LF)(SN)
J5	6510022621	S.CON 10FMN-BMTTR-A-TBT(LF)(SN)
J6	6510021722	S.CON 30FLT-SM2-TB(LF)(SN)(M)
J7	6510021722	S.CON 30FLT-SM2-TB(LF)(SN)(M)
J9	6510022611	S.CON 16FMN-BMTTR-A-TBT(LF)(SN)
DS1	5030002490	LCD A0087A LCD83.5*45.5*1.1T LCD
DS70	5040002940	S.LED TLYU1002A(T02)
DS71	5040002940	S.LED TLYU1002A(T02)
DS72	5040002940	S.LED TLYU1002A(T02)
DS73	5040002940	S.LED TLYU1002A(T02)
DS74	5040002940	S.LED TLYU1002A(T02)
DS75	5040002940	S.LED TLYU1002A(T02)
DS76	5040002940	S.LED TLYU1002A(T02)
DS77	5040002940	S.LED TLYU1002A(T02)
DS78	5040002940	S.LED TLYU1002A(T02)
DS79	5040002940	S.LED TLYU1002A(T02)
DS80	5040002940	S.LED TLYU1002A(T02)
DS81	5040002940	S.LED TLYU1002A(T02)
DS82	5040002940	S.LED TLYU1002A(T02)
DS83	5040002940	S.LED TLYU1002A(T02)
DS84	5040002940	S.LED TLYU1002A(T02)
DS85	5040002940	S.LED TLYU1002A(T02)

## [LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION
DS86	5040002940	S.LED TLYU1002A(T02)
DS87	5040002940	S.LED TLYU1002A(T02)
DS88	5040002940	S.LED TLYU1002A(T02)
DS89	5040002940	S.LED TLYU1002A(T02)
DS90	5040002940	S.LED TLYU1002A(T02)
EP2	6910012350	S.BEA MMZ1608Y 102BT
EP40	6910012350	S.BEA MMZ1608Y 102BT
EP45	6910012350	S.BEA MMZ1608Y 102BT
EP46	6910012350	S.BEA MMZ1608Y 102BT
EP70	8930051450	LCD SRCN-2241-SP-N-W (SHJ)
EP152	6910012350	S.BEA MMZ1608Y 102BT
EP155	6910012350	S.BEA MMZ1608Y 102BT
EP157	6910012350	S.BEA MMZ1608Y 102BT
EP159	6910012350	S.BEA MMZ1608Y 102BT

S.=Surface mount

[VR UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
R1	7210003040	VAR	TP96D26-22F-10KBX2-2240
R2	7210003030	VAR	TP96D00-22F-10KBX2-2240
R4	7030003540	S.RES	ERJ3GEYJ 682 V (6.8K)
J1	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [USA]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [EUR]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [ITA]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [FRA]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [ESP]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [DEN]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [OTH]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [CHN]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [KOR]
	6510022050	S.CON	10FM-1.0SP-1.9-TF [USA]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [CHN-01]

[MIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
J1	6510000191	CON	FM214-8SS(P)-1
J2	6510022621	S.CON	10FMN-BMTTR-A-TBT(LF)(SN)

S.=Surface mount

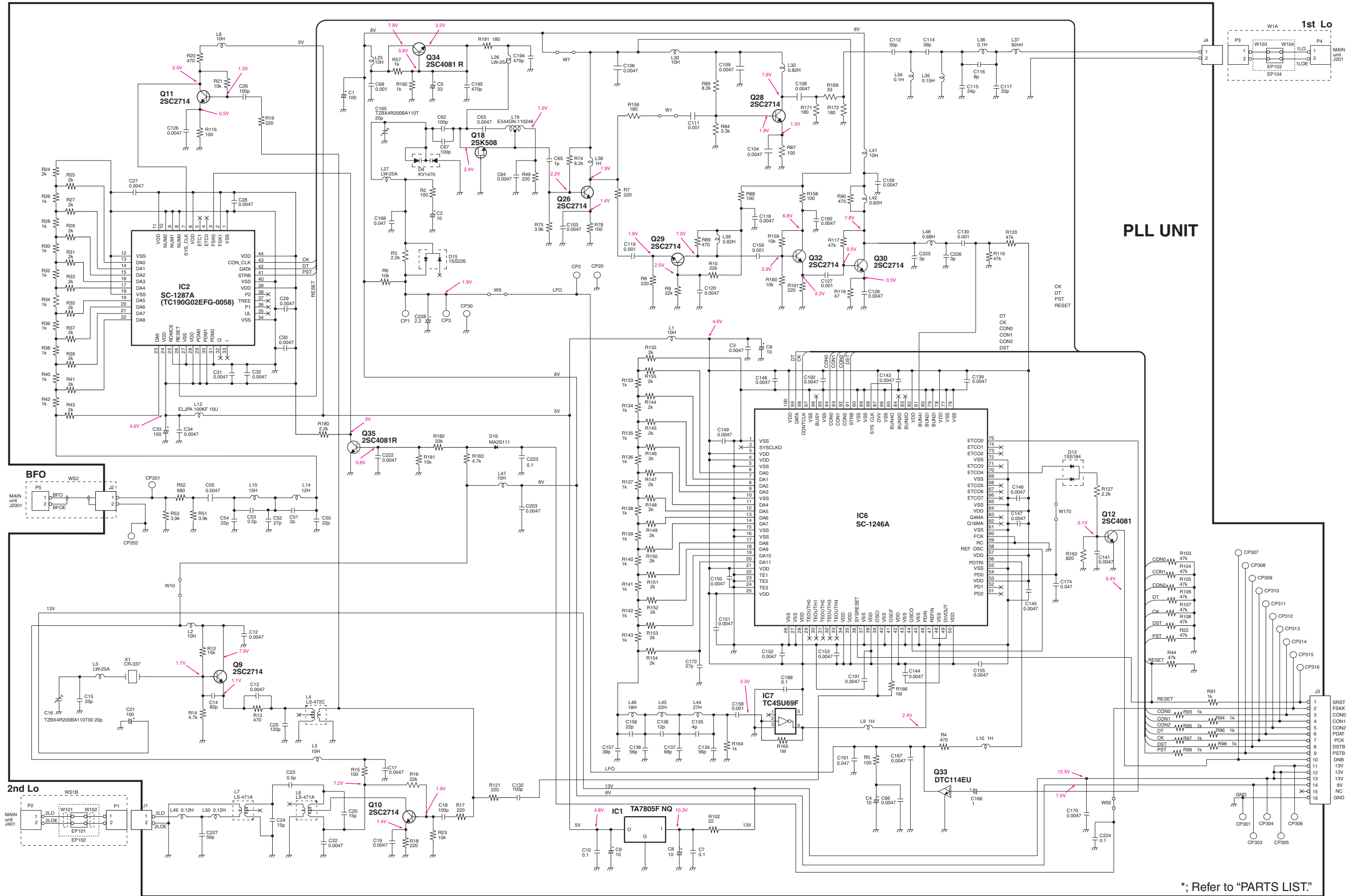


**[PHONE UNIT]**

REF NO.	ORDER NO.	DESCRIPTION
L1	6200003950	S.COI HF50ACC 322513-T
R1	7030006070	S.RES ERJ12YJ101U (100)
R2	7030006070	S.RES ERJ12YJ101U (100)
R3	7030003440	S.RES ERJ3GEYJ 102 V (1K)
C1	4030006880	S.CER C1608 JB 1H 472K-T
C2	4030006880	S.CER C1608 JB 1H 472K-T
C3	4030006880	S.CER C1608 JB 1H 472K-T
J1	6450001250	CON HLJ4306-01-3070
J2	6510022621	S.CON 10FMN-BMTTR-A-TBT(LF)(SN)

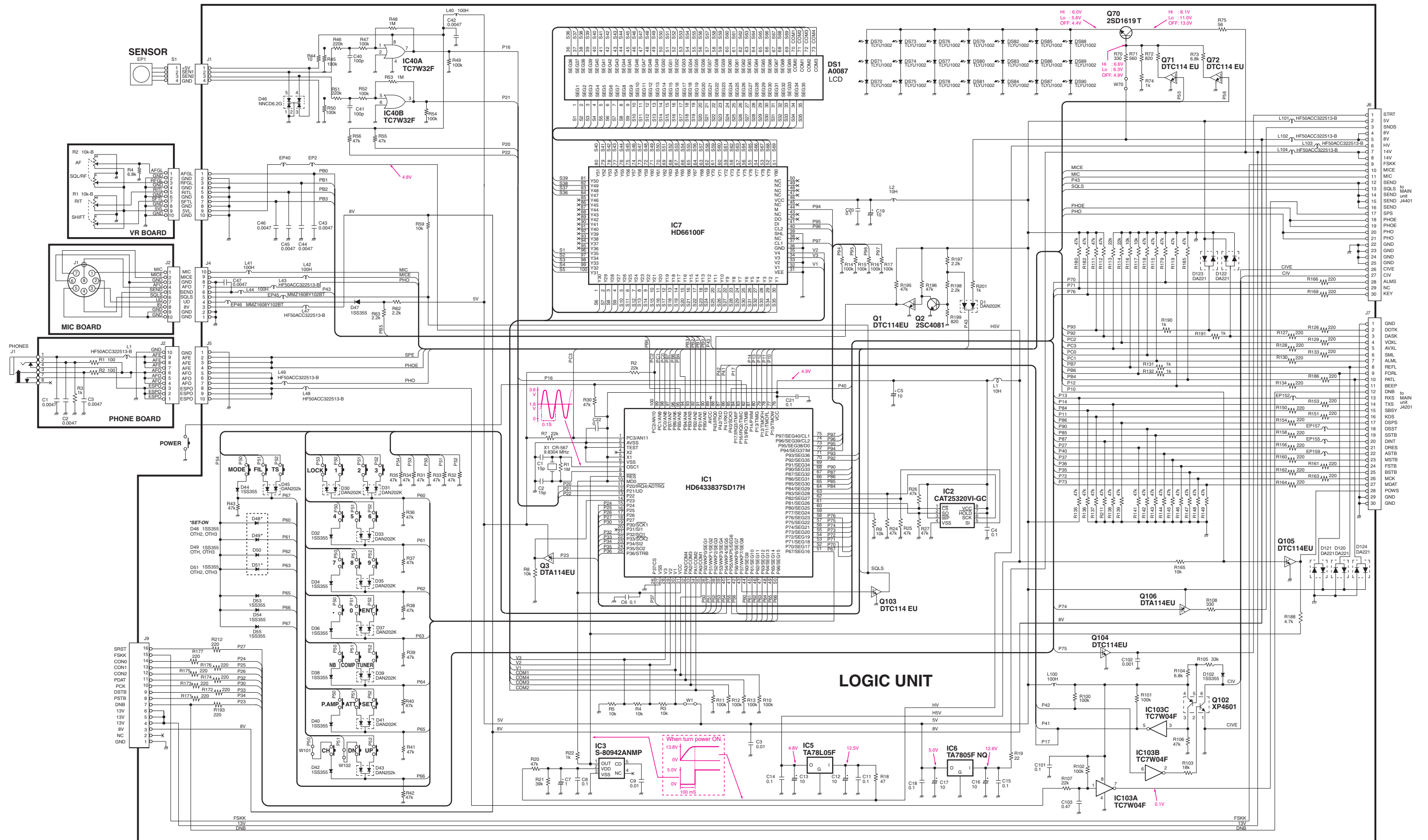
S.=Surface mount

# VOLTAGE DIAGRAM

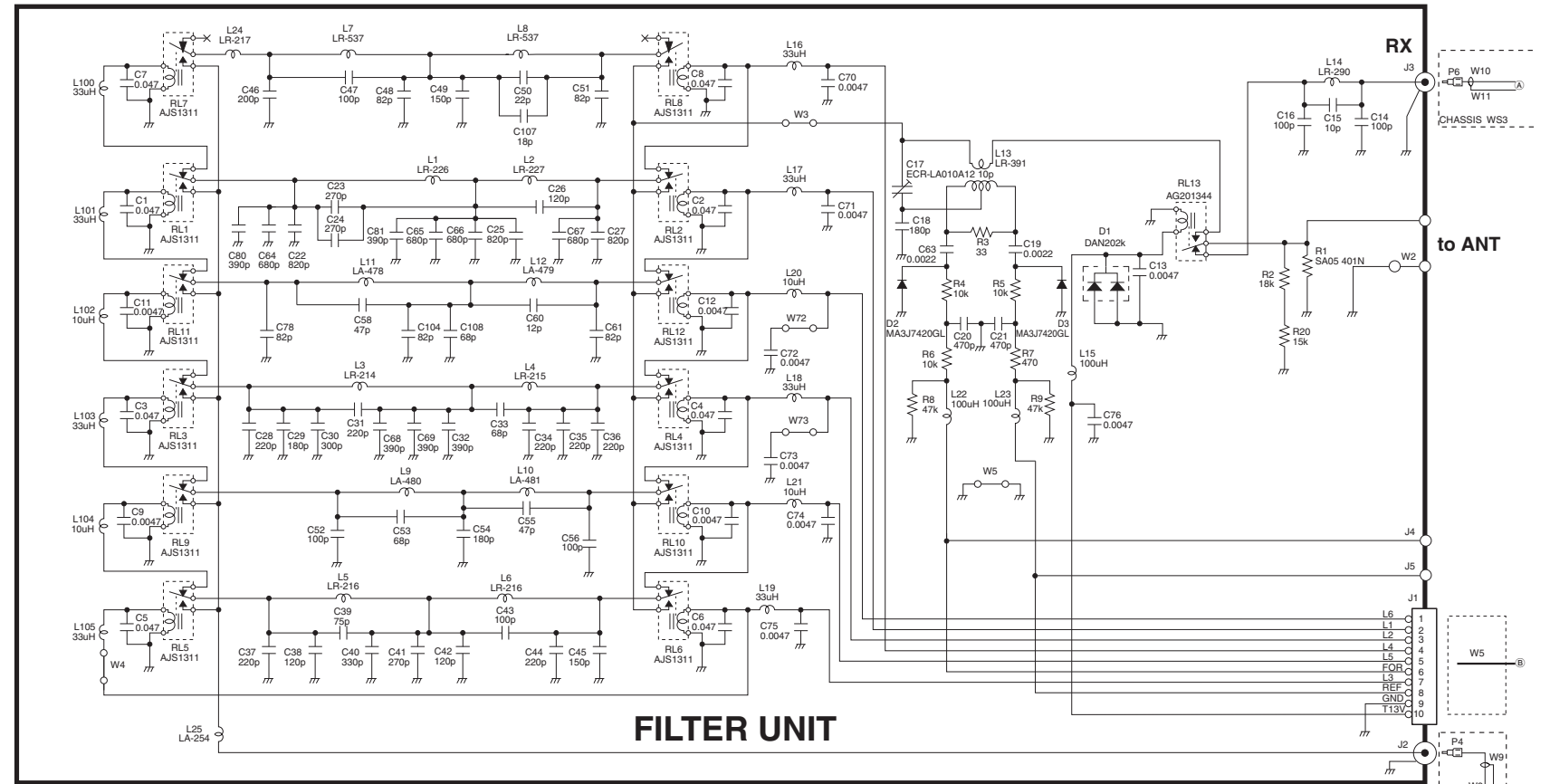


PLL UNIT

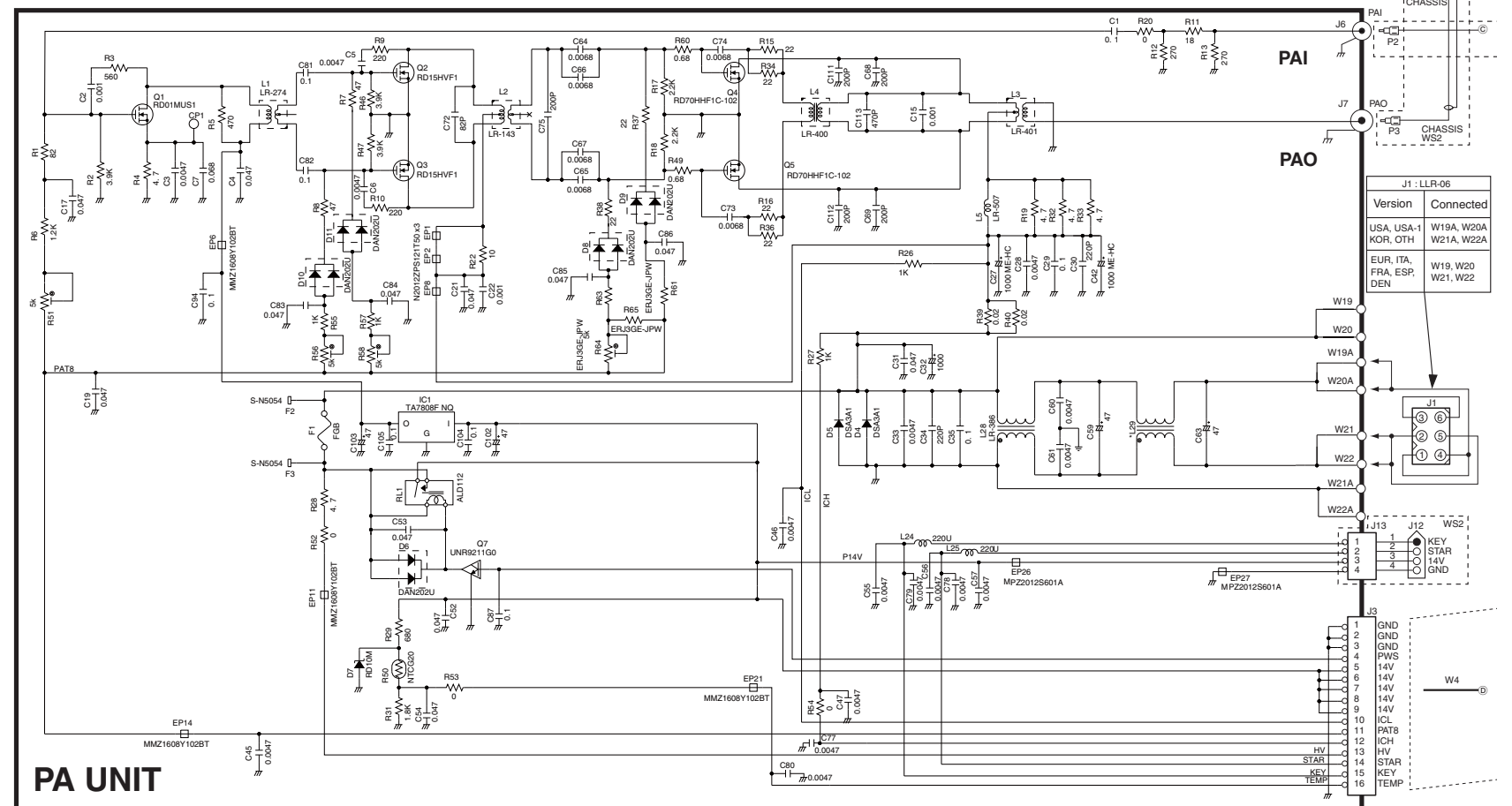
\*; Refer to "PARTS LIST."



\*; Refer to "PARTS LIST."



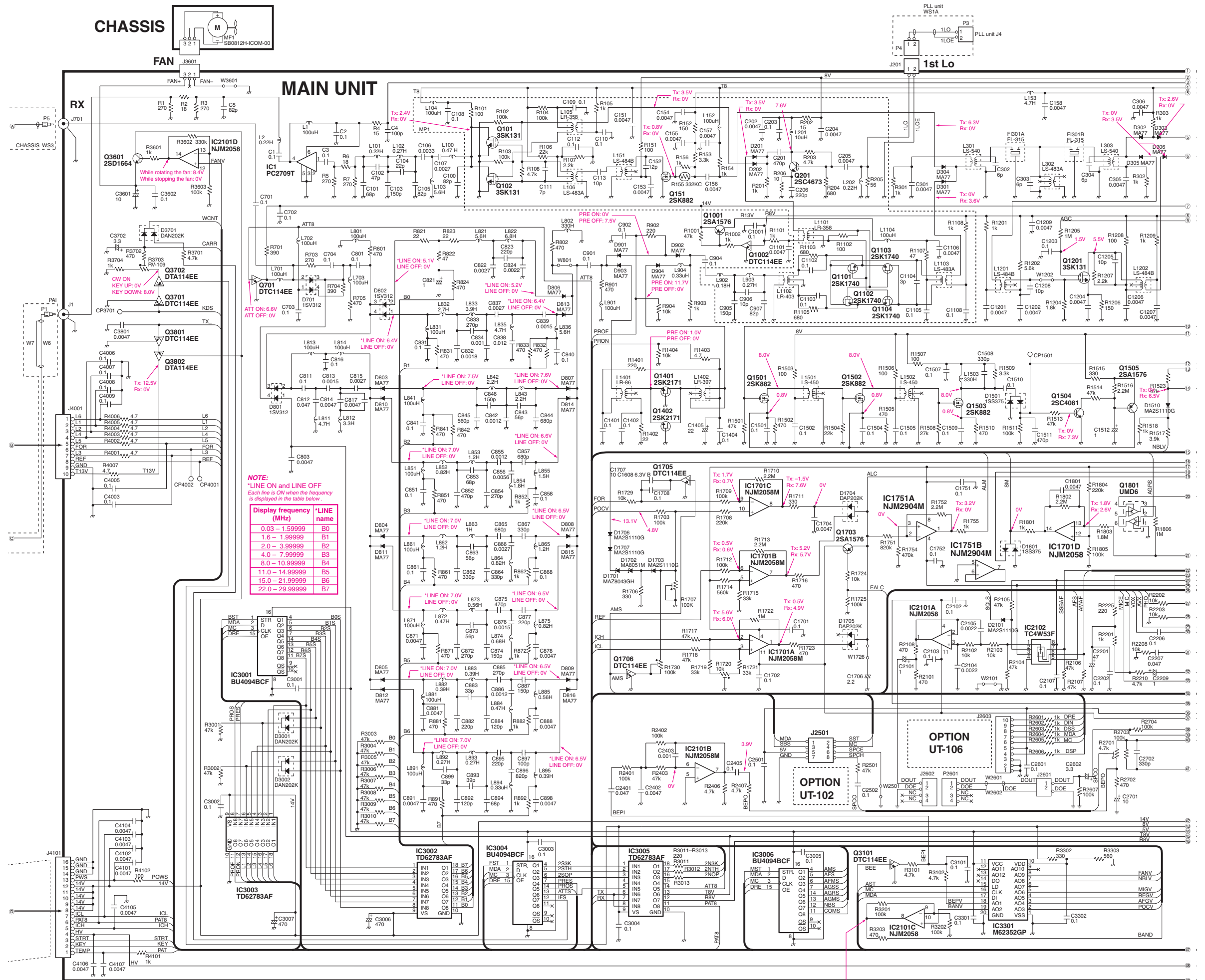
**FILTER UNIT**



**PA UNIT**

J1 - LLR-06	
Version	Connected
USA, USA-1	W19A, W20A
KOR, OTH	W21A, W22A
EUR, ITA, FRA, ESP, DEN	W19, W20
	W21, W22

\*; Refer to "PARTS LIST."

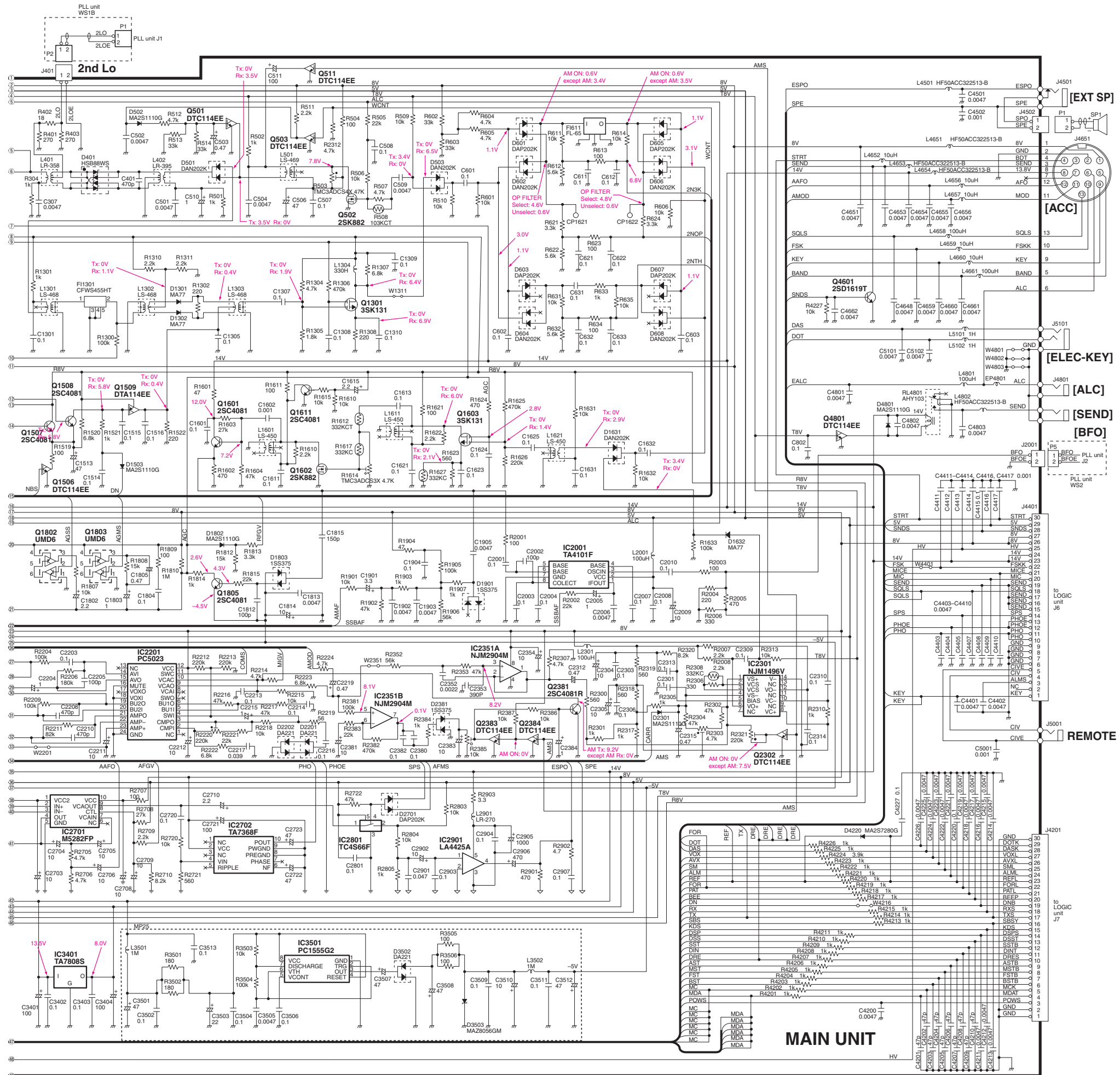


**NOTE:**  
"LINE ON" and "LINE OFF"  
Each line is ON when the frequency  
is displayed in the table below.

Display frequency (MHz)	"LINE" name
0.03 - 1.99999	B0
1.6 - 1.99999	B1
2.0 - 3.99999	B2
4.0 - 7.99999	B3
8.0 - 10.99999	B4
11.0 - 14.99999	B5
15.0 - 21.99999	B6
22.0 - 29.99999	B7

Display frequency (MHz)	Voltage (V)	Display frequency (MHz)	Voltage (V)
0.03 - 1.99999	7.4	11.0 - 14.99999	4.0
2.0 - 3.99999	6.0	15.0 - 21.99999	3.1
4.0 - 7.99999	5.0	22.0 - 29.99999	2.2
8.0 - 10.99999	0		

\*; Refer to "PARTS LIST."



\*, Refer to "PARTS LIST."

Jul. 2009



# SERVICE MANUAL ADDENDUM

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## IC-718

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[MAIN UNIT]

Table with 3 columns: REF NO., ORDER NO., DESCRIPTION. Contains multiple rows of part numbers and descriptions, including various ERJ3GGEYJ and ERJ3GED components.

[MAIN UNIT]

Table with 3 columns: REF NO., ORDER NO., DESCRIPTION. Contains multiple rows of part numbers and descriptions, including various C105, C106, C107, C108, C109, C110, C111, C112, C113, C151, C152, C153, C154, C155, C156, C157, C158, C201, C202, C203, C204, C205, C206, C301, C302, C303, C304, C305, C306, C307, C401, C501, C502, C503, C504, C506, C507, C508, C509, C510, C511, C601, C602, C603, C606, C611, C612, C621, C622, C631, C632, C633, C701, C702, C703, C704, C801, C802, C803, C811, C812, C813, C814, C815, C816, C817, C821, C822, C823, C824, C831, C832, C833, C834, C837, C838, C839, C840 components.

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side) S.=Surface mount

[MAIN UNIT]

Table with columns REF NO., ORDER NO., and DESCRIPTION. Contains multiple rows of order information for various components like C1608 JB 1E 104K-T, C1608 CH 1H 122K-T, etc.

[MAIN UNIT]

Table with columns REF NO., ORDER NO., and DESCRIPTION. Contains multiple rows of order information for various components like C1608 JB 1E 104K-T, C1608 CH 1H 122K-T, etc.

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side) S.=Surface mount

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION
C3001	4030011600	S.CER C1608 JB 1E 104K-T
C3002	4030011600	S.CER C1608 JB 1E 104K-T
C3003	4030011600	S.CER C1608 JB 1E 104K-T
C3004	4030011600	S.CER C1608 JB 1E 104K-T
C3005	4030011600	S.CER C1608 JB 1E 104K-T
C3006	4510004591	ELE 16 ME 470 HC
C3007	4510004591	ELE 16 ME 470 HC
C3101	4030011600	S.CER C1608 JB 1E 104K-T
C3301	4030011600	S.CER C1608 JB 1E 104K-T
C3302	4030011600	S.CER C1608 JB 1E 104K-T
C3401	4510004990	ELE 16 ME 100 HC
C3402	4030011600	S.CER C1608 JB 1E 104K-T
C3403	4030011600	S.CER C1608 JB 1E 104K-T
C3404	4510004990	ELE 16 ME 100 HC
C3501	4510008520	S.ELE EEE1CA470SP
C3502	4030011600	S.CER C1608 JB 1E 104K-T
C3503	4510008570	S.ELE EEE1CA220SR
C3504	4030011600	S.CER C1608 JB 1E 104K-T
C3505	4030006880	S.CER C1608 JB 1H 472K-T
C3506	4030011600	S.CER C1608 JB 1E 104K-T
C3507	4510008520	S.ELE EEE1CA470SP
C3508	4510008520	S.ELE EEE1CA470SP
C3509	4030011600	S.CER C1608 JB 1E 104K-T
C3510	4510008540	S.ELE EEE1CA100SR
C3511	4030011600	S.CER C1608 JB 1E 104K-T
C3512	4510008520	S.ELE EEE1CA470SP
C3513	4030011600	S.CER C1608 JB 1E 104K-T
C3601	4510008540	S.ELE EEE1CA100SR
C3602	4030011600	S.CER C1608 JB 1E 104K-T
C3702	4550006390	S.TAN TEESVA 1C 335M8R
C3801	4030006880	S.CER C1608 JB 1H 472K-T
C4003	4030011600	S.CER C1608 JB 1E 104K-T
C4005	4030011600	S.CER C1608 JB 1E 104K-T
C4006	4030011600	S.CER C1608 JB 1E 104K-T
C4007	4030011600	S.CER C1608 JB 1E 104K-T
C4008	4030011600	S.CER C1608 JB 1E 104K-T
C4009	4030011600	S.CER C1608 JB 1E 104K-T
C4101	4030006880	S.CER C1608 JB 1H 472K-T
C4102	4030006880	S.CER C1608 JB 1H 472K-T
C4103	4030006880	S.CER C1608 JB 1H 472K-T
C4104	4030006880	S.CER C1608 JB 1H 472K-T
C4105	4030006880	S.CER C1608 JB 1H 472K-T
C4106	4030006880	S.CER C1608 JB 1H 472K-T
C4107	4030006880	S.CER C1608 JB 1H 472K-T
C4200	4030006880	S.CER C1608 JB 1H 472K-T
C4201	4030007090	S.CER C1608 CH 1H 470J-T
C4202	4030007090	S.CER C1608 CH 1H 470J-T
C4203	4030007090	S.CER C1608 CH 1H 470J-T
C4204	4030007090	S.CER C1608 CH 1H 470J-T
C4205	4030007090	S.CER C1608 CH 1H 470J-T
C4206	4030007090	S.CER C1608 CH 1H 470J-T
C4207	4030007090	S.CER C1608 CH 1H 470J-T
C4208	4030007090	S.CER C1608 CH 1H 470J-T
C4209	4030007090	S.CER C1608 CH 1H 470J-T
C4210	4030007090	S.CER C1608 CH 1H 470J-T
C4211	4030006880	S.CER C1608 JB 1H 472K-T
C4212	4030006880	S.CER C1608 JB 1H 472K-T
C4213	4030006880	S.CER C1608 JB 1H 472K-T
C4214	4030006880	S.CER C1608 JB 1H 472K-T
C4215	4030006880	S.CER C1608 JB 1H 472K-T
C4216	4030006880	S.CER C1608 JB 1H 472K-T
C4217	4030006880	S.CER C1608 JB 1H 472K-T
C4218	4030006880	S.CER C1608 JB 1H 472K-T
C4219	4030006880	S.CER C1608 JB 1H 472K-T
C4220	4030011600	S.CER C1608 JB 1E 104K-T
C4221	4030006880	S.CER C1608 JB 1H 472K-T
C4222	4030006880	S.CER C1608 JB 1H 472K-T
C4223	4030006880	S.CER C1608 JB 1H 472K-T
C4224	4030006880	S.CER C1608 JB 1H 472K-T
C4225	4030006880	S.CER C1608 JB 1H 472K-T
C4226	4030006880	S.CER C1608 JB 1H 472K-T
C4227	4030011600	S.CER C1608 JB 1E 104K-T
C4401	4030006880	S.CER C1608 JB 1H 472K-T
C4402	4030006880	S.CER C1608 JB 1H 472K-T
C4403	4030006880	S.CER C1608 JB 1H 472K-T
C4404	4030006880	S.CER C1608 JB 1H 472K-T
C4405	4030006880	S.CER C1608 JB 1H 472K-T
C4407	4030006880	S.CER C1608 JB 1H 472K-T
C4408	4030006880	S.CER C1608 JB 1H 472K-T
C4409	4030006880	S.CER C1608 JB 1H 472K-T
C4410	4030006880	S.CER C1608 JB 1H 472K-T
C4411	4030006880	S.CER C1608 JB 1H 472K-T
C4412	4030006880	S.CER C1608 JB 1H 472K-T
C4413	4030006880	S.CER C1608 JB 1H 472K-T
C4414	4030006880	S.CER C1608 JB 1H 472K-T
C4415	4030011600	S.CER C1608 JB 1E 104K-T
C4416	4030006880	S.CER C1608 JB 1H 472K-T
C4417	4030006880	S.CER C1608 JB 1H 102K-T
C4501	4030006880	S.CER C1608 JB 1H 472K-T
C4502	4030006860	S.CER C1608 JB 1H 102K-T
C4648	4030006880	S.CER C1608 JB 1H 472K-T
C4651	4030006880	S.CER C1608 JB 1H 472K-T
C4653	4030006880	S.CER C1608 JB 1H 472K-T
C4654	4030006880	S.CER C1608 JB 1H 472K-T
C4655	4030006880	S.CER C1608 JB 1H 472K-T
C4656	4030006880	S.CER C1608 JB 1H 472K-T
C4659	4030006880	S.CER C1608 JB 1H 472K-T
C4660	4030006880	S.CER C1608 JB 1H 472K-T
C4661	4030006880	S.CER C1608 JB 1H 472K-T
C4662	4030006880	S.CER C1608 JB 1H 472K-T
C4801	4030006880	S.CER C1608 JB 1H 472K-T
C4802	4030006880	S.CER C1608 JB 1H 472K-T
C4803	4030006880	S.CER C1608 JB 1H 472K-T
C5001	4030006860	S.CER C1608 JB 1H 102K-T

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION
C5101	4030006880	S.CER C1608 JB 1H 472K-T
C5102	4030006880	S.CER C1608 JB 1H 472K-T
RL4801	6330001320	REL AHY103
J1	6510007020	CON TMP-J01X-V6
J201	6510018961	S.CON B2B-PH-SM4-TB(LF)(SN)
J401	6510018961	S.CON B2B-PH-SM4-TB(LF)(SN)
J701	6510007020	CON TMP-J01X-V6
J2001	6510018961	S.CON B2B-PH-SM4-TB(LF)(SN)
J2501	6510019191	S.CON 52365-0871
J2602	6510018971	S.CON B4B-PH-SM4-TB(LF)(SN)
J2603	6510022621	S.CON 10FMN-BMTTR-A-TBT(LF)(SN)
J3601	6510003391	CON B03B-EH-S(LF)(SN)
J4001	6510022621	S.CON 10FMN-BMTTR-A-TBT(LF)(SN)
J4101	6510022611	S.CON 16FMN-BMTTR-A-TBT(LF)(SN)
J4201	6510021722	S.CON 30FLT-SM2-TB(LF)(SN)(M)
J4401	6510021722	S.CON 30FLT-SM2-TB(LF)(SN)(M)
J4501	6450000140	CON HSJ0807-01-010
J4502	6510018961	S.CON B2B-PH-SM4-TB(LF)(SN)
J4651	6510024661	CON TCS5072-1041577
J4801	64500001130	CON JPJ2042-01-110
J5001	6450000140	CON HSJ0807-01-010
J5101	64500001791	CON HLJ7000-016010
EP4801	6910012350	S.BEA MMZ1608Y 102BT

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)  
S.=Surface mount



[PLL UNIT]

REF NO.	ORDER NO.	DESCRIPTION
R183	7030003520	S.RES ERJ3GEYJ 472 V (4.7K)
R191	7030003350	S.RES ERJ3GEYJ 181 V (180)
R192	7030003440	S.RES ERJ3GEYJ 102 V (1K)
W1	7030003860	S.RES ERJ3GE JPW V
W7	7030003860	S.RES ERJ3GE JPW V
W9	7030003860	S.RES ERJ3GE JPW V
W10	7030003860	S.RES ERJ3GE JPW V
W92	7030003860	S.RES ERJ3GE JPW V
W170	7030003860	S.RES ERJ3GE JPW V
C1	4510008500	S.ELE EEE1CA101WP
C2	4550006080	S.TAN TEESVB2 1C 106M8R
C3	4030006880	S.CER C1608 JB 1H 472K-T
C4	4550006080	S.TAN TEESVB2 1C 106M8R
C5	4510008880	S.ELE EEE1VA330WP
C6	4510008540	S.ELE EEE1CA100SR
C7	4030011600	S.CER C1608 JB 1E 104K-T
C8	4510008540	S.ELE EEE1CA100SR
C9	4510008540	S.ELE EEE1CA100SR
C10	4030011600	S.CER C1608 JB 1E 104K-T
C12	4030006880	S.CER C1608 JB 1H 472K-T
C13	4030006880	S.CER C1608 JB 1H 472K-T
C14	4030007150	S.CER C1608 CH 1H 151J-T
C15	4030008330	S.CER C1608 UJ 1H 560J-T
C16	4610002200	S.TRI TZB4R200EB10R00(TZBX4R200BE110)
C17	4030006880	S.CER C1608 JB 1H 472K-T
C18	4030007130	S.CER C1608 CH 1H 101J-T
C19	4030006880	S.CER C1608 JB 1H 472K-T
C20	4030007030	S.CER C1608 CH 1H 150J-T
C21	4510008500	S.ELE EEE1CA101WP
C22	4030006880	S.CER C1608 JB 1H 472K-T
C23	4030009500	S.CER C1608 CH 1H 0R5B-T
C24	4030007030	S.CER C1608 CH 1H 150J-T
C25	4030018700	S.CER GRM1882P1H121JZ01D
C26	4030007130	S.CER C1608 CH 1H 101J-T
C27	4030006880	S.CER C1608 JB 1H 472K-T
C28	4030006880	S.CER C1608 JB 1H 472K-T
C29	4030006880	S.CER C1608 JB 1H 472K-T
C30	4030006880	S.CER C1608 JB 1H 472K-T
C31	4030006880	S.CER C1608 JB 1H 472K-T
C32	4030006880	S.CER C1608 JB 1H 472K-T
C33	4510008500	S.ELE EEE1CA101WP
C34	4030006880	S.CER C1608 JB 1H 472K-T
C50	4030007050	S.CER C1608 CH 1H 220J-T
C51	4030006930	S.CER C1608 CH 1H 020C-T
C52	4030007060	S.CER C1608 CH 1H 270J-T
C53	4030009500	S.CER C1608 CH 1H 0R5B-T
C54	4030007050	S.CER C1608 CH 1H 220J-T
C55	4030006880	S.CER C1608 JB 1H 472K-T
C62	4030007130	S.CER C1608 CH 1H 101J-T
C63	4030006880	S.CER C1608 JB 1H 472K-T
C64	4030006880	S.CER C1608 JB 1H 472K-T
C65	4030006920	S.CER C1608 CH 1H 010C-T
C66	4030006880	S.CER C1608 JB 1H 472K-T
C67	4030007130	S.CER C1608 CH 1H 101J-T
C68	4030006860	S.CER C1608 JB 1H 102K-T
C103	4030006880	S.CER C1608 JB 1H 472K-T
C104	4030006880	S.CER C1608 JB 1H 472K-T
C106	4030006880	S.CER C1608 JB 1H 472K-T
C108	4030006880	S.CER C1608 JB 1H 472K-T
C109	4030006880	S.CER C1608 JB 1H 472K-T
C111	4030006860	S.CER C1608 JB 1H 102K-T
C112	4030007100	S.CER C1608 CH 1H 560J-T
C114	4030007080	S.CER C1608 CH 1H 390J-T
C115	4030009650	S.CER C1608 CH 1H 240J-T
C116	4030006990	S.CER C1608 CH 1H 080D-T
C117	4030007070	S.CER C1608 CH 1H 330J-T
C118	4030006880	S.CER C1608 JB 1H 472K-T
C119	4030006860	S.CER C1608 JB 1H 102K-T
C120	4030006880	S.CER C1608 JB 1H 472K-T
C126	4030006880	S.CER C1608 JB 1H 472K-T
C127	4030006860	S.CER C1608 JB 1H 102K-T
C128	4030006880	S.CER C1608 JB 1H 472K-T
C129	4030006880	S.CER C1608 JB 1H 472K-T
C130	4030006860	S.CER C1608 JB 1H 102K-T
C132	4030007130	S.CER C1608 CH 1H 101J-T
C134	4030007100	S.CER C1608 CH 1H 560J-T
C135	4030006950	S.CER C1608 CH 1H 040C-T
C136	4030007020	S.CER C1608 CH 1H 120J-T
C137	4030007110	S.CER C1608 CH 1H 680J-T
C138	4030007100	S.CER C1608 CH 1H 560J-T
C139	4030006880	S.CER C1608 JB 1H 472K-T
C141	4030006880	S.CER C1608 JB 1H 472K-T
C143	4030006880	S.CER C1608 JB 1H 472K-T
C144	4030006880	S.CER C1608 JB 1H 472K-T
C145	4030006880	S.CER C1608 JB 1H 472K-T
C146	4030006880	S.CER C1608 JB 1H 472K-T
C147	4030006880	S.CER C1608 JB 1H 472K-T
C148	4030006880	S.CER C1608 JB 1H 472K-T
C149	4030006880	S.CER C1608 JB 1H 472K-T
C150	4030006880	S.CER C1608 JB 1H 472K-T
C151	4030006880	S.CER C1608 JB 1H 472K-T
C152	4030006880	S.CER C1608 JB 1H 472K-T
C153	4030006880	S.CER C1608 JB 1H 472K-T
C155	4030006880	S.CER C1608 JB 1H 472K-T
C156	4030007050	S.CER C1608 CH 1H 220J-T
C157	4030007080	S.CER C1608 CH 1H 390J-T
C158	4030006860	S.CER C1608 JB 1H 102K-T
C159	4030006860	S.CER C1608 JB 1H 102K-T
C160	4030006880	S.CER C1608 JB 1H 472K-T
C161	4030008920	S.CER C1608 JB 1H 473K-T

[PLL UNIT]

REF NO.	ORDER NO.	DESCRIPTION
C165	4610001850	S.TRI TZB4R200AB10R00(TZBX4R200BA110)
C166	4550000460	S.TAN TEESVA 1C 105M8R
C167	4030006880	S.CER C1608 JB 1H 472K-T
C168	4030008920	S.CER C1608 JB 1H 473K-T
C170	4030006880	S.CER C1608 JB 1H 472K-T
C172	4030007060	S.CER C1608 CH 1H 270J-T
C174	4030008920	S.CER C1608 JB 1H 473K-T
C188	4030011600	S.CER C1608 JB 1E 104K-T
C191	4030006880	S.CER C1608 JB 1H 472K-T
C192	4030006880	S.CER C1608 JB 1H 472K-T
C194	4030011340	S.CER C1608 CH 1H 471J-T
C195	4030011340	S.CER C1608 CH 1H 471J-T
C203	4030006880	S.CER C1608 JB 1H 472K-T
C222	4030006880	S.CER C1608 JB 1H 472K-T
C223	4030011600	S.CER C1608 JB 1E 104K-T
C224	4030011600	S.CER C1608 JB 1E 104K-T
C225	4030006940	S.CER C1608 CH 1H 030C-T
C226	4030006940	S.CER C1608 CH 1H 030C-T
C227	4030007100	S.CER C1608 CH 1H 560J-T
C228	4550002890	S.TAN TEESVA 1A 225M8R
J1	6510018961	S.CON B2B-PH-SM4-TB(LF)(SN)
J3	6510022611	S.CON 16FMN-BMTTR-A-TBT(LF)(SN)
J4	6510018961	S.CON B2B-PH-SM4-TB(LF)(SN)

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)  
S.=Surface mount





[PA UNIT]

REF NO.	ORDER NO.	DESCRIPTION
EP14	6910012350	S.BEA MMZ1608Y 102BT
EP21	6910012350	S.BEA MMZ1608Y 102BT
EP26	6910018930	S.BEA MPZ2012S601A
EP27	6910018930	S.BEA MPZ2012S601A

[FILTER UNIT]

REF NO.	ORDER NO.	DESCRIPTION
D1	1160000070	S.DIO DAN202K T146
D2	1790000981	S.DIO MA3J7420GL
D3	1790000981	S.DIO MA3J7420GL
L1	6140001990	COI LR-226 (T68-2)
L2	6140002000	COI LR-227 (T68-2)
L3	6140001780	COI LR-214 (T50-2)
L4	6140001790	COI LR-215 (T50-2)
L5	6140001800	COI LR-216 (T50-2)
L6	6140001800	COI LR-216 (T50-2)
L7	6140004770	COI LR-537
L8	6140004750	COI LR-535
L9	6110002910	COI LA-480
L10	6110002920	COI LA-481
L11	6110002890	COI LA-478
L12	6110002900	COI LA-479
L13	6140003490	COI LR-391 (TR10X5X5 3A6)
L14	6140002520	COI LR-290 (TR6X3X2 7A3)
L15	6200002041	S.COI NLV25T-101J
L16	6200005051	S.COI NLV25T-330J
L17	6200005051	S.COI NLV25T-330J
L18	6200005051	S.COI NLV25T-330J
L19	6200005051	S.COI NLV25T-330J
L20	6200005011	S.COI NLV25T-100J
L21	6200005011	S.COI NLV25T-100J
L22	6200002041	S.COI NLV25T-101J
L23	6200002041	S.COI NLV25T-101J
L24	6140001810	COI LR-217 (T50-10)
L25	6110001680	COI LA-254
L100	6200005051	S.COI NLV25T-330J
L101	6200005051	S.COI NLV25T-330J
L102	6200005011	S.COI NLV25T-100J
L103	6200005051	S.COI NLV25T-330J
L104	6200005011	S.COI NLV25T-100J
L105	6200005051	S.COI NLV25T-330J
R1	7540000250	ABS SA05C 401N
R2	7030003590	S.RES ERJ3GEYJ 183 V (18K)
R3	7030008190	S.RES ERJ12YJ330U (33)
R4	7030003560	S.RES ERJ3GEYJ 103 V (10K)
R5	7030003560	S.RES ERJ3GEYJ 103 V (10K)
R6	7030003560	S.RES ERJ3GEYJ 103 V (10K)
R7	7030003400	S.RES ERJ3GEYJ 471 V (470)
R8	7030003640	S.RES ERJ3GEYJ 473 V (47K)
R9	7030003640	S.RES ERJ3GEYJ 473 V (47K)
R20	7030003580	S.RES ERJ3GEYJ 153 V (15K)
W5	7030008240	S.RES ERJ12Y0R00U
W72	7030003860	S.RES ERJ3GE JPW V
W73	7030003860	S.RES ERJ3GE JPW V
C1	4030008920	S.CER C1608 JB 1H 473K-T
C2	4030008920	S.CER C1608 JB 1H 473K-T
C3	4030008920	S.CER C1608 JB 1H 473K-T
C4	4030008920	S.CER C1608 JB 1H 473K-T
C5	4030008920	S.CER C1608 JB 1H 473K-T
C6	4030008920	S.CER C1608 JB 1H 473K-T
C7	4030008920	S.CER C1608 JB 1H 473K-T
C8	4030008920	S.CER C1608 JB 1H 473K-T
C9	4030006880	S.CER C1608 JB 1H 472K-T
C10	4030006880	S.CER C1608 JB 1H 472K-T
C11	4030006880	S.CER C1608 JB 1H 472K-T
C12	4030006880	S.CER C1608 JB 1H 472K-T
C13	4030006880	S.CER C1608 JB 1H 472K-T
C14	4030007130	S.CER C1608 CH 1H 101J-T
C15	4030007010	S.CER C1608 CH 1H 100D-T
C16	4030007130	S.CER C1608 CH 1H 101J-T
C17	4610001340	TRI ECR-LA010 A12
C18	4030007160	S.CER C1608 CH 1H 181J-T
C19	4030006870	S.CER C1608 JB 1H 222K-T
C20	4030011340	S.CER C1608 CH 1H 471J-T
C21	4030011340	S.CER C1608 CH 1H 471J-T
C22	4010007510	CER HM17SJ SL 821J 500V
C23	4010005880	CER HM95SJ SL 271J 500V
C24	4010005880	CER HM95SJ SL 271J 500V
C25	4010007510	CER HM17SJ SL 821J 500V
C26	4030012480	S.CER GRM31M2C2H121JV01L(GRM42-6 CH)
C27	4010007510	CER HM17SJ SL 821J 500V
C28	4010005870	CER HM95SJ SL 221J 500V
C29	4010005850	CER HM95SJ SL 181J 500V
C30	4010005360	CER HM11SJ SL 301J 500V
C31	4010005870	CER HM95SJ SL 221J 500V
C32	4010005930	CER HM11SJ SL 391J 500V
C33	4010005750	CER HM60SJ SL 680J 500V
C34	4010005870	CER HM95SJ SL 221J 500V
C35	4010005870	CER HM95SJ SL 221J 500V
C36	4010005870	CER HM95SJ SL 221J 500V
C37	4010005360	CER HM11SJ SL 301J 500V
C38	4030011550	S.CER GRM31M2C2H680JV01L(GRM42-6 CH)
C39	4010005780	CER HM60SJ SL 101J 500V
C40	4010005370	CER HM11SJ SL 331J 500V
C41	4010005370	CER HM11SJ SL 331J 500V
C43	4010005760	CER HM60SJ SL 750J 500V
C44	4010005880	CER HM95SJ SL 271J 500V
C45	4010005820	CER HM74SJ SL 121J 500V
C46	4010005860	CER HM95SJ SL 201J 500V
C47	4010005780	CER HM60SJ SL 101J 500V
C48	4030014460	S.CER GRM31M2C2H820JV01L(GRM42-6 CH)
C49	4010005830	CER HM74SJ SL 151J 500V
C50	4030011180	S.CER GRM31M2C2H220JV01L(GRM42-6 CH)

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)  
S.=Surface mount

[FILTER UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C51	4030014460	S.CER	GRM31M2C2H820JV01L(GRM42-6 CH)
C52	4030011550	S.CER	GRM31M2C2H680JV01L(GRM42-6 CH)
C53	4010005730	CER	HM60SJ SL 470J 500V
C54	4010005850	CER	HM95SJ SL 181J 500V
C55	4030011240	S.CER	GRM31M2C2H470JV01L(GRM42-6 CH)
C56	4010005770	CER	HM60SJ SL 820J 500V
C58	4030011240	S.CER	GRM31M2C2H470JV01L(GRM42-6 CH)
C60	4010005620	CER	HM60SJ SL 120J 500V
C61	4030014460	S.CER	GRM31M2C2H820JV01L(GRM42-6 CH)
C63	4030006870	S.CER	C1608 JB 1H 222K-T
C64	4010007590	CER	HM15SJ SL 681J 500V
C65	4010007590	CER	HM15SJ SL 681J 500V
C66	4010007590	CER	HM15SJ SL 681J 500V
C67	4010007590	CER	HM15SJ SL 681J 500V
C68	4010005930	CER	HM11SJ SL 391J 500V
C69	4010005930	CER	HM11SJ SL 391J 500V
C70	4030006880	S.CER	C1608 JB 1H 472K-T
C71	4030006880	S.CER	C1608 JB 1H 472K-T
C72	4030006880	S.CER	C1608 JB 1H 472K-T
C73	4030006880	S.CER	C1608 JB 1H 472K-T
C74	4030006880	S.CER	C1608 JB 1H 472K-T
C75	4030006880	S.CER	C1608 JB 1H 472K-T
C76	4030006880	S.CER	C1608 JB 1H 472K-T
C78	4030011730	S.CER	GRM31M2C2H101JV01L(GRM42-6 CH)
C80	4010005930	CER	HM11SJ SL 391J 500V
C81	4010005930	CER	HM11SJ SL 391J 500V
C101	4010005430	CER	HM60SJ CH 050C 500V
C103	4030011090	S.CER	GRM31M2C2H7R0DV01L(GRM42-6 CH)
C104	4030011550	S.CER	GRM31M2C2H680JV01L(GRM42-6 CH)
C107	4030011170	S.CER	GRM31M2C2H180JV01L(GRM42-6 CH)
C108	4030011510	S.CER	GRM31M2C2H560JV01L(GRM42-6 CH)
C110	4030011090	S.CER	GRM31M2C2H7R0DV01L(GRM42-6 CH)
RL1	6330001471	REL	AJS1311F-K2
RL2	6330001471	REL	AJS1311F-K2
RL3	6330001471	REL	AJS1311F-K2
RL4	6330001471	REL	AJS1311F-K2
RL5	6330001471	REL	AJS1311F-K2
RL6	6330001471	REL	AJS1311F-K2
RL7	6330001471	REL	AJS1311F-K2
RL8	6330001471	REL	AJS1311F-K2
RL9	6330001471	REL	AJS1311F-K2
RL10	6330001471	REL	AJS1311F-K2
RL11	6330001471	REL	AJS1311F-K2
RL12	6330001471	REL	AJS1311F-K2
RL13	6330001330	REL	AG 201344
J1	6510022631	CON	10FMN-BTRK-A(LF)(SN)
J2	6510007020	CON	TMP-J01X-V6
J3	6510007020	CON	TMP-J01X-V6
J4	6910001040	CON	IPS-1136
J5	6910001040	CON	IPS-1136
W2	9001502002	WIR	72/98/030/X98/X98 [USA]
	9001502002	WIR	72/98/030/X98/X98 [EUR]
	9037901027	JUM	73/98/030/X98/X98 [ITA]
	9001502002	WIR	72/98/030/X98/X98 [FRA]
	9001502002	WIR	72/98/030/X98/X98 [ESP]
	9037901027	JUM	73/98/030/X98/X98 [DEN]
	9001502002	WIR	72/98/030/X98/X98 [OTH]
	9037901027	JUM	73/98/030/X98/X98 [CHN]
	9037901027	JUM	73/98/030/X98/X98 [KOR]
	9037901027	JUM	73/98/030/X98/X98 [USA]
	9001502002	WIR	72/98/030/X98/X98 [CHN-01]
W3	6910001031	JUM	IPS-1041-4-PT
W4	6910001031	JUM	IPS-1041-4-PT

[FRONT UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
WS1	8970023640	SX2242 (1)/FR	
SP1	2510000671	SPE	VS-C50-0827
W3	8900014740	CAB	OPC-885A (P1,N10,L39) <TJM>
W4	8900014740	CAB	OPC-885A (P1,N10,L39) <TJM>
W5	8900014730	CAB	OPC-683A (P1,N10,L110) <TJM>
EP1	6910012480	E.O	RMS20-250-201-1R
EP2	6450001230	E.O	HLJ0999-01-4802

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)  
S.=Surface mount



[LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION
R160	7030003360	S.RES ERJ3GEYJ 221 V (220)
R161	7030003360	S.RES ERJ3GEYJ 221 V (220)
R162	7030003360	S.RES ERJ3GEYJ 221 V (220)
R163	7030003360	S.RES ERJ3GEYJ 221 V (220)
R164	7030003360	S.RES ERJ3GEYJ 221 V (220)
R165	7030003560	S.RES ERJ3GEYJ 103 V (10K)
R166	7030003360	S.RES ERJ3GEYJ 221 V (220)
R169	7030003360	S.RES ERJ3GEYJ 221 V (220)
R171	7030003360	S.RES ERJ3GEYJ 221 V (220)
R172	7030003360	S.RES ERJ3GEYJ 221 V (220)
R173	7030003360	S.RES ERJ3GEYJ 221 V (220)
R174	7030003360	S.RES ERJ3GEYJ 221 V (220)
R175	7030003360	S.RES ERJ3GEYJ 221 V (220)
R176	7030003360	S.RES ERJ3GEYJ 221 V (220)
R177	7030003360	S.RES ERJ3GEYJ 221 V (220)
R179	7030003640	S.RES ERJ3GEYJ 473 V (47K)
R180	7030003640	S.RES ERJ3GEYJ 473 V (47K)
R182	7030003640	S.RES ERJ3GEYJ 473 V (47K)
R185	7030003640	S.RES ERJ3GEYJ 473 V (47K)
R186	7030003360	S.RES ERJ3GEYJ 221 V (220)
R188	7030003520	S.RES ERJ3GEYJ 472 V (4.7K)
R190	7030003440	S.RES ERJ3GEYJ 102 V (1K)
R191	7030003440	S.RES ERJ3GEYJ 102 V (1K)
R193	7030003360	S.RES ERJ3GEYJ 221 V (220)
R195	7030003640	S.RES ERJ3GEYJ 473 V (47K)
R196	7030003640	S.RES ERJ3GEYJ 473 V (47K)
R197	7030003480	S.RES ERJ3GEYJ 222 V (2.2K)
R198	7030003480	S.RES ERJ3GEYJ 222 V (2.2K)
R199	7030003430	S.RES ERJ3GEYJ 821 V (820)
R201	7030003440	S.RES ERJ3GEYJ 102 V (1K)
R211	7030003640	S.RES ERJ3GEYJ 473 V (47K)
R212	7030003360	S.RES ERJ3GEYJ 221 V (220)
W1	7030003860	S.RES ERJ3GE JPW V
W70	7030003860	S.RES ERJ3GE JPW V
W101	7030003860	S.RES ERJ3GE JPW V
W102	7030003860	S.RES ERJ3GE JPW V
C1	4030007030	S.CER C1608 CH 1H 150J-T
C2	4030007030	S.CER C1608 CH 1H 150J-T
C3	4030006900	S.CER C1608 JB 1H 103K-T
C4	4030011600	S.CER C1608 JB 1E 104K-T
C5	4510008540	S.ELE EEE1CA100SR
C6	4030011600	S.CER C1608 JB 1E 104K-T
C7	4510008550	S.ELE EEE1HA010SR
C8	4030011600	S.CER C1608 JB 1E 104K-T
C9	4030006900	S.CER C1608 JB 1H 103K-T
C11	4030011600	S.CER C1608 JB 1E 104K-T
C12	4510008540	S.ELE EEE1CA100SR
C13	4510008540	S.ELE EEE1CA100SR
C14	4030011600	S.CER C1608 JB 1E 104K-T
C15	4030011600	S.CER C1608 JB 1E 104K-T
C16	4510008540	S.ELE EEE1CA100SR
C17	4510008540	S.ELE EEE1CA100SR
C18	4030011600	S.CER C1608 JB 1E 104K-T
C19	4510008540	S.ELE EEE1CA100SR
C20	4030011600	S.CER C1608 JB 1E 104K-T
C21	4030011600	S.CER C1608 JB 1E 104K-T
C22	4030011600	S.CER C1608 JB 1E 104K-T
C40	4030007130	S.CER C1608 CH 1H 101J-T
C41	4030007130	S.CER C1608 CH 1H 101J-T
C42	4030006880	S.CER C1608 JB 1H 472K-T
C43	4030006880	S.CER C1608 JB 1H 472K-T
C44	4030006880	S.CER C1608 JB 1H 472K-T
C45	4030006880	S.CER C1608 JB 1H 472K-T
C46	4030006880	S.CER C1608 JB 1H 472K-T
C47	4030006880	S.CER C1608 JB 1H 472K-T
C101	4030011600	S.CER C1608 JB 1E 104K-T
C102	4030006860	S.CER C1608 JB 1H 102K-T
C103	4030009110	S.CER C3216 JB 1C 474K-T
C111	4030011600	S.CER C1608 JB 1E 104K-T
C112	4030011600	S.CER C1608 JB 1E 104K-T
C113	4030011600	S.CER C1608 JB 1E 104K-T
C114	4030011600	S.CER C1608 JB 1E 104K-T
J1	6510020421	S.CON S4B-PH-SM4-TB(LF)(SN)
J3	6510022621	S.CON 10FMN-BMTTR-A-TBT(LF)(SN)
J4	6510022621	S.CON 10FMN-BMTTR-A-TBT(LF)(SN)
J5	6510022621	S.CON 10FMN-BMTTR-A-TBT(LF)(SN)
J6	6510021722	S.CON 30FLT-SM2-TB(LF)(SN)(M)
J7	6510021722	S.CON 30FLT-SM2-TB(LF)(SN)(M)
J9	6510022611	S.CON 16FMN-BMTTR-A-TBT(LF)(SN)
DS1	5030002490	LCD A0087A LCD83.5*45.5*1.1T LCD
DS70	5040002940	S.LED TLYU1002A(T02)
DS71	5040002940	S.LED TLYU1002A(T02)
DS72	5040002940	S.LED TLYU1002A(T02)
DS73	5040002940	S.LED TLYU1002A(T02)
DS74	5040002940	S.LED TLYU1002A(T02)
DS75	5040002940	S.LED TLYU1002A(T02)
DS76	5040002940	S.LED TLYU1002A(T02)
DS77	5040002940	S.LED TLYU1002A(T02)
DS78	5040002940	S.LED TLYU1002A(T02)
DS79	5040002940	S.LED TLYU1002A(T02)
DS80	5040002940	S.LED TLYU1002A(T02)
DS81	5040002940	S.LED TLYU1002A(T02)
DS82	5040002940	S.LED TLYU1002A(T02)
DS83	5040002940	S.LED TLYU1002A(T02)
DS84	5040002940	S.LED TLYU1002A(T02)
DS85	5040002940	S.LED TLYU1002A(T02)

[LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION
DS86	5040002940	S.LED TLYU1002A(T02)
DS87	5040002940	S.LED TLYU1002A(T02)
DS88	5040002940	S.LED TLYU1002A(T02)
DS89	5040002940	S.LED TLYU1002A(T02)
DS90	5040002940	S.LED TLYU1002A(T02)
EP2	6910012350	S.BEA MMZ1608Y 102BT
EP40	6910012350	S.BEA MMZ1608Y 102BT
EP45	6910012350	S.BEA MMZ1608Y 102BT
EP46	6910012350	S.BEA MMZ1608Y 102BT
EP70	8930051450	LCD SRCN-2241-SP-N-W (SHJ)
EP152	6910012350	S.BEA MMZ1608Y 102BT
EP155	6910012350	S.BEA MMZ1608Y 102BT
EP157	6910012350	S.BEA MMZ1608Y 102BT
EP159	6910012350	S.BEA MMZ1608Y 102BT

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)  
S.=Surface mount

[VR UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
R1	7210003040	VAR	TP96D26-22F-10KBX2-2240
R2	7210003030	VAR	TP96D00-22F-10KBX2-2240
R4	7030003540	S.RES	ERJ3GEYJ 682 V (6.8K)
J1	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [USA]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [EUR]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [ITA]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [FRA]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [ESP]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [DEN]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [OTH]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [CHN]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [KOR]
	6510022050	S.CON	10FM-1.0SP-1.9-TF [USA]
	6510022051	S.CON	10FM-1.0SP-1.9-TF(LF)(SN) [CHN-01]

[MIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
J1	6510000191	CON	FM214-8SS(P)-1
J2	6510022621	S.CON	10FMN-BMTTR-A-TBT(LF)(SN)

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)  
S.=Surface mount

**[PHONE UNIT]**

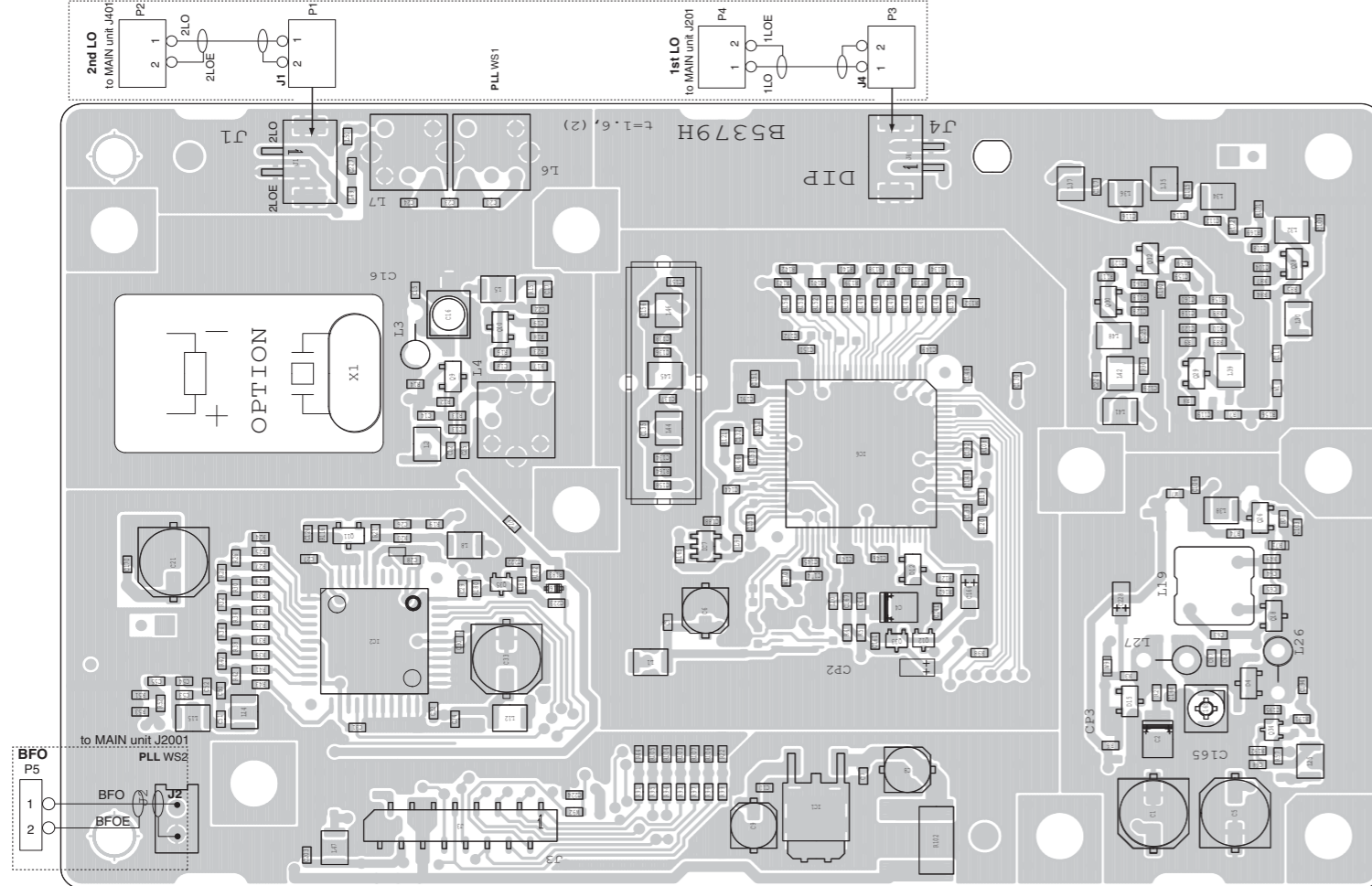
REF NO.	ORDER NO.	DESCRIPTION
L1	6200003950	S.COI HF50ACC 322513-T
R1	7030006070	S.RES ERJ12YJ101U (100)
R2	7030006070	S.RES ERJ12YJ101U (100)
R3	7030003440	S.RES ERJ3GEYJ 102 V (1K)
C1	4030006880	S.CER C1608 JB 1H 472K-T
C2	4030006880	S.CER C1608 JB 1H 472K-T
C3	4030006880	S.CER C1608 JB 1H 472K-T
J1	6450001250	CON HLJ4306-01-3070
J2	6510022621	S.CON 10FMN-BMTTR-A-TBT(LF)(SN)

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)  
S.=Surface mount

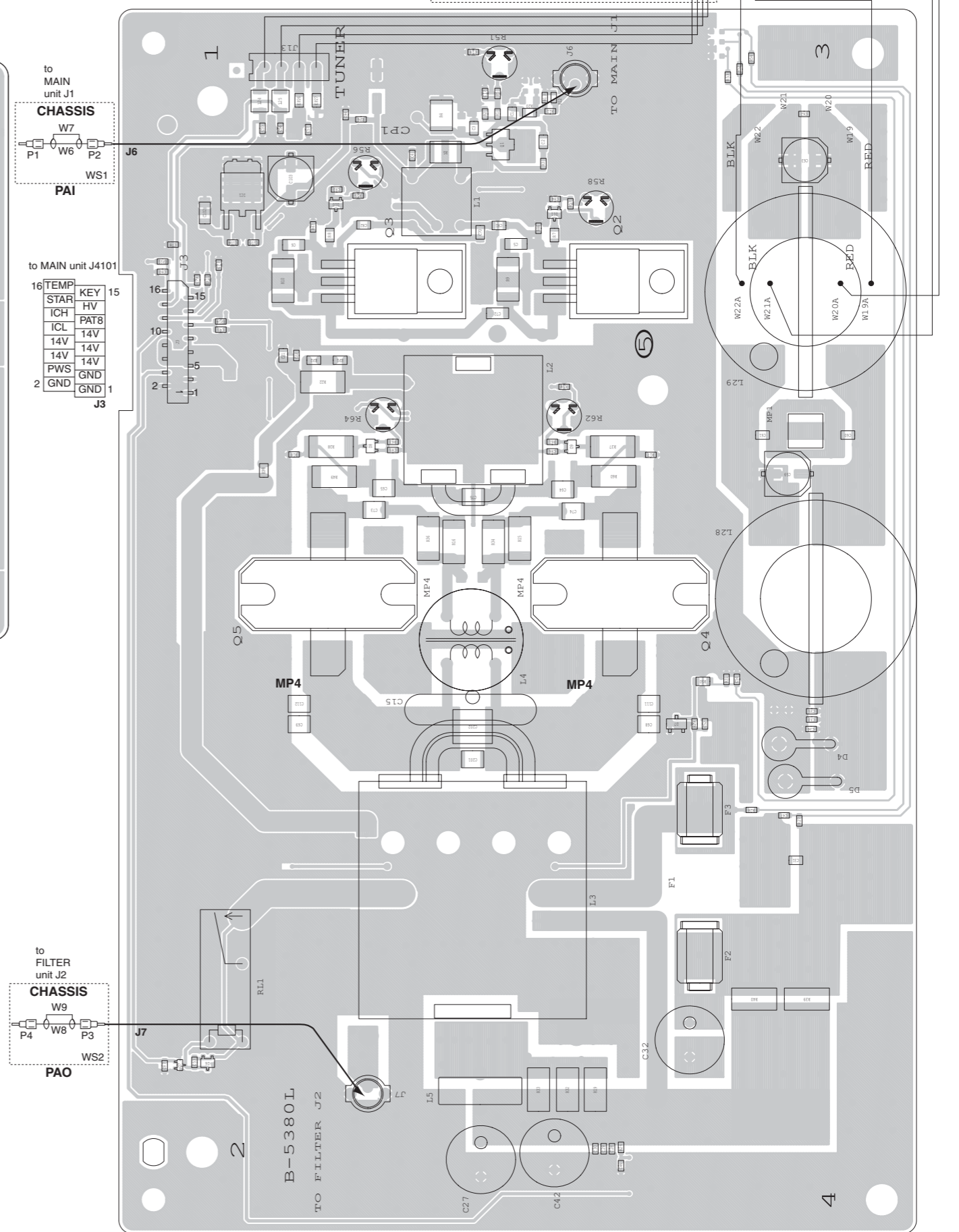
# BOARD LAYOUTS

The combination of this side and the bottom side shows the board layout in the same configuration as the actual P.C.Board.

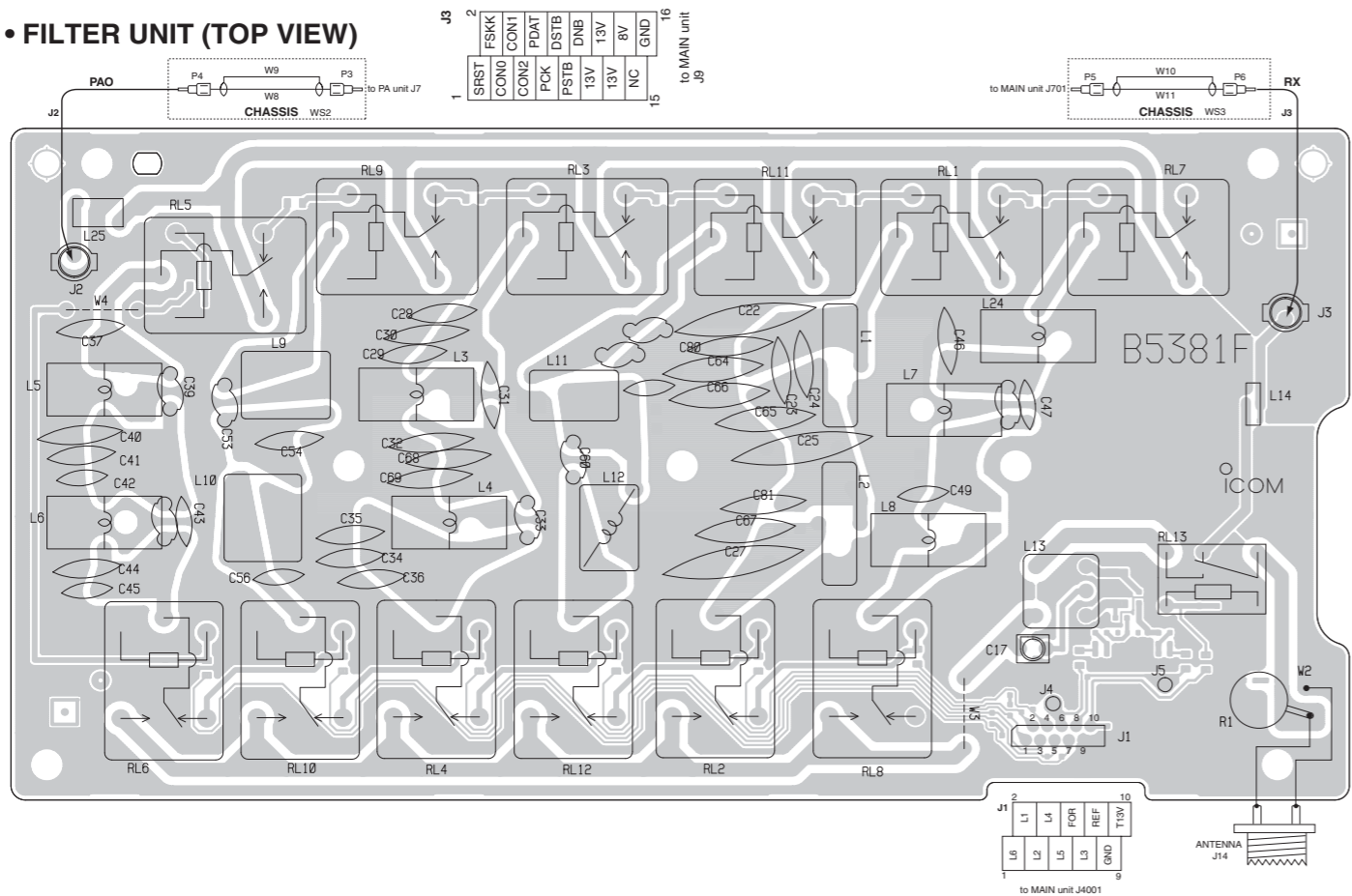
## • PLL UNIT (TOP VIEW)



## • PA UNIT (TOP VIEW)

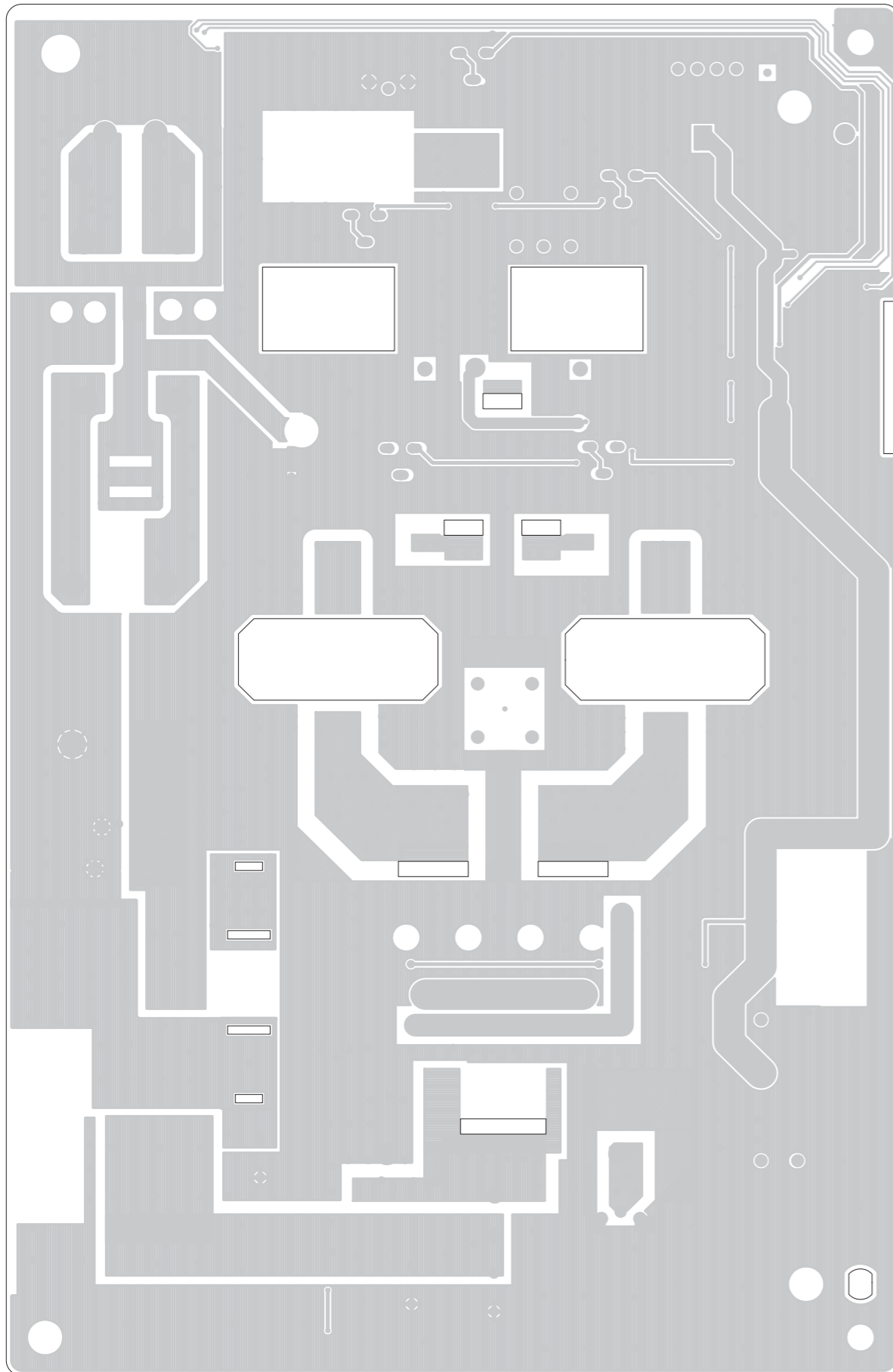


## • FILTER UNIT (TOP VIEW)

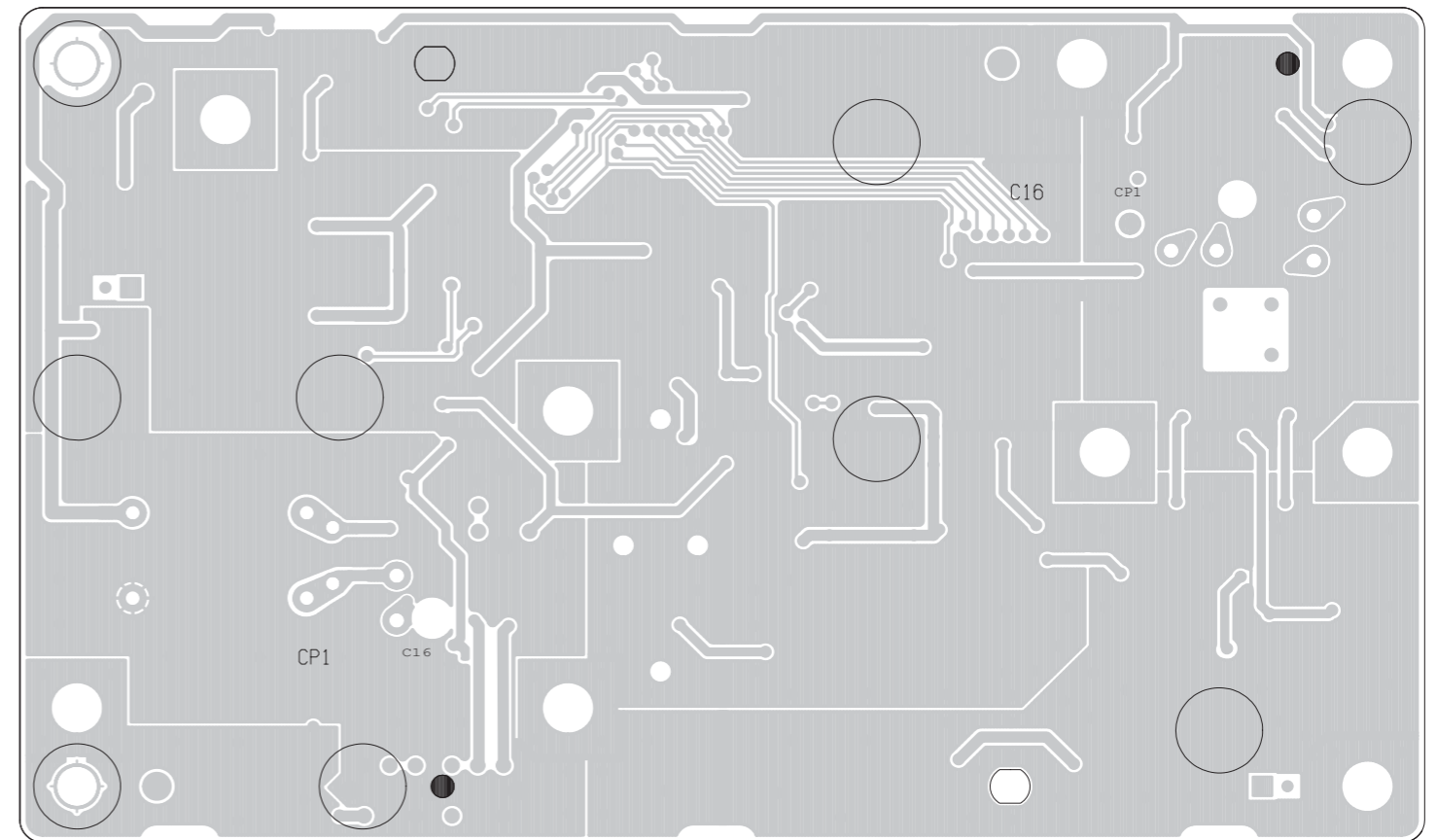


The combination of this side and the bottom side shows the board layout in the same configuration as the actual P.C.Board.

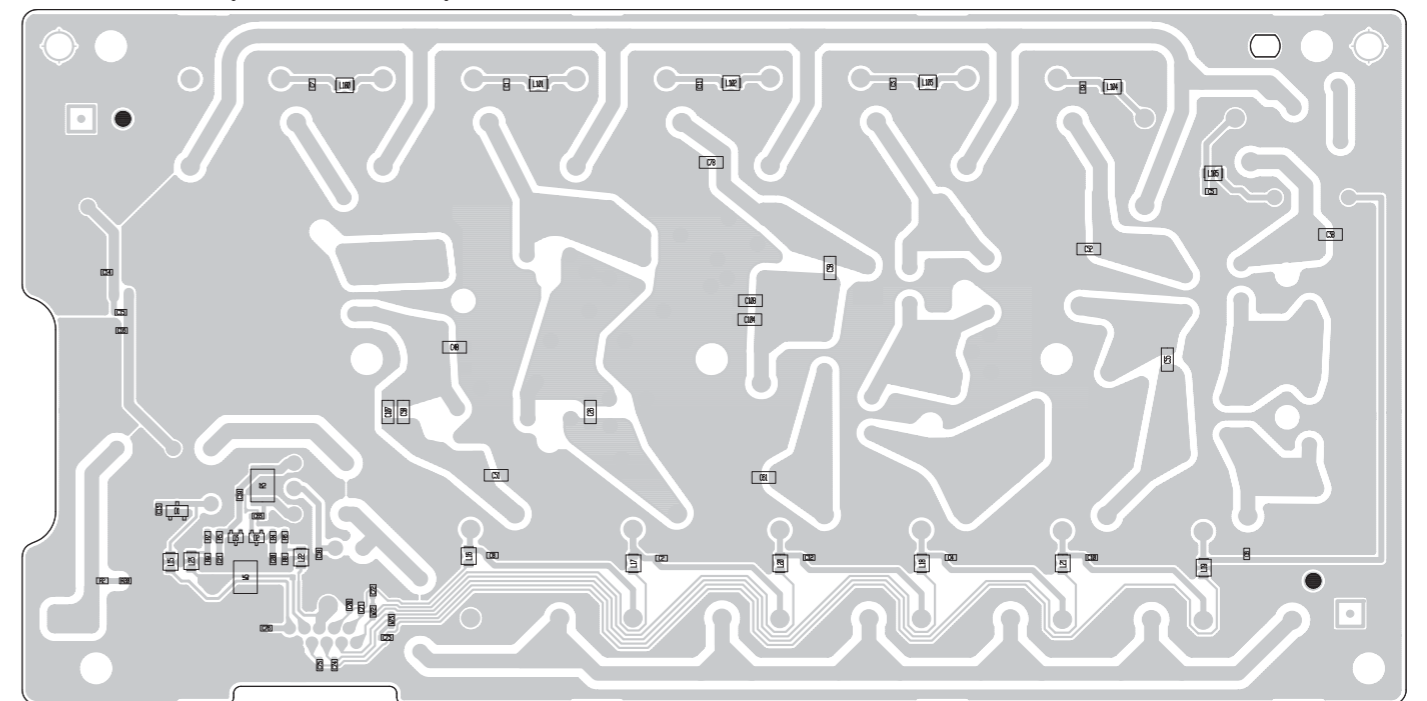
• PA UNIT (BOTTOM VIEW)



• PLL UNIT (BOTTOM VIEW)

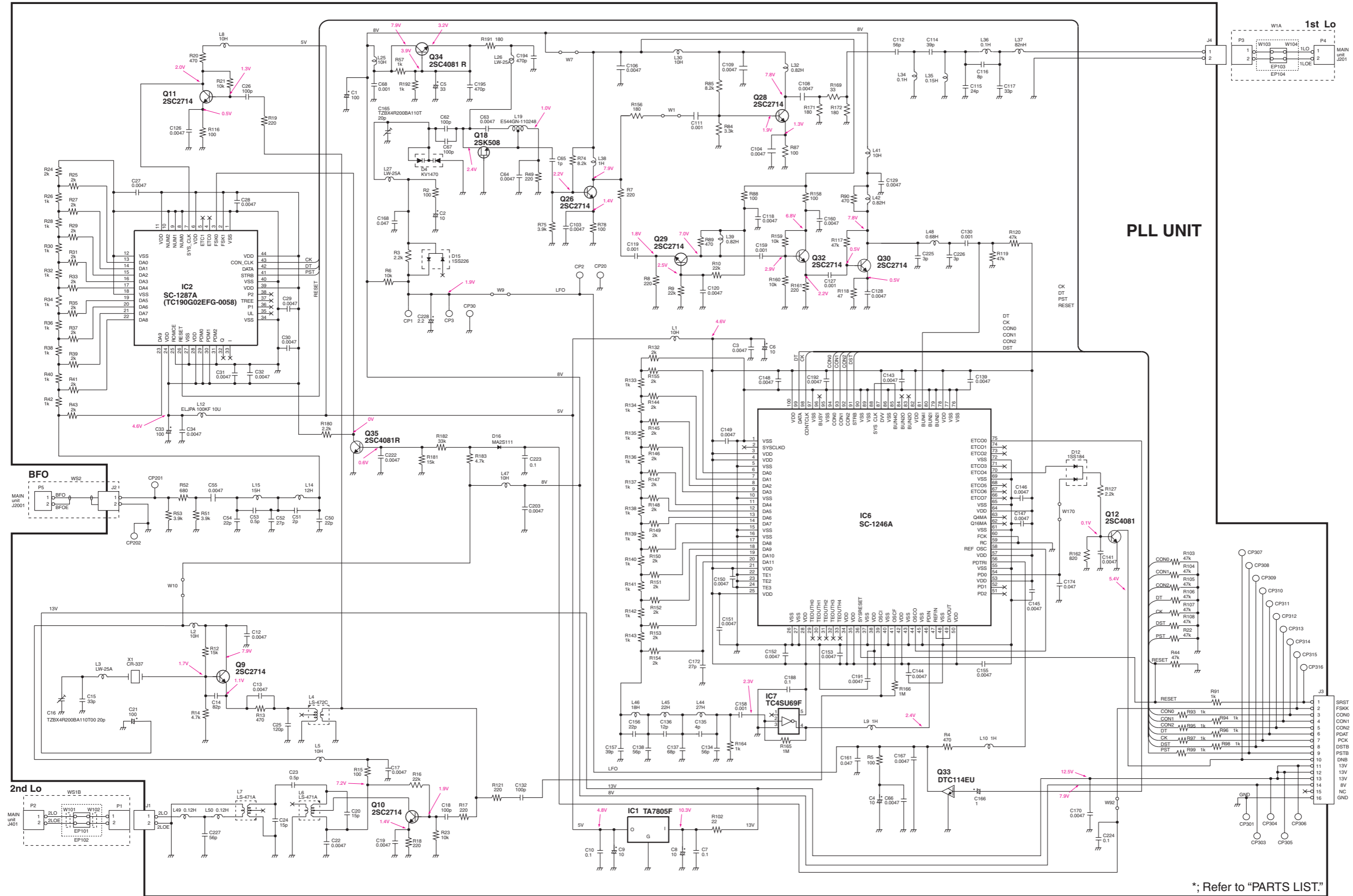


• FILTER UNIT (BOTTOM VIEW)

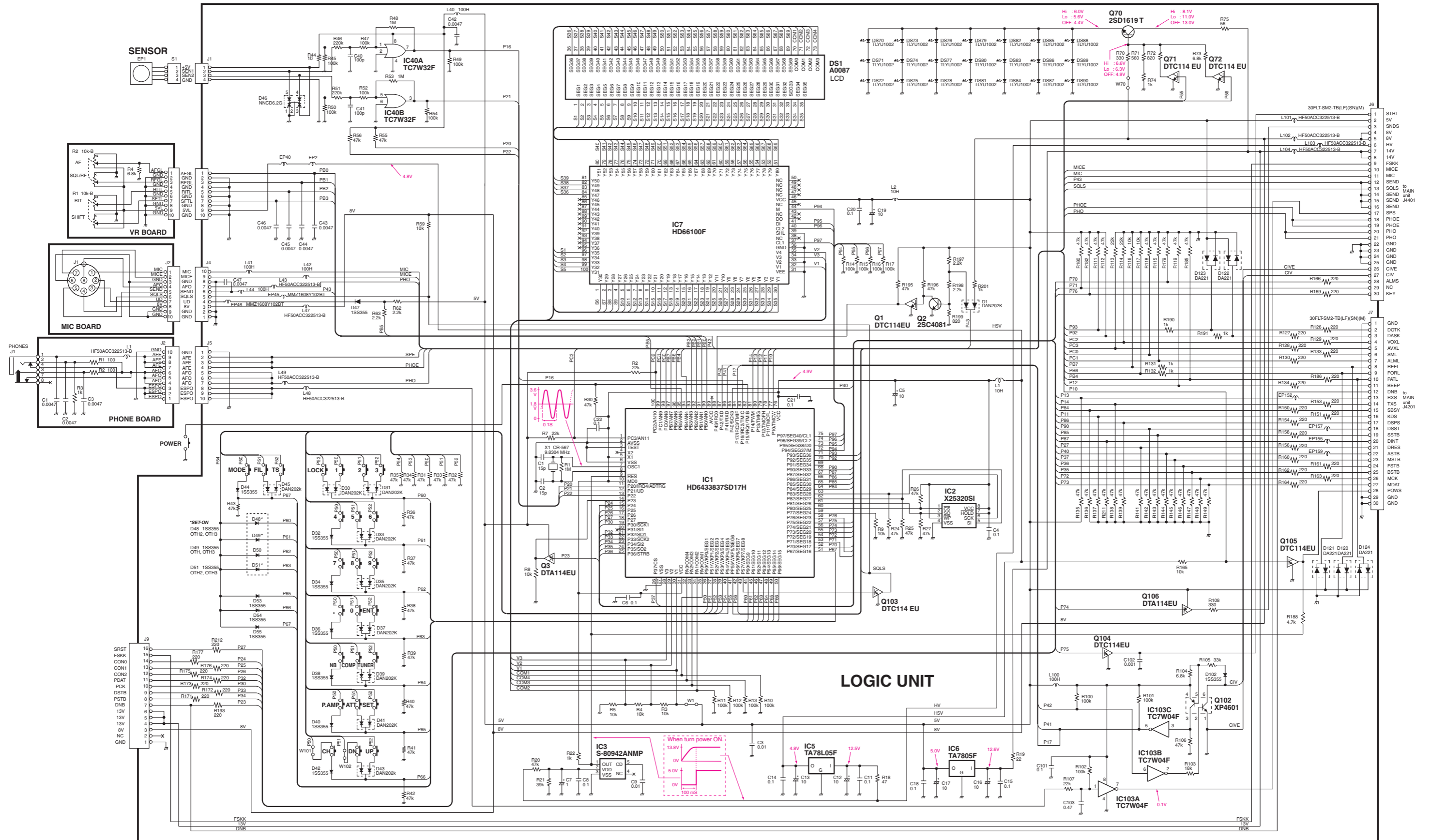




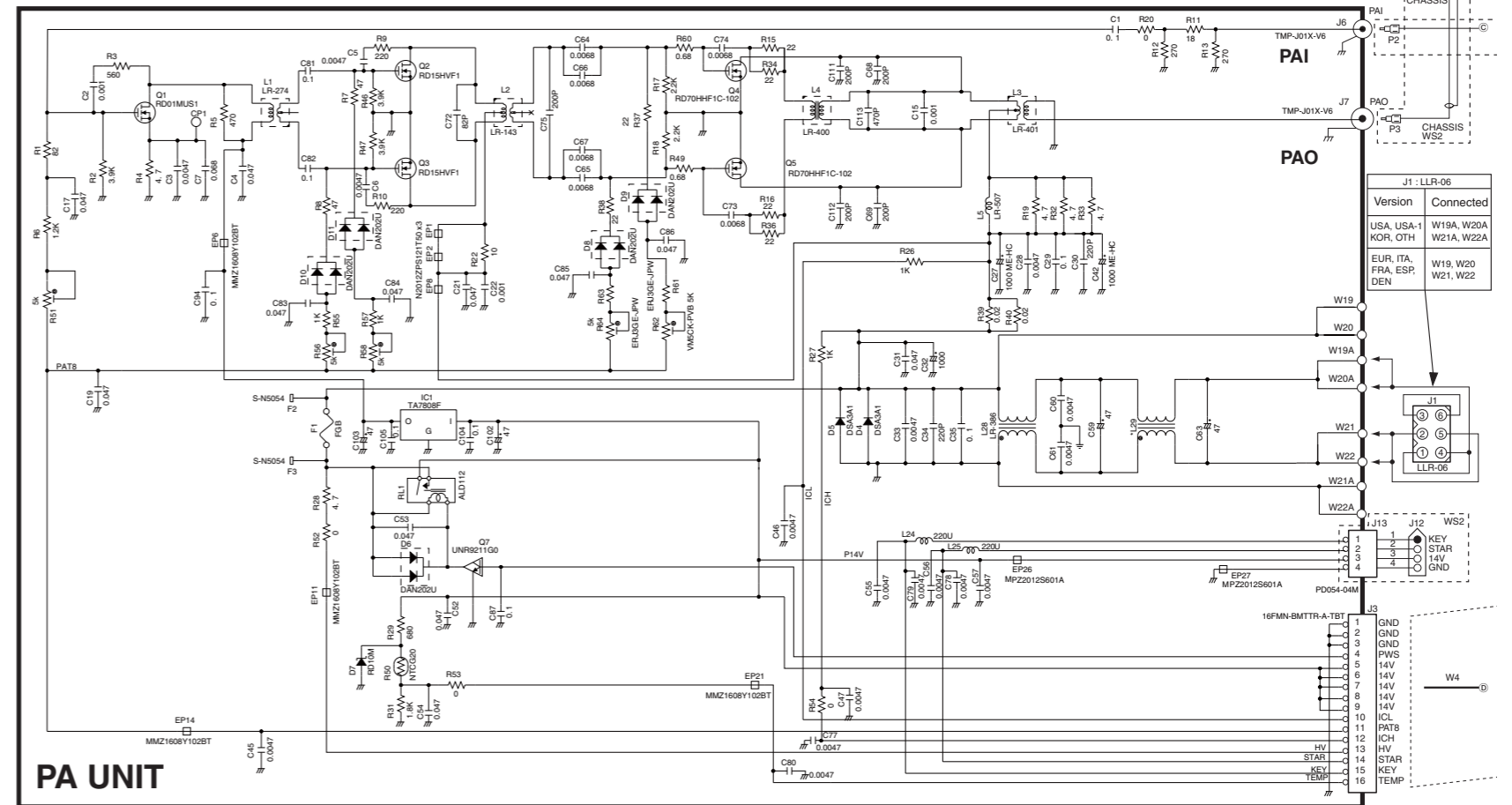
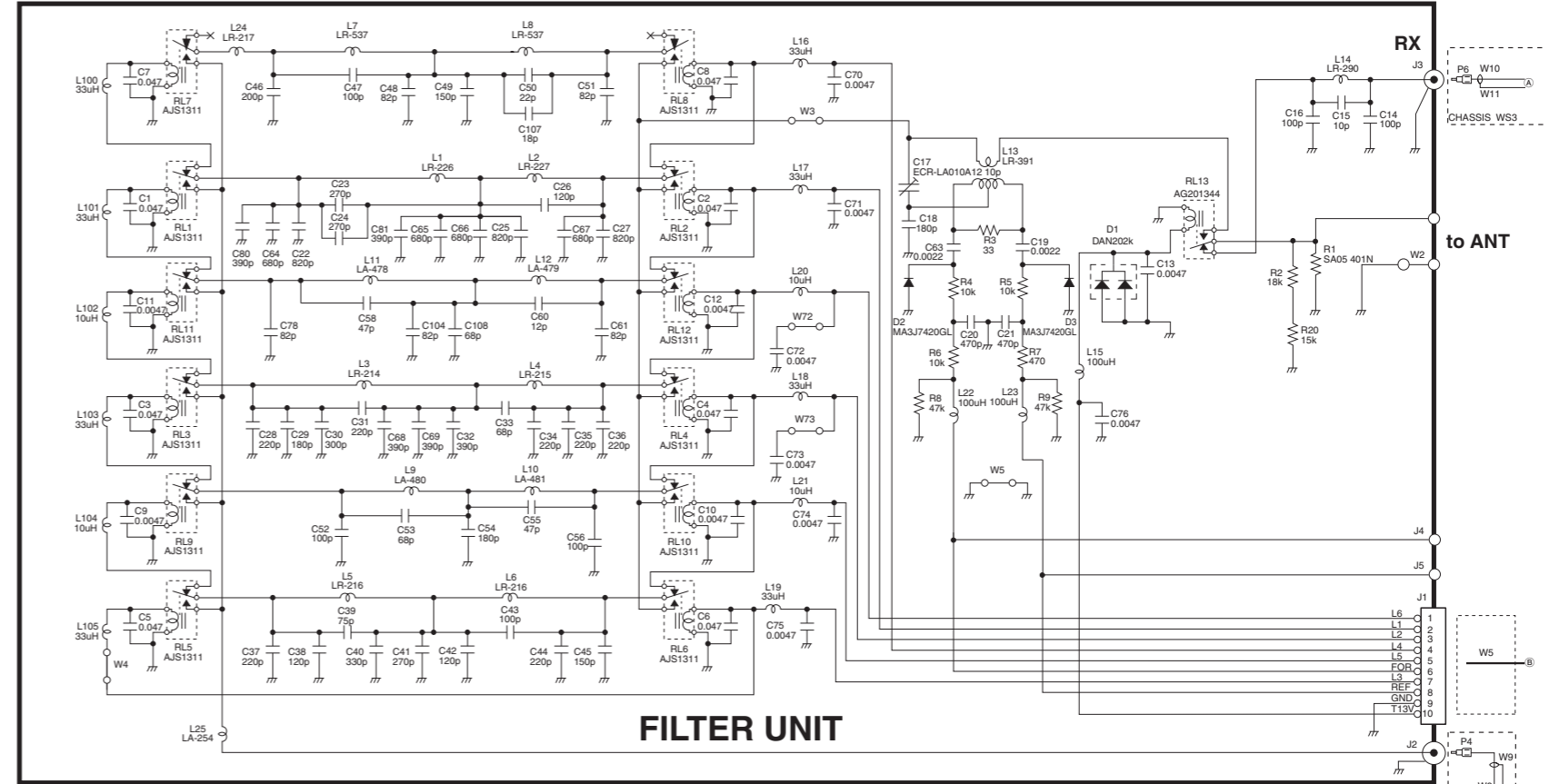
# VOLTAGE DIAGRAM



\*; Refer to "PARTS LIST."

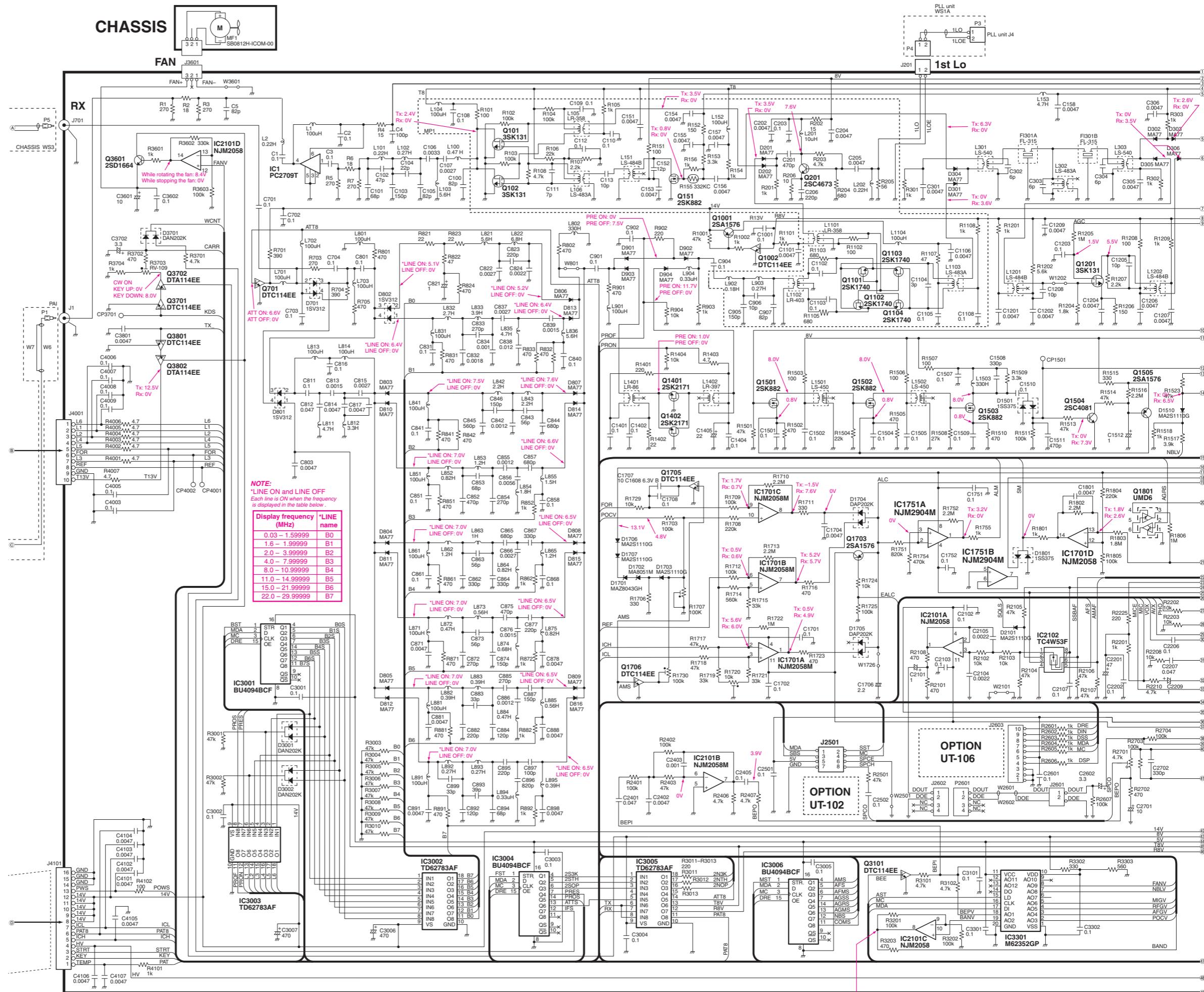


\*; Refer to "PARTS LIST."



Version	Connected
USA, USA-1	W19A, W20A
KOR, OTH	W21A, W22A
EUR, ITA, FRA, ESP, DEN	W19, W20, W21, W22

\*, Refer to "PARTS LIST."

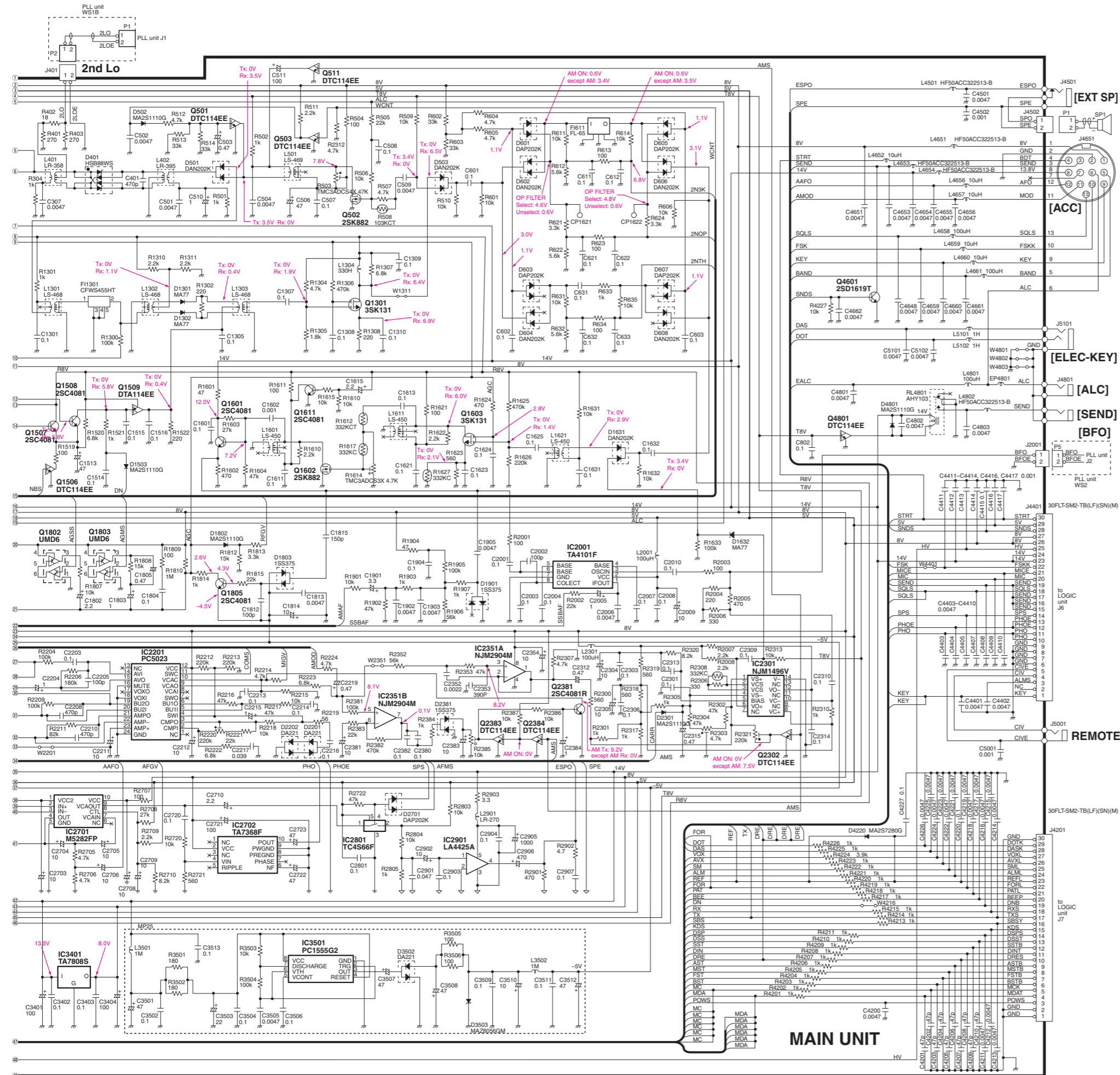


**NOTE:**  
Each line is ON when the frequency is displayed in the table below.

Display frequency (MHz)	*LINE name
0.03 - 1.99999	B0
1.6 - 1.99999	B1
2.0 - 3.99999	B2
4.0 - 7.99999	B3
8.0 - 10.99999	B4
11.0 - 14.99999	B5
15.0 - 21.99999	B6
22.0 - 29.99999	B7

Display frequency (MHz)	Voltage (V)	Display frequency (MHz)	Voltage (V)
0.03 - 1.99999	7.4	11.0 - 14.99999	4.0
2.0 - 3.99999	6.0	15.0 - 21.99999	3.1
4.0 - 7.99999	5.0	22.0 - 29.99999	2.2
8.0 - 10.99999	0		

\*; Refer to "PARTS LIST."



\*, Refer to "PARTS LIST."

Oct. 2008



# SERVICE MANUAL ADDENDUM

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## IC-718

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[LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
R146	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R147	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R148	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R149	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R150	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R151	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R153	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R154	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R156	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R158	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R160	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R161	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R162	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R163	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R164	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R165	7030003560	S.RES	ERJ3GEYJ 103 V (10 k)
R166	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R169	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R171	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R172	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R173	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R174	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R175	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R176	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R177	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R179	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R180	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R182	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R185	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R186	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R188	7030003520	S.RES	ERJ3GEYJ 472 V (4.7 k)
R190	7030003440	S.RES	ERJ3GEYJ 102 V (1 k)
R191	7030003440	S.RES	ERJ3GEYJ 102 V (1 k)
R193	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R195	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R196	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R197	7030003480	S.RES	ERJ3GEYJ 222 V (2.2 k)
R198	7030003480	S.RES	ERJ3GEYJ 222 V (2.2 k)
R199	7030003430	S.RES	ERJ3GEYJ 821 V (820)
R201	7030003440	S.RES	ERJ3GEYJ 102 V (1 k)
R211	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R212	7030003360	S.RES	ERJ3GEYJ 221 V (220)
C1	4030007030	S.CER	C1608 CH 1H 150J-T
C2	4030007030	S.CER	C1608 CH 1H 150J-T
C3	4030006900	S.CER	C1608 JB 1H 103K-T
C4	4030011600	S.CER	C1608 JB 1E 104K-T
C5	4510008540	S.ELE	EEE1CA100SR
C6	4030011600	S.CER	C1608 JB 1E 104K-T
C7	4510008550	S.ELE	EEE1HA010SR
C8	4030011600	S.CER	C1608 JB 1E 104K-T
C9	4030006900	S.CER	C1608 JB 1H 103K-T
C11	4030011600	S.CER	C1608 JB 1E 104K-T
C12	4510008540	S.ELE	EEE1CA100SR
C13	4510008540	S.ELE	EEE1CA100SR
C14	4030011600	S.CER	C1608 JB 1E 104K-T
C15	4030011600	S.CER	C1608 JB 1E 104K-T
C16	4510008540	S.ELE	EEE1CA100SR
C17	4510008540	S.ELE	EEE1CA100SR
C18	4030011600	S.CER	C1608 JB 1E 104K-T
C19	4510008540	S.ELE	EEE1CA100SR
C20	4030011600	S.CER	C1608 JB 1E 104K-T
C21	4030011600	S.CER	C1608 JB 1E 104K-T
C22	4030011600	S.CER	C1608 JB 1E 104K-T
C40	4030007130	S.CER	C1608 CH 1H 101J-T
C41	4030007130	S.CER	C1608 CH 1H 101J-T
C42	4030006880	S.CER	C1608 JB 1H 472K-T
C43	4030006880	S.CER	C1608 JB 1H 472K-T
C44	4030006880	S.CER	C1608 JB 1H 472K-T
C45	4030006880	S.CER	C1608 JB 1H 472K-T
C46	4030006880	S.CER	C1608 JB 1H 472K-T
C47	4030006880	S.CER	C1608 JB 1H 472K-T
C101	4030011600	S.CER	C1608 JB 1E 104K-T
C102	4030006860	S.CER	C1608 JB 1H 102K-T
C103	4030009110	S.CER	C3216 JB 1C 474K-T
C111	4030011600	S.CER	C1608 JB 1E 104K-T
C112	4030011600	S.CER	C1608 JB 1E 104K-T
C113	4030011600	S.CER	C1608 JB 1E 104K-T
C114	4030011600	S.CER	C1608 JB 1E 104K-T
J1	6510020421	S.CNR	S4B-PH-SM4-TB (LF) (SN)
J3	6510022621	S.CNR	10FMN-BMTTR-A-TBT (LF) (SN)
J4	6510022621	S.CNR	10FMN-BMTTR-A-TBT (LF) (SN)
J5	6510022621	S.CNR	10FMN-BMTTR-A-TBT (LF) (SN)
J6	6510021722	S.CNR	30FLT-SM2-TB(LF)(SN)(M)
J7	6510021722	S.CNR	30FLT-SM2-TB(LF)(SN)(M)
J9	6510022611	S.CNR	16FMN-BMTTR-A-TBT (LF) (SN)
DS1	5030002490	LCD	A0087A LCD
DS70	5040002940	S.LED	TLYU1002A (T02)
DS71	5040002940	S.LED	TLYU1002A (T02)
DS72	5040002940	S.LED	TLYU1002A (T02)
DS73	5040002940	S.LED	TLYU1002A (T02)
DS74	5040002940	S.LED	TLYU1002A (T02)
DS75	5040002940	S.LED	TLYU1002A (T02)
DS76	5040002940	S.LED	TLYU1002A (T02)
DS77	5040002940	S.LED	TLYU1002A (T02)
DS78	5040002940	S.LED	TLYU1002A (T02)
DS79	5040002940	S.LED	TLYU1002A (T02)
DS80	5040002940	S.LED	TLYU1002A (T02)
DS81	5040002940	S.LED	TLYU1002A (T02)

[LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
DS82	5040002940	S.LED	TLYU1002A (T02)
DS83	5040002940	S.LED	TLYU1002A (T02)
DS84	5040002940	S.LED	TLYU1002A (T02)
DS85	5040002940	S.LED	TLYU1002A (T02)
DS86	5040002940	S.LED	TLYU1002A (T02)
DS87	5040002940	S.LED	TLYU1002A (T02)
DS88	5040002940	S.LED	TLYU1002A (T02)
DS89	5040002940	S.LED	TLYU1002A (T02)
DS90	5040002940	S.LED	TLYU1002A (T02)
W1	7030003860	S.RES	ERJ3GE JPW V
W70	7030003860	S.RES	ERJ3GE JPW V
W101	7030003860	S.RES	ERJ3GE JPW V
W102	7030003860	S.RES	ERJ3GE JPW V
EP2	6910012350	S.BEA	MMZ1608Y 102BT
EP40	6910012350	S.BEA	MMZ1608Y 102BT
EP45	6910012350	S.BEA	MMZ1608Y 102BT
EP46	6910012350	S.BEA	MMZ1608Y 102BT
EP70	8930051450	LCT	SRCN-2241-SP-N-W
EP152	6910012350	S.BEA	MMZ1608Y 102BT
EP155	6910012350	S.BEA	MMZ1608Y 102BT
EP157	6910012350	S.BEA	MMZ1608Y 102BT
EP159	6910012350	S.BEA	MMZ1608Y 102BT

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)  
S.=Surface mount













[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C4661	4030006880	S.CER	C1608 JB 1H 472K-T
C4662	4030006880	S.CER	C1608 JB 1H 472K-T
C4801	4030006880	S.CER	C1608 JB 1H 472K-T
C4802	4030006880	S.CER	C1608 JB 1H 472K-T
C4803	4030006880	S.CER	C1608 JB 1H 472K-T
C5001	4030006860	S.CER	C1608 JB 1H 102K-T
C5101	4030006880	S.CER	C1608 JB 1H 472K-T
C5102	4030006880	S.CER	C1608 JB 1H 472K-T
RL4801	6330001320	RLY	AHY103
J1	6510007020	CNR	TMP-J01X-V6
J201	6510018961	S.CNR	B2B-PH-SM4-TB (LF) (SN)
J401	6510018961	S.CNR	B2B-PH-SM4-TB (LF) (SN)
J701	6510007020	CNR	TMP-J01X-V6
J2001	6510018961	S.CNR	B2B-PH-SM4-TB (LF) (SN)
J2501	6510019191	S.CNR	52365-0871
J2602	6510018971	S.CNR	B4B-PH-SM4-TB (LF) (SN)
J2603	6510022621	S.CNR	10FMN-BMTTR-A-TBT (LF) (SN)
J3601	6510003391	CNR	B03B-EH-S (LF) (SN)
J4001	6510022621	S.CNR	10FMN-BMTTR-A-TBT (LF) (SN)
J4101	6510022611	S.CNR	16FMN-BMTTR-A-TBT (LF) (SN)
J4201	6510021721	S.CNR	30FLT-SM2-TB (LF) (SN)
J4401	6510021721	S.CNR	30FLT-SM2-TB (LF) (SN)
J4501	6450000140	CNR	HSJ0807-01-010
J4502	6510018961	S.CNR	B2B-PH-SM4-TB (LF) (SN)
J4651	6510024661	CNR	TCS5072-1041577
J4801	6450001130	CNR	JPJ2042-01-110
J5001	6450000140	CNR	HSJ0807-01-010
J5101	6450001791	CNR	HLJ7000-016010
W801	7030003860	S.RES	ERJ3GE JPW V
W1202	7030003860	S.RES	ERJ3GE JPW V
W1311	7030003860	S.RES	ERJ3GE JPW V
W1726	7030003860	S.RES	ERJ3GE JPW V
W2101	7030003860	S.RES	ERJ3GE JPW V
W2201	7030003860	S.RES	ERJ3GE JPW V
W2351	7030003860	S.RES	ERJ3GE JPW V
W3601	7030003860	S.RES	ERJ3GE JPW V
W4216	7030003860	S.RES	ERJ3GE JPW V
W4401	7030003860	S.RES	ERJ3GE JPW V
W4801	7030003860	S.RES	ERJ3GE JPW V
W4802	7030003860	S.RES	ERJ3GE JPW V
W4803	7030003860	S.RES	ERJ3GE JPW V
EP4801	6910012350	S.BEA	MMZ1608Y 102BT

[PLL UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
IC1	1180001071	S.IC	TA7805F (TE16L,Q)
IC2	1140014960	S.IC	SC-1287A(TC190G02EFG-0058)
IC6	1140007881	S.IC	TC190G08EFG0046JDZ/SC1246A
IC7	1130003611	S.IC	TC4SU69F (TE85R,F)
Q9	1530002371	S.TR	2SC2714-O (TE85R,F)
Q10	1530002371	S.TR	2SC2714-O (TE85R,F)
Q11	1530002371	S.TR	2SC2714-O (TE85R,F)
Q12	1530002060	S.TR	2SC4081 T106 R
Q18	1560000491	S.FET	2SK508-T2B-A K52
Q26	1530002371	S.TR	2SC2714-O (TE85R,F)
Q28	1530002371	S.TR	2SC2714-O (TE85R,F)
Q29	1530002371	S.TR	2SC2714-O (TE85R,F)
Q30	1530002371	S.TR	2SC2714-O (TE85R,F)
Q32	1530002371	S.TR	2SC2714-O (TE85R,F)
Q33	1590000680	S.TR	DTC114EUA T106
Q34	1530002060	S.TR	2SC4081 T106 R
Q35	1530002060	S.TR	2SC4081 T106 R
D4	1720000860	S.VCP	KV1770S G 1-2
D12	1750000021	S.DIO	1SS184 (TE85R,F)
D15	1750000071	S.DIO	1SS226 (TE85R,F)
D16	1790001250	S.DIO	MA2S111-(TX)
X1	6050007351	XTL	CR-337A (32.000 MHz)
L1	6200009300	S.COL	ELJPA 100KF 10U
L2	6200001831	S.COL	NLV32T-100J
L3	6170000230	COL	LW-25
L4	6150004370	COL	LS-472C (C-15045)
L5	6200001831	S.COL	NLV32T-100J
L6	6150004250	COL	LS-471A (C-14922)
L7	6150004250	COL	LS-471A (C-14922)
L8	6200001831	S.COL	NLV32T-100J
L9	6200003960	S.COL	MLF1608A 1R0K-T
L10	6200003640	S.COL	MLF1608E 100K-T
L12	6200009300	S.COL	ELJPA 100KF 10U
L14	6200003131	S.COL	NLV32T-120J
L15	6200003141	S.COL	NLV32T-150J
L19	6190001281	COL	#E544GN-110248
L25	6200001831	S.COL	NLV32T-100J
L26	6170000230	COL	LW-25
L27	6170000230	COL	LW-25
L30	6200001831	S.COL	NLV32T-100J
L32	6200003051	S.COL	NLV32T-R82J
L34	6200003431	S.COL	NLV32T-R10J
L35	6200003421	S.COL	NLV32T-R15J
L36	6200003431	S.COL	NLV32T-R10J
L37	6200003451	S.COL	NLV32T-082J
L38	6200003331	S.COL	NLV32T-1R0J
L39	6200003051	S.COL	NLV32T-R82J
L41	6200001831	S.COL	NLV32T-100J
L42	6200003051	S.COL	NLV32T-R82J
L44	6200003161	S.COL	NLV32T-270J
L45	6200001711	S.COL	NLV32T-220J
L46	6200003151	S.COL	NLV32T-180J
L47	6200001831	S.COL	NLV32T-100J
L48	6200003041	S.COL	NLV32T-R68J
L49	6200004470	S.COL	MLF1608D R12K-T
L50	6200004470	S.COL	MLF1608D R12K-T
R2	7030003320	S.RES	ERJ3GEYJ 101 V (100)
R3	7030003480	S.RES	ERJ3GEYJ 222 V (2.2 k)
R4	7030003400	S.RES	ERJ3GEYJ 471 V (470)
R5	7030003320	S.RES	ERJ3GEYJ 101 V (100)
R6	7030003560	S.RES	ERJ3GEYJ 103 V (10 k)
R7	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R8	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R9	7030003600	S.RES	ERJ3GEYJ 223 V (22 k)
R10	7030003600	S.RES	ERJ3GEYJ 223 V (22 k)
R12	7030003580	S.RES	ERJ3GEYJ 153 V (15 k)
R13	7030003400	S.RES	ERJ3GEYJ 471 V (470)
R14	7030003520	S.RES	ERJ3GEYJ 472 V (4.7 k)
R15	7030003320	S.RES	ERJ3GEYJ 101 V (100)
R16	7030003600	S.RES	ERJ3GEYJ 223 V (22 k)
R17	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R18	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R19	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R20	7030003400	S.RES	ERJ3GEYJ 471 V (470)
R21	7030003560	S.RES	ERJ3GEYJ 103 V (10 k)
R22	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R23	7030003560	S.RES	ERJ3GEYJ 103 V (10 k)
R44	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R49	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R51	7030003510	S.RES	ERJ3GEYJ 392 V (3.9 k)
R52	7030003420	S.RES	ERJ3GEYJ 681 V (680)
R53	7030003510	S.RES	ERJ3GEYJ 392 V (3.9 k)
R57	7030003440	S.RES	ERJ3GEYJ 102 V (1 k)
R74	7030003550	S.RES	ERJ3GEYJ 822 V (8.2 k)
R75	7030003510	S.RES	ERJ3GEYJ 392 V (3.9 k)
R78	7030003320	S.RES	ERJ3GEYJ 101 V (100)
R84	7030003500	S.RES	ERJ3GEYJ 332 V (3.3 k)
R85	7030003550	S.RES	ERJ3GEYJ 822 V (8.2 k)
R87	7030003320	S.RES	ERJ3GEYJ 101 V (100)
R88	7030003320	S.RES	ERJ3GEYJ 101 V (100)
R89	7030003400	S.RES	ERJ3GEYJ 471 V (470)
R90	7030003400	S.RES	ERJ3GEYJ 471 V (470)
R91	7030003440	S.RES	ERJ3GEYJ 102 V (1 k)
R93	7030003440	S.RES	ERJ3GEYJ 102 V (1 k)

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)  
S.=Surface mount

[PLL UNIT]

REF NO.	ORDER NO.	DESCRIPTION
R94	7030003440	S.RES ERJ3GEYJ 102 V (1 k)
R95	7030003440	S.RES ERJ3GEYJ 102 V (1 k)
R96	7030003440	S.RES ERJ3GEYJ 102 V (1 k)
R97	7030003440	S.RES ERJ3GEYJ 102 V (1 k)
R98	7030003440	S.RES ERJ3GEYJ 102 V (1 k)
R99	7030003440	S.RES ERJ3GEYJ 102 V (1 k)
R102	7030006080	S.RES ERJ1WYJ220U (22)
R103	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R104	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R105	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R106	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R107	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R108	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R116	7030003320	S.RES ERJ3GEYJ 101 V (100)
R117	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R118	7030003280	S.RES ERJ3GEYJ 470 V (47)
R119	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R120	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R121	7030003360	S.RES ERJ3GEYJ 221 V (220)
R127	7030003480	S.RES ERJ3GEYJ 222 V (2.2 k)
R156	7030003350	S.RES ERJ3GEYJ 181 V (180)
R158	7030003320	S.RES ERJ3GEYJ 101 V (100)
R159	7030003560	S.RES ERJ3GEYJ 103 V (10 k)
R160	7030003560	S.RES ERJ3GEYJ 103 V (10 k)
R161	7030003360	S.RES ERJ3GEYJ 221 V (220)
R162	7030003430	S.RES ERJ3GEYJ 821 V (820)
R164	7030003440	S.RES ERJ3GEYJ 102 V (1 k)
R165	7030003800	S.RES ERJ3GEYJ 105 V (1 M)
R166	7030003800	S.RES ERJ3GEYJ 105 V (1 M)
R169	7030003260	S.RES ERJ3GEYJ 330 V (33)
R171	7030003350	S.RES ERJ3GEYJ 181 V (180)
R172	7030003350	S.RES ERJ3GEYJ 181 V (180)
R180	7030003480	S.RES ERJ3GEYJ 222 V (2.2 k)
R181	7030003580	S.RES ERJ3GEYJ 153 V (15 k)
R182	7030003620	S.RES ERJ3GEYJ 333 V (33 k)
R183	7030003520	S.RES ERJ3GEYJ 472 V (4.7 k)
R191	7030003350	S.RES ERJ3GEYJ 181 V (180)
R192	7030003440	S.RES ERJ3GEYJ 102 V (1 k)
C1	4510008500	S.ELE EEE1CA101WP
C2	4550006080	S.TAN TEESVB2 1C 106M8R
C3	4030006880	S.CER C1608 JB 1H 472K-T
C4	4550006080	S.TAN TEESVB2 1C 106M8R
C5	4510008880	S.ELE EEE1VA330WP
C6	4510008540	S.ELE EEE1CA100SR
C7	4030011600	S.CER C1608 JB 1E 104K-T
C8	4510008540	S.ELE EEE1CA100SR
C9	4510008540	S.ELE EEE1CA100SR
C10	4030011600	S.CER C1608 JB 1E 104K-T
C12	4030006880	S.CER C1608 JB 1H 472K-T
C13	4030006880	S.CER C1608 JB 1H 472K-T
C14	4030007150	S.CER C1608 CH 1H 151J-T
C15	4030008330	S.CER C1608 UJ 1H 560J-T
C16	4610002200	S.TRI TZB4R200EB10R00
C17	4030006880	S.CER C1608 JB 1H 472K-T
C18	4030007130	S.CER C1608 CH 1H 101J-T
C19	4030006880	S.CER C1608 JB 1H 472K-T
C20	4030007030	S.CER C1608 CH 1H 150J-T
C21	4510008500	S.ELE EEE1CA101WP
C22	4030006880	S.CER C1608 JB 1H 472K-T
C23	4030009500	S.CER C1608 CH 1H 0R5B-T
C24	4030007030	S.CER C1608 CH 1H 150J-T
C25	4030018700	S.CER GRM1882P1H121JZ01D
C26	4030007130	S.CER C1608 CH 1H 101J-T
C27	4030006880	S.CER C1608 JB 1H 472K-T
C28	4030006880	S.CER C1608 JB 1H 472K-T
C29	4030006880	S.CER C1608 JB 1H 472K-T
C30	4030006880	S.CER C1608 JB 1H 472K-T
C31	4030006880	S.CER C1608 JB 1H 472K-T
C32	4030006880	S.CER C1608 JB 1H 472K-T
C33	4510008500	S.ELE EEE1CA101WP
C34	4030006880	S.CER C1608 JB 1H 472K-T
C50	4030007050	S.CER C1608 CH 1H 220J-T
C51	4030006930	S.CER C1608 CH 1H 020C-T
C52	4030007060	S.CER C1608 CH 1H 270J-T
C53	4030009500	S.CER C1608 CH 1H 0R5B-T
C54	4030007050	S.CER C1608 CH 1H 220J-T
C55	4030006880	S.CER C1608 JB 1H 472K-T
C62	4030007130	S.CER C1608 CH 1H 101J-T
C63	4030006880	S.CER C1608 JB 1H 472K-T
C64	4030006880	S.CER C1608 JB 1H 472K-T
C65	4030006920	S.CER C1608 CH 1H 010C-T
C66	4030006880	S.CER C1608 JB 1H 472K-T
C67	4030007130	S.CER C1608 CH 1H 101J-T
C68	4030006860	S.CER C1608 JB 1H 102K-T
C103	4030006880	S.CER C1608 JB 1H 472K-T
C104	4030006880	S.CER C1608 JB 1H 472K-T
C106	4030006880	S.CER C1608 JB 1H 472K-T
C108	4030006880	S.CER C1608 JB 1H 472K-T
C109	4030006880	S.CER C1608 JB 1H 472K-T
C111	4030006860	S.CER C1608 JB 1H 102K-T
C112	4030007100	S.CER C1608 CH 1H 560J-T
C114	4030007080	S.CER C1608 CH 1H 390J-T
C115	4030009650	S.CER C1608 CH 1H 240J-T
C116	4030006990	S.CER C1608 CH 1H 080D-T
C117	4030007070	S.CER C1608 CH 1H 330J-T
C118	4030006880	S.CER C1608 JB 1H 472K-T
C119	4030006860	S.CER C1608 JB 1H 102K-T
C120	4030006880	S.CER C1608 JB 1H 472K-T
C126	4030006880	S.CER C1608 JB 1H 472K-T
C127	4030006860	S.CER C1608 JB 1H 102K-T
C128	4030006880	S.CER C1608 JB 1H 472K-T
C129	4030006880	S.CER C1608 JB 1H 472K-T

[PLL UNIT]

REF NO.	ORDER NO.	DESCRIPTION
C130	4030006860	S.CER C1608 JB 1H 102K-T
C132	4030007130	S.CER C1608 CH 1H 101J-T
C134	4030007100	S.CER C1608 CH 1H 560J-T
C135	4030006950	S.CER C1608 CH 1H 040C-T
C136	4030007020	S.CER C1608 CH 1H 120J-T
C137	4030007110	S.CER C1608 CH 1H 680J-T
C138	4030007100	S.CER C1608 CH 1H 560J-T
C139	4030006880	S.CER C1608 JB 1H 472K-T
C141	4030006880	S.CER C1608 JB 1H 472K-T
C143	4030006880	S.CER C1608 JB 1H 472K-T
C144	4030006880	S.CER C1608 JB 1H 472K-T
C145	4030006880	S.CER C1608 JB 1H 472K-T
C146	4030006880	S.CER C1608 JB 1H 472K-T
C147	4030006880	S.CER C1608 JB 1H 472K-T
C148	4030006880	S.CER C1608 JB 1H 472K-T
C149	4030006880	S.CER C1608 JB 1H 472K-T
C150	4030006880	S.CER C1608 JB 1H 472K-T
C151	4030006880	S.CER C1608 JB 1H 472K-T
C152	4030006880	S.CER C1608 JB 1H 472K-T
C153	4030006880	S.CER C1608 JB 1H 472K-T
C155	4030006880	S.CER C1608 JB 1H 472K-T
C156	4030007050	S.CER C1608 CH 1H 220J-T
C157	4030007080	S.CER C1608 CH 1H 390J-T
C158	4030006860	S.CER C1608 JB 1H 102K-T
C159	4030006860	S.CER C1608 JB 1H 102K-T
C160	4030006880	S.CER C1608 JB 1H 472K-T
C161	4030008920	S.CER C1608 JB 1H 472K-T
C165	4610001850	S.TRI TZB4R200AB10R00
C166	4550000460	S.TAN TEESVA 1C 105M8R
C167	4030006880	S.CER C1608 JB 1H 472K-T
C168	4030008920	S.CER C1608 JB 1H 473K-T
C170	4030006880	S.CER C1608 JB 1H 472K-T
C172	4030007060	S.CER C1608 CH 1H 270J-T
C174	4030008920	S.CER C1608 JB 1H 473K-T
C188	4030011600	S.CER C1608 JB 1E 104K-T
C191	4030006880	S.CER C1608 JB 1H 472K-T
C192	4030006880	S.CER C1608 JB 1H 472K-T
C194	4030011340	S.CER C1608 CH 1H 471J-T
C195	4030011340	S.CER C1608 CH 1H 471J-T
C203	4030006880	S.CER C1608 JB 1H 472K-T
C222	4030006880	S.CER C1608 JB 1H 472K-T
C223	4030011600	S.CER C1608 JB 1E 104K-T
C224	4030011600	S.CER C1608 JB 1E 104K-T
C225	4030006940	S.CER C1608 CH 1H 030C-T
C226	4030006940	S.CER C1608 CH 1H 030C-T
C227	4030007100	S.CER C1608 CH 1H 560J-T
C228	4550002890	S.TAN TEESVA 1A 225M8R
J1	6510018961	S.CNR B2B-PH-SM4-TB (LF) (SN)
J3	6510022611	S.CNR 16FMN-BMTR-A-TBT (LF) (SN)
J4	6510018961	S.CNR B2B-PH-SM4-TB (LF) (SN)
W1	7030003860	S.RES ERJ3GE JPW V
W7	7030003860	S.RES ERJ3GE JPW V
W9	7030003860	S.RES ERJ3GE JPW V
W10	7030003860	S.RES ERJ3GE JPW V
W92	7030003860	S.RES ERJ3GE JPW V
W170	7030003860	S.RES ERJ3GE JPW V

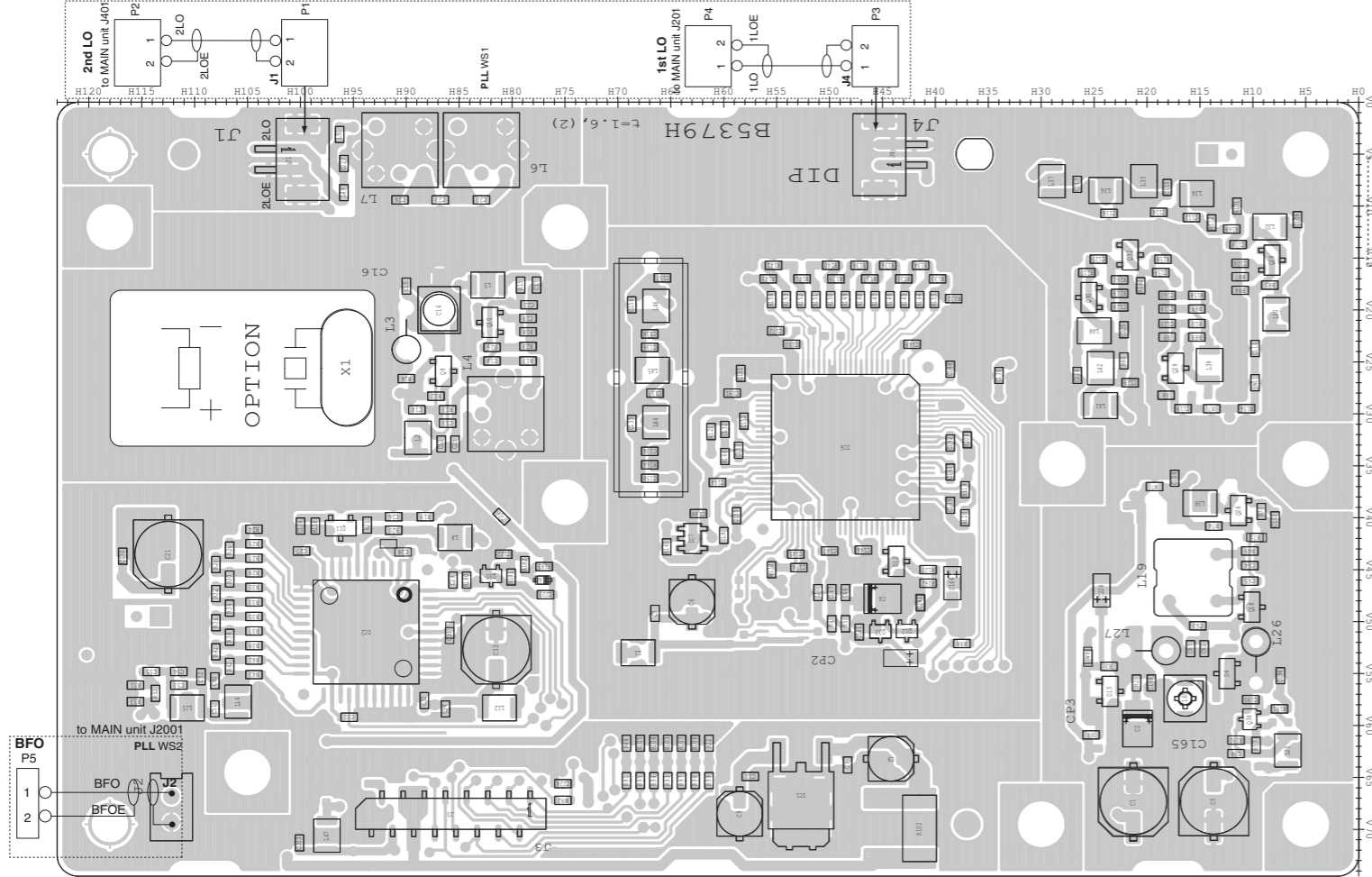
M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)  
S.=Surface mount





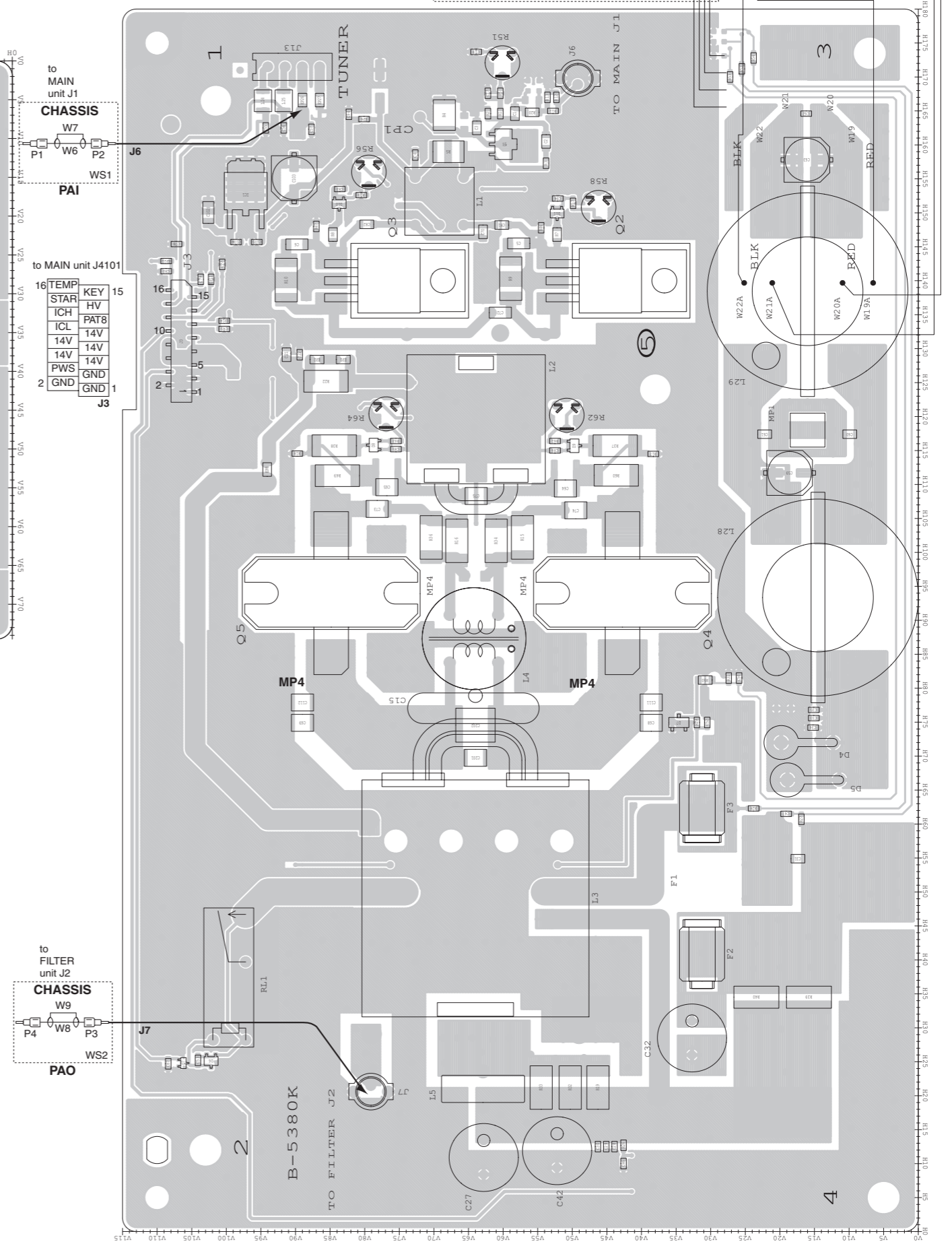


• PLL UNIT (TOP VIEW)

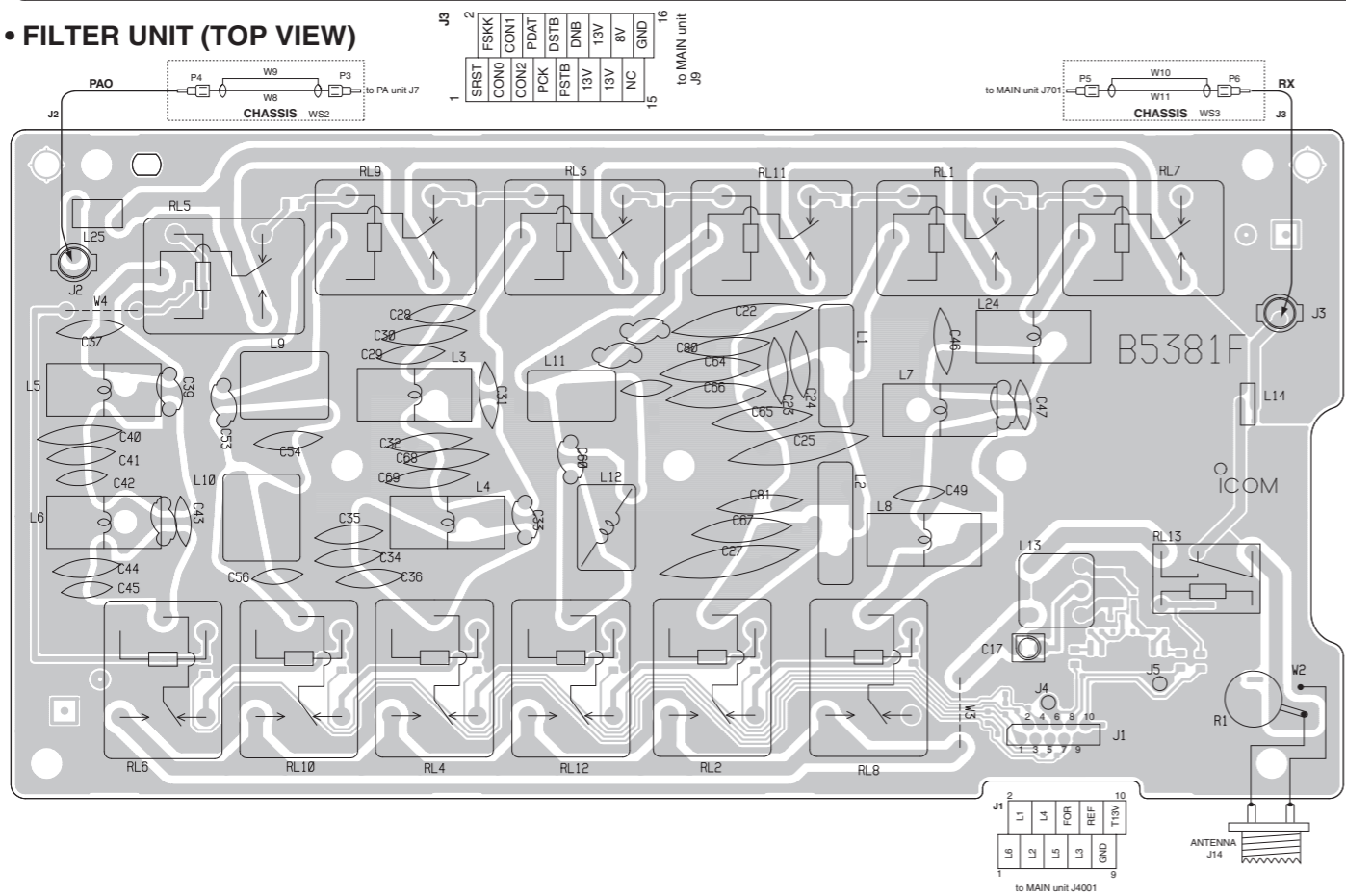


The combination of this side and the bottom side shows the board layout in the same configuration as the actual P.C.Board.

• PA UNIT (TOP VIEW)

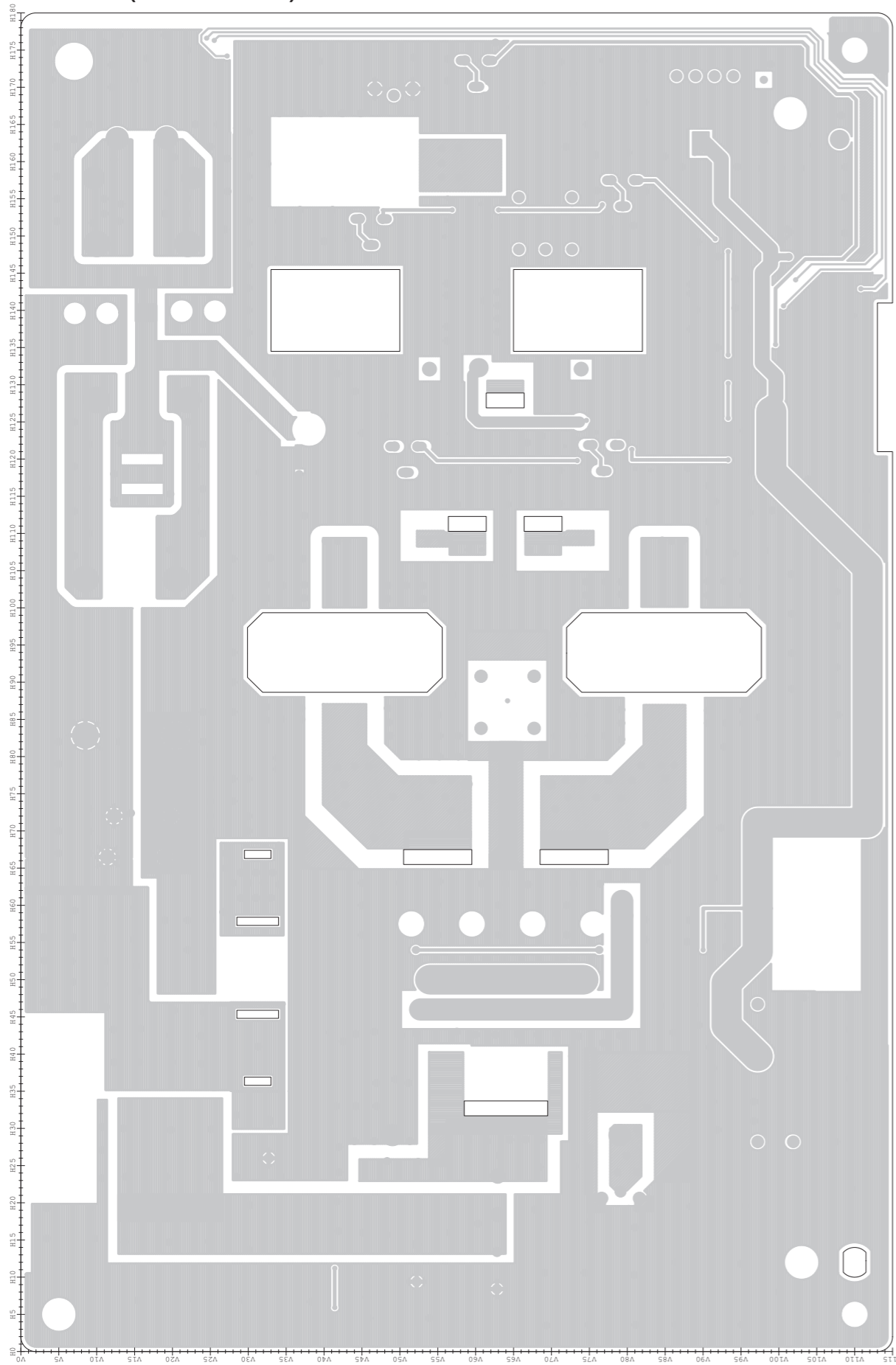


• FILTER UNIT (TOP VIEW)

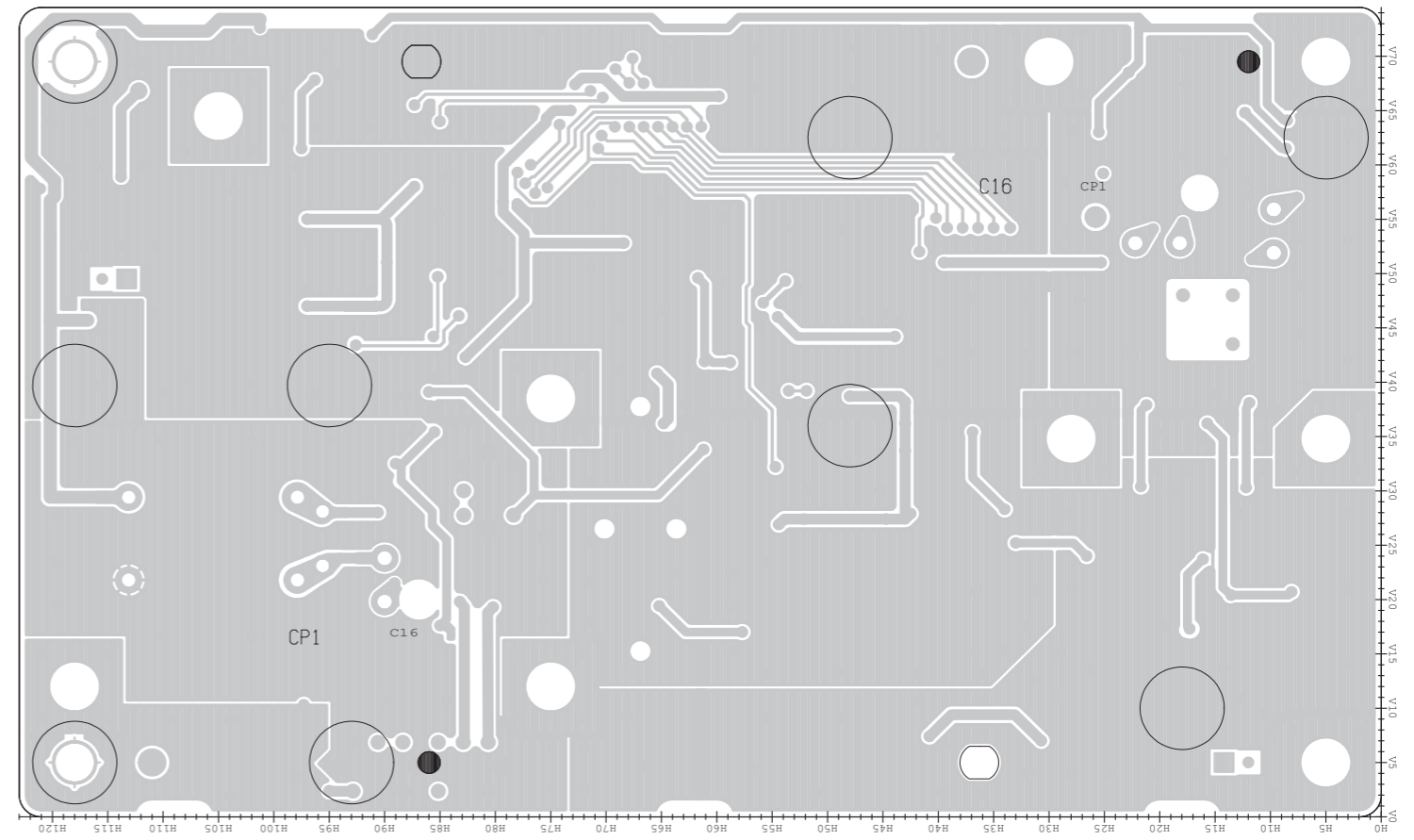


The combination of this side and the bottom side shows the board layout in the same configuration as the actual P.C.Board.

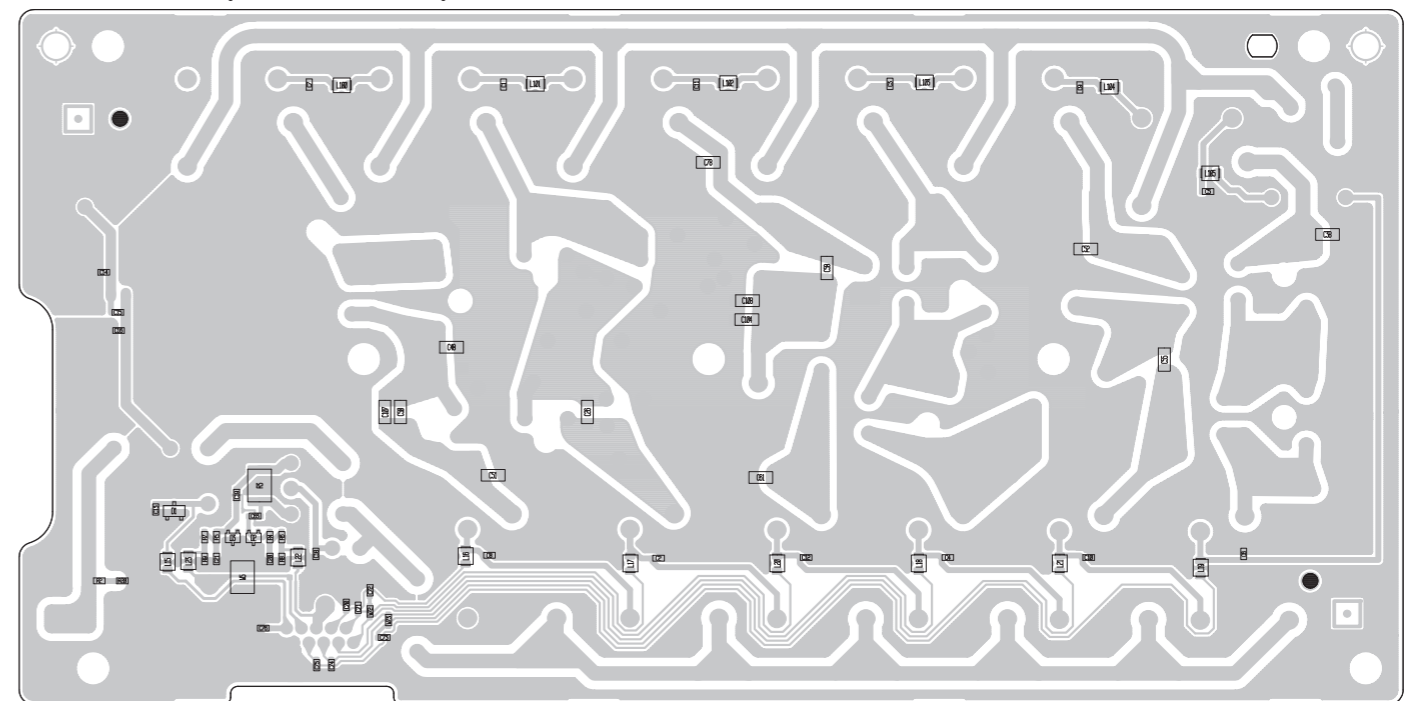
• PA UNIT (BOTTOM VIEW)



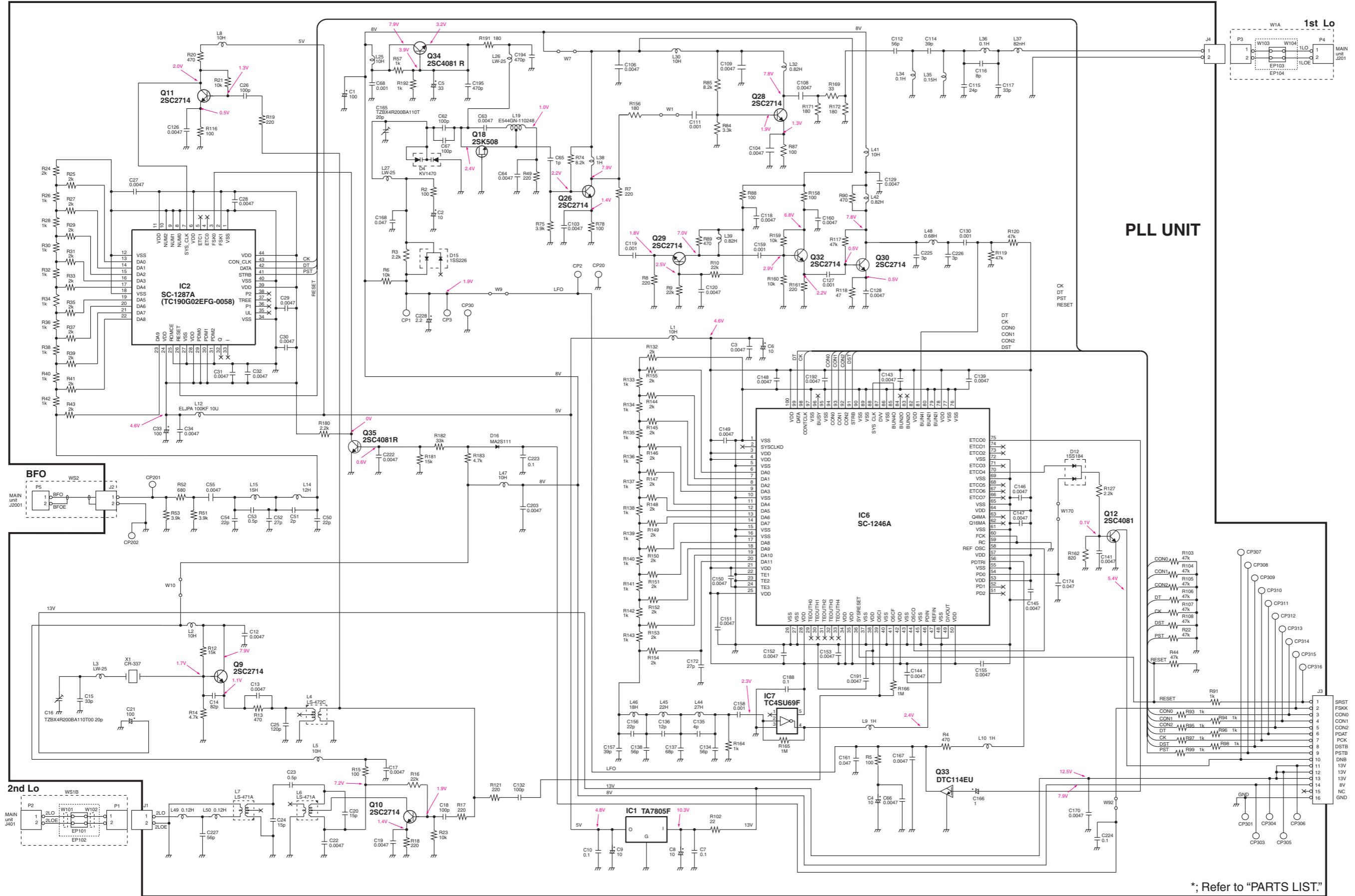
• PLL UNIT (BOTTOM VIEW)



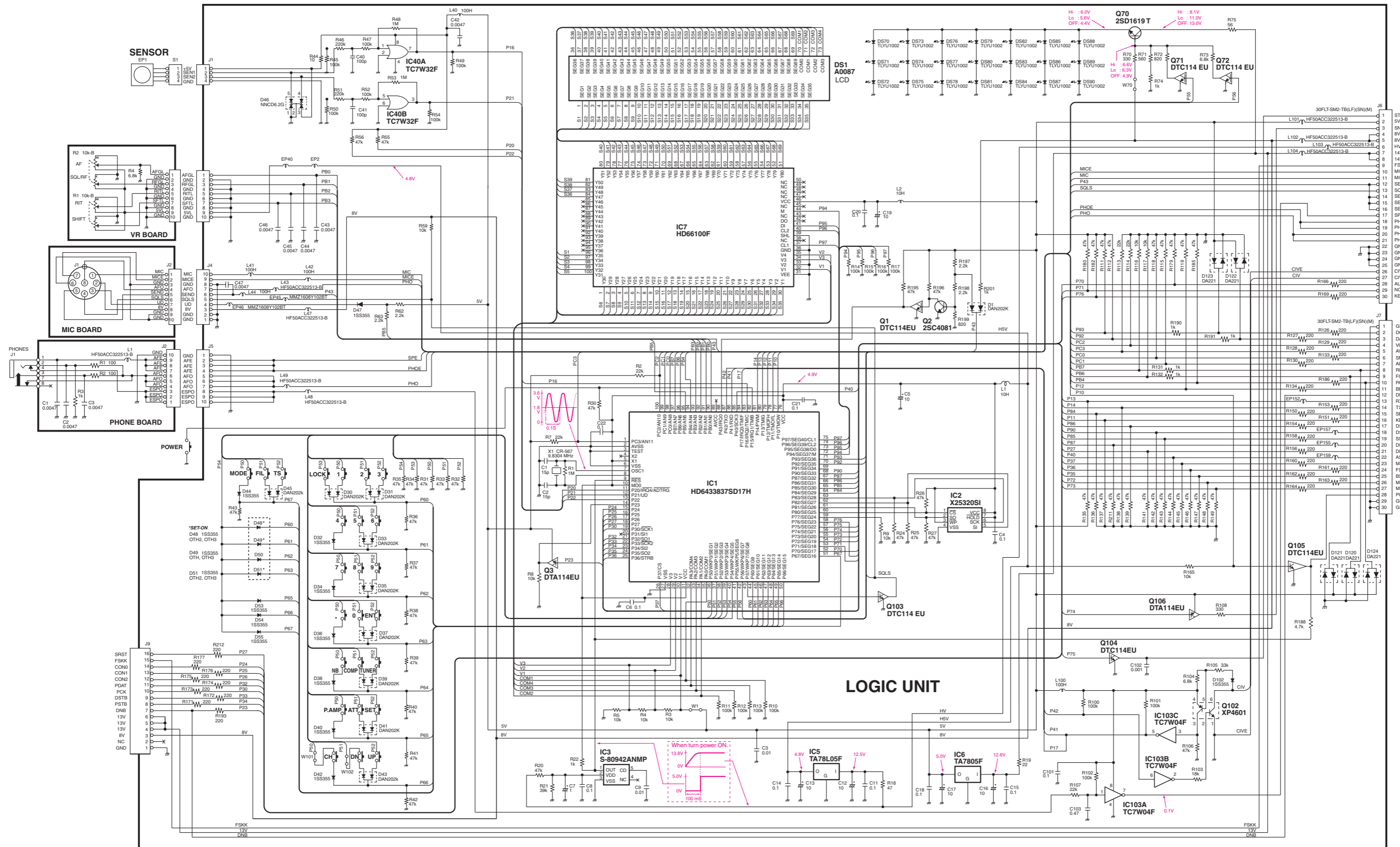
• FILTER UNIT (BOTTOM VIEW)



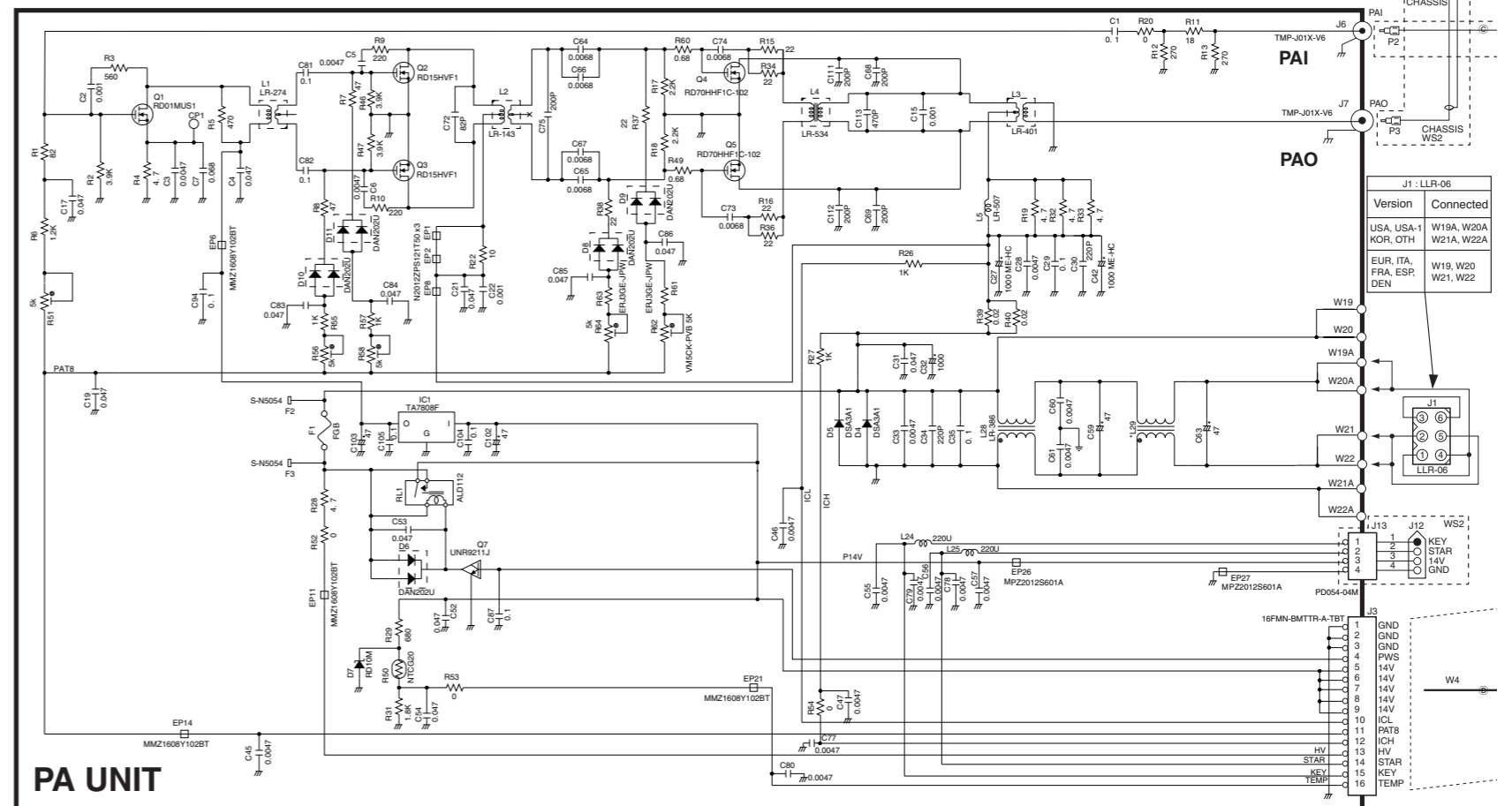
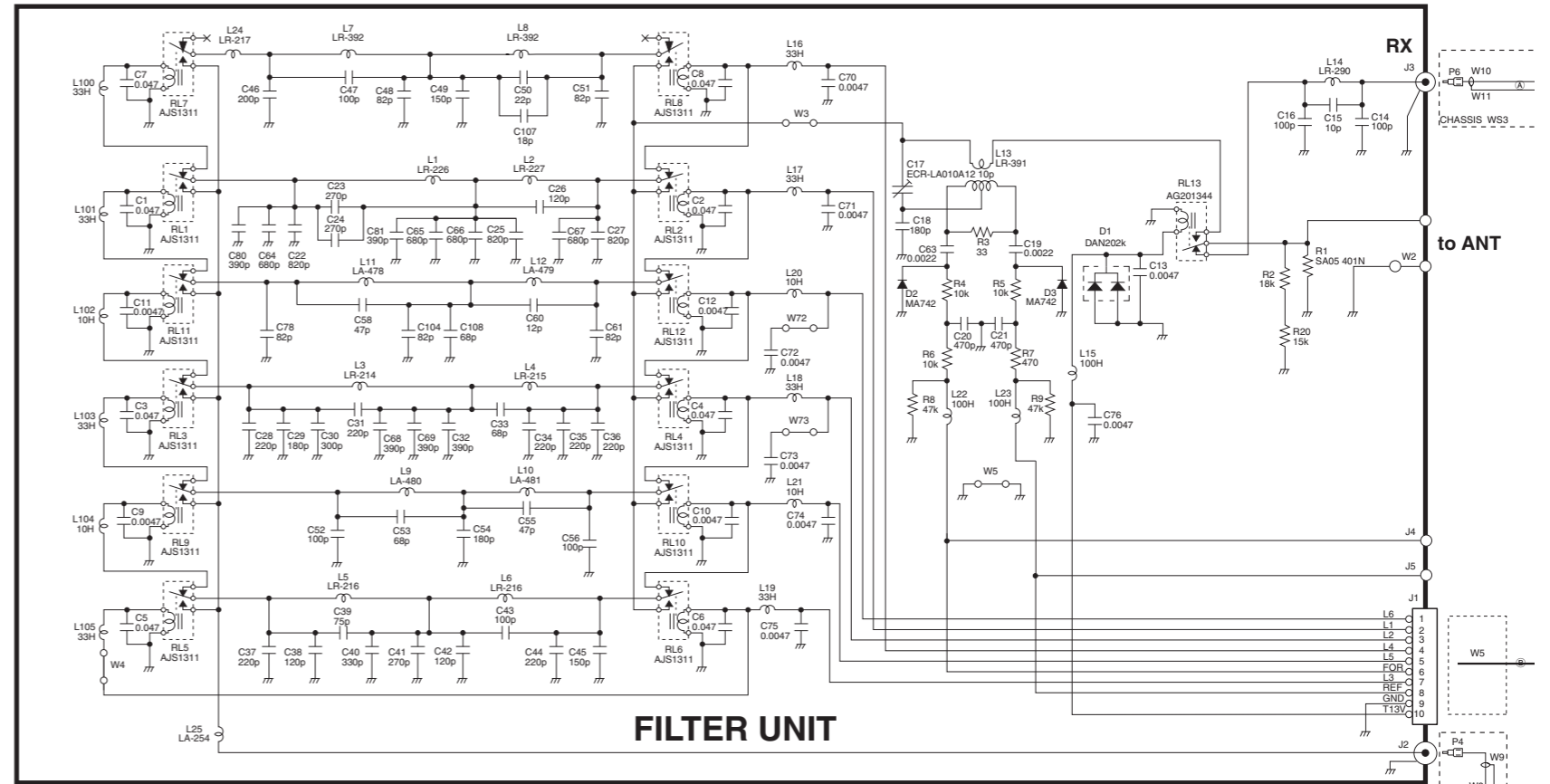
# VOLTAGE DIAGRAM



\*; Refer to "PARTS LIST."

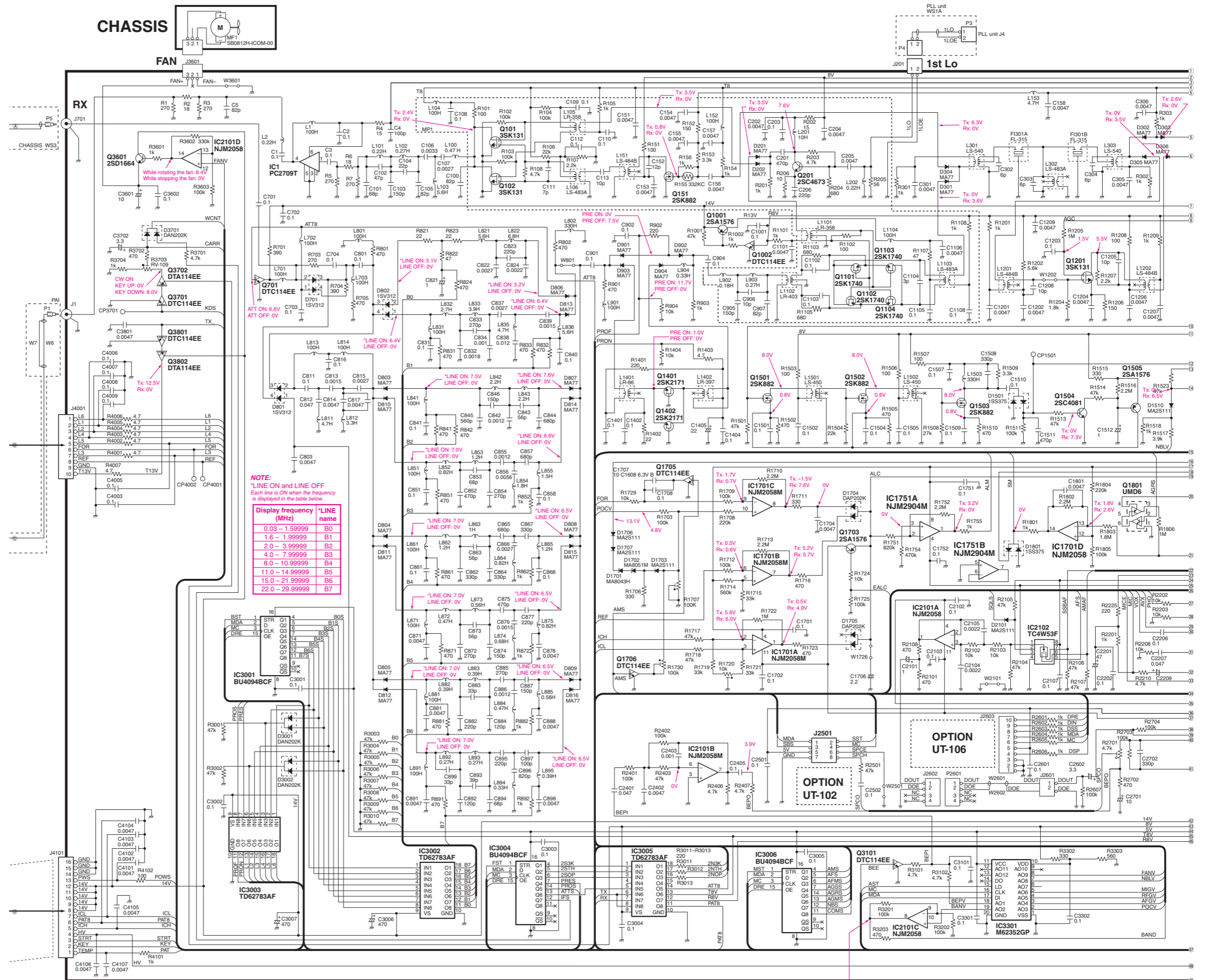


\*; Refer to "PARTS LIST"



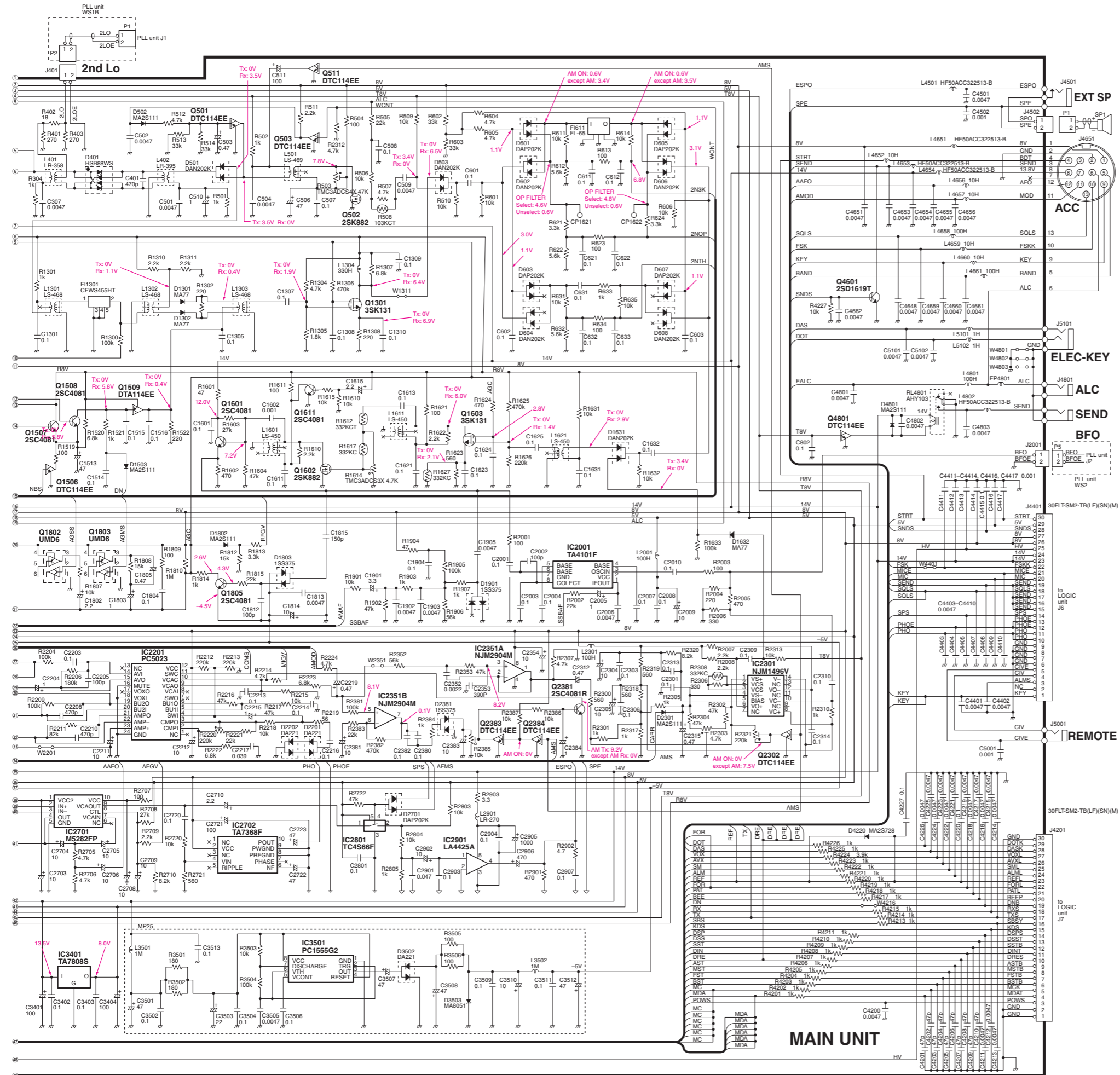
Version	Connected
USA, USA-1	W19A, W20A
KOR, OTH	W21A, W22A
EUR, ITA, FRA, ESP, DEN	W19, W20, W21, W22

\*; Refer to "PARTS LIST."



Display frequency (MHz)	Voltage (V)	Display frequency (MHz)	Voltage (V)
0.03 - 1.99999	7.4	11.0 - 14.99999	4.0
2.0 - 3.99999	6.0	15.0 - 21.99999	3.1
4.0 - 7.99999	5.0	22.0 - 29.99999	2.2
8.0 - 10.99999	0		

\*, Refer to "PARTS LIST."



\*; Refer to "PARTS LIST."



Oct. 2007



# SERVICE MANUAL ADDENDUM

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## IC-718

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## 5-3 TRANSMITTER ADJUSTMENT

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT		
		UNIT	LOCATION		UNIT	ADJUST	
IDLING CURRENT (for pre-driver)	1	<ul style="list-style-type: none"> <li>• Display frequency : 14.10000 MHz</li> <li>• Mode : USB</li> <li>• RF power : Minimum (L)</li> <li>• Mic gain : Minimum (0)</li> <li>• Disconnect J3601 (MAIN unit) and preset R51, R56, R58, R62, R64 (PA unit) to counter clockwise.</li> <li>• Transmitting</li> </ul>	PA	Connect a digital multimeter to the CP1.	Set the voltage between CP1 and GND to 0.5 V.	PA	R51
	(for driver)	1	<ul style="list-style-type: none"> <li>• Transmitting</li> </ul>	PA	Connect an ammeter (10 A) between the power supply and IC-718.	At the point where the Tx current increases 800 mA.	PA
	2			At the point where the Tx current increases another 800 mA.			R58
(for final amplifier)	1	<ul style="list-style-type: none"> <li>• Transmitting</li> </ul>	PA		At the point where the Tx current increases 800 mA.	PA	R62
	2				At the point where the Tx current increases another 800 mA.		R64
After the "IDLING CURRENT" adjustment, recover the connection of J3601.							
SWR DETECTOR	1	<ul style="list-style-type: none"> <li>• Display frequency : 14.10000 MHz</li> <li>• Mode : USB</li> <li>• RF power : Maximum (H)</li> <li>• Connect J4 (FILTER unit) to GND.</li> <li>• Connect an audio generator to [MIC] connector and set as; Frequency : 1.5 kHz Level : 30 mVrms</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to [ANT] connector.	100 W	Front panel	Mic gain control in the "quick set mode."
	2	<ul style="list-style-type: none"> <li>• Transmitting</li> </ul>	FILTER	Connect a digital multimeter to J5.	Minimum voltage	FILTER	C17
After the "SWR DETECTOR" adjustment, recover the connection of J4.							
TRANSMITTER TOTAL GAIN	1	<ul style="list-style-type: none"> <li>• Display frequency : 14.10000 MHz</li> <li>• Mode : USB</li> <li>• RF power : Maximum (H)</li> <li>• R2701 (MAIN unit) : Center</li> <li>• Mic gain : Center (50)</li> <li>• Connect an audio generator to [MIC] connector and set as; Frequency : 1.5 kHz Level : 3 mVrms</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to [ANT] connector.	Maximum output power	MAIN	L106, L151, L301, L302, L303, L501
	2	<ul style="list-style-type: none"> <li>• Transmitting</li> </ul>			50 W		R503
OUTPUT POWER	1	<ul style="list-style-type: none"> <li>• Display frequency : 14.10000 MHz</li> <li>• Mode : USB</li> <li>• RF power : Maximum (H)</li> <li>• Mic gain : Center (50)</li> <li>• Connect an audio generator to [MIC] connector and set as; Frequency : 1.5 kHz Level : 30 mVrms</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to [ANT] connector.	100 W	MAIN	R1707
Ic APC	1	<ul style="list-style-type: none"> <li>• Display frequency : 3.55000 MHz</li> <li>• Mode : USB</li> <li>• RF power : Maximum (H)</li> <li>• Mic gain : Center (50)</li> <li>• Connect CP4002 (MAIN unit) to GND.</li> <li>• Connect an audio generator to [MIC] connector and set as; Frequency : 1.5 kHz Level : 30 mVrms</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an ammeter (30 A) between power supply and the IC-718.	22 A	MAIN	R1720
After the "Ic APC" adjustment, recover the connection of CP4002.							



[LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
R146	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R147	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R148	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R149	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R150	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R151	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R153	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R154	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R156	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R158	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R160	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R161	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R162	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R163	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R164	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R165	7030003560	S.RES	ERJ3GEYJ 103 V (10 k)
R166	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R169	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R171	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R172	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R173	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R174	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R175	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R176	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R177	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R179	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R180	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R182	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R185	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R186	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R188	7030003520	S.RES	ERJ3GEYJ 472 V (4.7 k)
R190	7030003440	S.RES	ERJ3GEYJ 102 V (1 k)
R191	7030003440	S.RES	ERJ3GEYJ 102 V (1 k)
R193	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R195	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R196	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R197	7030003480	S.RES	ERJ3GEYJ 222 V (2.2 k)
R198	7030003480	S.RES	ERJ3GEYJ 222 V (2.2 k)
R199	7030003430	S.RES	ERJ3GEYJ 821 V (820)
R201	7030003440	S.RES	ERJ3GEYJ 102 V (1 k)
R211	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R212	7030003360	S.RES	ERJ3GEYJ 221 V (220)
C1	4030007030	S.CER	C1608 CH 1H 150J-T
C2	4030007030	S.CER	C1608 CH 1H 150J-T
C3	4030006900	S.CER	C1608 JB 1H 103K-T
C4	4030011600	S.CER	C1608 JB 1E 104K-T
C5	4510008540	S.ELE	EEE1CA100SR
C6	4030011600	S.CER	C1608 JB 1E 104K-T
C7	4510008550	S.ELE	EEE1HA010SR
C8	4030011600	S.CER	C1608 JB 1E 104K-T
C9	4030006900	S.CER	C1608 JB 1H 103K-T
C11	4030011600	S.CER	C1608 JB 1E 104K-T
C12	4510008540	S.ELE	EEE1CA100SR
C13	4510008540	S.ELE	EEE1CA100SR
C14	4030011600	S.CER	C1608 JB 1E 104K-T
C15	4030011600	S.CER	C1608 JB 1E 104K-T
C16	4510008540	S.ELE	EEE1CA100SR
C17	4510008540	S.ELE	EEE1CA100SR
C18	4030011600	S.CER	C1608 JB 1E 104K-T
C19	4510008540	S.ELE	EEE1CA100SR
C20	4030011600	S.CER	C1608 JB 1E 104K-T
C21	4030011600	S.CER	C1608 JB 1E 104K-T
C22	4030011600	S.CER	C1608 JB 1E 104K-T
C40	4030007130	S.CER	C1608 CH 1H 101J-T
C41	4030007130	S.CER	C1608 CH 1H 101J-T
C42	4030006880	S.CER	C1608 JB 1H 472K-T
C43	4030006880	S.CER	C1608 JB 1H 472K-T
C44	4030006880	S.CER	C1608 JB 1H 472K-T
C45	4030006880	S.CER	C1608 JB 1H 472K-T
C46	4030006880	S.CER	C1608 JB 1H 472K-T
C47	4030006880	S.CER	C1608 JB 1H 472K-T
C101	4030011600	S.CER	C1608 JB 1E 104K-T
C102	4030006860	S.CER	C1608 JB 1H 102K-T
C103	4030009110	S.CER	C3216 JB 1C 474K-T
C111	4030011600	S.CER	C1608 JB 1E 104K-T
C112	4030011600	S.CER	C1608 JB 1E 104K-T
C113	4030011600	S.CER	C1608 JB 1E 104K-T
C114	4030011600	S.CER	C1608 JB 1E 104K-T
J1	6510020421	S.CNR	S4B-PH-SM4-TB (LF) (SN)
J3	6510022621	S.CNR	10FMN-BMTTR-A-TBT (LF) (SN)
J4	6510022621	S.CNR	10FMN-BMTTR-A-TBT (LF) (SN)
J5	6510022621	S.CNR	10FMN-BMTTR-A-TBT (LF) (SN)
J6	6510021721	S.CNR	30FLT-SM2-TB (LF) (SN)
J7	6510021721	S.CNR	30FLT-SM2-TB (LF) (SN)
J9	6510022611	S.CNR	16FMN-BMTTR-A-TBT (LF) (SN)
DS1	5030002490	LCD	A0087A LCD
DS70	5040002940	S.LED	TLYU1002A (T02)
DS71	5040002940	S.LED	TLYU1002A (T02)
DS72	5040002940	S.LED	TLYU1002A (T02)
DS73	5040002940	S.LED	TLYU1002A (T02)
DS74	5040002940	S.LED	TLYU1002A (T02)
DS75	5040002940	S.LED	TLYU1002A (T02)
DS76	5040002940	S.LED	TLYU1002A (T02)
DS77	5040002940	S.LED	TLYU1002A (T02)
DS78	5040002940	S.LED	TLYU1002A (T02)
DS79	5040002940	S.LED	TLYU1002A (T02)
DS80	5040002940	S.LED	TLYU1002A (T02)
DS81	5040002940	S.LED	TLYU1002A (T02)

[LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
DS82	5040002940	S.LED	TLYU1002A (T02)
DS83	5040002940	S.LED	TLYU1002A (T02)
DS84	5040002940	S.LED	TLYU1002A (T02)
DS85	5040002940	S.LED	TLYU1002A (T02)
DS86	5040002940	S.LED	TLYU1002A (T02)
DS87	5040002940	S.LED	TLYU1002A (T02)
DS88	5040002940	S.LED	TLYU1002A (T02)
DS89	5040002940	S.LED	TLYU1002A (T02)
DS90	5040002940	S.LED	TLYU1002A (T02)
W1	7030003860	S.RES	ERJ3GE JPW V
W70	7030003860	S.RES	ERJ3GE JPW V
W101	7030003860	S.RES	ERJ3GE JPW V
W102	7030003860	S.RES	ERJ3GE JPW V
EP2	6910012350	S.BEA	MMZ1608Y 102BT
EP40	6910012350	S.BEA	MMZ1608Y 102BT
EP45	6910012350	S.BEA	MMZ1608Y 102BT
EP46	6910012350	S.BEA	MMZ1608Y 102BT
EP70	8930051450	LCT	SRCN-2241-SP-N-W
EP152	6910012350	S.BEA	MMZ1608Y 102BT
EP155	6910012350	S.BEA	MMZ1608Y 102BT
EP157	6910012350	S.BEA	MMZ1608Y 102BT
EP159	6910012350	S.BEA	MMZ1608Y 102BT

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)  
S.=Surface mount













[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C4661	4030006880	S.CER	C1608 JB 1H 472K-T
C4662	4030006880	S.CER	C1608 JB 1H 472K-T
C4801	4030006880	S.CER	C1608 JB 1H 472K-T
C4802	4030006880	S.CER	C1608 JB 1H 472K-T
C4803	4030006880	S.CER	C1608 JB 1H 472K-T
C5001	4030006860	S.CER	C1608 JB 1H 102K-T
C5101	4030006880	S.CER	C1608 JB 1H 472K-T
C5102	4030006880	S.CER	C1608 JB 1H 472K-T
RL4801	6330001320	RLY	AHY103
J1	6510007020	CNR	TMP-J01X-V6
J201	6510018961	S.CNR	B2B-PH-SM4-TB (LF) (SN)
J401	6510018961	S.CNR	B2B-PH-SM4-TB (LF) (SN)
J701	6510007020	CNR	TMP-J01X-V6
J2001	6510018961	S.CNR	B2B-PH-SM4-TB (LF) (SN)
J2501	6510019191	S.CNR	52365-0871
J2602	6510018971	S.CNR	B4B-PH-SM4-TB (LF) (SN)
J2603	6510022621	S.CNR	10FMN-BMTTR-A-TBT (LF) (SN)
J3601	6510003391	CNR	B03B-EH-S (LF) (SN)
J4001	6510022621	S.CNR	10FMN-BMTTR-A-TBT (LF) (SN)
J4101	6510022611	S.CNR	16FMN-BMTTR-A-TBT (LF) (SN)
J4201	6510021721	S.CNR	30FLT-SM2-TB (LF) (SN)
J4401	6510021721	S.CNR	30FLT-SM2-TB (LF) (SN)
J4501	6450000140	CNR	HSJ0807-01-010
J4502	6510018961	S.CNR	B2B-PH-SM4-TB (LF) (SN)
J4651	6510024661	CNR	TCS5072-1041577
J4801	6450001130	CNR	JPJ2042-01-110
J5001	6450000140	CNR	HSJ0807-01-010
J5101	6450001791	CNR	HLJ7000-016010
W801	7030003860	S.RES	ERJ3GE JPW V
W1202	7030003860	S.RES	ERJ3GE JPW V
W1311	7030003860	S.RES	ERJ3GE JPW V
W1726	7030003860	S.RES	ERJ3GE JPW V
W2101	7030003860	S.RES	ERJ3GE JPW V
W2201	7030003860	S.RES	ERJ3GE JPW V
W2351	7030003860	S.RES	ERJ3GE JPW V
W3601	7030003860	S.RES	ERJ3GE JPW V
W4216	7030003860	S.RES	ERJ3GE JPW V
W4401	7030003860	S.RES	ERJ3GE JPW V
W4801	7030003860	S.RES	ERJ3GE JPW V
W4802	7030003860	S.RES	ERJ3GE JPW V
W4803	7030003860	S.RES	ERJ3GE JPW V
EP4801	6910012350	S.BEA	MMZ1608Y 102BT

[PLL UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
IC1	1180001071	S.IC	TA7805F (TE16L,Q)
IC2	1140004550	S.IC	M65343FP/SC1287
IC6	1140007881	S.IC	TC190G08EFG0046JDZ/SC1246A
IC7	1130003611	S.IC	TC4SU69F (TE85R,F)
Q9	1530002371	S.TR	2SC2714-O (TE85R,F)
Q10	1530002371	S.TR	2SC2714-O (TE85R,F)
Q11	1530002371	S.TR	2SC2714-O (TE85R,F)
Q12	1530002060	S.TR	2SC4081 T106 R
Q18	1560000491	S.FET	2SK508-T2B-A K52
Q26	1530002371	S.TR	2SC2714-O (TE85R,F)
Q28	1530002371	S.TR	2SC2714-O (TE85R,F)
Q29	1530002371	S.TR	2SC2714-O (TE85R,F)
Q30	1530002371	S.TR	2SC2714-O (TE85R,F)
Q32	1530002371	S.TR	2SC2714-O (TE85R,F)
Q33	1590000680	S.TR	DTC114EUA T106
Q34	1530002060	S.TR	2SC4081 T106 R
Q35	1530002060	S.TR	2SC4081 T106 R
D4	1720000860	S.VCP	KV1770S G 1-2
D12	1750000021	S.DIO	1SS184 (TE85R,F)
D15	1750000071	S.DIO	1SS226 (TE85R,F)
D16	1790001250	S.DIO	MA2S111-(TX)
X1	6050007351	XTL	CR-337A (32.000 MHz)
L1	6200009300	S.COL	ELJPA 100KF 10U
L2	6200001831	S.COL	NLV32T-100J
L3	6170000230	COL	LW-25
L4	6150004370	COL	LS-472C (C-15045)
L5	6200001831	S.COL	NLV32T-100J
L6	6150004250	COL	LS-471A (C-14922)
L7	6150004250	COL	LS-471A (C-14922)
L8	6200001831	S.COL	NLV32T-100J
L9	6200003960	S.COL	MLF1608A 1R0K-T
L10	6200003640	S.COL	MLF1608E 100K-T
L12	6200003261	S.COL	NLV32T-101J
L14	6200003131	S.COL	NLV32T-120J
L15	6200003141	S.COL	NLV32T-150J
L19	6190001281	COL	#E544GN-110248
L25	6200001831	S.COL	NLV32T-100J
L26	6170000230	COL	LW-25
L27	6170000230	COL	LW-25
L30	6200001831	S.COL	NLV32T-100J
L32	6200003051	S.COL	NLV32T-R82J
L34	6200003431	S.COL	NLV32T-R10J
L35	6200003421	S.COL	NLV32T-R15J
L36	6200003431	S.COL	NLV32T-R10J
L37	6200003451	S.COL	NLV32T-082J
L38	6200003331	S.COL	NLV32T-1R0J
L39	6200003051	S.COL	NLV32T-R82J
L41	6200001831	S.COL	NLV32T-100J
L42	6200003051	S.COL	NLV32T-R82J
L44	6200003161	S.COL	NLV32T-270J
L45	6200001711	S.COL	NLV32T-220J
L46	6200003151	S.COL	NLV32T-180J
L47	6200001831	S.COL	NLV32T-100J
L48	6200003041	S.COL	NLV32T-R68J
L49	6200004470	S.COL	MLF1608D R12K-T
L50	6200004470	S.COL	MLF1608D R12K-T
R2	7030003320	S.RES	ERJ3GEYJ 101 V (100)
R3	7030003480	S.RES	ERJ3GEYJ 222 V (2.2 k)
R4	7030003400	S.RES	ERJ3GEYJ 471 V (470)
R5	7030003320	S.RES	ERJ3GEYJ 101 V (100)
R6	7030003560	S.RES	ERJ3GEYJ 103 V (10 k)
R7	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R8	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R9	7030003600	S.RES	ERJ3GEYJ 223 V (22 k)
R10	7030003600	S.RES	ERJ3GEYJ 223 V (22 k)
R12	7030003580	S.RES	ERJ3GEYJ 153 V (15 k)
R13	7030003400	S.RES	ERJ3GEYJ 471 V (470)
R14	7030003520	S.RES	ERJ3GEYJ 472 V (4.7 k)
R15	7030003320	S.RES	ERJ3GEYJ 101 V (100)
R16	7030003600	S.RES	ERJ3GEYJ 223 V (22 k)
R17	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R18	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R19	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R20	7030003400	S.RES	ERJ3GEYJ 471 V (470)
R21	7030003560	S.RES	ERJ3GEYJ 103 V (10 k)
R22	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R23	7030003560	S.RES	ERJ3GEYJ 103 V (10 k)
R44	7030003640	S.RES	ERJ3GEYJ 473 V (47 k)
R49	7030003360	S.RES	ERJ3GEYJ 221 V (220)
R51	7030003510	S.RES	ERJ3GEYJ 392 V (3.9 k)
R52	7030003420	S.RES	ERJ3GEYJ 681 V (680)
R53	7030003510	S.RES	ERJ3GEYJ 392 V (3.9 k)
R57	7030003440	S.RES	ERJ3GEYJ 102 V (1 k)
R74	7030003550	S.RES	ERJ3GEYJ 822 V (8.2 k)
R75	7030003510	S.RES	ERJ3GEYJ 392 V (3.9 k)
R78	7030003320	S.RES	ERJ3GEYJ 101 V (100)
R84	7030003500	S.RES	ERJ3GEYJ 332 V (3.3 k)
R85	7030003550	S.RES	ERJ3GEYJ 822 V (8.2 k)
R87	7030003320	S.RES	ERJ3GEYJ 101 V (100)
R88	7030003320	S.RES	ERJ3GEYJ 101 V (100)
R89	7030003400	S.RES	ERJ3GEYJ 471 V (470)
R90	7030003400	S.RES	ERJ3GEYJ 471 V (470)
R91	7030003440	S.RES	ERJ3GEYJ 102 V (1 k)
R93	7030003440	S.RES	ERJ3GEYJ 102 V (1 k)

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)  
S.=Surface mount

[PLL UNIT]

REF NO.	ORDER NO.	DESCRIPTION
R94	7030003440	S.RES ERJ3GEYJ 102 V (1 k)
R95	7030003440	S.RES ERJ3GEYJ 102 V (1 k)
R96	7030003440	S.RES ERJ3GEYJ 102 V (1 k)
R97	7030003440	S.RES ERJ3GEYJ 102 V (1 k)
R98	7030003440	S.RES ERJ3GEYJ 102 V (1 k)
R99	7030003440	S.RES ERJ3GEYJ 102 V (1 k)
R102	7030006080	S.RES ERJ1WYJ220U (22)
R103	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R104	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R105	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R106	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R107	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R108	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R116	7030003320	S.RES ERJ3GEYJ 101 V (100)
R117	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R118	7030003280	S.RES ERJ3GEYJ 470 V (47)
R119	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R120	7030003640	S.RES ERJ3GEYJ 473 V (47 k)
R121	7030003360	S.RES ERJ3GEYJ 221 V (220)
R127	7030003480	S.RES ERJ3GEYJ 222 V (2.2 k)
R156	7030003350	S.RES ERJ3GEYJ 181 V (180)
R158	7030003320	S.RES ERJ3GEYJ 101 V (100)
R159	7030003560	S.RES ERJ3GEYJ 103 V (10 k)
R160	7030003560	S.RES ERJ3GEYJ 103 V (10 k)
R161	7030003360	S.RES ERJ3GEYJ 221 V (220)
R162	7030003430	S.RES ERJ3GEYJ 821 V (820)
R164	7030003440	S.RES ERJ3GEYJ 102 V (1 k)
R165	7030003800	S.RES ERJ3GEYJ 105 V (1 M)
R166	7030003800	S.RES ERJ3GEYJ 105 V (1 M)
R169	7030003260	S.RES ERJ3GEYJ 330 V (33)
R171	7030003350	S.RES ERJ3GEYJ 181 V (180)
R172	7030003350	S.RES ERJ3GEYJ 181 V (180)
R180	7030003480	S.RES ERJ3GEYJ 222 V (2.2 k)
R181	7030003580	S.RES ERJ3GEYJ 153 V (15 k)
R182	7030003620	S.RES ERJ3GEYJ 333 V (33 k)
R183	7030003520	S.RES ERJ3GEYJ 472 V (4.7 k)
R191	7030003350	S.RES ERJ3GEYJ 181 V (180)
R192	7030003440	S.RES ERJ3GEYJ 102 V (1 k)
C1	4510008500	S.ELE EEE1CA101WP
C2	4550006080	S.TAN TEESVB2 1C 106M8R
C3	4030006880	S.CER C1608 JB 1H 472K-T
C4	4550006080	S.TAN TEESVB2 1C 106M8R
C5	4510008880	S.ELE EEE1VA330WP
C6	4510008540	S.ELE EEE1CA100SR
C7	4030011600	S.CER C1608 JB 1E 104K-T
C8	4510008540	S.ELE EEE1CA100SR
C9	4510008540	S.ELE EEE1CA100SR
C10	4030011600	S.CER C1608 JB 1E 104K-T
C12	4030006880	S.CER C1608 JB 1H 472K-T
C13	4030006880	S.CER C1608 JB 1H 472K-T
C14	4030007150	S.CER C1608 CH 1H 151J-T
C15	4030008330	S.CER C1608 UJ 1H 560J-T
C16	4610002200	S.TRI TZB4R200EB10R00
C17	4030006880	S.CER C1608 JB 1H 472K-T
C18	4030007130	S.CER C1608 CH 1H 101J-T
C19	4030006880	S.CER C1608 JB 1H 472K-T
C20	4030007030	S.CER C1608 CH 1H 150J-T
C21	4510008500	S.ELE EEE1CA101WP
C22	4030006880	S.CER C1608 JB 1H 472K-T
C23	4030009500	S.CER C1608 CH 1H 0R5B-T
C24	4030007030	S.CER C1608 CH 1H 150J-T
C25	4030018700	S.CER GRM1882P1H121JZ01D
C26	4030007130	S.CER C1608 CH 1H 101J-T
C27	4030006880	S.CER C1608 JB 1H 472K-T
C28	4030006880	S.CER C1608 JB 1H 472K-T
C29	4030006880	S.CER C1608 JB 1H 472K-T
C30	4030006880	S.CER C1608 JB 1H 472K-T
C31	4030006880	S.CER C1608 JB 1H 472K-T
C32	4030006880	S.CER C1608 JB 1H 472K-T
C33	4510008500	S.ELE EEE1CA101WP
C34	4030006880	S.CER C1608 JB 1H 472K-T
C50	4030007050	S.CER C1608 CH 1H 220J-T
C51	4030006930	S.CER C1608 CH 1H 020C-T
C52	4030007060	S.CER C1608 CH 1H 270J-T
C53	4030009500	S.CER C1608 CH 1H 0R5B-T
C54	4030007050	S.CER C1608 CH 1H 220J-T
C55	4030006880	S.CER C1608 JB 1H 472K-T
C62	4030007130	S.CER C1608 CH 1H 101J-T
C63	4030006880	S.CER C1608 JB 1H 472K-T
C64	4030006880	S.CER C1608 JB 1H 472K-T
C65	4030006920	S.CER C1608 CH 1H 010C-T
C66	4030006880	S.CER C1608 JB 1H 472K-T
C67	4030007130	S.CER C1608 CH 1H 101J-T
C68	4030006860	S.CER C1608 JB 1H 102K-T
C103	4030006880	S.CER C1608 JB 1H 472K-T
C104	4030006880	S.CER C1608 JB 1H 472K-T
C106	4030006880	S.CER C1608 JB 1H 472K-T
C108	4030006880	S.CER C1608 JB 1H 472K-T
C109	4030006880	S.CER C1608 JB 1H 472K-T
C111	4030006860	S.CER C1608 JB 1H 102K-T
C112	4030007100	S.CER C1608 CH 1H 560J-T
C114	4030007080	S.CER C1608 CH 1H 390J-T
C115	4030009650	S.CER C1608 CH 1H 240J-T
C116	4030006990	S.CER C1608 CH 1H 080D-T
C117	4030007070	S.CER C1608 CH 1H 330J-T
C118	4030006880	S.CER C1608 JB 1H 472K-T
C119	4030006860	S.CER C1608 JB 1H 102K-T
C120	4030006880	S.CER C1608 JB 1H 472K-T
C126	4030006880	S.CER C1608 JB 1H 472K-T
C127	4030006860	S.CER C1608 JB 1H 102K-T
C128	4030006880	S.CER C1608 JB 1H 472K-T
C129	4030006880	S.CER C1608 JB 1H 472K-T

[PLL UNIT]

REF NO.	ORDER NO.	DESCRIPTION
C130	4030006860	S.CER C1608 JB 1H 102K-T
C132	4030007130	S.CER C1608 CH 1H 101J-T
C134	4030007100	S.CER C1608 CH 1H 560J-T
C135	4030006950	S.CER C1608 CH 1H 040C-T
C136	4030007020	S.CER C1608 CH 1H 120J-T
C137	4030007110	S.CER C1608 CH 1H 680J-T
C138	4030007100	S.CER C1608 CH 1H 560J-T
C139	4030006880	S.CER C1608 JB 1H 472K-T
C141	4030006880	S.CER C1608 JB 1H 472K-T
C143	4030006880	S.CER C1608 JB 1H 472K-T
C144	4030006880	S.CER C1608 JB 1H 472K-T
C145	4030006880	S.CER C1608 JB 1H 472K-T
C146	4030006880	S.CER C1608 JB 1H 472K-T
C147	4030006880	S.CER C1608 JB 1H 472K-T
C148	4030006880	S.CER C1608 JB 1H 472K-T
C149	4030006880	S.CER C1608 JB 1H 472K-T
C150	4030006880	S.CER C1608 JB 1H 472K-T
C151	4030006880	S.CER C1608 JB 1H 472K-T
C152	4030006880	S.CER C1608 JB 1H 472K-T
C153	4030006880	S.CER C1608 JB 1H 472K-T
C155	4030006880	S.CER C1608 JB 1H 472K-T
C156	4030007050	S.CER C1608 CH 1H 220J-T
C157	4030007080	S.CER C1608 CH 1H 390J-T
C158	4030006860	S.CER C1608 JB 1H 102K-T
C159	4030006860	S.CER C1608 JB 1H 102K-T
C160	4030006880	S.CER C1608 JB 1H 472K-T
C161	4030008920	S.CER C1608 JB 1H 472K-T
C165	4610001850	S.TRI TZB4R200AB10R00
C166	4550000460	S.TAN TEESVA 1C 105M8R
C167	4030006880	S.CER C1608 JB 1H 472K-T
C168	4030008920	S.CER C1608 JB 1H 473K-T
C170	4030006880	S.CER C1608 JB 1H 472K-T
C172	4030007060	S.CER C1608 CH 1H 270J-T
C174	4030008920	S.CER C1608 JB 1H 473K-T
C188	4030011600	S.CER C1608 JB 1E 104K-T
C191	4030006880	S.CER C1608 JB 1H 472K-T
C192	4030006880	S.CER C1608 JB 1H 472K-T
C194	4030011340	S.CER C1608 CH 1H 471J-T
C195	4030011340	S.CER C1608 CH 1H 471J-T
C203	4030006880	S.CER C1608 JB 1H 472K-T
C222	4030006880	S.CER C1608 JB 1H 472K-T
C223	4030011600	S.CER C1608 JB 1E 104K-T
C224	4030011600	S.CER C1608 JB 1E 104K-T
C225	4030006940	S.CER C1608 CH 1H 030C-T
C226	4030006940	S.CER C1608 CH 1H 030C-T
C227	4030007100	S.CER C1608 CH 1H 560J-T
C228	4550002890	S.TAN TEESVA 1A 225M8R
J1	6510018961	S.CNR B2B-PH-SM4-TB (LF) (SN)
J3	6510022611	S.CNR 16FMN-BMTRR-A-TBT (LF) (SN)
J4	6510018961	S.CNR B2B-PH-SM4-TB (LF) (SN)
W1	7030003860	S.RES ERJ3GE JPW V
W7	7030003860	S.RES ERJ3GE JPW V
W9	7030003860	S.RES ERJ3GE JPW V
W10	7030003860	S.RES ERJ3GE JPW V
W92	7030003860	S.RES ERJ3GE JPW V
W170	7030003860	S.RES ERJ3GE JPW V

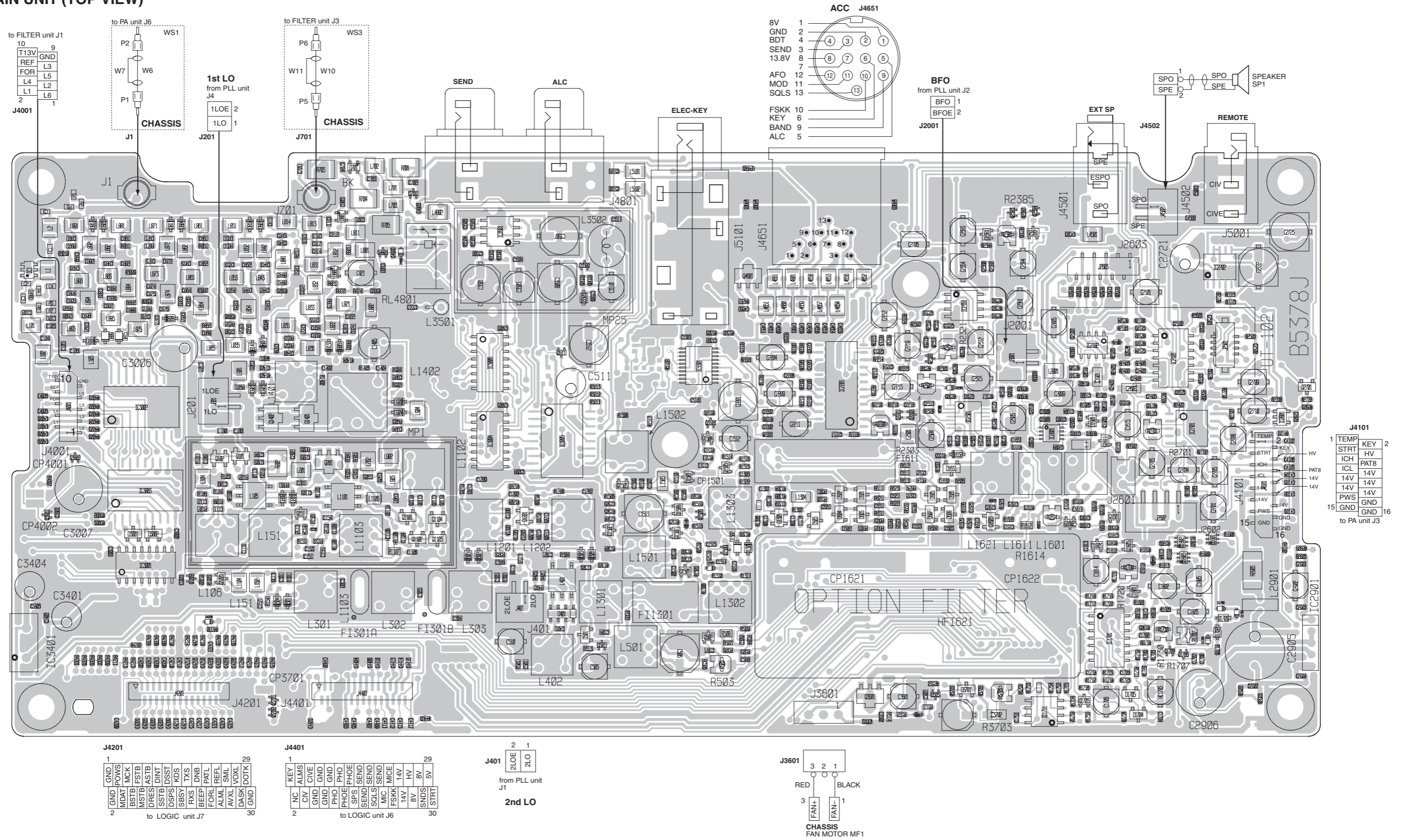
M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)  
S.=Surface mount





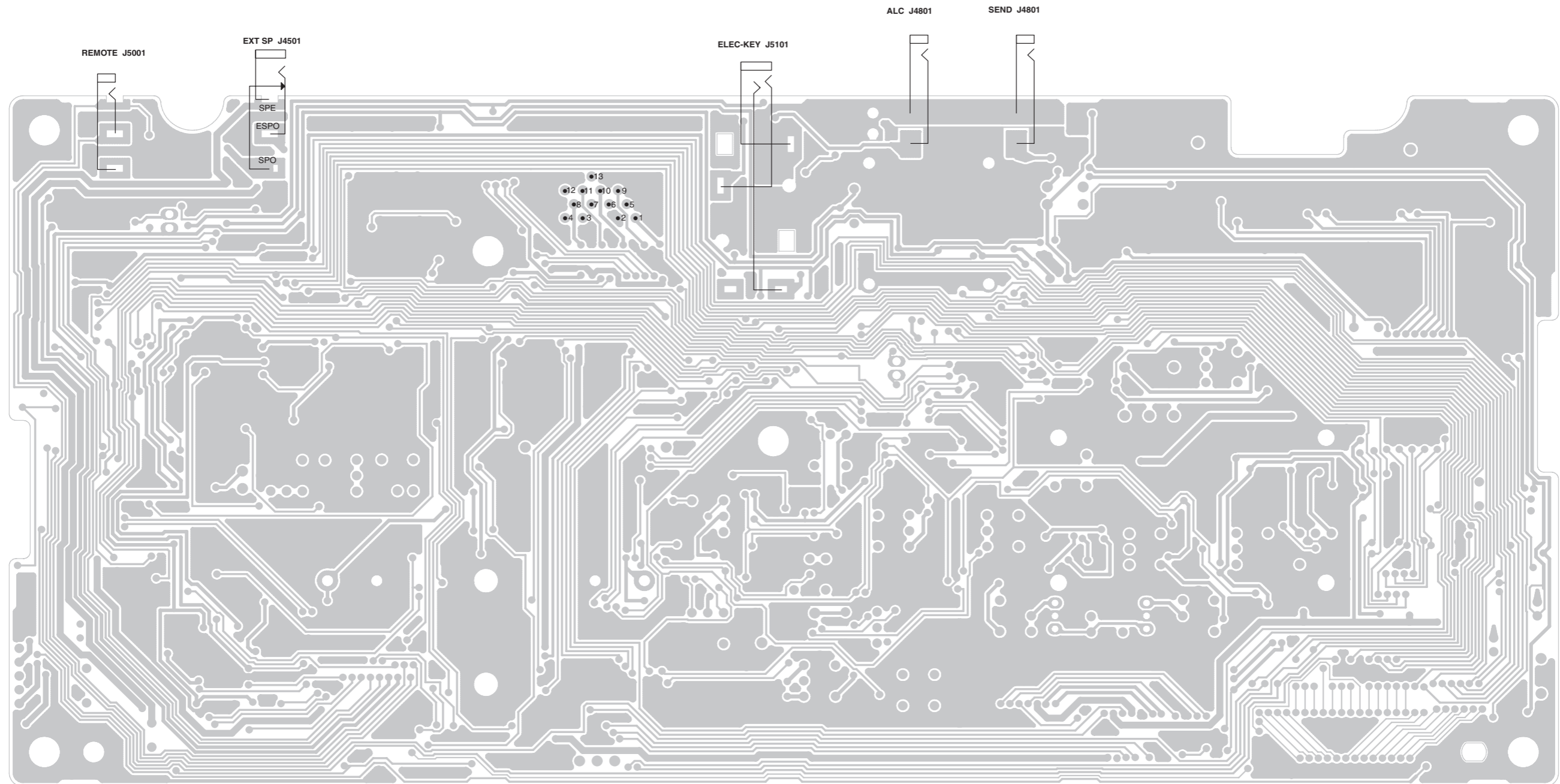
# BOARD LAYOUTS

## • MAIN UNIT (TOP VIEW)

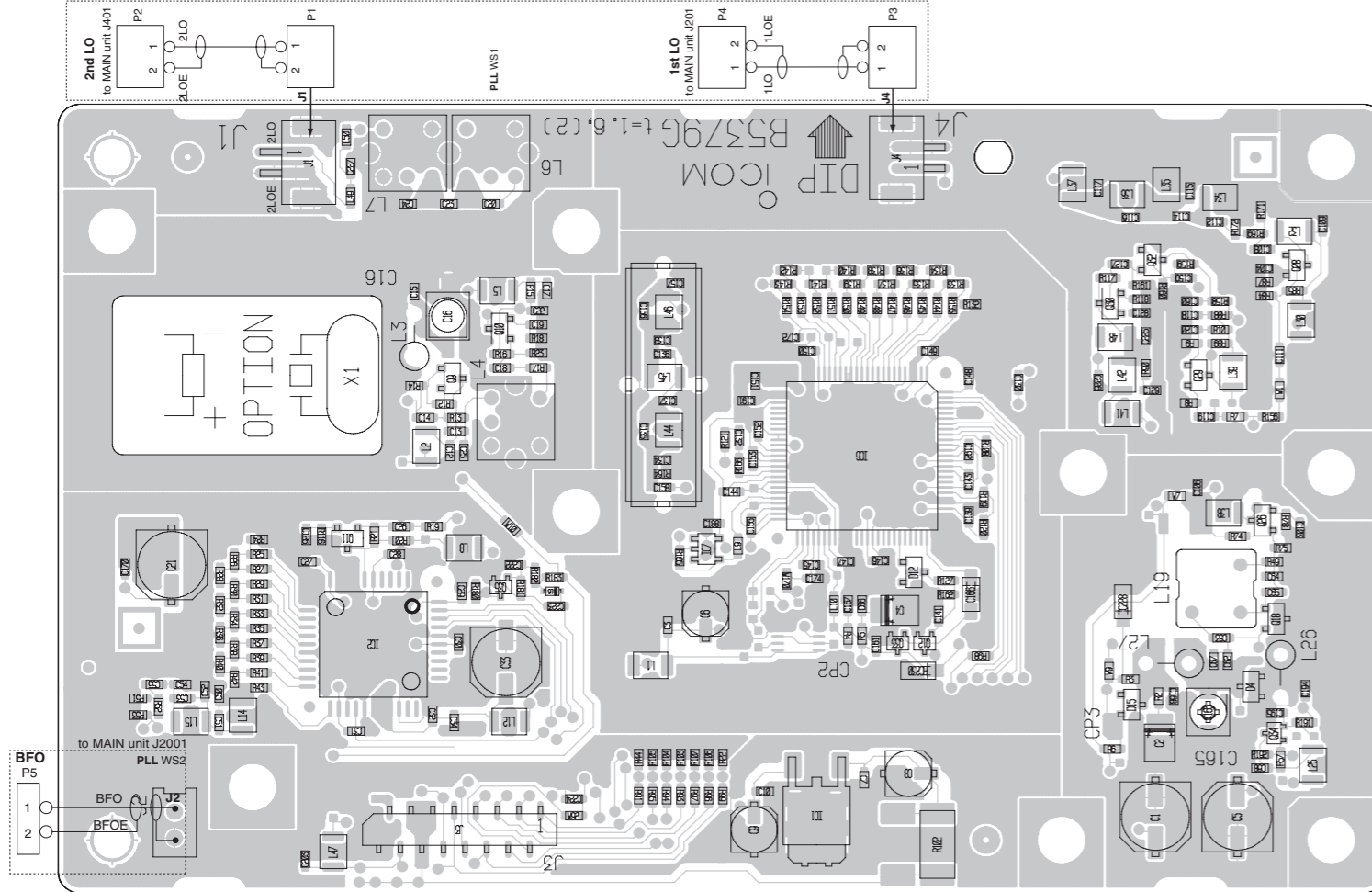


The combination of this side and the bottom side shows the board layout in the same configuration as the actual P.C.Board.

• MAIN UNIT (BOTTOM VIEW)

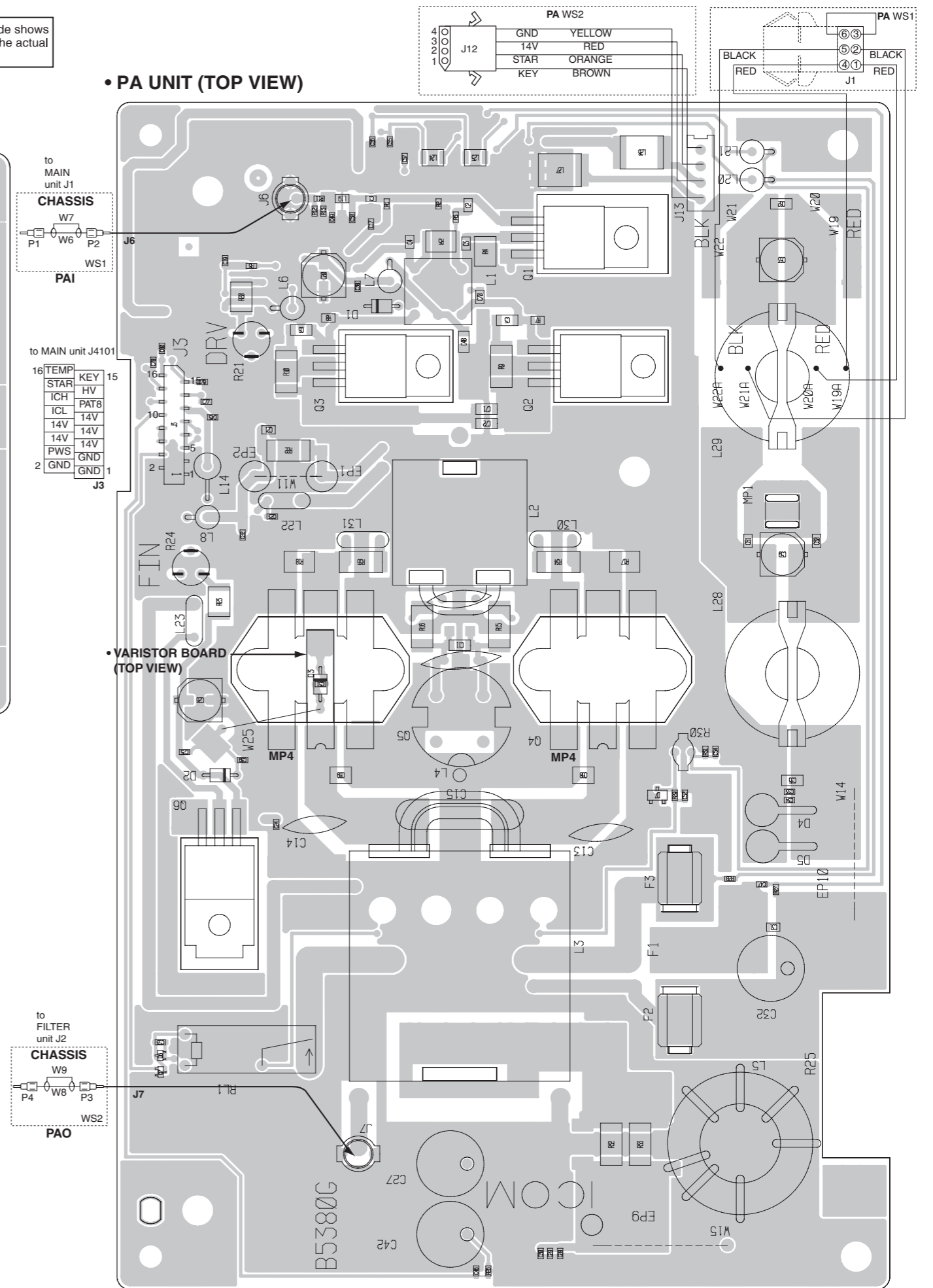


• PLL UNIT (TOP VIEW)

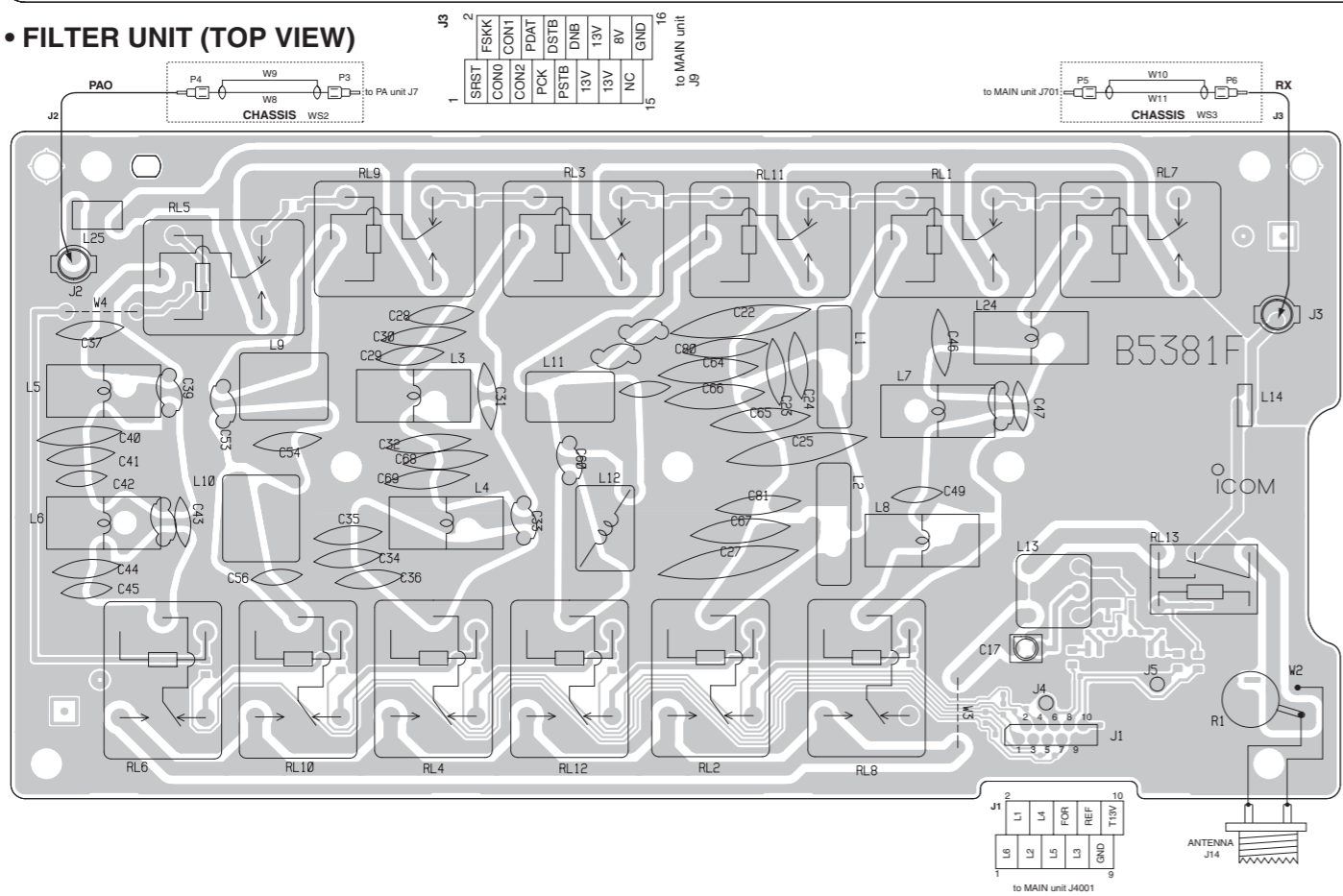


The combination of this side and the bottom side shows the board layout in the same configuration as the actual P.C.Board.

• PA UNIT (TOP VIEW)



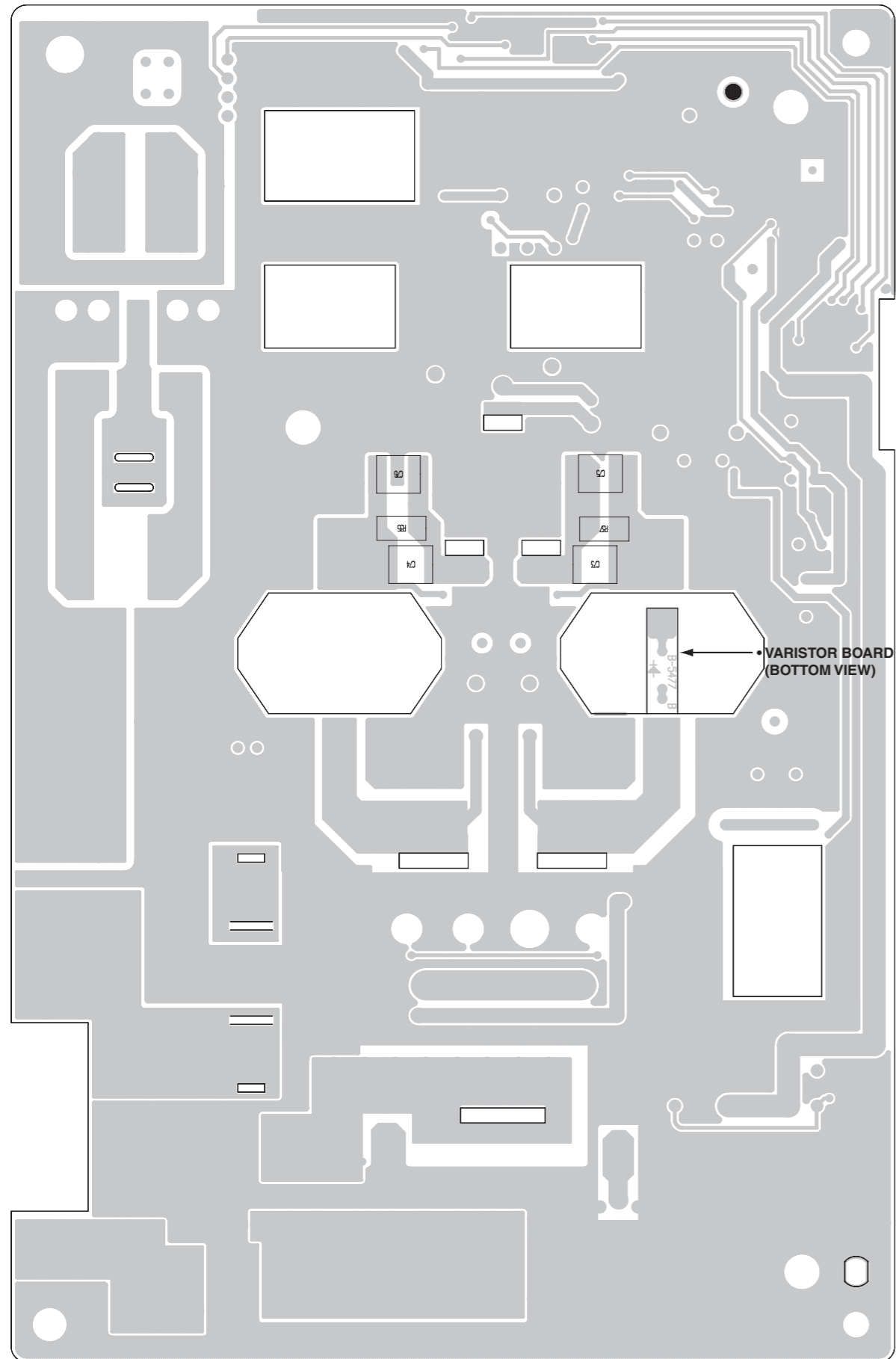
• FILTER UNIT (TOP VIEW)



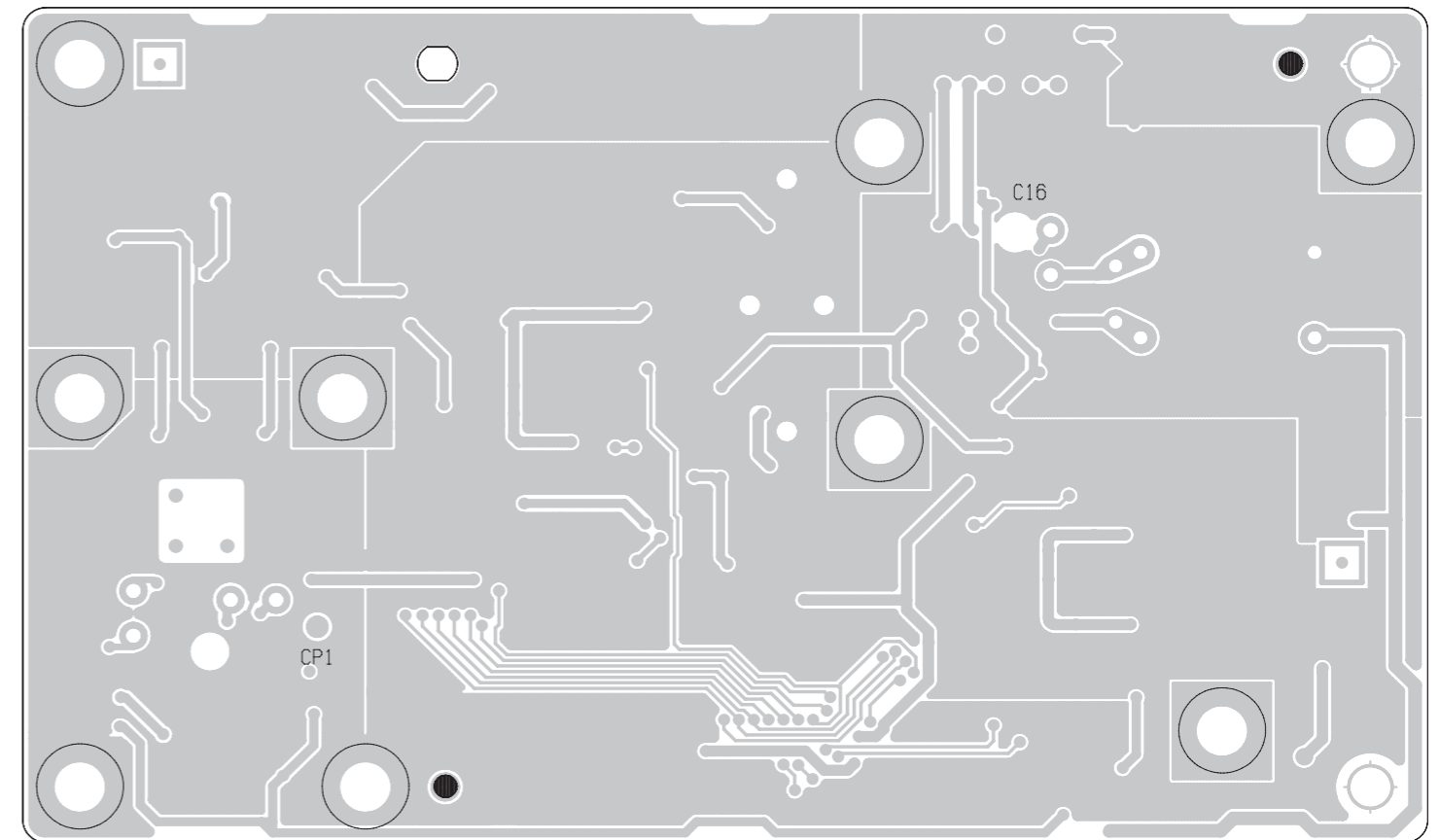


The combination of this side and the bottom side shows the board layout in the same configuration as the actual P.C.Board.

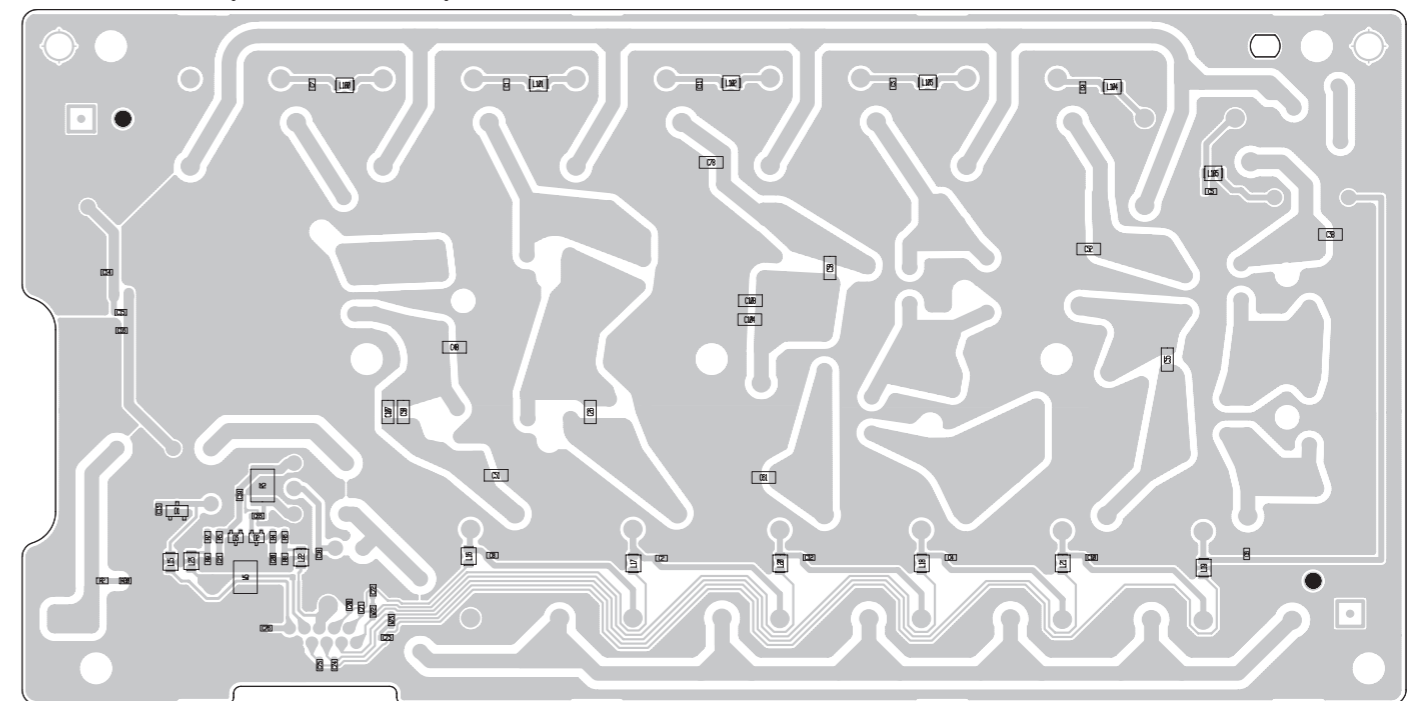
• PA UNIT (BOTTOM VIEW)



• PLL UNIT (BOTTOM VIEW)

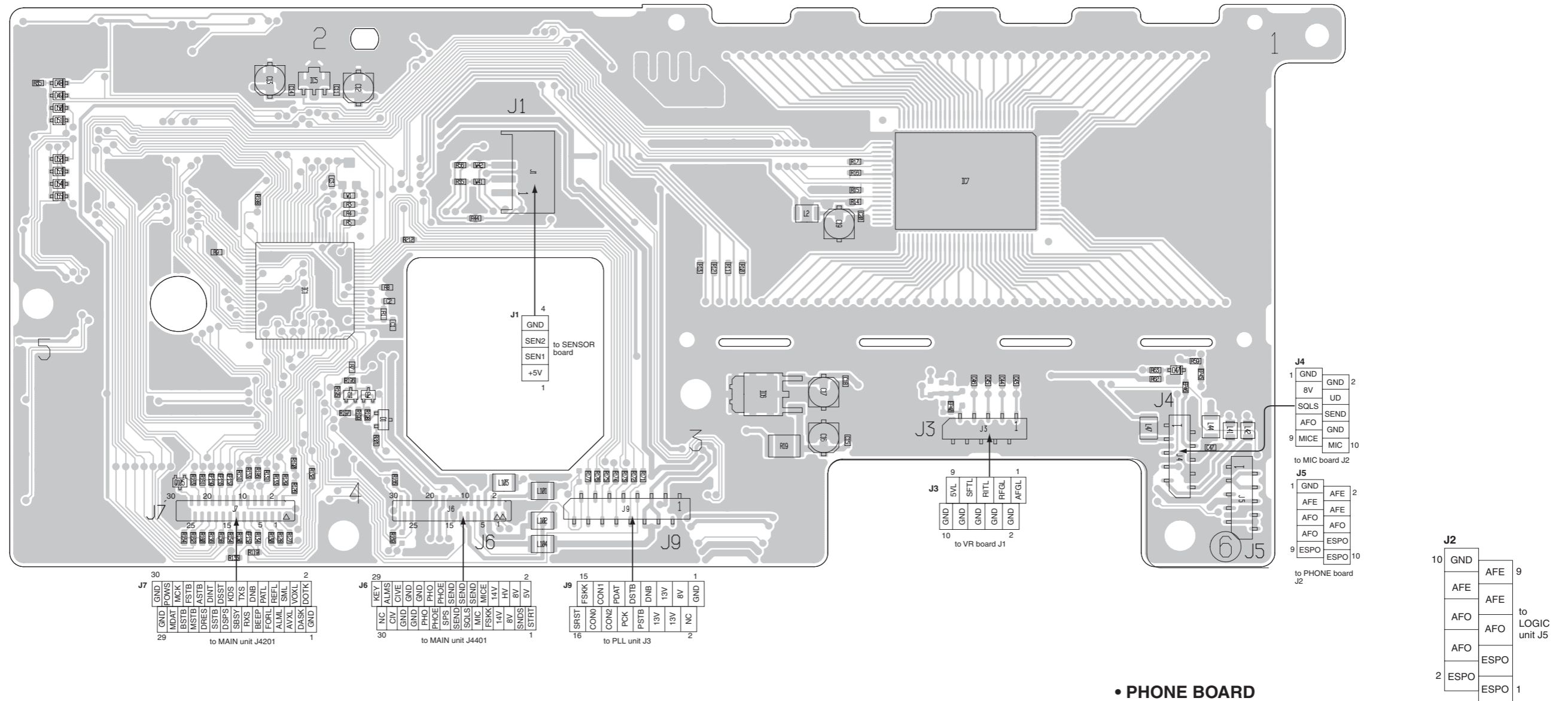


• FILTER UNIT (BOTTOM VIEW)

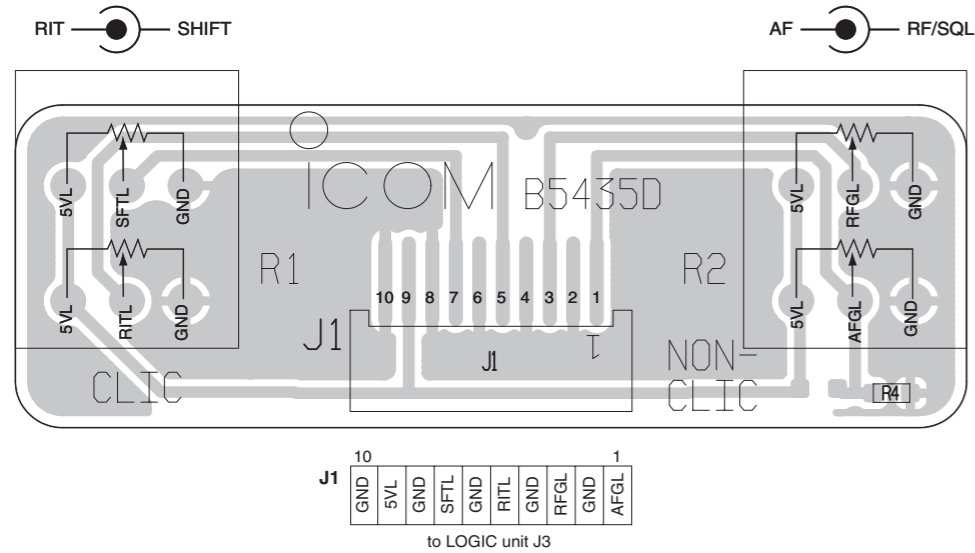


The combination of this side and the bottom side shows the board layout in the same configuration as the actual P.C.Board.

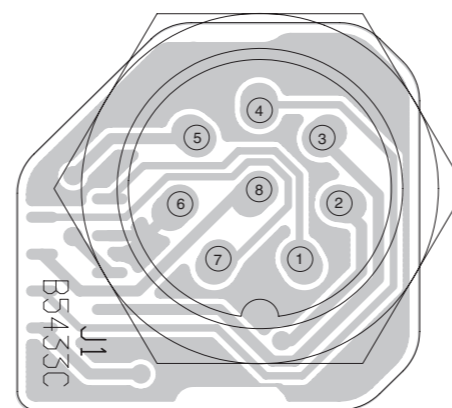
• LOGIC UNIT (BOTTOM VIEW)



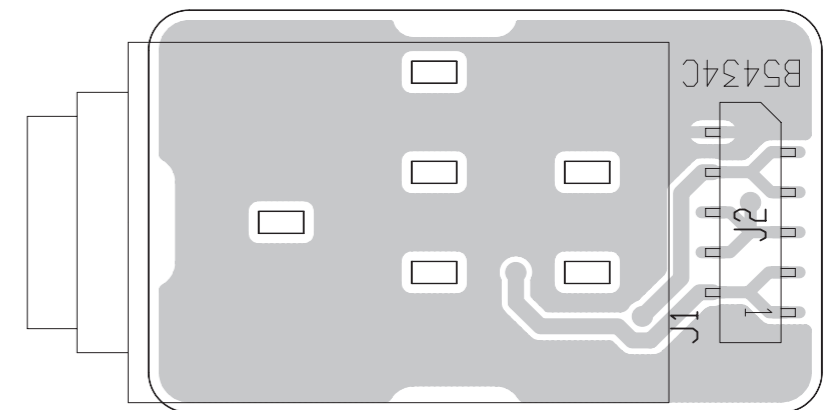
• VR BOARD



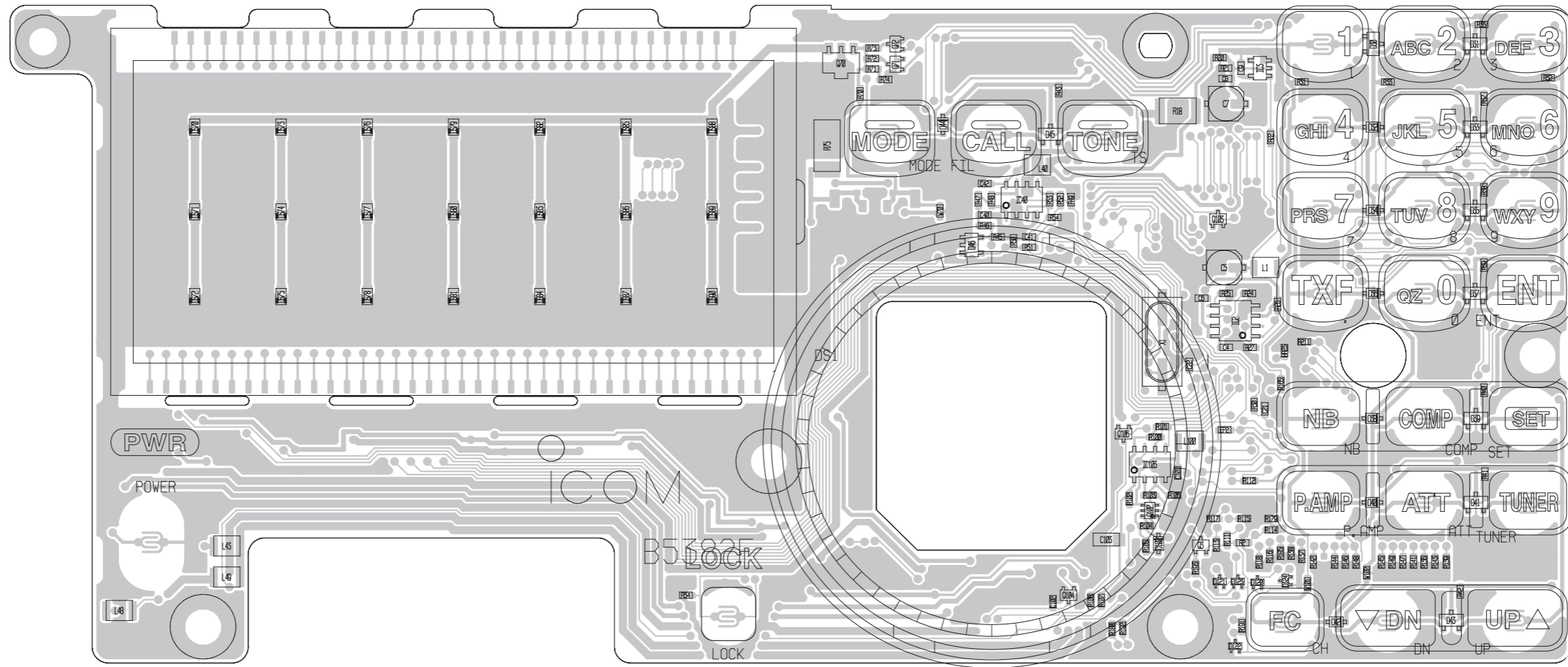
• MIC BOARD (BOTTOM VIEW)



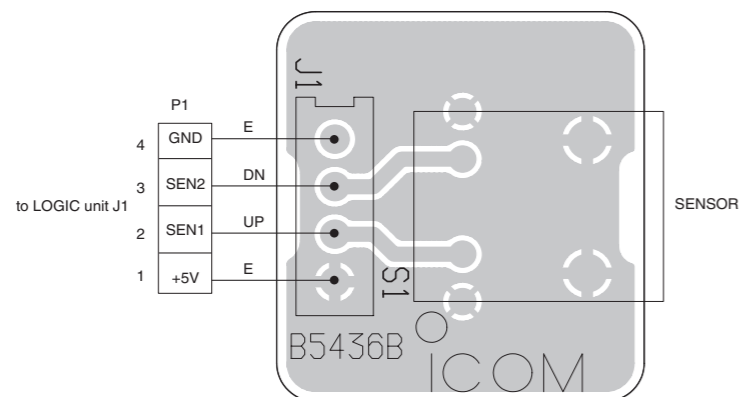
• PHONE BOARD



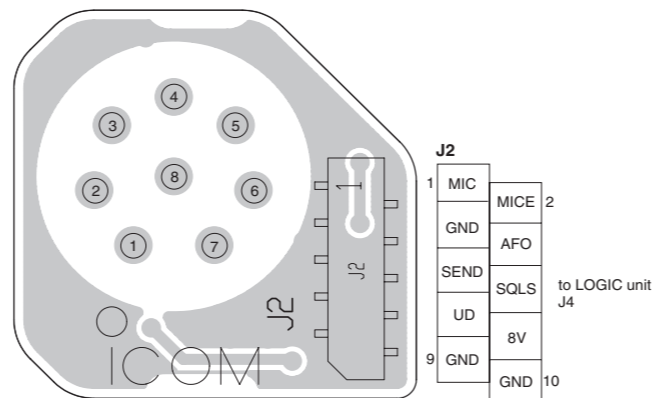
• LOGIC UNIT (TOP VIEW)



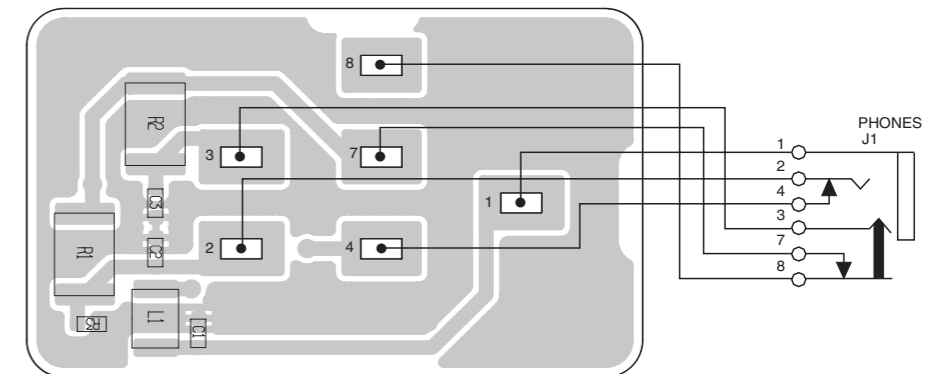
• SENSOR BOARD



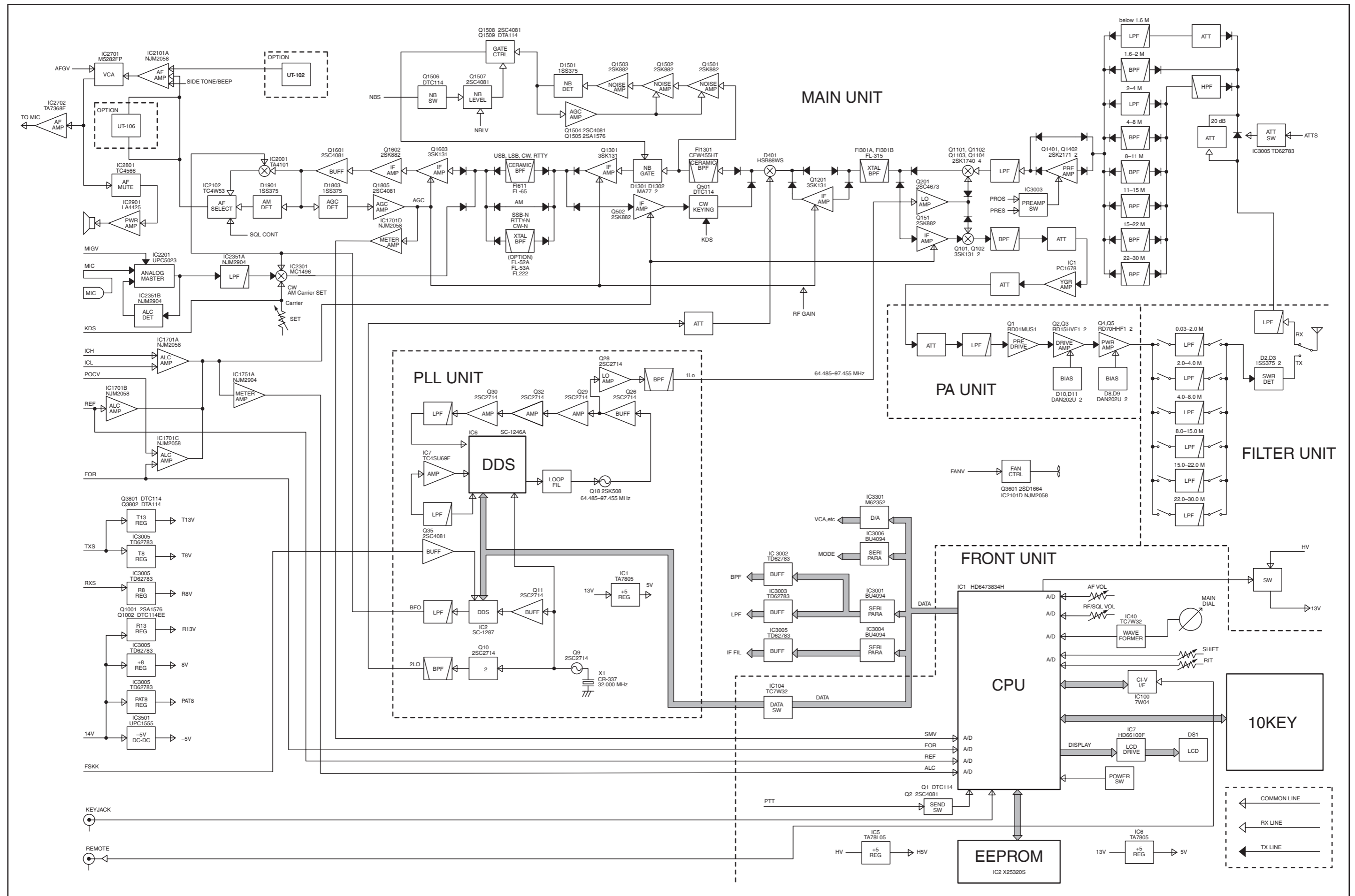
• MIC BOARD (TOP VIEW)



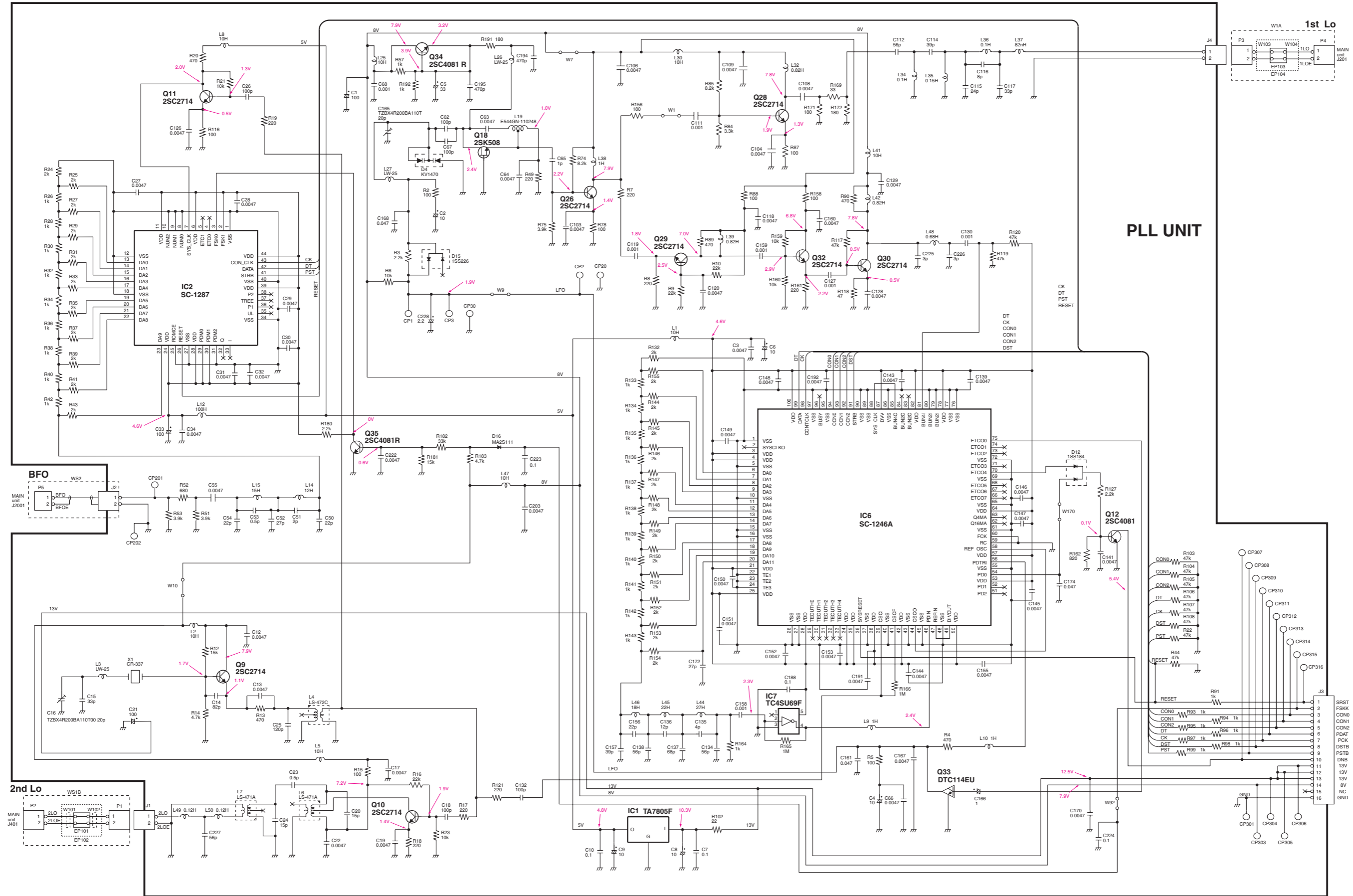
• PHONE BOARD

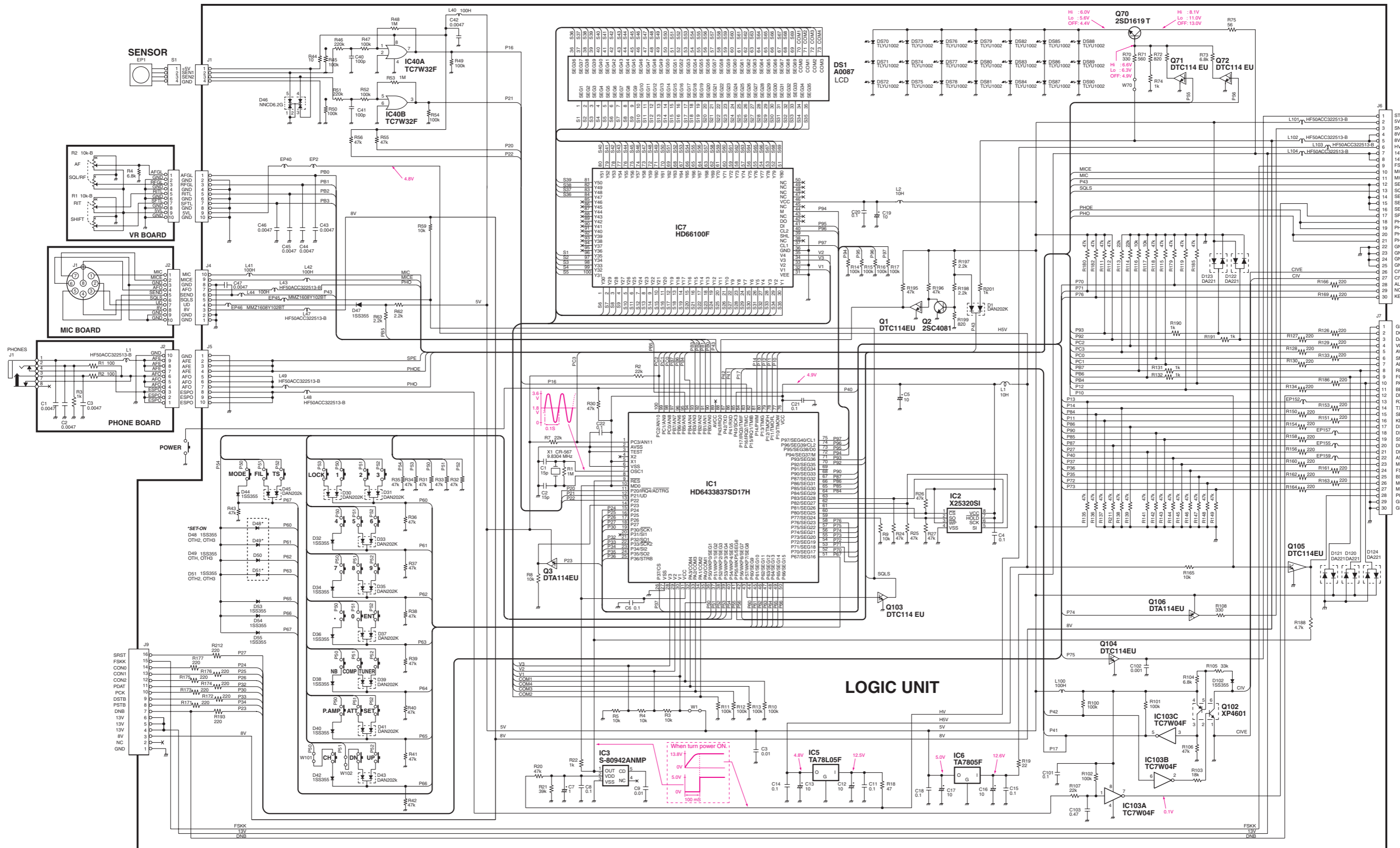


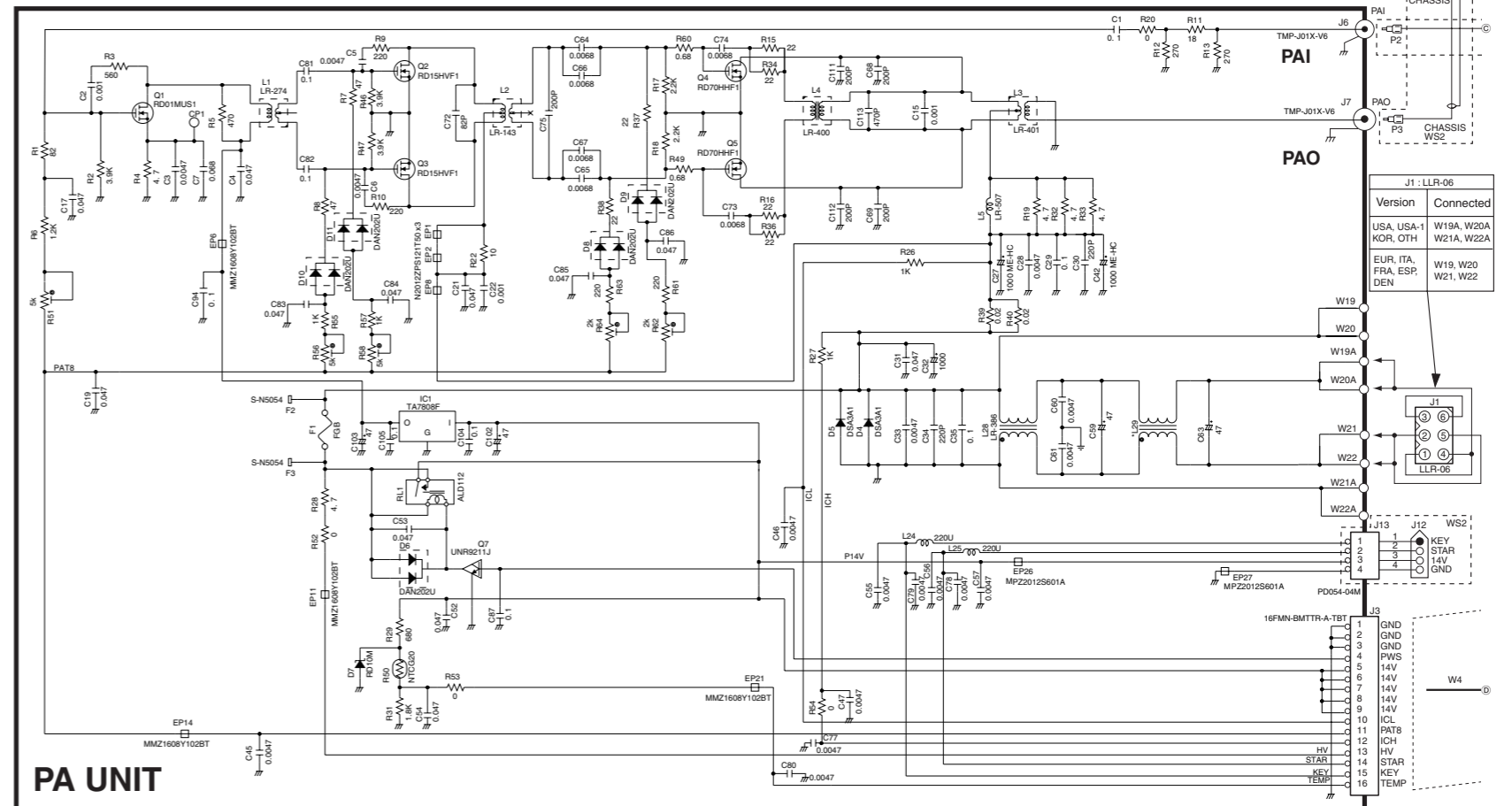
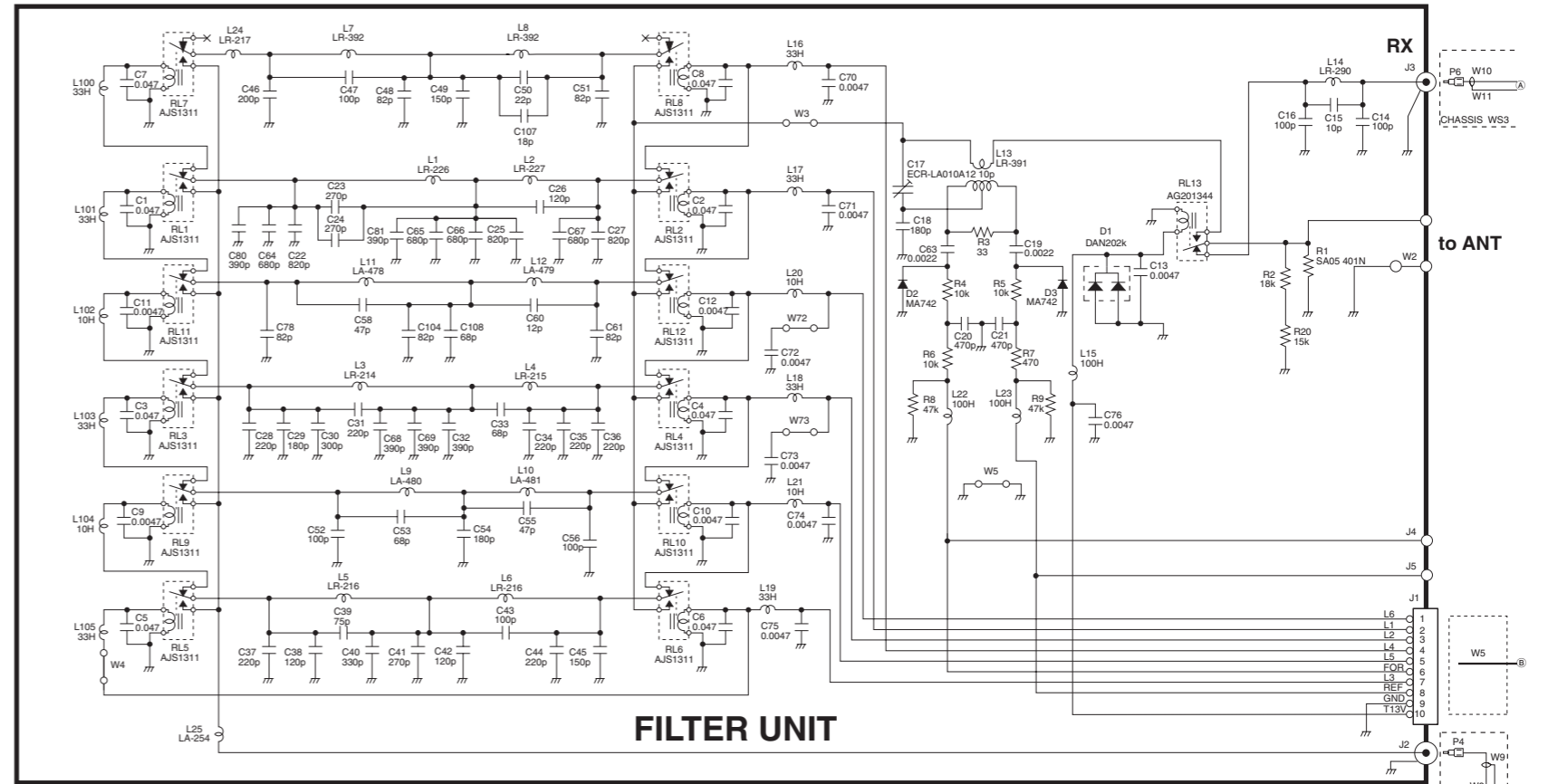
# BLOCK DIAGRAM

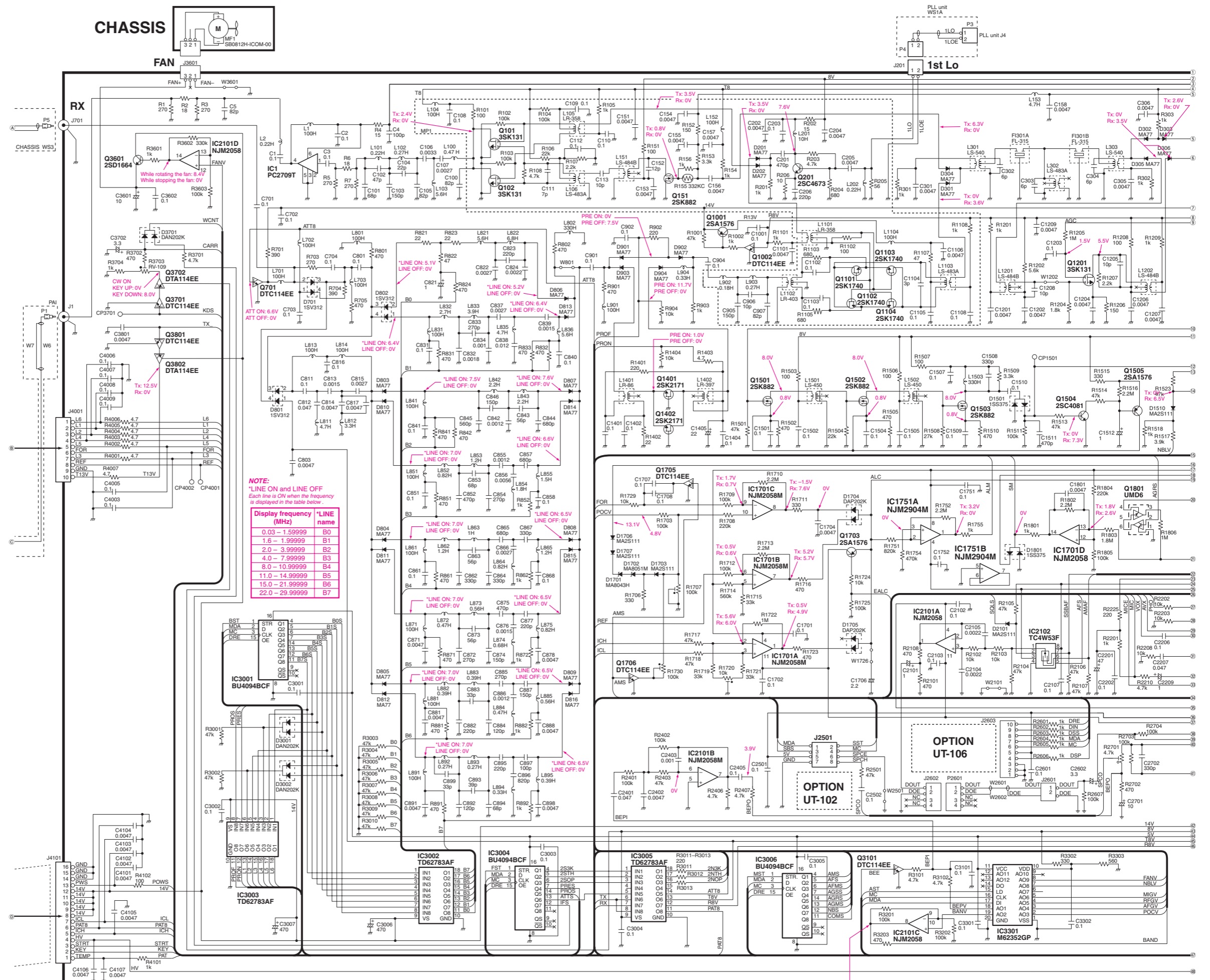


# VOLTAGE DIAGRAM







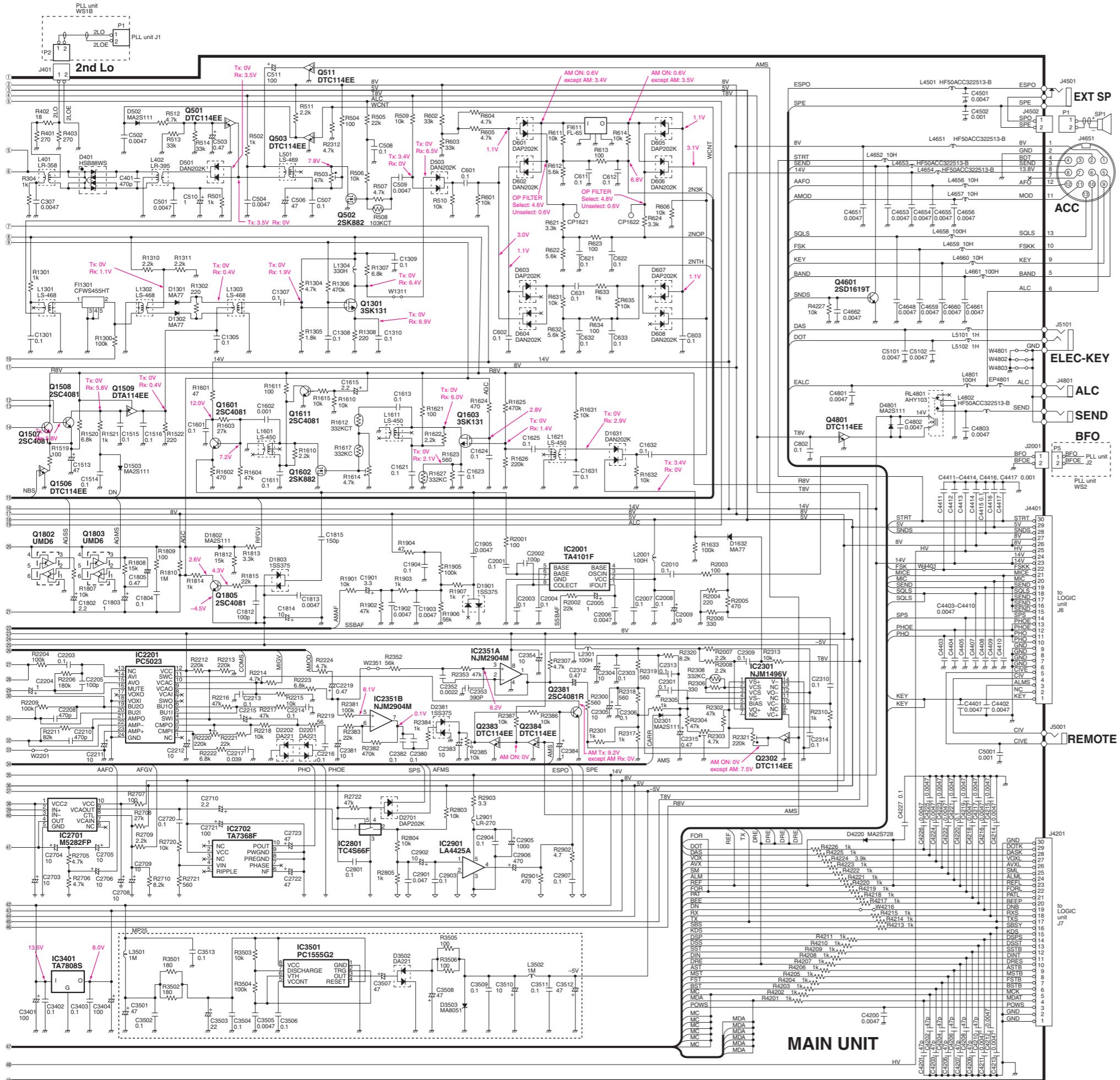


**NOTE:**  
 \*LINE ON and LINE OFF  
 Each line is ON when the frequency  
 is displayed in the table below.

Display frequency (MHz)	*LINE name
0.03 - 1.99999	B0
1.6 - 1.99999	B1
2.0 - 3.99999	B2
4.0 - 7.99999	B3
8.0 - 10.99999	B4
11.0 - 14.99999	B5
15.0 - 21.99999	B6
22.0 - 29.99999	B7

Display frequency (MHz)	Voltage (V)	Display frequency (MHz)	Voltage (V)
0.03 - 1.99999	7.4	11.0 - 14.99999	4.0
2.0 - 3.99999	6.0	15.0 - 21.99999	3.1
4.0 - 7.99999	5.0	22.0 - 29.99999	2.2
8.0 - 10.99999	0		







# SERVICE MANUAL

HF TRANCEIVER

# IC-718

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## INTRODUCTION

This service manual describes the latest service information for the **IC-718** HF TRANSCEIVER at the time of publication.

**To upgrade quality, all electrical or mechanical parts and internal circuits are subject to change without notice or obligation.**

VERSION NO.	VERSION	SYMBOL
#02	U.S.A.	USA
#03	Europe	EUR
#04	Italy	ITA
#05	France	FRA
#06	Spain	ESP
#08	Other	OTH
#10	Korea	KOR
#12	U.S.A.	USA-1

## DANGER

**NEVER** connect the transceiver to an AC outlet or to a DC power supply that uses more than 16 V. This will ruin the transceiver.

**DO NOT** expose the transceiver to rain, snow or any liquids.

**DO NOT** reverse the polarities of the power supply when connecting the transceiver.

**DO NOT** apply an RF signal of more than 20 dBm (100 mW) to the antenna connector. This could damage the transceiver's front end.



## ORDERING PARTS

Be sure to include the following four points when ordering replacement parts:

1. 10-digit order numbers
2. Component part number and name
3. Equipment model name and unit name
4. Quantity required

### <SAMPLE ORDER>

1110001810 S.IC TA7368F IC-718 MAIN UNIT 1 piece  
8810009650 Screw FH BT M3 × 8 NI-ZU IC-718 CHASSIS 6 pieces

Addresses are provided on the inside back cover for your convenience.

## REPAIR NOTES

1. Make sure a problem is internal before disassembling the transceiver.
2. **DO NOT** open the transceiver until the transceiver is disconnected from its power source.
3. **DO NOT** force any of the variable components. Turn them slowly and smoothly.
4. **DO NOT** short any circuits or electronic parts. An insulated tuning tool **MUST** be used for all adjustments.
5. **DO NOT** keep power ON for a long time when the transceiver is defective.
6. **DO NOT** transmit power into a signal generator or a sweep generator.
7. **ALWAYS** connect a 50 dB or 60 dB attenuator between the transceiver and a deviation meter or spectrum analyser when using such test equipment.
8. **READ** the instructions of test equipment thoroughly before connecting equipment to the transceiver.

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# SECTION 1 SPECIFICATIONS

## ■ GENERAL

- Frequency coverage :
  - Receive 0.030–29.999999 MHz\*1
  - Transmit 1.800–1.999 MHz\*2 3.500–3.999 MHz\*2
  - 7.000–7.300 MHz 10.100–10.150 MHz
  - 14.000–14.350 MHz 18.068–18.168 MHz
  - 21.000–21.450 MHz 24.890–24.990 MHz
  - 28.000–29.700 MHz
- \*1 Guaranteed range: 0.5–29.999999 MHz.
- \*2 Varies according to version.
- Mode : USB, LSB, CW, AM, RTTY (FSK)
- No. of memory Ch. : 101 (99 regular, 2 scan edges)
- Freq. resolution : 1 Hz
- Frequency stability : Less than  $\pm 200$  Hz from 1 min. to 60 min. after power ON. After that rate of stability less than  $\pm 30$  Hz/hr at  $+25^{\circ}\text{C}$  ( $+77^{\circ}\text{F}$ ). Temperature fluctuations  $0^{\circ}\text{C}$  to  $50^{\circ}\text{C}$  ( $+32^{\circ}\text{F}$  to  $+122^{\circ}\text{F}$ ) less than  $\pm 350$  Hz.
- Power supply requirement: 13.8 V DC  $\pm 15\%$  (negative ground)
- Current consumption :
  - Transmit max. power 20.0 A
  - Receive stand-by 1.3 A
  - max. audio 2.0 A
- Usable temp. range :  $-10^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$  ( $14^{\circ}\text{F}$  to  $140^{\circ}\text{F}$ )
- Antenna connector : SO-239 (50  $\Omega$ )
- Dimensions : 240 (W)  $\times$  95(H)  $\times$  239(D) mm (projection not included) 97 $\frac{1}{16}$ (W)  $\times$  3 $\frac{3}{4}$ (H)  $\times$  9 $\frac{13}{32}$ (D) in
- Weight : 3.8 kg (8 lb 6 oz)
- ACC connector : 13-pin
- REMOTE connector : 2-conductor 3.5(d) mm ( $\frac{1}{8}$ "

## ■ TRANSMITTER

- Modulation system :
  - SSB Balanced modulation
  - AM Low level modulation
- Output power :
  - SSB/CW/RTTY 2–100 W
  - AM 2–40 W
- Spurious emission : Less than  $-50$  dB below peak output power
  - \* spurious frequency ; below 30 MHz:  $-50$  dB,
  - above 30 MHz:  $-60$  dB
- Carrier suppression : More than 40 dB
- Unwanted sideband suppression: More than 50 dB
- Mic. connector : 8-pin connector (600  $\Omega$ )
- KEY connector : 3-conductor 6.5(d) mm ( $\frac{1}{4}$ "
- SEND connector : Phono (RCA)
- ALC connector : Phono (RCA)

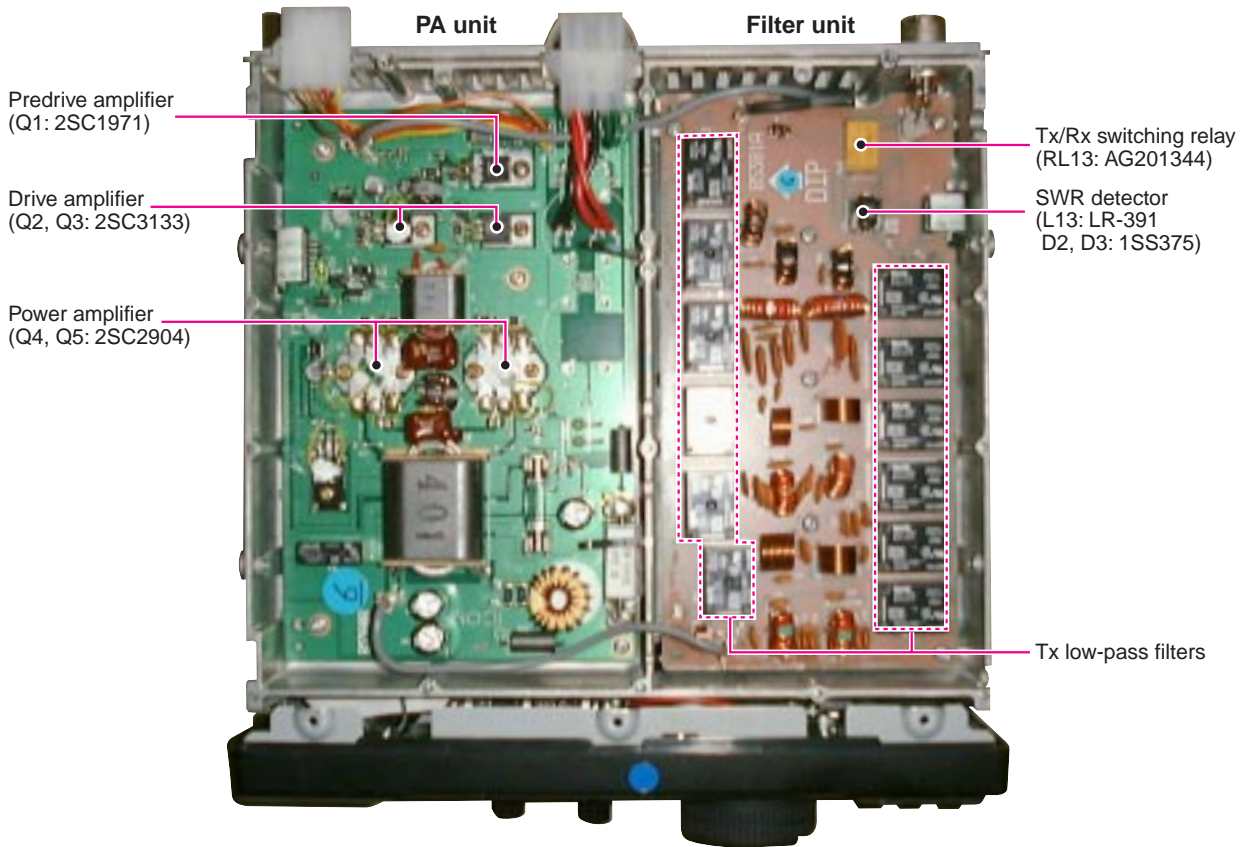
## ■ RECEIVER

- Receive system : Double-conversion superheterodyne
- Sensitivity (10 dB S/N) :
  - SSB, CW, RTTY 0.16  $\mu\text{V}^{*1}$  (1.8–29.999999 MHz)
  - AM 13  $\mu\text{V}$  (0.5–1.799999 MHz)
  - 2.0  $\mu\text{V}^{*1}$  (1.8–29.999999 MHz)
- \*1 Pre-amp 1 ON
- Squelch sensitivity : Less than 5.6  $\mu\text{V}$  (SSB)
- Selectivity :
  - SSB, CW, RTTY More than 2.1 kHz/ $-6$  dB
  - Less than 4.5 kHz/ $-60$  dB
  - AM More than 6.0 kHz/ $-6$  dB
  - Less than 20.0 kHz/ $-40$  dB
- Spurious and image rejection ratio:
  - More than 70 dB
  - (1.8–29.999999 MHz)
- Audio output power : More than 2.0 W (at 13.8 V DC) at 10 % distortion with an 8  $\Omega$  load
- RIT variable range :  $\pm 1200$  Hz
- PHONES connector : 3-conductor 6.5(d) mm ( $\frac{1}{4}$ "
- EXT SP connector : 2-conductor 3.5(d) mm ( $\frac{1}{8}$ " 8  $\Omega$

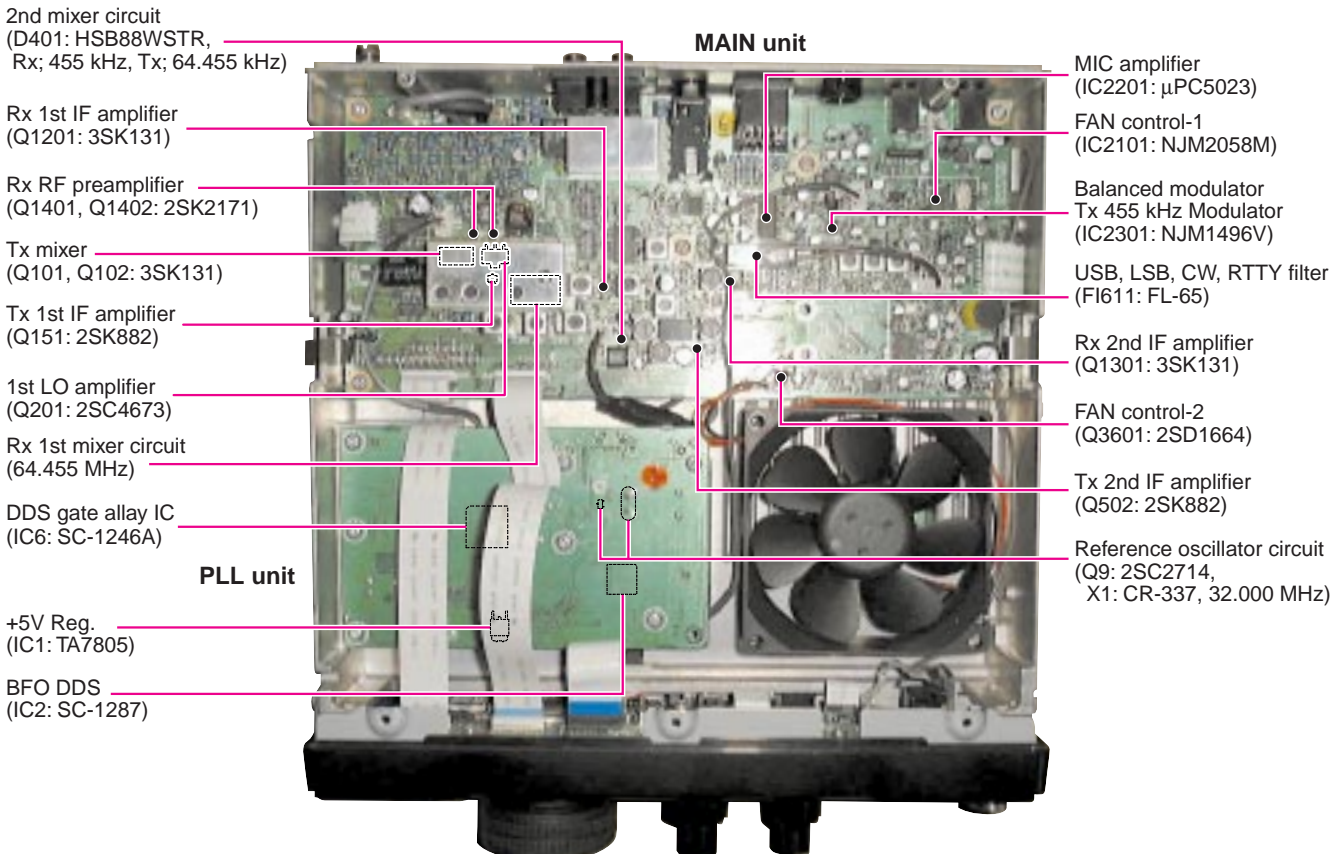
All stated specifications are subject to change without notice or obligation.

## SECTION 2 INSIDE VIEWS

### • Top view (PA AND FILTER UNITS)



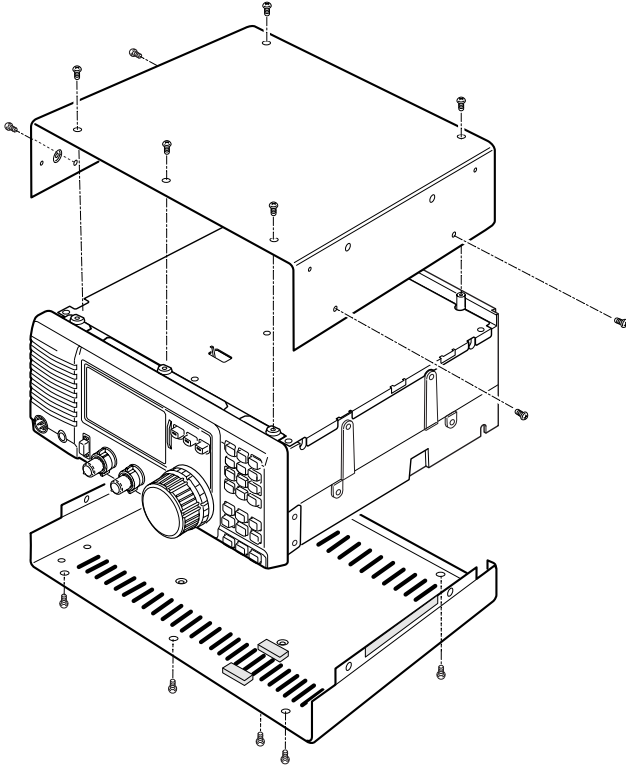
### • Bottom view (MAIN AND PLL UNITS)



## SECTION 3 DISASSEMBLY INSTRUCTIONS

### • Removing the covers

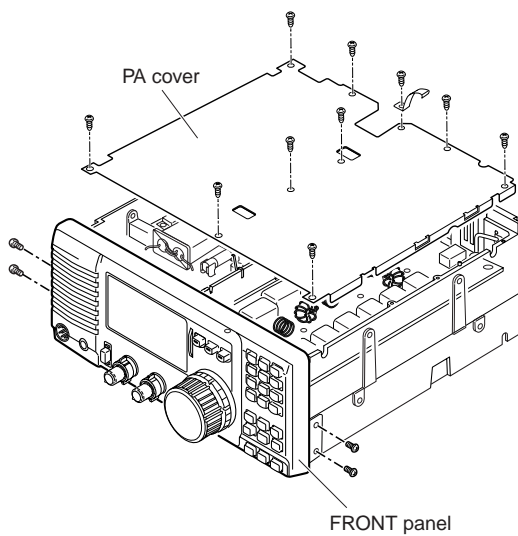
Remove 14 screws from the top and bottom covers.



### • Removing the Front unit and PA cover

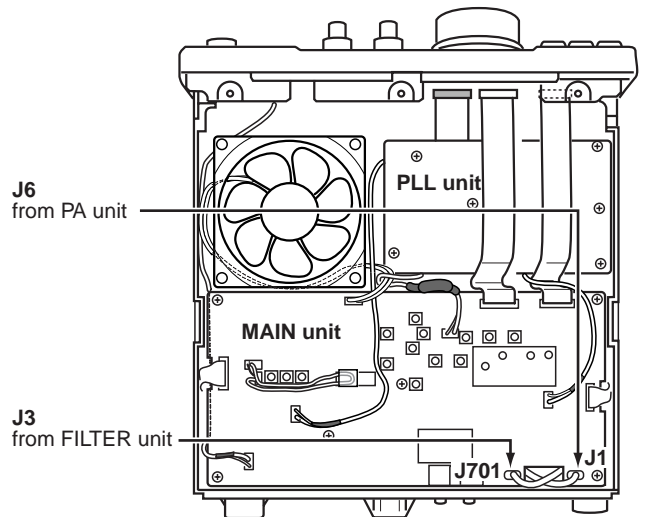
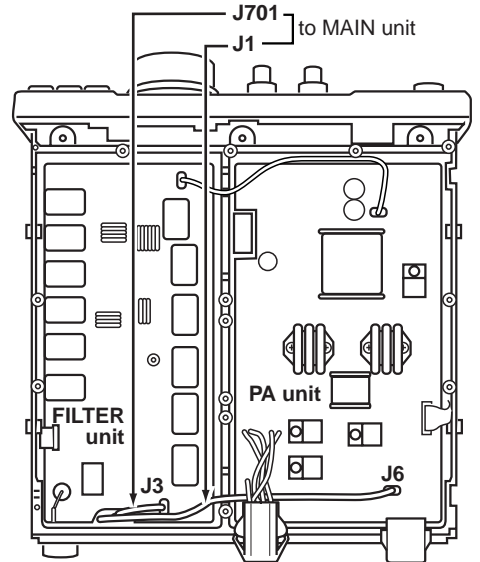
Remove 4 screws from the front panel.

Remove 10 screws from the shield cover.



### • How to connect the coaxial cable

Connect the coaxial cable as shown below.



# SECTION 4 CIRCUIT DESCRIPTION

## 4-1 RECEIVER CIRCUITS

### 4-1-1 RF SWITCHING CIRCUIT (FILTER AND MAIN UNITS)

The RF switching circuit leads receive signals to bandpass filters from the antenna connector while receiving. While transmitting, this circuit leads signals from the RF power amplifier to the antenna connector. This circuit includes a 20 dB RF attenuator circuit to prevent distortion from very strong signals.

RF signals from the antenna connector pass through the transmit/receive switching relay (RL13), and low-pass filter (L14, C14–C16), and are then applied to the MAIN unit via J3 (MAIN unit; J701).

The signals from the FILTER unit are either bypassed or are attenuated at the 20 dB attenuator (D701, R703). The signals are then applied to RF filters.

### 4-1-2 RF BANDPASS FILTER CIRCUIT (MAIN UNIT)

RF bandpass filters pass only the desired band signals and suppress any undesired band signals.

The RF circuit has 7 RF bandpass filters (BPF) for signals above 1.6 MHz and 1 low-pass filter (LPF) for signals and suppress any undesired band signals.

#### (1) 0.03–1.6 MHz

The signals pass through the low-pass filter (L821, L822, C822–C824) to suppress unwanted frequencies. The filtered signals are bypassed a pre-amplifier by a BPF control signal (B0) and preamp control signal (PROF), and are then applied to the 1st mixer circuit (Q1101–Q1104).

#### (2) 1.6–2.0 MHz

The signals pass through a bandpass filter (L831–L833, L835, L836, C831–C834, C837–C840) to suppress unwanted frequencies. The filtered signals are then applied to the pre-amplifier circuit.

#### (3) 2.0–30.0 MHz

The signals pass through a high pass filter (L811–L814, C811–C817) to suppress excessively strong signals below 2.0 MHz, such as from broadcasting stations. The filtered signals are applied to a low-pass filter or one of 5 bandpass filters depending on their frequencies and are then applied to the pre-amplifier circuit.

#### • Used RF filter

Band	Control signal	Input diode	Band	Control signal	Input diode
0.03–1.6 MHz	B0	D802 <sup>1/2</sup>	8–11 MHz	B4	D804
1.6–2 MHz	B1	D802 <sup>1/2</sup>	11–15 MHz	B5	D811
2–4 MHz	B2	D803	15–22 MHz	B6	D805
4–8 MHz	B3	D810	22–30 MHz	B7	D812

### 4-1-3 PRE-AMPLIFIER CIRCUIT (MAIN UNIT)

The pre-amplifier circuit uses two 2SK2171s to obtain 10 dB of gain over a wideband frequency range. When the pre-amplifier is turned ON, the signals above 1.6 MHz are applied to the pre-amplifier circuit.

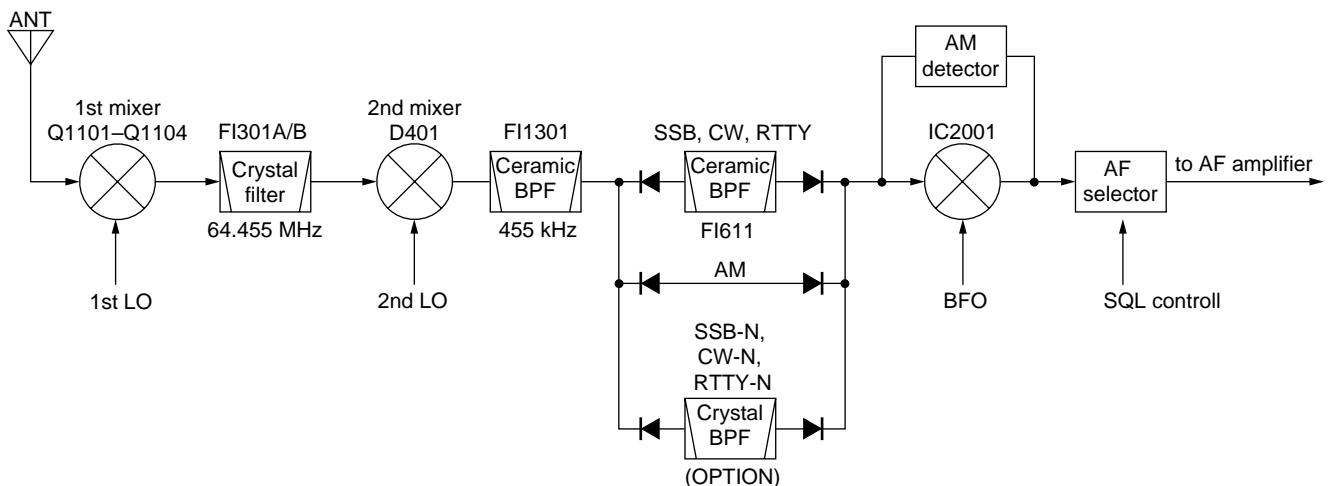
Q1401 and Q1402 are connected in parallel to easily match the impedance to 50 Ω. IC3003 (pins 11, 12) switches the signals from a bandpass filter, either to be bypassed, or to be applied to the pre-amplifier, depending on the [PREAMP] switch condition.

Amplified or bypassed signals are applied to the 1st mixer circuit (Q1102–Q1104)

### 4-1-4 1ST MIXER CIRCUIT (MAIN UNIT)

The 1st mixer circuit mixes the receive signals with the 1st LO signal to convert the receive signal frequencies into a 64.455 MHz 1st IF signal.

## • RECEIVER CONSTRUCTION





The signals from the pre-amplifier circuit, or signals which bypass the pre-amplifier, pass through a low-pass filter (L902, L903, C904–C907). This low-pass filter suppresses signals above 30 MHz to eliminate direct receiving of signals at 64.455 MHz and image interference at 130–160 MHz. The signals are then applied to the 1st mixer (Q1102–Q1104).

The 1st LO signal (64.485–94.455 MHz) enters the MAIN unit from the PLL unit via J201 (PLL unit; J4). The LO signal is amplified at Q201 and then applied to the 1st mixer.

The 1st mixer (Q1101–Q1104) uses four 2SK1740s to produce high level mixing with a high intercept point.

#### 4-1-5 1ST IF CIRCUIT (MAIN UNIT)

The 1st IF circuit filters and amplifies the 1st IF signals. The 1st IF signals from the 1st mixer circuit are applied to MCF (Monolithic Crystal Filter: F1301) to suppress out-of-band signals. The passband width of F1301 is  $\pm 7.5$  kHz/–6 dB. The filtered signals are applied to the 1st IF amplifier (Q1201). AGC voltage is supplied to the 2nd gate of Q1201.

##### • Exact 1st IF frequency

Mode	Frequency (MHz)
LSB	64.4535
USB	64.4565
CW	64.4541
AM, CW-N	64.4550

#### 4-1-6 2ND MIXER CIRCUIT (MAIN UNIT)

The 2nd mixer circuit mixes the amplified 1st IF signals and 2nd LO signal (64.00 MHz) to convert the 1st IF signals into a 2nd IF signal.

The amplified 1st IF signals from Q1201 are converted into 455 kHz 2nd IF signal at the 2nd mixer (D401). D401 is a DBM (Double Balanced Mixer). The 2nd LO level is approx. 0 dBm.

The 2nd IF signals are applied to F11301 to suppress undesired signals such as the 2nd LO signal, and are then applied to the NB circuit.

##### • Exact 2nd IF frequency

Mode	Frequency (kHz)
LSB	453.5
USB	456.5
CW	454.1
AM, CW-N	455.0

#### 4-1-7 NOISE BLANKER CIRCUIT (MAIN UNIT)

The noise blanker circuit detects pulse type noise, and turns OFF the signal line when noise appears.

The 2nd IF signals from F11301 are applied to the noise blanker gate (D1301, D1302). A portion of the signals from

F11301 is amplified at the noise amplifiers (Q1501, Q1502, Q1503), then detected at the noise detector (D1501). The detected signal from the noise detector is applied to the noise blanker control (Q1508, Q1509).

A portion of the detected signals from the noise detector is applied to the noise AGC circuit (Q1504, Q1505, R1514, R1516, C1512) to control the bias voltage of the noise amplifier (Q1501, Q1502).

The threshold level of the noise blanker switch (Q1508) is set at 0.9 V. When the detected voltage exceeds the threshold level, Q1509 outputs a blanking signal to close the noise blanker gate (D1301, D1302), depending on the pulse noise period. When the operating frequency is changed, the “DN” signal line becomes “LOW”, turning Q1509 ON through D1503. In this case, the noise blanker gate prevents PLL click noise.

#### 4-1-8 2ND IF CIRCUIT (MAIN UNIT)

The signals passed through the noise blanker gate (D1301, D1302) are amplified at Q1301. AGC voltage is supplied to the 2nd gate of Q1301.

When SSB, CW or RTTY mode is selected, the amplified signals pass through F1611 (FL-65). When an optional CW narrow filter is installed and CW-N mode is selected, the signals pass through the CW narrow filter. When AM mode is selected, the signals bypass the 2nd IF filter.

The filters are selected with mode selecting signals (SSB/CW, AM, CW-N) and the “T8V” voltage line.

The filtered signal is amplified at Q1603–Q1601 to obtain a detectable level. AGC voltage is supplied to the 2nd gate of Q1603. Two thermistors (R1612, R1617), connected to the gate of Q1602, improves the temperature characteristics of the receiver gain. R1614 adjusts the receiver gain.

While in SSB, CW or RTTY mode, output signal from Q1601 is applied to the product detector (IC2001). In AM mode, output signals from Q1601 are shared between the AM detector (D1901) and AGC detector (D1803).

#### 4-1-9 BFO CIRCUIT (PLL UNIT)

BFO (Beat Frequency Oscillator) frequency is used at the SSB/CW detector and the balanced modulator. The IC-718 uses a DDS IC for the BFO circuit.

Output signals from the DDS IC (IC2) are filtered by the low-pass filter (L14, L15, C50–C54), and applied to the product detector (MAIN unit; IC2001) for receive demodulation.

##### • BFO frequency in each mode

Mode	Frequency (kHz)	
	Receive	Transmit
LSB	453.5	453.5
USB	456.5	456.5
CW	454.1	455.0
CW-N	455.0	455.0
AM	No output	455.0

#### 4-1-10 SSB/CW DEMODULATOR CIRCUITS (MAIN UNIT)

In SSB or CW mode, the 2nd IF signal from the IF amplifier (Q1601) is mixed with the BFO signal from the PLL unit at the product detector (IC2001) to demodulate the 2nd IF signal into AF signals. The detected signals (AF) from IC2001 (pin 1) are applied to the AF input mode selector switch (IC2102, pin 7).

#### 4-1-11 AM DEMODULATOR CIRCUITS (MAIN UNIT)

In AM mode, the 2nd IF signal from the buffer amplifier (Q1601) passes through C1905 and is detected at D1901. The detected signal (AF) is then applied to the AF input mode selector switch (IC2102, pin 6).

#### 4-1-12 AF INPUT MODE SELECTOR SWITCH (MAIN UNIT)

The AF signal from one of the detector circuits is applied to the AF input mode selector switch (IC2102). IC2102 consists of analog switches which are selected with a mode signal and the squelch control signal. The AF signal is output from IC2102 (pin 1) and then applied to the AF amplifier circuit.

#### 4-1-13 AGC CIRCUIT (MAIN UNIT)

The AGC (Automatic Gain Control) circuit reduces IF amplifier gain to keep the audio output at a constant level.

The voltage on the AGC line (Q1805, collector) determines the receiver gain. The voltage is usually set by D1803 and the resistance ratio of R1812 and R1813.

The 2nd IF signal from the buffer amplifier (Q1601) is detected at the AGC detector (D1803) and is then applied to the DC amplifier (Q1805). -5 V is applied to the Q1805 emitter to activate the AGC line with minus voltage.

When receiving strong signals, the detected voltage increases and the voltage of the AGC line decreases via the DC amplifier (Q1805). As the AGC line is used for the bias voltage of the IF amplifiers (Q1301, Q1201, Q1603), IF amplifier gain is decreased.

When the strong signal disappears, C1804 and R1809 release the AGC line voltage in CW or RTTY mode to obtain a fast AGC release time. While in SSB or AM mode, C1803, C1805, R1808 and C1802, R1807 are connected in parallel to obtain an appropriate AGC characteristics (middle or slow AGC release time), respectively.

#### 4-1-14 S-METER CIRCUIT (MAIN UNIT)

The S-meter circuit indicates the relative received signal strength while receiving by utilizing the AGC voltage which changes depending on the received signal strength.

The AGC bias voltage (time constant line) is applied to a differential amplifier (IC1701d, pin 13) where the difference between the bias and reference voltage is detected.

The S-meter signal is applied to the A/D converter section in the CPU (LOGIC unit; IC1, pin 98) and the S/R/F indicator displays the relative signal strength.

#### 4-1-15 SQUELCH CIRCUIT (MAIN UNIT)

The squelch circuit mutes audio output when the S-meter signal is lower than the [SQL] control setting level.

The S-meter signal from IC1701d (pin 14) is applied to the CPU (LOGIC unit; IC1) to be compared with the threshold level set by the [SQL] control.

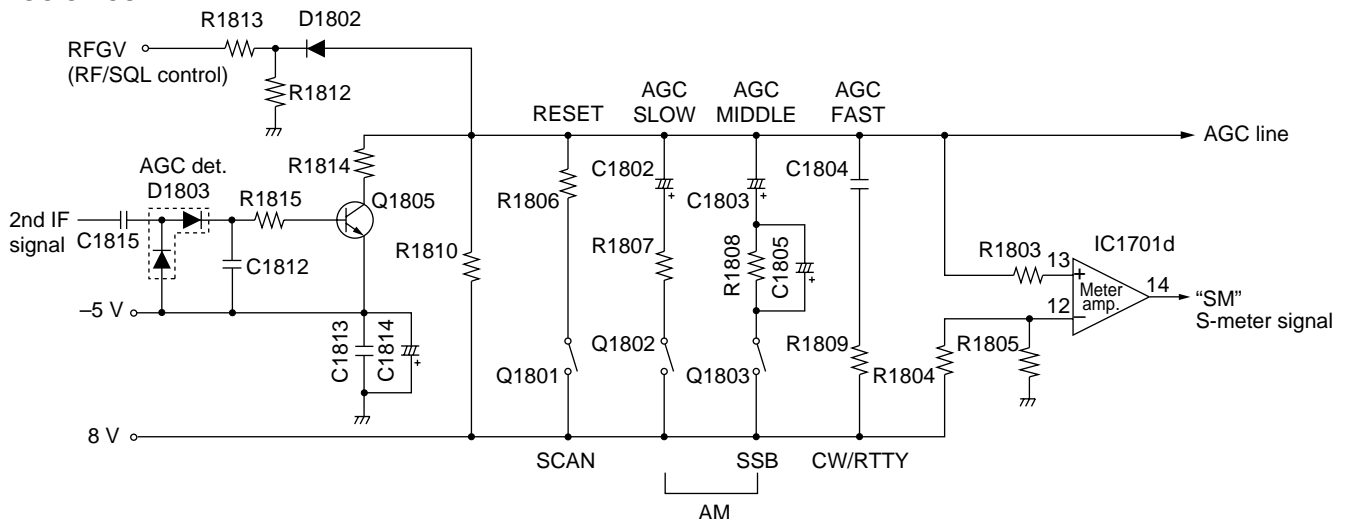
When the S-meter signal is lower than the threshold level, the CPU outputs control signal to the AF input mode selector switch (IC2102, pin 5) via the D/A converter (IC3006). This cuts the AF signal OFF. The CPU also controls turning OFF the [RX] indicator, and CPU (pin 43) outputs "SQLS" signal to the [MIC] connector (pin 6) and [ACC] connector (pin 13).

#### 4-1-16 AF AMPLIFIER CIRCUIT (MAIN UNIT)

The AF amplifier amplifies the AF input signal to a suitable driving level for the speaker.

The AF signal from the AF input mode selector switch is applied to the AF pre-amplifier (IC2101a). The CW side tone signal is also applied to IC2101a.

#### • AGC CIRCUIT



The amplified signal is applied to the VCA (IC2701), and then volume controlled AF signal is power-amplified at the AF power amplifier (IC2901) to drive the speaker. The AF signal is applied to the speaker.

## **4-2 TRANSMITTER CIRCUITS**

### **4-2-1 MICROPHONE AMPLIFIER CIRCUIT (MAIN UNIT)**

The microphone amplifier circuit amplifies microphone-input signals and outputs the amplified signal to the balanced modulator.

Audio signals from the [MIC] connector are applied to the MIC amplifier IC (IC2201). IC2201 consists of the microphone amplifier, microphone gain controller, speech compressor and VOX circuit. External modulation input from the [ACC] socket (pin 11) is also applied to IC2201. The microphone bias voltage is supplied from the 8V line via R2225 and R2201.

In AM mode, the ALC circuit (IC2351b, D2381) limits maximum level of the IC2201 output. The maximum modulation level is set by R2385.

### **4-2-2 BALANCED MODULATOR (MAIN UNIT)**

The balanced modulator converts the AF signal from the microphone amplifier into a 455 kHz IF signal with a BFO signal.

Output signals from the microphone amplifier or the CW keying signal are applied to the balanced modulator (IC2301, pin 1). The BFO signal from the PLL unit is applied to IC2301 (pin 10) as a carrier signal.

C2301 is a doubled balanced mixer IC and outputs a double side band (DSB) signal with -40 dB carrier suppression.

R2303 adjusts the balanced level of IC2301 for maximum carrier suppression. In CW mode, the CW keying signal upsets the balance to create a carrier signal. In AM mode, Q2302 and R2321 upset the balance to create an AM carrier signal.

### **4-2-3 CW KEYING CIRCUIT (MAIN UNIT)**

When the CW key is closed, control signal is output from CPU (LOGIC unit) and controls break-in operation, the side tone signal.

The input signal (DOT or DAS) from CW keyer is applied to the CPU (LOGIC unit; IC1, pins 71, 70) and then CPU outputs CW control signal (KDS) from pin 77. The CW control signal is applied to the balanced modulator (IC2301) via Q3701, Q3702, D3701 to unbalance the IC2301 input bias voltage and create a carrier signal. R3703 determines the transmit delay timing.

### **4-2-4 IF AMPLIFIER (MAIN UNIT)**

The SSB/CW/RTTY 455 kHz IF signal passes through FI611 (FL-65) to suppress unwanted sideband signals, then the signal is applied to a transmit IF amplifier (Q502). The optional CW narrow filter is not used in transmitting.

The amplified signal from Q502 is mixed with the 2nd LO signal and converted into a 64.455 MHz IF signal at D401. D401 is used in receiving and transmitting. The AM signal bypasses FI611, and is amplified at Q502 and is then applied to D401.

The 64.455 MHz IF signal is filtered at FI301, and amplified at the IF amplifier (Q151) and is then converted into the displayed frequency at the balanced mixer (Q101, Q102) with the 1st LO signal.

The gates of the IF amplifiers (Q151, Q502) are controlled by ALC bias voltage from the ALC circuit. A thermistor (R508), connected to the gate of Q502, improves the temperature characteristics of the transmitter gain. R503 adjusts the total transmitter gain.

### **4-2-5 RF CIRCUIT (MAIN AND PA UNITS)**

The displayed frequency signal converted at the balanced mixer (MAIN unit; Q101, Q102) is applied to the bandpass filter (L100-L103, C101-C107) where unwanted LO signal emission is reduced. The filtered signal is attenuated at R5-R7 and amplified at IC1, and is then applied to the PA unit via the attenuator (R1-R3).

The signals from the MAIN unit are amplified at the predrive amplifier (Q1), drive amplifier (Q2, Q3) and power amplifier (Q4, Q5) in the PA unit to obtain a stable 100 W of RF output power.

The predrive amplifier is a class-A amplifier with a VCC of 13.8 V. The drive amplifier is a class-AB push-pull amplifier with a VCC of 13.8 V. D1 controls bias voltage to the drive amplifier.

The impedance of the signal from the drive amplifier is converted at L2, and then the signal is applied to the power amplifier (Q4, Q5). The power amplifier is a class-AB push-pull amplifier and amplifies the input signal to 100 W. D2 and D3 control bias voltage to the power amplifier. The signal from the power amplifier is applied to one of the low-pass filters in the FILTER unit.

### **4-2-6 LOW-PASS FILTER CIRCUIT (FILTER UNIT)**

The low-pass filter circuit consists of 6 Chebyshev low-pass filters to suppress the higher harmonic components. The signal from the power amplifier (Q4, Q5) is applied to one of the low-pass filters (depending on its frequency). The filter switching voltage from the MAIN unit (J4001) is applied to the FILTER unit via J1.

The filtered signal passes through the SWR detector circuit (L13) and is then applied to the antenna connector.

### **4-2-7 ALC CIRCUIT (MAIN UNIT)**

The ALC (Automatic Level Control) circuit controls the gain of IF amplifiers in order for the IC-718 to output a constant RF power set by the [RF PWR] control even when the supplied voltage shifts, etc.

The "FOR" voltage from the FILTER unit is applied to IC1701c (pin 9) in the MAIN unit. The "POCV" voltage from the D/A converter (IC3301, pin 2), determined by the RF power setting, is applied to IC1701c (pin 10) as the reference voltage.

When the "FOR" voltage exceeds the "POCV" voltage, ALC bias voltage from IC1701c (pin 8) controls the IF amplifiers (Q151, Q502). This adjusts the output power to the determined level by the RF power setting until the "FOR" and "POCV" voltages are equalized.

In AM mode, Q1705 turns ON and C1707, C1708 are connected to the "FOR" voltage line to obtain an averaging ALC operation. Q1706 turns ON and the "POCV" voltage is shifted for 40 W AM output power (maximum) through R1730.

An external ALC input from the [ACC] socket or the [ALC] jack is applied to the buffer amplifier (Q1703). External ALC operation is identical to that of the internal ALC.

#### 4-2-8 APC CIRCUIT (MAIN UNIT)

The APC (Automatic Power Control) circuit protects the power amplifiers on the PA unit from high SWR and excessive current.

A reflected wave signal appears and increases on the antenna connector when the antenna is mismatched. D3 of the SWR detector circuit (L13, D2, D3) in the FILTER unit detects the signal and applies it to IC1701b in the MAIN unit as the "REF" signal. When the "REF" signal level increases, IC1701b decreases the ALC line voltage via R1716 to activate the ALC.

For the current APC, the power transistor current is obtained by detecting the voltage ("ICH" and "ICL") which appear at both terminals of a 0.012 Ω resistor (PA unit; R25). The detected voltage is applied to the differential amplifier (IC1701a, pins 2, 3). When the current of the final transistors is more than 22 A, IC1701a controls the ALC line via D1705 to prevent excessive current flow.

#### 4-2-9 TEMPERATURE PROTECTION CIRCUIT (MAIN UNIT)

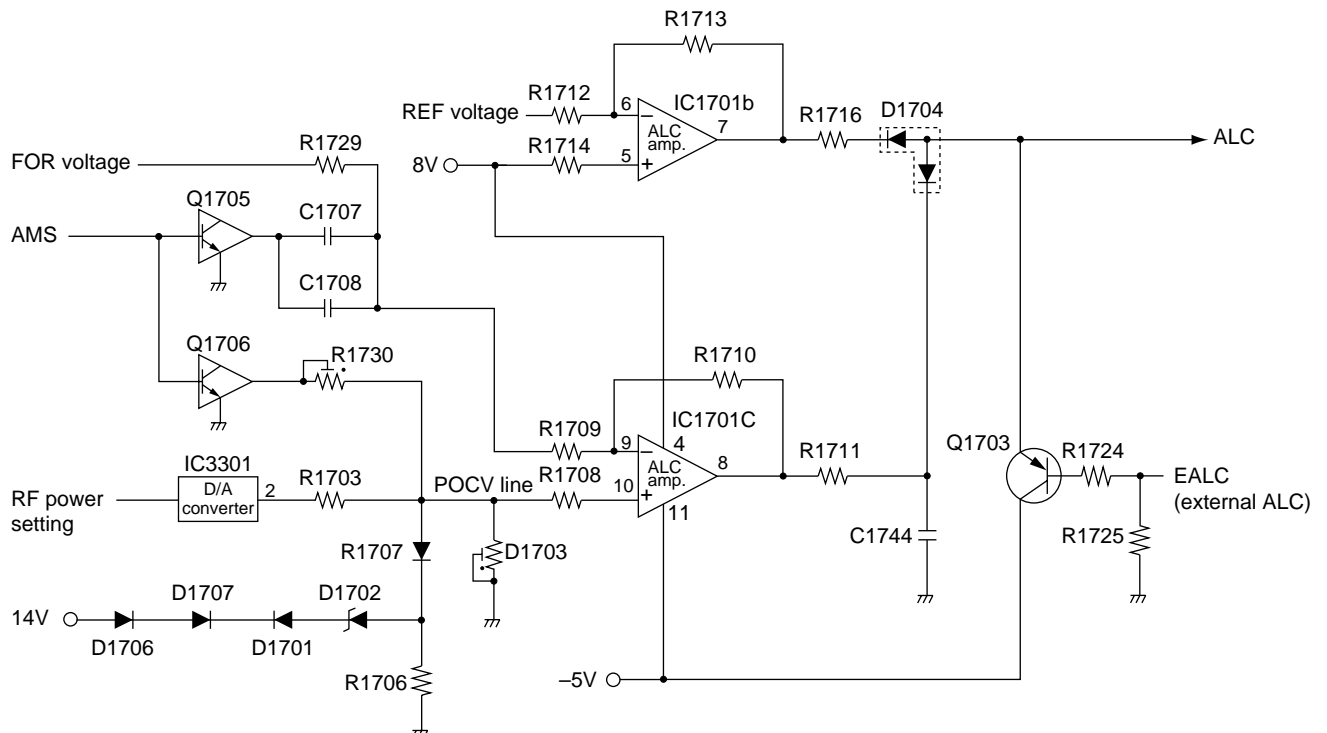
A cooling fan (CHASSIS; MF1) is activated while transmitting or if the temperature of Q4 (PA unit) exceeds the preset value.

While transmitting, PAT8 voltage is provided to MF1 via R30. Thermistor R30 on the PA unit detects the temperature of Q4. If the Q4 temperature is more than 50°C (122°F), R30 becomes very low impedance. Then TEMP signal from PA unit is applied to the A/D converter section of the CPU (IC1, pin 94) in the LOGIC unit as PATL signal. And the CPU outputs control signal to rotate the cooling fan at high speed via the I/O expander (IC3301, pin 8) as FANV signal – even when the transceiver condition has changed from transmit to receive.

#### 4-2-10 RF METER CIRCUIT (MAIN UNIT)

The "FOR" voltage from the FILTER unit is applied to the RF meter amplifier (IC1751a, pin 2) via the ALC amplifier (IC1701c). The amplified voltage is output from pin 1 (IC1751a) and then applied to the A/D converter section of the CPU (IC1, pin 99) in the LOGIC unit.

#### • ALC CIRCUIT



## 4-3 PLL CIRCUITS

### 4-3-1 GENERAL DESCRIPTION

The PLL unit contains 2 DDS circuits for generating a 1st LO signal (64.485–94.455 MHz variable) and a BFO frequency (453.5–456.5 kHz). The 1st LO PLL employs a 1 loop DDS PLL whose reference oscillator is also used as the 2nd LO signal (64.00 MHz fixed). The DDS (Direct Digital Synthesizer) circuit performs signal-sampling, generation of digital sine wave and digital phase detection.

### 4-3-2 1ST LO CIRCUIT (PLL UNIT)

The PLL contain one VCO circuit (Q18, D4) for all HF band coverage within 1 Hz step. The VCO oscillation signal is buffer-amplified at Q26 and is then amplified at Q29, Q32 and Q30. The resulting signal is applied to the DDS IC (IC6).

The DDS IC outputs pulse-type signals. The signals are applied to the loop filter to be converted into DC voltage (lock voltage).

The lock voltage is applied to the varactor diode (D4) in the VCO circuit to change the capacitance of this diode and control the oscillation frequency.

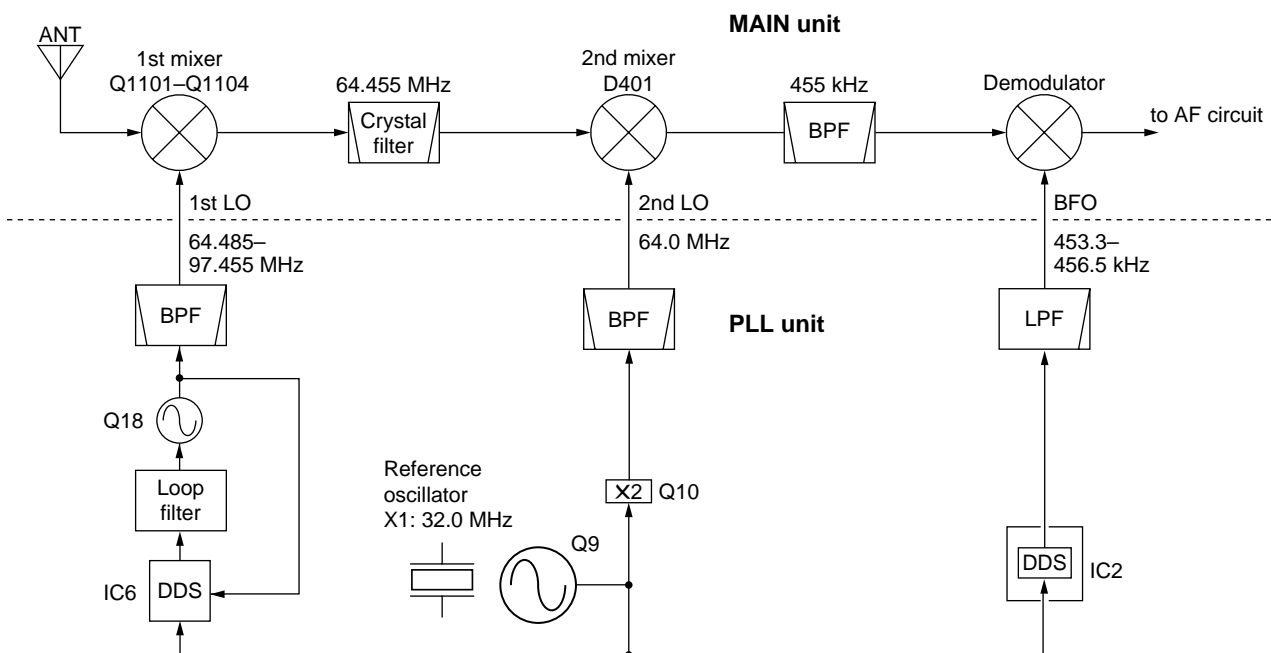
The VCO oscillating signal is then buffer-amplified at the buffer amplifier (Q26), and amplified at the LO amplifier (Q28), and finally applied to the MAIN unit as a 1st LO signal.

### 4-3-3 REFERENCE OSCILLATOR CIRCUIT (PLL UNIT)

The reference oscillator circuit consists of Q9 and X1. A 32.00 MHz reference frequency is oscillated to produce a 2nd LO signal, DDS reference frequency and BFO DDS clock signal.

The 32.00 MHz reference frequency is doubled at Q10 to obtain the 2nd LO signal. The resulting 64.00 MHz signal is filtered at the bandpass filter and is then applied to the MAIN unit via J1 as the 2nd LO signal.

### • FREQUENCY CONSTRUCTION



## 4-4 LOGIC CIRCUITS

### 4-4-1 BAND SELECTION DATA (MAIN UNIT)

To select the correct bandpass filter and low-pass filter, the CPU outputs the following band selection data through the I/O expander (MAIN unit; IC3001) depending on the displayed frequency.

The band voltage is produced at the D/A converter (IC3301) and IC2101c.

#### • Band selection data

Band	BPF	Band voltage	LPF
0.03–1.59999 MHz	B0	7.4 V	L1
1.6–1.99999 MHz	B1		
2.0–3.99999 MHz	B2	6.0 V	L2
4.0–7.99999 MHz	B3	5.0 V	L3
8.0–10.99999 MHz	B4	0 V	L4
11.0–14.99999 MHz	B5	4.0 V	
15.0–21.99999 MHz	B6	3.1 V	L5
22.0–30.00000 MHz	B7	2.2 V	L6

### 4-4-2 RIT CONTROL (FRONT UNIT)

The [RIT] control shifts the “RITL” voltage in order to shift the receive frequency. The voltage is applied to the A/D converter section of the CPU (IC1, pin 92). The CPU shifts the N-data for the DDS IC.

#### 4-4-3 CPU (LOGIC UNIT)

The CPU (IC1) contains an 8-bit CMOS CPU, a 60 k-byte ROM, a 2 k-byte RAM. A 9.8304 MHz clock is used for rapid operation. The CPU controls the operating frequency, mode, function display, etc. The memory channel information is stored in the EEPROM (IC2).

The Icom CI-V network system allows the IC-718 to be remotely controlled by a personal computer using an RS-232C I/O port.

#### • PORT ALLOCATIONS (LOGIC unit; IC1)

Pin number	Port name	Description
1	AVXL	Input port for the anti-VOX voltage.
15-17	CON0-CON2	Output control bit signals for the 1st LO DDS circuit (PLL unit; IC6).
18	DRES	Output reset signal for the DDS circuits (PLL unit; IC2, IC6) and D/A converters (MAIN unit; IC3001, IC3004, IC3006), etc.
19	PCK	Outputs serial clock signal for the DDS circuits (PLL unit; IC2, IC6).
21	PDAT	Outputs serial data signals for the DDS circuits (PLL unit; IC2, IC6).
22	DSTB	Outputs strobe signals for the 1st LO DDS circuit (PLL unit; IC6).
23	PSTB	Outputs strobe signals for the BFO DDS circuit (PLL unit; IC2).
24	BSTB	Outputs strobe signals for the D/A converter (MAIN unit; IC3001).
25	FSTB	Outputs strobe signals for the D/A converter (MAIN unit; IC3004).
26	MSTB	Outputs strobe signals for the D/A converter (MAIN unit; IC3006).
41, 42	P55, P56	Output LCD backlight control signals for the dimmer circuit (Q70-Q72).
43	SQLS	Outputs squelch mute control signal, applied to the AF selector switch (MAIN unit; IC2102). High : Squelch opens
54	MCK	Outputs serial clock signal for the I/O expander (MAIN unit; IC3301) and D/A converters (MAIN unit; IC3001, IC3004, IC3006).
55	MDAT	Outputs serial data signals for the I/O expander (IC3301) and D/A converters (IC3001, IC3004, IC3006) on the MAIN unit.
57	STAT	Outputs start signal for the optional antenna tuner.
58	KEY	Input port for transmit control signal from the optional antenna tuner CPU.
60	ECS	Outputs chip select signal for EEPROM (IC2).
61	ESI	Input port for serial signal from EEPROM (IC2).

#### LOGIC unit; IC1

Pin number	Port name	Description
62	ESO	Outputs serial signal to EEPROM (IC2).
63	ESCK	Outputs serial clock signal to EEPROM (IC2).
64, 65	SBSY, SPST	Output control signals for the optional UT-102 (VOICE SYNTHESIZER UNIT).
66, 67, 68	DSPS, DINT, DSST	Output control signals for the optional UT-106 (DSP UNIT).
70	DASK	Input port for [KEY] jack, dash signal. Low : During key down.
71	DOTK	Input port for [KEY] jack, dot signal. Low : During key down.
77	POWS	Outputs switching relay (PA unit; RL1) control signal.
79	BEEP	Outputs beep/CW side tone signals.
80	RXS	Outputs R8V regulator (MAIN unit; IC3005) control signal. Low : While receiving.
81	TXS	Outputs T8V regulator (MAIN unit; IC3005) T13V regulator (MAIN unit; Q3801, Q3802) control signal. Low : While transmitting.
82	PWRK	Input port for the [POWER] switch. Low : While [POWER] is pushed.
85	ASTB	Outputs strobe signals for the I/O expander (MAIN unit; IC3301).
86	P41	Input port for the CI-V control signals.
87	P42	Outputs CI-V control signals.
88	SEND	Input port for connected microphone's PTT switch and SEND signal from the [ACC] jack. Low : While the PTT is pushed or activated from an external unit.
90	AFGL	A/D input port for the [AF] control.
91	RFGL	A/D input port for the [RF/SQ] control.
92	RITL	A/D input port for the [RIT] control.
93	SFTL	A/D input port for the [SHIFT] control.
95	UD	A/D input port for the microphone up/down signal.
96	FORL	A/D input port for the SWR detector circuit (FILTER unit; D2).
97	REFL	A/D input port for the SWR detector circuit (FILTER unit; D3).
98	SML	A/D input port for the S-meter amplifier circuit (MAIN unit; IC1701d).
99	ALML	A/D input port for the ALC meter amplifier circuit (MAIN unit; IC1751a).
100	VOXL	A/D input port for the VOX voltage.

## 4-5 POWER SUPPLY CIRCUITS

### 4-5-1 PA UNIT

LINE	DESCRIPTION
HV	The voltage from an external power supply passed through a fuse (F1).
14 V	The same voltage as the HV line passed through the switching relay (RL1).

### 4-5-2 LOGIC UNIT

LINE	DESCRIPTION
H5V	Common 5 V converted from the HV line and regulated by the H5V regulator circuit (IC5).
5 V	Common 5 V converted from the 14 V line and regulated by the 5V regulator circuit (IC6).

### 4-5-3 MAIN UNIT

LINE	DESCRIPTION
8V	Common 8 V converted from the 14 V line and regulated by the 8V regulator circuit (IC3005).
T8V	8 V for transmitter circuits converted from the 14 V line using TX signal and regulated by the T8V regulator circuit (IC3005).
R8V	8 V for receiver circuits converted from the 14 V line using RX signal and regulated by the R8V regulator circuit (IC3005).
-5V	Common -5 V converted from the 14 V line and converted by the -5V DC-DC converter circuit (IC3501, D3502). The voltage is applied to the AGC (Q1805, D1803), ALC (IC1701) and AF selector (IC2102), etc.
PAT8	8 V for transmitter circuits converted from the 8 V line and regulated by the PAT8 regulator circuit (IC3005).
T13V	13 V for transmitter circuits converted from the 14 V line using TX signal and regulated by the T13V regulator circuit (Q3801, Q3802). The voltage is applied to the TX/RX switching relay (FILTER unit; RL13).
R13V	13 V for receiver circuits converted from the 14 V line using R8V signal and regulated by the R13V regulator circuit (Q1001, Q1002). The voltage is applied to the receive 1st mixer circuit (Q1101-Q1104).

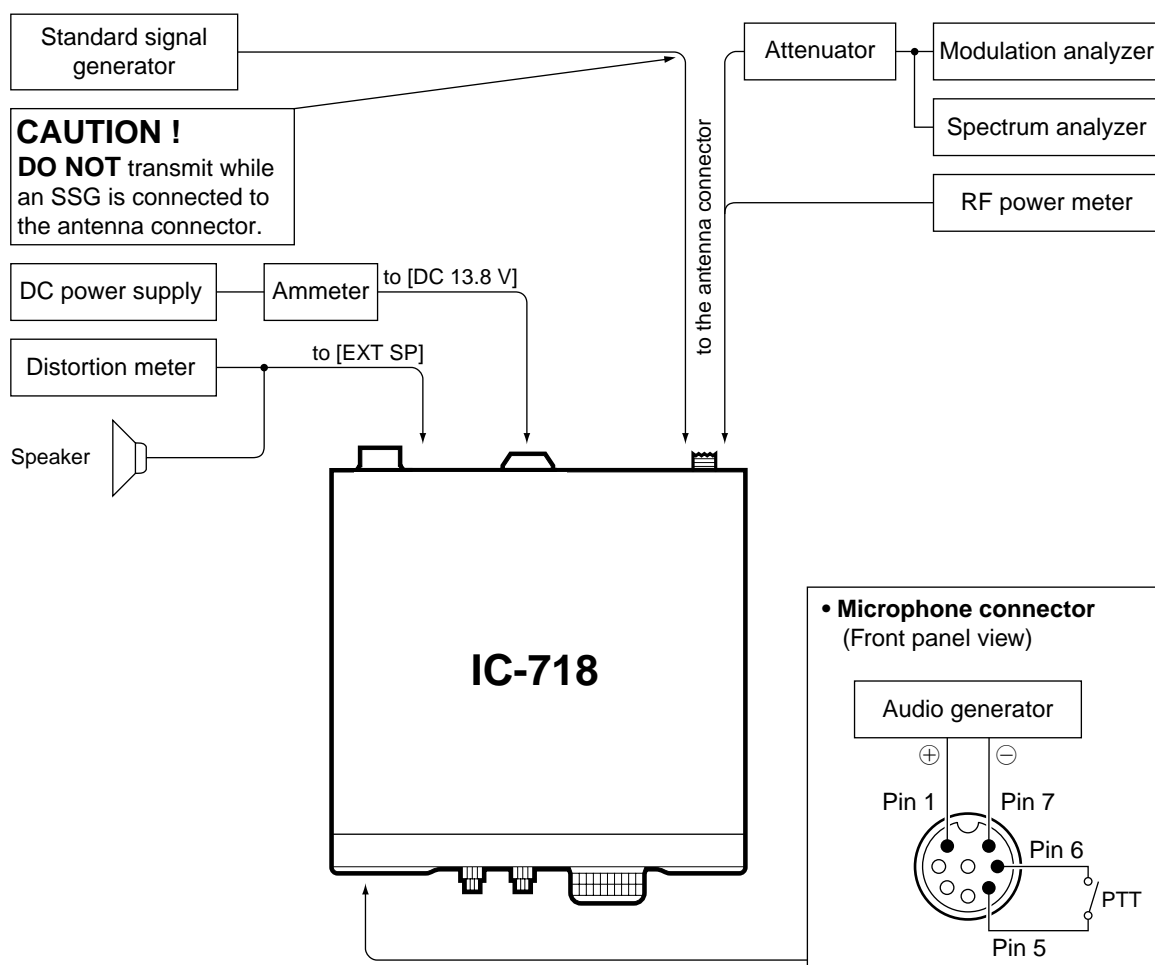
# SECTION 5 ADJUSTMENT PROCEDURES

## 5-1 PREPARATION BEFORE SERVICING

### ■ REQUIRED TEST EQUIPMENT

EQUIPMENT	GRADE AND RANGE	EQUIPMENT	GRADE AND RENG
DC power supply	Output voltage : 13.8 V DC Current capacity : 30 A or more	Spectram analyzer	Frequency range : At least 90 MHz Spectraum bandwidth : 100 kHz or more
RF power meter (terminated type)	Measuring range : 10–200 W Frequency range : 1.8–30 MHz Impedance : 50 Ω SWR : Less than 1.2 : 1	Standard signal generator (SSG)	Frequency range : 0.1–100 MHz Output level : 0.1 μV–32 mV (–127 to –17 dBm)
Frequency counter	Frequency range : 0.1–100 MHz Frequency accuracy : ±0.5 ppm or better Sensitivity : 100 mV or better	AC millivoltmeter	Measuring range : 10 mV–10 V
		DC voltmeter	Input impedance : 50 kΩ/V DC or better
		DC ammeter	Measurement capability: 1 A and 30 A
RF voltmeter	Frequency range : 0.1–100 MHz Measuring range : 0.01–10 V	Audio generator	Frequency range : 300–3000 Hz Measuring range : 1–500 mV
Modulation analyzer	Frequency range : At least 30 MHz Measuring range : 0–100 %	Attenuator	Power attenuation : 50 or 60 dB Capacity : 150 W or more
Distortion meter	Frequency range : 1 kHz ±10 % Measuring range : 1–100 %	External speaker	Input impedance : 8 Ω Capacity : 5 W or more
Oscilloscope	Frequency range : DC–20 MHz Measuring range : 0.01–10 V	Terminator	Resistance : 50 and 150 Ω Capacity : 150 W or more
Digital multimeter	Imput impedance : 10 MΩ/DC or beter		

### ■ CONNECTIONS

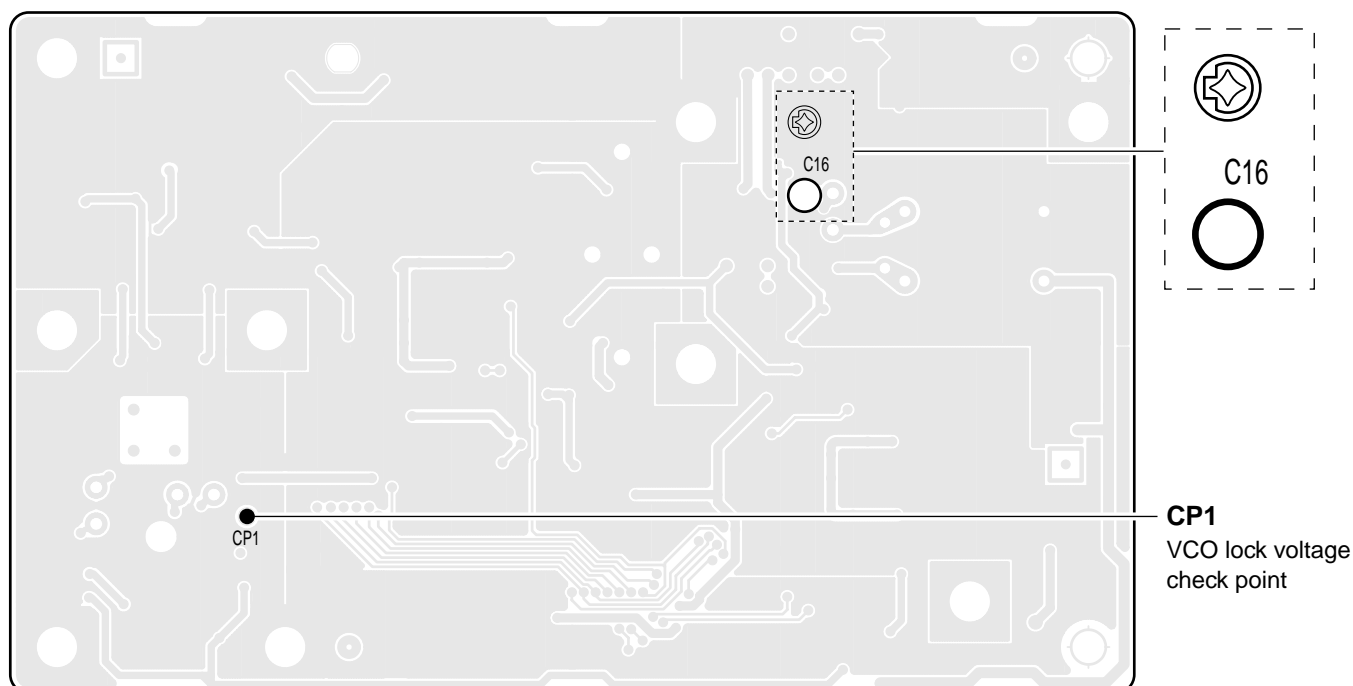




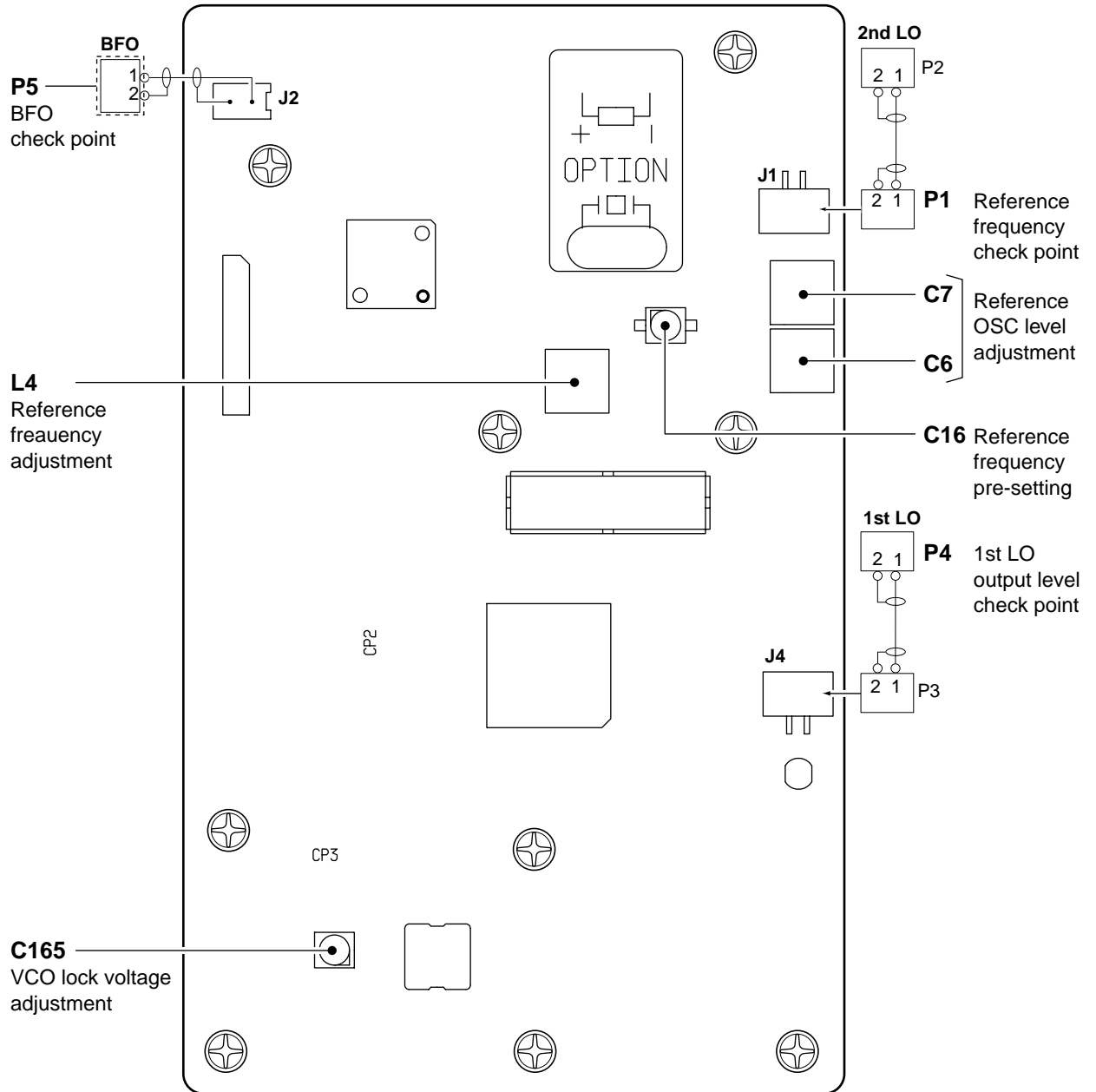
## 5-2 PLL ADJUSTMENTS

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT		
		UNIT	LOCATION		UNIT	ADJUST	
REFERENCE FREQUENCY	1	<ul style="list-style-type: none"> <li>• Display frequency: Any</li> <li>• Set C16 as illustration at below.</li> <li>• Receiving</li> </ul>	PLL	Connect a frequency counter to check point P1.	Turn L6, L7 on the PLL unit to downside for presetting until the frequency counter reads frequency.		
	2				64.00000 MHz	PLL	L4
	3				Maximum level		L6, L7
VCO LOCK VOLTAGE	1	<ul style="list-style-type: none"> <li>• Display frequency: 29.99999 MHz</li> <li>• Receiving</li> </ul>	PLL	Connect a digital multimeter or oscilloscope to check point CP1.	4.15 V	PLL	C165
	2				More than 0.8 V		Verify
1ST LO OUTPUT LEVEL	1	<ul style="list-style-type: none"> <li>• Display frequency: 29.99999 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	PLL	Connect an RF voltmeter to check point P4.	-3 dBm to +3dBm		Verify
	2				<ul style="list-style-type: none"> <li>• Display frequency: 0.03000 MHz</li> <li>• Mode : LSB</li> <li>• Receiving</li> </ul>		
2ND LO OUTPUT LEVEL	1	<ul style="list-style-type: none"> <li>• Display frequency: 14.10000 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	PLL	Connect an RF voltmeter to check point P1.	-2 dBm to +4 dBm		Verify
BFO OUTPUT	1	<ul style="list-style-type: none"> <li>• Display frequency: 14.10000 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	PLL	Connect an RF voltmeter to check point P5.	-18 dBm to -12 dBm		Verify
	2				Connect a frequency counter to check point P5.	456.5 kHz	
	3	<ul style="list-style-type: none"> <li>• Mode : AM</li> <li>• Receiving</li> </ul>		No output			

### • PLL unit (bottom view)



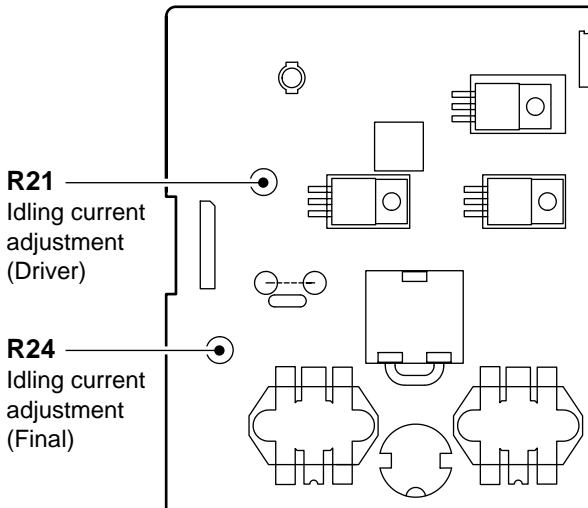
• PLL unit



### 5-3 TRANSMITTER ADJUSTMENTS

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT		
		UNIT	LOCATION		UNIT	ADJUST	
IDLING CURRENT (for driver)	1	<ul style="list-style-type: none"> <li>• Display frequency: 14.10000 MHz</li> <li>• Mode : USB</li> <li>• RF power : Minimum (L)</li> <li>• Mic gain : Minimum (0)</li> <li>• Disconnect J3601 (MAIN unit) and preset R21, R24 (PA unit) to max. counter clockwise.</li> <li>• Transmitting</li> </ul>	PA	Connect an ammeter (3 A) between power supply and the IC-718.	At the point where the Tx current Increases 200 mA.	PA	R21
	(for final amplifier)	2	<ul style="list-style-type: none"> <li>• Transmitting</li> </ul>				
After adjustment, connect J3601 on the MAIN unit.							
SWR DETECTOR	1	<ul style="list-style-type: none"> <li>• Display frequency: 14.10000 MHz</li> <li>• Mode : USB</li> <li>• RF power : Maximum (H)</li> <li>• Connect J4 (FILTER) unit to GND.</li> <li>• Connect an audio generator to [MIC] connector and set as: Frequency : 1.5 kHz Level : 30 mVrms</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to [ANT] connector.	100 W	Front panel	Mic gain control in the quick set mode
	2	<ul style="list-style-type: none"> <li>• Transmitting</li> </ul>	FILTER	Connect a digital multimeter or oscilloscope to J5.	Minimum voltage	FILTER	C17
After adjustment, disconnect J4 on the FILTER unit from GND.							
TRANSMITTER TOTAL GAIN	1	<ul style="list-style-type: none"> <li>• Display frequency: 14.10000 MHz</li> <li>• Mode : USB</li> <li>• RF power : Maximum (H)</li> <li>• Mic gain : Center (50)</li> <li>• R2701 (MAIN unit): Center</li> <li>• Connect an audio generator to [MIC] connector and set as: Frequency : 1.5 kHz Level : 3 mVrms</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to [ANT] connector.	Maximum output power	MAIN	L106, L151, L301, L302, L303, L501
	2	<ul style="list-style-type: none"> <li>• Transmitting</li> </ul>			50 W		R503
OUTPUT POWER	1	<ul style="list-style-type: none"> <li>• Display frequency: 14.10000 MHz</li> <li>• Mode : USB</li> <li>• RF power : Maximum (H)</li> <li>• MIC gain : Center (50)</li> <li>• Connect an audio generator to [MIC] connector and set as: Frequency : 1.5 kHz Level : 30 mVrms</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to [ANT] connector.	100 W	MAIN	R1707
Ic APC	1	<ul style="list-style-type: none"> <li>• Display frequency: 3.55000 MHz</li> <li>• Mode : USB</li> <li>• Connect CP4002 (MAIN unit) to GND.</li> <li>• RF power : Maximum (H)</li> <li>• Mic gain : Center (50)</li> <li>• Connect an audio generator to [MIC] connector and set as: Frequency : 1.5 kHz Level : 30 mVrms</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an ammeter (30A) between power supply and the IC-718.	22 A	MAIN	R1720
	After adjustment, disconnect CP4002 on the MAIN unit from GND.						

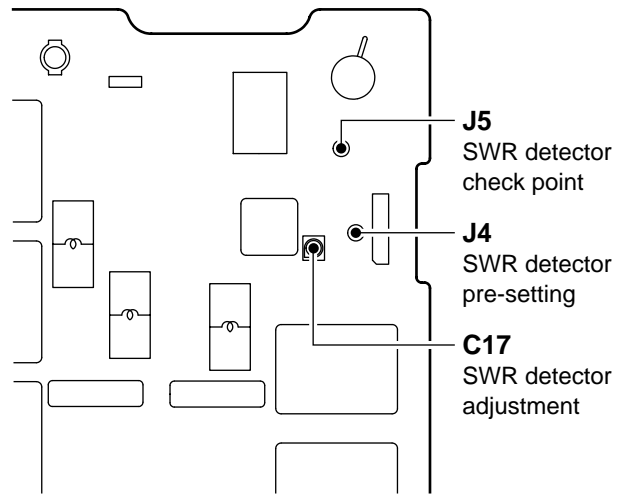
• PA unit



**R21**  
Idling current  
adjustment  
(Driver)

**R24**  
Idling current  
adjustment  
(Final)

• FILTER unit

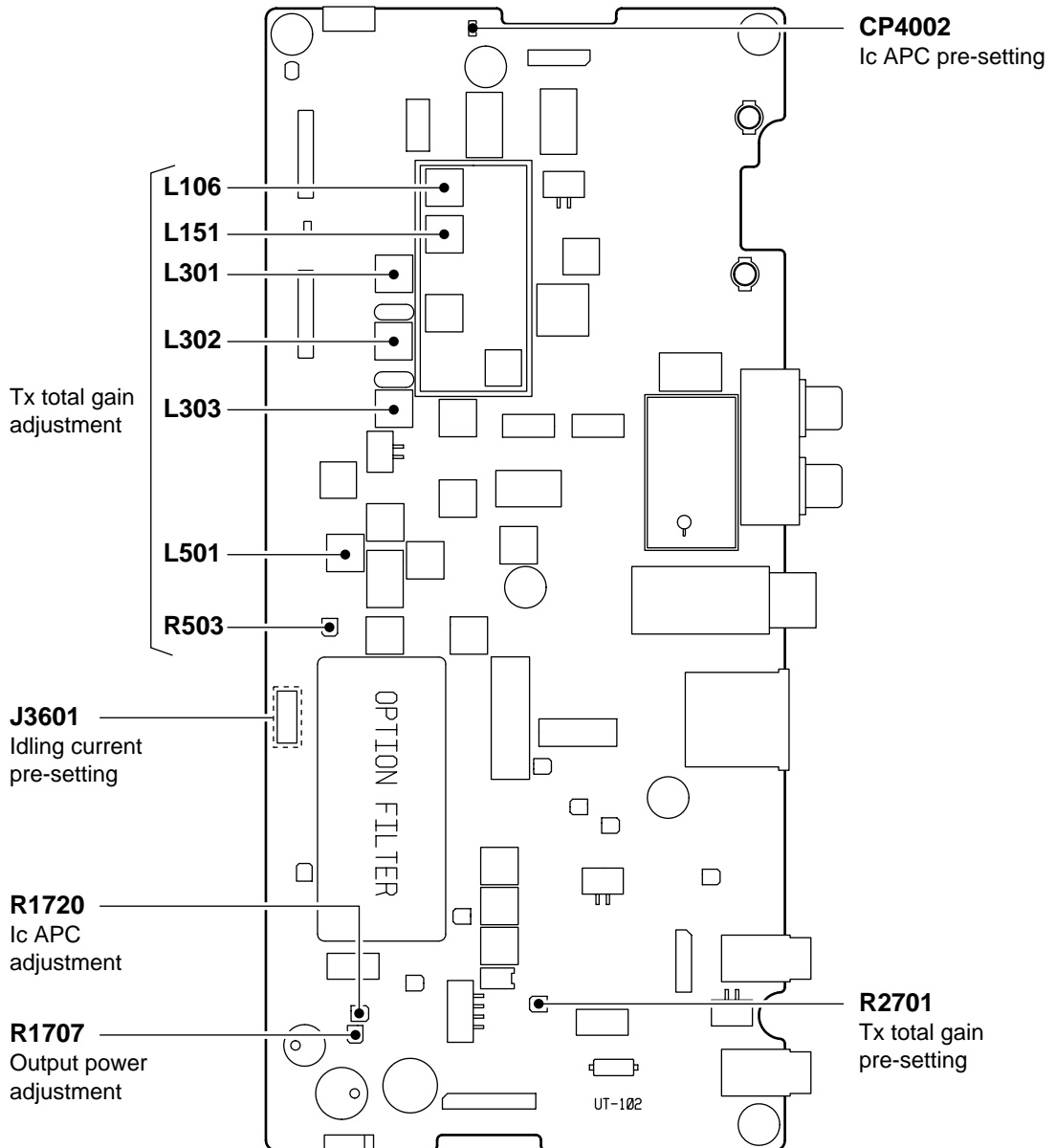


**J5**  
SWR detector  
check point

**J4**  
SWR detector  
pre-setting

**C17**  
SWR detector  
adjustment

• MAIN unit



Tx total gain  
adjustment

**L106**

**L151**

**L301**

**L302**

**L303**

**L501**

**R503**

**J3601**  
Idling current  
pre-setting

**R1720**  
Ic APC  
adjustment

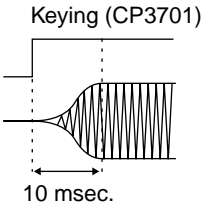
**R1707**  
Output power  
adjustment

**CP4002**  
Ic APC pre-setting

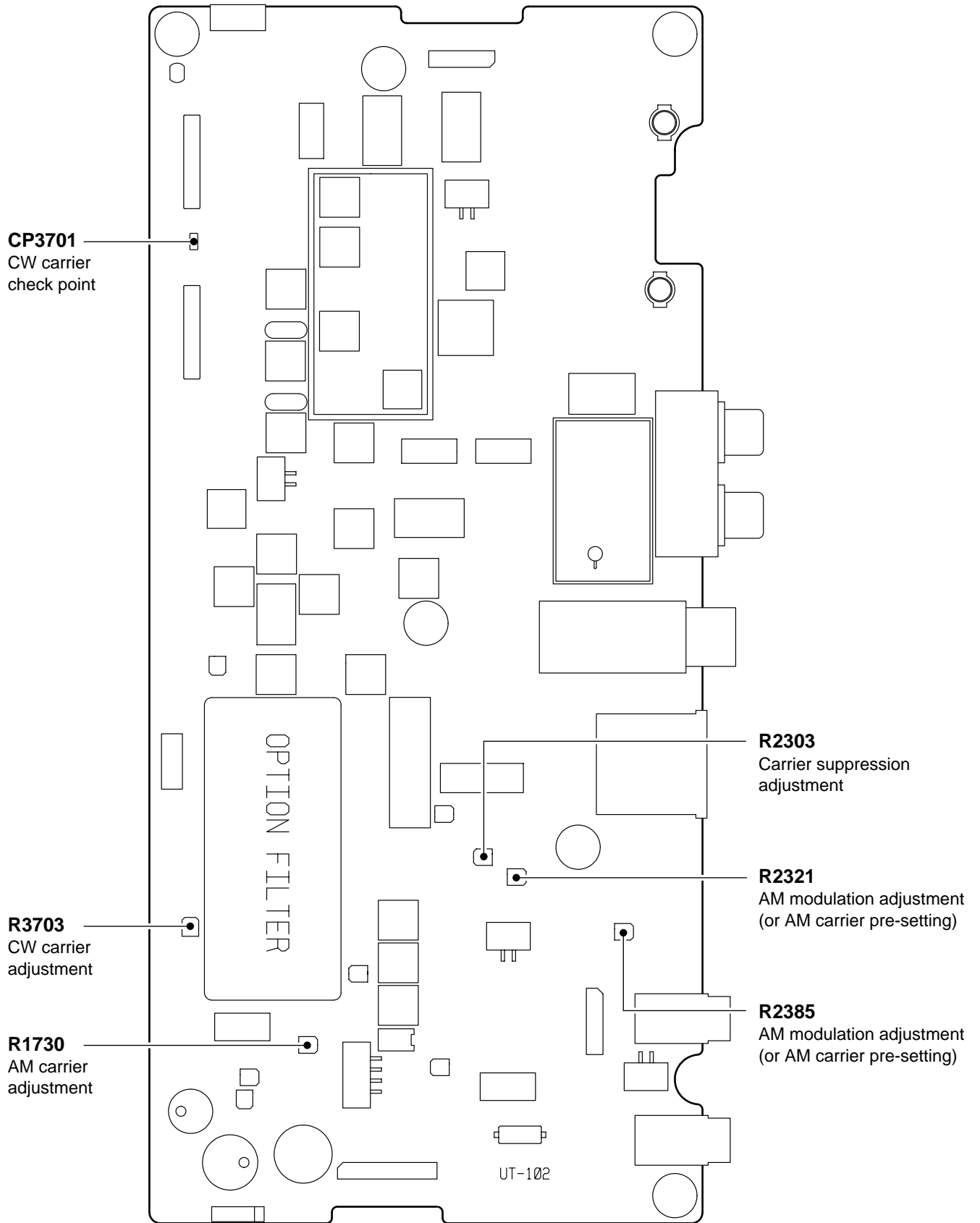
**R2701**  
Tx total gain  
pre-setting

UT-102

## TRANSMITTER ADJUSTMENTS—continued

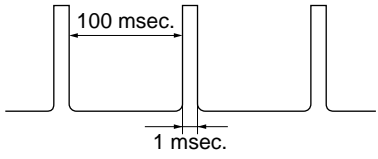
ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
CARRIER SUPPRESSION	1 <ul style="list-style-type: none"> <li>• Display frequency: 14.10000 MHz</li> <li>• Mode : USB</li> <li>• Mic gain : Minimum (0)</li> <li>• Apply no audio signals to [MIC] connector.</li> <li>• Transmitting</li> </ul>	Rear panel	Connect a spectrum analyzer to the [ANT] connector through an attenuator.	Minimum carrier level	MAIN	R2303
AM CARRIER	1 <ul style="list-style-type: none"> <li>• Display frequency: 14.10000 MHz</li> <li>• Mode : AM</li> <li>• RF power : Maximum (H)</li> <li>• Mic gain : Minimum (0)</li> <li>• R2321 (MAIN unit): Center</li> <li>• R2385 (MAIN unit): Center</li> <li>• Apply no audio signals to [MIC] connector.</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to [ANT] connector.	40 W	MAIN	R1730
AM MODULATION	1 <ul style="list-style-type: none"> <li>• Display frequency: 14.10000 MHz</li> <li>• Mode : AM</li> <li>• RF power : Maximum (H)</li> <li>• Mic gain : Center (50)</li> <li>• R2385 (MAIN unit): 9 o'clock</li> <li>• Connect an audio generator to [MIC] connector and set as: Frequency : 1 kHz Level : 3 mVrms</li> <li>• Transmitting</li> </ul>	Rear panel	Connect a modulation analyzer to the [ANT] connector through an attenuator.	70% modulation	MAIN	R2321
	2 <ul style="list-style-type: none"> <li>• Set an AG as: Frequency : 1 kHz Level : 30 mVrms</li> <li>• Transmitting</li> </ul>			90% modulation		R2385
CW CARRIER	1 <ul style="list-style-type: none"> <li>• Display frequency: 14.10000 MHz</li> <li>• Mode : CW</li> <li>• RF power : Maximum (H)</li> <li>• Connect a keyer to the [KEY] jack.</li> <li>• Key down (transmitting)</li> </ul>	MAIN	Connect an oscilloscope to CP3701 and [ANT] connector.	Adjust as follows:  	MAIN	R3703

• MAIN unit



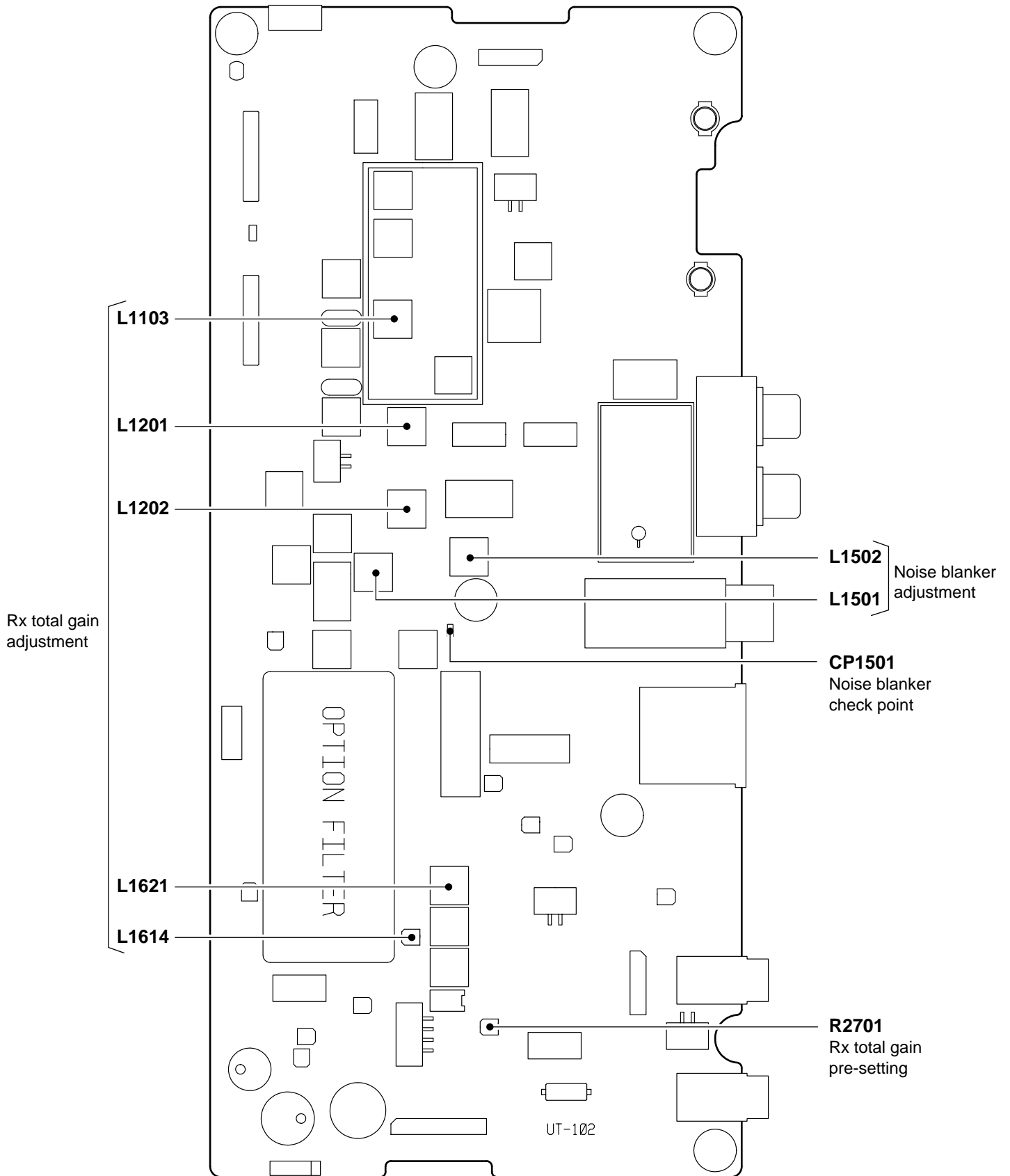
## 5-4 RECEIVER ADJUSTMENTS

Receiver total gain adjustment must perform after transmitter total gain adjustment.

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
RECEIVER TOTAL GAIN	1 <ul style="list-style-type: none"> <li>• R2701 (MAIN unit): Center</li> <li>• Turn R1614 (MAIN unit) to 90° counter clockwise from center position.</li> <li>• Display frequency: 14.10000 MHz</li> <li>• Mode : USB</li> <li>• [RIT] : OFF (Center)</li> <li>• [NB] : OFF</li> <li>• [P.AMP] : ON</li> <li>• [ATT] : OFF</li> <li>• Connect a standard signal generator to [ANT] connector and set as: Frequency : 14.10150 MHz Level : 1.0 <math>\mu</math>V* (-107 dBm) Modulation: OFF</li> <li>• Receiving</li> </ul>	Rear panel	Connect an AC millivolt meter to [EXT SP] connector with an 8 $\Omega$ load.	Maximum audio output level	MAIN	Adjust in sequence L1103, L1201, L1202, L1621 several times.
	2 <ul style="list-style-type: none"> <li>• [P.AMP] : OFF</li> <li>• [ATT] : OFF</li> <li>• Set an SSG as: Level : 1.0 mV* (-47 dBm) and OFF</li> <li>• Receiving</li> </ul>					
NOISE BLANKER	1 <ul style="list-style-type: none"> <li>• Display frequency: 14.10000 MHz</li> <li>• Mode : USB</li> <li>• [P.AMP] : ON</li> <li>• [NB] : OFF</li> <li>• Connect an SSG to [ANT] connector and set as: Frequency : 14.10150 MHz Level : 3.2 <math>\mu</math>V* (-97 dBm) Modulation: OFF</li> <li>and apply following signal to [ANT] connector.</li> </ul>  <ul style="list-style-type: none"> <li>• Receiving</li> </ul>	MAIN	Connect an oscilloscope to check point CP1501.	Maximum noise waveform	MAIN	L1501, L1502
	2 <ul style="list-style-type: none"> <li>• [NB] : ON</li> <li>• Receiving</li> </ul>					

\*This output level of a standard signal generator (SSG) is indicated as SSG's open circuit.

• MAIN unit





## 5-5 SET MODE ADJUSTMENT

ADJUSTMENT	ADJUSTMENT CONDITION	DISPLAY	OPERATION
ENTERING SET MODE ADJUSTMENT FOR RX	1 <ul style="list-style-type: none"> <li>• Enter set mode adjustment for RX: <ol style="list-style-type: none"> <li>① Turn power OFF.</li> <li>② Terminate the [REMOTE] jack with a 3.5(d) mm mini-plug.</li> <li>③ While pushing [MODE] and [TS] keys, turn power ON.</li> </ol> </li> </ul>	--RX--	Push [SET] key to enter the RX setting. Or push [UP] key to skip the set mode adjustment for RX.
VOLUME CENTER	1 <ul style="list-style-type: none"> <li>• Set the [RIT] and [SHIFT] controls to center.</li> </ul>	RIT/SHIFT	Push and hold [SET] key to set the volume center positions.
	2	Good	Verify the display shows "Good", then push [UP] key to enter the "S METER" adjustment.
S METER	1 <ul style="list-style-type: none"> <li>• Connect a standard signal generator to [ANT] and set as : <ul style="list-style-type: none"> <li>Frequency : 14.15150 MHz</li> <li>Level : OFF</li> </ul> </li> <li>• Receiving</li> </ul>	S0 LEVEL	Push [SET] key to set the "S0 level".
	2 <ul style="list-style-type: none"> <li>• Set an SSG as : <ul style="list-style-type: none"> <li>Level : 50 <math>\mu</math>V (-73 dBm)</li> <li>Modulation : OFF</li> </ul> </li> <li>• Receiving</li> </ul>	S9 LEVEL	Push [SET] key to set the "S9 level".
	3 <ul style="list-style-type: none"> <li>• Set an SSG as : <ul style="list-style-type: none"> <li>Level : 50 mV (-13 dBm)</li> <li>Modulation : OFF</li> </ul> </li> <li>• Receiving</li> </ul>	+60 LEVEL	Push [SET] key to set the "+60 dB level". Push [UP] key to return the set mode adjustment for RX.
SET MODE ADJUSTMENT FOR TX	1 <ul style="list-style-type: none"> <li>• Push [UP] to enter the set mode adjustment for TX.</li> </ul>	--TX--	Push [SET] key to enter the TX setting.
FILTER CALIBRATION	1 <ul style="list-style-type: none"> <li>• Connect an RF power meter to [ANT] connector.</li> </ul>	FIL CAL	Push [SET] key to make the calibration. • Transceiver transmits for a while.
POWER METER	1 <ul style="list-style-type: none"> <li>• Connect an RF power meter to [ANT] connector.</li> <li>• Connect an audio generator to [MIC] jack and set as: <ul style="list-style-type: none"> <li>Frequency : 1.5 kHz</li> <li>Level : 30 mVrms</li> </ul> </li> </ul>	P0 90W	Push [SET] key to transmit. • Transceiver transmits automatically. Set to 90 W using [MAIN DIAL], then push [SET] key while transmitting.
	2	P0 50W	Set to 50 W using [MAIN DIAL], then push [SET] key while transmitting.
	3	P0 10W	Set to 10 W using [MAIN DIAL], then push [SET] key while transmitting. Push [UP] key to enter the "ALC METER" adjustment.
ALC METER	1 <ul style="list-style-type: none"> <li>• Connect an RF power meter to [ANT] connector.</li> <li>• Connect an audio generator to [MIC] jack and set as: <ul style="list-style-type: none"> <li>Frequency : 1.5 kHz</li> <li>Level : 30 mVrms</li> </ul> </li> </ul>	AL -M SET	Push [SET] key to set ALC reference level. • Transceiver transmits automatically.
		ALC STRT	Push [UP] key to enter the "SWR METER" adjustment.

## SET MODE ADJUSTMENT —continued

ADJUSTMENT	ADJUSTMENT CONDITION	DISPLAY	OPERATION
SWR METER	1 • Connect a 50 $\Omega$ dummy load or power meter to [ANT] connector.	SWR SET	Transmit using an external PTT switch to set SWR reference level after pushing [SET].
	SWR 1 Ld		
	2 • Connect a 100 $\Omega$ dummy load or power meter to [ANT] connector.	SWR 2 Ld	Transmit using an external PTT switch to set SWR2 level after pushing [SET]. • The display returns to the same as the set mode adjustment for TX.

# SECTION 6 PARTS LIST

## [FRONT UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
SP1	2510000670	SPEAKER	VS-50-0827
W3	8900008930	CABLE	OPC-885 (P=1 N=10 L=39)
W4	8900008930	CABLE	OPC-885 (P=1 N=10 L=39)
W5	8900006990	CABLE	OPC-683 (N:10 L:110)
WS1	8970023640	E.OTHER	SX2242 ICOM SHIELD (1) /FR
EP1	6910012480	E.OTHER	RMS20-250-201-1R
EP2	6450001230	E.OTHER	HLJ0999-01-480

## [LOGIC BOARD]

REF NO.	ORDER NO.	DESCRIPTION	
D123	1750000370	S.DIODE	DA221 TL
D124	1750000370	S.DIODE	DA221 TL
X1	6050009870	S.XTAL	CR-567 (9.8304 MHz)
L1	6200001830	S.COIL	NL 322522T-100J
L2	6200001830	S.COIL	NL 322522T-100J
L40	6200003260	S.COIL	NL 322522T-101J
L41	6200002040	S.COIL	NL 252018T-101J
L42	6200002040	S.COIL	NL 252018T-101J
L43	6200003950	S.COIL	HF50ACC 322513-T
L44	6200009300	S.COIL	ELJPA 100KF 10U
L47	6200003950	S.COIL	HF50ACC 322513-T
L48	6200003950	S.COIL	HF50ACC 322513-T
L49	6200003950	S.COIL	HF50ACC 322513-T
L100	6200003260	S.COIL	NL 322522T-101J
L101	6200003950	S.COIL	HF50ACC 322513-T
L102	6200003950	S.COIL	HF50ACC 322513-T
L103	6200003950	S.COIL	HF50ACC 322513-T
L104	6200003950	S.COIL	HF50ACC 322513-T

## [LOGIC BOARD]

REF NO.	ORDER NO.	DESCRIPTION	
IC1	1140009160	S.IC	HD6433837SD17H
IC2	1140005880	S.IC	X25320S8I-2.7T6
IC3	1130009110	S.IC	S-80942ANMP-DD6-T2
IC5	1180000420	S.IC	TA78L05F (TE12R)
IC6	1180001070	S.IC	TA7805F (TE16L)
IC7	1140005130	S.IC	HD66100F
IC40	1130007040	S.IC	TC7W32F (TE12L)
IC103	1130005720	S.IC	TC7W04F (TE12L)
Q1	1590000680	S.TRANSISTOR	DTC114EUA T106
Q2	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q3	1590001330	S.TRANSISTOR	DTA114EUA T106
Q70	1540000440	S.TRANSISTOR	2SD1619-T-TD
Q71	1590000680	S.TRANSISTOR	DTC114EUA T106
Q72	1590000680	S.TRANSISTOR	DTC114EUA T106
Q102	1590001650	S.TRANSISTOR	XP4601 (TX)
Q103	1590000680	S.TRANSISTOR	DTC114EUA T106
Q104	1590000680	S.TRANSISTOR	DTC114EUA T106
Q105	1590000680	S.TRANSISTOR	DTC114EUA T106
Q106	1590001330	S.TRANSISTOR	DTA114EUA T106
D1	1160000070	S.DIODE	DAN202K T146
D30	1160000070	S.DIODE	DAN202K T146
D31	1160000070	S.DIODE	DAN202K T146
D32	1750000550	S.DIODE	1SS355 TE-17
D33	1160000070	S.DIODE	DAN202K T146
D34	1750000550	S.DIODE	1SS355 TE-17
D35	1160000070	S.DIODE	DAN202K T146
D36	1750000550	S.DIODE	1SS355 TE-17
D37	1160000070	S.DIODE	DAN202K T146
D38	1750000550	S.DIODE	1SS355 TE-17
D39	1160000070	S.DIODE	DAN202K T146
D40	1750000550	S.DIODE	1SS355 TE-17
D41	1160000070	S.DIODE	DAN202K T146
D42	1750000550	S.DIODE	1SS355 TE-17
D43	1160000070	S.DIODE	DAN202K T146
D44	1750000550	S.DIODE	1SS355 TE-17
D45	1160000070	S.DIODE	DAN202K T146
D46	1730002530	S.ZENER	NNCD6.2G-T1
D47	1750000550	S.DIODE	1SS355 TE-17
D48	1750000550	S.DIODE	1SS355 TE-17
			[USA], [ESP], [KOR]
D49	1750000550	S.DIODE	1SS355 TE-17 [EUR], [ITA], [KOR]
D50	1750000550	S.DIODE	1SS355 TE-17 [ITA], [FRA], [ESP]
D51	1750000550	S.DIODE	1SS355 TE-17 [KOR], [USA-1]
D53	1750000550	S.DIODE	1SS355 TE-17
D54	1750000550	S.DIODE	1SS355 TE-17
D55	1750000550	S.DIODE	1SS355 TE-17
D102	1750000550	S.DIODE	1SS355 TE-17
D120	1750000370	S.DIODE	DA221 TL
D121	1750000370	S.DIODE	DA221 TL
D122	1750000370	S.DIODE	DA221 TL

R1	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R2	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R3	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R4	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R5	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R7	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R8	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R9	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R10	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R11	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R12	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R13	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R14	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R15	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R16	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R17	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R18	7030006220	S.RESISTOR	ERJ12YJ470U (47 Ω)
R19	7030007190	S.RESISTOR	ERJ12YJ220U (22 Ω)
R20	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R21	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ)
R22	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R24	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R25	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R26	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R27	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R30	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R31	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R32	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R33	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R34	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R35	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R36	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R37	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R38	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R39	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R40	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R41	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R42	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R43	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R44	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R45	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R46	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R47	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R48	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R49	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R50	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R51	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R52	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R53	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R54	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R55	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R56	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)

S.=Surface mount

**[LOGIC BOARD]**

REF NO.	ORDER NO.	DESCRIPTION	
R59	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R62	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R63	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R70	7030003370	S.RESISTOR	ERJ3GEYJ 271 V (270 Ω)
R71	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω)
R72	7030003430	S.RESISTOR	ERJ3GEYJ 821 V (820 Ω)
R73	7030003510	S.RESISTOR	ERJ3GEYJ 392 V (3.9 kΩ)
R74	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R75	7030009670	S.RESISTOR	ERJ1WYJ390U (39 Ω)
R100	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R101	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R102	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R103	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)
R104	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
R105	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R106	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R107	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R108	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)
R111	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R112	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R113	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R114	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R115	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R116	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R117	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R118	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R119	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R126	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R127	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R128	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R129	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R130	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R131	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R132	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R133	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R134	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R135	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R136	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R137	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R138	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R139	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R141	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R142	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R143	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R144	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R145	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R146	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R147	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R148	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R149	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R150	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R151	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R153	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R154	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R156	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R158	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R160	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R161	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R162	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R163	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R164	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R165	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R166	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R169	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R171	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R172	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R173	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R174	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R175	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R176	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R177	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R179	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R180	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R182	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R185	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R186	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R188	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R190	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R191	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R193	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R195	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R196	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)

**[LOGIC BOARD]**

REF NO.	ORDER NO.	DESCRIPTION	
R197	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R198	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R199	7030003430	S.RESISTOR	ERJ3GEYJ 821 V (820 Ω)
R201	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R211	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R212	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
C1	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A
C2	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A
C3	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C4	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C5	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C6	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C7	4510004440	S.ELECTROLYTIC	ECEV1HA010SR
C8	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C9	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C11	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C12	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C13	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C14	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C15	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C16	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C17	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C18	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C19	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C20	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C21	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C22	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C40	4030007130	S.CERAMIC	C1608 CH 1H 101J-T-A
C41	4030007130	S.CERAMIC	C1608 CH 1H 101J-T-A
C42	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C43	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C44	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C45	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C46	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C47	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C101	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C102	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C103	4030009110	S.CERAMIC	C3216 JB 1C 474K-T-A
J1	6510020420	S.CONNECTOR	S4B-PH-SM3-TB
J3	6510021990	S.CONNECTOR	10FMN-BMTTR-TBT
J4	6510021990	S.CONNECTOR	10FMN-BMTTR-TBT
J5	6510021990	S.CONNECTOR	10FMN-BMTTR-TBT
J6	6510021720	S.CONNECTOR	30FLT-SM1-TB
J7	6510021720	S.CONNECTOR	30FLT-SM1-TB
J9	6510022000	S.CONNECTOR	16FMN-BMTTR-TBT
DS1	5030001820	LCD	A0087
DS70	5040002600	LED	TLYU1002
DS71	5040002600	LED	TLYU1002
DS72	5040002600	LED	TLYU1002
DS73	5040002600	LED	TLYU1002
DS74	5040002600	LED	TLYU1002
DS75	5040002600	LED	TLYU1002
DS76	5040002600	LED	TLYU1002
DS77	5040002600	LED	TLYU1002
DS78	5040002600	LED	TLYU1002
DS79	5040002600	LED	TLYU1002
DS80	5040002600	LED	TLYU1002
DS81	5040002600	LED	TLYU1002
DS82	5040002600	LED	TLYU1002
DS83	5040002600	LED	TLYU1002
DS84	5040002600	LED	TLYU1002
DS85	5040002600	LED	TLYU1002
DS86	5040002600	LED	TLYU1002
DS87	5040002600	LED	TLYU1002
DS88	5040002600	LED	TLYU1002
DS89	5040002600	LED	TLYU1002
DS90	5040002600	LED	TLYU1002
W1	7030003860	S.JUMPER	ERJ3GE JPW V
W70	7030003860	S.JUMPER	ERJ3GE JPW V
W101	7030003860	S.JUMPER	ERJ3GE JPW V
W102	7030003860	S.JUMPER	ERJ3GE JPW V

S.=Surface mount

**[LOGIC BOARD]**

REF NO.	ORDER NO.	DESCRIPTION	
EP1	0910052055	PCB	B 5382E
EP2	6910012350	S.BEAD	MMZ1608Y 102BT
EP40	6910012350	S.BEAD	MMZ1608Y 102BT
EP45	6910012350	S.BEAD	MMZ1608Y 102BT
EP46	6910012350	S.BEAD	MMZ1608Y 102BT
EP70	8930051450	LCD CONTACT	SRCN-2241-SP-N-W
EP152	6910012350	S.BEAD	MMZ1608Y 102BT
EP155	6910012350	S.BEAD	MMZ1608Y 102BT
EP157	6910012350	S.BEAD	MMZ1608Y 102BT
EP159	6910012350	S.BEAD	MMZ1608Y 102BT

**[MIC BOARD]**

REF NO.	ORDER NO.	DESCRIPTION	
J1	6510000190	CONNECTOR	FM214-8SS (P)
J2	6510021990	S.CONNECTOR	10FMN-BMTTR-TBT
EP1	0910052153	PCB	B 5433C

**[PHONE BOARD]**

REF NO.	ORDER NO.	DESCRIPTION	
L1	6200003950	S.COIL	HF50ACC 322513-T
R1	7030006070	S.RESISTOR	ERJ12YJ101U (100 Ω)
R2	7030006070	S.RESISTOR	ERJ12YJ101U (100 Ω)
R3	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
C1	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C2	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C3	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
J1	6450001250	CONNECTOR	HLJ4306-01-3070
J2	6510021990	S.CONNECTOR	10FMN-BMTTR-TBT
EP1	0910052163	PCB	B 5434C

**[VR BOARD]**

REF NO.	ORDER NO.	DESCRIPTION	
R1	7210003040	VARIABLE	TP96D26-22F-10KBX2-2240
R2	7210003030	VARIABLE	TP96D00-22F-10KBX2-2240
R4	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
J1	6510022050	S.CONNECTOR	10FM-1.0SP-1.9-TF
EP1	0910052174	PCB	B 5435D

**[MAIN UNIT]**

REF NO.	ORDER NO.	DESCRIPTION	
IC1	1110004080	S.IC	μPC2709T-E3
IC1701	1110003870	S.IC	NJM2058M-T1
IC1751	1110002700	S.IC	NJM2904M-T1
IC2001	1110004870	S.IC	TA4101F (TE12L)
IC2101	1110003870	S.IC	NJM2058M-T1
IC2102	1130005640	S.IC	TC4W53F (TE12L)
IC2201	1140005280	S.IC	μPC5023GS-077-E1
IC2301	1110004840	S.IC	NJM1496V-TE1
IC2351	1110002700	S.IC	NJM2904M-T1
IC2701	1110003300	S.IC	M5282FP 70CD
IC2702	1110001810	S.IC	TA7368F (TP1)
IC2801	1130004200	S.IC	TC4S66F (TE85R)
IC2901	1110003090	IC	LA4425A
IC3001	1130007700	S.IC	BU4094BCF-T1
IC3002	1160000130	S.IC	TD62783AF (TP1)
IC3003	1160000130	S.IC	TD62783AF (TP1)
IC3004	1130007700	S.IC	BU4094BCF-T1
IC3005	1160000130	S.IC	TD62783AF (TP1)
IC3006	1130007700	S.IC	BU4094BCF-T1
IC3301	1110004310	S.IC	M62352GP 75EC
IC3401	1110002030	IC	TA7808S
IC3501	1110001400	S.IC	μPC1555G2-T1
Q101	1580000620	S.FET	3SK131-T2 MAS
Q102	1580000620	S.FET	3SK131-T2 MAS
Q151	1560000560	S.FET	2SK882-GR (TE85L)
Q201	1530003150	S.TRANSISTOR	2SC4673D-TD
Q501	1590002310	S.TRANSISTOR	DTC114EE TL
Q502	1560000560	S.FET	2SK882-GR (TE85L)
Q503	1590002310	S.TRANSISTOR	DTC114EE TL
Q511	1590002310	S.TRANSISTOR	DTC114EE TL
Q701	1590002310	S.TRANSISTOR	DTC114EE TL
Q1001	1510000510	S.TRANSISTOR	2SA1576A T106R
Q1002	1590002310	S.TRANSISTOR	DTC114EE TL
Q1101	1560000640	S.FET	2SK1740-TA
Q1102	1560000640	S.FET	2SK1740-TA
Q1103	1560000640	S.FET	2SK1740-TA
Q1104	1560000640	S.FET	2SK1740-TA
Q1201	1580000620	S.FET	3SK131-T2 MAS
Q1301	1580000620	S.FET	3SK131-T2 MAS
Q1401	1560000720	S.FET	2SK2171-4-TD
Q1402	1560000720	S.FET	2SK2171-4-TD
Q1501	1560000560	S.FET	2SK882-GR (TE85L)
Q1502	1560000560	S.FET	2SK882-GR (TE85L)
Q1503	1560000560	S.FET	2SK882-GR (TE85L)
Q1504	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q1505	1510000510	S.TRANSISTOR	2SA1576A T106R
Q1506	1590002310	S.TRANSISTOR	DTC114EE TL
Q1507	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q1508	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q1509	1590001870	S.TRANSISTOR	DTA114EE TL
Q1601	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q1602	1560000560	S.FET	2SK882-GR (TE85L)
Q1603	1580000620	S.FET	3SK131-T2 MAS
Q1611	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q1703	1510000510	S.TRANSISTOR	2SA1576A T106R
Q1705	1590002310	S.TRANSISTOR	DTC114EE TL
Q1706	1590002310	S.TRANSISTOR	DTC114EE TL
Q1801	1590001540	S.TRANSISTOR	UMD6N TR
Q1802	1590001540	S.TRANSISTOR	UMD6N TR
Q1803	1590001540	S.TRANSISTOR	UMD6N TR
Q1805	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q2302	1590002310	S.TRANSISTOR	DTC114EE TL
Q2381	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q2383	1590002310	S.TRANSISTOR	DTC114EE TL
Q2384	1590002310	S.TRANSISTOR	DTC114EE TL
Q3101	1590002310	S.TRANSISTOR	DTC114EE TL
Q3601	1540000550	S.TRANSISTOR	2SD1664 T100Q
Q3701	1590002310	S.TRANSISTOR	DTC114EE TL
Q3702	1590001870	S.TRANSISTOR	DTA114EE TL
Q3801	1590002310	S.TRANSISTOR	DTC114EE TL
Q3802	1590001870	S.TRANSISTOR	DTA114EE TL
Q4601	1540000440	S.TRANSISTOR	2SD1619-T-TD
Q4801	1590002310	S.TRANSISTOR	DTC114EE TL
D201	1790000620	S.DIODE	MA77 (TX)
D202	1790000620	S.DIODE	MA77 (TX)
D301	1790000620	S.DIODE	MA77 (TX)
D302	1790000620	S.DIODE	MA77 (TX)
D303	1790000620	S.DIODE	MA77 (TX)

S.=Surface mount























**[FILTER UNIT]**

REF NO.	ORDER NO.	DESCRIPTION	
C33	4010005750	CERAMIC	HM60SJ SL 680J 500V
C34	4010005870	CERAMIC	HM95SJ SL 221J 500V
C35	4010005870	CERAMIC	HM95SJ SL 221J 500V
C36	4010005870	CERAMIC	HM95SJ SL 221J 500V
C37	4010005870	CERAMIC	HM95SJ SL 221J 500V
C38	4030012480	S.CERAMIC	GRM42-6 CH 121J 500PT
C39	4010005760	CERAMIC	HM60SJ SL 750J 500V
C40	4010005370	CERAMIC	HM11SJ SL 331J 500V
C41	4010005880	CERAMIC	HM95SJ SL 271J 500V
C42	4010005820	CERAMIC	HM74SJ SL 121J 500V
C43	4010005780	CERAMIC	HM60SJ SL 101J 500V
C44	4010005870	CERAMIC	HM95SJ SL 221J 500V
C45	4010005830	CERAMIC	HM74SJ SL 151J 500V
C46	4010005860	CERAMIC	HM95SJ SL 201J 500V
C47	4010005780	CERAMIC	HM60SJ SL 101J 500V
C48	4030014460	S.CERAMIC	GRM42-6 CH 820J 500PT
C49	4010005830	CERAMIC	HM74SJ SL 151J 500V
C50	4030011180	S.CERAMIC	GRM42-6 CH 220J 500PT
C51	4030014460	S.CERAMIC	GRM42-6 CH 820J 500PT
C52	4030011730	S.CERAMIC	GRM42-6 CH 101J 500PT
C53	4010005750	CERAMIC	HM60SJ SL 680J 500V
C54	4010005850	CERAMIC	HM95SJ SL 181J 500V
C55	4030011240	S.CERAMIC	GRM42-6 CH 470J 500PT
C56	4010005780	CERAMIC	HM60SJ SL 101J 500V
C58	4030011240	S.CERAMIC	GRM42-6 CH 470J 500PT
C60	4010005620	CERAMIC	HM60SJ SL 120J 500V
C61	4030014460	S.CERAMIC	GRM42-6 CH 820J 500PT
C63	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A
C64	4010007590	CERAMIC	HM15SJ SL 681J 500V
C65	4010007590	CERAMIC	HM15SJ SL 681J 500V
C66	4010007590	CERAMIC	HM15SJ SL 681J 500V
C67	4010007590	CERAMIC	HM15SJ SL 681J 500V
C68	4010005930	CERAMIC	HM11SJ SL 391J 500V
C69	4010005930	CERAMIC	HM11SJ SL 391J 500V
C70	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C71	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C72	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C73	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C74	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C75	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C76	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C78	4030014460	S.CERAMIC	GRM42-6 CH 820J 500PT
C80	4010005930	CERAMIC	HM11SJ SL 391J 500V
C81	4010005930	CERAMIC	HM11SJ SL 391J 500V
C104	4030014460	S.CERAMIC	GRM42-6 CH 820J 500PT
C107	4030011170	S.CERAMIC	GRM42-6 CH 180J 500PT
C108	4030011550	S.CERAMIC	GRM42-6 CH 680J 500PT
RL1	6330001470	RELAY	AJS1311
RL2	6330001470	RELAY	AJS1311
RL3	6330001470	RELAY	AJS1311
RL4	6330001470	RELAY	AJS1311
RL5	6330001470	RELAY	AJS1311
RL6	6330001470	RELAY	AJS1311
RL7	6330001470	RELAY	AJS1311
RL8	6330001470	RELAY	AJS1311
RL9	6330001470	RELAY	AJS1311
RL10	6330001470	RELAY	AJS1311
RL11	6330001470	RELAY	AJS1311
RL12	6330001470	RELAY	AJS1311
RL13	6330001330	RELAY	AG 201344
J1	6510021980	CONNECTOR	10FMN-BTRK
J2	6510007020	CONNECTOR	TMP-J01X-V6
J3	6510007020	CONNECTOR	TMP-J01X-V6
J4	6910001040	CONNECTOR	IPS-1136
J5	6910001040	CONNECTOR	IPS-1136
W3	6910001030	JUMPER	IPS-1041-4
W4	6910001030	JUMPER	IPS-1041-4
W5	7030008240	S.JUMPER	ERJ12YJ0R00U
W72	7030003860	S.JUMPER	ERJ3GE JPW V
W73	7030003860	S.JUMPER	ERJ3GE JPW V
EP1	0910052046	PCB	B 5381F

**[CHASSIS PARTS]**

REF NO.	ORDER NO.	DESCRIPTION	
J1	6510000370	CONNECTOR	MR-DS
MF1	2710000520	FAN	SB0812H-ICOM-00
W1	8900009501	CABLE	OPC-939A
W2	8900009511	CABLE	OPC-940A
W3	8900009511	CABLE	OPC-940A
W4	8900009521	CABLE	OPC-941A
W5	8900009531	CABLE	OPC-942A
WS1	8970023580	E.OTHER	SX2242 1.5D COAXIAL A (1)/CH
WS2	8970023590	E.OTHER	SX2242 1.5D COAXIAL B (1)/CH
WS3	8970023600	E.OTHER	SX2242 1.5D COAXIAL C (1)/CH
EP1	8930021010	PLUG	DOMED PLUG DP-500
EP2	6910000310	PLATE	B312D INSULATION WASHER
EP3	6910000340	SHEET	P101 KD INSULATION SHEET

S.=Surface mount



# SECTION 7 MECHANICAL PARTS AND DISASSEMBLY

## [FRONT UNIT]

REF NO.	ORDER NO.	DESCRIPTION	QTY.
SP1	2510000670	Speaker VS-50-0827	1
EP1	6910012480	Sensor RMS20-250-201-1R	1
EP2	6450001230	Snap plate HLJ0999-01-480	1
MP1	8210016660	2241 front panel (A)	1
MP2	8930051400	2241 21-key (A)	1
MP3	8930050930	2241 3-key	1
MP4	8930050960	2241 power key	1
MP5	8930050950	2241 lock key	1
MP6	8010018050	2241 sub chassis assembly	1
MP9	8610010420	Knob N261	1
MP10	8610010420	Knob N261	1
MP11	8610010710	Knob N272	1
MP12	8610010710	Knob N272	1
MP13	8610007510	Knob spring No.7800	1
MP14	8610007510	Knob spring No.7800	1
MP15	8610009230	Knob N213 assembly	1
MP18	8610009170	Knob N-213 cover	1
MP21	8830001100	Knut M9 B11-H2	1
MP22	8810008660	Screw PH BT M3 × 8 NI-ZU	5
MP23	8810009130	Screw PH BT M3 × 12 NI-ZU	6
MP24	8930049930	Non-woven sheet	2
MP25	8930036870	Sponge (DZ)	1

## [CHASSIS PARTS]

REF NO.	ORDER NO.	DESCRIPTION	QTY.
J 1	6510000370	ANT connector MR-DS	1
MF1	2710000520	Fan SB0812H-ICOM-00	1
EP1	8930021010	Domed plug DP-500	1
EP2	6910000310	B312D insulation washer	1
EP3	6910000340	P101 KD insulation sheet	1
MP1	8110007050	Bottom cover 2241 L-cover	1
MP2	8110007060	Top cover 2241 U-cover	1
MP3	8010018020	2241 chassis	1
MP4	8930037001	1691 grounding plate-1	1
MP6	8930002900	Rubber foot (A) SK1912A	2
MP7	8010001520	Stand (C)	1
MP8	8930005790	Color foot (A) for stand	1
MP9	8930005800	Color foot (B) for stand	1
MP10	8930018520	TR clip (A)	1
MP11	8930018520	TR clip (A)	1
MP12	8810009650	Screw FH BT M3 × 8 NI-ZU	4
MP13	8810008660	Screw PH BT M3 × 8 NI-ZU	2
MP14	8810008660	Screw PH BT M3 × 8 NI-ZU	5
MP15	8810008660	Screw PH BT M3 × 8 NI-ZU	7
MP16	8810008660	Screw PH BT M3 × 8 NI-ZU	6
MP17	8810008660	Screw PH BT M3 × 8 NI-ZU	9
MP18	8810008660	Screw PH BT M3 × 8 NI-ZU	4
MP19	8810008660	Screw PH BT M3 × 8 NI-ZU	1
MP20	8810003170	Set screw A M3 × 8	8
MP21	8820000550	Cap bolt M4 × 8 ZK	4
MP22	8810005770	Bind M3 × 8 ZK	14
MP23	8820000530	Frange bolt M4 × 8 NI	1
MP24	8850000140	Flat washer M4 NI BS	2
MP25	8850000430	Spring washer M4 NI	1
MP26	8930052550	2241 sheet	4
MP28	8810009130	Screw FH BT M3 × 12 NI-ZU	2
MP29	8930052080	2241 grounding spring	1
MP31	8930007120	Non-woven sheet B	2
MP32	8930028840	Sponge (DF)	2
MP35	8930053610	2242 grounding spring [EMC]	1
MP36	8930053610	2242 grounding spring [EMC]	1
MP37	8510013370	2242 shield cover [EMC]	1
MP38	8810008660	Screw PH BT M3 × 8 NI-ZU [EMC]	10

[EMC]: [EUR], [ITA], [FRA], [ESP]

**Screw abbreviations:** PH: Pan head FH: Flat head  
BT, A0: Self-tapping ZK: Black  
NI-ZU: Nickel-Zinc

## [MAIN UNIT]

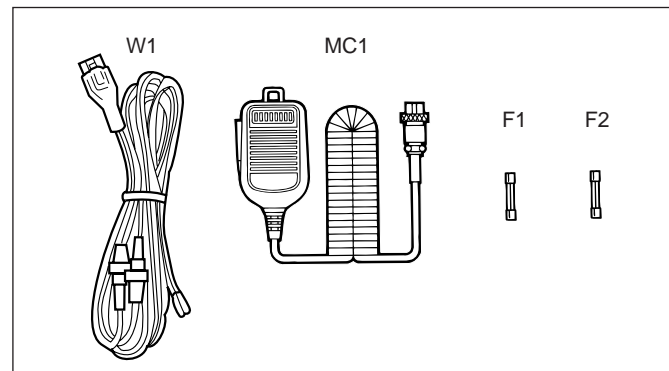
REF NO.	ORDER NO.	DESCRIPTION	QTY.
MP1	8510013040	2241 mixer case	1
MP25	8510013140	DC-A case	1

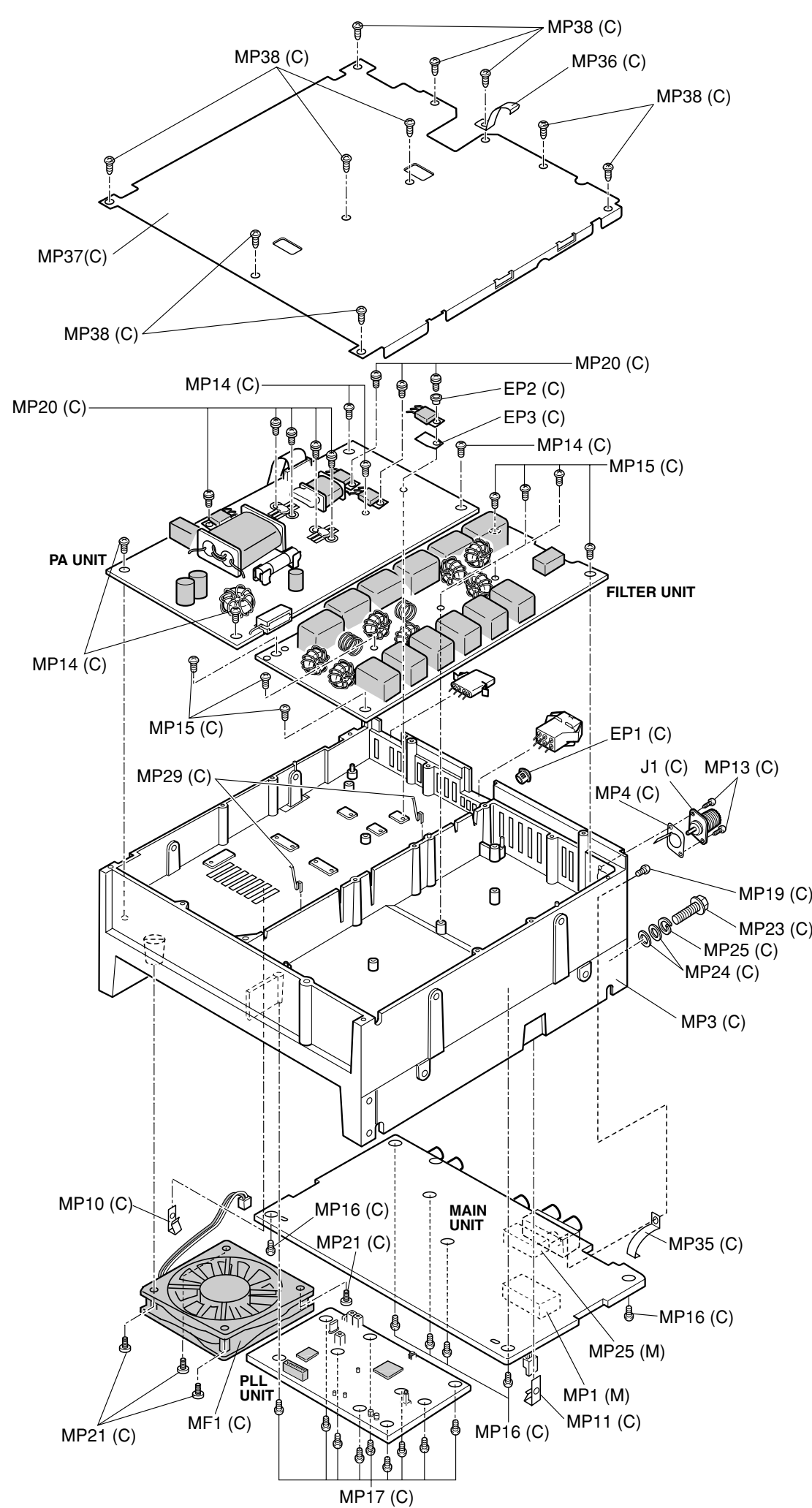
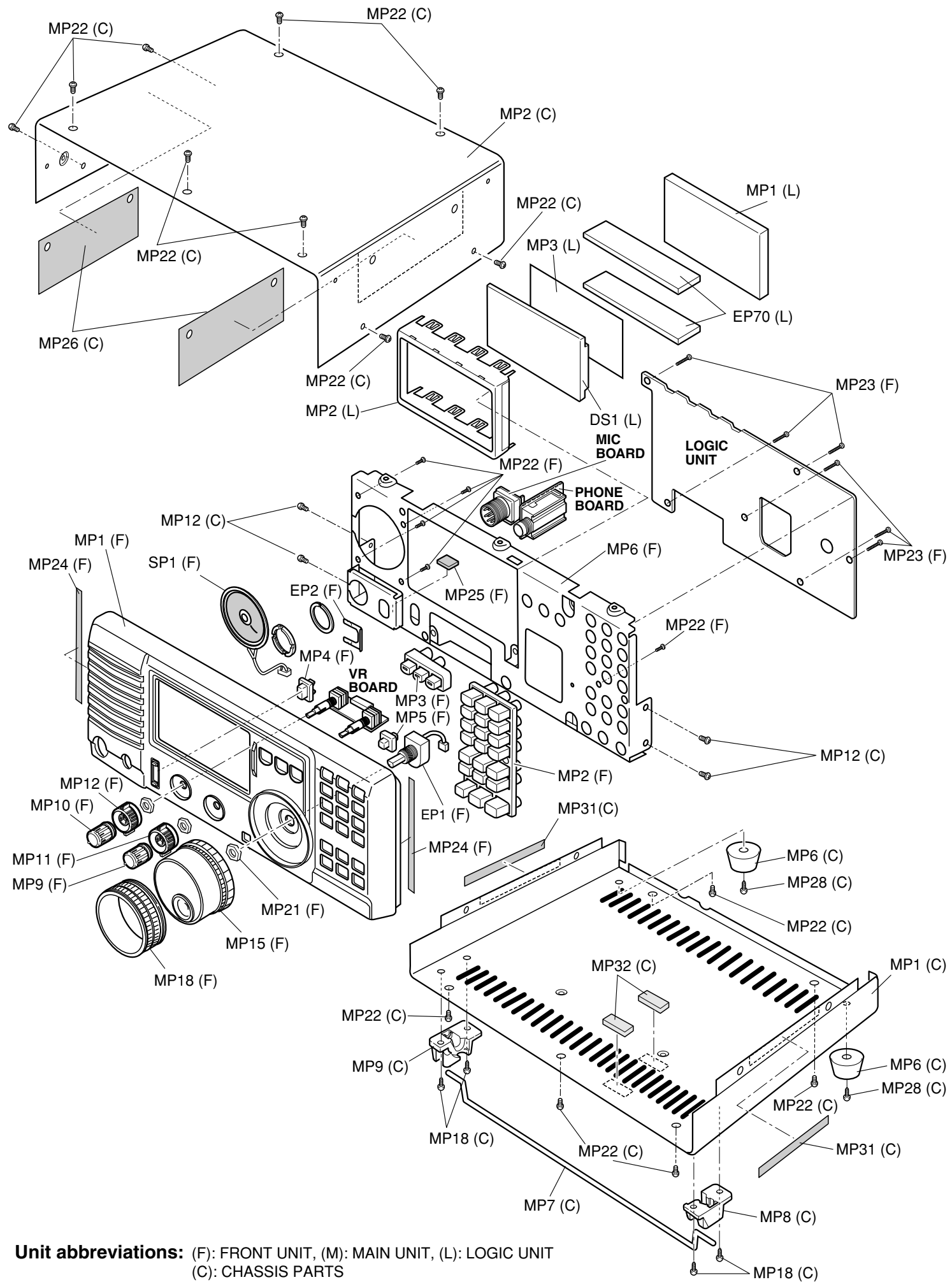
## [LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	QTY.
DS1	5030001820	LCD A0087	1
EP70	8930051450	LCD contact SRCN-2241-SP-N-W	2
MP1	8210016610	2241 reflector	1
MP2	8930050970	2241 LCD holder	1
MP3	8930051090	2241 LCD filter	1

## [ACCESSORIES]

REF NO.	ORDER NO.	DESCRIPTION	QTY.
F1	5210000080	Fuse FGB 20A	1
F2	5210000130	Fuse FGB 4A	1
MC1	Optional product	Microphone HM-36	1
W1	Optional product	DC power cable OPC-025 A	1





**Unit abbreviations:** (F): FRONT UNIT, (M): MAIN UNIT, (L): LOGIC UNIT  
(C): CHASSIS PARTS

# SECTION 8 SEMI-CONDUCTOR INFORMATIONS

## 8-1 TRANSISTORS

NAME	SYMBOL	INSIDE VIEW
2SA1576A R	FR	
2SC1971 2SC3133	None None	
2SC2714-O 2SC4081 R	QO BR	
2SC2904	None	
2SC4673D-TD	CO	
2SD1585K	None	
2SD1619-T-TD 2SD1664 T100Q	DB DA	
2SK508 2SK1740-TA	K52 IJ	

NAME	SYMBOL	INSIDE VIEW
2SK882-GR	TG	
2SK2171-4	KM	
3SK131-T2 MAS	V11	
DTA114EE TL DTA114EUA T106	14 16	
DTC114EE TL DTC114EUA UN9211 (TX)	24 24 8A	
UMD6N TR	D6	
XP4311 (TX)	7X	
XP4601 (TX)	5C	

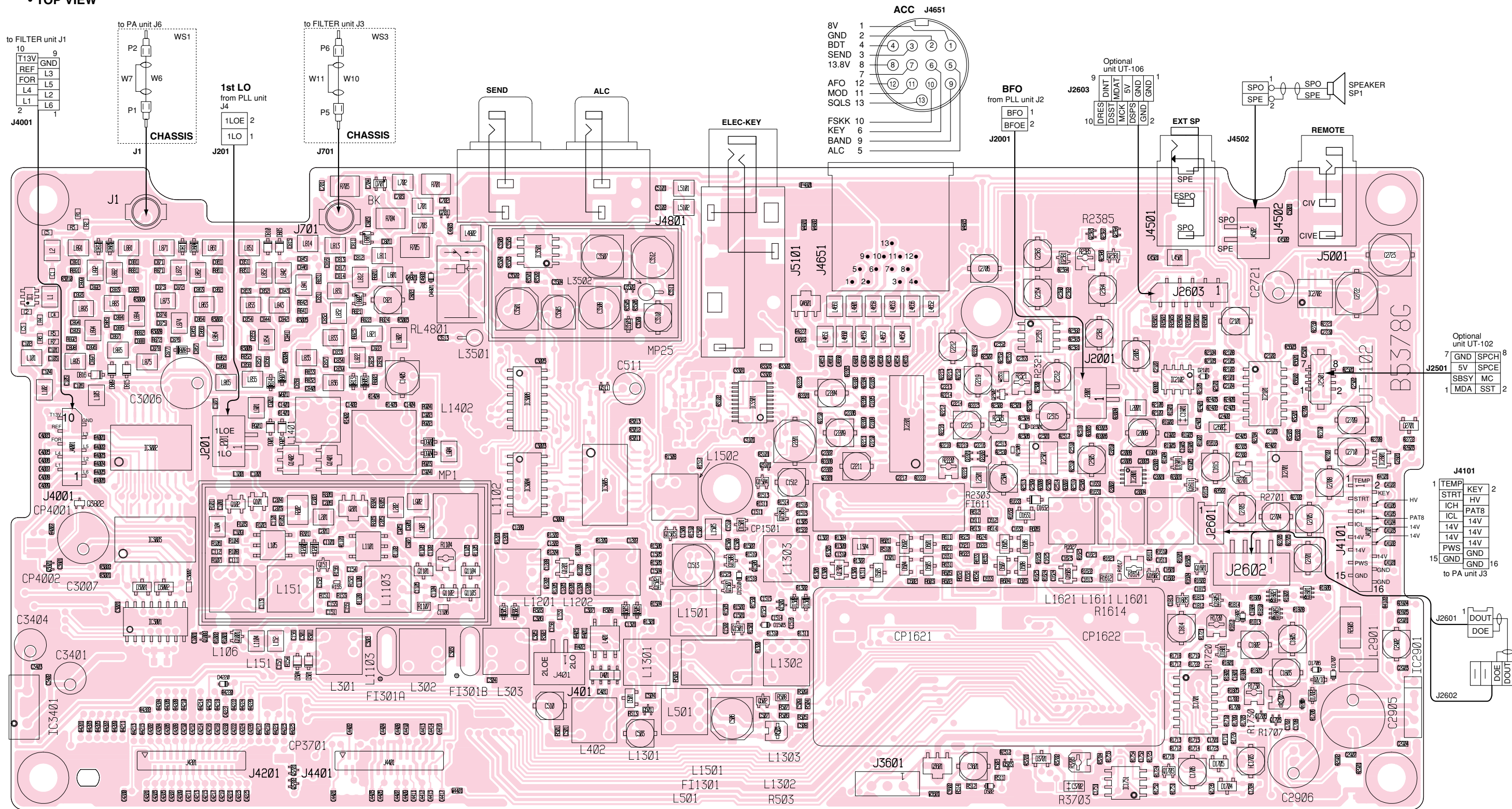
## 8-2 DIODES

NAME	SYMBOL	INSIDE VIEW
1SS184 DAN202K	B3 N	
1SS226 1SS375-TL DA221 TL MA742	C3 FH K M1U	
1SS355 MA2S111 MA2S728	A A B	
1SV312	BB	
DAP202K T146 DAP222 TL	P P	
HSB88WSTR	Silver line	
KV1470TL	F7	

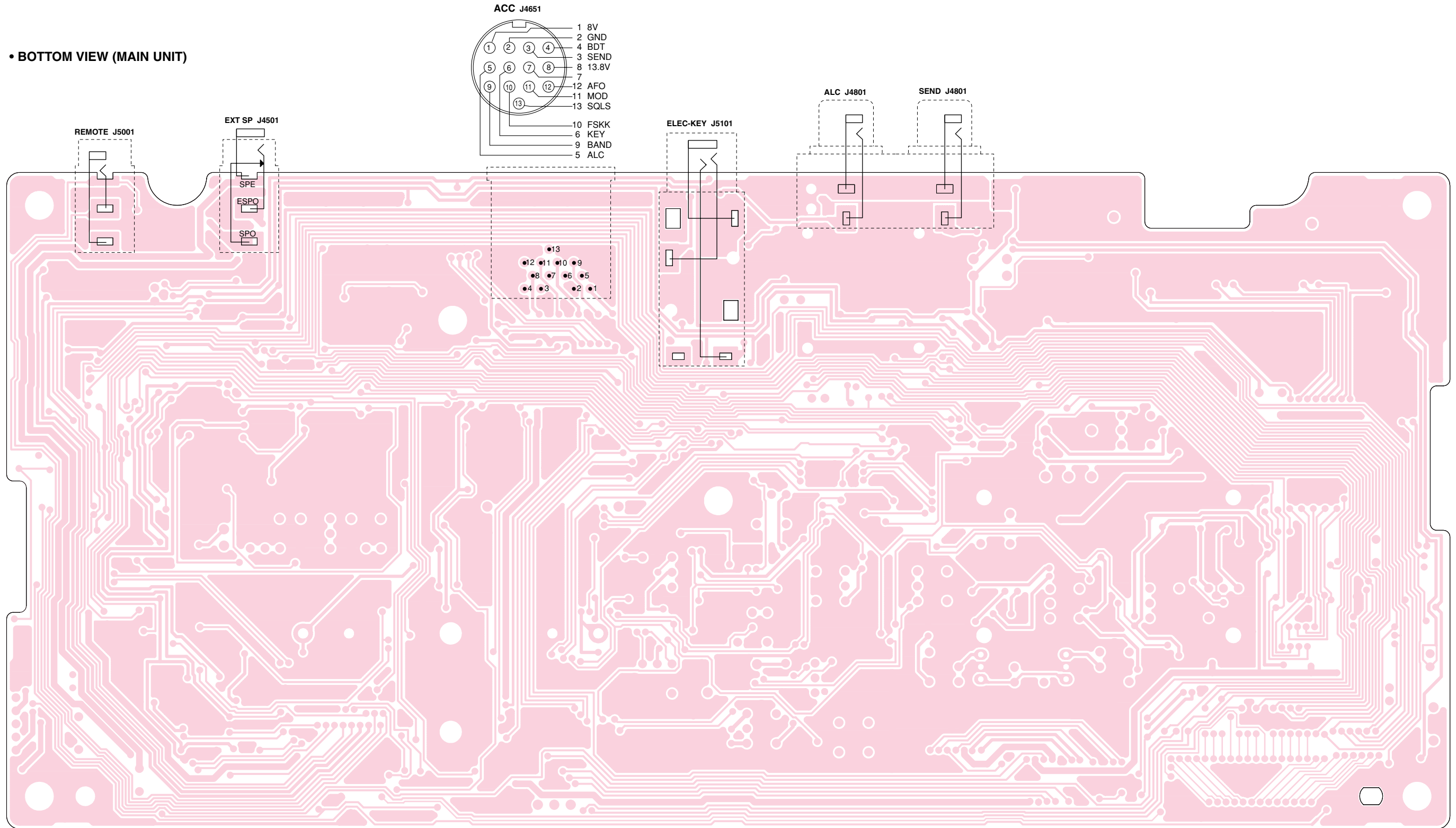
NAME	SYMBOL	INSIDE VIEW
MA29B	Y	
MA77	4B	
MA8043-H MA8051-M (TX)	4^3 5-1	
NNCD6.2G-T1	62G	
RD10M-T2B3	103	

# SECTION 9 BOARD LAYOUTS

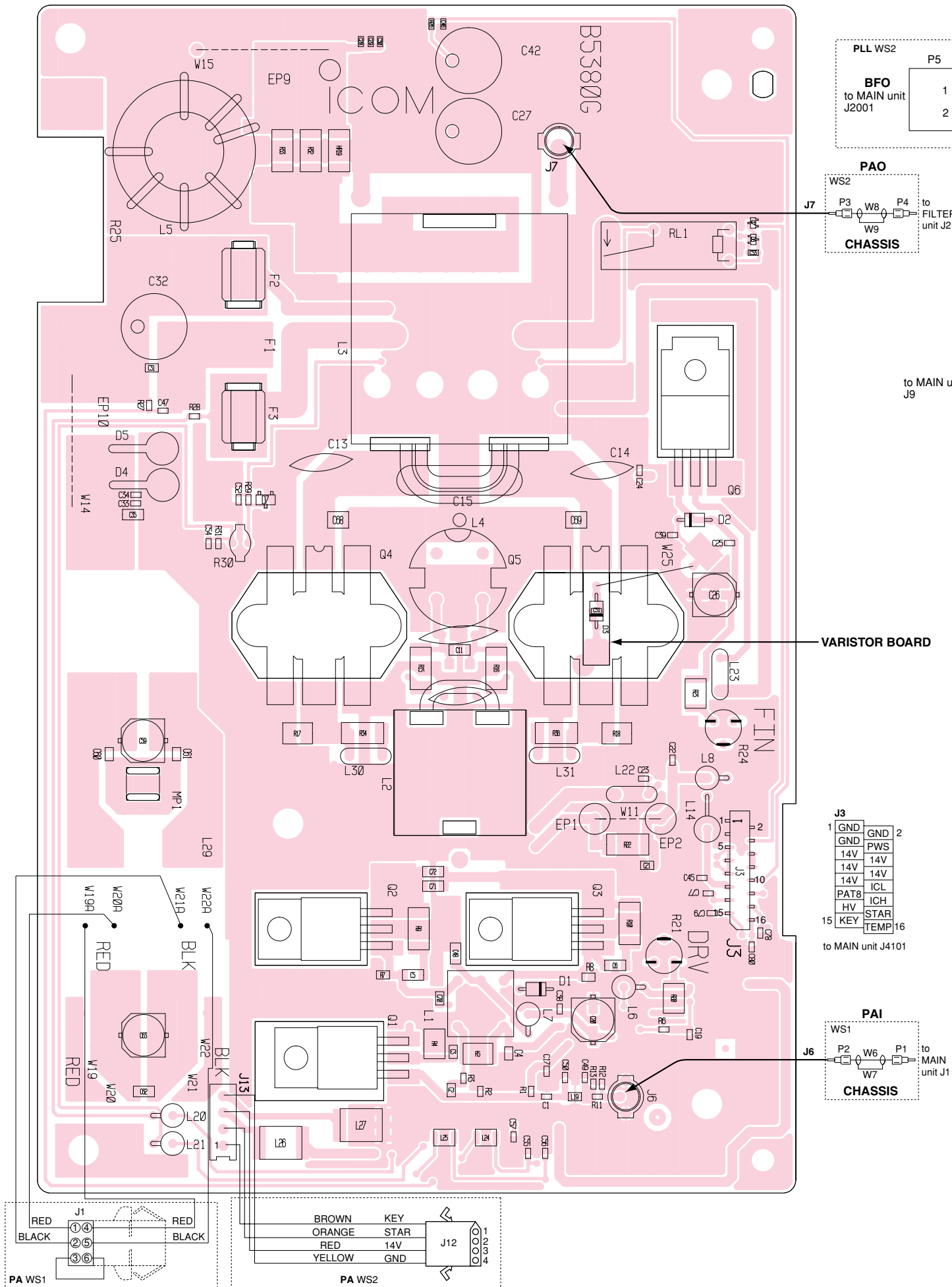
## 9-1 MAIN UNIT • TOP VIEW



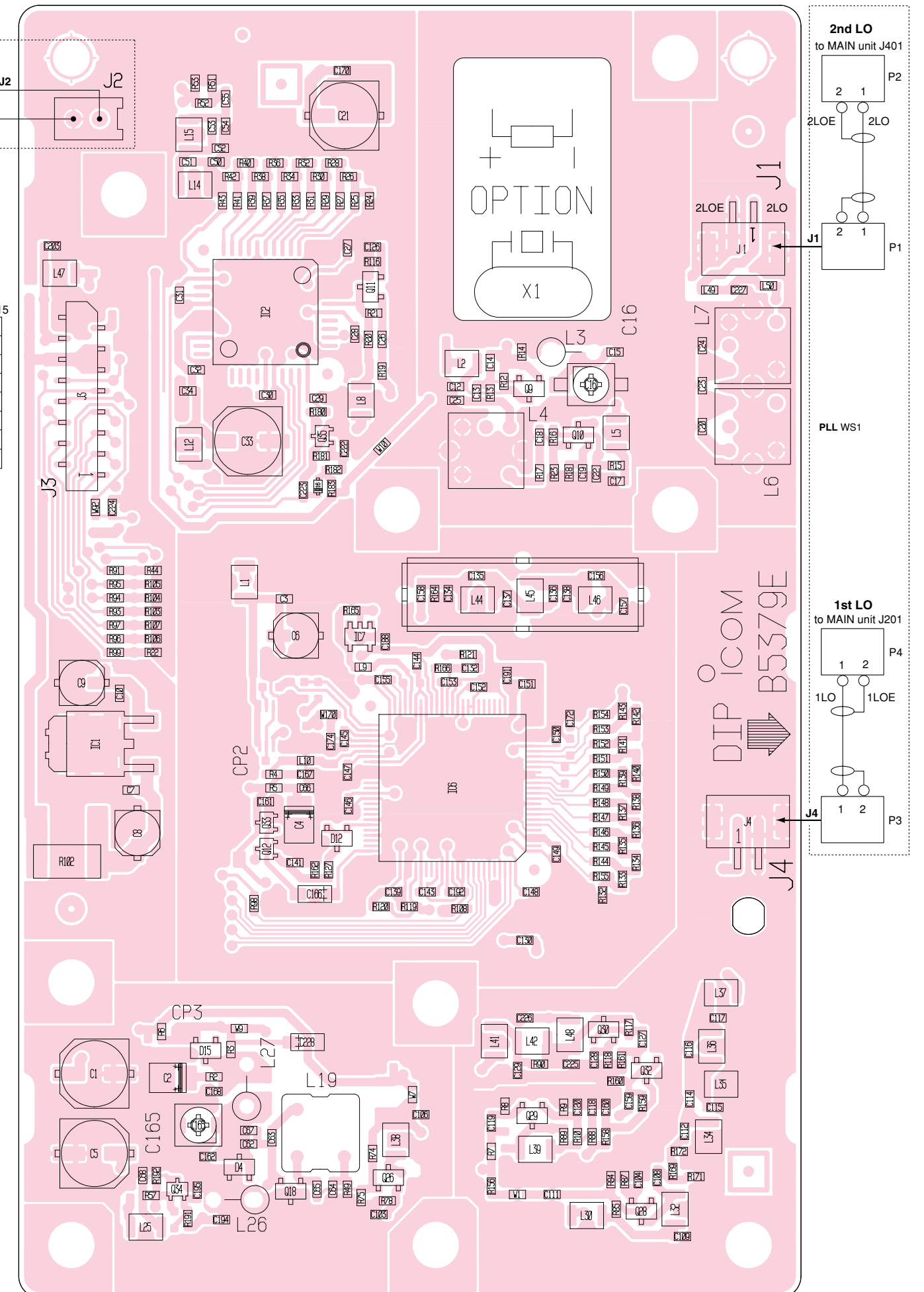
• BOTTOM VIEW (MAIN UNIT)



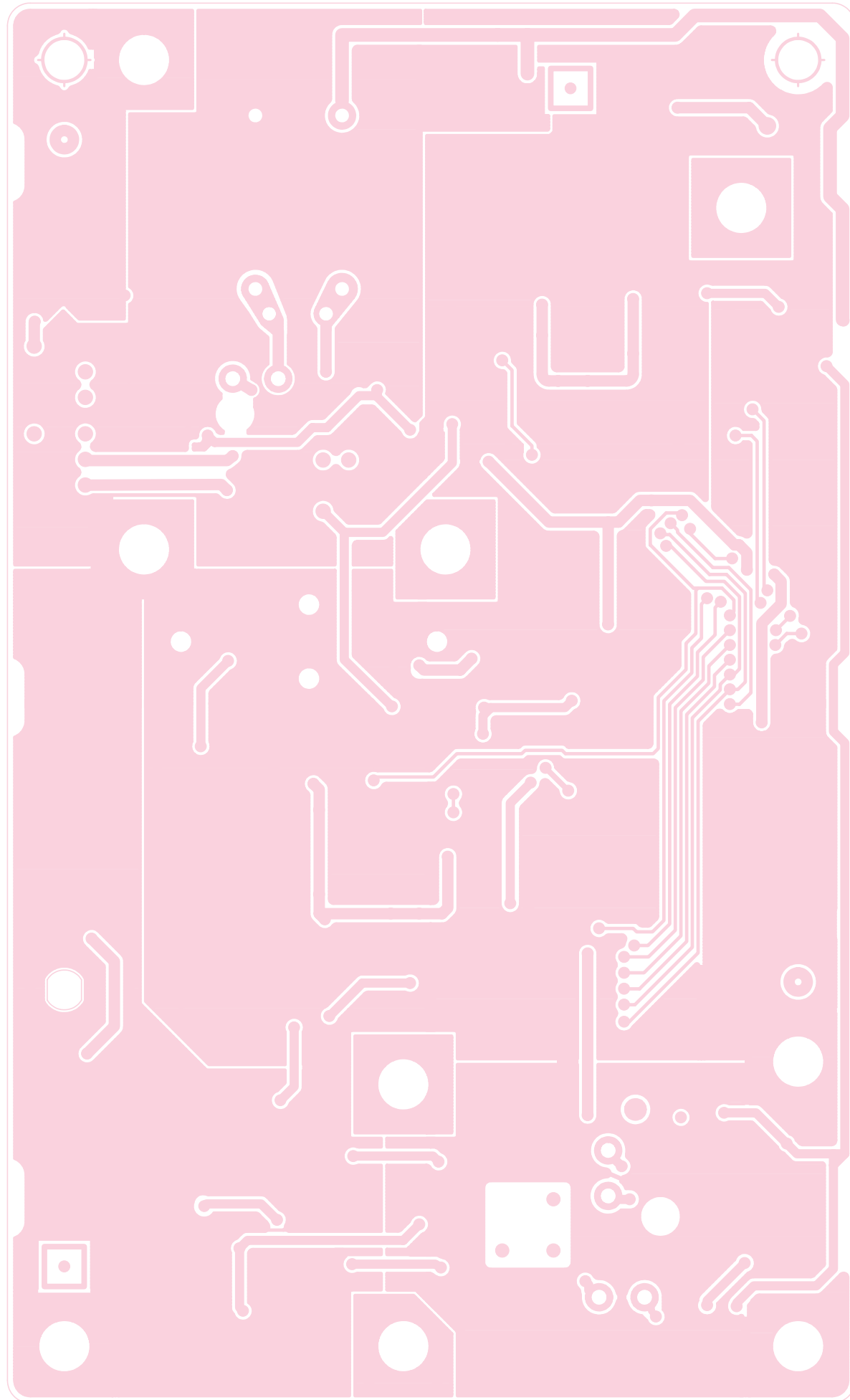
**9-2 PA UNIT**  
• TOP VIEW



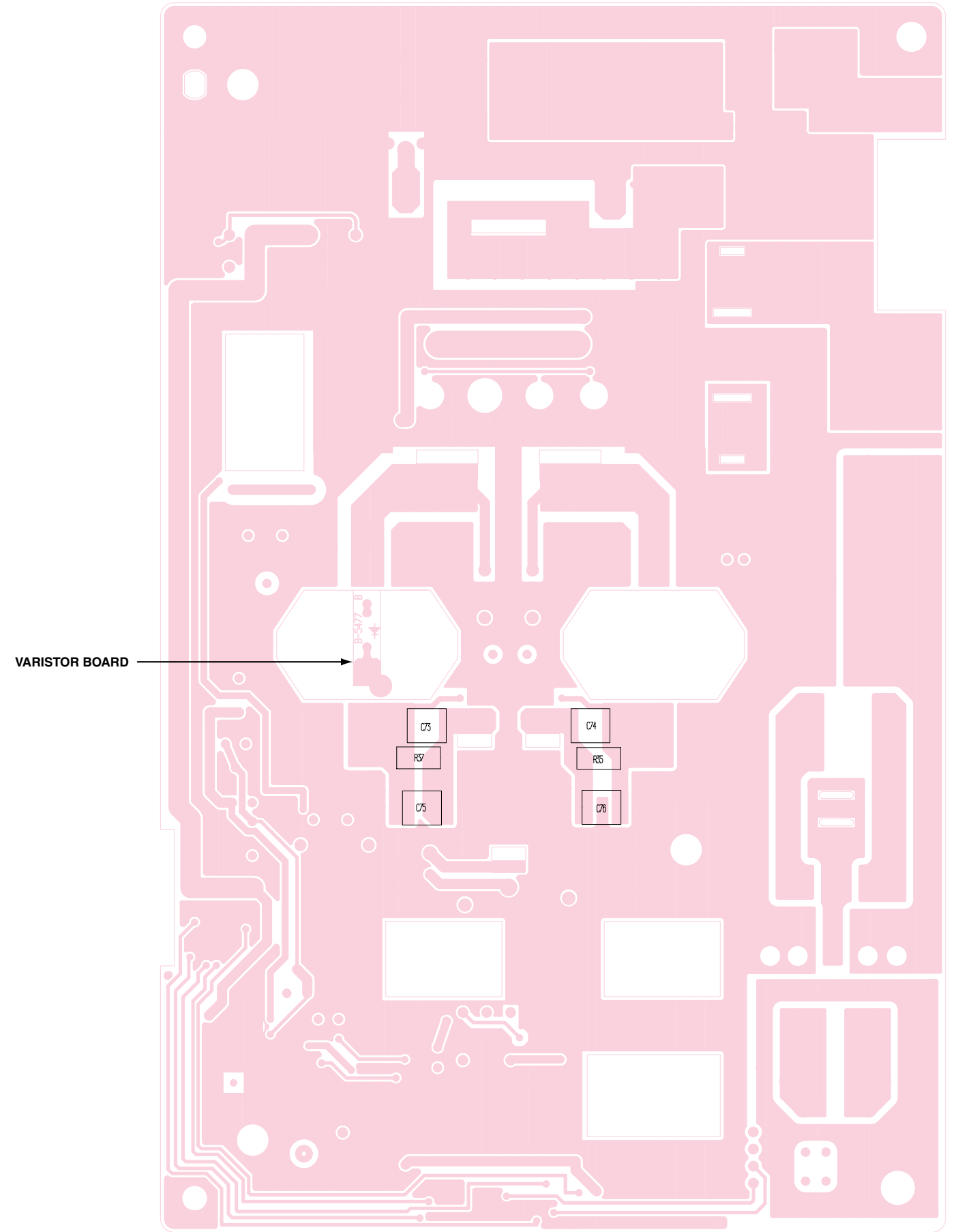
**9-3 PLL UNIT**  
• TOP VIEW



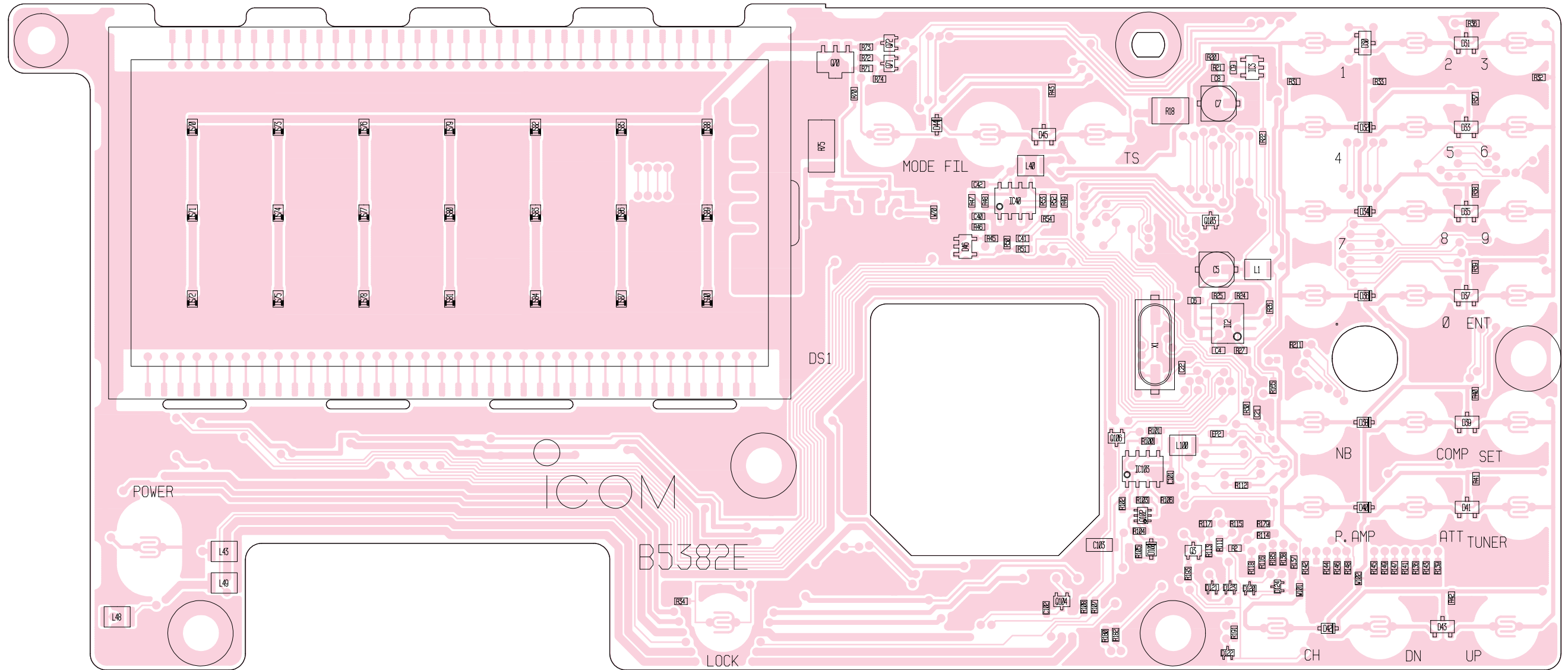
• BOTTOM VIEW (PLL UNIT)



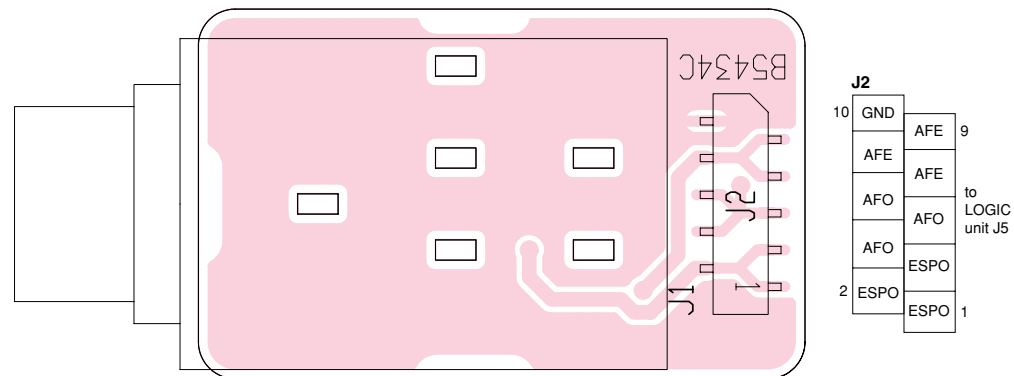
• BOTTOM VIEW (PA UNIT)



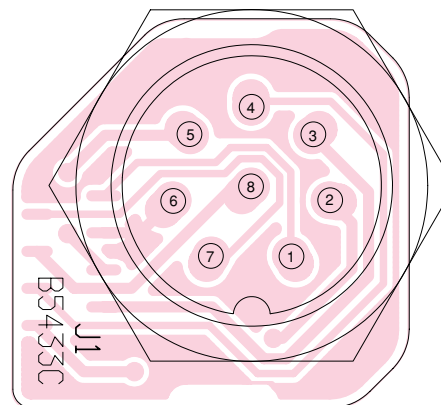
**9-4 LOGIC UNIT**  
• TOP VIEW



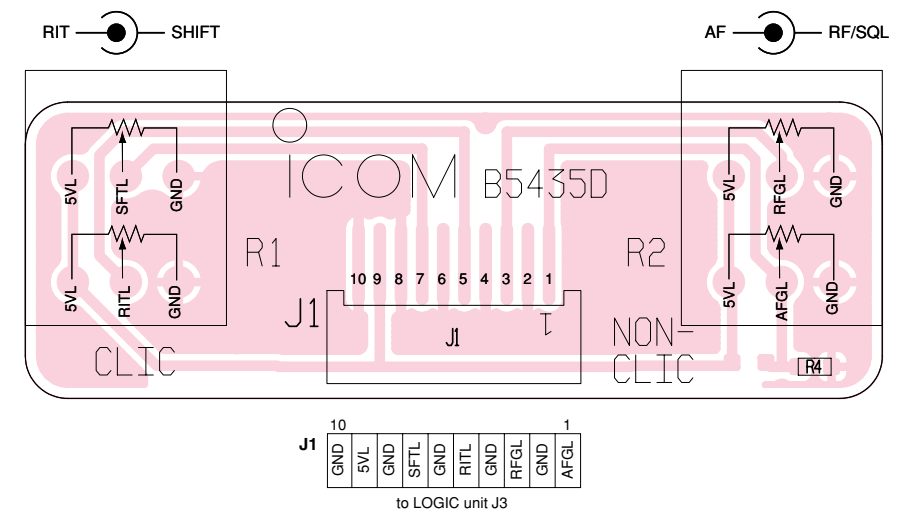
**9-5 PHONE BOARD**  
• TOP VIEW



**9-6 MIC BOARD**  
• TOP VIEW

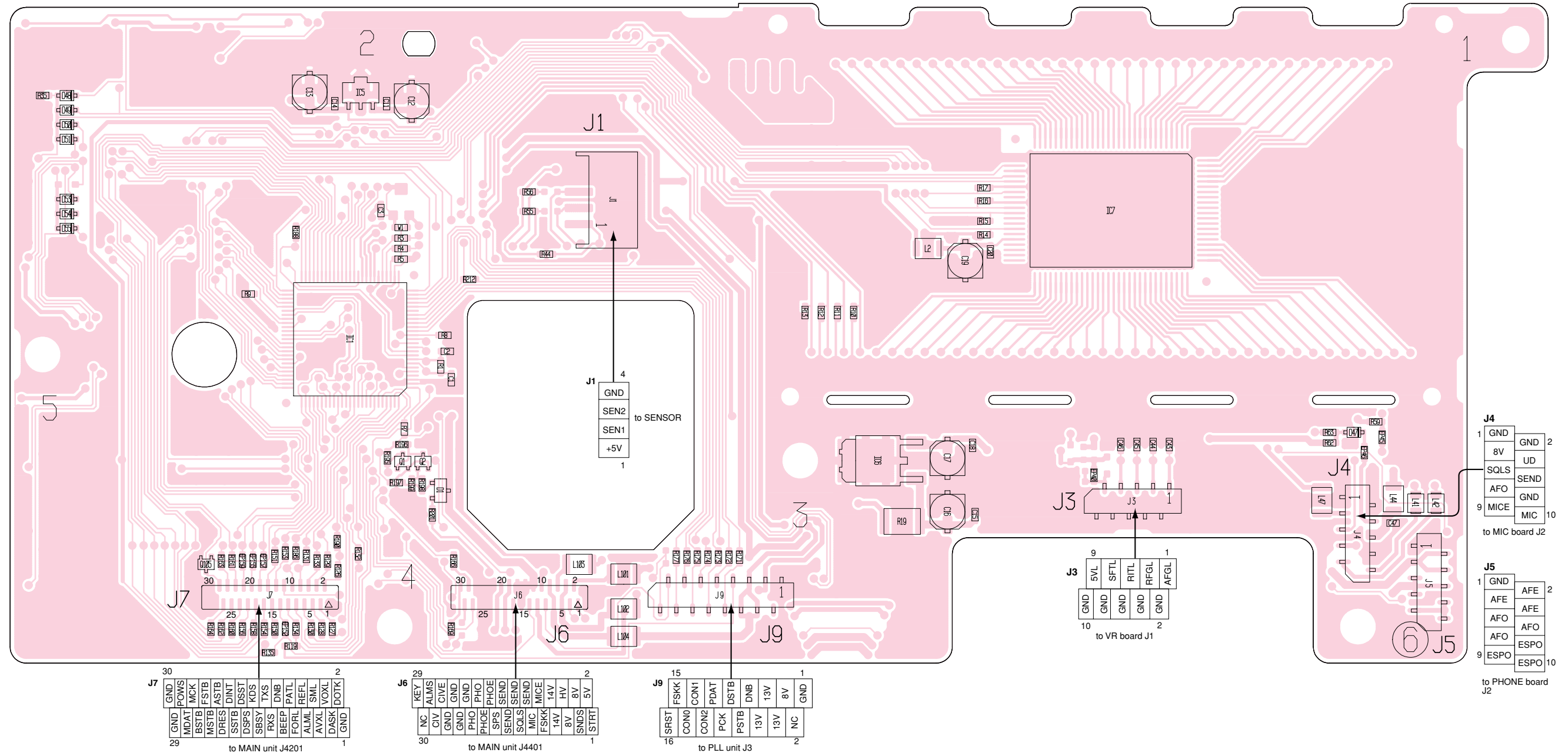


**9-7 VR BOARD**  
• TOP VIEW

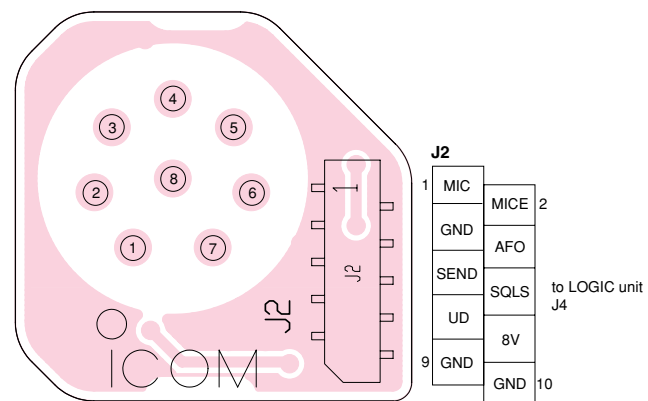




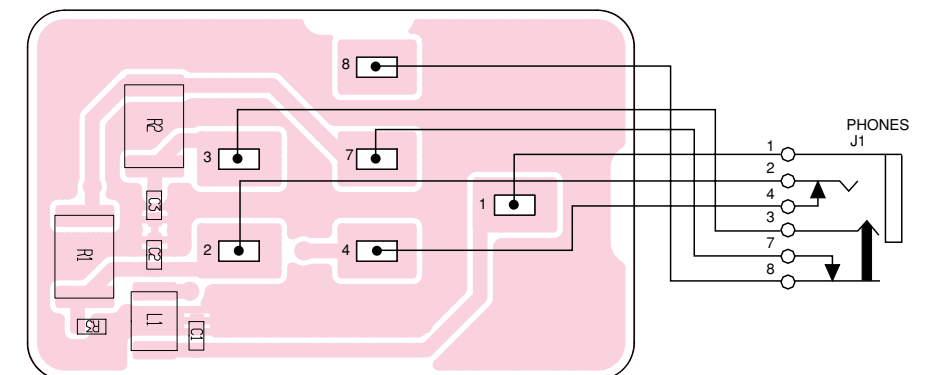
• BOTTOM VIEW (LOGIC UNIT)



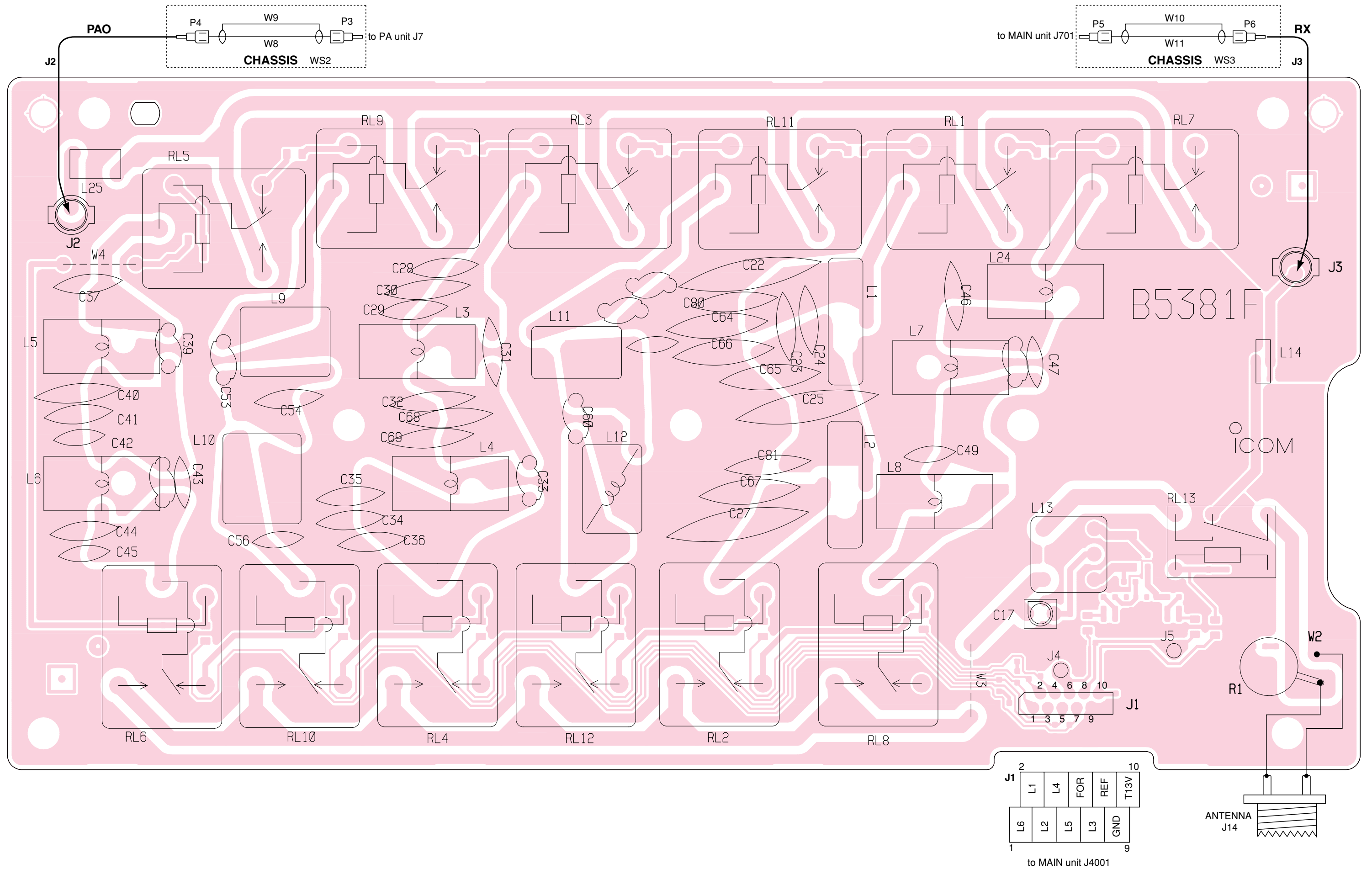
• BOTTOM VIEW (MIC BOARD)



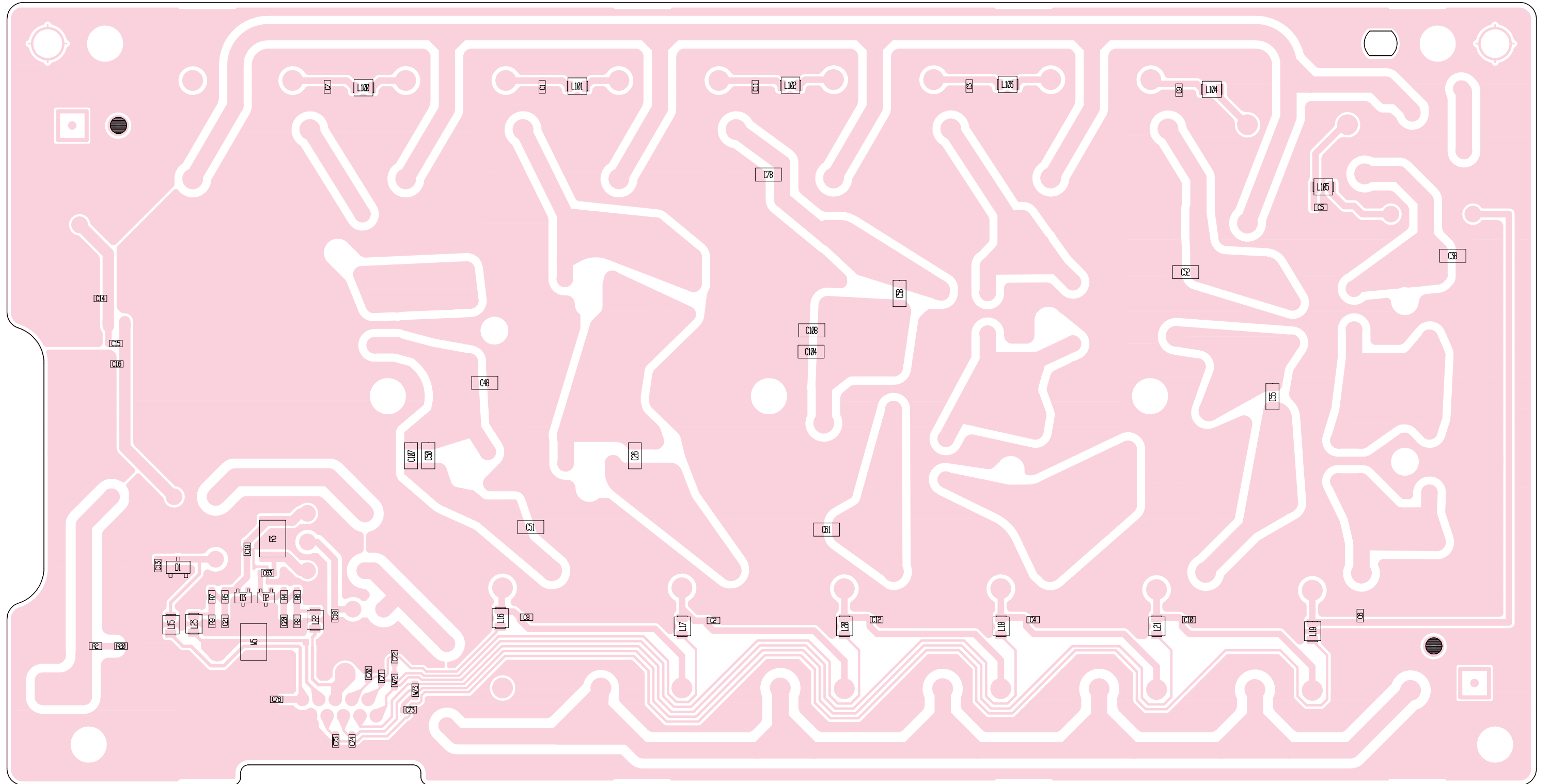
• BOTTOM VIEW (PHONE BOARD)



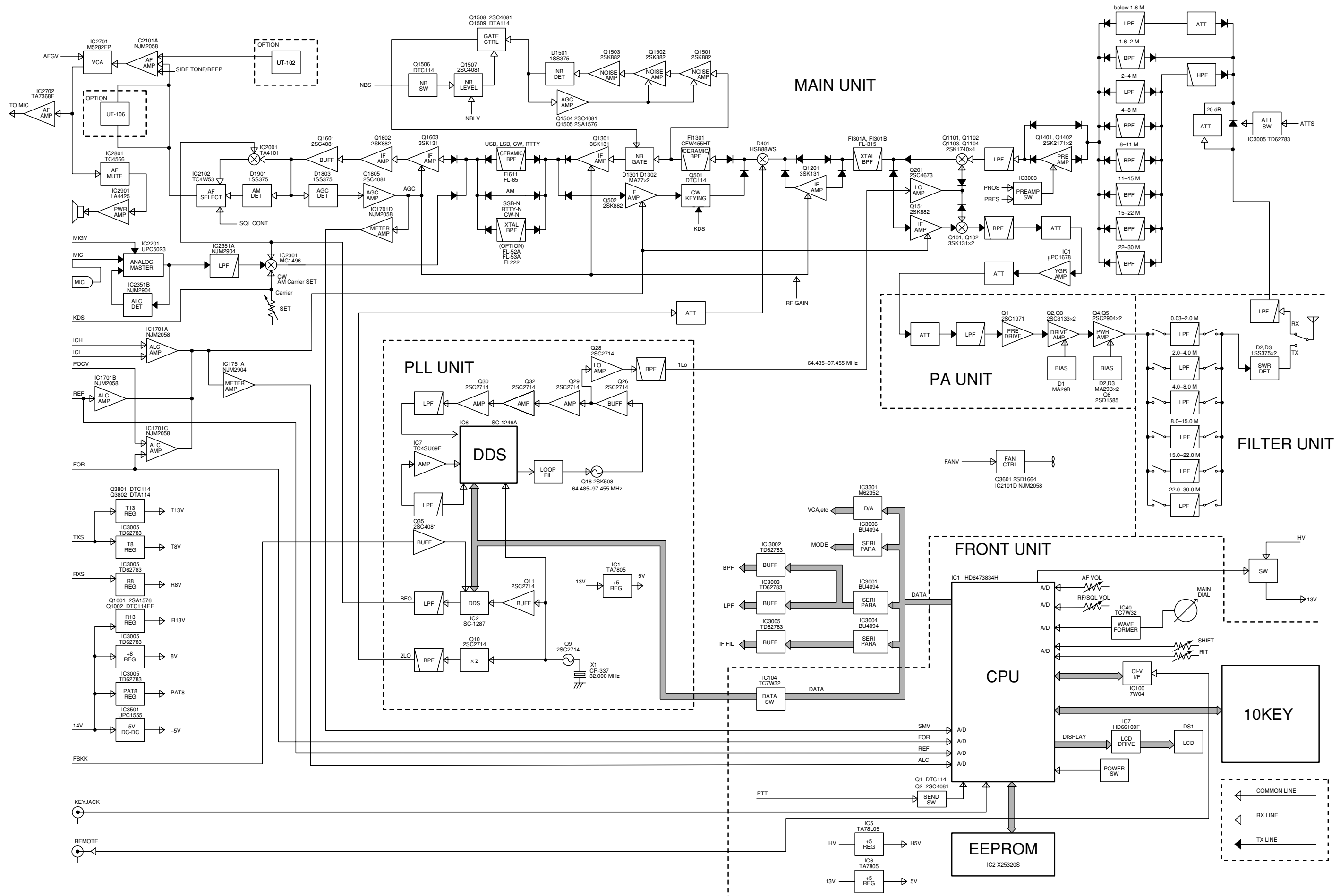
**9-9 FILTER UNIT**  
• TOP VIEW



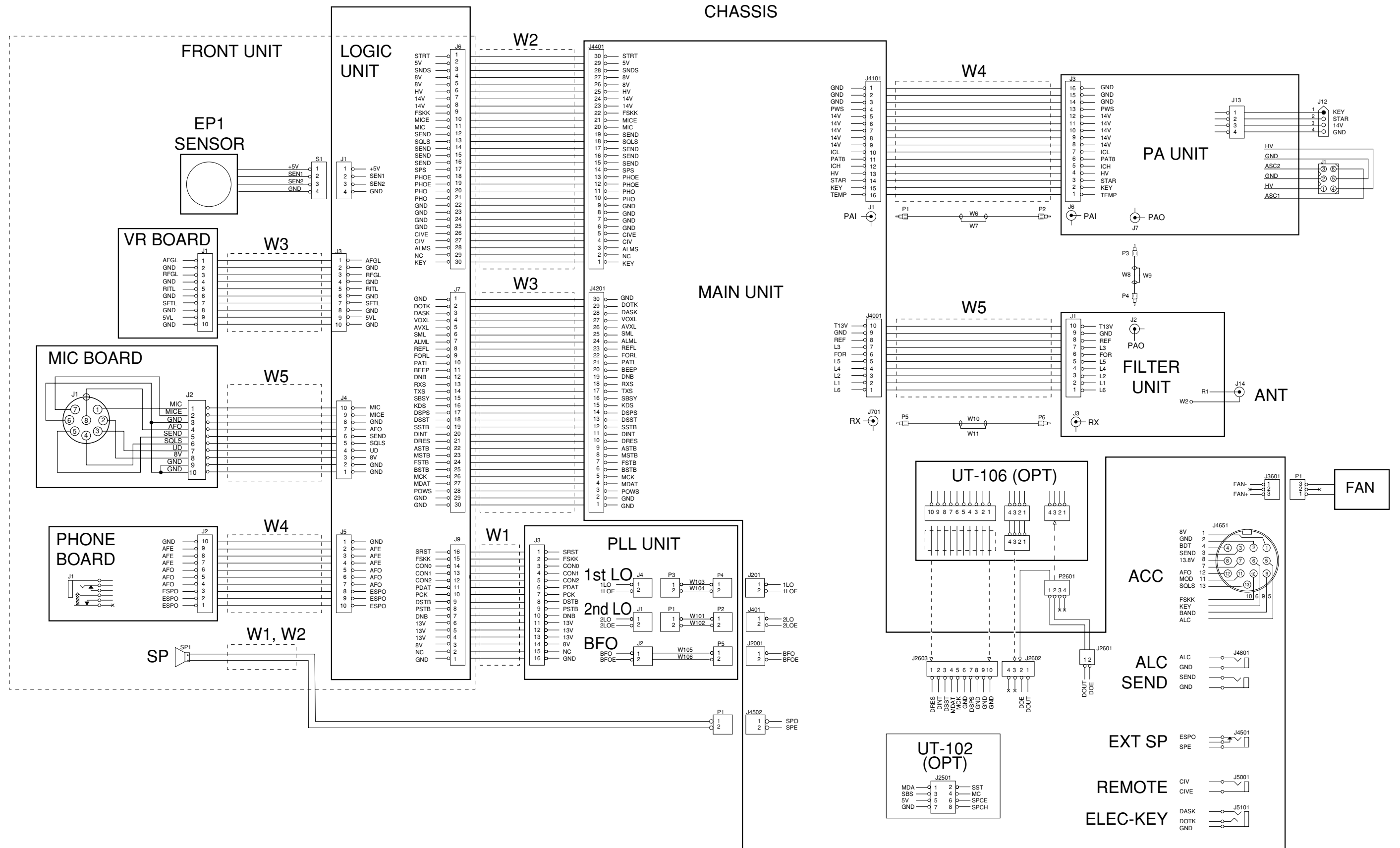
• BOTTOM VIEW (FILTER UNIT)



# SECTION 10 BLOCK DIAGRAM

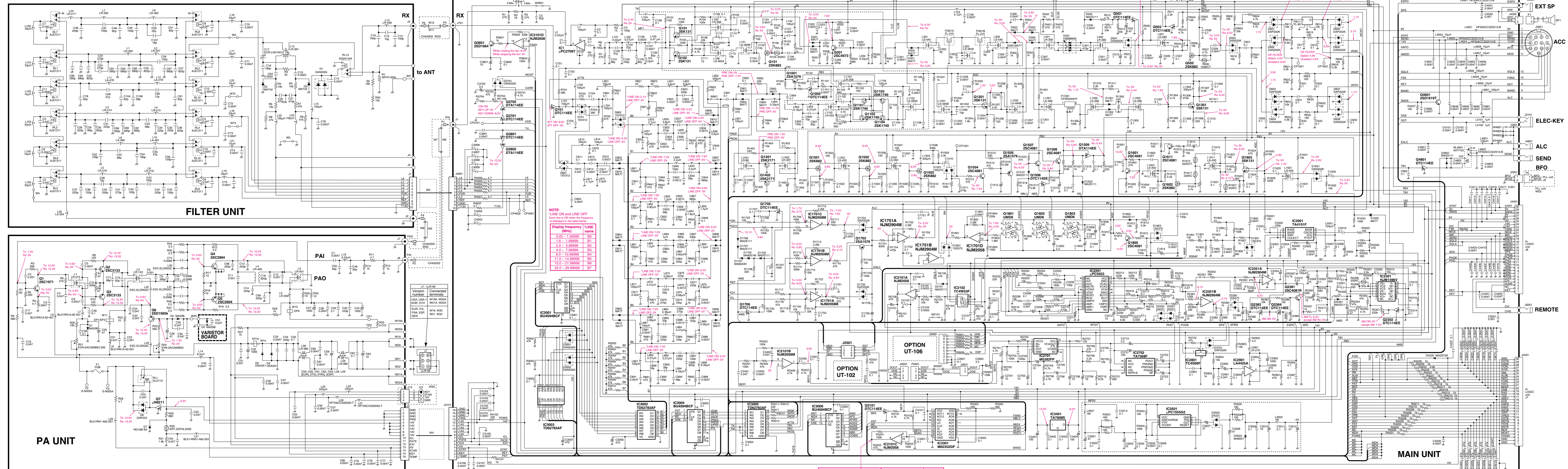


# SECTION 11 WIRING DIAGRAM

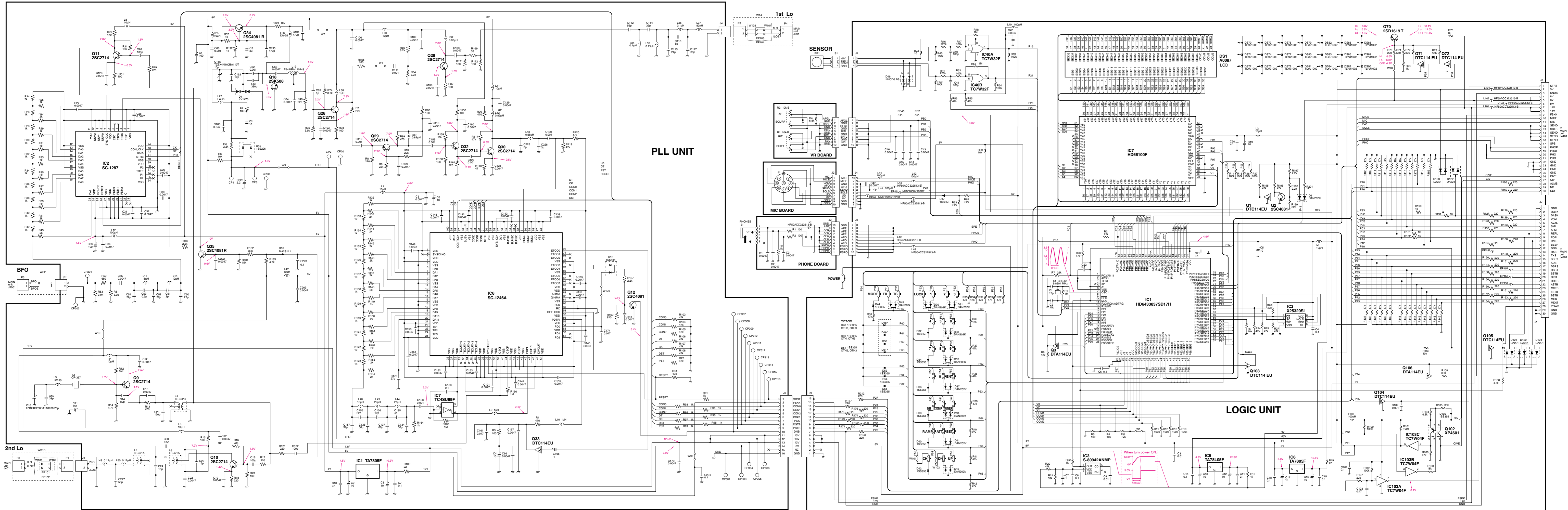


# SECTION 12 VOLTAGE DIAGRAM

## 12-1 FILTER, PA and MAIN units



Display frequency (MHz)	Voltage (V)	Display frequency (MHz)	Voltage (V)
0.03 - 1.99999	2.4	11.0 - 14.99999	3.1
2.0 - 3.99999	6.0	15.0 - 21.99999	3.1
4.0 - 7.99999	5.0	22.0 - 29.99999	2.2
8.0 - 10.99999	0		



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