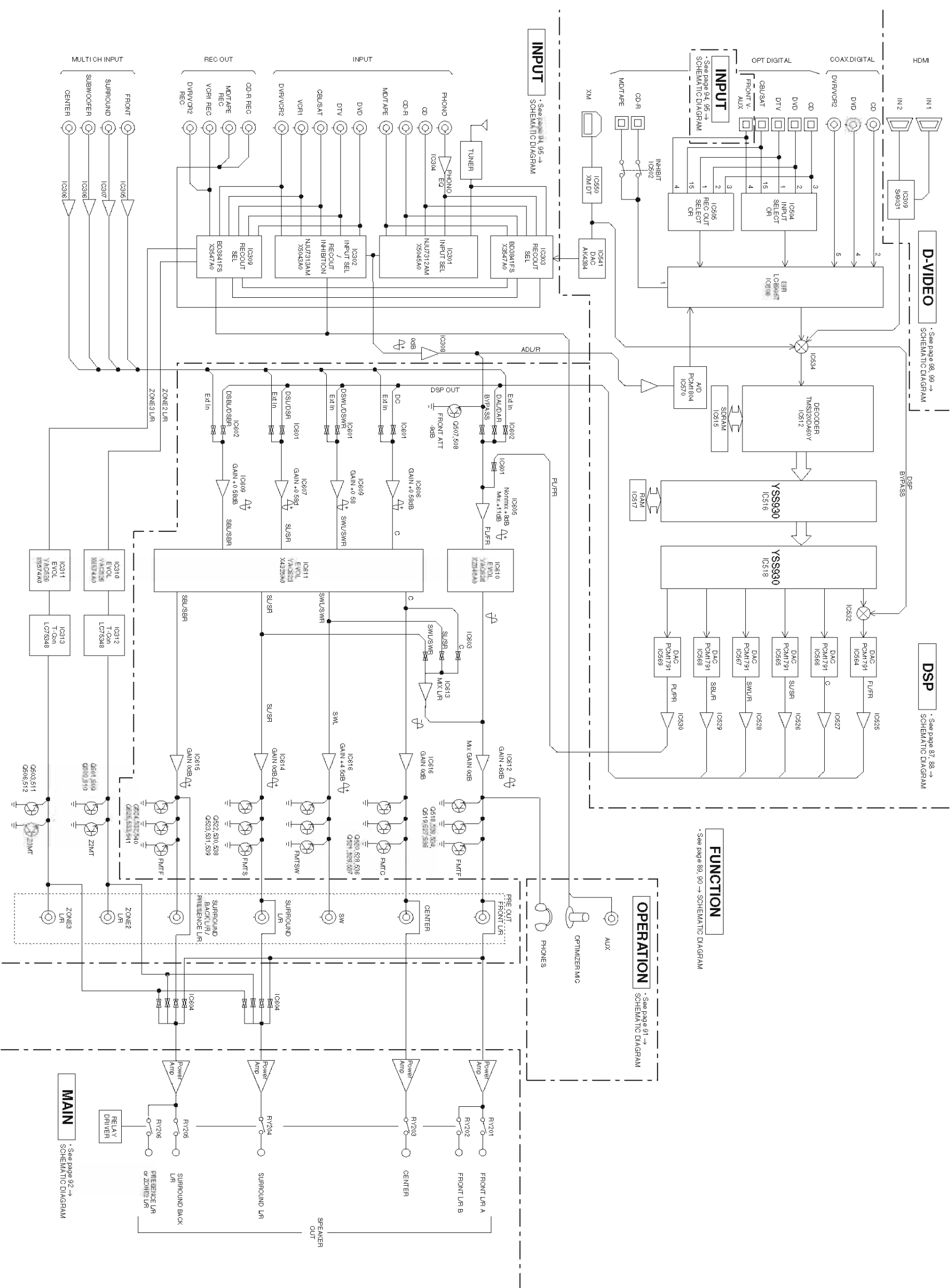
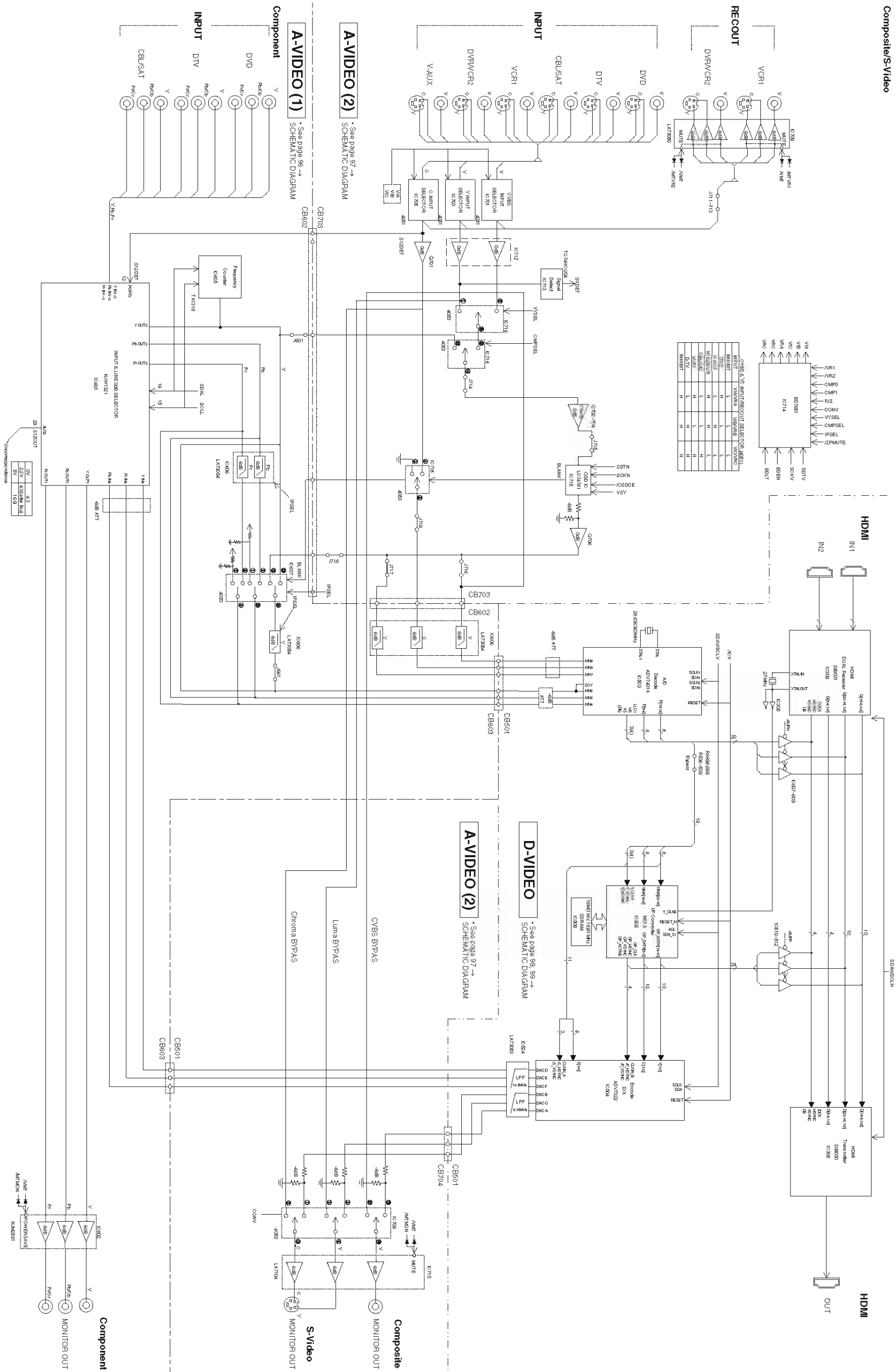


■ BLOCK DIAGRAM (1/3)

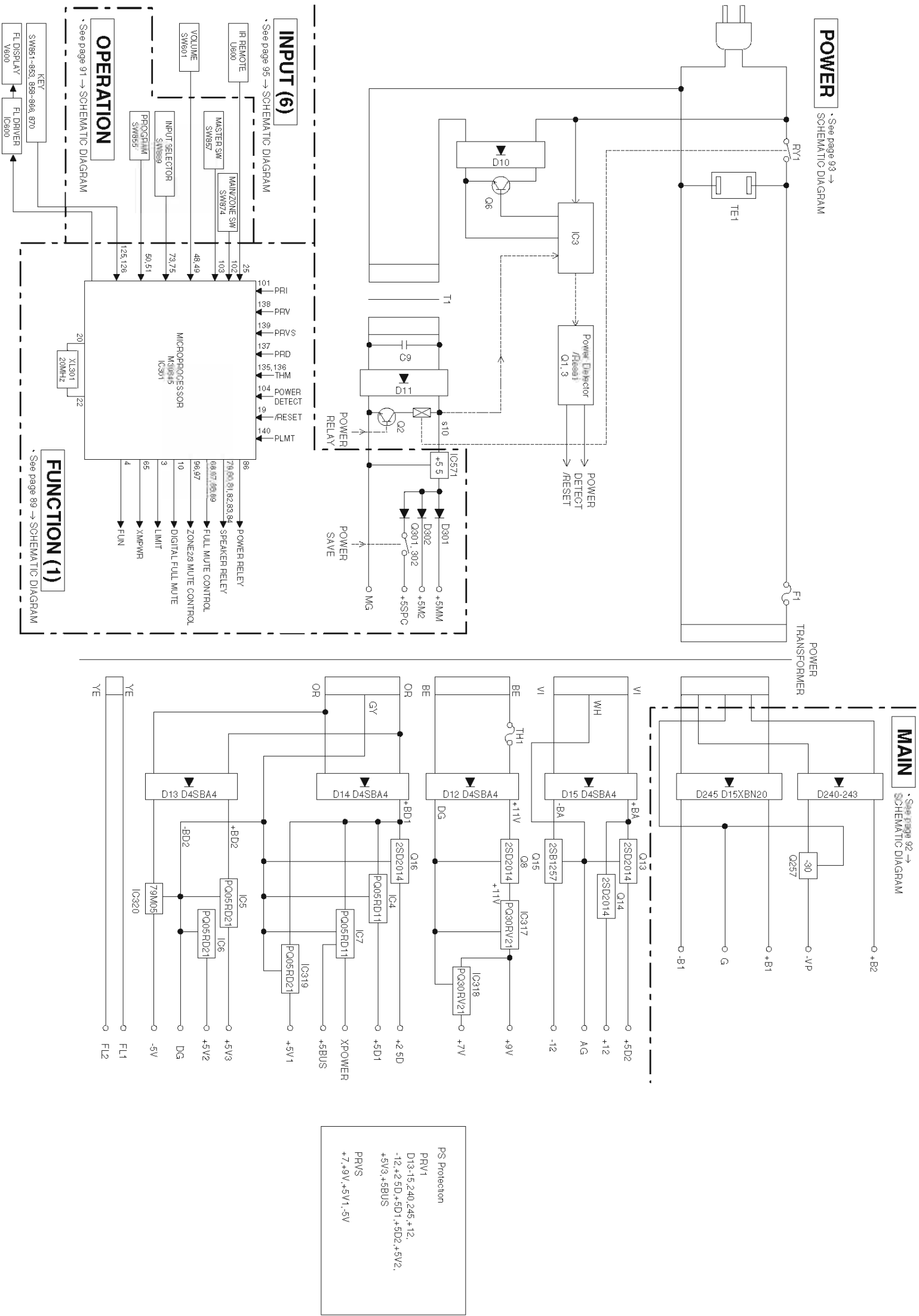


■ BLOCK DIAGRAM (2/3)

Composite/S-Video



■ BLOCK DIAGRAM (3/3)



PARTS LIST

■ ELECTRICAL PARTS

■ WARNING

- Components having special characteristics are marked $\triangle$ and must be replaced with parts having specifications equal to those originally installed.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

C.A.EL.CHP	: CHIP ALUMI.ELECTROLYTIC CAP	L.EMIT	: LIGHT EMITTING MODULE
C.CE	: CERAMIC CAP	LED.DSPLY	: LED DISPLAY
C.CE.ARRAY	: CERAMIC CAP ARRAY	LED.INFRD	: LED, INFRARED
C.CE.CHP	: CHIP CERAMIC CAP	MODUL.RF	: MODULATOR, RF
C.CE.ML	: MULTILAYER CERAMIC CAP	PHOT.CPL	: PHOTO COUPLER
C.CE.M.CHP	: CHIP MULTILAYER CERAMIC CAP	PHOT.INTR	: PHOTO INTERRUPTER
C.CE.SAFTY	: RECOGNIZED CERAMIC CAP	PHOT.RFLCT	: PHOTO REFLECTOR
C.CE.TUBLR	: CERAMIC TUBULAR CAP	PIN.TEST	: PIN, TEST POINT
C.CE.SMI	: SEMI CONDUCTIVE CERAMIC CAP	PLST.RIVET	: PLASTIC RIVET
C.EL	: ELECTROLYTIC CAP	R.ARRAY	: RESISTOR ARRAY
C.MICA	: MICA CAP	R.CAR.	: CARBON RESISTOR
C.ML.FLM	: MULTILAYER FILM CAP	R.CAR.CHP	: CHIP RESISTOR
C.MP	: METALLIZED PAPER CAP	R.CAR.FP	: FLAME PROOF CARBON RESISTOR
C.MYLAR	: MYLAR FILM CAP	R.FUS	: FUSABLE RESISTOR
C.MYLAR.ML	: MULTILAYER MYLAR FILM CAP	R.MTL.CHP	: CHIP METAL FILM RESISTOR
C.PAPER	: PAPER CAPACITOR	R.MTL.FLM	: METAL FILM RESISTOR
C.PLS	: POLYSTYRENE FILM CAP	R.MTL.OXD	: METAL OXIDE FILM RESISTOR
C.POL	: POLYESTER FILM CAP	R.MTL.PLAT	: METAL PLATE RESISTOR
C.POLY	: POLYETHYLENE FILM CAP	RSNR.CE	: CERAMIC RESONATOR
C.PP	: POLYPROPYLENE FILM CAP	RSNR.CRYS	: CRYSTAL RESONATOR
C.TNTL	: TANTALUM CAP	R.TW.CEM	: TWIN CEMENT FIXED RESISTOR
C.TNTL.CHP	: CHIP TANTALUM CAP	R.CEMENT	: CEMENT RESISTOR
C.TRIM	: TRIMMER CAP	SCR.BND.HD	: BIND HEAD B-TITE SCREW
CN	: CONNECTOR	SCR.BW.HD	: BW HEAD TAPPING SCREW
CN.BS.PIN	: CONNECTOR, BASE PIN	SCR.CUP	: CUP TITE SCREW
CN.CANNON	: CONNECTOR, CANNON	SCR.TERM	: SCREW TERMINAL
CN.DIN	: CONNECTOR, DIN	SCR.TR	: SCREW, TRANSISTOR
CN.FLAT	: CONNECTOR, FLAT CABLE	SUPRT.PCB	: SUPPORT, P.C.B.
CN.POST	: CONNECTOR, BASE POST	SURG.PRTCT	: SURGE PROTECTOR
COIL.MX.AM	: COIL, AM MIX	SW.TACT	: TACT SWITCH
COIL.AT.FM	: COIL, FM ANTENNA	SW.LEAF	: LEAF SWITCH
COIL.DT.FM	: COIL, FM DETECT	SW.LEVER	: LEVER SWITCH
COIL.MX.FM	: COIL, FM MIX	SW.MICRO	: MICRO SWITCH
COIL.OUTPT	: OUTPUT COIL	SW.PUSH	: PUSH SWITCH
DIOD.ARRAY	: DIODE ARRAY	SW.RT.ENC	: ROTARY ENCODER
DIODE.BRG	: DIODE BRIDGE	SW.RT.MTR	: ROTARY SWITCH WITH MOTOR
DIODE.CHP	: CHIP DIODE	SW.RT	: ROTARY SWITCH
DIODE.VAR	: VARACTOR DIODE	SW.SLIDE	: SLIDE SWITCH
DIOD.Z.CHP	: CHIP ZENER DIODE	TERM.SP	: SPEAKER TERMINAL
DIODE.ZENR	: ZENER DIODE	TERM.WRAP	: WRAPPING TERMINAL
DSCR.CE	: CERAMIC DISCRIMINATOR	THRMST.CHP	: CHIP THERMISTOR
FER.BEAD	: FERRITE BEADS	TR.CHP	: CHIP TRANSISTOR
FER.CORE	: FERRITE CORE	TR.DGT	: DIGITAL TRANSISTOR
FET.CHP	: CHIP FET	TR.DGT.CHP	: CHIP DIGITAL TRANSISTOR
FL.DSPLY	: FLUORESCENT DISPLAY	TRANS	: TRANSFORMER
FLTR.CE	: CERAMIC FILTER	TRANS.PULS	: PULSE TRANSFORMER
FLTR.COMB	: COMB FILTER MODULE	TRANS.PWR	: POWER TRANSFORMER ASS'Y
FLTR.LC.RF	: LC FILTER, EMI	TUNER.AM	: TUNER PACK, AM
GND.MTL	: GROUND PLATE	TUNER.FM	: TUNER PACK, FM
GND.TERM	: GROUND TERMINAL	TUNER.PK	: FRONT-END TUNER PACK
HOLDER.FUS	: FUSE HOLDER	VR	: ROTARY POTENTIOMETER
IC.PRTCT	: IC PROTECTOR	VR.MTR	: POTENTIOMETER WITH MOTOR
JUMPER.CN	: JUMPER CONNECTOR	VR.SW	: POTENTIOMETER WITH ROTARY SW
JUMPER.TST	: JUMPER, TEST POINT	VR.SLIDE	: SLIDE POTENTIOMETER
L.DTCT	: LIGHT DETECTING MODULE	VR.TRIM	: TRIMMER POTENTIOMETER

P.C.B. DSP

Ref. No.	Part No.	Description	Markets
	WG078400	P. C. B.	DSP
* CB1	WE161800	CN	CAM-C16 4P SE
* CB2	VF982300	CN. BS. PIN	17P
CB3	VB858700	CN. BS. PIN	8P
CB4-5	V9356900	CN	JE 19P SE
CB21	V9356900	CN	JE 19P SE
CB22	VQ044900	CN. BS. PIN	19P
C5	US035100	C. CE. CHP	0.1uF 16V B
C6	US035100	C. CE. CHP	0.1uF 16V B
C7	US060500	C. CE. CHP	5pF 50V B
C8	US035100	C. CE. CHP	0.1uF 16V B
C9	US060500	C. CE. CHP	5pF 50V B
C10-16	US035100	C. CE. CHP	0.1uF 16V B
C17	US061470	C. CE. CHP	47pF 50V B
C20	US061470	C. CE. CHP	47pF 50V B
C23	US061470	C. CE. CHP	47pF 50V B
C24-25	US035100	C. CE. CHP	0.1uF 16V B
C26	US135100	C. CE. CHP	0.1uF 16V
C29	US061470	C. CE. CHP	47pF 50V B
C30	US061470	C. CE. CHP	47pF 50V B
C31-33	US061220	C. CE. CHP	22pF 50V B
C34-39	US135100	C. CE. CHP	0.1uF 16V
C40-42	US135100	C. CE. CHP	0.1uF 16V
C43-45	UR237220	C. EL	22uF 16V
C46	UU238330	C. EL	330uF 16V
C47	UR237470	C. EL	47uF 16V
C48	US135100	C. CE. CHP	0.1uF 16V
C49	UR237470	C. EL	47uF 16V
C50-52	US135100	C. CE. CHP	0.1uF 16V
C53	UR237220	C. EL	22uF 16V
C54-55	US135100	C. CE. CHP	0.1uF 16V
C57	US135100	C. CE. CHP	0.1uF 16V
C58	UU238100	C. EL	100uF 16V
C59	UR218100	C. EL	100uF 6.3V
C60	US135100	C. CE. CHP	0.1uF 16V
C62-63	US135100	C. CE. CHP	0.1uF 16V
C64	VE326000	C. MYLAR	0.1uF 50V
C65	VE326600	C. MYLAR	0.33uF 50V J
C66	UA654220	C. MYLAR	0.022uF 50V J
C68	UR237470	C. EL	47uF 16V
C69	US135100	C. CE. CHP	0.1uF 16V
C70	US135100	C. CE. CHP	0.1uF 16V
C71	UR218100	C. EL	100uF 6.3V
C72	US135100	C. CE. CHP	0.1uF 16V
C74-75	US135100	C. CE. CHP	0.1uF 16V
C76	UU238100	C. EL	100uF 16V
C78	US135100	C. CE. CHP	0.1uF 16V
C80	UU267470	C. EL	47uF 50V

* New Parts

P.C.B. DSP

Ref. No.	Part No.	Description	Markets
C81	US061470	C. CE. CHP	47pF 50V B
C82	US135100	C. CE. CHP	0.1uF 16V
C83	UU267470	C. EL	47uF 50V
C84	UU238100	C. EL	100uF 16V
C85-89	US135100	C. CE. CHP	0.1uF 16V
C90	US063100	C. CE. CHP	1000pF 50V B
C91-93	US135100	C. CE. CHP	0.1uF 16V
C94	UU219100	C. EL	1000uF 6.3V
C95	UU267470	C. EL	47uF 50V
C97	UR237100	C. EL	10uF 16V
C98-99	US135100	C. CE. CHP	0.1uF 16V
C100-118	US135100	C. CE. CHP	0.1uF 16V
C119	UR237100	C. EL	10uF 16V
C120	US126100	C. CE. CHP	1uF 10V
C121-122	US135100	C. CE. CHP	0.1uF 16V
C125	US135100	C. CE. CHP	0.1uF 16V
C126	US062100	C. CE. CHP	100pF 50V B
C129-131	US135100	C. CE. CHP	0.1uF 16V
C132	UR237100	C. EL	10uF 16V
C133-138	US135100	C. CE. CHP	0.1uF 16V
C143-146	US135100	C. CE. CHP	0.1uF 16V
C147-153	US061470	C. CE. CHP	47pF 50V B
C154-170	US135100	C. CE. CHP	0.1uF 16V
C171	UR238100	C. EL	100uF 16V
C172	UU238100	C. EL	100uF 16V
C173-174	US135100	C. CE. CHP	0.1uF 16V
C175-177	US063100	C. CE. CHP	1000pF 50V B
C178-179	US135100	C. CE. CHP	0.1uF 16V
C180-182	US063100	C. CE. CHP	1000pF 50V B
C183-184	US135100	C. CE. CHP	0.1uF 16V
C185	UU238100	C. EL	100uF 16V
C186	US035100	C. CE. CHP	0.1uF 16V B
C187	UR237100	C. EL	10uF 16V
C188	UR237220	C. EL	22uF 16V
C189-190	US135100	C. CE. CHP	0.1uF 16V
C191	UU267100	C. EL	10uF 50V
C192	US135100	C. CE. CHP	0.1uF 16V
C193	UU267100	C. EL	10uF 50V
C194-198	US135100	C. CE. CHP	0.1uF 16V
C199	UR237220	C. EL	22uF 16V
C200	US135100	C. CE. CHP	0.1uF 16V
C201	UU267100	C. EL	10uF 50V
C202	US135100	C. CE. CHP	0.1uF 16V
C203	UU267100	C. EL	10uF 50V
C204	US135100	C. CE. CHP	0.1uF 16V
C205-208	UA652100	C. MYLAR	100pF 50V J
C209	US135100	C. CE. CHP	0.1uF 16V
C210	US063470	C. CE. CHP	4700pF 50V B

* New Parts

P.C.B. DSP

Ref. No.	Part No.	Description	Markets
C211-212	UA654220	C.MYLAR 0.022uF 50V J	
C213	US062470	C.CE.CHP 470pF 50V B	
C214	US135100	C.CE.CHP 0.1uF 16V	
C215-218	UA652470	C.MYLAR 470pF 50V J	
C219	UR237100	C.EL 10uF 16V	
C220-221	US135100	C.CE.CHP 0.1uF 16V	
C222-224	UU267100	C.EL 10uF 50V	
C225-227	US135100	C.CE.CHP 0.1uF 16V	
C228	UU267100	C.EL 10uF 50V	
C229	US135100	C.CE.CHP 0.1uF 16V	
C230	UR237100	C.EL 10uF 16V	
C231	UR237220	C.EL 22uF 16V	
C232-233	UU267220	C.EL 22uF 50V	
C234-235	US135100	C.CE.CHP 0.1uF 16V	
C236-237	UR237470	C.EL 47uF 16V	
C238-241	US135100	C.CE.CHP 0.1uF 16V	
C242-243	US064100	C.CE.CHP 0.01uF 50V B	
C244	US063470	C.CE.CHP 4700pF 50V B	
C245	US062470	C.CE.CHP 470pF 50V B	
C246-251	US135100	C.CE.CHP 0.1uF 16V	
C252	UR237100	C.EL 10uF 16V	
C253	UR837100	C.EL 10uF 16V	
C254	US135100	C.CE.CHP 0.1uF 16V	
C256	UR837470	C.EL 47uF 16V	
C257	US135100	C.CE.CHP 0.1uF 16V	
C258	US135100	C.CE.CHP 0.1uF 16V	
C259-260	UR837470	C.EL 47uF 16V	
C261-263	US135100	C.CE.CHP 0.1uF 16V	
C264-265	UR837100	C.EL 10uF 16V	
C268-269	US135100	C.CE.CHP 0.1uF 16V	
C270-271	UR837470	C.EL 47uF 16V	
C272	US135100	C.CE.CHP 0.1uF 16V	
C274	UU238100	C.EL 100uF 16V	
C279	US135100	C.CE.CHP 0.1uF 16V	
C283-288	US135100	C.CE.CHP 0.1uF 16V	
C289-294	UU238100	C.EL 100uF 16V	
C295-299	US135100	C.CE.CHP 0.1uF 16V	
C300	US135100	C.CE.CHP 0.1uF 16V	
C301-306	UU267100	C.EL 10uF 50V	
C307-312	UU238100	C.EL 100uF 16V	
C313-318	US135100	C.CE.CHP 0.1uF 16V	
C319-323	UA652560	C.MYLAR 560pF 50V J	
C324-328	UA653680	C.MYLAR 6800pF 50V J	
C329-330	UA654560	C.MYLAR 0.056uF 50V J	
C331-334	UA653680	C.MYLAR 6800pF 50V J	
C335-339	UA652390	C.MYLAR 390pF 50V J	
C340-341	UA654150	C.MYLAR 0.015uF 50V J	
C342-350	UA652390	C.MYLAR 390pF 50V J	

* New Parts

P.C.B. DSP

Ref. No.	Part No.	Description	Markets
C351-352	UA654150	C.MYLAR 0.015uF 50V J	
C353-356	UA652390	C.MYLAR 390pF 50V J	
C368-374	UU267100	C.EL 10uF 50V	
C375-376	UR237100	C.EL 10uF 16V	
C377-378	UU267100	C.EL 10uF 50V	
C379-390	US135100	C.CE.CHP 0.1uF 16V	
C391-396	UR237470	C.EL 47uF 16V	
C399	US061470	C.CE.CHP 47pF 50V B	
C400	US061470	C.CE.CHP 47pF 50V B	
C401-409	US135100	C.CE.CHP 0.1uF 16V	
C411-412	US135100	C.CE.CHP 0.1uF 16V	
C413-419	US163100	C.CE.CHP 1000pF 50V	
C423	US063100	C.CE.CHP 1000pF 50V B	
C426	UR238100	C.EL 100uF 16V	
C531-534	UA653270	C.MYLAR 2700pF 50V J	
C535-548	US061470	C.CE.CHP 47pF 50V B	
C551-573	US135100	C.CE.CHP 0.1uF 16V	
C574-594	US163100	C.CE.CHP 1000pF 50V	
C595-599	US135100	C.CE.CHP 0.1uF 16V	
C600-608	US135100	C.CE.CHP 0.1uF 16V	
D1	WE674800	DIODE AVR1161A1R1NTB	
D2	WE674800	DIODE AVR1161A1R1NTB	
D3	WE674800	DIODE AVR1161A1R1NTB	
D5	VT332900	DIODE 1SS355	
D7	VT332900	DIODE 1SS355	
D13	VT332900	DIODE 1SS355	
D14-19	VV220700	DIODE. SHOT RB501V-40	
D20-23	VV220700	DIODE. SHOT RB501V-40	
IC501	X3936A00	IC SN74LVU04APWR	
IC502	X5482A00	IC NE5532DR OP AMP	
IC504-505	XN518A00	IC SN74LS151NSR 8-1 S	
IC506	X6989A00	IC LC89057W-VF4A-E	
IC507	X5945A00	IC PQ012FZ01ZPH	
IC508	XZ003A00	IC PQ025EZ5M2P 2.5V	
IC509	X6051A00	IC UPC29M33T-E1-AZ	
IC510	X2080A00	IC SN74AHCT1G32DCKR	
IC511	X3824A00	IC SN74AHCT08PWR	
IC513	X3693A00	IC SN74LV245APWR TRAN	
IC514	X6123A00	IC SN74LV157APWR	
IC515	X2590B00	IC W9816G6CH-7 SDRAM	
IC516	X3567A00	IC YSS930-SZ	
IC517	XV077B00	IC MSM514260E-60JS	
IC518	X3567A00	IC YSS930-SZ	
IC520	X3505A00	IC NJM2068MD-TE2	
IC525-530	X3505A00	IC NJM2068MD-TE2	
IC532	X6123A00	IC SN74LV157APWR	
IC533-534	XV894A00	IC TC74VHC153FT MULTI	

* New Parts

P.C.B. DSP & P.C.B. FUNCTION

Ref. No.	Part No.	Description	Markets
IC539-540	X3505A00	IC	NJM2068MD-TE2
* IC541	X6231A00	IC	AK4384ET
* IC542	X7016A00	IC	MX29LV400BC-70G
* IC550	X6227B00	IC	F2602E-01
IC551	X2080A00	IC	SN74AHCT1G32DCKR
IC552	X3693A00	IC	SN74LV245APWR TRAN
IC560	X5482A00	IC	NE5532DR OP AMP
* IC564-569	X6873A00	IC	PCM1791ADBR
* IC570	X6872A00	IC	PCM1804DBR
IC571	X3833A00	IC	SN74AHC1G08DCKR
* PJ1	WF860400	JACK. PIN	LPR6520-G080FM
PN1	V9637500	PIN	L=70 #18
Q6	VD303700	TR	2SC3326 A, B
Q19	VV655400	TR. DGT	DTC114EKA
R41-42	HV753100	R. CAR. FP	1 Ω 1/4W
R52-53	HV753100	R. CAR. FP	1 Ω 1/4W
R59	HV753100	R. CAR. FP	1 Ω 1/4W
R76	HV753100	R. CAR. FP	1 Ω 1/4W
R98	HV753100	R. CAR. FP	1 Ω 1/4W
R252-253	VP939600	R. MTL. FLM	2.2 Ω 1W
R273	HV753100	R. CAR. FP	1 Ω 1/4W
R296	HV753100	R. CAR. FP	1 Ω 1/4W
R298	HV753100	R. CAR. FP	1 Ω 1/4W
R365-374	HV753470	R. CAR. FP	4.7 Ω 1/4W
R398-399	HV753470	R. CAR. FP	4.7 Ω 1/4W
U1	WB920900	CN. PHOT. SN	1P GP1FA513TZ0F
U2	WB920900	CN. PHOT. SN	1P GP1FA513TZ0F
U3	WB547900	CN. PHOT. SN	1P GP1FA513RZ0F
U4	WB547900	CN. PHOT. SN	1P GP1FA513RZ0F
U5	WB547900	CN. PHOT. SN	1P GP1FA513RZ0F
U6	WB547900	CN. PHOT. SN	1P GP1FA513RZ0F
* XL1	WE436500	RSNR. CRYST	45.1584MHz DSX840GA
XL2	V6931900	RESONATOR	24.576MHz DS0751SV
*	WG080800	P. C. B.	FUNCTION
CB301	VB858700	CN. BS. PIN	8P
CB303	VM929900	CN. BS. PIN	15P
CB304	VQ046000	CN. BS. PIN	31P
CB305	VB858800	CN. BS. PIN	9P
CB306	LB919060	CN. BS. PIN	6P
* CB307	V8810200	CN	JE 9P TE
* CB308	VU446000	CN	JE 15P TE
CB309-310	V8875600	CN	JE 13P TE
CB311	V7826400	CN	14P TE TUC SERIES
CB312	V7826100	CN	11P TE TUC SERIES
CB313	V8875600	CN	JE 13P TE

* New Parts

P.C.B. FUNCTION

Ref. No.	Part No.	Description	Markets
CB314-315	V9357000	CN	JE 19P TE
CB316	VU446000	CN	JE 15P TE
CB317-319	V9357000	CN	JE 19P TE
CB601	VU443800	CN	JE 15P SE
CB602	VB390100	CN. BS. PIN	5P
CB603	VB390500	CN. BS. PIN	9P
CB604	VQ047400	CN. BS. PIN	19P
CB605	LB919040	CN. BS. PIN	4P
CB606	VB389800	CN. BS. PIN	2P
CB607	VB390200	CN. BS. PIN	6P
CB608	LB918020	CN. BS. PIN	2P
C301	UR239100	C. EL	1000uF 16V
C303	US063100	C. CE. CHP	1000pF 50V B
C304	UR067100	C. EL	10uF 50V
C305	WB165500	C. EL	0.33F 5.5V
C306-307	UR219100	C. EL	1000uF 6.3V
C308	US064100	C. CE. CHP	0.01uF 50V B
C309	UR238100	C. EL	100uF 16V
C310-326	US135100	C. CE. CHP	0.1uF 16V
C327-334	UR266220	C. EL	2.2uF 50V
C335	UR239100	C. EL	1000uF 16V
C338	US064100	C. CE. CHP	0.01uF 50V B
C339	UR266220	C. EL	2.2uF 50V
C340	UR237470	C. EL	47uF 16V
C351	US135100	C. CE. CHP	0.1uF 16V
C352	UR267470	C. EL	47uF 50V
C353	UR237470	C. EL	47uF 16V
C354	US135100	C. CE. CHP	0.1uF 16V
C355-356	UR267470	C. EL	47uF 50V
C358-359	US062100	C. CE. CHP	100pF 50V B
C361-362	US062100	C. CE. CHP	100pF 50V B
C365-366	US062100	C. CE. CHP	100pF 50V B
C368-375	US062100	C. CE. CHP	100pF 50V B
C378-388	US062100	C. CE. CHP	100pF 50V B
C392	US062100	C. CE. CHP	100pF 50V B
C394-399	US062100	C. CE. CHP	100pF 50V B
C400-402	US062100	C. CE. CHP	100pF 50V B
C403	US135100	C. CE. CHP	0.1uF 16V
C404	UR218220	C. EL	220uF 6.3V
C405	US135100	C. CE. CHP	0.1uF 16V
C406-407	US064100	C. CE. CHP	0.01uF 50V B
C408-409	US062100	C. CE. CHP	100pF 50V B
C410-413	US135100	C. CE. CHP	0.1uF 16V
C601-602	UR237100	C. EL	10uF 16V
C603	US135220	C. CE. CHP	0.22uF 16V
C604-605	US135100	C. CE. CHP	0.1uF 16V
C606-607	UR267470	C. EL	47uF 50V
C608	US135100	C. CE. CHP	0.1uF 16V

* New Parts

P.C.B. FUNCTION

Ref. No.	Part No.	Description	Markets
C609-612	UR237100	C.EL 10uF 16V	*
C613	US135100	C.CE.CHP 0.1uF 16V	
C614-618	UR237100	C.EL 10uF 16V	
C619-625	UR238100	C.EL 100uF 16V	*
C626-627	US062100	C.CE.CHP 100pF 50V B	
C628-630	UT952100	C.PP 100pF 100V	
C631-634	US062100	C.CE.CHP 100pF 50V B	*
C635-636	UR266470	C.EL 4.7uF 50V	
C637-638	UR267470	C.EL 47uF 50V	
C639	UR266470	C.EL 4.7uF 50V	*
C640-641	UR237100	C.EL 10uF 16V	
C642-643	UR266470	C.EL 4.7uF 50V	
C644-645	UR266330	C.EL 3.3uF 50V	*
C646-651	US135100	C.CE.CHP 0.1uF 16V	
C652	UR237470	C.EL 47uF 16V	
C653	US135100	C.CE.CHP 0.1uF 16V	*
C654	WG781200	C.EL 33uF 25V	
C655	UR267470	C.EL 47uF 50V	
C656	WG782300	C.EL 10uF 50V	*
C657	WG781200	C.EL 33uF 25V	
C658	UR237470	C.EL 47uF 16V	
C659	WG781200	C.EL 33uF 25V	*
C660	UR237100	C.EL 10uF 16V	
C661	WG781200	C.EL 33uF 25V	
C662	UR267470	C.EL 47uF 50V	*
C663-665	WG781200	C.EL 33uF 25V	
C666	US135100	C.CE.CHP 0.1uF 16V	
C667-668	UR237470	C.EL 47uF 16V	*
C669-670	US061470	C.CE.CHP 47pF 50V B	
C671	US062100	C.CE.CHP 100pF 50V B	
C672-673	UR237100	C.EL 10uF 16V	*
C674-675	UT952100	C.PP 100pF 100V	
C676-681	UU267100	C.EL 10uF 50V	
C682-683	UR267470	C.EL 47uF 50V	*
C684	UR237220	C.EL 22uF 16V	
C685-686	UU267100	C.EL 10uF 50V	
C687	UR237220	C.EL 22uF 16V	*
C688-689	US135100	C.CE.CHP 0.1uF 16V	
C690-691	UR267470	C.EL 47uF 50V	
C693	US135100	C.CE.CHP 0.1uF 16V	*
C695	US135100	C.CE.CHP 0.1uF 16V	
D301	VV833200	DIODE 1SS380	
D302-307	VT332900	DIODE 1SS355	*
D308	VU992600	DIODE.ZENR MA8051-M 5.1V	
D309-310	VT332900	DIODE 1SS355	
D311	VU172000	DIODE.ZENR UDZS5.6BTE-17 5.6V	*
D312	VU993700	DIODE.ZENR MA8068-L 6.6V	
D313	VU995300	DIODE.ZENR MA8100-L 9.7V	

* New Parts

P.C.B. FUNCTION & OPERATION

Ref. No.	Part No.	Description	Markets
D314	VU993700	DIODE.ZENR MA8068-L 6.6V	(unwritten)
D601-604	VT332900	DIODE 1SS355	
D605-606	VU993700	DIODE.ZENR MA8068-L 6.6V	
IC301	X7014A00	IC CPU M30845FJGP	(unwritten)
IC571	X5886A00	IC RH5RE58AA-T1-FA	
IC601	X5044A00	IC NJU7311AM	
IC602	X5045A00	IC NJU7312AM	(unwritten)
IC603	X5044A00	IC NJU7311AM	
IC604	X5043A00	IC NJU7313AM	
IC605-609	X3505A00	IC NJM2068MD-TE2	(unwritten)
IC610	X5574A00	IC YAC526-EZE2	
IC611	X4325A00	IC YAC523-EVR2	
IC612	XF291A00	IC uPC4570G2	(unwritten)
IC613	X3505A00	IC NJM2068MD-TE2	
IC614	XF291A00	IC uPC4570G2	
IC616	XF291A00	IC uPC4570G2	(unwritten)
PN301	V9637500	PIN L=70 #18	
PN601-606	V9637500	PIN L=70 #18	
Q301	WD974200	TR 2SA1036KT146 P,Q,R	(unwritten)
Q302	VV556500	TR 2SA1037K Q,R,S	
Q303-306	VD303700	TR 2SC3326 A,B	
Q307	iC287820	TR 2SC2878 A,B	(unwritten)
Q308-315	WF767900	FET 5HP01C-TB-E	
Q323	VD303700	TR 2SC3326 A,B	
Q324	iC181510	TR 2SC1815 Y	(unwritten)
Q326-327	VP872700	TR 2SC4488 S,T	
Q328	VP872600	TR 2SA1708 S,T	
Q603	VP872700	TR 2SC4488 S,T	(unwritten)
Q604	VP872600	TR 2SA1708 S,T	
Q605-606	VZ725900	TR 2SD1938F S,T	
Q609-610	VZ725900	TR 2SD1938F S,T	(unwritten)
Q613-628	VZ725900	TR 2SD1938F S,T	
R301	VP939800	R.MTL.OXD 10Ω 1W	
R677-678	V8070200	R.MTL.FLM 4.7Ω 1W	(unwritten)
R723	HF355330	R.CAR 330Ω 1/2W	
XL301	WF997400	RSNR.CE 20MHz	
	WG083600	P.C.B. OPERATION	
CB901	VB389800	CN.BS.PIN 2P	(unwritten)
CB902	VB390200	CN.BS.PIN 6P	
CB903	VB858500	CN.BS.PIN 6P	
CB904	VB390000	CN.BS.PIN 4P	(unwritten)
CB905	VB389900	CN.BS.PIN 3P	
CB906	VB390200	CN.BS.PIN 6P	
CB907-908	VB390300	CN.BS.PIN 7P	(unwritten)
CB911	V7825900	CN 9P TE TUC SERIES	

* New Parts

P.C.B. OPERATION

Ref. No.	Part No.	Description	Markets
CB912	VQ046000	CN. BS. PIN	31P
CB913	VP798200	CN. BS. PIN	24P
C857-858	US063100	C. CE. CHP	1000pF 50V B
C883-884	US063100	C. CE. CHP	1000pF 50V B
C899	US135100	C. CE. CHP	0.1uF 16V
C900-901	UR237220	C. EL	22uF 16V
C902	US135100	C. CE. CHP	0.1uF 16V
C903	UR237100	C. EL	10uF 16V
C904	UA653100	C. MYLAR	1000pF 50V J
C905	US064100	C. CE. CHP	0.01uF 50V B
C906	UA653100	C. MYLAR	1000pF 50V J
C907-908	UR237100	C. EL	10uF 16V
C909	US061330	C. CE. CHP	33pF 50V B
C910	US135100	C. CE. CHP	0.1uF 16V
C911	UR817470	C. EL	47uF 6.3V
C912	UR237470	C. EL	47uF 16V
C913-914	US062470	C. CE. CHP	470pF 50V B
C915	US063100	C. CE. CHP	1000pF 50V B
C916-917	US062100	C. CE. CHP	100pF 50V B
C918	US135100	C. CE. CHP	0.1uF 16V
C919-920	US062100	C. CE. CHP	100pF 50V B
C921	UR237220	C. EL	22uF 16V
C922-923	US135100	C. CE. CHP	0.1uF 16V
C924-925	UR237100	C. EL	10uF 16V
C926	US135100	C. CE. CHP	0.1uF 16V
C927	US062100	C. CE. CHP	100pF 50V B
C928-929	US061100	C. CE. CHP	10pF 50V B
C930	UR237100	C. EL	10uF 16V
C931-932	WB553000	C. EL	1000uF 16V
C933	US063100	C. CE. CHP	1000pF 50V B
C934	US064100	C. CE. CHP	0.01uF 50V B
C941-942	US135100	C. CE. CHP	0.1uF 16V
C945	US135100	C. CE. CHP	0.1uF 16V
C954-958	US135100	C. CE. CHP	0.1uF 16V
D860	VU171900	DIODE. ZENR	UDZ5.1B 5.1V
D861-862	VV307700	DIODE	1N4002S
D868	WB071400	LED	BE SLR343BBT
D872-878	VT332900	DIODE	1SS355
IC853	X2080A00	IC	SN74AHCT1G32DCKR
IC854	XS377A00	IC	BA15218F OP AMP
IC855	XF291A00	IC	uPC4570G2
JK858	V9408200	JACK. PHONE	MSJ-064-05B GR
JK859	V2589500	CN. DIN	1P
JK860	WC814400	JACK. MNI	JY-3554-01-130
PJ854	V7190100	JACK. PIN	3P
PN901-903	V9637500	PIN	L=70 #18
Q864-865	VZ725900	TR	2SD1938F S, T
Q866	VV556400	TR	2SC2412K Q, R, S

* New Parts

P.C.B. OPERATION & P.C.B. MAIN

Ref. No.	Part No.	Description	Markets
Q868	VV655400	TR. DGT	DTC114EKA
R932-933	HF355100	R. CAR	100 Ω 1/2W
R955-956	HL005220	R. MTL. OXD	220 Ω 1/2W
ST853-854	WA246200	SCR. TERM	3.5
ST855-856	V4040500	SCR. TERM	M3
ST857	WA246200	SCR. TERM	3.5
SW851-853	V4757100	SW. TACT	EVQ11A
SW855	V9281200	SW. RT. ENC	EVEGC1F2512B
SW856	V4757100	SW. TACT	EVQ11A
SW857	WF875900	SW. PUSH	SPUN127100
SW858-866	V4757100	SW. TACT	EVQ11A
SW869	V9281200	SW. RT. ENC	EVEGC1F2512B
SW870-874	V4757100	SW. TACT	EVQ11A
U852	WB547900	CN. PHOT. SN	1P GP1FA513RZ0F
	WG075500	P.C.B.	MAIN
CB205	V7825800	CN	8P TE TUC SERIES
CB206	V7825500	CN	5P TE TUC SERIES
CB208	LB918030	CN. BS. PIN	3P
CB211	WB127100	CN. BS. PIN	3P TE XH
CB212	LB932060	CN. BS. PIN	6P
CB215	VB390300	CN. BS. PIN	7P
CB216	LB918020	CN. BS. PIN	2P
CB217	V7826100	CN	11P TE TUC SERIES
CB218	V7825400	CN	4P TE TUC SERIES
CB219	VB390400	CN. BS. PIN	8P
C201	VJ599100	C. CE. TUBLR	0.1uF 50V
C202	WE100900	C. PP	220pF 630V
C226	VJ599100	C. CE. TUBLR	0.1uF 50V
C234	WE100500	C. PP	100pF 630V
C235	UR297100	C. EL	10uF 100V
C236-237	WE100500	C. PP	100pF 630V
C238	UR297100	C. EL	10uF 100V
C239-240	WE100500	C. PP	100pF 630V
C241	UR397100	C. EL	10uF 100V
C242-243	WE100500	C. PP	100pF 630V
C244	UR397100	C. EL	10uF 100V
C245-246	WE100500	C. PP	100pF 630V
C247	UR297100	C. EL	10uF 100V
C248-249	WE100500	C. PP	100pF 630V
C250	UR297100	C. EL	10uF 100V
C251-252	WE100500	C. PP	100pF 630V
C253	UR297100	C. EL	10uF 100V
C254	WE100500	C. PP	100pF 630V
C255-256	VR169100	C. MYLAR	0.39uF 50V
C257	VR325300	C. MYLAR	0.047uF 100V

* New Parts

P.C.B. MAIN

Ref. No.	Part No.	Description	Markets
C258	VR325300	C.MYLAR 0.047uF 100V	
C259-260	UA654470	C.MYLAR 0.047uF 50V J	
C261	VR325300	C.MYLAR 0.047uF 100V	
C262	VR325300	C.MYLAR 0.047uF 100V	
C263	VR325300	C.MYLAR 0.047uF 100V	
C264-269	UR297100	C.EL 10uF 100V	
C270	UR266470	C.EL 4.7uF 50V	
C271	UR267330	C.EL 33uF 50V	
C275-278	UA654100	C.MYLAR 0.01uF 50V J	
C279	UA654220	C.MYLAR 0.022uF 50V J	
C280-281	UA654100	C.MYLAR 0.01uF 50V J	
* C283-284	WG001700	C.EL 12000uF 71V	
C286	UR268330	C.EL 330uF 50V	
C287	UR268100	C.EL 100uF 50V	
C288-289	VR324900	C.MYLAR 0.1uF 100V	
C290-295	UA654220	C.MYLAR 0.022uF 50V J	
C296-297	UA654100	C.MYLAR 0.01uF 50V J	
C299	UA654100	C.MYLAR 0.01uF 50V J	
C300	UA654100	C.MYLAR 0.01uF 50V J	
C301	VR324900	C.MYLAR 0.1uF 100V	
C302	VR324900	C.MYLAR 0.1uF 100V	
C303-304	UA654220	C.MYLAR 0.022uF 50V J	
C305	UA654100	C.MYLAR 0.01uF 50V J	
C350-356	UA654100	C.MYLAR 0.01uF 50V J	
D207-213	VD631600	DIODE 1SS133, 176	
D214-222	WA180300	DIODE 1SS244	
D225	VM976300	DIODE. ZENR HZS242TD 24V	
D227	VM976300	DIODE. ZENR HZS242TD 24V	
D228	VG443700	DIODE. ZENR MTZJ33B 33V	
D231	VM976300	DIODE. ZENR HZS242TD 24V	
D233	VM976300	DIODE. ZENR HZS242TD 24V	
D235	VM976300	DIODE. ZENR HZS242TD 24V	
D238	VM976300	DIODE. ZENR HZS242TD 24V	
△ D240-243	VS997800	DIODE 1T2	
△ D246	VZ755200	DIODE. BRG D15XB20 15A 200V	
D247-253	VD631600	DIODE 1SS133, 176	
D270-276	VG437500	DIODE. ZENR MTZJ5.1C 5.1V	
G201	V5995800	PLATE. GND	
IC201-202	X0515A00	IC LM61C1Z THERMAL	
PN201-208	V9637500	PIN L=70 #18	
△ Q213-214	VK432900	TR 2SD1915F S,T	
△ Q215-216	iC224030	TR 2SC2240 GR, BL	
△ Q217-219	VK432900	TR 2SD1915F S,T	
△ Q220A	iX632610	TR 2SA1837 O,Y	
△ Q220C	iX632620	TR 2SC4793 O,Y	
△ Q221A	iX632610	TR 2SA1837 O,Y	
△ Q221C	iX632620	TR 2SC4793 O,Y	
△ Q222A	iX632610	TR 2SA1837 O,Y	

* New Parts

P.C.B. MAIN

Ref. No.	Part No.	Description	Markets
△ Q222C	iX632620	TR 2SC4793 O,Y	
△ Q223A	iX632610	TR 2SA1837 O,Y	
△ Q223C	iX632620	TR 2SC4793 O,Y	
△ Q224A	iX632610	TR 2SA1837 O,Y	
△ Q224C	iX632620	TR 2SC4793 O,Y	
△ Q225A	iX632610	TR 2SA1837 O,Y	
△ Q225C	iX632620	TR 2SC4793 O,Y	
△ Q226A	iX606460	TR 2SA1492 O,P,Y	
△ Q226C	iX606470	TR 2SC3856 O,P,Y	
△ Q227A	iX606460	TR 2SA1492 O,P,Y	
△ Q227C	iX606470	TR 2SC3856 O,P,Y	
△ Q228A	iX606460	TR 2SA1492 O,P,Y	
△ Q228C	iX606470	TR 2SC3856 O,P,Y	
△ Q229A	iX606460	TR 2SA1492 O,P,Y	
△ Q229C	iX606470	TR 2SC3856 O,P,Y	
△ Q230A	iX606460	TR 2SA1492 O,P,Y	
△ Q230C	iX606470	TR 2SC3856 O,P,Y	
△ Q231A	iX606460	TR 2SA1492 O,P,Y	
△ Q231C	iX606470	TR 2SC3856 O,P,Y	
△ Q232A	iX606460	TR 2SA1492 O,P,Y	
△ Q232C	iX606470	TR 2SC3856 O,P,Y	
△ Q233A	iX632610	TR 2SA1837 O,Y	
△ Q233C	iX632620	TR 2SC4793 O,Y	
Q248-254	iC224030	TR 2SC2240 GR, BL	
Q255-256	VP872700	TR 2SC4488 S,T	
Q257	iA101510	TR 2SA1015 Y	
Q258	VP872700	TR 2SC4488 S,T	
Q261-262	VP872700	TR 2SC4488 S,T	
△ Q263-269	VR325600	TR 2SC2229 O,Y	
Q280	VP872700	TR 2SC4488 S,T	
△ R201	V3943000	R. MTL. FLM 4.7Ω 1/2W	
R202-204	HV753470	R. CAR. FP 4.7Ω 1/4W	
R212-213	HV753470	R. CAR. FP 4.7Ω 1/4W	
R215-218	HV753470	R. CAR. FP 4.7Ω 1/4W	
△ R220	HV753100	R. CAR. FP 1Ω 1/4W	
△ R222	HV753100	R. CAR. FP 1Ω 1/4W	
R263	V3946100	R. MTL. OXD 2.7KΩ 1/2W	
R264	V3945100	R. MTL. OXD 390Ω 1/2W	
R265	V3945500	R. MTL. OXD 820Ω 1/2W	
△ R266	HV755120	R. CAR. FP 120Ω 1/4W	
R267	V3946100	R. MTL. OXD 2.7KΩ 1/2W	
R268	V3945100	R. MTL. OXD 390Ω 1/2W	
R269	V3945500	R. MTL. OXD 820Ω 1/2W	
△ R270	HV755120	R. CAR. FP 120Ω 1/4W	
R271	V3946100	R. MTL. OXD 2.7KΩ 1/2W	
R272	V3944900	R. MTL. OXD 270Ω 1/2W	
R273	V3945600	R. MTL. OXD 1KΩ 1/2W	
△ R274	HV755120	R. CAR. FP 120Ω 1/4W	

* New Parts

P.C.B. MAIN & P.C.B. POWER

Ref. No.	Part No.	Description	Markets
R275	V3946100	R. MTL. OXD 2.7K Ω 1/2W	
R276	V3944900	R. MTL. OXD 270 Ω 1/2W	
R277	V3945600	R. MTL. OXD 1K Ω 1/2W	*
△ R278	HV755120	R. CAR. FP 120 Ω 1/4W	
R279	V3946100	R. MTL. OXD 2.7K Ω 1/2W	
R280	V3945100	R. MTL. OXD 390 Ω 1/2W	*
R281	V3945500	R. MTL. OXD 820 Ω 1/2W	
△ R282	HV755120	R. CAR. FP 120 Ω 1/4W	
R283	V3946100	R. MTL. OXD 2.7K Ω 1/2W	
R284	V3945100	R. MTL. OXD 390 Ω 1/2W	
R285	V3945500	R. MTL. OXD 820 Ω 1/2W	
△ R286	HV755120	R. CAR. FP 120 Ω 1/4W	
R287	V3946100	R. MTL. OXD 2.7K Ω 1/2W	
R288	V3945100	R. MTL. OXD 390 Ω 1/2W	
R289	V3945500	R. MTL. OXD 820 Ω 1/2W	
△ R290	HV755120	R. CAR. FP 120 Ω 1/4W	
R291-297	V3945600	R. MTL. OXD 1K Ω 1/2W	
△ R298-299	HV755220	R. CAR. FP 220 Ω 1/4W	
△ R300-304	HV755220	R. CAR. FP 220 Ω 1/4W	
△ R305-318	HV753470	R. CAR. FP 4.7 Ω 1/4W	
R319-320	V3873200	R. CEMENT 0.22 Ω 3W	
R321-322	WB279900	R. CEMENT RGC55C 0.22+0.22	
R325	V3873200	R. CEMENT 0.22 Ω 3W	
R326-327	WB279900	R. CEMENT RGC55C 0.22+0.22	
R349-355	VP939700	R. MTL. FLM 4.7 Ω 1W	
R363-365	HV754100	R. CAR. FP 10 Ω 1/4W	△
R367	HV754100	R. CAR. FP 10 Ω 1/4W	
R371-373	HV754100	R. CAR. FP 10 Ω 1/4W	
△ R380-382	V3942700	R. MTL. FLM 1 Ω 1/2W	*
R387	HV756100	R. CAR. FP 1K Ω 1/4W	
△ R389	HV755100	R. CAR. FP 100 Ω 1/4W	*
△ R400-404	HV754820	R. CAR. FP 82 Ω 1/4W	
R422	HV754820	R. CAR. FP 82 Ω 1/4W	
RY201-205	V6322600	RELAY DC DH24D2-OT(M)-SL	
RY206	WA544800	RELAY DC G5PA-28	
TE201	WD477700	TERM. SP LTS0810-1019FM	
TE202	WD756900	TERM. SP LTS3210-1004FM	
TE203	WD039300	TERM. SP LQR2411-0001FM	
TE204	WD477700	TERM. SP LTS0810-1019FM	
	VT669300	SCR. BW. HD 3x8-8 MFC2	
*	WG076400	P. C. B. POWER	
CB2-3	WC050700	CLIP. FUSE EYF-52BCY	
CB4	VS996100	HOLDER. FUS EYF64BC	
CB4	VS996100	HOLDER. FUS EYF64BC	
CB6	VS996100	HOLDER. FUS EYF64BC	

* New Parts

P.C.B. POWER

Ref. No.	Part No.	Description	Markets
CB6	VS996100	HOLDER. FUS EYF64BC	
CB7	VG879900	CN. BS. PIN 2P	
CB12	LB933030	CN. BS. PIN 3P	
CB13	LB919090	CN. BS. PIN 9P	
CB14	VB858400	CN. BS. PIN 5P	
CB16	LB918100	CN. BS. PIN 10P	
CB17	LB918050	CN. BS. PIN 5P	
CB20-21	VB389900	CN. BS. PIN 3P	
CB40	VB858700	CN. BS. PIN 8P	
CB41	V7827600	SOCKET 9P SE TUC SERIES	
CB42	V7827500	SOCKET 8P SE TUC SERIES	
CB43	V7827200	SOCKET 5P TE TUC SERIES	
CB44	VB858300	CN. BS. PIN 4P	
CB46	VB858500	CN. BS. PIN 6P	
CB47	V7827800	SOCKET 11P SE TUC SERIES	
CB48	V7827100	SOCKET 4P TE TUC SERIES	
CB324	VB858200	CN. BS. PIN 3P	
CB325	VB858300	CN. BS. PIN 4P	
C1	UR866220	C. EL 2.2uF 50V	
C2	UR266220	C. EL 2.2uF 50V	
C3	UA654100	C. MYLAR 0.01uF 50V J	
C4	WB687100	C. POL. MTL 0.047uF 400V	
C5	UR266100	C. EL 1uF 50V	
C6	UA653470	C. MYLAR 4700pF 50V J	
C7	WB696300	C. POL. MTL 0.1uF 400V	
△ C8	V6185300	C. CE. SAFTY 0.01uF 275V	
C9	WE102900	C. PP 0.01uF 100V	
C10	UU249330	C. EL 3300uF 25V	
C16-17	UU23A150	C. EL 15000uF 16V	
C18	UR239330	C. EL 3300uF 16V	
C19	UU23A150	C. EL 15000uF 16V	
C20	UR268100	C. EL 100uF 50V	
C21-22	UR267100	C. EL 10uF 50V	
C23	UR258470	C. EL 470uF 35V	
C24	UR249680	C. EL 6800uF 25V	
C25	UR249330	C. EL 3300uF 25V	
C26-29	UR267100	C. EL 10uF 50V	
C30-32	US035100	C. CE. CHP 0.1uF 16V B	
C33	US035100	C. CE. CHP 0.1uF 16V B	
C34-35	UR267470	C. EL 47uF 50V	
C36	UR238100	C. EL 100uF 16V	
C37-38	UR238100	C. EL 100uF 16V	
C39	UR238100	C. EL 100uF 16V	
C40	WE102900	C. PP 0.01uF 100V	
C41-45	V9415100	C. EL 10uF 16V	
C46	WE100400	C. PP 47pF 630V	
C47	WE100900	C. PP 220pF 630V	
C48	UR267100	C. EL 10uF 50V	

* New Parts

P.C.B. POWER

Ref. No.	Part No.	Description	Markets
C49	WE100400	C.PP 47pF 630V	
C50	WE100900	C.PP 220pF 630V	
C51	UR267100	C.EL 10uF 50V	
C52	WE100400	C.PP 47pF 630V	
C53	WE100900	C.PP 220pF 630V	
C54	UR267100	C.EL 10uF 50V	
C55	WE100400	C.PP 47pF 630V	
C56	WE100900	C.PP 220pF 630V	
C57	UR267100	C.EL 10uF 50V	
C58	WE100400	C.PP 47pF 630V	
C59	WE100900	C.PP 220pF 630V	*
C60	UR267100	C.EL 10uF 50V	
C61-62	UU268100	C.EL 100uF 50V	
C63-64	UR267470	C.EL 47uF 50V	
C65	UU268100	C.EL 100uF 50V	
C66-69	WE100100	C.PP 15pF 630V	
C70	WE100100	C.PP 15pF 630V	
C71-75	WE101700	C.PP 1000pF 100V	
C76	UR266470	C.EL 4.7uF 50V	
C77	UR267470	C.EL 47uF 50V	
C78	UR218220	C.EL 220uF 6.3V	
C79	UR237100	C.EL 10uF 16V	
C80	UR237100	C.EL 10uF 16V	
C81	WE100400	C.PP 47pF 630V	
C82	UA652220	C.MYLAR 220pF 50V J	
C83	UR267100	C.EL 10uF 50V	
C84	WE100400	C.PP 47pF 630V	
C85	UA652220	C.MYLAR 220pF 50V J	
C86	UR267100	C.EL 10uF 50V	
C87-88	UR297220	C.EL 22uF 100V	
C89	UR267470	C.EL 47uF 50V	
C90	UR267470	C.EL 47uF 50V	
C91-92	UA653100	C.MYLAR 1000pF 50V J	
C93-94	WE100100	C.PP 15pF 630V	
C95	WE100900	C.PP 220pF 630V	
C96	UU238100	C.EL 100uF 16V	
C98	UR267470	C.EL 47uF 50V	
C99	UR297220	C.EL 22uF 100V	
C100	UR297220	C.EL 22uF 100V	
C101	UR267470	C.EL 47uF 50V	
C102	US035100	C.CE.CHP 0.1uF 16V B	
C103	US035100	C.CE.CHP 0.1uF 16V B	
* C104-106	UU23A150	C.EL 15000uF 16V	
C107	UR247100	C.EL 10uF 25V	
C108	UR218470	C.EL 470uF 6.3V	
C111	US035100	C.CE.CHP 0.1uF 16V B	
C112-114	US065100	C.CE.CHP 0.1uF 50V B	
C210	UR297470	C.EL 47uF 100V	

* New Parts

P.C.B. POWER

Ref. No.	Part No.	Description	Markets
C369-371	US035100	C.CE.CHP 0.1uF 16V B	
C372	UR267470	C.EL 47uF 50V	
C495	UR267470	C.EL 47uF 50V	
C499	UU266220	C.EL 2.2uF 50V	
C500	UR267470	C.EL 47uF 50V	
C501	UU266100	C.EL 1uF 50V	
D1	VD631600	DIODE 1SS133, 176	
D2	VD631600	DIODE 1SS133, 176	
D3	VD631600	DIODE 1SS133, 176	
D4	VD631600	DIODE 1SS133, 176	
D5	WA631200	DIODE.ZENR HZS3B1TD 3.0V TP	
D6	VG438300	DIODE.ZENR MTZJ6.8B 6.8V	
D7	VG439500	DIODE.ZENR MTZJ10B 10V	
D8	VD631600	DIODE 1SS133, 176	
D9	VG438700	DIODE.ZENR MTZJ7.5C 7.5V	
△ D10	V4756800	DIODE S1NB60 1.0A 600V	
△ D11	VR253700	DIODE.BRG S1NB20 1A 200V	
△ D12-14	V6855600	DIODE.BRG D4SBS4-4101 4A	
△ D15	V4269600	DIODE.BRG D2SBA20 1.5A 200V	
D16	VG440400	DIODE.ZENR MTZJ13A 13V	
D19	VU993400	DIODE.ZENR MA8062-M 6.2V	
D20	VS997800	DIODE 1T2	
D21	VS858600	DIODE.ZENR HZS24-1 24V	
D22-23	VU996600	DIODE.ZENR MA8130-M 13.0V	
D24	VU991700	DIODE.ZENR MA8043-L 4.1V	
D28	V2376600	DIODE.SHOT RB500V-40	
D30	VT332900	DIODE 1SS355	
D31	VT332900	DIODE 1SS355	
D40-42	VD631600	DIODE 1SS133, 176	
D43-45	WA180300	DIODE 1SS244	
D46	VG437200	DIODE.ZENR MTZJ4.7C 4.7V	
D47-49	WA180300	DIODE 1SS244	
D50-54	WA180300	DIODE 1SS244	
D56	VG437400	DIODE.ZENR MTZJ5.1B 5.1V	
D323	VT332900	DIODE 1SS355	
△ F1	KB001390	FUSE 10A 250V	
△ F2	VS823400	FUSE 10A 125V	
△ IC1-2	V8100500	PHOT.CPL TLP421 GR	
△ IC3	iG001180	IC TC4013BP FF	
△ IC4	XU814A00	IC PQ05RD11 +5V 1.0A	
△ IC5-6	X2530A00	IC PQ05RD21 +5V 2.0A	
△ IC7	XU814A00	IC PQ05RD11 +5V 1.0A	
* △ IC317-318	X7218A00	IC PQ30RV21	
△ IC319	X2530A00	IC PQ05RD21 +5V 2.0A	
IC320	XE436A00	IC NJM79M05FA	
PN1	V9637500	PIN L=70 #18	
PN40	V9637500	PIN L=70 #18	
PN42-47	V9637500	PIN L=70 #18	

* New Parts

P.C.B. POWER & P.C.B. INPUT

Ref. No.	Part No.	Description	Markets
R61	HF357330	R. CAR	33K Ω 1/2W
R62-63	HF356220	R. CAR	2.2K Ω 1/2W
R67	HF356220	R. CAR	2.2K Ω 1/2W
R68	HF357330	R. CAR	33K Ω 1/2W
R70	HF357330	R. CAR	33K Ω 1/2W
R76-77	HF356120	R. CAR	1.2K Ω 1/2W
R80	HF356120	R. CAR	1.2K Ω 1/2W
R81-82	HF357330	R. CAR	33K Ω 1/2W
R85	HF357330	R. CAR	33K Ω 1/2W
R86-87	HF355330	R. CAR	330 Ω 1/2W
R90	HF355330	R. CAR	330 Ω 1/2W
R91	V3733100	R. MTL. OXD	39 Ω 1W
R92	HF355470	R. CAR	470 Ω 1/2W
R93	V3733100	R. MTL. OXD	39 Ω 1W
R94	HF355470	R. CAR	470 Ω 1/2W
R95-96	HV754390	R. CAR. FP	39 Ω 1/4W
R97	V3733100	R. MTL. OXD	39 Ω 1W
R98	HF355470	R. CAR	470 Ω 1/2W
R101-102	HF357470	R. CAR	47K Ω 1/2W
R105	HF357470	R. CAR	47K Ω 1/2W
R138	HF353220	R. CAR	2.2 Ω 1/2W
R145-146	HV754390	R. CAR. FP	39 Ω 1/4W
R153	HV756470	R. CAR. FP	4.7K Ω 1/4W
R154	HV756680	R. CAR. FP	6.8K Ω 1/4W
R155	HV756820	R. CAR. FP	8.2K Ω 1/4W
R160-162	HV753470	R. CAR. FP	4.7 Ω 1/4W
R164	HV757100	R. CAR. FP	10K Ω 1/4W
R166	HV754100	R. CAR. FP	10 Ω 1/4W
R168	HV754100	R. CAR. FP	10 Ω 1/4W
R170-173	HV755100	R. CAR. FP	100 Ω 1/4W
R499	VP939500	R. MTL. FLM	1 Ω 1W
R500-501	VP939500	R. MTL. FLM	1 Ω 1W
RY1	V9366900	RELAY	DLS9D1-O (M) 0.25W
ST301	WA246200	SCR. TERM	3.5
T1	X7033A00	TRANS. PWR	
TE1	VU543100	OUTLET. AC	2P
TE2	WB782600	AC INLET	R-30190 (26)
TH1	VV458400	POLY SW	RUEF600 6.00A 30V
	VT669300	SCR. BW. HD	3x8-8 MFC2
	WG082700	P. C. B.	INPUT
CB301	VU443800	CN	JE 15P SE
CB302	V7828200	SOCKET	15P TE TUC SERIES
CB303-304	V8875300	CN	JE 13P SE
CB305	V7826500	CN	15P TE TUC SERIES
CB306	V8809800	CN	JE 9P SE
CB307	VB858400	CN. BS. PIN	5P

* New Parts

P.C.B. INPUT

Ref. No.	Part No.	Description	Markets
CB308	V7826500	CN 15P TE TUC SERIES	
CB309	V7828200	SOCKET 15P TE TUC SERIES	
CB315-316	V7827000	CN 20P TE TUC SERIES	
CB317	V7825600	CN 6P TE TUC SERIES	
CB332	VB390800	CN.BS.PIN 12P	
CB600	VP798200	CN.BS.PIN 24P	
CB601	VC166500	CN.BS.PIN 12P	
CB909	VF982300	CN.BS.PIN 17P	
CB910	VQ047200	CN.BS.PIN 9P	
C301-302	US135100	C.CE.CHP 0.1uF 16V	
C303-306	US062220	C.CE.CHP 220pF 50V B	
C307-308	US062100	C.CE.CHP 100pF 50V B	
C309-310	US062220	C.CE.CHP 220pF 50V B	
C311-312	US062100	C.CE.CHP 100pF 50V B	
C313-314	UA652220	C.MYLAR 220pF 50V J	
C315-316	US062220	C.CE.CHP 220pF 50V B	
C317-320	UA652220	C.MYLAR 220pF 50V J	
C321	UA652470	C.MYLAR 470pF 50V J	
C322	UA652220	C.MYLAR 220pF 50V J	
C323-328	UR266220	C.EL 2.2uF 50V	
C329-330	UR218220	C.EL 220uF 6.3V	
C331-332	UA654390	C.MYLAR 0.039uF 50V J	
C333-334	UA654110	C.MYLAR 0.011uF 50V J	
C335-342	UR237100	C.EL 10uF 16V	
C343-344	UR237470	C.EL 47uF 16V	
C345-348	UA653100	C.MYLAR 1000pF 50V J	
C349-350	UR267470	C.EL 47uF 50V	
C351-354	UR237100	C.EL 10uF 16V	
C355-356	UR267470	C.EL 47uF 50V	
C357-358	UR266470	C.EL 4.7uF 50V	
C359-360	UT952100	C.PP 100pF 100V	
C361-362	UR267470	C.EL 47uF 50V	
C363	US135100	C.CE.CHP 0.1uF 16V	
C364-365	UR266470	C.EL 4.7uF 50V	
C366	US135100	C.CE.CHP 0.1uF 16V	
C367-368	UR237100	C.EL 10uF 16V	
C373-376	US062470	C.CE.CHP 470pF 50V B	
C377-380	US062220	C.CE.CHP 220pF 50V B	
C381-382	US062100	C.CE.CHP 100pF 50V B	
C383-384	US062220	C.CE.CHP 220pF 50V B	
C385-386	US062100	C.CE.CHP 100pF 50V B	
C387-388	UA652220	C.MYLAR 220pF 50V J	
C389-390	US062220	C.CE.CHP 220pF 50V B	
C391-394	UR266470	C.EL 4.7uF 50V	
C395	UR237100	C.EL 10uF 16V	
C396	US135100	C.CE.CHP 0.1uF 16V	
C397	UR237100	C.EL 10uF 16V	
C398-399	UR237470	C.EL 47uF 16V	

* New Parts

P.C.B. INPUT

Ref. No.	Part No.	Description	Markets
C400-401	UR237220	C.EL 22uF 16V	
C403	UR237470	C.EL 47uF 16V	
C404	US135100	C.CE.CHP 0.1uF 16V	
C405-406	US034680	C.CE.CHP 0.068uF 16V K	
C407-414	VR168300	C.MYLAR 0.1uF 50V	
C415-418	UA653270	C.MYLAR 2700pF 50V J	
C419	US135100	C.CE.CHP 0.1uF 16V	
C420-421	UR267470	C.EL 47uF 50V	
C422-425	UR266470	C.EL 4.7uF 50V	
C426-429	US135100	C.CE.CHP 0.1uF 16V	
C430	UR237470	C.EL 47uF 16V	
C431	US135100	C.CE.CHP 0.1uF 16V	
C432-434	UR237100	C.EL 10uF 16V	
C435	UR237470	C.EL 47uF 16V	
C436	UR237100	C.EL 10uF 16V	
C437	US135100	C.CE.CHP 0.1uF 16V	
C438-439	UR237100	C.EL 10uF 16V	
C442	US063100	C.CE.CHP 1000pF 50V B	
C443-444	US135100	C.CE.CHP 0.1uF 16V	
C447	US063100	C.CE.CHP 1000pF 50V B	
C448-451	UA652470	C.MYLAR 470pF 50V J	
C452	VE326800	C.MYLAR 0.47uF 50V	
C453-455	UA652470	C.MYLAR 470pF 50V J	
C456	US063100	C.CE.CHP 1000pF 50V B	
C461	UR218100	C.EL 100uF 6.3V	
C600-602	US064100	C.CE.CHP 0.01uF 50V B	
C603	US135100	C.CE.CHP 0.1uF 16V	
C604	UR218100	C.EL 100uF 6.3V	
C605	US064100	C.CE.CHP 0.01uF 50V B	
C606	UR218330	C.EL 330uF 6.3V	
C607	US135100	C.CE.CHP 0.1uF 16V	
C608-609	US062100	C.CE.CHP 100pF 50V B	
C610	US135100	C.CE.CHP 0.1uF 16V	
C611	UR218330	C.EL 330uF 6.3V	
C612	US135100	C.CE.CHP 0.1uF 16V	
C614	US062100	C.CE.CHP 100pF 50V B	
C619	US064100	C.CE.CHP 0.01uF 50V B	
C622	US064100	C.CE.CHP 0.01uF 50V B	
C623-624	US135100	C.CE.CHP 0.1uF 16V	
C625-631	US061220	C.CE.CHP 22pF 50V B	
C632	US135100	C.CE.CHP 0.1uF 16V	
C633-634	US063100	C.CE.CHP 1000pF 50V B	
C635	UR267470	C.EL 47uF 50V	
D301-302	VT332900	DIODE 1SS355	
D305	VT332900	DIODE 1SS355	
D307-308	VT332900	DIODE 1SS355	
D309	V2598200	LED SIR-505ST	
D311-312	VT332900	DIODE 1SS355	

* New Parts

P.C.B. A-VIDEO

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Ref. No.	Part No.	Description	Markets
CB602	VQ047800	CN. BS. PIN	27P
CB603	V7828700	SOCKET	20P SE TUC SERIES
CB701	V7828100	SOCKET	14P TE TUC SERIES
CB703	VQ045600	CN. BS. PIN	27P SE
CB704	V7827300	SOCKET	6P TE TUC SERIES
C611-613	US060800	C. CE. CHP	8pF 50V B
C641	US135100	C. CE. CHP	0.1uF 16V
C642	UR237470	C. EL	47uF 16V
C643	US135100	C. CE. CHP	0.1uF 16V
C644	UR237470	C. EL	47uF 16V
C645	US135100	C. CE. CHP	0.1uF 16V
C646	UR237470	C. EL	47uF 16V
C647	US135100	C. CE. CHP	0.1uF 16V
C648	UR237470	C. EL	47uF 16V
C649	US135100	C. CE. CHP	0.1uF 16V
C650	UR237470	C. EL	47uF 16V
C651	US135100	C. CE. CHP	0.1uF 16V
C652	UR237470	C. EL	47uF 16V
C653	US135100	C. CE. CHP	0.1uF 16V
C654	UR237470	C. EL	47uF 16V
C655	US135100	C. CE. CHP	0.1uF 16V
C656	UR237470	C. EL	47uF 16V
C657	US135100	C. CE. CHP	0.1uF 16V
C658	UR237470	C. EL	47uF 16V
C659	US135100	C. CE. CHP	0.1uF 16V
C660	UR237470	C. EL	47uF 16V
C661	US135100	C. CE. CHP	0.1uF 16V
C662-663	UR237470	C. EL	47uF 16V
C664-665	US135100	C. CE. CHP	0.1uF 16V
C666-667	UR237470	C. EL	47uF 16V
C668-669	US135100	C. CE. CHP	0.1uF 16V
C670	UR237470	C. EL	47uF 16V
C672-673	US135100	C. CE. CHP	0.1uF 16V
C674	UR237470	C. EL	47uF 16V
C676	US135100	C. CE. CHP	0.1uF 16V
C677	UR218330	C. EL	330uF 6.3V
C678	US135100	C. CE. CHP	0.1uF 16V
C679	UR238330	C. EL	330uF 16V
C680	US135100	C. CE. CHP	0.1uF 16V
C681	UR218330	C. EL	330uF 6.3V
C682	US135100	C. CE. CHP	0.1uF 16V
C683	UR266100	C. EL	1uF 50V
C686	US135100	C. CE. CHP	0.1uF 16V
C687-691	UR266100	C. EL	1uF 50V
C692	US135100	C. CE. CHP	0.1uF 16V
C693	UR238470	C. EL	470uF 16V
C694	US135100	C. CE. CHP	0.1uF 16V
C695	US064100	C. CE. CHP	0.01uF 50V B

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P.C.B. A-VIDEO

Ref. No.	Part No.	Description	Markets
C696	UR266220	C. EL 2.2uF 50V	
C697	US135100	C. CE. CHP 0.1uF 16V	
C698	UR238100	C. EL 100uF 16V	
C699	US135100	C. CE. CHP 0.1uF 16V	
C701-702	US135100	C. CE. CHP 0.1uF 16V	
C703	US135100	C. CE. CHP 0.1uF 16V	*
C704-705	US135100	C. CE. CHP 0.1uF 16V	
C706-708	US061470	C. CE. CHP 47pF 50V B	
C709	US135100	C. CE. CHP 0.1uF 16V	*
C710-712	US061470	C. CE. CHP 47pF 50V B	
C713	US135100	C. CE. CHP 0.1uF 16V	
C714-716	US062100	C. CE. CHP 100pF 50V B	
C718	US135100	C. CE. CHP 0.1uF 16V	
C742-743	UR237470	C. EL 47uF 16V	
C745-746	UR237470	C. EL 47uF 16V	*
C748-749	UR237470	C. EL 47uF 16V	
C752-754	US135100	C. CE. CHP 0.1uF 16V	
C755	UR218220	C. EL 220uF 6.3V	
C757	UR218220	C. EL 220uF 6.3V	*
C759-760	UR218100	C. EL 100uF 6.3V	
C761-762	US135100	C. CE. CHP 0.1uF 16V	
C763	UR218220	C. EL 220uF 6.3V	*
C764-765	US135100	C. CE. CHP 0.1uF 16V	*
C766	UR218220	C. EL 220uF 6.3V	*
C771-772	UR266470	C. EL 4.7uF 50V	
C774-775	US135100	C. CE. CHP 0.1uF 16V	*
C776	UR237100	C. EL 10uF 16V	
C777	UR266470	C. EL 4.7uF 50V	*
C778	UR218100	C. EL 100uF 6.3V	
C779	UR218330	C. EL 330uF 6.3V	*
C780	UR218100	C. EL 100uF 6.3V	
C781-782	US060300	C. CE. CHP 3pF 50V B	
C783-784	US061240	C. CE. CHP 24pF 50V B	*
C785	US060300	C. CE. CHP 3pF 50V B	
C786	US135100	C. CE. CHP 0.1uF 16V	
C787	UR218100	C. EL 100uF 6.3V	
C788-789	UR266100	C. EL 1uF 50V	
C791	US063120	C. CE. CHP 1200pF 50V B	
C792	US062470	C. CE. CHP 470pF 50V B	
C799	US135100	C. CE. CHP 0.1uF 16V	
C811	US064100	C. CE. CHP 0.01uF 50V B	
C812	UR218470	C. EL 470uF 6.3V	
C813	US062120	C. CE. CHP 120pF 50V B	
C814	US062220	C. CE. CHP 220pF 50V B	
C815	UR237100	C. EL 10uF 16V	
C816	UR237470	C. EL 47uF 16V	
C821-822	US135100	C. CE. CHP 0.1uF 16V	
C824	US062220	C. CE. CHP 220pF 50V B	

* New Parts

P.C.B. A-VIDEO

Ref. No.	Part No.	Description	Markets
C826	US062220	C. CE. CHP 220pF 50V B	
D611-612	VT332900	DIODE 1SS355	
D701-706	VT332900	DIODE 1SS355	
D771-774	VT332900	DIODE 1SS355	
D811-812	VT332900	DIODE 1SS355	
IC601	X6757A00	IC NJW1321FP1	
IC602	X2904A00	IC NJM2581M VIDEO AMP	
IC605	X2484A00	IC TA1318AF	
IC606	X6758A00	IC LA73054-TLM-E	
IC607	XY877A00	IC MM74HC4053SJX	
IC701	XY550A00	IC MM74HC4051SJX	
IC703	XY550A00	IC MM74HC4051SJX	
IC705	X4321A00	IC CD4051BNSR	
IC708	XY877A00	IC MM74HC4053SJX	
IC709	X6742A00	IC LA73050-TLM-E	
IC710	XZ177A00	IC LA7104M VIDEO AMP	
IC712	XW939A00	IC TK15420M VIDEO AMP	
IC713	XD598A00	IC TC74HCU04AFEL INV	
IC714	X6849A00	IC BD7851FP-E2	
IC715	X5597A00	IC LC74781JM-9798	
IC716	XY877A00	IC MM74HC4053SJX	
JK701-702	WD396300	JACK. PIN LAP5100-1601FC	
JK703	WD396100	JACK. PIN LAP5100-1801FC	
PJ601-602	WD442700	JACK. PIN LPR6520-M610FC	
PN701-702	V9637500	PIN L=70 #18	
Q601-602	WG261200	FET 2SK2158-T2B-A	
Q701	VV556400	TR 2SC2412K Q, R, S	
Q702	WF550000	TR 2SC3837K T146 N, P	
Q703	VV556500	TR 2SA1037K Q, R, S	
Q704	WF549900	TR 2SC3906K T146 R, S	
Q705	VZ725900	TR 2SD1938F S, T	
Q706	VV556400	TR 2SC2412K Q, R, S	
Q711-713	WG261200	FET 2SK2158-T2B-A	
Q717	VV556400	TR 2SC2412K Q, R, S	
R665	HV753100	R. CAR. FP 1Ω 1/4W	
R676-677	HV753100	R. CAR. FP 1Ω 1/4W	
R680	HV753100	R. CAR. FP 1Ω 1/4W	
R688-690	HV753100	R. CAR. FP 1Ω 1/4W	
R738-739	HV753100	R. CAR. FP 1Ω 1/4W	
R760-763	HV753100	R. CAR. FP 1Ω 1/4W	
R780	HV755470	R. CAR. FP 470Ω 1/4W	
R783	HV753220	R. CAR. FP 2.2Ω 1/4W	
R787	HV755470	R. CAR. FP 470Ω 1/4W	
R790-791	HV755470	R. CAR. FP 470Ω 1/4W	
R794-795	HV753100	R. CAR. FP 1Ω 1/4W	
R800	HV755470	R. CAR. FP 470Ω 1/4W	
R812	HV753220	R. CAR. FP 2.2Ω 1/4W	
R821	HV753100	R. CAR. FP 1Ω 1/4W	

* New Parts

P.C.B. A-VIDEO & P.C.B. D-VIDEO

Ref. No.	Part No.	Description	Markets
XL601	V5345200	RSNR. CE	CSBLA503KECZF30-B0
XL715	WC061400	RSNR. CRYST	14.31818MHz SMD-49
*	WG081900	P.C.B.	D-VIDEO
	CB302	V9356900	CN JE 19P SE
	CB501	V7828700	SOCKET 20P SE TUC SERIES
	CB502	V8875300	CN JE 13P SE
	CB504	VQ044400	CN.BS. PIN 9P
	CB506	LB919020	CN.BS. PIN 2P
	CB507	V6509500	SOCKET 9P SE 3170
	CB508	LB919040	CN.BS. PIN 4P
	CB510	V9356900	CN JE 19P SE
*	CN301-303	WC688700	CN 19P HDMI
	C301-302	US135100	C.CE. CHP 0.1uF 16V
	C303	V5333500	C.CE. CHP 10uF 6.3V
	C304-305	US063100	C.CE. CHP 1000pF 50V B
	C306-309	US135100	C.CE. CHP 0.1uF 16V
	C310-311	US063100	C.CE. CHP 1000pF 50V B
	C312	US135100	C.CE. CHP 0.1uF 16V
	C313	US063100	C.CE. CHP 1000pF 50V B
	C314-316	US135100	C.CE. CHP 0.1uF 16V
	C317	US063100	C.CE. CHP 1000pF 50V B
	C318-319	US135100	C.CE. CHP 0.1uF 16V
	C320	US063100	C.CE. CHP 1000pF 50V B
	C321-322	US064100	C.CE. CHP 0.01uF 50V B
	C323-325	V5333500	C.CE. CHP 10uF 6.3V
	C326	US135100	C.CE. CHP 0.1uF 16V
	C327-329	V5333500	C.CE. CHP 10uF 6.3V
	C330-344	US135100	C.CE. CHP 0.1uF 16V
	C345	US061150	C.CE. CHP 15pF 50V B
	C346	US064100	C.CE. CHP 0.01uF 50V B
	C350	US135100	C.CE. CHP 0.1uF 16V
	C351	US064100	C.CE. CHP 0.01uF 50V B
	C352	US061150	C.CE. CHP 15pF 50V B
	C353-363	US135100	C.CE. CHP 0.1uF 16V
	C364	UF018100	C.EL. CHP 100uF 6.3V
	C365-366	US135100	C.CE. CHP 0.1uF 16V
	C367	UF018100	C.EL. CHP 100uF 6.3V
	C368	US135100	C.CE. CHP 0.1uF 16V
	C381-383	US135100	C.CE. CHP 0.1uF 16V
	C384-387	US063100	C.CE. CHP 1000pF 50V B
	C388-389	US135100	C.CE. CHP 0.1uF 16V
	C390-392	US063100	C.CE. CHP 1000pF 50V B
	C509	US135100	C.CE. CHP 0.1uF 16V
	C510	US064100	C.CE. CHP 0.01uF 50V B
	C511	UF037100	C.EL. CHP 10uF 16V

* New Parts

P.C.B. D-VIDEO

Ref. No.	Part No.	Description	Markets
C512-513	US135100	C.CE. CHP 0.1uF 16V	
C514-515	UF037100	C.EL. CHP 10uF 16V	
C517-520	US135100	C.CE. CHP 0.1uF 16V	
C521-522	US064100	C.CE. CHP 0.01uF 50V B	
C524	UF037100	C.EL. CHP 10uF 16V	
C525-531	US135100	C.CE. CHP 0.1uF 16V	
C532	US064100	C.CE. CHP 0.01uF 50V B	
C533	US063100	C.CE. CHP 1000pF 50V B	
C534	US064100	C.CE. CHP 0.01uF 50V B	
C536	US034820	C.CE. CHP 0.082uF 16V K	
C538	US064100	C.CE. CHP 0.01uF 50V B	
C539	US135100	C.CE. CHP 0.1uF 16V	
C540	US060700	C.CE. CHP 7pF 50V B	
C541	US064100	C.CE. CHP 0.01uF 50V B	
C542-543	US135100	C.CE. CHP 0.1uF 16V	
C544	US060700	C.CE. CHP 7pF 50V B	
C545	UF018100	C.EL. CHP 100uF 6.3V	
C546	US135100	C.CE. CHP 0.1uF 16V	
C548	US135100	C.CE. CHP 0.1uF 16V	
C549-555	UF018100	C.EL. CHP 100uF 6.3V	
C558	US064100	C.CE. CHP 0.01uF 50V B	
C559	US135100	C.CE. CHP 0.1uF 16V	
C560-561	US064100	C.CE. CHP 0.01uF 50V B	
C562-563	US135100	C.CE. CHP 0.1uF 16V	
C564	UF037470	C.EL. CHP 47uF 16V	
C567	US062820	C.CE. CHP 820pF 50V B	
C568-569	US135100	C.CE. CHP 0.1uF 16V	
C570	US063390	C.CE. CHP 3900pF 50V B	
C571-572	US135100	C.CE. CHP 0.1uF 16V	
C583-584	UF037100	C.EL. CHP 10uF 16V	
C587	US135100	C.CE. CHP 0.1uF 16V	
C598	UF037100	C.EL. CHP 10uF 16V	
C600	UF037100	C.EL. CHP 10uF 16V	
C601-602	US135100	C.CE. CHP 0.1uF 16V	
C603	UF037470	C.EL. CHP 47uF 16V	
C609	UF037470	C.EL. CHP 47uF 16V	
C610	US135100	C.CE. CHP 0.1uF 16V	
C612-620	US135100	C.CE. CHP 0.1uF 16V	
C621	UF037470	C.EL. CHP 47uF 16V	
C622-629	US135100	C.CE. CHP 0.1uF 16V	
C630	UF037470	C.EL. CHP 47uF 16V	
C631	US135100	C.CE. CHP 0.1uF 16V	
C633-636	US135100	C.CE. CHP 0.1uF 16V	
C638-639	US135100	C.CE. CHP 0.1uF 16V	
C640	UF037470	C.EL. CHP 47uF 16V	
C641-643	US135100	C.CE. CHP 0.1uF 16V	
C644	US063100	C.CE. CHP 1000pF 50V B	
C645	US135100	C.CE. CHP 0.1uF 16V	

* New Parts

P.C.B. D-VIDEO

Ref. No.	Part No.	Description	Markets
C647	US135100	C.CE.CHP 0.1uF 16V	
C651-652	UR238470	C.EL 470uF 16V	
C654-657	US135100	C.CE.CHP 0.1uF 16V	
C660	UF018100	C.EL.CHP 100uF 6.3V	
C663-664	US135100	C.CE.CHP 0.1uF 16V	
C666-667	UR237470	C.EL 47uF 16V	
C669-670	UR238470	C.EL 470uF 16V	
C673	US135100	C.CE.CHP 0.1uF 16V	
C675-676	US135100	C.CE.CHP 0.1uF 16V	
C679-680	US135100	C.CE.CHP 0.1uF 16V	
C684	UF037470	C.EL.CHP 47uF 16V	
C685-686	UR237470	C.EL 47uF 16V	
C689	US064100	C.CE.CHP 0.01uF 50V B	
C690	UF037470	C.EL.CHP 47uF 16V	
C691-693	US135100	C.CE.CHP 0.1uF 16V	
C697-699	US135100	C.CE.CHP 0.1uF 16V	
C700-701	US135100	C.CE.CHP 0.1uF 16V	
C704-705	US135100	C.CE.CHP 0.1uF 16V	
C706-708	US064100	C.CE.CHP 0.01uF 50V B	
C710	US064100	C.CE.CHP 0.01uF 50V B	
C714	US135100	C.CE.CHP 0.1uF 16V	
C726	US135100	C.CE.CHP 0.1uF 16V	
C740	US135100	C.CE.CHP 0.1uF 16V	
C741	US063100	C.CE.CHP 1000pF 50V B	*
C742	US135100	C.CE.CHP 0.1uF 16V	*
C743	US063100	C.CE.CHP 1000pF 50V B	*
C744	US135100	C.CE.CHP 0.1uF 16V	*
C745	US063100	C.CE.CHP 1000pF 50V B	
C746	US135100	C.CE.CHP 0.1uF 16V	
C747	US063100	C.CE.CHP 1000pF 50V B	
C748-749	US135100	C.CE.CHP 0.1uF 16V	
C750	US063100	C.CE.CHP 1000pF 50V B	
C751-752	US135100	C.CE.CHP 0.1uF 16V	*
C753	US063100	C.CE.CHP 1000pF 50V B	*
C754	US135100	C.CE.CHP 0.1uF 16V	
C755	US063100	C.CE.CHP 1000pF 50V B	
C756-757	US135100	C.CE.CHP 0.1uF 16V	
C758	US063100	C.CE.CHP 1000pF 50V B	*
C759-762	US135100	C.CE.CHP 0.1uF 16V	
C763	US063100	C.CE.CHP 1000pF 50V B	*
C764-767	US135100	C.CE.CHP 0.1uF 16V	*
C771	US063100	C.CE.CHP 1000pF 50V B	*
C772	US126100	C.CE.CHP 1uF 10V	*
C773	US063100	C.CE.CHP 1000pF 50V B	
C774	US126100	C.CE.CHP 1uF 10V	
C775-780	US063100	C.CE.CHP 1000pF 50V B	
C781	US126100	C.CE.CHP 1uF 10V	
C782	US063100	C.CE.CHP 1000pF 50V B	

* New Parts

P.C.B. D-VIDEO

Ref. No.	Part No.	Description	Markets
C783	US126100	C.CE.CHP 1uF 10V	
C784-786	US064100	C.CE.CHP 0.01uF 50V B	
C787	US135100	C.CE.CHP 0.1uF 16V	
C789	US135100	C.CE.CHP 0.1uF 16V	
D312	VT332900	DIODE 1SS355	
D315	VT332900	DIODE 1SS355	
D318	VT332900	DIODE 1SS355	
D321-325	VT332900	DIODE 1SS355	
D601-603	VT332900	DIODE 1SS355	
D605-608	VT332900	DIODE 1SS355	
D610-617	VT332900	DIODE 1SS355	
IC301-302	X4503A00	IC SN74CBT3306PWR	
IC303-304	X3530A00	IC 24LC04BT-1/SN	
IC305	X4061A00	IC SN74AHC2GU04HDCTR	
IC306	X5817A00	IC LE50ABD 5.0V 0.1A	
IC307	X3801A00	IC SN74LVC1G125DCKR	
IC308	X5816A00	IC.CPU SI19030CTU HDMI TX	
IC309	X5815A00	IC.CPU SI19031CTU HDMI RX	
IC310	X5818A00	IC.CPU PCA9540BDP 12C MUX	
IC311	XZ287A00	IC SN74LVC245APWR	
IC312	X5827A00	IC UPC37M31TJ-E1-AZ	
IC314	X4465A00	IC SN74AHCT1G125DCKR	
IC501	X2965A00	IC.CPU M30805SGP	
IC503	X6802A00	IC ADV7401BSTZ-80	
IC504	X6801A00	IC ADV7322KSTZ	
IC505	X6853A00	IC MATISSE 1A G	
IC507	X7220A00	IC S29JL032H70TF1020	
IC509	X2590B00	IC W9816G6CH-7 SDRAM	
IC510-512	X5741A00	IC SN74LVC541APWR	
IC520	X2709A00	IC SN74AHCT245PWR	
IC521	X4463A00	IC SN74LV08APWR	
IC522	X3824A00	IC SN74AHCT08PWR	
IC524	X6848A00	IC LA73053-TLM-E	
IC525	X7171A00	IC SN74LVC2G125DCUR	
IC526	X4465A00	IC SN74AHCT1G125DCKR	
IC527	XZ000A00	IC PST9242NR	
IC528	X4454A00	IC SN74LVC2G17DCKR	
IC529	X6876A00	IC ADM222ARZ	
IC601	X5826A00	IC UPC2905AT-E1-AZ	
IC602	X6869A00	IC NJM2885DL1-33	
IC603	X6870A00	IC NJM2845DL1-33	
IC605	X6867A00	IC NJM2391DL1-25	
IC606	X6868A00	IC NJM2885DL1-18	
IC607-609	X5741A00	IC SN74LVC541APWR	
PS301	V2997600	IC SMD050-02	
Q301-302	VQ986700	TR 2SC4081 T106	
Q309	WE834500	FET UPA672T-T1-A	
Q310-311	WD760200	FET 2N7002-NL TP	

* New Parts

P.C.B. D-VIDEO

Ref. No.	Part No.	Description	Markets
Q501-504	VQ986700	TR	2SC4081 T106
* Q505-508	WG261200	FET	2SK2158-T2B-A
R630-632	VP939700	R. MTL. FLM	4.7 Ω 1W
R637	VP939700	R. MTL. FLM	4.7 Ω 1W
R642	VP939600	R. MTL. FLM	2.2 Ω 1W
R643	WB784100	R. MTL. FLM	1.2 Ω 1W
RV309-332	WE674800	DIODE	AVRL161A1R1NTB
ST301	V4040500	SCR. TERM	M3
XL301	VZ268400	RSNR. CRYST	27MHz SMD-49
XL501	V9864200	RSNR. CE	10.0MHz
* XL502	VZ772700	RSNR. CRYST	28.63636MHz

* New Parts

Chip Resistors

- The chip resistor is not supplied as a replacement part.
* When a chip resistor is necessary, use the following part.
AAAX60720: CHIP RESISTOR SAMPLE BOOK

Ref. No.	Part No.	Description	Markets
	R, CHP	0 Ω	1/16W J
	R, CHP	2.2 Ω	1/16W J
	R, CHP	10 Ω	1/16W J
	R, CHP	47 Ω	1/16W J
	R, CHP	56 Ω	1/16W J
	R, CHP	75 Ω	1/16W J
	R, CHP	82 Ω	1/16W J
	R, CHP	100 Ω	1/16W J
	R, CHP	180 Ω	1/16W J
	R, CHP	220 Ω	1/16W J
	R, CHP	470 Ω	1/16W J
	R, CHP	820 Ω	1/16W J
	R, CHP	1K Ω	1/16W J
	R, CHP	1.2K Ω	1/16W J
	R, CHP	1.3K Ω	1/16W J
	R, CHP	1.5K Ω	1/16W J
	R, CHP	1.8K Ω	1/16W J
	R, CHP	2.2K Ω	1/16W J
	R, CHP	2.4K Ω	1/16W J
	R, CHP	2.7K Ω	1/16W J
	R, CHP	3.3K Ω	1/16W J
	R, CHP	4.7K Ω	1/16W J
	R, CHP	5.6K Ω	1/16W J
	R, CHP	8.2K Ω	1/16W J
	R, CHP	10K Ω	1/16W J
	R, CHP	18K Ω	1/16W J
	R, CHP	22K Ω	1/16W J
	R, CHP	27K Ω	1/16W J
	R, CHP	47K Ω	1/16W J
	R, CHP	56K Ω	1/16W J
	R, CHP	62K Ω	1/16W J
	R, CHP	100K Ω	1/16W J
	R, CHP	220K Ω	1/16W J
	R, CHP	470K Ω	1/16W J
	R, CHP	1M Ω	1/16W J
	R, MTL, CHP	10 Ω	1/16W D
	R, MTL, CHP	33 Ω	1/16W D
	R, MTL, CHP	47 Ω	1/16W D
	R, MTL, CHP	100 Ω	1/16W D
	R, MTL, CHP	120 Ω	1/16W D
	R, MTL, CHP	150 Ω	1/16W D
	R, MTL, CHP	180 Ω	1/16W D
	R, MTL, CHP	330 Ω	1/16W D
	R, MTL, CHP	470 Ω	1/16W D
	R, MTL, CHP	620 Ω	1/16W D

*: New Parts

Chip Resistors

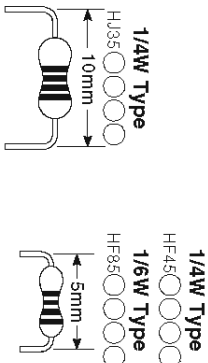
Ref. No.	Part No.	Description	Markets
	R, MTL, CHP	2K Ω	1/16W D
	R, MTL, CHP	2.2K Ω	1/16W D
	R, MTL, CHP	2.4K Ω	1/16W D
	R, MTL, CHP	2.7K Ω	1/16W D
	R, MTL, CHP	3K Ω	1/16W D
	R, MTL, CHP	3.3K Ω	1/16W D
	R, MTL, CHP	4.3K Ω	1/16W D
	R, MTL, CHP	4.7K Ω	1/16W D
	R, MTL, CHP	5.6K Ω	1/16W D
	R, MTL, CHP	6.8K Ω	1/16W D
	R, MTL, CHP	7.5K Ω	1/16W D
	R, MTL, CHP	11K Ω	1/16W D
	R, MTL, CHP	12K Ω	1/16W D
	R, MTL, CHP	15K Ω	1/16W D
	R, MTL, CHP	47K Ω	1/16W D
	R, MTL, CHP	82K Ω	1/16W D
	R, CAR, CHP	180K Ω	1/16W J

*

*: New Parts

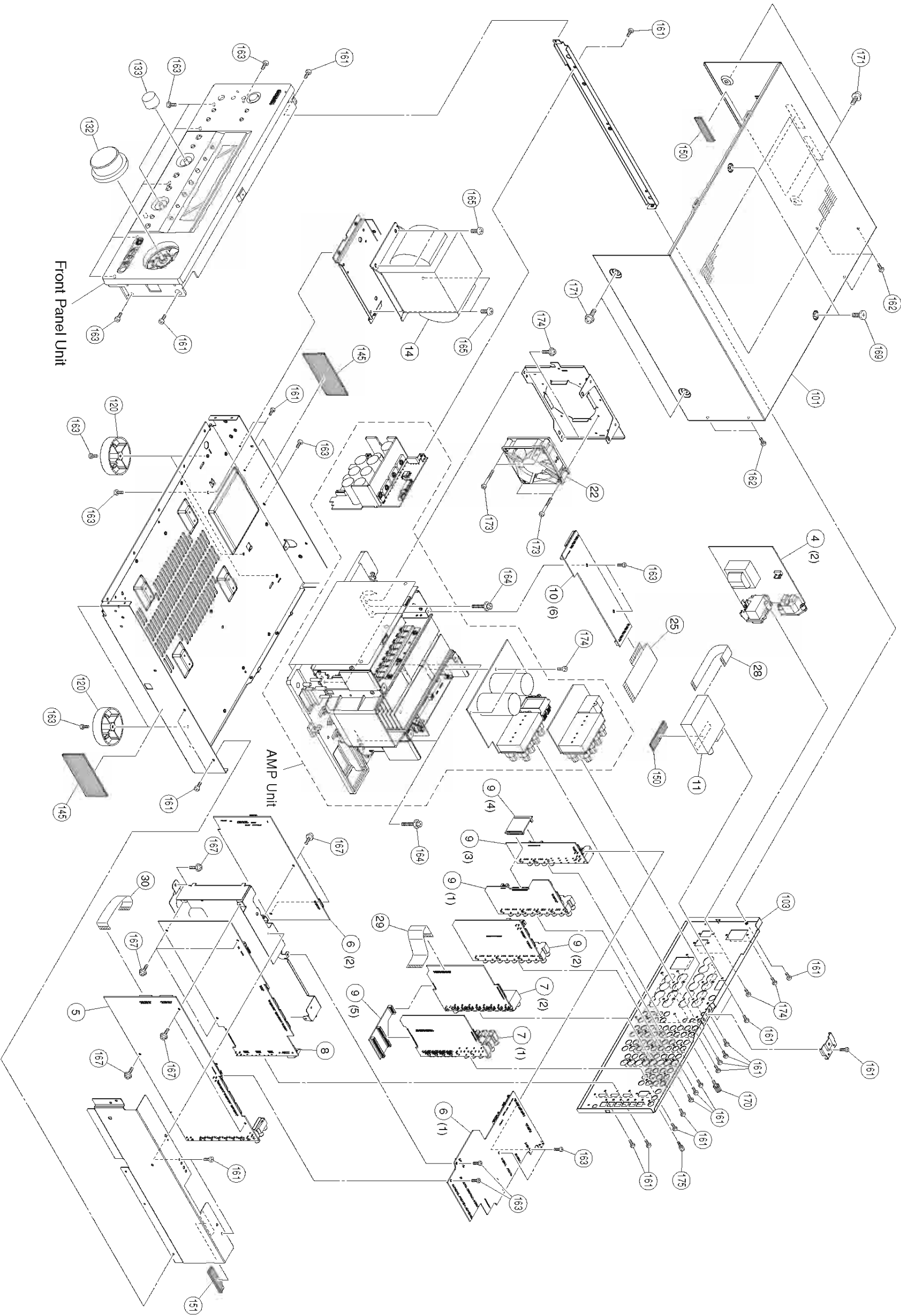
Parts List for Carbon Resistors

Value	1/4W Type Part No.	1/6W Type Part No.	Value	1/4W Type Part No.	1/6W Type Part No.
1.0 Ω	HJ35 3100	HF85 3100	10 KΩ	HF45 7100	HF45 7100
1.8 Ω	HJ35 3180	*	11 KΩ	HF45 7110	HF45 7110
2.2 Ω	HJ35 3220	HF85 3220	12 KΩ	HJ35 7120	HF85 7120
3.3 Ω	HJ35 3330	HF85 3330	13 KΩ	HF45 7130	HF45 7130
4.7 Ω	HJ35 3470	HF85 3470	15 KΩ	HF45 7150	HF45 7150
5.6 Ω	HJ35 3560	HF85 3560	18 KΩ	HF45 7180	HF45 7180
10 Ω	HF45 4100	HF45 4100	22 KΩ	HF45 7220	HF45 7220
15 Ω	HJ35 4150	HF85 4150	24 KΩ	HF45 7240	HF45 7240
22 Ω	HF45 4220	HF45 4220	27 KΩ	HJ35 7270	HF85 7270
27 Ω	HJ35 4270	HF45 4270	30 KΩ	HF45 7300	HF45 7300
33 Ω	HF45 4330	HF45 4330	33 KΩ	HF45 7330	HF45 7330
39 Ω	HJ35 4470	HF85 4390	36 KΩ	HF45 7360	HF45 7360
47 Ω	HF45 4470	HF45 4470	39 KΩ	HF45 7390	HF45 7390
56 Ω	HF45 4560	HF45 4560	47 KΩ	HF45 7470	HF45 7470
68 Ω	HF45 4680	HF45 4680	51 KΩ	HF45 7510	HF45 7510
75 Ω	HF45 4750	HF45 4750	56 KΩ	HF45 7560	HF45 7560
82 Ω	HF45 4820	HF45 4820	62 KΩ	HF45 7620	HF45 7620
91 Ω	HF45 4910	HF45 4910	68 KΩ	HF45 7680	HF45 7680
100 Ω	HF45 5100	HF45 5100	82 KΩ	HF45 7820	HF45 7820
110 Ω	HJ35 5110	HF85 5110	91 KΩ	HF45 7910	HF45 7910
120 Ω	HF45 5120	HF45 5120	100 KΩ	HF45 8100	HF45 8100
150 Ω	HF45 5150	HF45 5150	110 KΩ	HF45 8110	HF45 8110
160 Ω	HJ35 5160	*	120 KΩ	HF45 8120	HF45 8120
180 Ω	HF45 5180	HF45 5180	150 KΩ	HF45 8150	HF45 8150
200 Ω	HF45 5200	HF45 5200	180 KΩ	HF45 8180	HF45 8180
220 Ω	HF45 5220	HF45 5220	220 KΩ	HJ35 8220	HF85 8220
270 Ω	HF45 5270	HF45 5270	270 KΩ	HF45 8270	HF45 8270
330 Ω	HF45 5330	HF45 5330	300 KΩ	HF45 8300	HF45 8300
390 Ω	HF45 5390	HF45 5390	330 KΩ	HF45 8330	HF45 8330
430 Ω	HF45 5430	HF45 5430	390 KΩ	HJ35 8390	HF85 8390
470 Ω	HF45 5470	HF45 5470	470 KΩ	HF45 8470	HF45 8470
510 Ω	HF45 5510	HF45 5510	560 KΩ	HJ35 8560	HF85 8560
560 Ω	HF45 5560	HF45 5560	680 KΩ	HJ35 8680	HF85 8680
680 Ω	HF45 5680	HF45 5680	820 KΩ	HJ35 8820	HF85 8820
820 Ω	HF45 5820	HF45 5820	1.0 MΩ	HF45 9100	HF45 9100
910 Ω	HF45 5910	HF45 5910	1.2 MΩ	HJ35 9120	*
1.0 KΩ	HF45 6100	HF45 6100	1.5 MΩ	HJ35 9150	HF85 9150
1.2 KΩ	HF45 6120	HF45 6120	1.8 MΩ	HJ35 9180	HF85 9180
1.5 KΩ	HF45 6150	HF45 6150	2.2 MΩ	HJ35 9220	HF85 9220
1.8 KΩ	HF45 6180	HF45 6180	3.3 MΩ	HJ35 9330	HF85 9330
2.0 KΩ	HJ35 6200	HF85 6200	3.9 MΩ	HJ35 9390	*
2.2 KΩ	HF45 6220	HF45 6220	4.7 MΩ	HJ35 9470	HF85 9470
2.4 KΩ	HJ35 6240	HF85 6240			
2.7 KΩ	HF45 6270	HF45 6270			
3.0 KΩ	HF45 6300	HF45 6300			
3.3 KΩ	HF45 6330	HF45 6330			
3.6 KΩ	HJ35 6360	HF85 6360			
3.9 KΩ	HF45 6390	HF45 6390			
4.7 KΩ	HF45 6470	HF45 6470			
5.1 KΩ	HF45 6510	HF45 6510			
5.6 KΩ	HF45 6560	HF45 6560			
6.8 KΩ	HF45 6680	HF45 6680			
8.2 KΩ	HF45 6820	HF45 6820			
9.1 KΩ	HF45 6910	HF45 6910			



*: Not available

EXPLODED VIEW

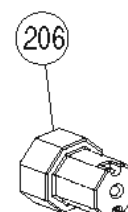
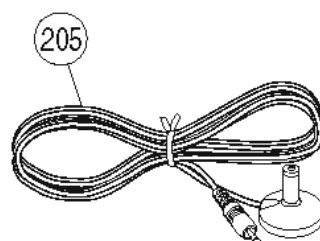
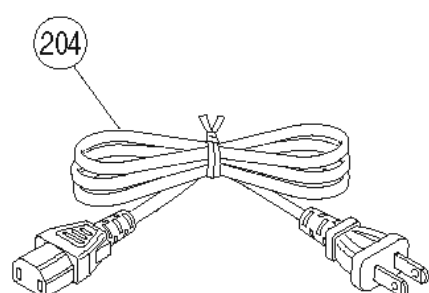
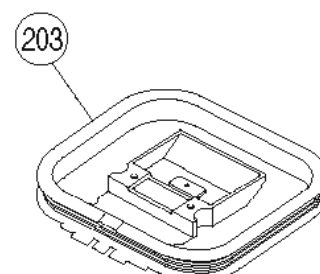
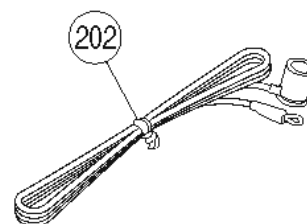
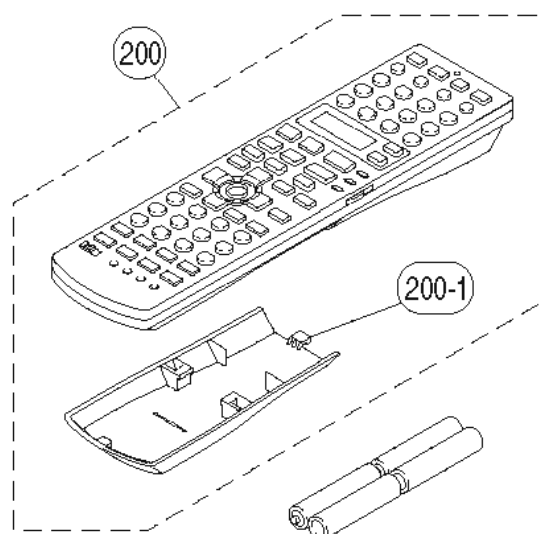


MECHANICAL PARTS

	Ref. No.	Part No.	Description	Remarks	Markets
*	4	WG076400	P.C.B. ASS'Y	POWER	
*	5	WG078400	P.C.B. ASS'Y	DSP	
*	6	WG080800	P.C.B. ASS'Y	FUNCTION	
*	7	WG081000	P.C.B. ASS'Y	A-VIDEO	
*	8	WG081900	P.C.B. ASS'Y	D-VIDEO	
*	9	WG082700	P.C.B. ASS'Y	INPUT	
*	10	WG083600	P.C.B. ASS'Y	OPERATION	
*	11	WD048300	AM/FM TUNER	FAE385-A01F	
* 	14	X7037A00	POWER TRANSFORMER		
	22	V8466600	DC FAN MOTOR 24V	DC D08A-24TG	
*	25	MF131120	FLEXIBLE FLAT CABLE	31P 120mm P=1.25	
	28	MF115140	FLEXIBLE FLAT CABLE	15P 140mm P=1.25	
*	29	MF127100	FLEXIBLE FLAT CABLE	27P 100mm P=1.25	
*	30	MF119070	FLEXIBLE FLAT CABLE	19P 70mm P=1.25	
	101	V9151100	TOP COVER		
*	103	WF554500	REAR PANEL		
	120	VV544300	LEG	D60xH21	
*	132	WE183300	KNOB D48	VOLUME	
*	133	WC560500	KNOB D23		
	145	V3198100	DAMPER	GUARD	
	150	VZ117100	DAMPER T2	TOP-F	
*	151	VS658200	DAMPER TR		
	161	WE774100	BIND HEAD BONDING B-T. SCREW	3x8 MFZN2B3	
	162	WE774400	BIND HEAD B-TIGHT SCREW	3x8 MFZN2B3	
	163	WE936300	BIND HEAD B-TIGHT SCREW	3x6 MFZN2W3	
	164	WE774600	SCREW IC	3x18 MFZN2W3	
	165	WE774700	BIND HEAD S-TIGHT SCREW	4x10 MFZN2W3	
	167	VT669300	PW HEAD B-TIGHT SCREW	3x8-8 MFC2	
	169	VK522100	SPECIAL S-TIGHT SCREW	4x8-10 MFC2BL	
	170	AA627310	GROUND TERMINAL		
	171	VH313200	PW HEAD S-TIGHT SCREW	4x8-10 MFN13BL	
	173	WE774500	BIND HEAD B-TIGHT SCREW	3x30 MFZN2B3	
	174	WE774800	BIND HEAD P-TIGHT SCREW	3x8 MFZN2W3	
	175	V6509600	JACK SCREW	SS6-A47511848	

* New Parts

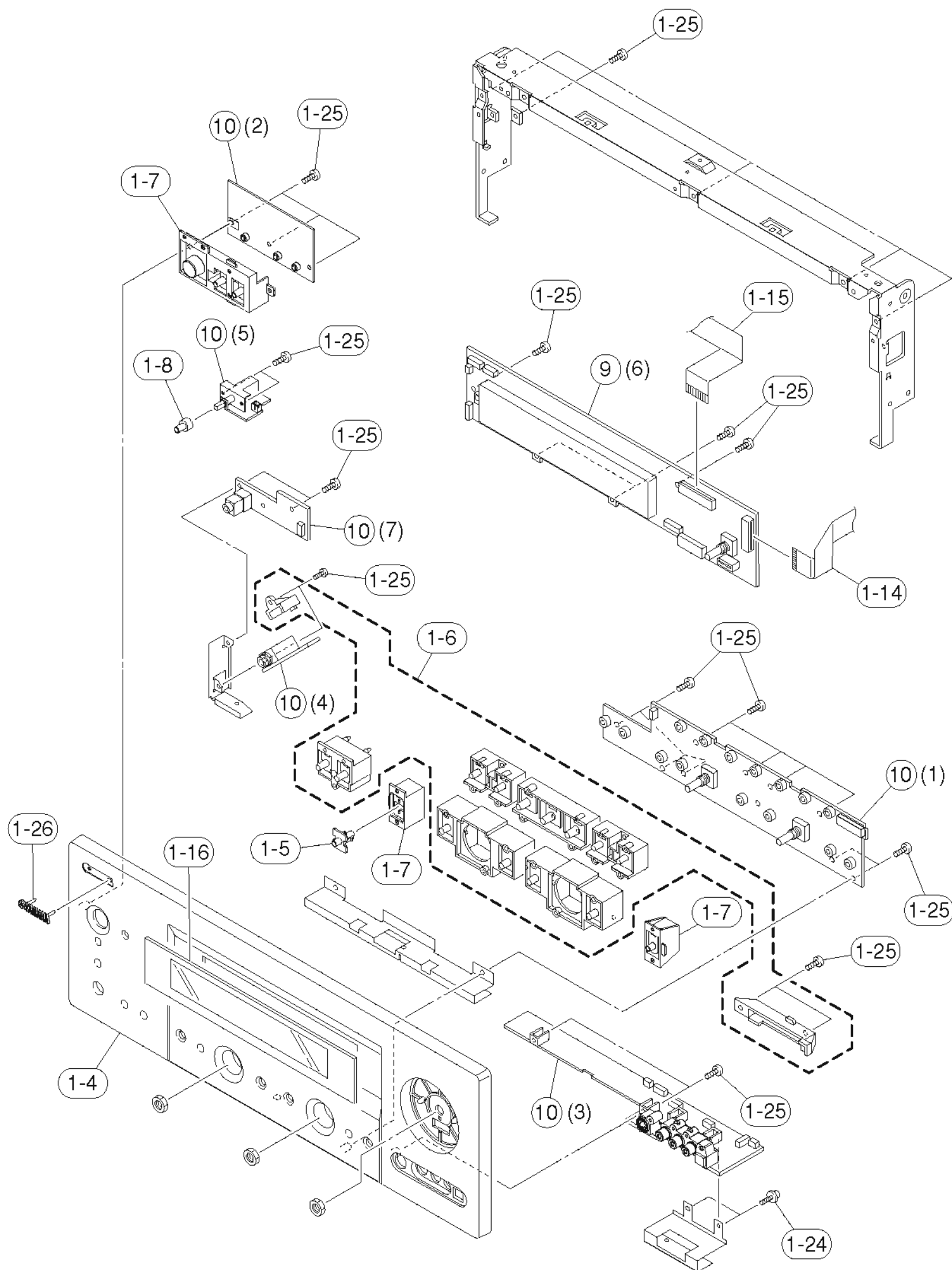
HTR-5990

■ ACCESSORIES

Ref. No.	Part No.	Description	Remarks	Markets
*	200	WF365400 ACCESSORIES		
		REMOTE CONTROL	RAV356	RC1596007/00
	200-1	AAX59640 BATTERY COVER		3139 238 08051
	202	V6267000 IND00R FM ANTENNA	1.4m 1pc	
	203	VR248500 AM LOOP ANTENNA	1.0m 1pc	
	△ 204	V7704800 POWER CABLE	2m 1pc	
	205	WB929200 OPTIMIZER MICROPHONE	EMX-251 6m 1pc	
	206	WC080100 SPEAKER TERMINAL WRENCH	LTS0090-0002GM 1pc	
		BATTERY (MANGANESE DRY)	UM-4E 4pcs	
		SERVICE TOOL		
*	MF117350	FLEXIBLE FLAT CABLE	17P 350mm P=1.25	
	MF124500	FLEXIBLE FLAT CABLE	24P 500mm P=1.25	
	MF131500	FLEXIBLE FLAT CABLE	31P 500mm P=1.25	
	MF404250	CRIMPING ASS'Y B&C	4P 250mm B&C	
	MF405400	CRIMPING ASS'Y B&C	5P 400mm B&C	
	MF408250	CRIMPING ASS'Y B&C	8P 250mm B&C	

* New Parts

HTR-5990

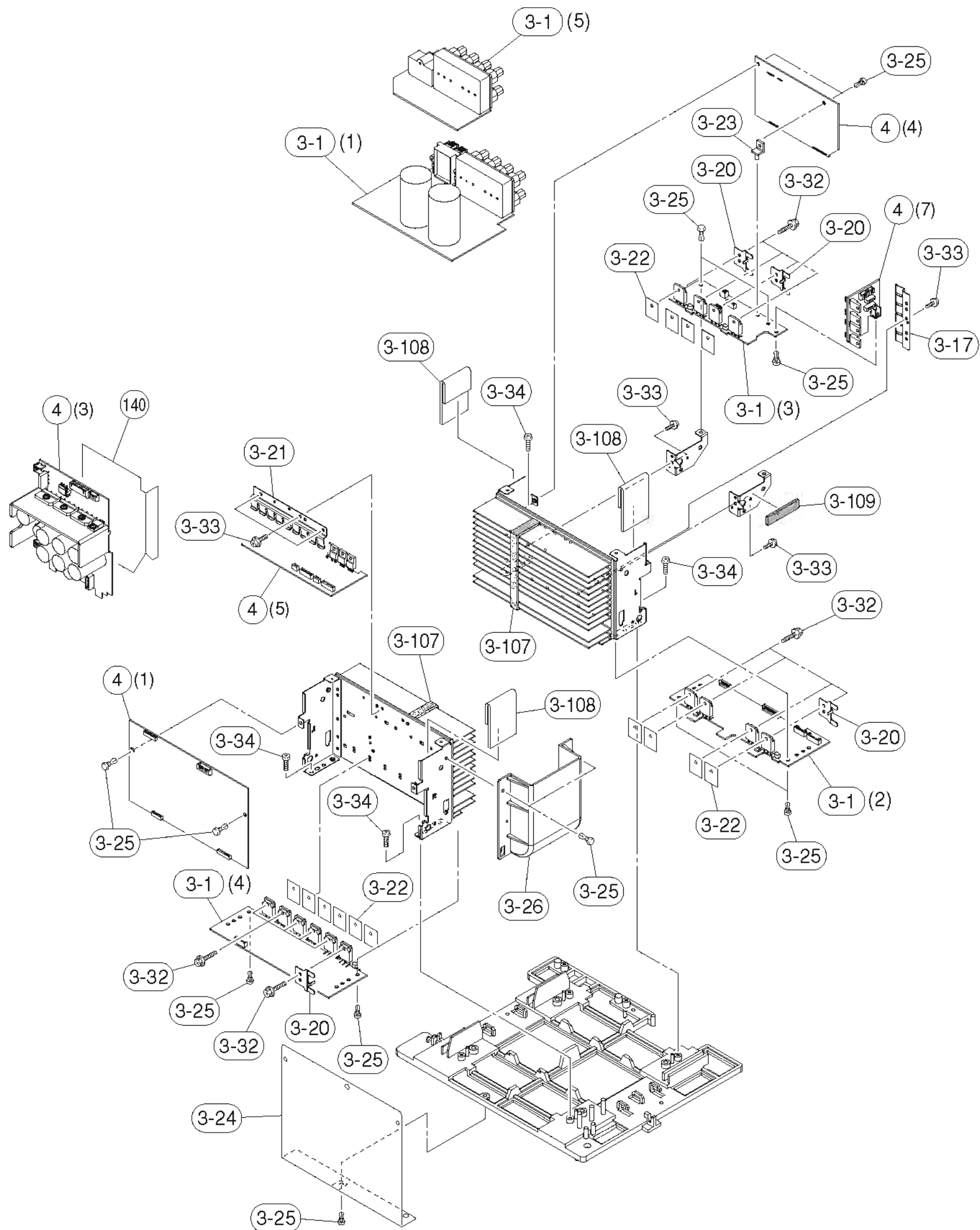
FRONT PANEL UNIT

	Ref. No.	Part No.	Description		Remarks	Markets
*	1-4	WF586400	FRONT PANEL ASS'Y			
	1-5	WC504300	LENS BUTTON			
*	1-6	WC491700	BUTTON CASE 5760			
*	1-7	WF552000	BUTTON 5990			
	1-8	V6001900	BUTTON D5			
	1-14	MF117100	FLEXIBLE FLAT CABLE	17P 100mm P=1.25		
*	1-15	MF124300	FLEXIBLE FLAT CABLE	24P 300mm P=1.25		
*	1-16	WF872200	SHEET WINDOW			
	1-24	WE774100	BIND HEAD BONDING B-T. SCREW	3x8 MFZN2B3		
	1-25	WE774800	BIND HEAD P-TIGHT SCREW	3x8 MFZN2W3		
	1-26	V6034200	EMBLEM			
*	9	WG082700	P.C.B. ASS'Y	INPUT		
*	10	WG083600	P.C.B. ASS'Y	OPERATION		

* New Parts

HTR-5990

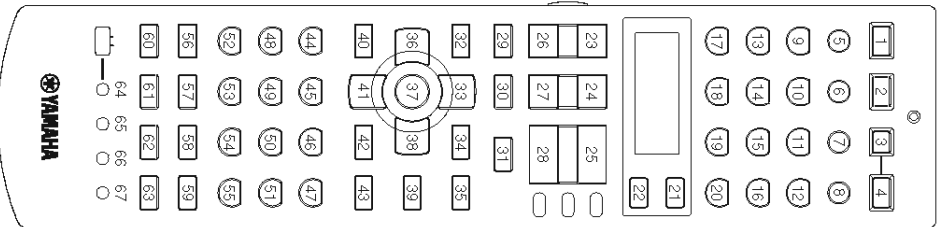
■ AMP UNIT



Ref. No.	Part No.	Description	Remarks	Markets
* 3-1	WG075500	P.C.B. ASS'Y	MAIN	
* 3-17	WG432400	SUPPORT TR-6		
* 3-20	WB297600	SUPPORT TR		
3-21	WD418800	SUPPORT TR-9		
3-22	VV849300	RADIATION SHEET	19x24	
3-23	CB091290	SUPPORT P.C.B.	No. 1645	
3-24	WA207000	SHEET SHIELD B		
3-25	V0368600	PUSH RIVET	P3555-B	
3-26	V9120600	DUCT		
3-32	VK173200	SCREW TRANSLTOR	3x15 SP MFC2	
3-33	VT669300	PW HEAD B-TIGHT SCREW	3x8-8 MFC2	
3-34	WE774800	BIND HEAD P-TIGHT SCREW	3x8 MFZN2W3	
3-107	VP922500	DAMPER	2x10x170	
3-108	V3198100	DAMPER	GUARD	
3-109	VZ117100	DAMPER T2	TOP-F	
* 4	WG076400	P.C.B. ASS'Y	POWER	
140	WG662000	BARRIER TRANS		

*: New Parts

• KEY NO. LAYOUT



• KEY CHART

NO	Label	AREA	LEARN	MACRO	Luminous or transparent	AMP Library AMP21: 2001 MAIN	ZONE2	ZONE3	SYSTEM (default)	AMP Library AMP22: 2002 MAIN	ZONE2	ZONE3	SYSTEM
-	LED	-	-	-	-	-	-	-	-	-	-	-	-
SW1 (SOURCE/AMP/TV)													
3	STANDBY	1	O	O	O	7E-7F 7E-8B	7A-EE	7A-1E	7D-B1	7D-63	7D-73	7D-91	OFF
4	POWER on	1	O	O	O	7E-7E 7E-BA	7A-ED	7A-1D	7D-B2	7D-64	7D-74	7D-90	Power ON
5	A	1	O	O	-	-	-	-	-	-	-	-	Macro feature
6	XMB	1	O	O	-	7A-B4/- 7A-B6/- 7A-B9/-	7D-26/- 7D-2F/-	7D-65	7D-75	7D-30/-	-	-	Macro feature & change Device mode
9	PHONO	1	O	O	-	7A-14 7A-D0 7A-F1	7D-88	7D-89	7D-66	7D-76	-	-	Macro feature & change Device mode
10	TUNER	1	O	O	-	7A-16 7A-D2 7A-F3	7D-87	7D-67	7D-77	-	-	-	Macro feature & change Device mode
11	CD	1	O	O	-	7A-15 7A-D1 7A-F2	-	-	-	-	-	-	Macro feature & change Device mode
12	MULTI CH INPUT	1	O	O	-	7A-87	7D-8C	-	-	-	-	-	Macro feature & change Device mode
13	V-AUX	1	O	O	-	7A-55 7A-D8 7A-F0	7D-8A	7D-68	7D-78	-	-	-	Macro feature & change Device mode
14	CBL/SAT	1	O	O	-	7A-C0 7A-CC 7A-F7	7D-96	7D-69	7D-79	-	-	-	Macro feature & change Device mode
15	MD/TAPE	1	O	O	-	7A-18 7A-D3 7A-F4	7D-8B	7D-6A	7D-7A	-	-	-	Macro feature & change Device mode
16	CD-R	1	O	O	-	7A-19 7A-D4 7A-F5	7D-99	7D-6B	7D-7B	-	-	-	Macro feature & change Device mode
17	DTV	1	O	O	-	7A-54 7A-D9 7A-F6	7D-84	7D-6C	7D-7C	-	-	-	Macro feature & change Device mode
18	VCR1	1	O	O	-	7A-0F 7A-D6 7A-F9	7D-81	7D-6D	7D-7D	-	-	-	Macro feature & change Device mode
19	DVR/VCR2	1	O	O	-	7A-13 7A-D7 7A-FA	7D-82	7D-6E	7D-7E	-	-	-	Macro feature & change Device mode
20	DVD	1	O	O	-	7A-C1 7A-CD 7A-FC	7D-97	7D-6F	7D-7F	-	-	-	Macro feature & change Device mode
21	SELECT up	1	-	-	O	-	-	-	-	-	-	-	Select Device mode(up)
22	SELECT down	1	-	-	O	-	-	-	-	-	-	-	Select Device mode(down)
SW2 (MACRO ON/OFF)													
3	STANDBY	1	O	O	O	7E-7F 7E-8B	7A-EE	7A-1E	7D-B1	7D-63	7D-73	7D-91	OFF
4	POWER on	1	O	O	O	7E-7E 7E-BA	7A-ED	7A-1D	7D-B2	7D-64	7D-74	7D-90	Power ON
5	A	1	O	O	-	-	-	-	-	-	-	-	Macro feature
6	XMB	1	O	O	-	7A-B4/- 7A-B6/- 7A-B9/-	7D-26/- 7D-2F/-	7D-65	7D-75	7D-30/-	-	-	Macro feature & change Device mode
9	PHONO	1	O	O	-	7A-14 7A-D0 7A-F1	7D-88	7D-89	7D-66	7D-76	-	-	Macro feature & change Device mode
10	TUNER	1	O	O	-	7A-16 7A-D2 7A-F3	7D-87	7D-67	7D-77	-	-	-	Macro feature & change Device mode
11	CD	1	O	O	-	7A-15 7A-D1 7A-F2	-	-	-	-	-	-	Macro feature & change Device mode
12	MULTI CH INPUT	1	O	O	-	7A-87	7D-8C	-	-	-	-	-	Macro feature & change Device mode
13	V-AUX	1	O	O	-	7A-55 7A-D8 7A-F0	7D-8A	7D-68	7D-78	-	-	-	Macro feature & change Device mode
14	CBL/SAT	1	O	O	-	7A-C0 7A-CC 7A-F7	7D-96	7D-69	7D-79	-	-	-	Macro feature & change Device mode
15	MD/TAPE	1	O	O	-	7A-18 7A-D3 7A-F4	7D-8B	7D-6A	7D-7A	-	-	-	Macro feature & change Device mode
16	CD-R	1	O	O	-	7A-19 7A-D4 7A-F5	7D-99	7D-6B	7D-7B	-	-	-	Macro feature & change Device mode
17	DTV	1	O	O	-	7A-54 7A-D9 7A-F6	7D-84	7D-6C	7D-7C	-	-	-	Macro feature & change Device mode
18	VCR1	1	O	O	-	7A-0F 7A-D6 7A-F9	7D-81	7D-6D	7D-7D	-	-	-	Macro feature & change Device mode
19	DVR/VCR2	1	O	O	-	7A-13 7A-D7 7A-FA	7D-82	7D-6E	7D-7E	-	-	-	Macro feature & change Device mode
20	DVD	1	O	O	-	7A-C1 7A-CD 7A-FC	7D-97	7D-6F	7D-7F	-	-	-	Macro feature & change Device mode
21	SELECT up	1	-	-	O	-	-	-	-	-	-	-	Select Device mode(up)
22	SELECT down	1	-	-	O	-	-	-	-	-	-	-	Select Device mode(down)
SW1 (SOURCE/AMP/TV)													
SOURCE													
20	DVD	19	18	17	16	15	14	13	12	11	10	9	5 letters
19	DVR/VCR2	VCR1	DTV	CD-R	MD/TAPE	CBL/SAT	V-AUX	MULTI	CD	TUNER	PHONO	B	3 letters
18	VCR1	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	STB
17	DTV	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	PWR
16	CD-R	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	A
15	MD/TAPE	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	XMB
14	CBL/SAT	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	PHO
13	V-AUX	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	TUNER
12	MULTI CH INPUT	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	CD
11	CD	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	MD
10	TUNER	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	AUX
9	PHONO	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	SAT
8	SLEEP	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	MD
7	INPUT MODE	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	CD-R
6	XMB	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	DTV
5	A	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	VCR1
4	POWER on	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	DVR
3	STANDBY	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	DVD
2	AV POWER	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	DVD
1	TV POWER	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	Power	DVD
INPUT MODE													
23	TV VOL up	16	O	-	O	-	-	-	-	-	-	-	TV VOL up
24	CH up	16	O	-	O	-	-	-	-	-	-	-	TV CH up
25	VOL up	1	O	-	O	-	-	-	-	-	-	-	TV VOL up
26	TV VOL down	16	O	-	O	-	-	-	-	-	-	-	TV VOL down
27	CH down	16	O	-	O	-	-	-	-	-	-	-	TV CH down
28	VOL down	1	O	-	O	-	-	-	-	-	-	-	TV VOL down
29	TV mute	16	O	-	O	-	-	-	-	-	-	-	TV mute
30	TV input	16	O	-	O	-	-	-	-	-	-	-	TV input
31	MUTE	1	O	-	O	-	-	-	-	-	-	-	TV MUTE
32	TITLE	16	O	-	O	-	-	-	-	-	-	-	TV TITLE
33	UP	16	O	-	O	-	-	-	-	-	-	-	TV UP
34	MENU	16	O	-	O	-	-	-	-	-	-	-	TV MENU
35	Pure Direct	1	O	-	O	-	-	-	-	-	-	-	TV Pure Direct
36	Left	16	O	-	O	-	-	-	-	-	-	-	TV Left
37	Enter	16	O	-	O	-	-	-	-	-	-	-	TV Enter
38	Right	16	O	-	O	-	-	-	-	-	-	-	TV Right
39	AUDIO	16	O	-	O	-	-	-	-	-	-	-	TV AUDIO
40	RETURN	16	O	-	O	-	-	-	-	-	-	-	TV RETURN
41	Down	16	O	-	O	-	-	-	-	-	-	-	TV Down
42	DISPLAY	16	O	-	O	-	-	-	-	-	-	-	TV DISPLAY
43	STRAIGHT	1	O	-	O	-	-	-	-	-	-	-	TV STRAIGHT
44	PRG1	16	O	-	O	-	-	-	-	-	-	-	TV PRG1
45	PRG2	16	O	-	O	-	-	-	-	-	-	-	TV PRG2
46	PRG3	16	O	-	O	-	-	-	-	-	-	-	TV PRG3
47	PRG4	16	O	-	O	-	-	-	-	-	-	-	TV PRG4
48	PRG5	16	O	-	O	-	-	-	-	-	-	-	TV PRG5
49	PRG6	16	O	-	O	-	-	-	-	-	-	-	TV PRG6
50	PRG7	16	O	-	O	-	-	-	-	-	-	-	TV PRG7
51	PRG8	16	O	-	O	-	-	-	-	-	-	-	TV PRG8
52	PRG9	16	O	-	O	-	-	-	-	-	-	-	TV PRG9
53	PRG10	16	O	-	O	-	-	-	-	-	-	-	TV PRG10
54	PRG11	16	O	-	O	-	-	-	-	-	-	-	TV PRG11
55	PRG12	16	O	-	O	-	-	-	-	-	-	-	TV PRG12
56	REW (SEARCH)	16	O	-	O	-	-	-	-	-	-	-	TV REW
57	FF (SEARCH)	16	O	-	O	-	-	-	-	-	-	-	TV FF
58	CHP/SKIP-	16	O	-	O	-	-	-	-	-	-	-	TV CHP/SKIP-
59	CHP/SKIP+	16	O	-	O	-	-	-	-	-	-	-	TV CHP/SKIP+
60	REC	16	O	-	O	-	-	-	-	-	-	-	TV REC
61	STOP	16	O	-	O	-	-	-	-	-	-	-	TV STOP
62	PAUSE	16	O	-	O	-	-	-	-	-	-	-	TV PAUSE
63	PLAY	16	O	-	O	-	-	-	-	-	-	-	TV PLAY
64	MACRO	-	-	-	-	-	-	-	-	-	-	-	TV MACRO
65	LEARN	-	-	-	-	-	-	-	-	-	-	-	TV LEARN
66	CLEAR	-	-	-	-	-	-	-	-	-	-	-	TV CLEAR
67	RE-NAME	-	-	-	-	-	-	-	-	-	-	-	TV RE-NAME

ADVANCED SETUP

This unit has additional menus that are displayed in the front panel display. The ADVANCED SETUP menu offers additional operations to adjust and customize the way this unit operates. Change the initial settings (indicated in bold under each parameter) to reflect the needs of your listening environment.

Using ADVANCED SETUP

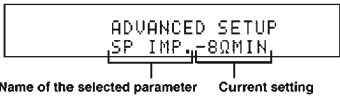
1 Press MASTER ON/OFF on the front panel to release it outward to the OFF position to set this unit, Zone 2 and Zone 3 to the standby mode.



2 Press and hold STRAIGHT (EFFECT) on the front panel and then press MASTER ON/OFF inward to the ON position to turn on the power of this unit.



3 Rotate the PROGRAM selector on the front panel to select the parameter you want to adjust. The name of the selected parameter appears in the front panel display. See pages 88 and 89 for a complete list of available parameters.



4 Press STRAIGHT (EFFECT) on the front panel repeatedly to change the setting.



5 Press MASTER ON/OFF on the front panel to release it outward to the OFF position to save the new setting and set this unit, Zone 2 and Zone 3 to the standby mode.



The new setting is activated next time you press MASTER ON/OFF inward to the ON position to turn on the power of this unit, Zone 2 and Zone 3.

Notes

- The control buttons on the remote control and VOLUME as well as the other control buttons on the front panel except MASTER ON/OFF, STRAIGHT (EFFECT) and the PROGRAM selector are ineffective while you are using the ADVANCED SETUP menu.
- Zone 2, Zone 3 and the speaker relay are all turned off and all audio and video output is muted while you are using the ADVANCED SETUP menu.
- The ADVANCED SETUP menu is only available in the front panel display.

■ Speaker impedance SP IMP.

Use to set the impedance of this unit so that it matches that of your speakers.

Choices: 6ΩMIN, **8ΩMIN**

- Select 6ΩMIN for speakers with 6 ohms or higher.
- Select 8ΩMIN for speakers with 8 ohms or higher.

■ User preset PRESET

Use to reset all the parameters of this unit to the initial factory settings with the exception of System Memory and AUTO SETUP settings.

Choices: **CANCEL**, RESET

- Select CANCEL if you do not want to reset the parameters of this unit.
- Select RESET to reset the parameters of this unit.

Notes

- This setting does not affect the ADVANCED SETUP menu item parameters.
- The initial factory settings are activated next time you turn on the power of this unit.

ADVANCED SETUP

■ Remote sensor REMOTE SEN

Use to activate or deactivate the signal-receiving capability of the remote control sensor on the front panel of this unit.

Choices: **ON**, OFF

- Select ON if you want to activate the signal-receiving capability of the remote control sensor.
- Select OFF if you want to deactivate the signal-receiving capability of the remote control sensor.

Note

We recommend setting this parameter to ON in most cases.

■ Wake on RS-232C access WAKE ON 232C

Use to set this unit to transmit data via the RS-232C interface when this unit is in the standby mode.

Choices: Y (yes), N (no)

- Select Y set this unit to transmit data via the RS-232C interface.
- Select N set this unit not to transmit data via the RS-232C interface.

■ Remote control AMP ID REMOTE AMP

Use to set the AMP ID of this unit for remote control recognition (see page 93).

Choices: ID1, ID2

- Select ID1 when the remote control AMP library code is set to 2001.
- Select ID2 when the remote control AMP library code is set to 2002.

Note

You need to set the corresponding remote control code for the remote control.

■ Remote control tuner ID REMOTE TUN

Use to set the tuner ID of this unit for remote control recognition (see page 93).

Choices: ID1, ID2

- Select ID1 when the remote control tuner library code is set to 2602.
- Select ID2 when the remote control tuner library code is set to 2603.

Note

You need to set the corresponding remote control code for the remote control.

■ Remote control XM ID REMOTE XM

Use to switch the XM-related remote control codes between ID1 and ID2.

Choices: ID1, ID2

- Select ID1 when the remote control XM library code is set to 2604.
- Select ID2 when the remote control XM library code is set to 2605.

Note

You need to set the corresponding remote control code for the remote control.

■ Fan operation mode FAN MODE

Use to set the operation of the cooling fan of this unit.

Choices: **AUTO**, CONT.

- Select AUTO to set the fan to operate automatically according to the temperature of this unit.
- Select CONT. to set the fan to operate continuously regardless of the temperature of this unit.

■ Bi-AMP BI-AMP

Use to activate or deactivate the bi-AMP function.

Choices: ON, **OFF**

- Select ON if you want to activate the bi-AMP function.
- Select OFF if you want to deactivate the bi-AMP function.

Note

When BI-AMP is set to ON, the SURROUND BACK terminals cannot be used to connect surround back speakers in that the SURROUND BACK terminals are already used for the bi-AMP connection (see page 17).

■ Video reset U-RESET

Use to initialize the parameter settings for DISPLAY SET in OPTION MENU (see page 83). This feature is useful if the SET MENU items are not displayed on your video monitor due to a technical error between the CMPNT I/P setting and the capability of your video monitor. That is, if your video monitor does not support the analog video signals with 480p of resolution, the SET MENU items may not be displayed on your video monitor when CMPNT I/P is set to ON (see page 83).

Choices: YES, **CANCEL**

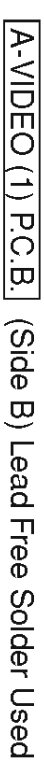
Note

The parameter setting for DIMMER is not initialized (see page 83).



HTR-5990

A-VIDEO (1) P.C.B. (Side A) Lead Free Solder Used

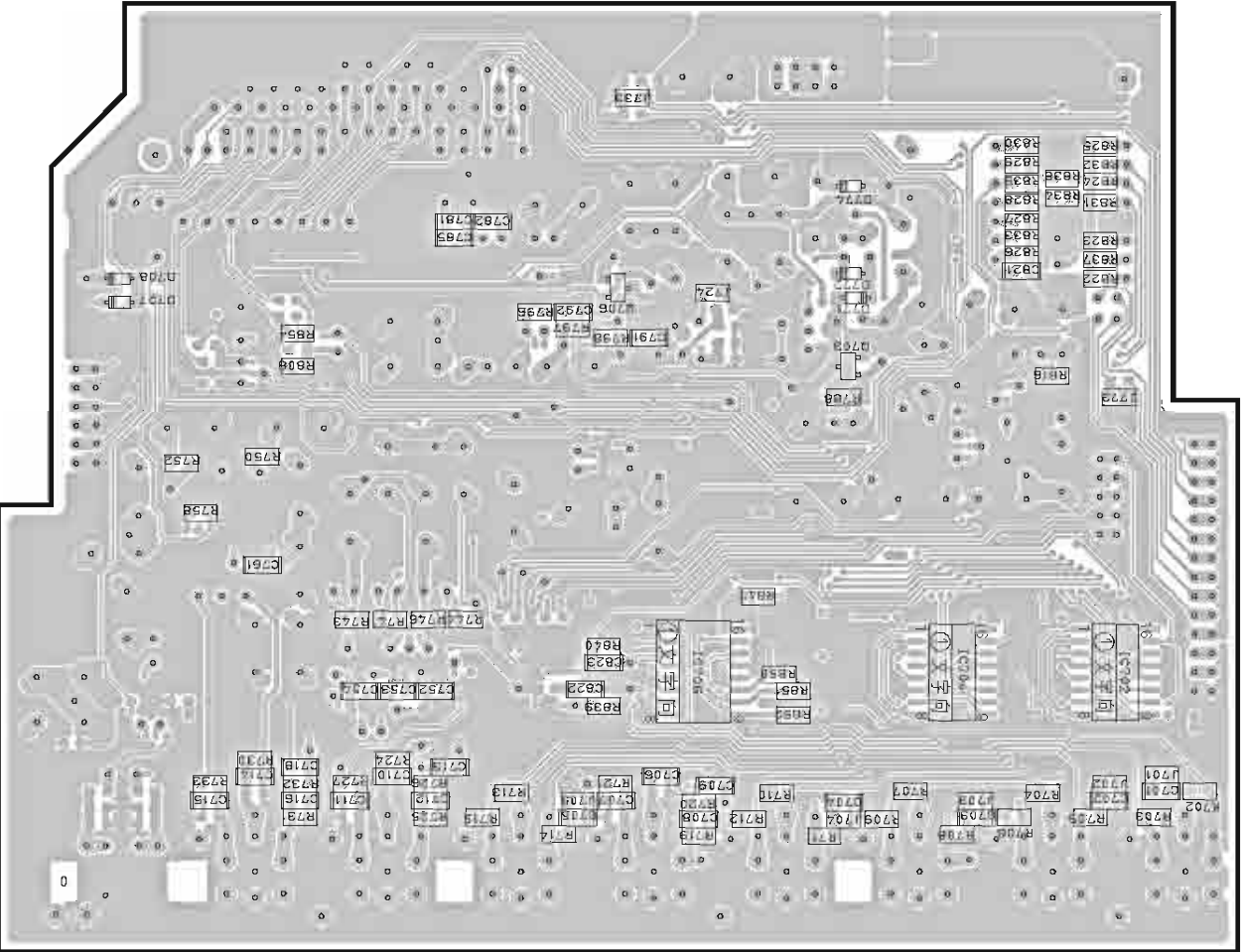
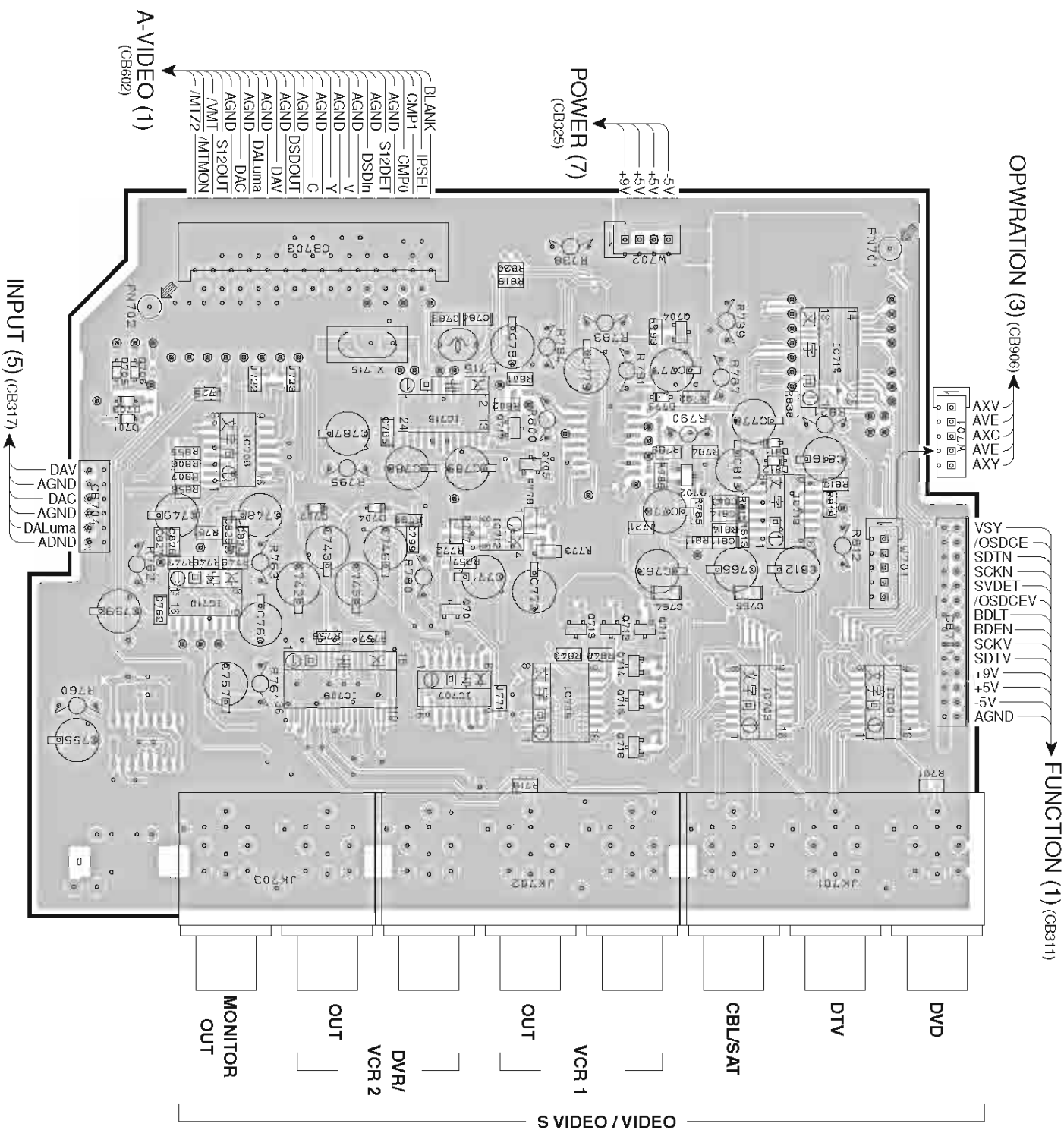


- Semiconductor Location

PRINTED CIRCUIT BOARD

A-VIDEO (2) P.C.B. (Side A) Lead Free Solder Used

A-VIDEO (2) P.C.B. (Side B) Lead Free Solder Used

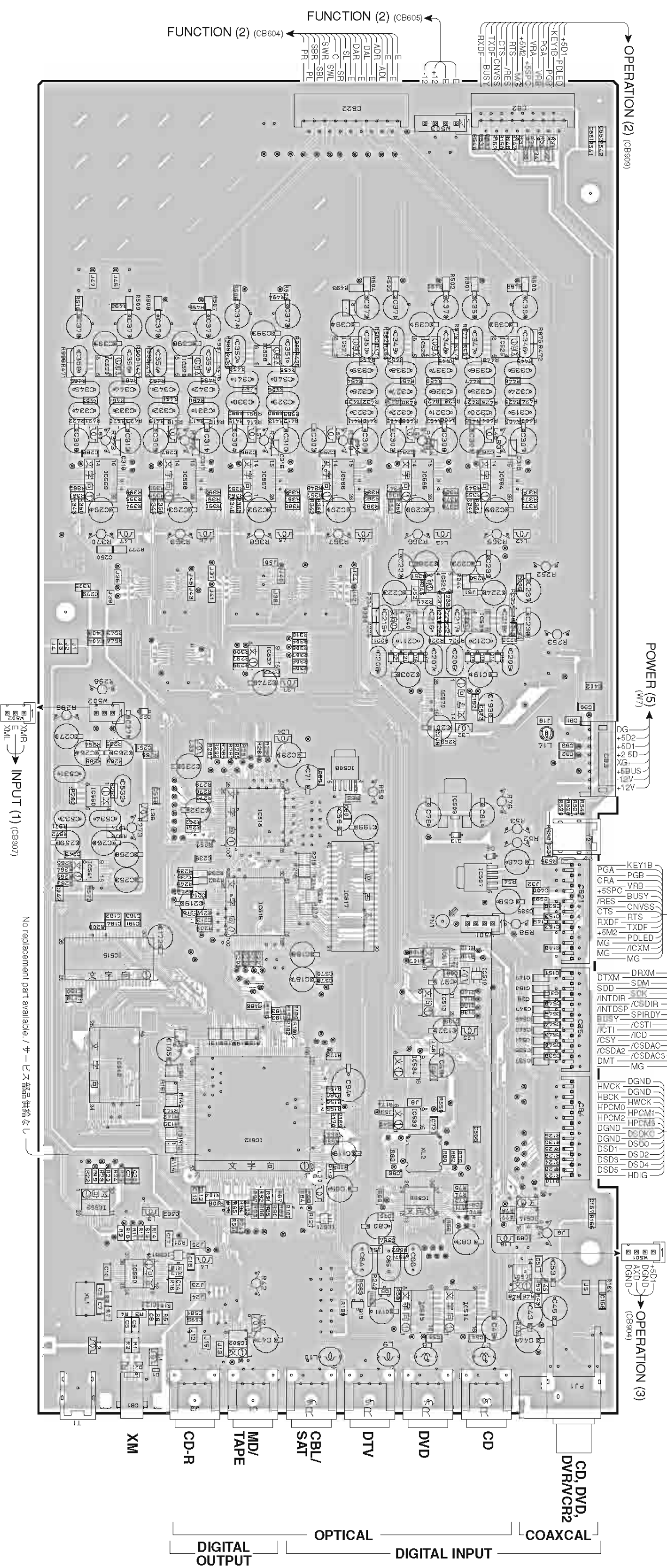


• Semiconductor Location

Ref no.	Location
D701	C6
D702	C5
D703	B6
D704	C5
D705	B6
D706	B6
D707	G5
D708	G5
D771	G3
D772	G3
D773	B3
D774	G3
D811	C3
D812	C3
IC701	D2
IC702	I2
IC703	D3
IC704	I3
IC705	D4
IC706	I4
IC707	D4
IC708	C5
IC709	D5
IC710	C5
IC712	C4
IC713	C3
IC714	B3
IC715	C4
IC716	-
Q701	C4
Q702	C3
Q703	H3
Q704	B3
Q705	C4
Q706	G4
Q711	D3
Q712	D4
Q713	D4
Q714	D4
Q715	D4
Q716	D4
Q717	C4

PRINTED CIRCUIT BOARD

DSP (1) P.C.B. (Side A) Lead Free Solder Used

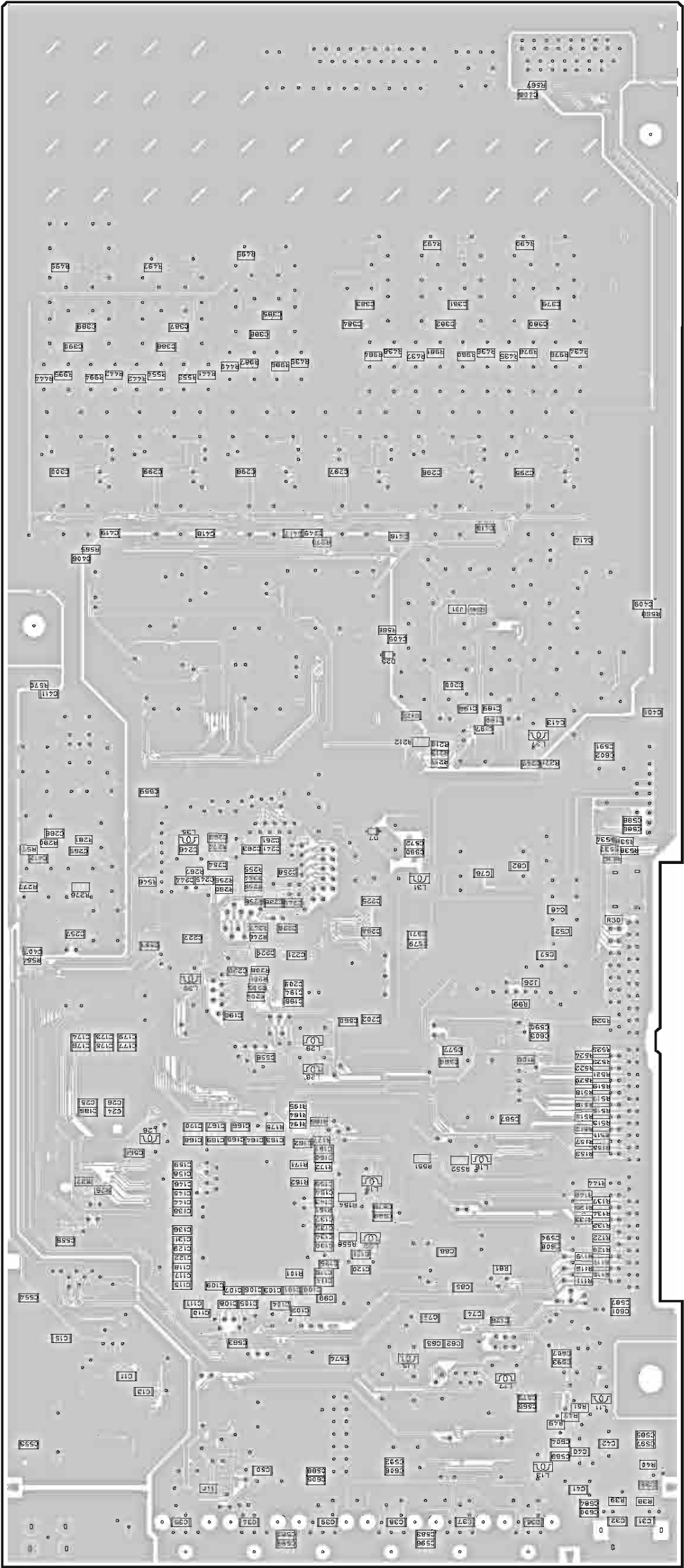


Semiconductor Location

Ref.no.	Location	Ref.no.	Location	Ref.no.	Location	Ref.no.	Location	Ref.no.	Location
D1	I5	D20	E3	IC510	G3	IC526	C3	IC542	G5
D2	I5	D21	E3	IC511	G3	IC527	C4	IC550	I5
D3	I5	D22	E5	IC512	H4	IC528	C4	IC551	I5
D5	F3	IC501	I3	IC513	G3	IC529	C5	IC552	H5
D13	F3	IC502	I4	IC514	H3	IC530	C5	IC560	F5
D14	E3	IC504	I3	IC515	G5	IC532	E4	IC564	D3
D15	E3	IC505	I3	IC516	G4	IC533	H3	IC565	D3
D16	E3	IC506	H3	IC517	F4	IC534	H3	IC566	D4
D17	E3	IC507	F3	IC518	F4	IC539	E3	IC567	D4
D18	E3	IC508	F4	IC520	D3	IC540	E3	IC568	D5
D19	E3	IC509	F3	IC525	C3	IC541	F5	IC569	D5

PRINTED CIRCUIT BOARD

DSP (1) P.C.B. (Side B) Lead Free Solder Used



• Semiconductor Location

Ref.no	Location
D7	F3
D23	E3

D-VIDEO P.C.B. (Side A) Lead Free Solder Used



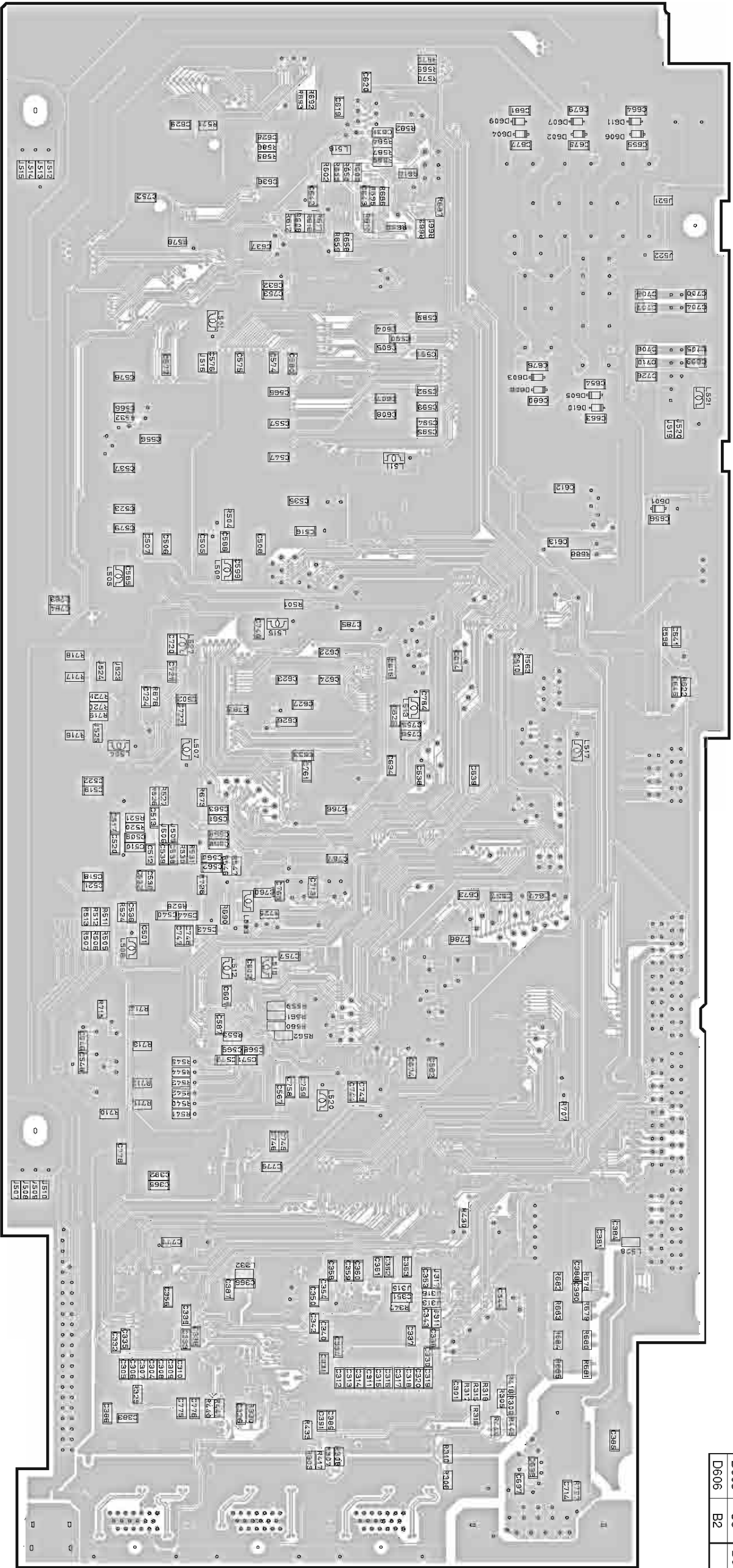
Ref.no.	Location	Ref.no.	Location	Ref.no.	Location	Ref.no.	Location	Ref.no.	Location	Ref.no.	Location	Ref.no.	Location	Ref.no.	Location	Ref.no.	Location	Ref.no.	Location	Ref.no.	Location	Ref.no.	Location				
D312	I5	D324	I3	D616	F3	IC305	H5	IC311	H5	IC504	G5	IC510	-	IC516	C5	IC523	D4	IC529	I3	IC602	B3	IC608	E5	Q310	H3	Q504	B5
D315	H5	D325	I5	D617	G3	IC306	I5	IC312	H6	IC505	E4	IC511	-	IC517	B5	IC524	G6	IC531	F4	IC603	C3	IC609	F5	Q311	H3	Q505	H3
D318	H5	D612	H3	IC301	I4	IC307	I5	IC314	H4	IC506	G4	IC512	-	IC518	B5	IC525	F5	IC532	F5	IC604	B3	IC610	D4	Q410	-	Q506	H3
D321	I4	D613	H3	IC302	I4	IC308	H5	IC501	B5	IC507	B5	IC513	G4	IC520	D3	IC526	E3	IC533	F4	IC605	C3	Q301	I4	Q501	B4	Q507	H3
D322	I4	D614	H3	IC303	I4	IC309	H4	IC502	D5	IC508	C4	IC514	G4	IC521	D3	IC527	E3	IC541	E6	IC606	B3	Q302	I4	Q502	B5	Q508	I3
D323	I3	D615	I3	IC304	I4	IC310	H4	IC503	F5	IC509	E5	IC515	G4	IC522	B4	IC528	B4	IC601	D3	IC607	F5	Q309	I5	Q503	B5		

PRINTED CIRCUIT BOARD

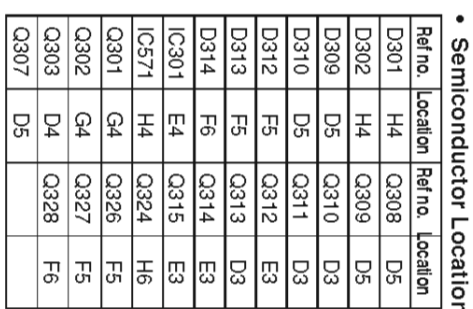
D-VIDEO P.C.B. (Side B) Lead Free Solder Used

Semiconductor Location

Ref.no.	Location	Ref.no.	Location
D601	D2	D607	B3
D602	B3	D608	C3
D603	C3	D609	B3
D604	B3	D610	C3
D605	C3	D611	B2
D606	B2		

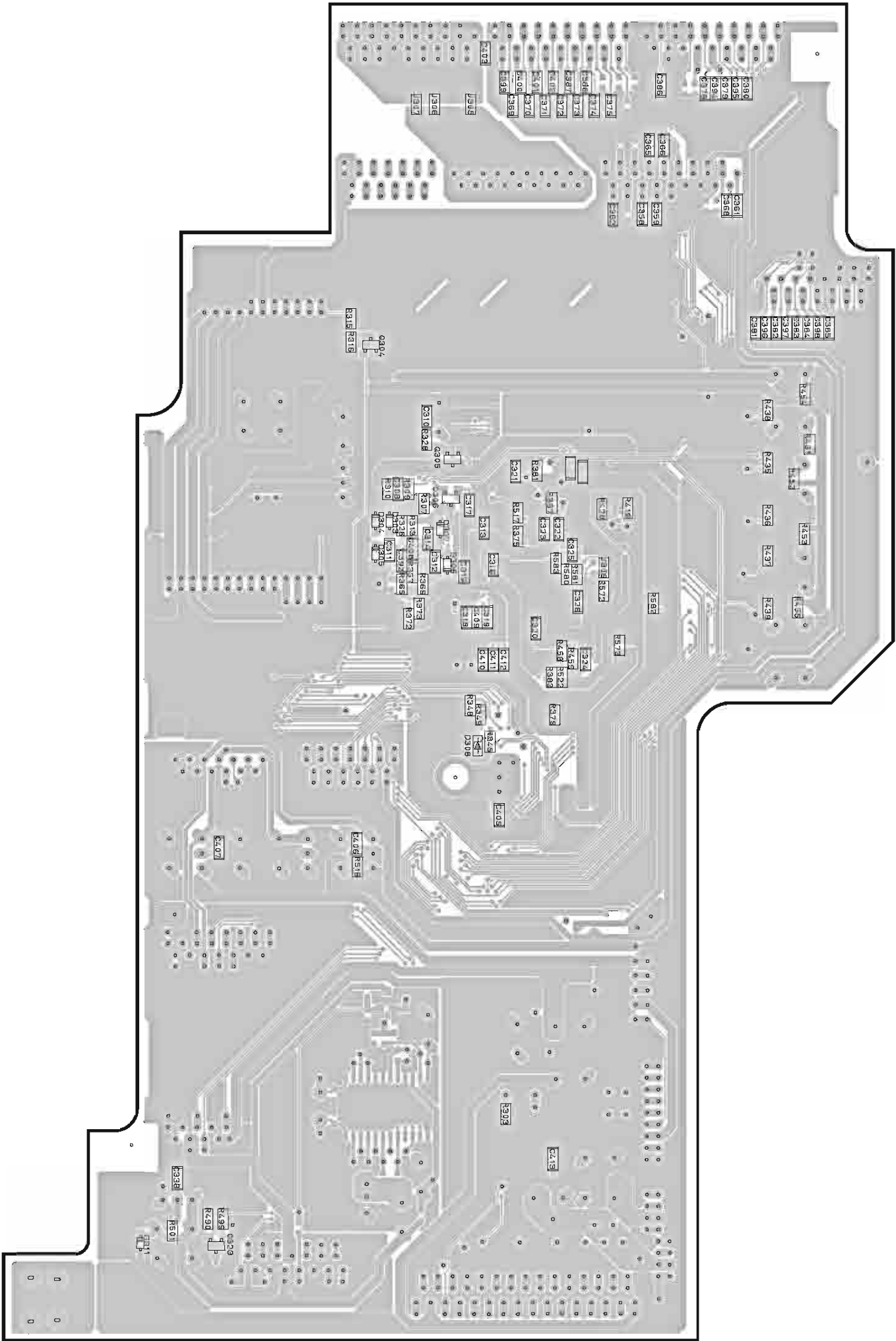


FUNCTION (1) P.C.B. (Side A) Lead Free Solder Used



1 ■ PRINTED CIRCUIT BOARD

FUNCTION (1) P.C.B. (Side B) Lead Free Solder Used



• Semiconductor Location

Ref no.	Location
D303	E5
D304	E5
D305	E5
D306	E4
D307	E4
D308	F4
D311	H6
Q304	D5
Q305	D4
Q306	D4
Q323	H5

A

B

C

D

E

F

G

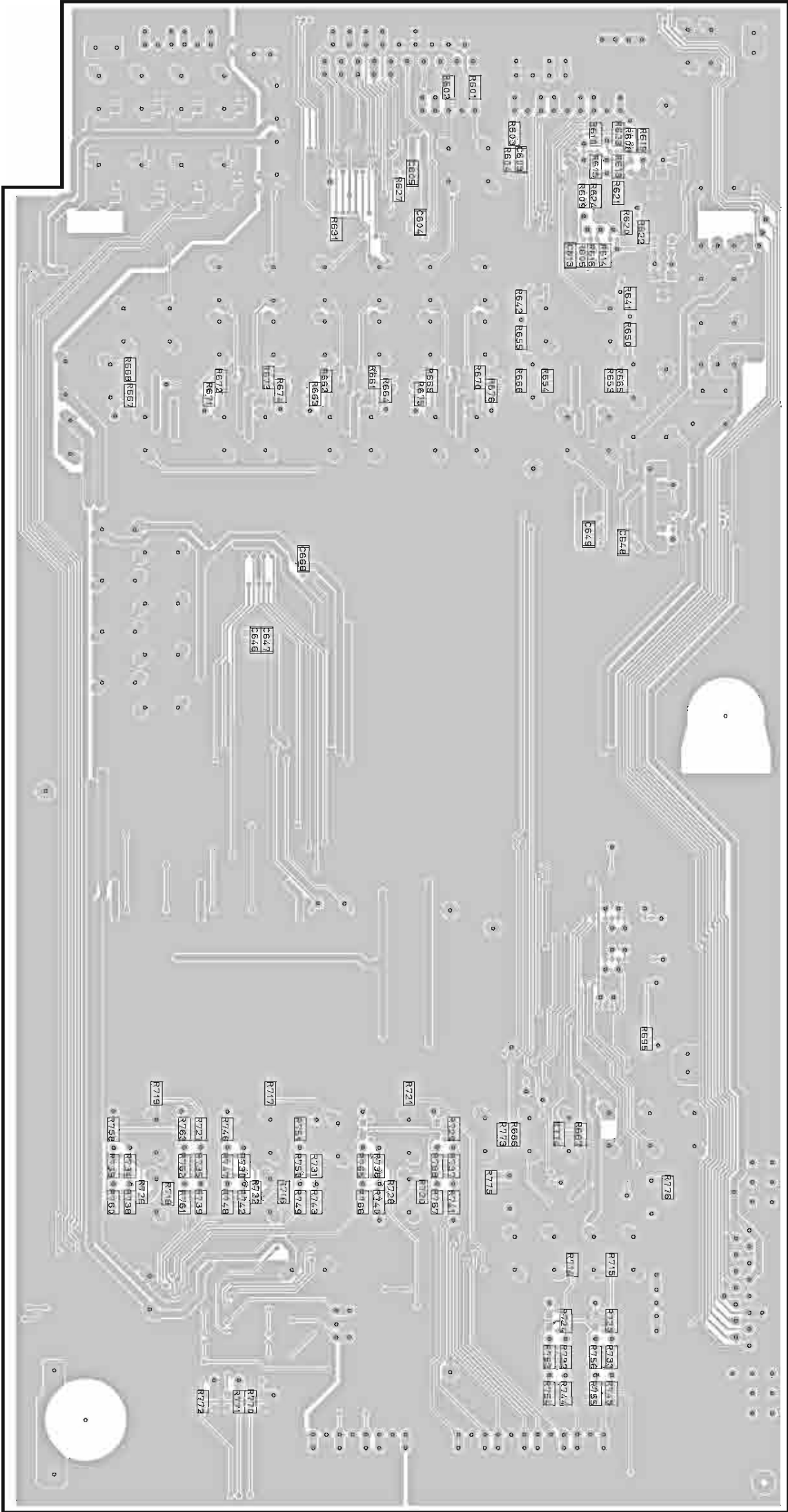
H

I

J

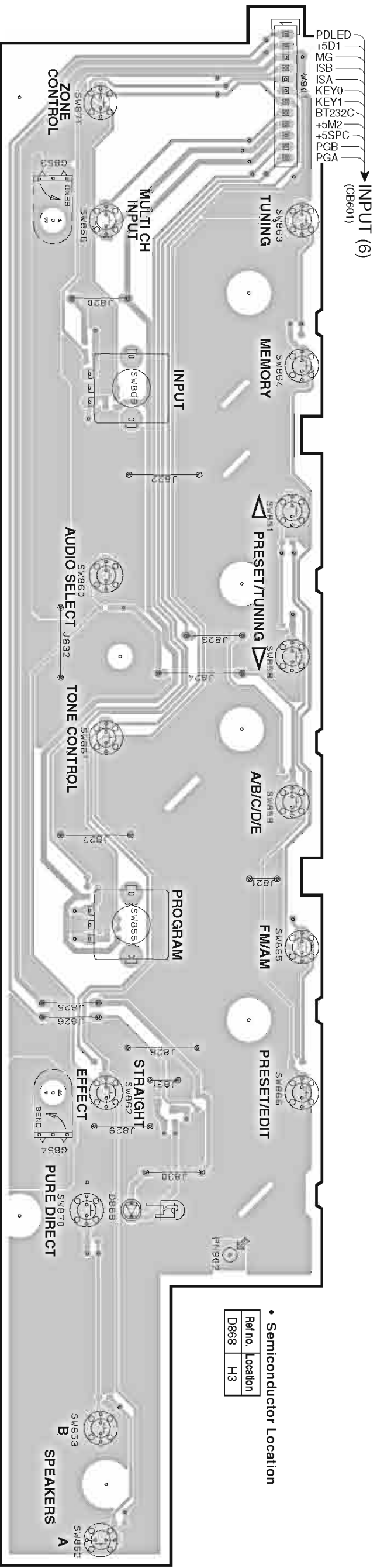
1 ■ PRINTED CIRCUIT BOARD

FUNCTION (2) P.C.B. (Side B) Lead Free Solder Used



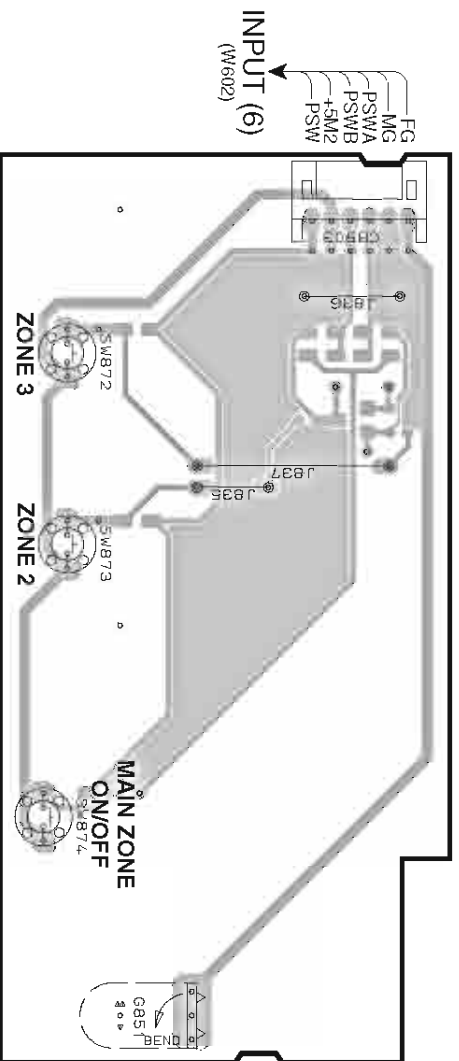
OPERATION (1) P.C.B.

(Side A)



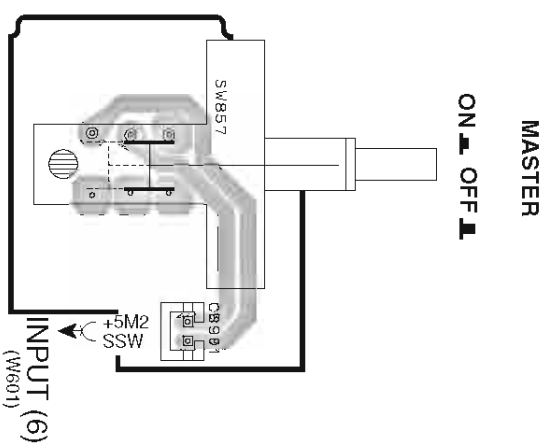
OPERATION (2) P.C.B.

(Side A)



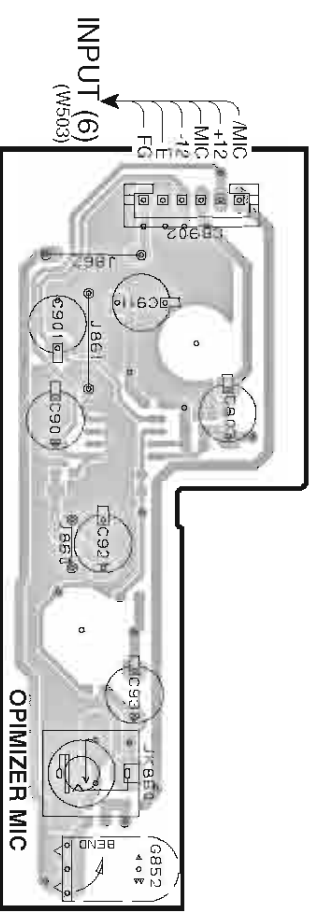
OPERATION (5) P.C.B.

(Side A)



OPERATION (7) P.C.B.

(Side A)



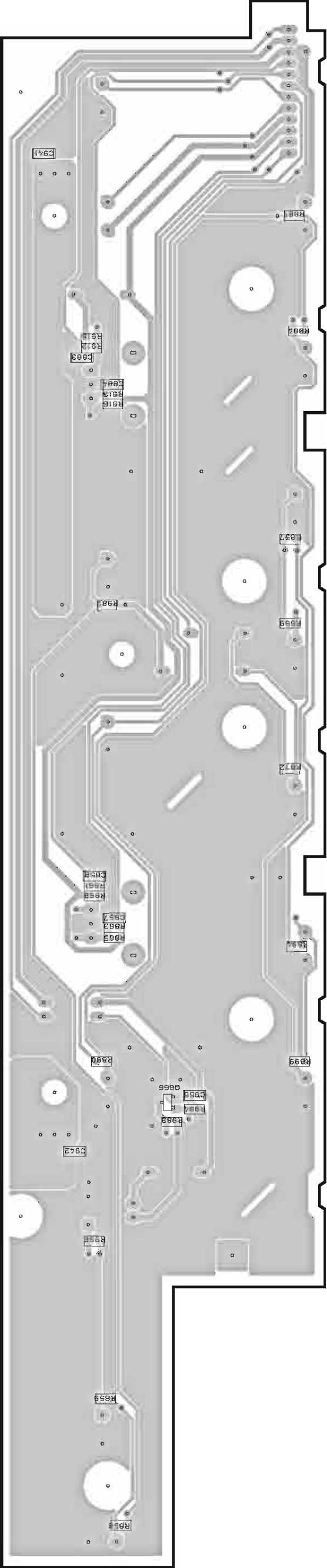
- Semiconductor Location

Ref no.	Location
D868	H3

1 ■ PRINTED CIRCUIT BOARD

OPERATION (1) P.C.B.

(Side B) Lead Free Solder Used

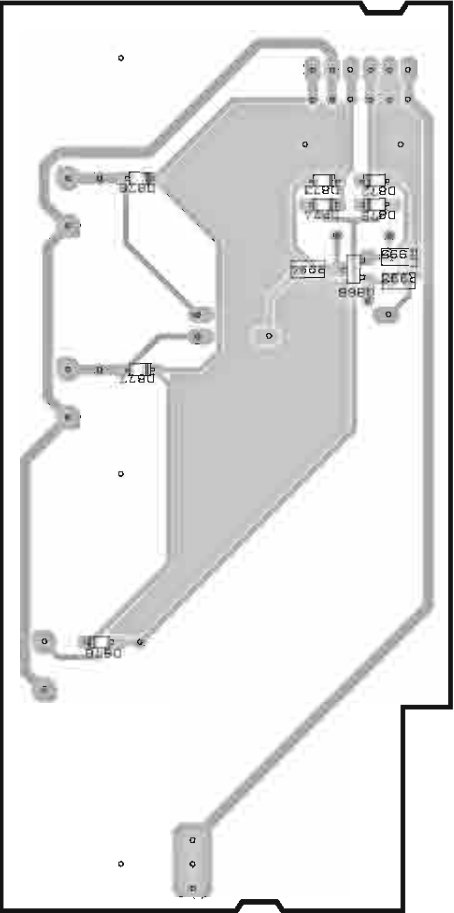


• Semiconductor Location

Ref.no.	location	Ref.no.	location
D860	H6	D877	C6
D872	B6	D878	B6
D873	B6	IC855	H6
D874	B6	Q866	G3
D875	B6	Q868	B6
D876	D7		

OPERATION (2) P.C.B.

(Side B) Lead Free Solder Used



OPERATION (7) P.C.B.

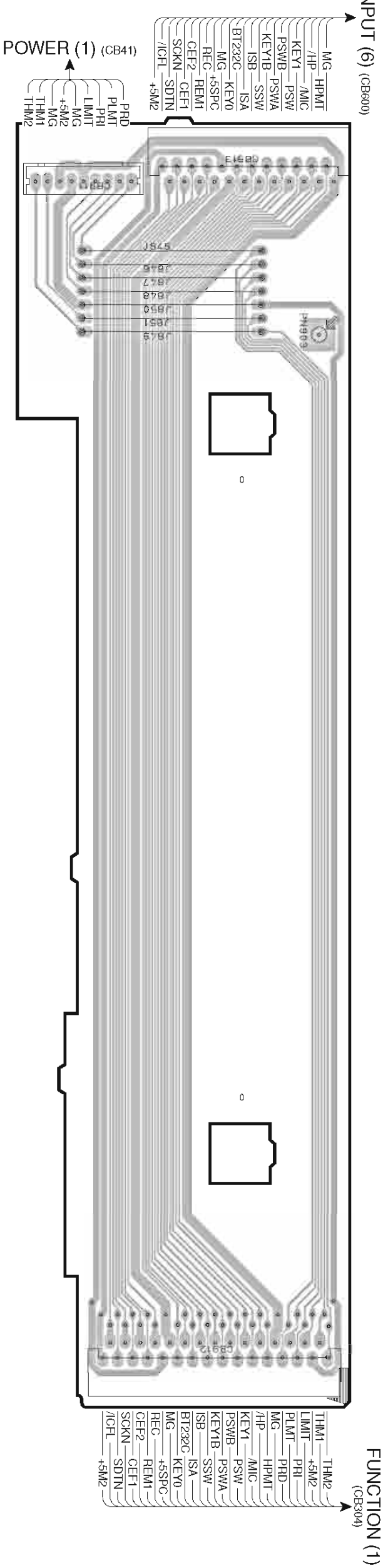
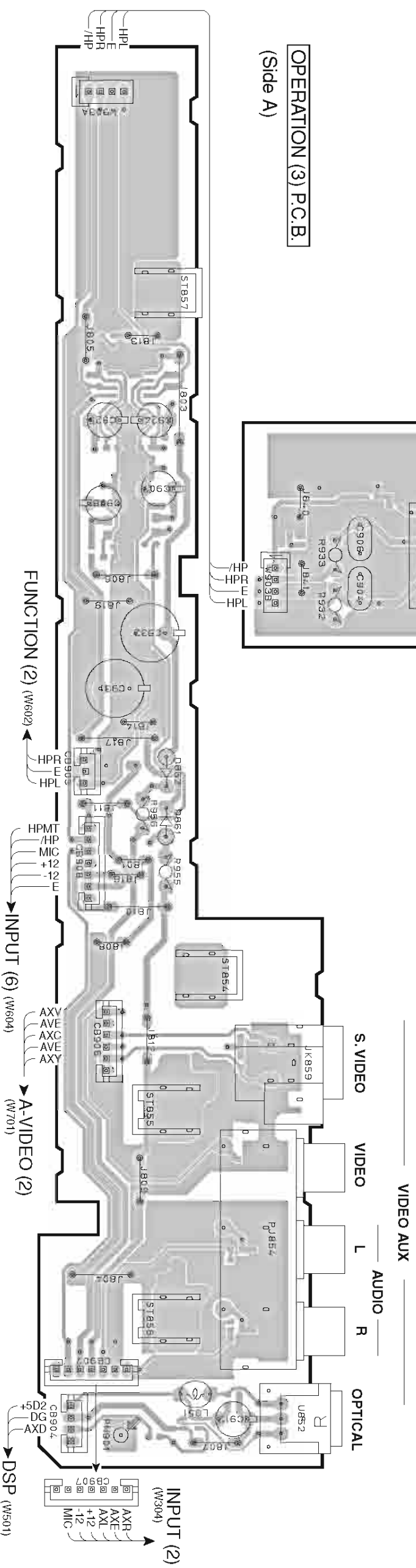
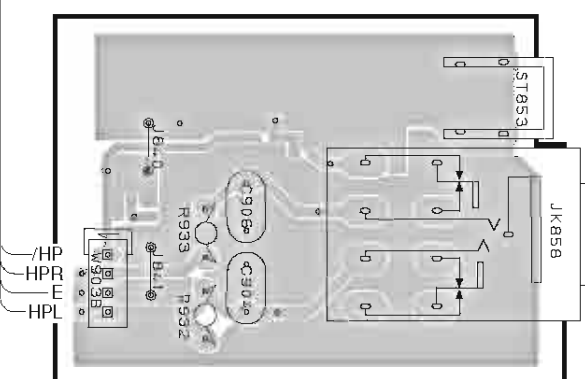
(Side B) Lead Free Solder Used





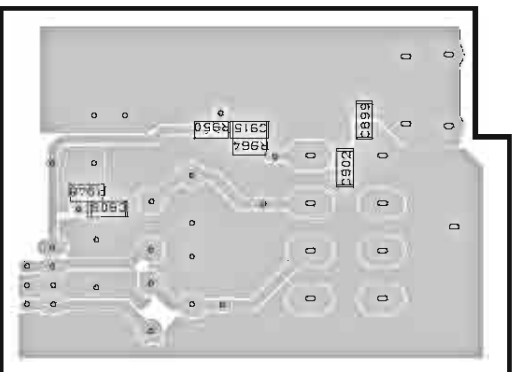
- **Semiconductor Location**

Ref.no.	Location
D861	F4
D862	E4

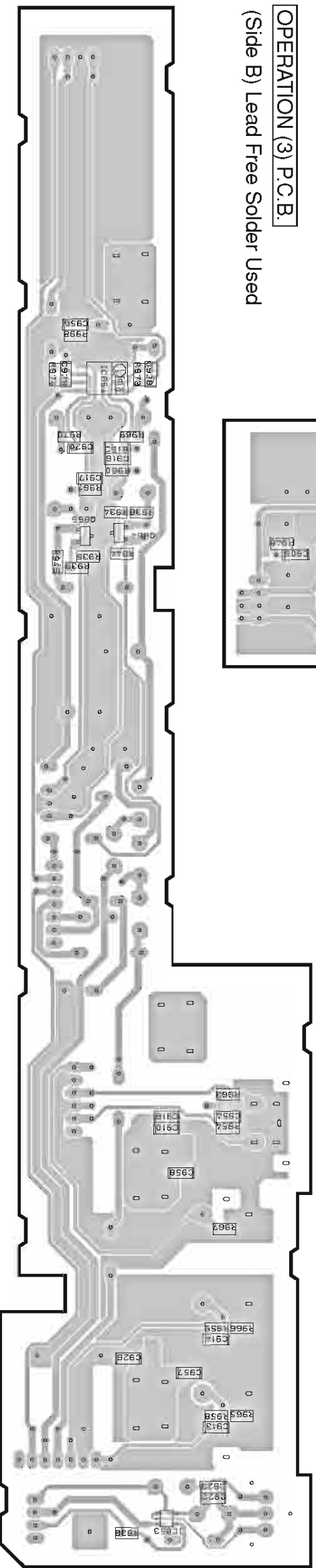


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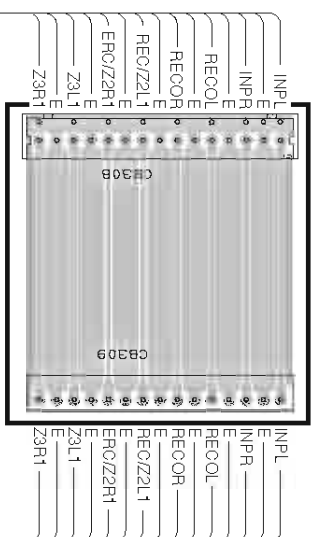
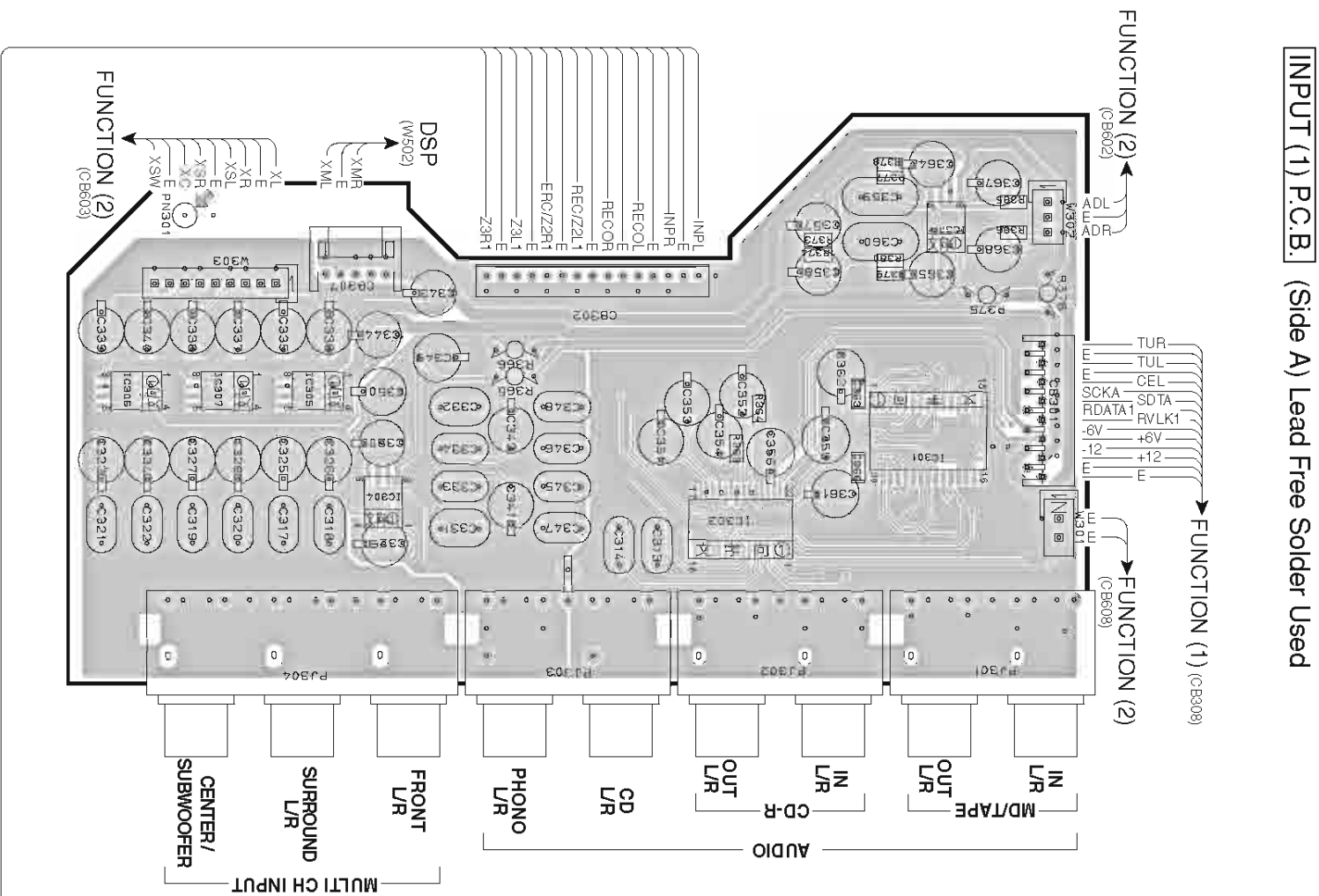
o/c



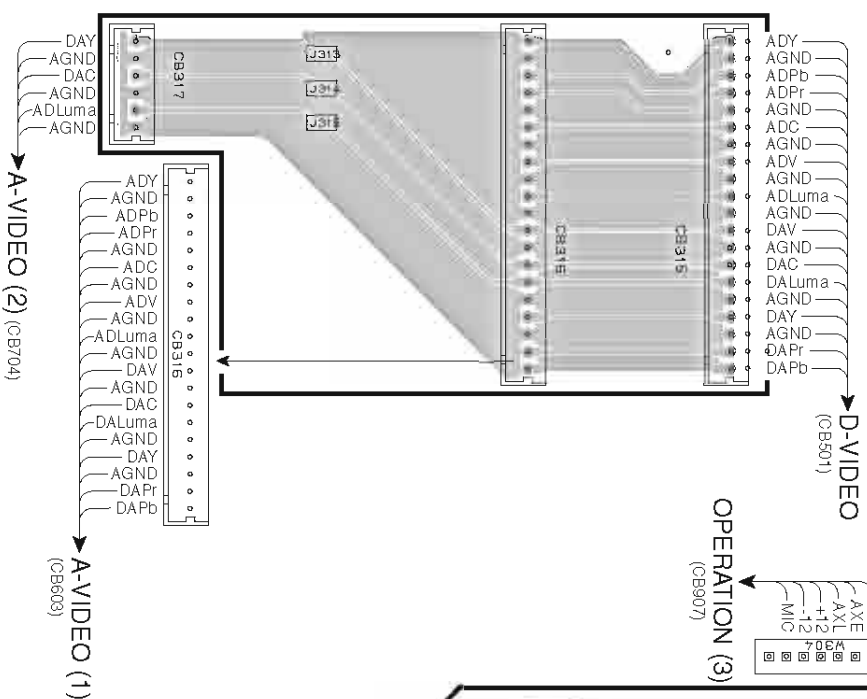
10



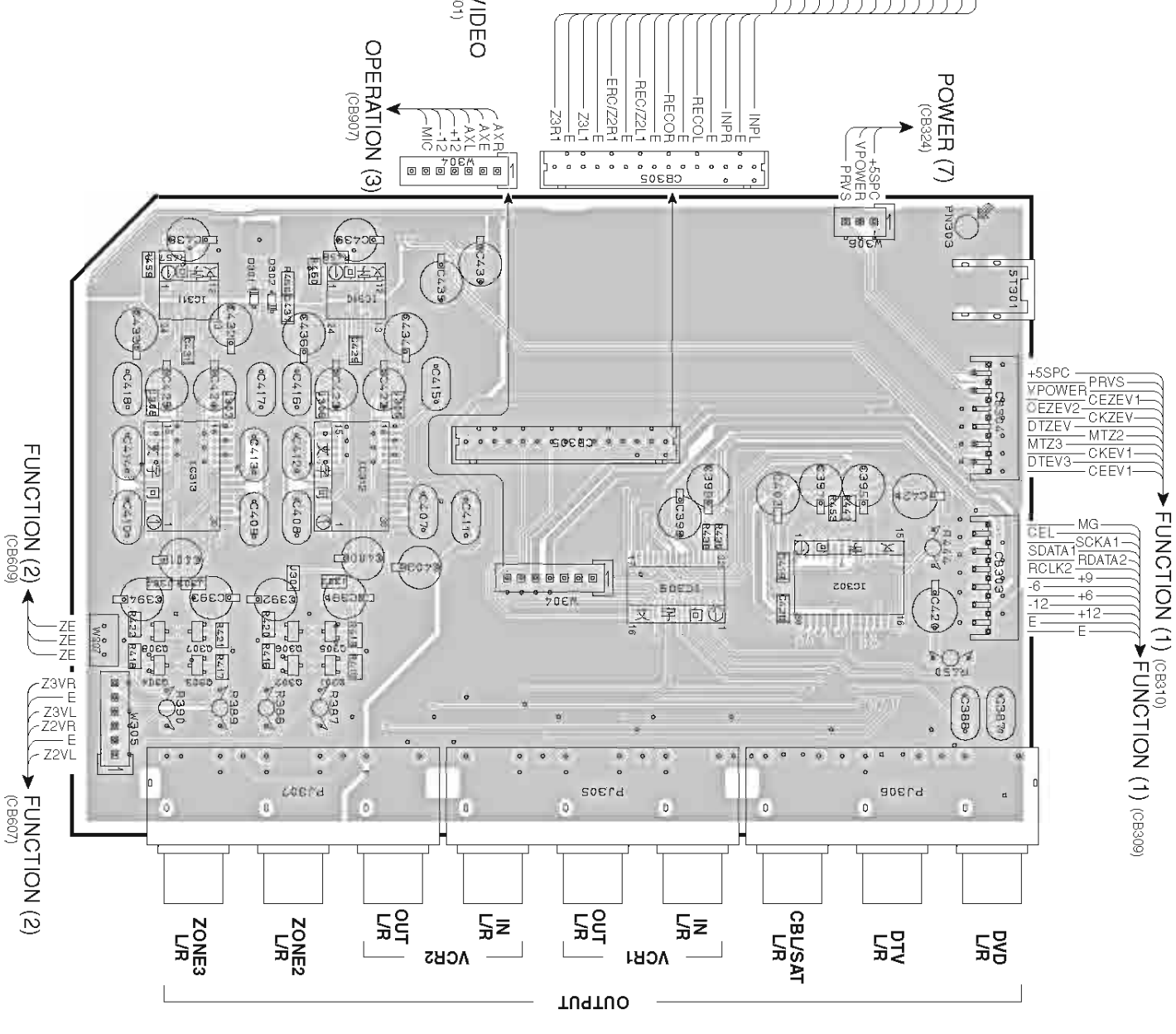
■ PRINTED CIRCUIT BOARD



INPUT (5) P.C.B. (Side A)
Lead Free Solder Used

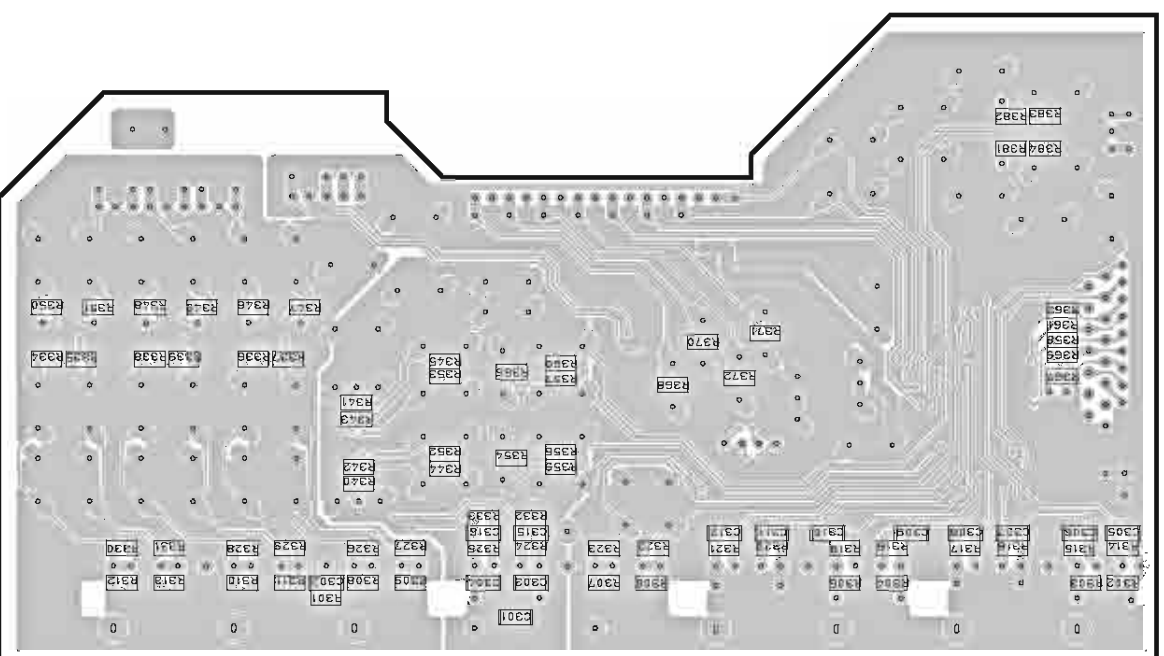


INPUT (2) P.C.B. (Side A) Lead Free Solder Used

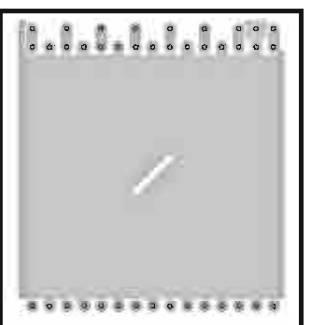


Ref.no.	Location	Ref.no.	Location	Ref.no.	Location	Ref.no.	Location	Ref.no.	Location	Ref.no.	Location	Ref.no.	Location	Ref.no.	Location
D301	G5	IC303	C4	IC307	B6	IC311	G5	Q302	I5	Q306	I5				
D302	G5	IC304	C5	IC308	B3	IC312	H5	Q303	I5	Q307	I5				
IC301	B3	IC305	B5	IC309	I3	IC313	H5	Q304	I5	Q308	I5				
IC302	I3	IC306	B6	IC310	G5	Q301	I5	Q305	I5						

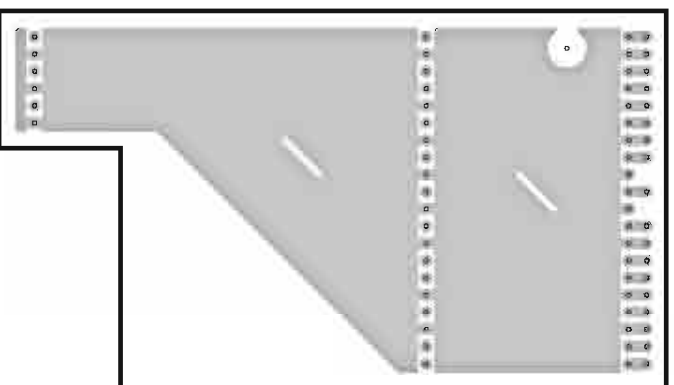
INPUT (1) P.C.B.
(Side B) Lead Free Solder Used



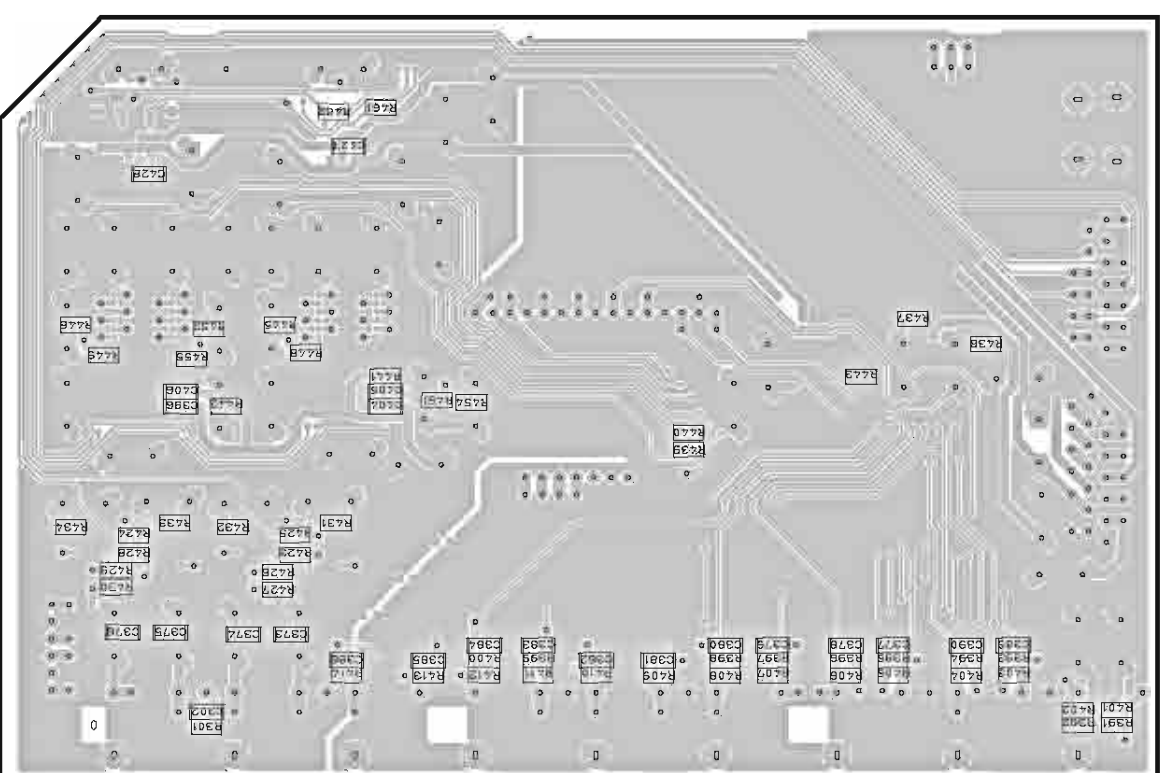
INPUT (4) P.C.B. (Side B)
Lead Free Solder Used



INPUT (5) P.C.B. (Side B)
Lead Free Solder Used

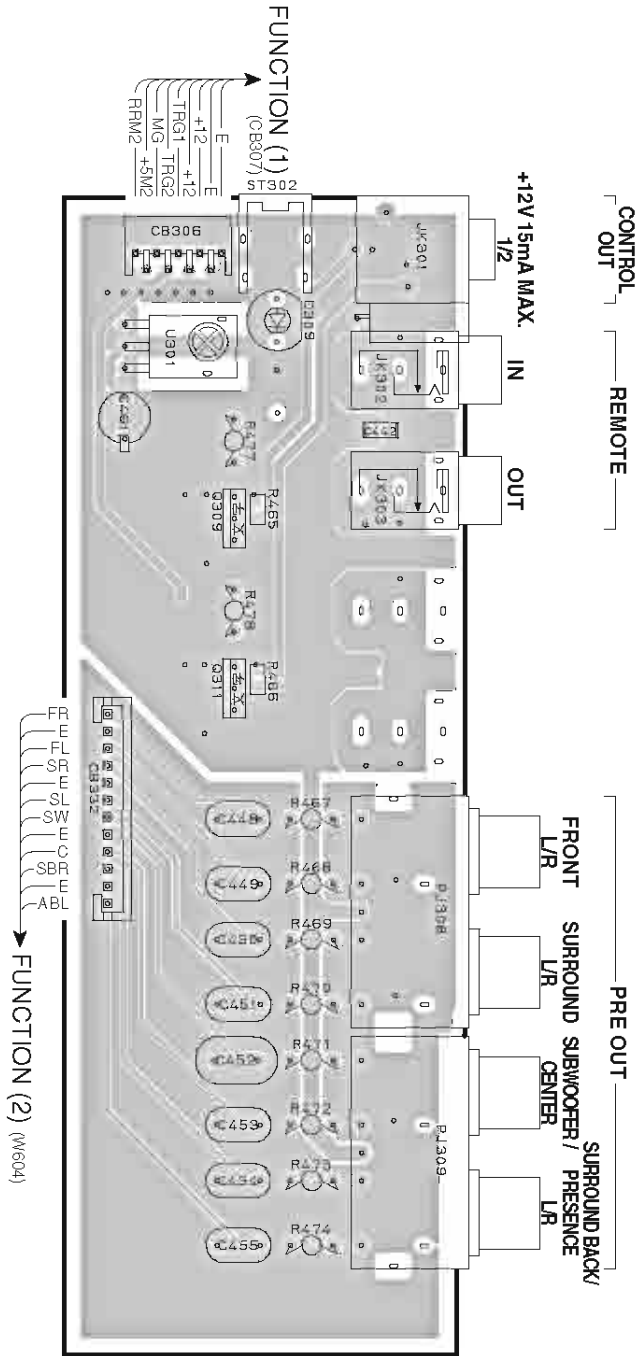


INPUT (2) P.C.B. (Side B) Lead Free Solder Used



PRINTED CIRCUIT BOARD

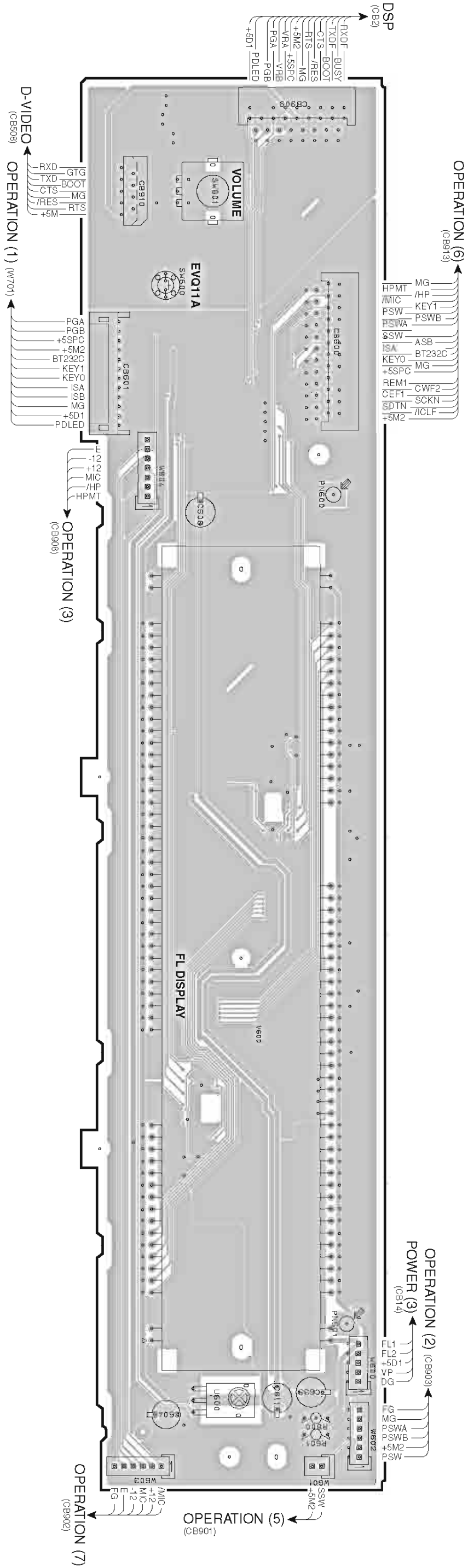
INPUT (3) P.C.B. (Side A) Lead Free Solder Used



• Semiconductor Location

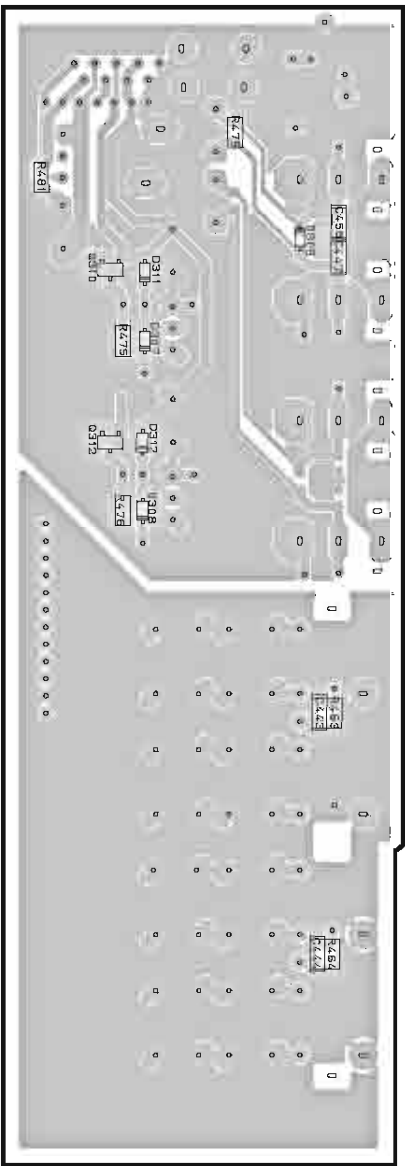
Ref.no.	Location
D309	D3
Q309	E3
Q311	E3

INPUT (6) P.C.B. (Side A) Lead Free Solder Used



■ PRINTED CIRCUIT BOARD

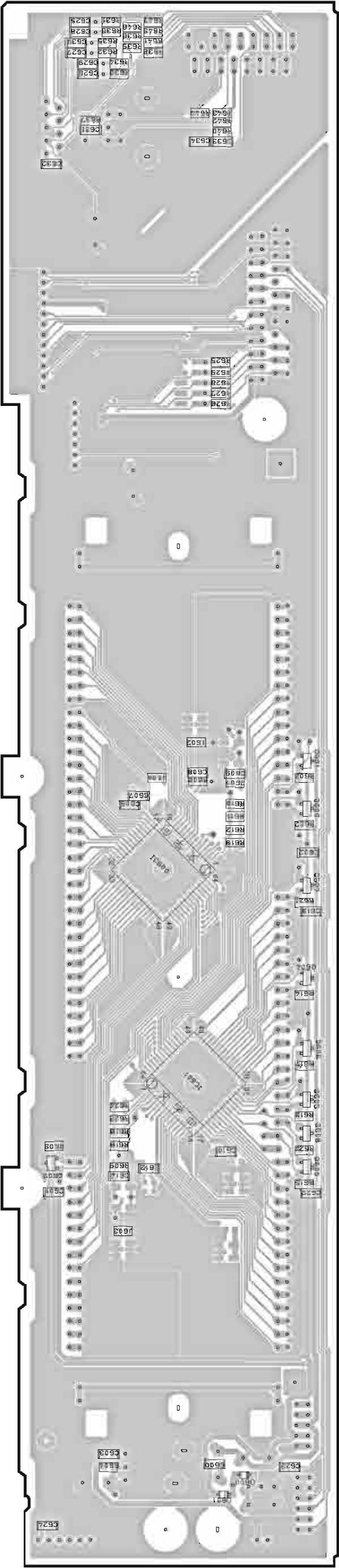
INPUT (3) P.C.B. (Side B) Lead Free Solder Used



• Semiconductor Location

Ref.no.	Location	Ref.no.	Location	Ref.no.	Location
D305	E2	IC600	F5	Q603	H5
D307	E3	IC601	G5	Q604	G5
D308	F3	Q310	E3	Q605	H5
D311	E3	Q312	E3	Q606	G5
D312	E3	Q600	F5	Q607	F5
D600	J5	Q601	E5	Q608	H5
D601	J5	Q602	H6		

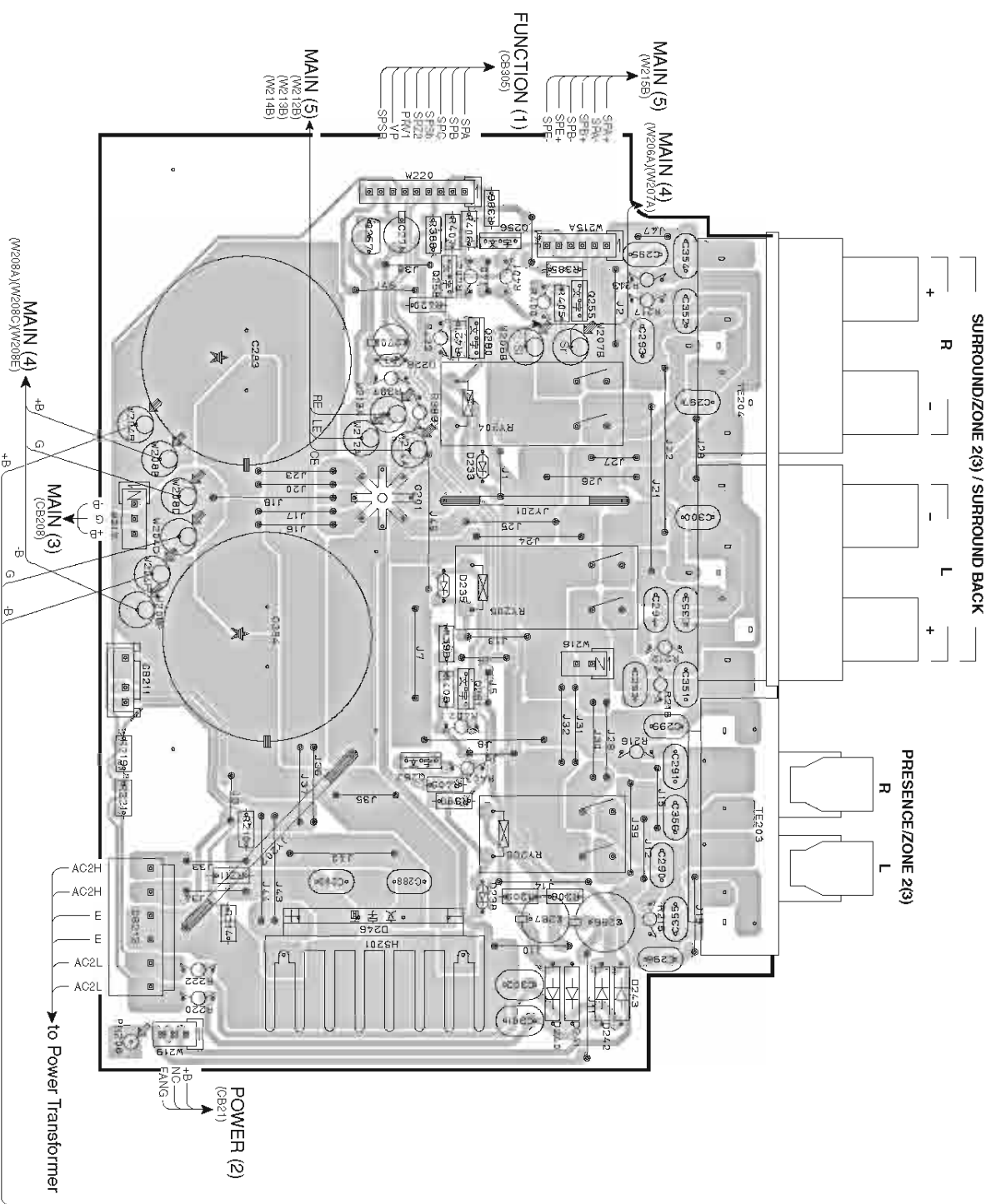
INPUT (6) P.C.B. (Side B) Lead Free Solder Used



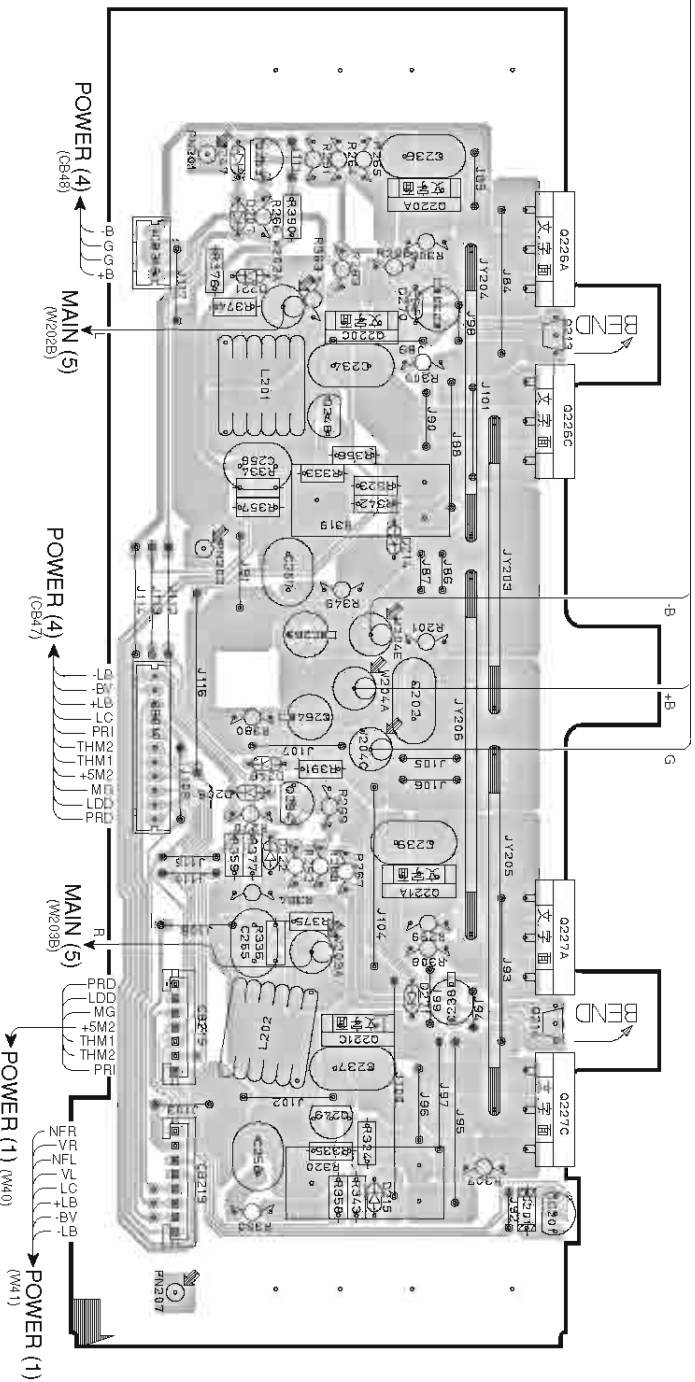
PRINTED CIRCUIT BOARD

Lead Free Solder Used

MAIN (1) P.C.B. (Side A)



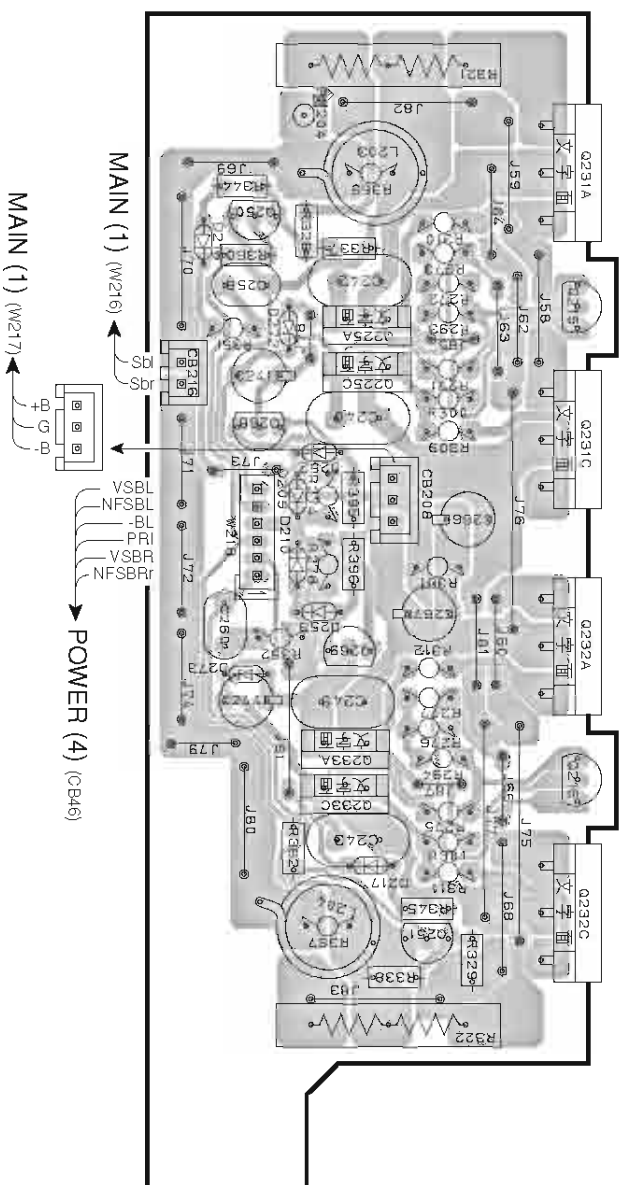
MAIN (2) P.C.B. (Side A)



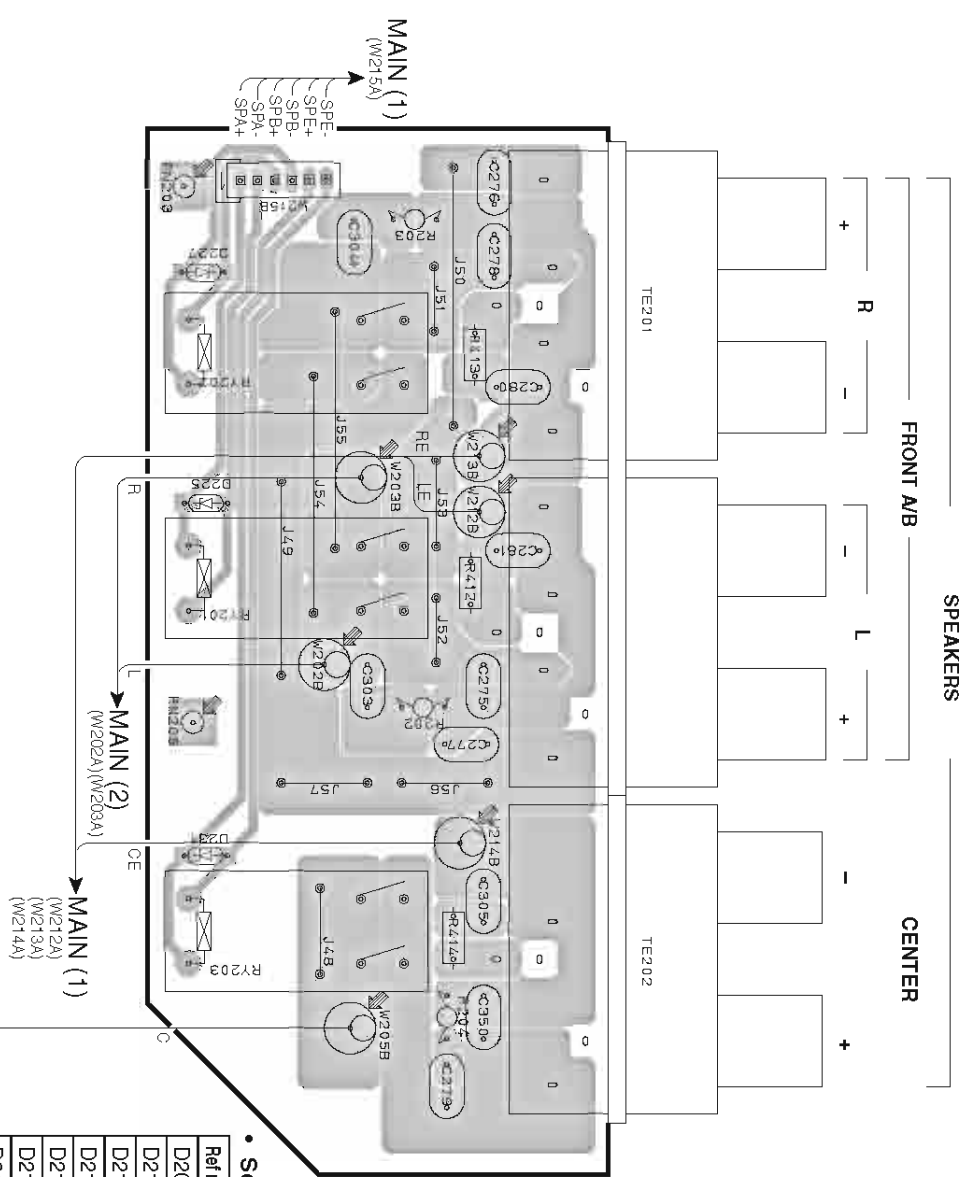
Semiconductor Location			
Ref.no	Location	Ref.no	Location
D207	G4	D243	E3
D208	I4	D246	E3
D214	H4	D247	F4
D215	J4	D248	H4
D221	G4	D270	G4
D222	I4	D271	I4
D228	B4	D272	J4
D233	C4	D273	K4
D235	E4	D274	L4
D238	F4	D275	M4
D240	G4	D276	N4
D241	H4	D277	O4
D242	I4	D278	P4

■ **PRINTED CIRCUIT BOARD** Lead Free Solder Used

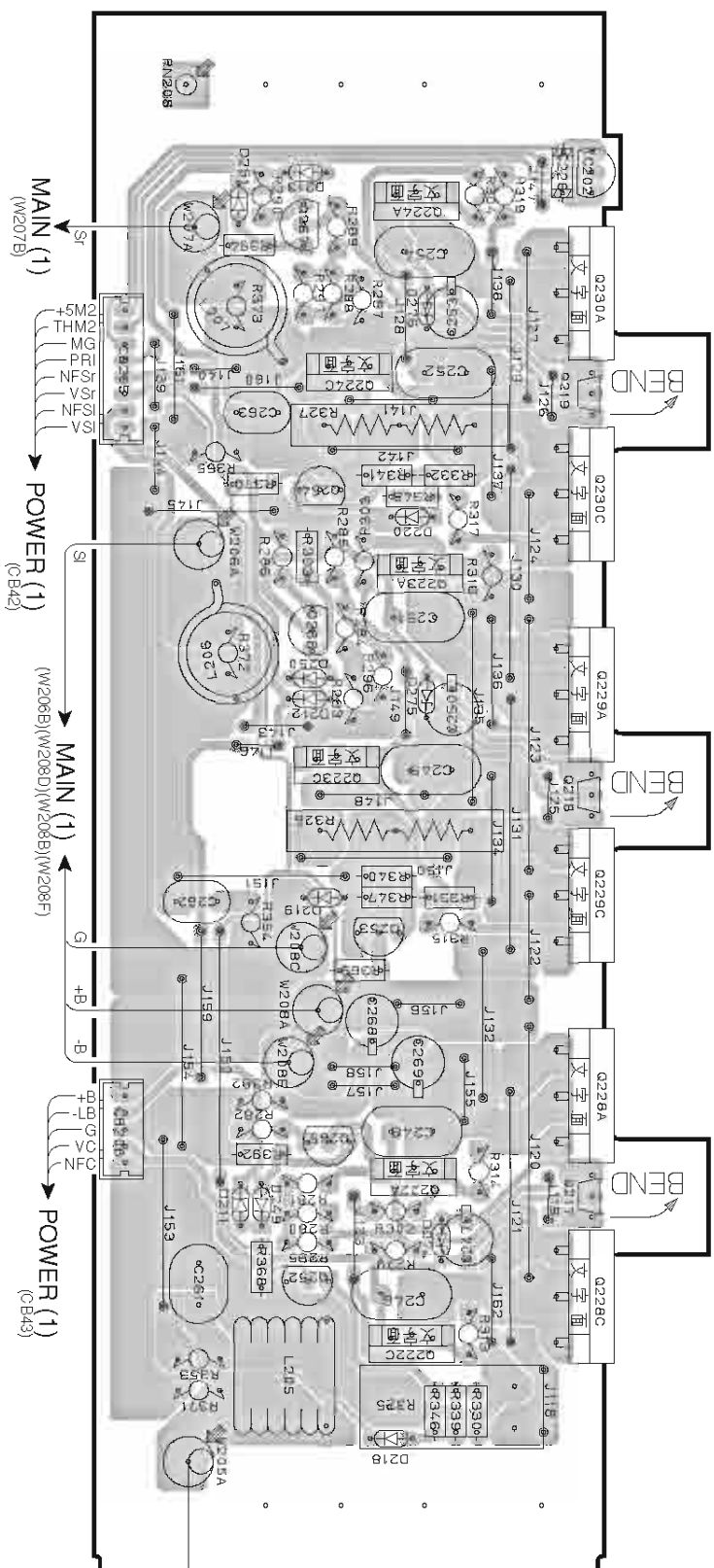
MAIN (3) P.C.B. (Side A)



MAIN (5) P.C.B. (Side A)



MAIN (4) P.C.B. (Side A)

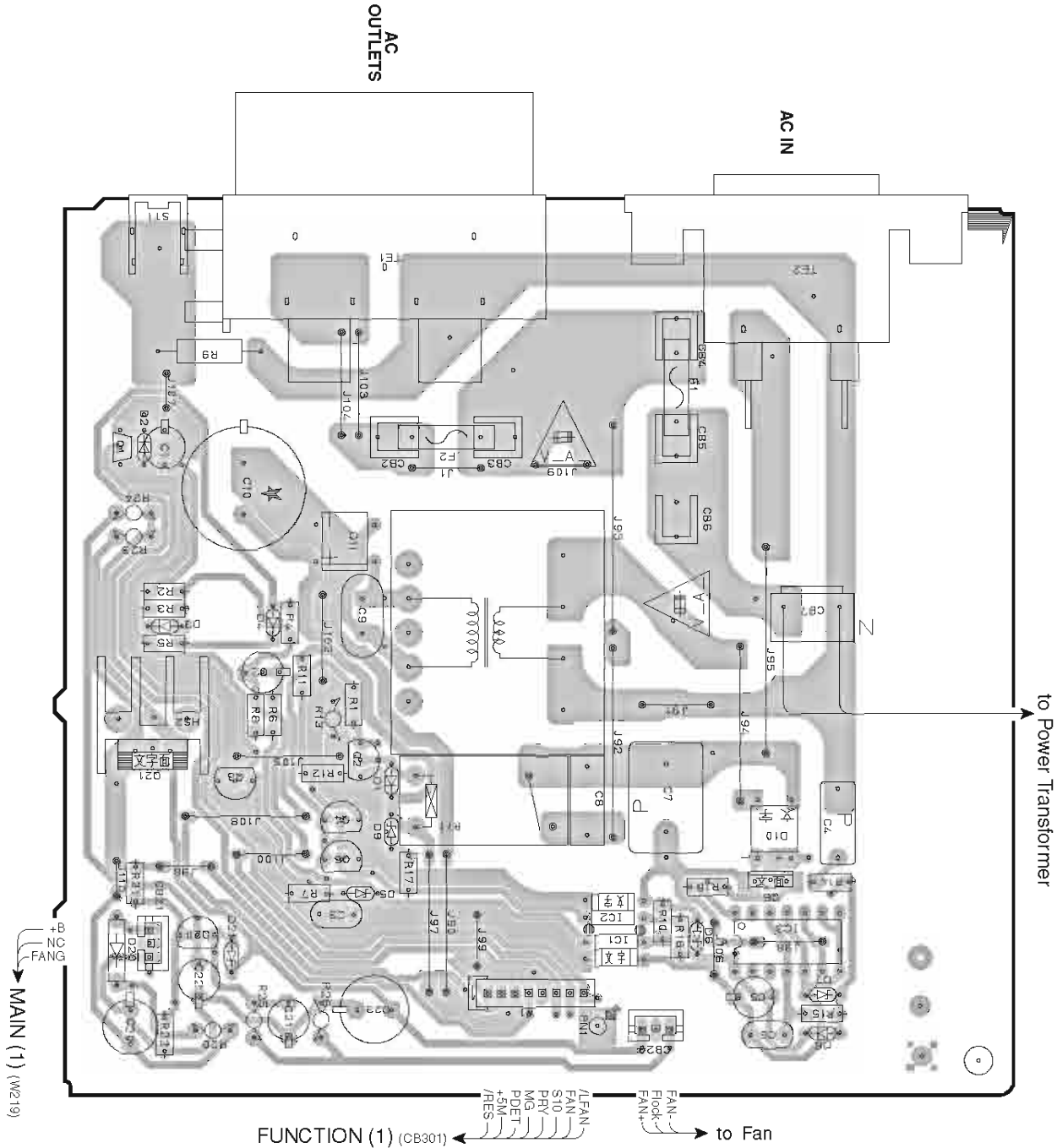


- **Semiconductor Location**

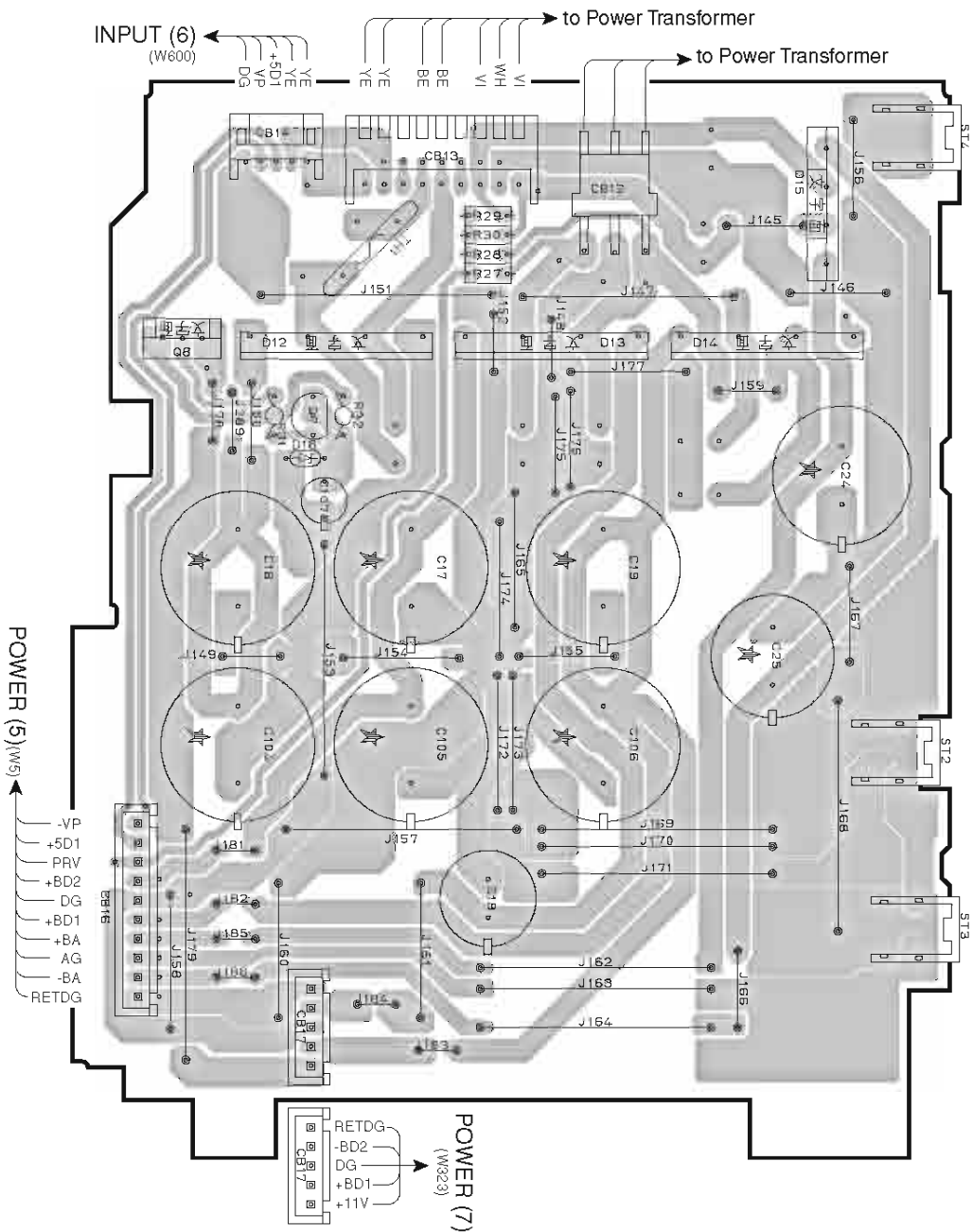
Ref. no.	Location	Ref. no.	Location
D209	B3	Q223A	C3
D210	C3	Q223C	C3
D211	E6	Q224A	A5
D212	C6	Q224C	B6
D213	B6	Q225A	B2
D216	B3	Q225C	B2
D217	D2	Q228A	E5
D218	F5	Q228C	E5
D219	D6	Q229A	C5
D220	C5	Q229C	D5
D225	G4	Q230A	B5
D227	F4	Q230C	C5
D231	H4	Q231A	A2
D249	E6	Q231C	B2
D250	C6	Q232A	D2
D251	A6	Q232C	C2
D252	B3	Q233A	C5
D253	C3	Q233C	D5
D272	B3	Q248	-
D273	C3	Q249	-
D274	E5	Q250	B3
D275	C5	Q251	D2
D276	B5	Q252	E6
IC202	A5	Q253	D5
Q215	B2	Q254	C6
Q216	C2	Q265	E6
Q217	E5	Q266	C6
Q218	D5	Q267	B6
Q219	B5	Q268	B3
Q222A	E5	Q269	C3
Q222C	E5		

PRINTED CIRCUIT BOARD

POWER (2) P.C.B. (Side A)



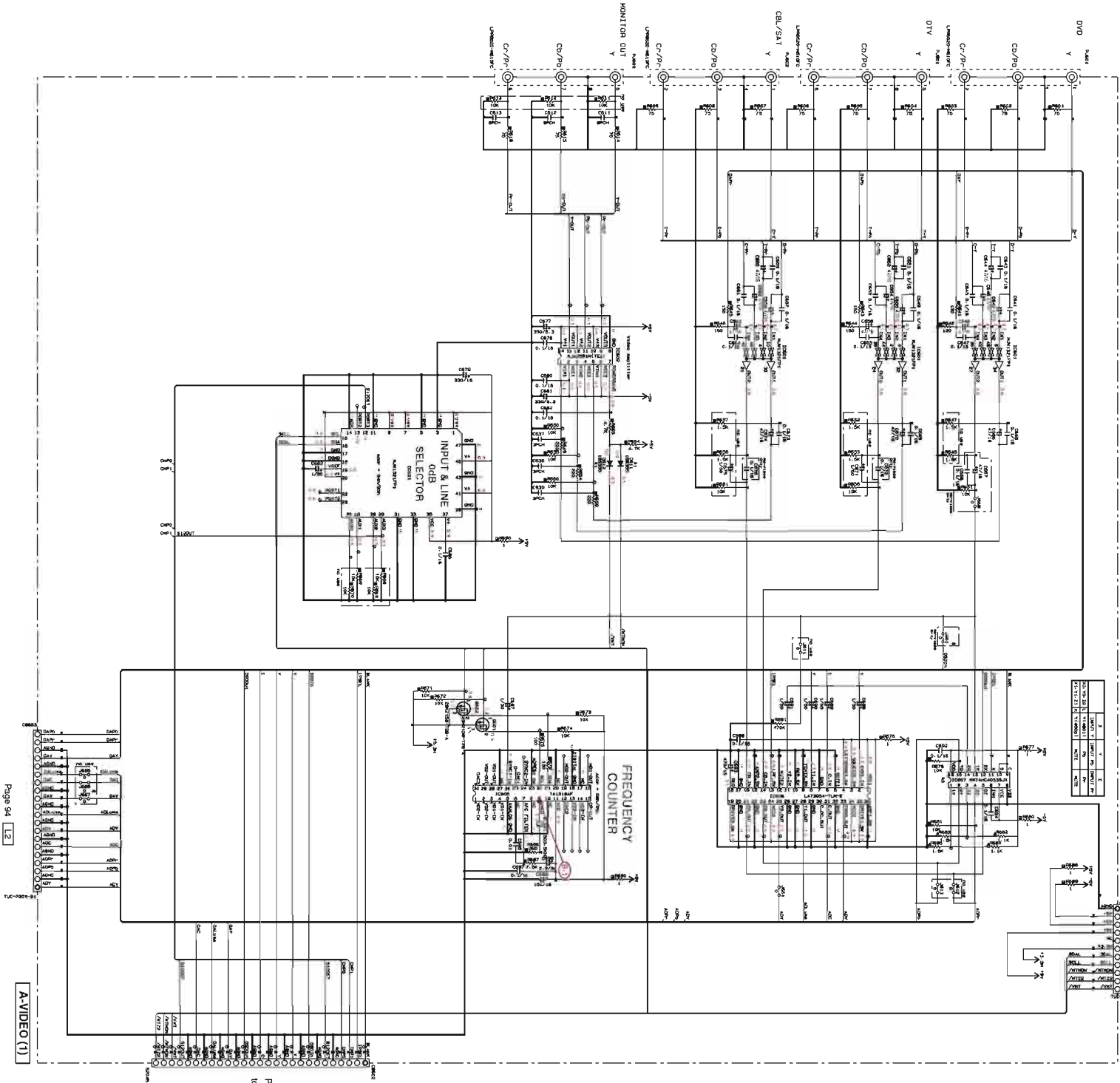
POWER (3) P.C.B. (Side A)



Semiconductor Location

Ref.no.	location	Ref.no.	location	Ref.no.	location
D1	D4	D12	G4	Q2	D4
D2	C5	D13	G3	Q3	D5
D3	C5	D14	G3	Q4	D5
D4	C5	D15	F2	Q5	D5
D5	D4	D16	G4	Q6	D3
D6	D3	D20	D5	Q7	G4
D7	E3	D21	E5	Q8	G5
D8	E3	IC1	E3	Q20	D5
D9	D4	IC2	D3	Q21	D5
D10	D3	IC3	D3		
D11	C5	Q1	C5		

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to FUNCTION (1), CB312



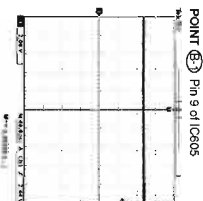
Page 94 [L2]
to INPUT (5), CB316

A-VIDEO (1)

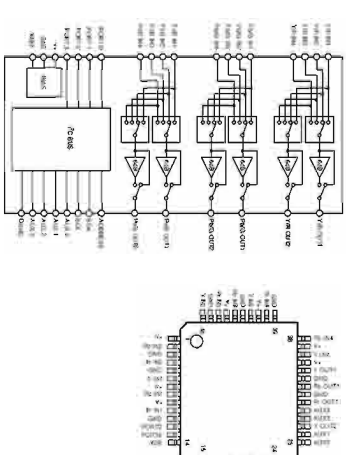
Page 97 [G3]
to A-VIDEO (2), CB703

INDEPENDENTLY TESTED AT MANUFACTURING PLANT			
ITEM	TESTED PARTS NUMBER	TESTED DATE	TESTED BY
1	LA73054-TLM-E	1977.10.10	LA73054
2	LA73054-TLM-E	1977.10.10	LA73054
3	LA73054-TLM-E	1977.10.10	LA73054
4	LA73054-TLM-E	1977.10.10	LA73054
5	LA73054-TLM-E	1977.10.10	LA73054
6	LA73054-TLM-E	1977.10.10	LA73054
7	LA73054-TLM-E	1977.10.10	LA73054
8	LA73054-TLM-E	1977.10.10	LA73054
9	LA73054-TLM-E	1977.10.10	LA73054
10	LA73054-TLM-E	1977.10.10	LA73054
11	LA73054-TLM-E	1977.10.10	LA73054
12	LA73054-TLM-E	1977.10.10	LA73054
13	LA73054-TLM-E	1977.10.10	LA73054
14	LA73054-TLM-E	1977.10.10	LA73054
15	LA73054-TLM-E	1977.10.10	LA73054
16	LA73054-TLM-E	1977.10.10	LA73054
17	LA73054-TLM-E	1977.10.10	LA73054
18	LA73054-TLM-E	1977.10.10	LA73054
19	LA73054-TLM-E	1977.10.10	LA73054
20	LA73054-TLM-E	1977.10.10	LA73054

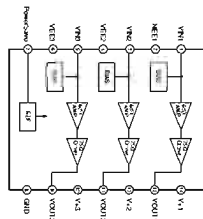
NOTICE (Item 1)	
1	U.S.A.
2	U.S.A.
3	U.S.A.
4	U.S.A.
5	U.S.A.
6	U.S.A.
7	U.S.A.
8	U.S.A.
9	U.S.A.
10	U.S.A.
11	U.S.A.
12	U.S.A.
13	U.S.A.
14	U.S.A.
15	U.S.A.
16	U.S.A.
17	U.S.A.
18	U.S.A.
19	U.S.A.
20	U.S.A.



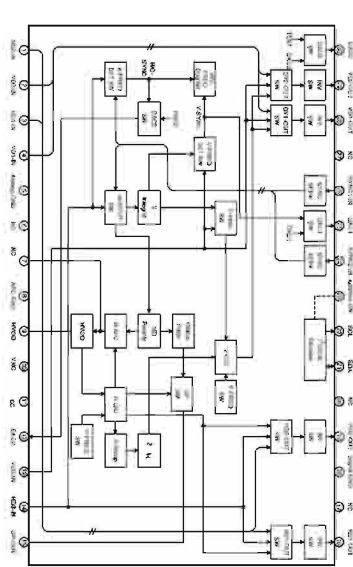
IC601: NJM1321FP1
Wide Band Video Switch with IC BUS



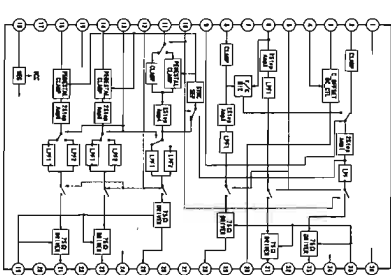
IC602: NJM2581M
Video Amp



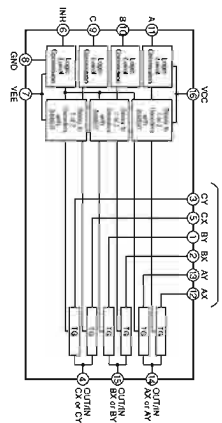
IC605: TA1318AF
SYNC Processor, Frequency Counter IC for TV Component Signals



IC606: LA73054-TLM-E
Analog Amp



IC607: MM74HC4053JX
Triple 2-Channel Analog Multiplexer



* All voltages are measured with a 10kΩV DC electronic voltmeter.
* Components having special characteristics are marked Δ, and must be replaced with parts having specifications equal to those originally installed.
* Schematic diagram is subject to change without notice.

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to OPERATION (9)_CB906

Page 99 92
to FUNCTION (1)_CB911

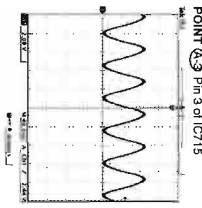
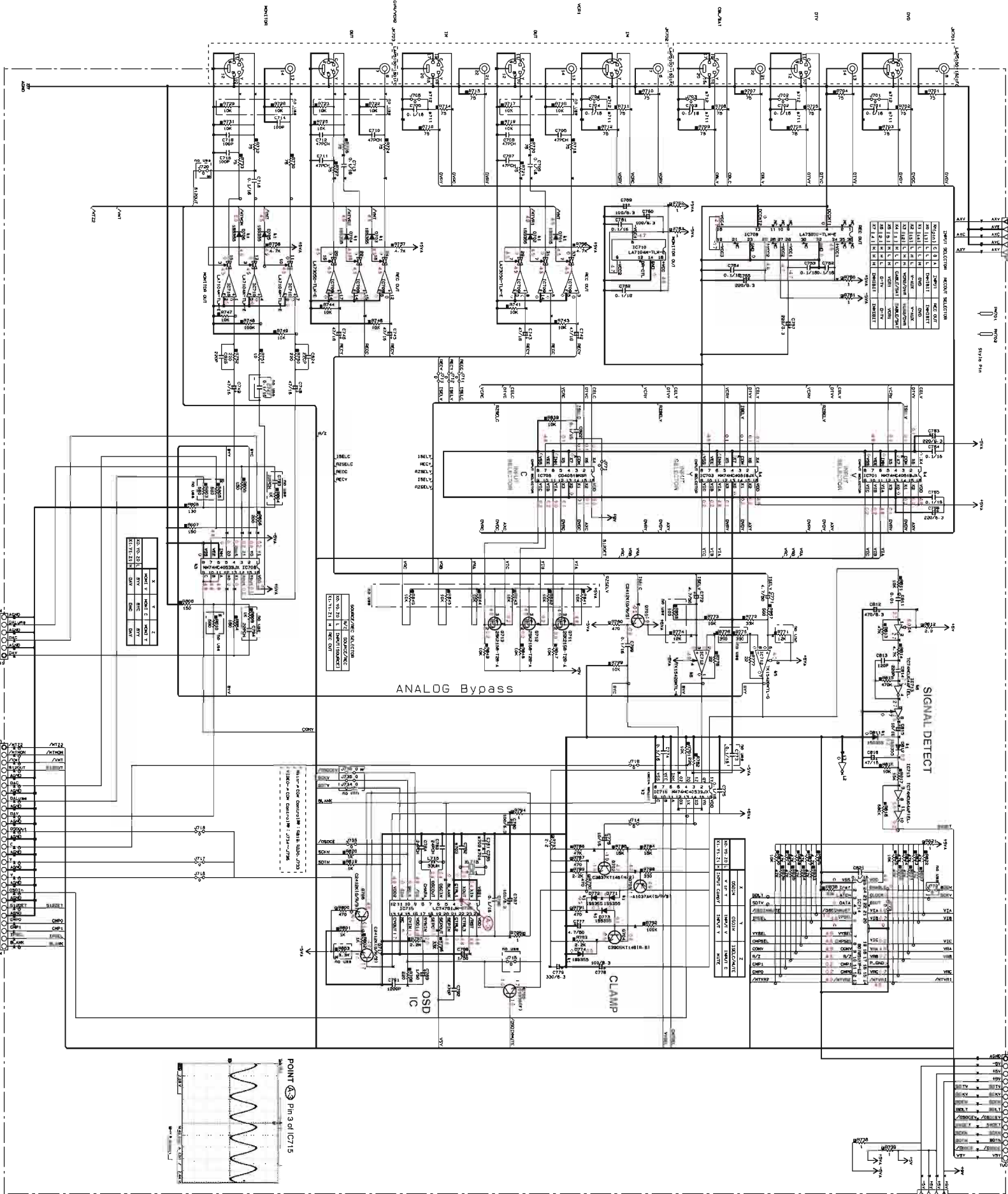
Page 93 12
to POWER (7)_CB925

NOTICE (Import)
(U)..... JAPAN
(I)..... CANADA
(C)..... GENERAL
(F)..... FRANCE
(B)..... BRITISH
(L)..... SINGAPORE
(E)..... SOUTH AFRICA
(A)..... AUSTRIA

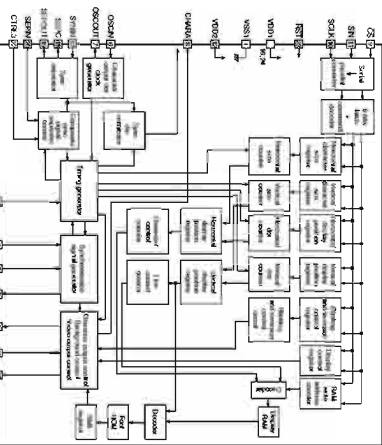
SYMBOL	MARK	UNIT
RESISTOR	Ω, K, M	Ω, K, M
CAPACITOR	μF, nF, pF	μF, nF, pF
INDUCTOR	mH, H	mH, H
DIODE	—	—
TRANSISTOR	—	—
IC	—	—
RELAY	—	—
SWITCH	—	—
LED	—	—
SPK	—	—
ANTENNA	—	—
GROUND	—	—

MARK	UNIT
RESISTOR	Ω, K, M
CAPACITOR	μF, nF, pF
INDUCTOR	mH, H
DIODE	—
TRANSISTOR	—
IC	—
RELAY	—
SWITCH	—
LED	—
SPK	—
ANTENNA	—
GROUND	—

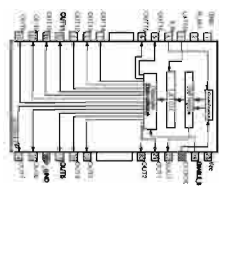
MARK	UNIT
RESISTOR	Ω, K, M
CAPACITOR	μF, nF, pF
INDUCTOR	mH, H
DIODE	—
TRANSISTOR	—
IC	—
RELAY	—
SWITCH	—
LED	—
SPK	—
ANTENNA	—
GROUND	—



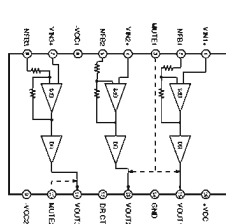
A-VIDEO (2)



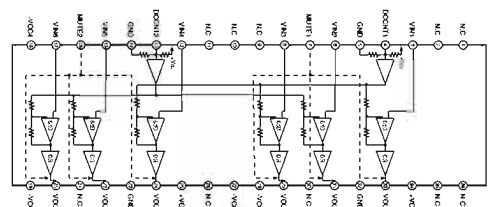
IC715: LC74781 LM-9798 On-Screen Display Controller LSI



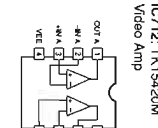
IC714: BD7851-FP-E2 LED driver IC with built-in 16bit shift register



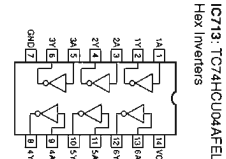
IC710: LA7104M Video Amp



IC709: LA73050-TLME Analog Amp

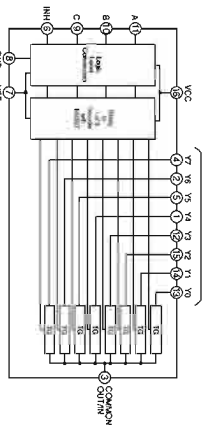


IC712: TK1S420M Video Amp

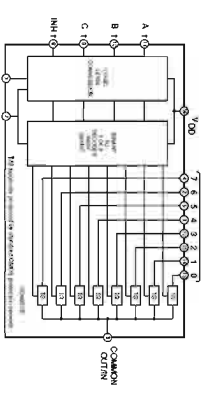


IC713: TC74HC04AFEL Hex Inverters

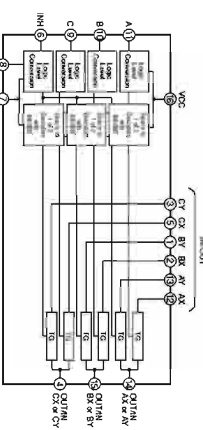
IC701, 703: MM74HC4051S1X 8-Channel Analog Multiplexer



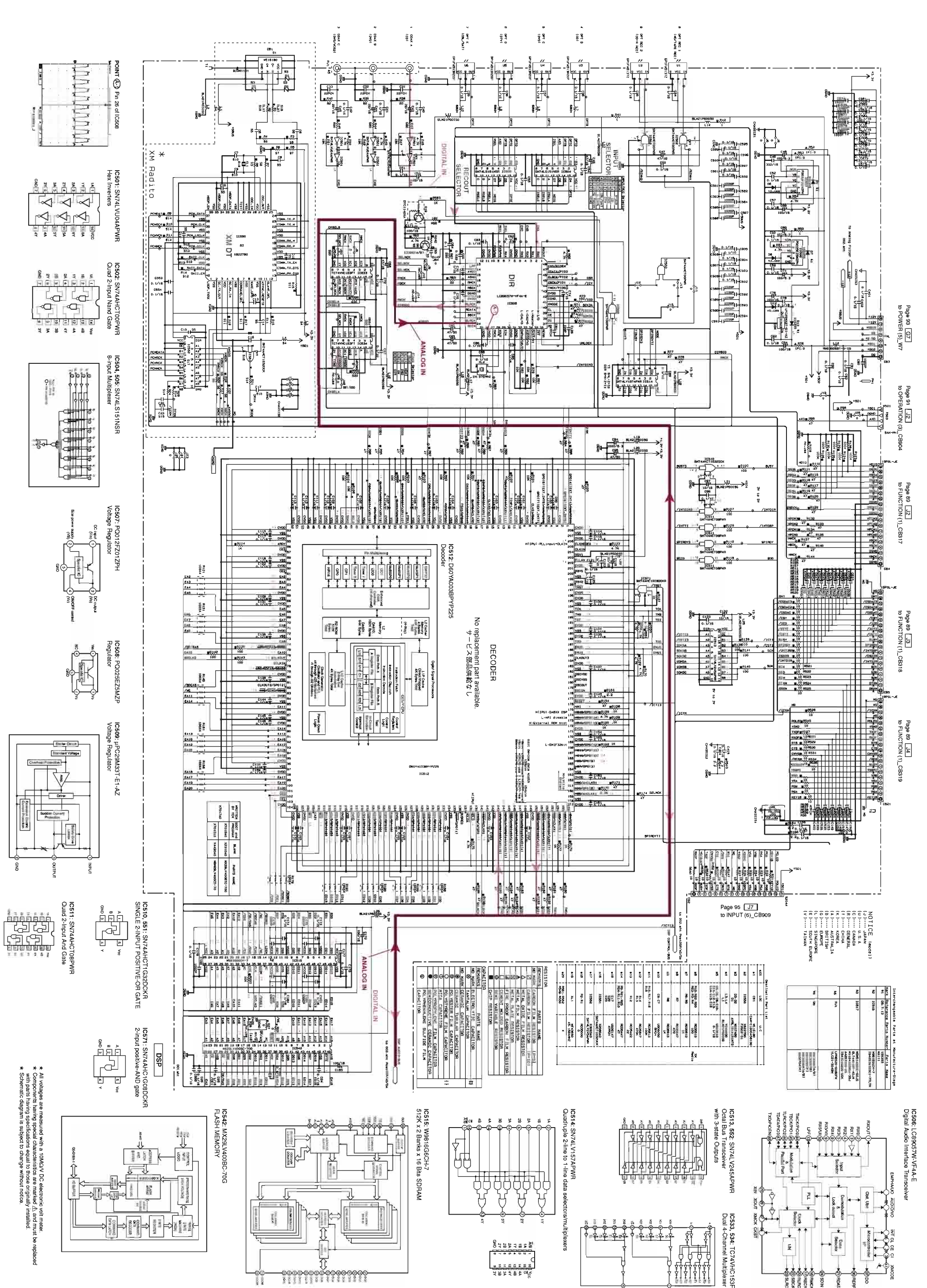
IC705: CD4051BNSR Single 8-Channel multiplexer

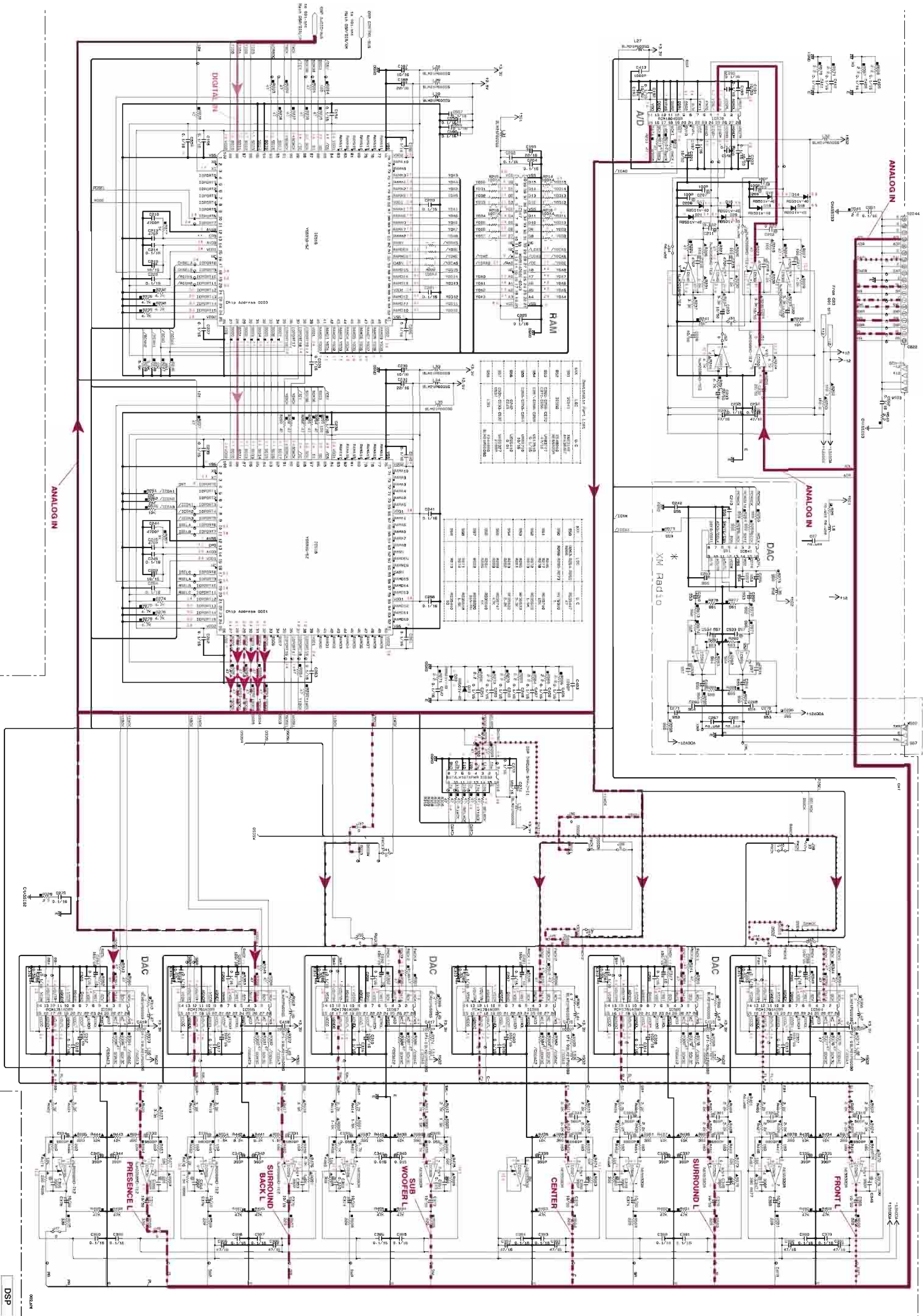


IC706, 716: MM74HC4053S1X Triple 2-Channel Analog Multiplexer

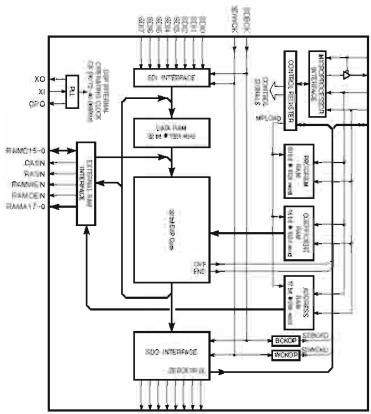


* All voltages are measured with a 10MΩV DC electronic volt meter.
* Components having special characteristics are marked Δ and must be replaced with parts having specifications equal to those originally installed.
* Schematic diagram is subject to change without notice.

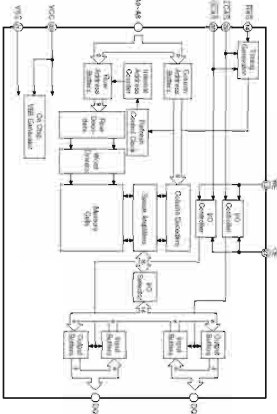




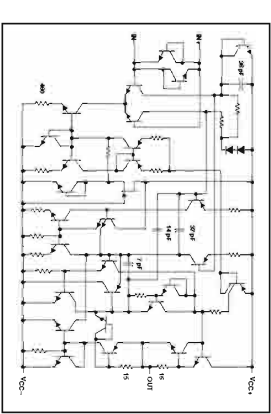
IC516, 518, YSS930-SZ
DSP



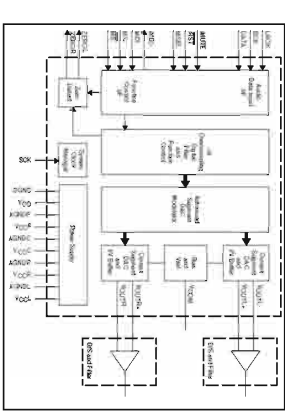
IC517, NSM514290E-60LS
4Mb1 DRAM



IC560, NESS52DR
DUAL LOW-NOISE OPERATIONAL AMPLIFIERS

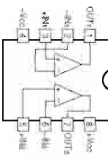


IC564, 568, PCM179, ADNR
Audio stereo digital-to-analog converter

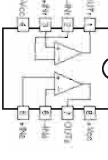


IC570, PCM190, ADNR
Stereo A/D converter

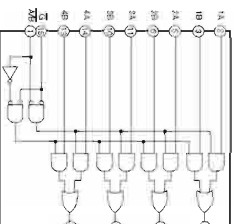
IC529, 529, 530, 539, 540, NJM2068MD-TE2
Dual OP-Amp



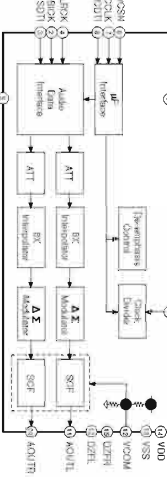
IC525, 528, NESS52DR
Dual OP-Amp



IC522, SN74LV157APWR
Quad 2-line to 1-line data selectors/multiplexers



IC541, AK4394ET
D/A Converter



NOTICE [Index]

- (U) JAPAN
- (D) DUTCH
- (C) CHINA
- (K) KOREA
- (A) AUSTRALIA
- (S) SINGAPORE
- (E) EUROPE

* All voltages are measured with a 10MΩV DC electronic volt meter.
* Components having special characteristics are marked Δ, and must be replaced with parts having specifications equal to those originally installed.
* Schematic diagram is subject to change without notice.

AV RECEIVER

HTR-5990

SERVICE MANUAL

HTR-5990

IMPORTANT NOTICE

This manual has been provided for the use of authorized YAMAHA Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically YAMAHA Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components, and failure of the product to perform as specified. For these reasons, we advise all YAMAHA product owners that any service required should be performed by an authorized YAMAHA Retailer or the appointed service representative.

IMPORTANT: The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of YAMAHA are continually striving to improve YAMAHA products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and part replacement. Recheck all work before you apply power to the unit.

■ CONTENTS

TO SERVICE PERSONNEL	2	DISPLAY DATA	48~49
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DISASSEMBLY PROCEDURES	8~11	PARTS LIST	101~125
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このサービスマニュアルは、エコマーク認定の再生紙を使用しています。
This Service Manual uses recycled paper.

100982

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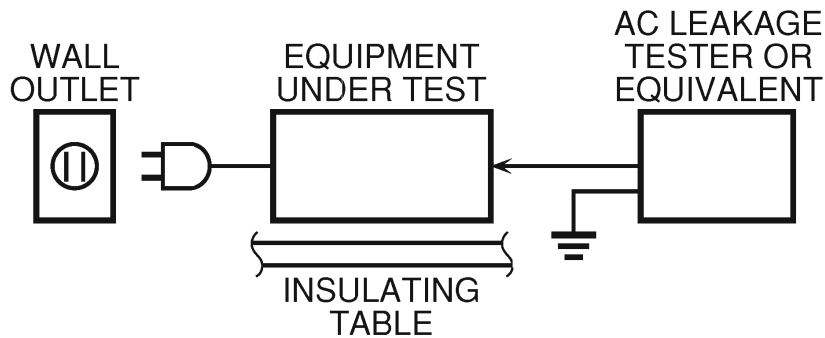
YAMAHA

YAMAHA CORPORATION
P.O.Box 1, Hamamatsu, Japan

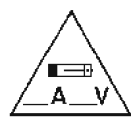
05 11

TO SERVICE PERSONNEL

- 1. Critical Components Information
Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
- 2. Leakage Current Measurement (For 120V Models Only)
When service has been completed, it is imperative to verify that all exposed conductive surfaces are properly insulated from supply circuits.
- Meter impedance should be equivalent to 1500 ohms shunted by 0.15µF.



- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC plug in both polarities.



“CAUTION”
“F2: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE 10A, 125V FUSE.”

CAUTION
F2: REPLACE WITH SAME TYPE 10A, 125V FUSE.

ATTENTION
F2: UTILISER UN FUSIBLE DE RECHANGE DE MEME TYPE DE 10A, 125V.

WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and/or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHATSOEVER!

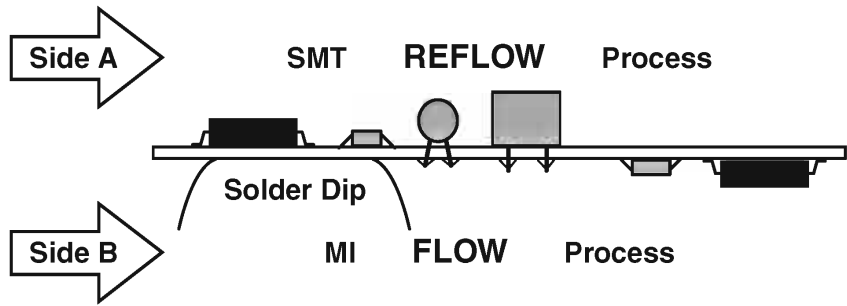
Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

About lead free solder

The P.C.B.s installed in this unit are soldered using the following solder.

	Side A	Side B
DSP P.C.B.	Lead Free Solder	Lead Free Solder
FUNCTION P.C.B.	Lead Free Solder	Lead Free Solder
OPERATION P.C.B.	—	Lead Free Solder
MAIN P.C.B.	—	Lead Free Solder
POWER PC.B.	—	Lead Free Solder
INPUT P.C.B.	Lead Free Solder	Lead Free Solder
A-VIDEO P.C.B.	Lead Free Solder	Lead Free Solder
D-VIDEO P.C.B.	Lead Free Solder	Lead Free Solder



Among some types of lead free solder currently available, it is recommended to use one of the following types for the repair work.

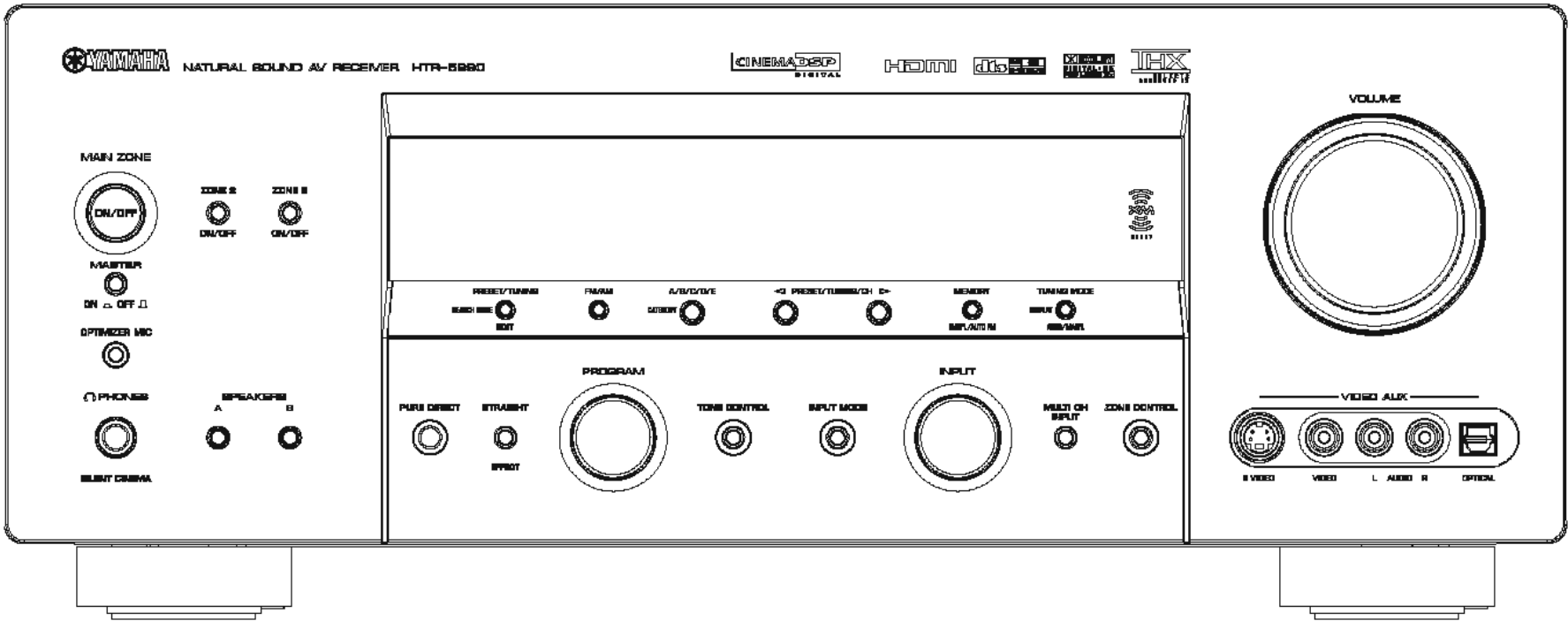
- Sn + Ag + Cu (tin + silver + copper)
- Sn + Cu (tin + copper)
- Sn + Zn + Bi (tin + zinc + bismuth)

Caution:

1. As the melting point temperature of the lead free solder is about 30°C to 40°C (50°F to 70°F) higher than that of the lead solder, be sure to use a soldering iron suitable to each solder.
2. If lead solder must be used, be sure to remove lead free solder from each terminal section of the parts to be replaced and from the area around it completely before soldering, or make sure that the lead-free solder and lead solder melt together fully.

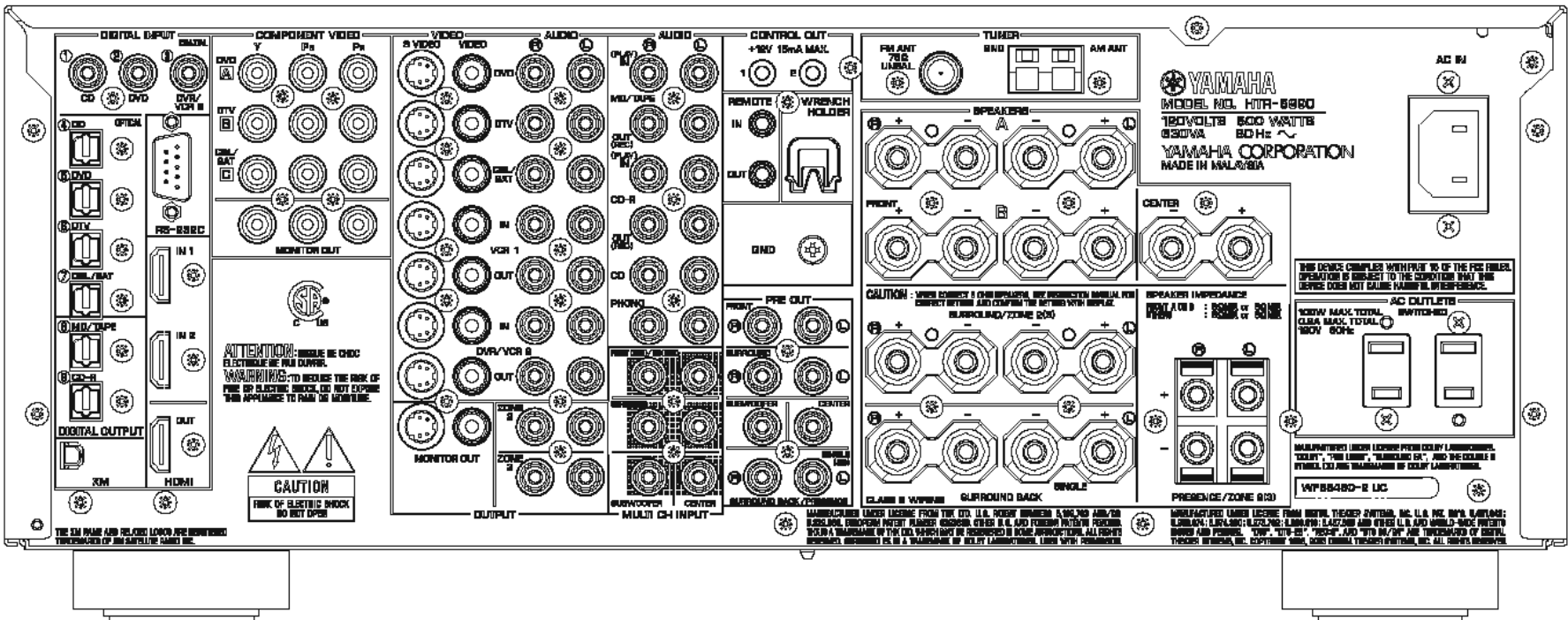
FRONT PANEL

U, C models



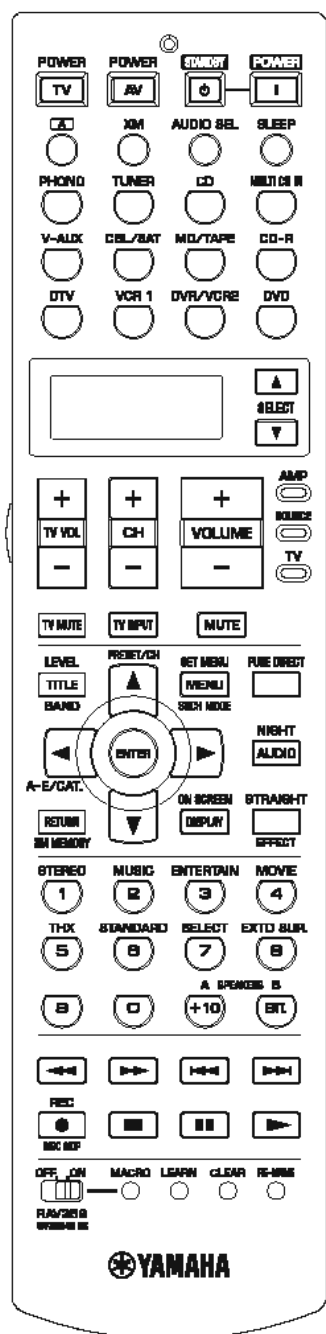
REAR PANEL

U, C models



REMOTE CONTROL PANEL

U, C models



SPECIFICATIONS / 参考仕様

Audio Section

Minimum RMS Output Power (Power Amp. Section) (20 Hz to 20 kHz, 0.04 % THD, 8 ohms)

FRONT L/R	120 W + 120 W
CENTER	120 W
SURROUND L/R	120 W + 120 W
SURROUND BACK L/R	120 W + 120 W

Dynamic Power Per Channel (IHF)

FRONT L/R (8/6/4/2 ohms)	155/195/250/330 W
--------------------------	-------------------

Dynamic Headroom

8 ohms	1.03 dB
--------	---------

Damping Factor (20 Hz to 20 kHz, SPEAKER-A, 8 ohms)

FRONT L/R	140 or more
-----------	-------------

Input Sensitivity / Input Impedance

PHONO (MM)	3.5 mV / 47 k-ohms
CD, etc.	200 mV / 47 k-ohms
MULTI CH INPUT	
FRONT L/R, CENTER, SURROUND L/R, SUBWOOFER	200 mV / 47 k-ohms

Maximum Input Signal Level

PHONO (MM) (1 kHz, 0.1 % THD)	60 mV or more
CD, etc. (1 kHz, 0.5 % THD)	2.4 V or more

Output Level / Output Impedance

REC OUT	200 mV / 1.2 k-ohms
PRE OUT (FRONT L/R, CENTER, SURROUND L/R, SURROUND BACK L/R)	1.0 V / 500 ohms
SUBWOOFER (20 Hz)	2.0 V / 500 ohms
ZONE 2 OUT	1.0 V / 1.2 k-ohms
ZONE 3 OUT	1.0 V / 1.2 k-ohms

Headphone Jack Rated Output / Impedance

CD, etc. INPUT (1 kHz, 40 mV, 8 ohms)	150 mV / 100 ohms
---------------------------------------	-------------------

Frequency Response (10 Hz to 100 kHz)

CD, etc., PURE Direct to FRONT L/R	+0/-3.0 dB
------------------------------------	------------

RIAA Equalization Deviation

20 Hz to 20 kHz, PHONO (MM)	0±0.5 dB
-----------------------------	----------

Total Harmonic Distortion (20 Hz to 20 kHz)

PHONO (MM) to REC OUT (1V)	0.02% or less
CD, etc. (STEREO) to FRONT L/R SP OUT (60 W, 8 ohms)	0.04% or less

Signal to Noise Ratio (IHF-A network)

PHONO (MM) (Input shorted) to SP OUT	
5 mV	80 dB or more
CD, etc. (Input shorted, STEREO) to SP OUT	
250 mV	100 dB or more

Residual Noise (IHF-A network)

FRONT L/R SP OUT	150 µV or less
------------------	----------------

Channel Separation (STEREO)

PHONO (Input shorted, 1 kHz/10 kHz)	60 dB or more/55 dB or more
CD, etc. (Input 5.1 k-ohms shorted, 1 kHz/10 kHz)	60 dB or more/45 dB or more

Tone Control Characteristics

BASS	
Boost/Cut	±6 dB (50 Hz)
Turnover Frequency	350 Hz
TREBLE	
Boost/Cut	±6 dB (20 kHz)
Turnover Frequency	3.5 kHz

Zone2/Zone3 Tone Control Characteristics

BASS	
Boost/Cut	±10 dB (100 Hz)
Turnover Frequency	450 Hz
TREBLE	
Boost/Cut	±10 dB (20 kHz)
Turnover Frequency	1.5 kHz

Filter Characteristics

FRONT, CENTER, SURROUND, SURROUND BACK SP Small (H.P.F.)	fc=40/60/80/90/100/110/120/160/200 Hz / 12 dB oct.
SUBWOOFER (L.P.F.)	fc=40/60/80/90/100/110/120/160/200 Hz / 24 dB oct.

Video Section

Video Signal Type

Monitor Out (Gray Back)	NTSC
Video Conversion	NTSC/PAL

Composite Video Signal Level

	1 Vp-p / 75 ohms
--	------------------

S-Video Signal Level

Y	1 Vp-p / 75 ohms
C	0.286 Vp-p / 75 ohms

Component Video Signal Level

Y	1 Vp-p / 75 ohms
Pb/Pr	0.7 Vp-p / 75 ohms

Video Maximum Input Level

	1.5 Vp-p or more
--	------------------

Video Signal to Noise Ratio

	60 dB or more
--	---------------

Monitor Out Frequency Response

Component Video Signal	5 Hz to 100 MHz, ±3 dB
------------------------	------------------------

FM Section

Tuning Range

	87.5 to 107.9 MHz
--	-------------------

50dB Quietening Sensitivity (IHF) (1 kHz, 100 % MOD.)

Mono	2.0 µV (17.3 dBf)
Stereo	25 µV (39.2 dBf)

Usable Sensitivity (IHF)

Mono	1.0 µV (11.2 dBf)
------	-------------------

Selectivity at 400 kHz	70 dB
Signal to Noise Ratio (IHF)	
Mono	76 dB
Stereo	70 dB
Harmonic Distortion (1 kHz)	
Mono	0.2 %
Stereo	0.3 %
Stereo Separation (1 kHz)	42 dB
Frequency Response (20 Hz to 15 kHz)	+0.5 / -2 dB
Antenna Input	75 ohms unbalanced

■ AM Section	
Tuning Range	530 to 1,710 kHz
Usable Sensitivity	300 µV/m
Antenna Input	Loop Antenna
■ General	
Power Supply	AC 120 V, 60 Hz
Power Consumption	500 W / 630 VA
Standby Power Consumption (reference data)	0.1 W or less
AC Outlets	
2 Switched Outlets	100 W max. total / 0.8 A max. total
Dimensions (W x H x D)	435 x 171 x 424 mm (17-1/8" x 6-3/4" x 16-11/16")
Weight	16.8 kg (37 lbs.)
Finish	
Black Color	U, C models
Accessories	
Remote Control x 1, Batteries (Manganese Dry) x 4, Indoor FM Antenna x 1, AM Loop Antenna x 1, Optimizer Microphone x 1, Power Cable x 1, Speaker Terminal Wrench x 1	

* Specifications are subject to change without notice due to product improvements.

U U.S.A. model C Canadian model



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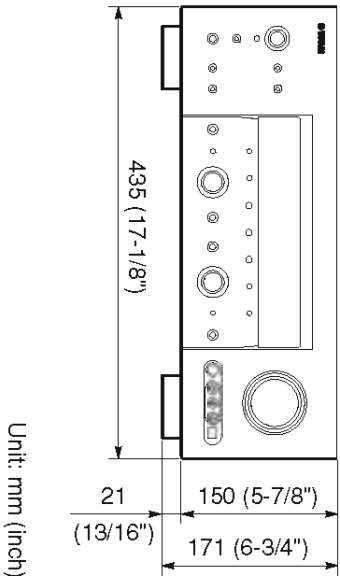
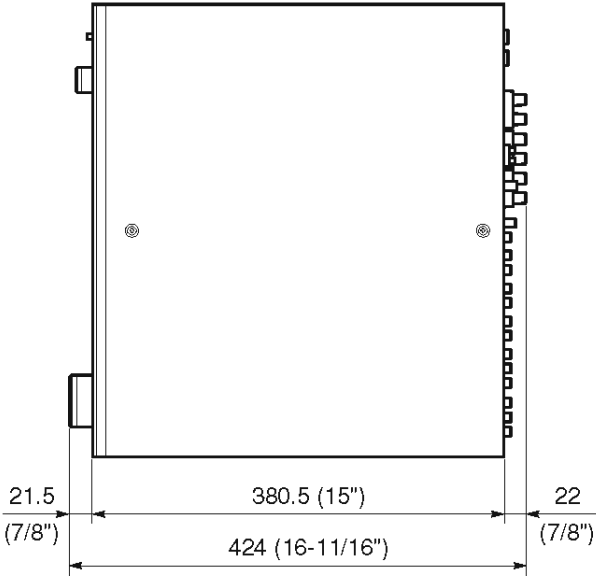
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• DIMENSIONS



Unit: mm (inch)

• SOUND/SURROUND SELECT MENU

Sound Select		Min./Max./Step								
Main Menu	Parameter	Center Level 0 / 100 / 1 %	Surround L Level 0 / 100 / 1 %	Surround R Level 0 / 100 / 1 %	Sur. Back Level 0 / 100 / 1 %	Presence L Level 0 / 100 / 1 %	Presence R Level 0 / 100 / 1 %	Initialize NO / YES	DIRECT AUTO / OFF AUTO	
STEREO	2ch Stereo	-	-	-	-	-	-	-	-	
	7ch Stereo	100	100	100	50 (LRG1)	35 (LRG2)	33	33	NO	

Surround Select Min./Max./Step

		Decode Type -6 / +3 / 1 dB	DSP Level 1 / 99 / 1 ms	Init. Delay 0.1 / 2.0 / 0.1	Room Size 0 / 10 / 1	Liveness 1 / 49 / 1 ms	Sur. Init. Delay 0.1 / 2.0 / 0.1	Sur. Room Size 1 / 49 / 1 ms	SB Init. Delay 0.1 / 2.0 / 0.1	SB Room Size 10 / 50 / 0.1 ms	Rev. Time 0 / 250 / 1 ms	Rev. Delay 0 / 100 / 1 %	Rev. Level 0 / 5 / 1	Dialogue Lift NO / YES	Initialize
MUSIC	Vienna		0	30	1.0	5	-	-	-	-	-	-	-	(0)	NO
	The Bottom Line		0	30	1.0	5	-	-	-	-	-	-	-	(0)	NO
	The Roxy Theater		0	15	1.0	5	-	-	-	-	1.6	120	9	(0)	NO
ENTERTAINMENT	Pop/Rock			21	1.0	-	-	-	-	-	-	-	-	(0)	NO
	TV Sports		0	10	1.0	-	30	1.0	(15)	(1.0)	1.6	100	4	(0)	NO
	Mono Movie		0	69	1.0	3	-	-	-	(1.0)	2.5	160	2	(0)	NO
	Game		0	36	1.0	-	15	1.0	(15)	(1.0)	-	-	-	(0)	NO
MOVIE THEATER	Disco		0	26	-	5	-	-	-	-	2.7	120	4	(0)	NO
	Spectacle	Pro Logic	0	13	1.0	-	23	1.0	(15)	(1.0)	-	-	-	(0)	NO
		Pro Logic II x	0	13	1.0	-	32	1.0	15	1.0	-	-	-	(0)	NO
	Sci-Fi	Neo : 6	0	13	1.0	-	32	1.0	15	1.0	-	-	-	(0)	NO
		Pro Logic	0	16	1.0	-	20	1.0	(15)	(1.0)	-	-	-	(0)	NO
		Pro Logic II x	0	16	1.0	-	2	1.0	15	1.0	-	-	-	(0)	NO
	Adventure	Neo : 6	0	16	1.0	-	2	1.0	15	1.0	-	-	-	(0)	NO
		Pro Logic	0	15	1.0	-	20	1.0	(15)	(1.0)	-	-	-	(0)	NO
		Pro Logic II x	0	15	1.0	-	30	1.0	15	1.0	-	-	-	(0)	NO
		Neo : 6	0	15	1.0	-	30	1.0	15	1.0	-	-	-	(0)	NO
	General	Pro Logic	0	15	1.0	-	20	1.0	(15)	(1.0)	-	-	-	(0)	NO
		Pro Logic II x	0	15	1.0	-	26	1.0	15	1.0	-	-	-	(0)	NO
		Neo : 6	0	15	1.0	-	26	1.0	15	1.0	-	-	-	(0)	NO

Main Menu	Sub Menu	Parameter	Setting value ([] Initial value) / 設定値 ([] 初期値)									
THX	Cinema	Decode Type	[Pro Logic]									
			Pro Logic II x									
			Neo : 6									
	MUSIC GAME											
SURROUND	Standard	Decode Type	[Pro Logic]									
			PL II x Movie									
			PL II x Music									
			PL II x Game									
			Neo : 6 Cinema									
			Neo : 6 Music									
			[OFF] / ON									
			Dimension									
		-3 / +3 / 1 [STD]										
		Center Width										
		0 / 7 / 1 [3]										
		Center Image										
		0.0 / 1.0 / 0.1 [0.3]										
		Initialize										
	[NO] / YES											

- SET MENU TABLE

AUTO SETUP

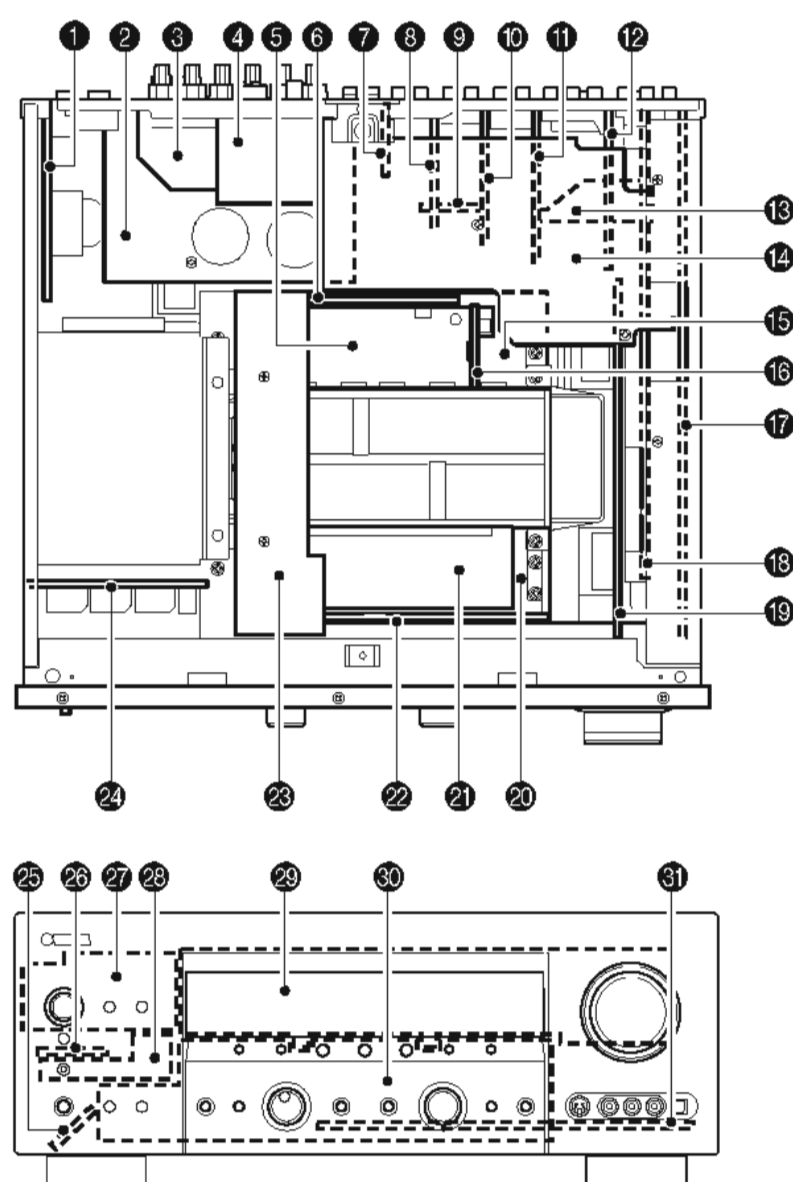
MAIN MENU	PARAMETER
SETUP	AUTO / RELOAD
WIRING	
DISTANCE	CHECK / SKIP
SIZE	
EQ	NATURAL / SKIP / FLAT / FRONT
LEVEL	CHECK / SKIP
	START / ENTER

MANUAL SETUP

MAIN MENU	SUB MENU	PARAMETER	SETTING VALUE (1: INITIAL VALUE)
1 BASIC	A SPEAKER SET	BASS OUT FRONT CENTER SUR. L/R SUR. B PRESENCE Cross Over SWFR PHASE PRIORITY	[SWFR] / FRONT / BOTH [LARGE] / [SMALL] [SMALL] / LARGE / NONE [SMALL] / LARGE / NONE [SMLx2] / LRGx1 / LRGx2 / NONE / SMLx1 [NONE] / YES 40 / 60 / 80 / 90 / 100 / 110 / 120 / 160 / 200 Hz [NRM] / REV [SUR. B] / PRES
	B SP LEVEL	FRONT L FRONT R CENTER SURROUND L SURROUND R SURROUND BACK L SURROUND BACK R SUBWOOFER PRESENCE L PRESENCE R	----- ----- -10.0 ~ +10.0dB 0.5dB step [0.0dB]
	C SP DISTANCE	UNIT FRONT L FRONT R CENTER SURROUND L SURROUND R SURROUND BACK L SURROUND BACK R SWFR. PRESENCE L PRESENCE R	meters / feet
	D THX SET	SB Dist.	Under 0.3m / [0.3-1.2m] / Over 1.2m Under 1ft / [1-4ft] / Over 4ft
	E TEST TONE	TEST TONE	[OFF] / ON
2 SOUND	A EQUALIZER	EQ SELECT	[PEQ] / GEQ / OFF
	B LFE LEVEL	SPEAKER HEADPHONE	-20dB ~ ±0.0dB, 1.0dB step [±0.0dB]
	C DYNA. RANGE	SPEAKER HEADPHONE	[MAX] / MIN / STD
	D AUDIO SET	Mute Type A. DELAY T. BYPASS DUAL MONO (μ model)	[FULL] / -20dB 0 ~ 240ms, 1ms step [0ms] [AUTO] / OFF [MAIN] / SUB / ALL
	E HDMI SET	S. AUDIO	[5990 (model)] / OTHER
3 INPUT	A I/O ASSIGN	C. V [A] C. V [B] C. V [C] IN (1) IN (2) IN (3) IN (4) IN (5) IN (6) IN (7) OUT (8) OUT (9) IN1 IN2	[IDVD] [DTV] [CBLSAT] [CD] [IDVD] [IDVD] [CD] [CD / CD-R / MD/TAPE / DVD / DTV / CBLSAT / VCR1 / DVR/VCR2 / V-AUX / PHONO [CD] [CD / CD-R / MD/TAPE / DVD / DTV / CBLSAT / VCR1 / DVR/VCR2 / V-AUX / PHONO [CD] [CD / CD-R / MD/TAPE / DVD / DTV / CBLSAT / VCR1 / DVR/VCR2 / V-AUX / PHONO [IDVD] [CD / CD-R / MD/TAPE / DVD / DTV / CBLSAT / VCR1 / DVR/VCR2 / V-AUX / PHONO [CBLSAT] [CBLSAT]

MAIN MENU	SUB MENU	PARAMETER	SETTING VALUE (↑ INITIAL VALUE)
B	INPUT RENAME	DVD DVR/VCR2 VCR1 DTV CD-R MD/TAPE CBL/SAT V-AUX CD TUNER PHONO	Input is possible to 8 characters Input possible Character type CAPITAL A to Z SMALL a to z FIGURE 0 to 9 Space MARK # * + , - . / : < > ? etc.
C	VOLUME TRIM	PHONO CD CD-R MD/TAPE DVD DTV CBL/SAT VCR1 DVR/VCR2 V-AUX	-6.0 ~ +6.0, 0.5dB step [0.0dB]
D	DECODER MODE	CD DVD DTV CBL/SAT DVR/VCR2 MD/TAPE DVD DTV VCR1 V-AUX	[AUTO] / DTS / AAC (J model)
E	MULTI CH INPUT	INPUT CH	[6CH] / 8CH
A	DISPLAY SET	DIMMER OSD SHIFT GRAY BACK V CONV. CMPNT I/P HDMI I/P	-4 ~ 0, 1 step [0] -5 ~ +5, 1 step [0] [AUTO] / OFF [ON] / OFF [ON] / [OFF] [ON] / OFF
B	MEMORY GUARD		[OFF] / ON
C	AUDIO SELECT		[AUTO] / LAST
D	DECODER MODE		[AUTO] / LAST
E	PARAM. INI	STEREO MUSIC ENTERTAIN MOVIE STANDARD	Param No Change / *
F	ZONE SET	SP B ZONE2 VOL ZONE3 VOL ZONE2 AMP ZONE3 AMP	[MAIN] / ZONE B [VAR] / FIX
G	XM RADIO SET (U, C models)	DISPLAY ANTENNA	[EXT] / SUR / PRNS / BOTH OFF / [10s] / 30s / ON NONE, 0 ~ 100%

■ INTERNAL VIEW



- ① POWER (2) P.C.B.
- ② MAIN (1) P.C.B.
- ③ MAIN (5) P.C.B.
- ④ TUNER
- ⑤ MAIN (3) P.C.B.
- ⑥ POWER (4) P.C.B.
- ⑦ INPUT (3) P.C.B.
- ⑧ INPUT (1) P.C.B.
- ⑨ INPUT (4) P.C.B.
- ⑩ INPUT (2) P.C.B.
- ⑪ A-VIDEO (2) P.C.B.
- ⑫ A-VIDEO (1) P.C.B.
- ⑬ INPUT (5) P.C.B.
- ⑭ FUNCTION (1) P.C.B.
- ⑮ MAIN (2) P.C.B.
- ⑯ POWER (7) P.C.B.
- ⑰ DSP P.C.B.
- ⑱ D-VIDEO P.C.B.
- ⑲ FUNCTION (2) P.C.B.
- ⑳ MAIN (4) P.C.B.
- ㉑ POWER (5) P.C.B.
- ㉒ POWER (1) P.C.B.
- ㉓ OPERATION (6) P.C.B.
- ㉔ POWER (3) P.C.B.
- ㉕ OPERATION (4) P.C.B.
- ㉖ OPERATION (5) P.C.B.
- ㉗ OPERATION (2) P.C.B.
- ㉘ OPERATION (7) P.C.B.
- ㉙ INPUT (6) P.C.B.
- ㉚ OPERATION (1) P.C.B.
- ㉛ OPERATION (3) P.C.B.

■ DISASSEMBLY PROCEDURES

(Remove parts in the order as numbered.)

Disconnect the power cable from the AC outlet.

1. Removal of Top Cover

- a. Remove 2 screws (①), 4 screws (②) and 5 screws (③). (Fig. 1)
- b. Slide the Top Cover rearward to remove it. (Fig. 1)

2. Removal of Front Panel Unit

- a. Remove 7 screws (④), 2 screws (⑤) and then slide the Front Panel Unit forward. (Fig. 1)
- b. Remove CB2, CB14, CB904 ~ CB907 and CB913. (Fig. 2)

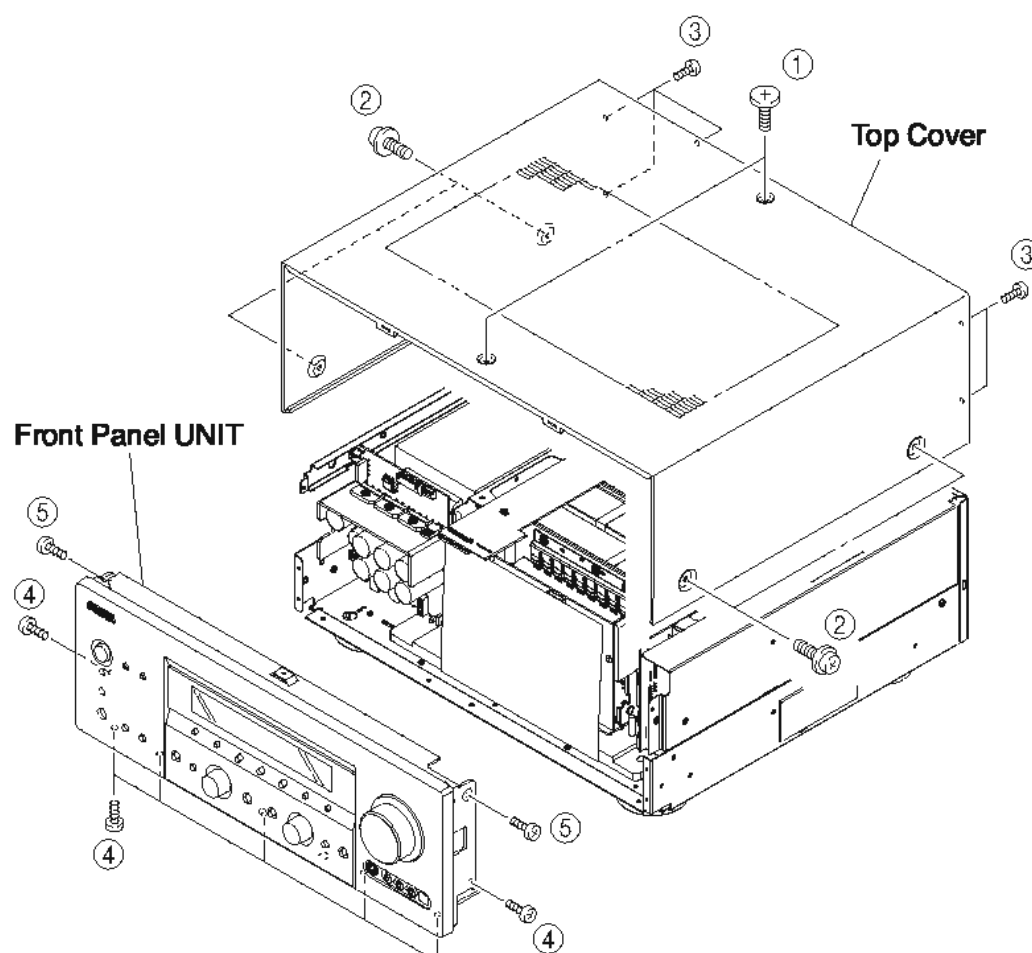


Fig. 1

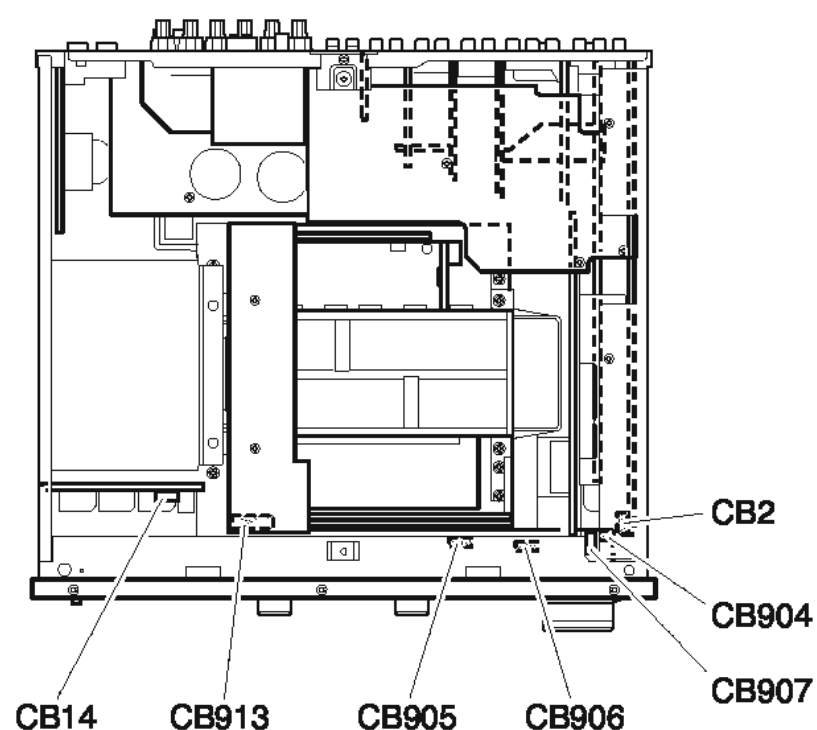


Fig. 2

3. Removal of FUNCTION (1) P.C.B.

- a. Remove 4 screws (⑥) and then remove the Bracket. (Fig. 4)
- b. Remove 1 screw (⑦) and then remove the Support Top. (Fig. 4)
- c. Remove 1 screw (⑧) and 4 screws (⑨). (Fig. 4)
- d. Remove CB301 and CB303 ~ CB306. (Fig. 3)
- e. Remove the FUNCTION (1) P.C.B. which is connected directly to the lower P.C.B. with connectors. (Fig. 4)

4. Removal of DSP, FUNCTION (2), INPUT (5), D-VIDEO, A-VIDEO (1), (2) P.C.B.s

- Remove 2 push rivets (10) and then remove the Duct. (Fig. 4)
- Remove 1 screw (11). (Fig. 4)
- Remove 21 screws (12) and 2 jack screws (13). (Fig. 5)
- Remove CB40, CB44, CB307, CB325, CB332, CB506, CB508, CB602, CB603, CB606, CB608 and CB609. (Fig. 3)
- Remove the DSP, FUNCTION (2), INPUT (5), D-VIDEO, A-VIDEO (1) and (2) P.C.B.s.. (Fig. 3)

5. Removal of INPUT (1) ~ (4) P.C.B.s

- Remove 14 screws (14). (Fig. 5)
- Remove CB324. (Fig. 3)
- Remove the INPUT (1) ~ (4) P.C.B.s.. (Fig. 3)

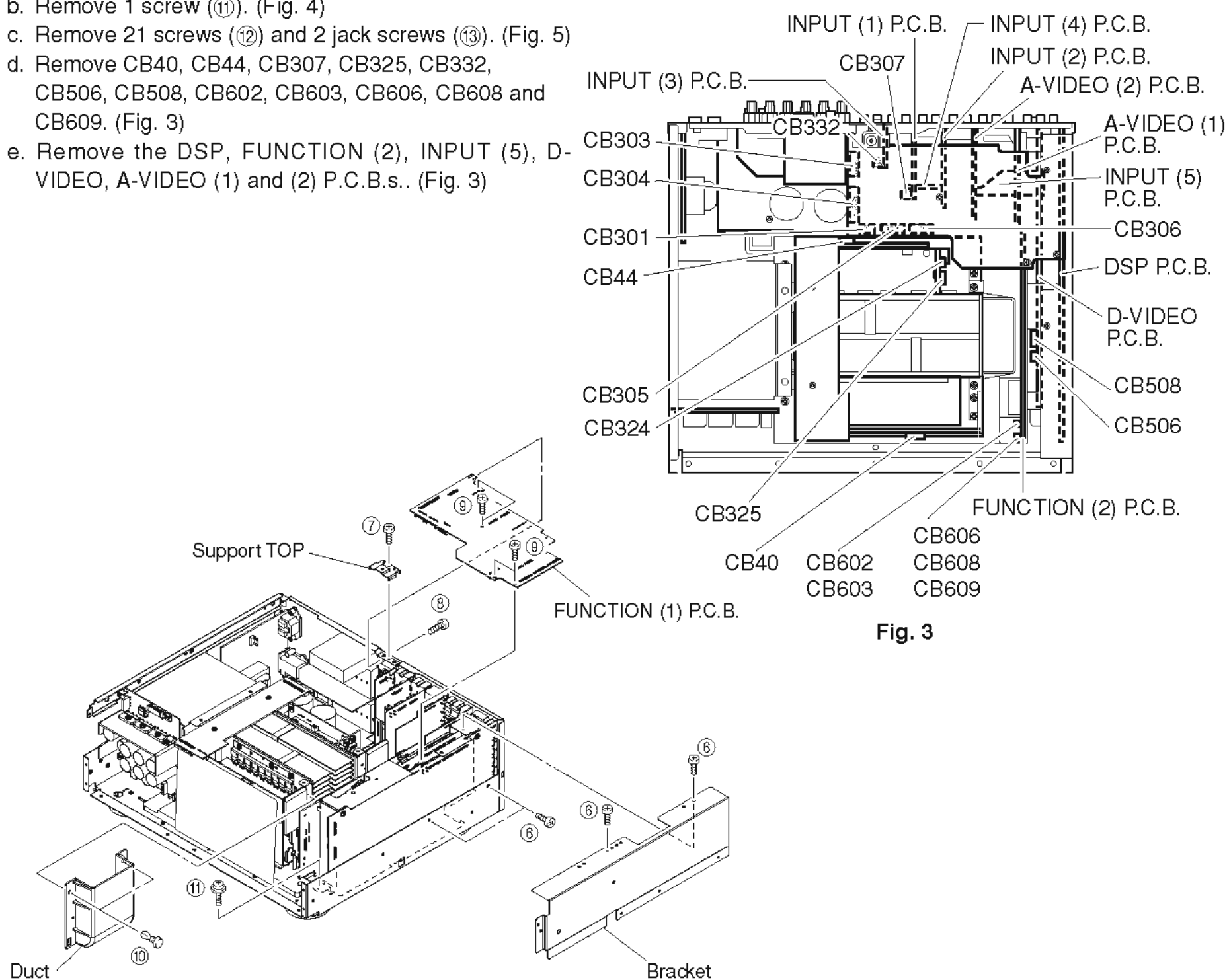


Fig. 3

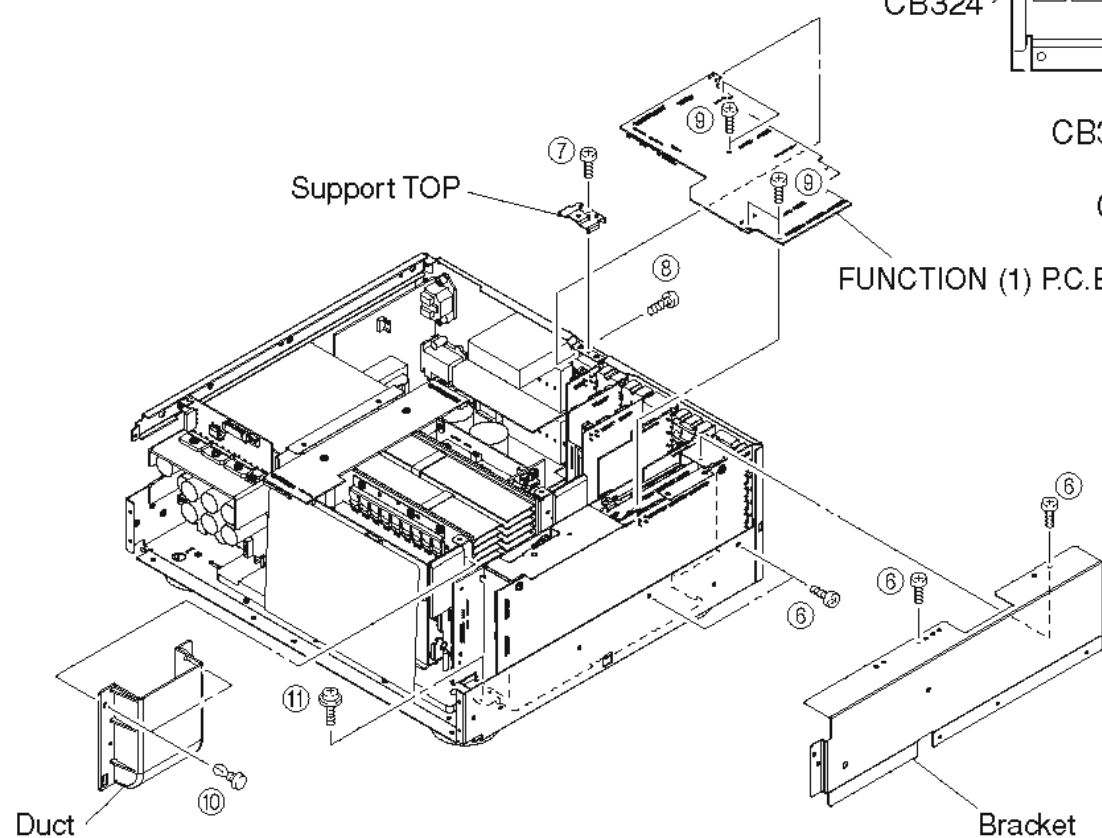


Fig. 4

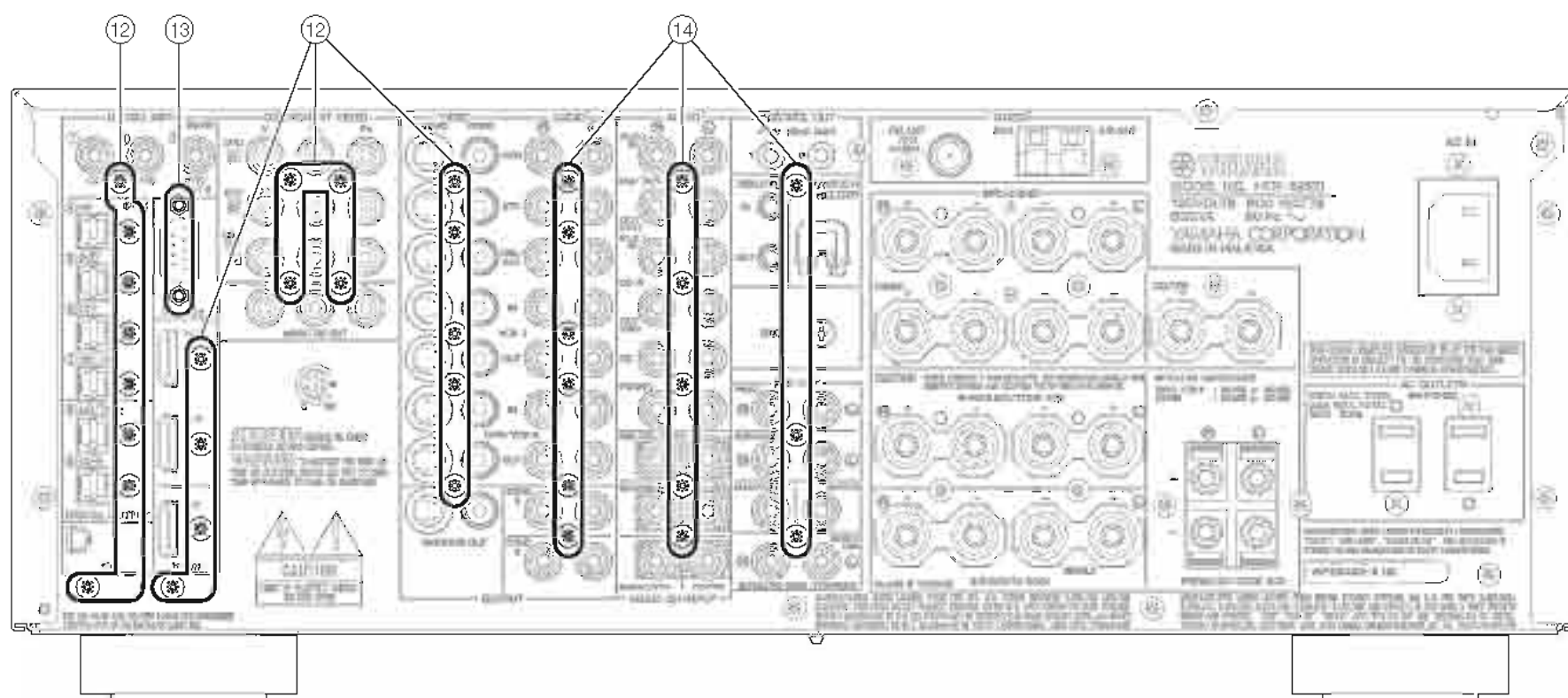


Fig. 5

When checking the P.C.B.:

- Put the Rubber Sheet and the Cloth over the equipment. Then place the P.C.B. upside down on the Cloth and check it. (Fig. A)
- Reconnect all cables (connectors) that have been disconnected.

Be sure to use the extension cable for servicing for the following section.

DSP P.C.B. CB2 – INPUT (6) P.C.B. CB909:

MF117350 (17P 350mm)

OPERATION (6) P.C.B. CB912 – FUNCTION (1) P.C.B. CB304:

MF131500 (31P 500mm)

FUNCTION (1) P.C.B. CB301 – POWER (2) P.C.B. W1:

MF408250 (8P 250mm)

A-VIDEO (2) P.C.B. W702 – POWER (7) P.C.B. CB325:

MF404250 (4P 250mm)

- When connecting the cable, use care for the polarity.

- In this unit, the ground of P.C.B.s shown below is connected to the rear panel. When these P.C.B.s are removed from the rear panel, connect the ground to the rear panel or chassis, using a lead wire or the like. (Fig. B)

DSP P.C.B. : PJ1 (DIGITAL INPUT)

D-VIDEO P.C.B. : CN301 (HDMI OUT)

A-VIDEO (1) P.C.B. : PJ602 (MONITOR OUT)

A-VIDEO (2) P.C.B. : JK703 (MONITOR OUT)

INPUT (1) P.C.B. : PJ304 (MULTI CH INPUT)

INPUT (2) P.C.B. : PJ307 (ZONE3 OUTPUT)

INPUT (3) P.C.B. : PJ309 (PRE OUT)

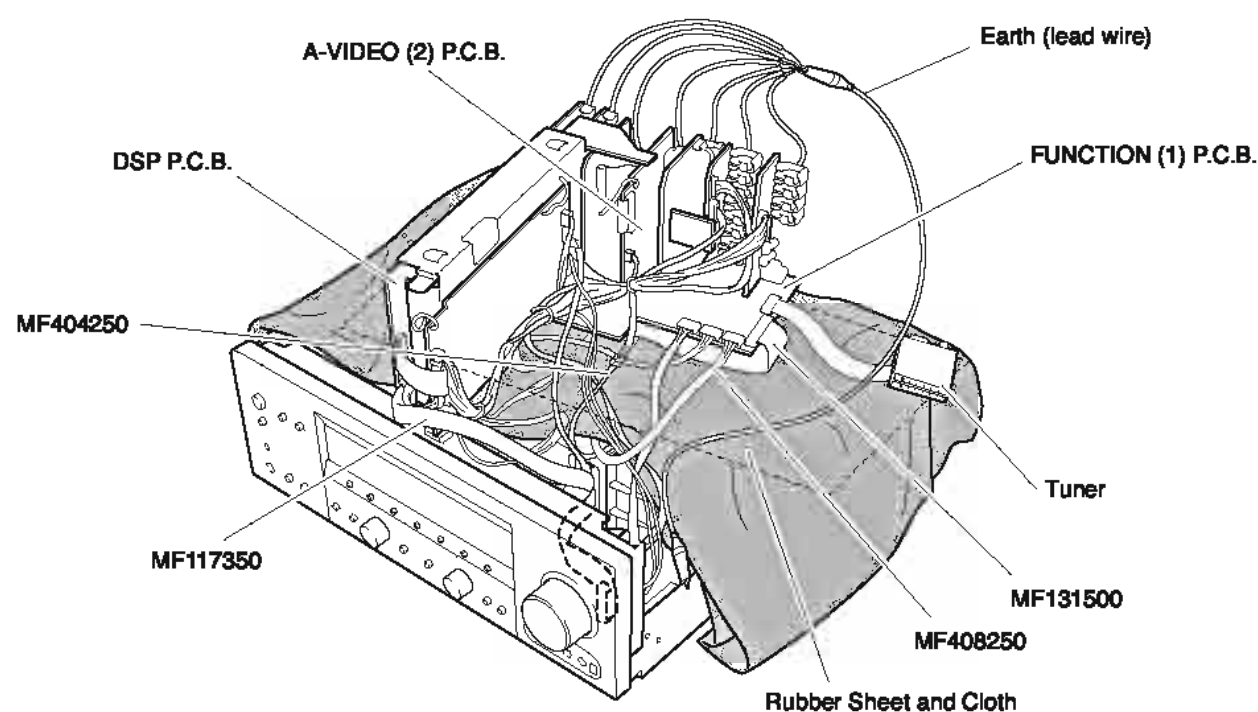


Fig. A

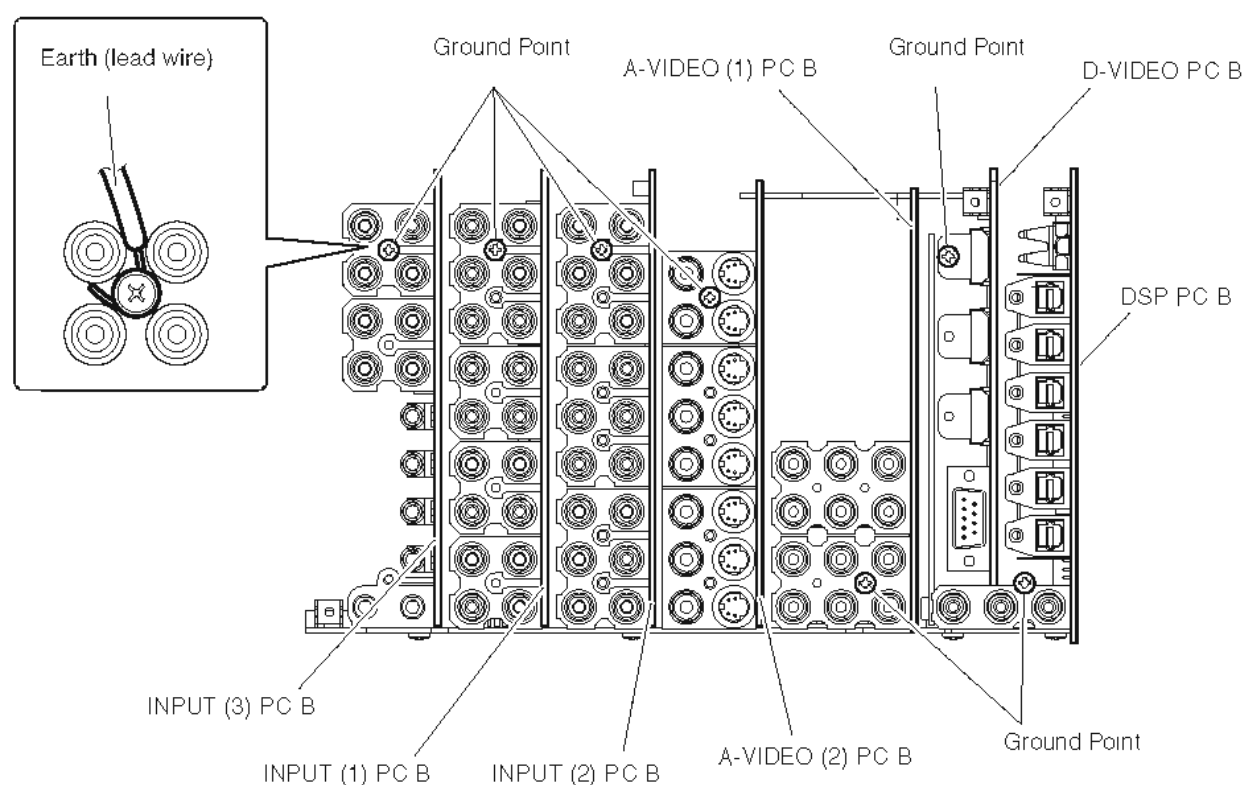


Fig. B

6. Removal of OPERATION (6) P.C.B.

- Remove 2 screws (15). (Fig. 6)
- Remove the OPERATION (6) P.C.B. which is connected directly to the lower P.C.B. with connectors. (Fig. 6)

7. Removal of Fan

- Remove CB20. (Fig. 6)
- Remove 2 screws (16). (Fig. 6)
- Remove the Fan together with the frame by lifting them up. (Fig. 6)

8. Removal of Amp Unit

- Remove 4 screws (17) and 4 screws (18). (Fig. 6)
- Remove the Amp Unit. (Fig. 6)

When checking the Amp Unit:

- The Front Panel Unit put on the Rubber Sheet and the Cloth and check it. (Fig. C)
- Reconnect all cables (connectors) that have been disconnected.

Be sure to use the extension cable for servicing for the following section.

DSP P.C.B. CB2 – INPUT (6) P.C.B. CB909:

MF117350 (17P 350mm)

INPUT (6) P.C.B. CB600 – OPERATION (6) P.C.B. CB913:

MF124500 (24P 500mm)

INPUT (6) P.C.B. W600 – POWER (3) P.C.B. CB14:

MF405400 (5P 400mm)

- When connecting the flat cable, use care for the polarity.

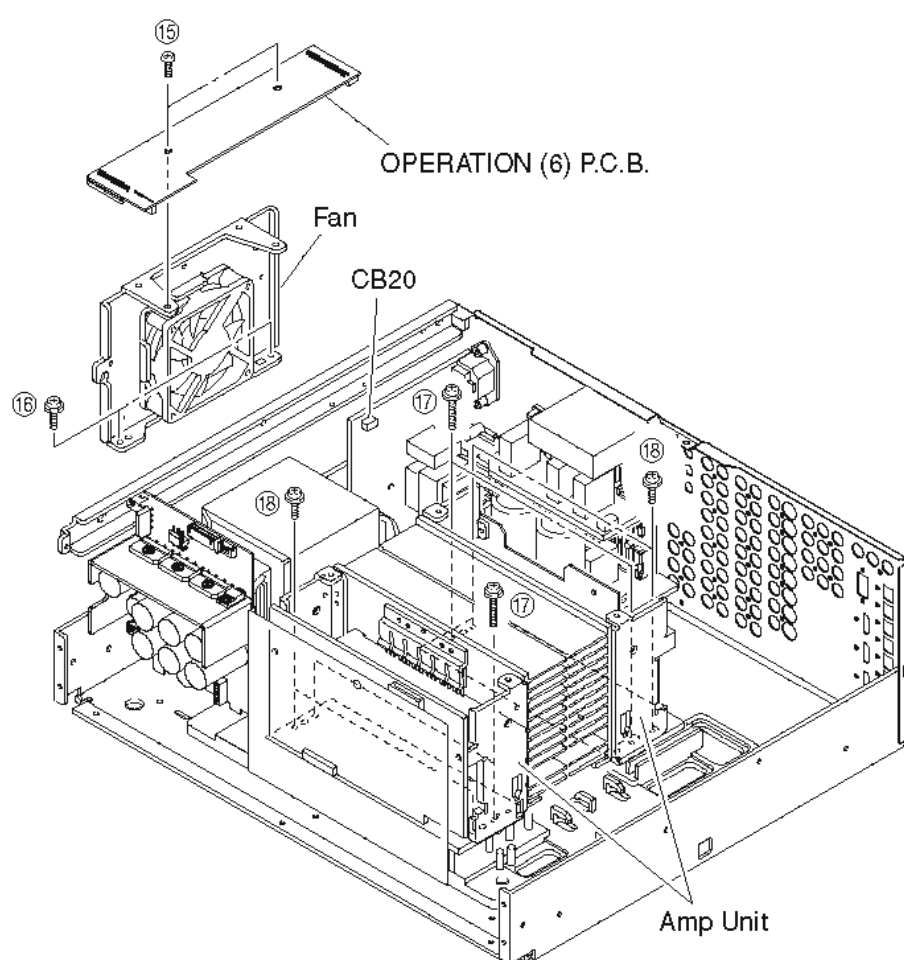


Fig. 6

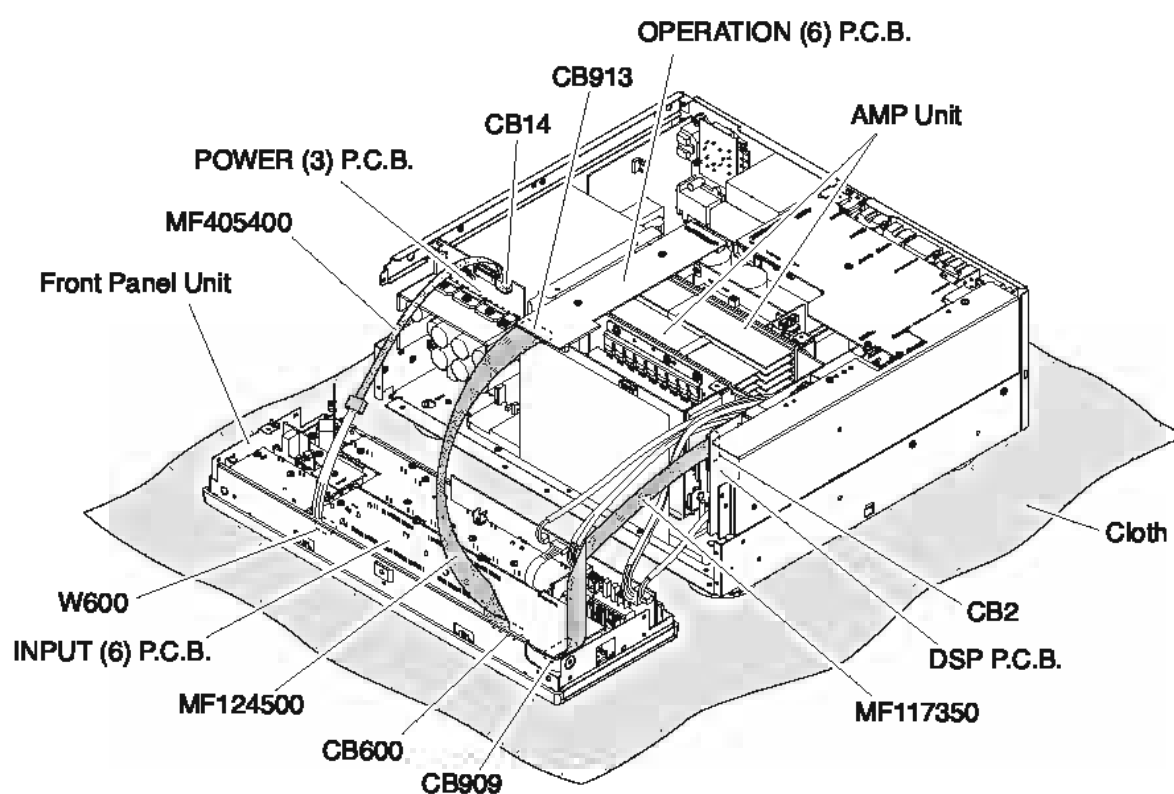


Fig. C

■ UPDATING FIRMWARE

When replacing the following parts, be sure to write the updated data of the firmware.

IC301 of P.C.B. ASS'Y FUNCTION : X6909A00
 ... Writing of MAIN
 IC507 of P.C.B. ASS'Y D-VIDEO : X7220A00
 ... Writing of VIDEO
 IC542 of P.C.B. ASS'Y DSP : X7016A00
 ... Writing of DSP

● Required tools

- DOS/V machine, OS: Windows 98/2000/Me/XP, PC with a serial port (RS232C)
- Program upgrading program
 DSP_FLASHER_Vx600.exe
- Firmware
 - * Be sure to put following 3 firmwares in the same folder.
 - MAIN V16Mxxxx.mot
 - VIDEO V16Vxxxx.mot
 - DSP Vx600_verX_XX_0XXXXXXXXX.hex

- RS232C cross cable "D-sub 9 pin female"

(Specifications)

Pin No.2 RxD	Pin No.2 RxD
Pin No.3 TxD	Pin No.3 TxD
Pin No.5 GND	Pin No.5 GND
Pin No.7 RTS	Pin No.7 RTS
Pin No.8 CTS	Pin No.8 CTS

● Preparation and precautions before starting the operation

- Download DSP_FLASHER_Vx600.exe from the specified source to the PC being used.
- Prepare the above specified RS232C cross cable.
- While writing, keep the other application software on the PC closed. It is also recommended to keep the software on the task tray closed as well.

● Operation Procedure

Writing of MAIN or VIDEO

1. Install DSP_FLASHER_Vx600.exe into the PC.
2. Connect the RS232C terminal of the main unit to the PC's RS232C terminal with the RS232C cross cable. (Fig. 1)

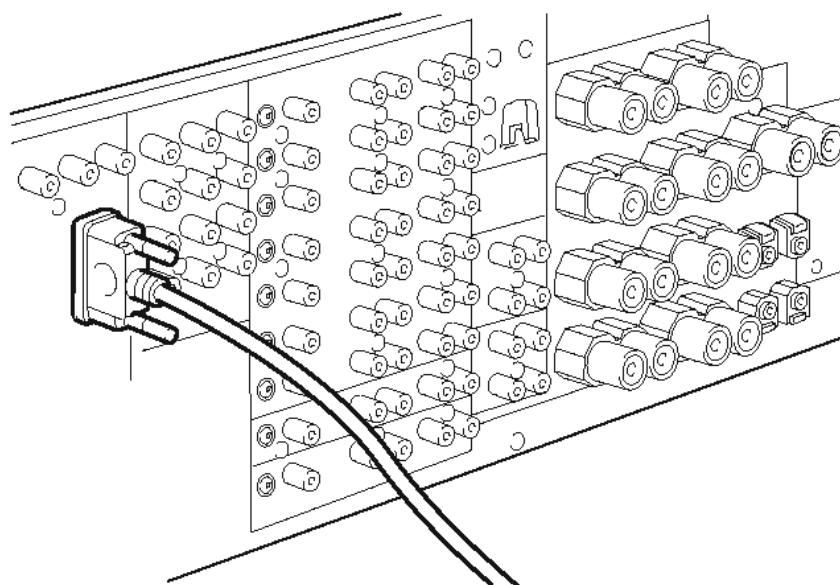
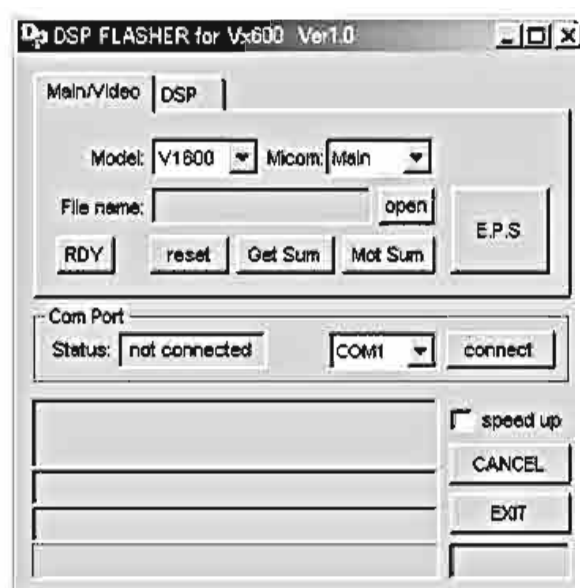


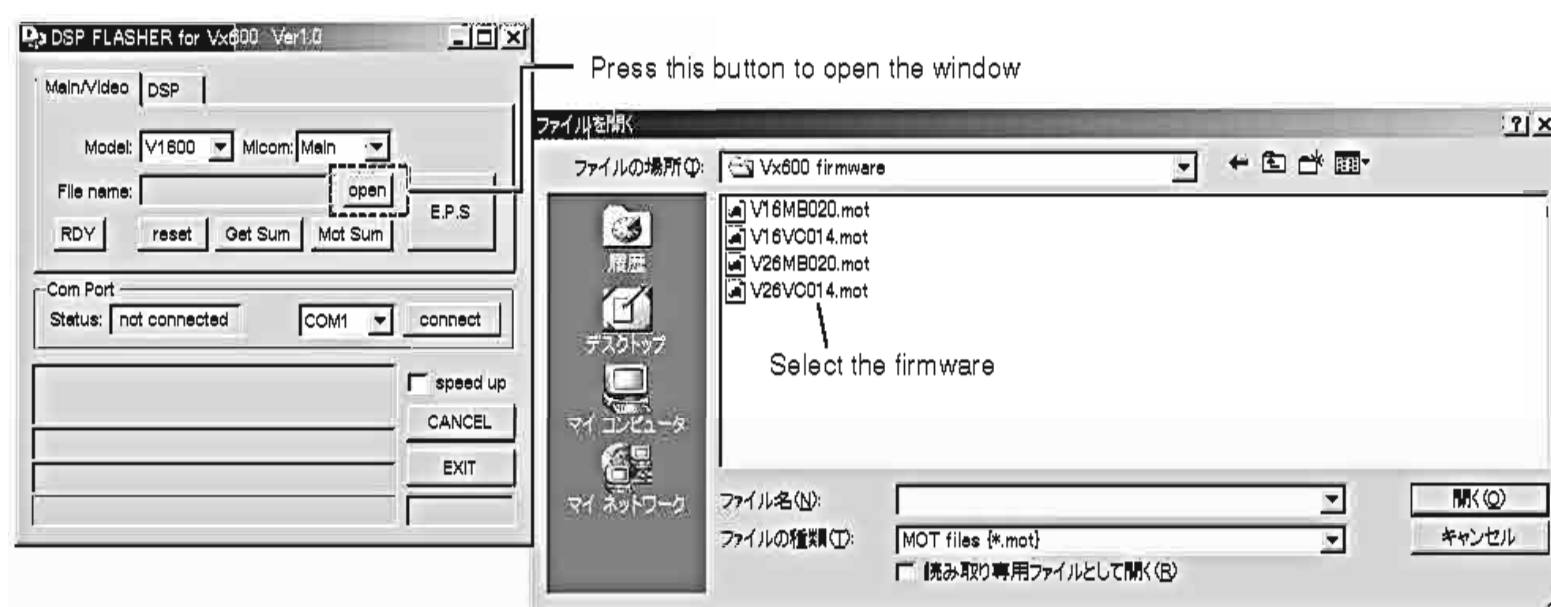
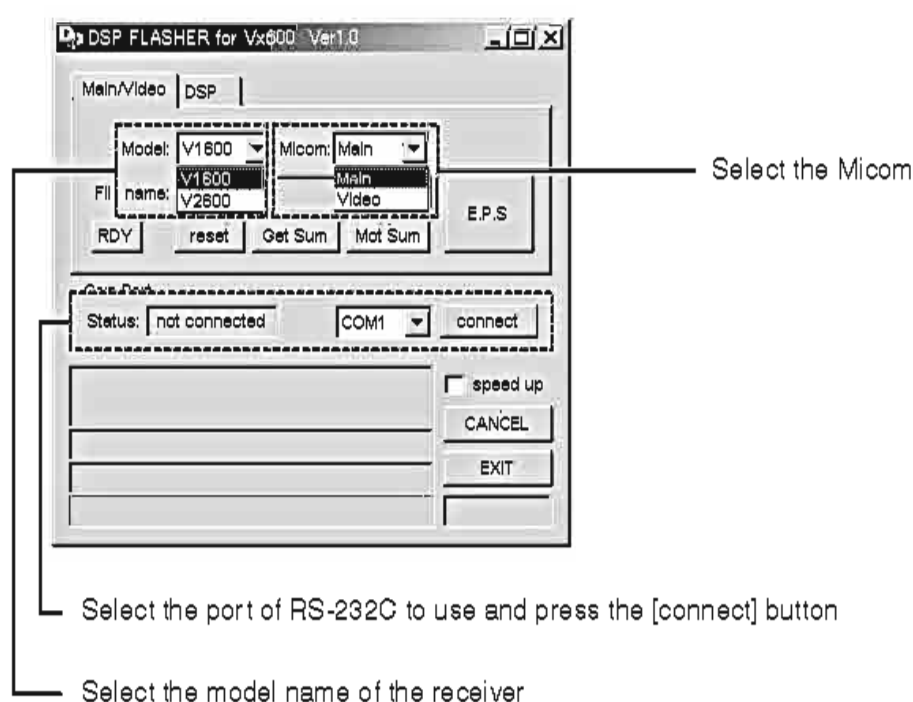
Fig. 1

3. Start up DSP_FLASHER_Vx600.exe.
Then the screen shown below is displayed.



4. Select the model name of the receiver, the Micom, Com Port and File name.

- **Model**
Select "V1600".
- **Micom**
Writing of MAIN : Select "Main".
Writing of VIDEO : Select "Video"
- **Com Port**
Select the port of RS-232C to use and press the [connect] button.
(Com Port Status changes to "connected")
- **File name**
Writing of MAIN : Select "V16Mxxxx.mot".
Writing of VIDEO : Select "V16Vxxxx.mot"



5. Connect the power cable of main unit to the AC outlet. While pressing the "PRESET/TUNING ►" key and "A/B/C/D/E" key of the main unit, press the "MASTER ON/OFF" key to activate the DIAG function.

- a. Using the "PROGRAM" knob of the main unit, select the DIAG menu in the figure below.

24. FLASH 232C
MAIN

- b. Using the "PRESET/TUNING ►" key of the main unit, select the DIAG sub-menu in the figure below.

- Writing of MAIN

24. FLASH 232C
MAIN

- Writing of VIDEO

24. FLASH 232C
VIDEO

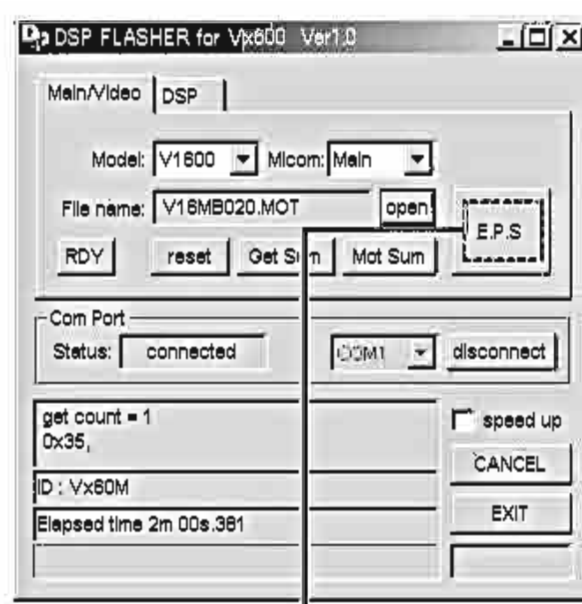
6. Press the [RDY] button.



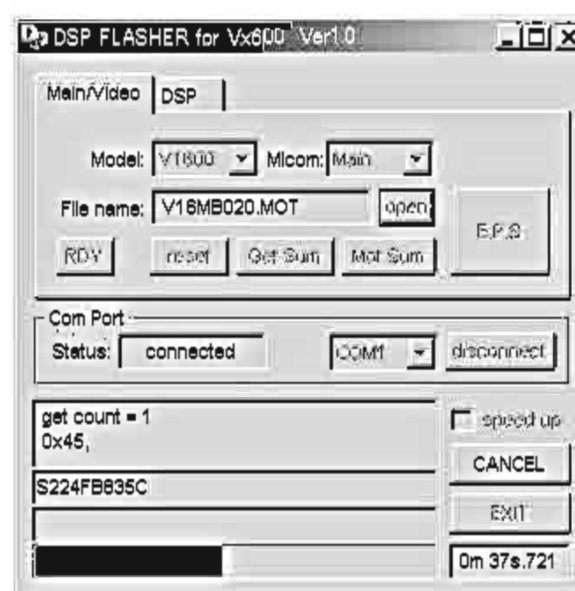
Press this button

7. Press the "STRAIGHT" key of the main unit.

8. Press the [E.P.S.] button and start writing.



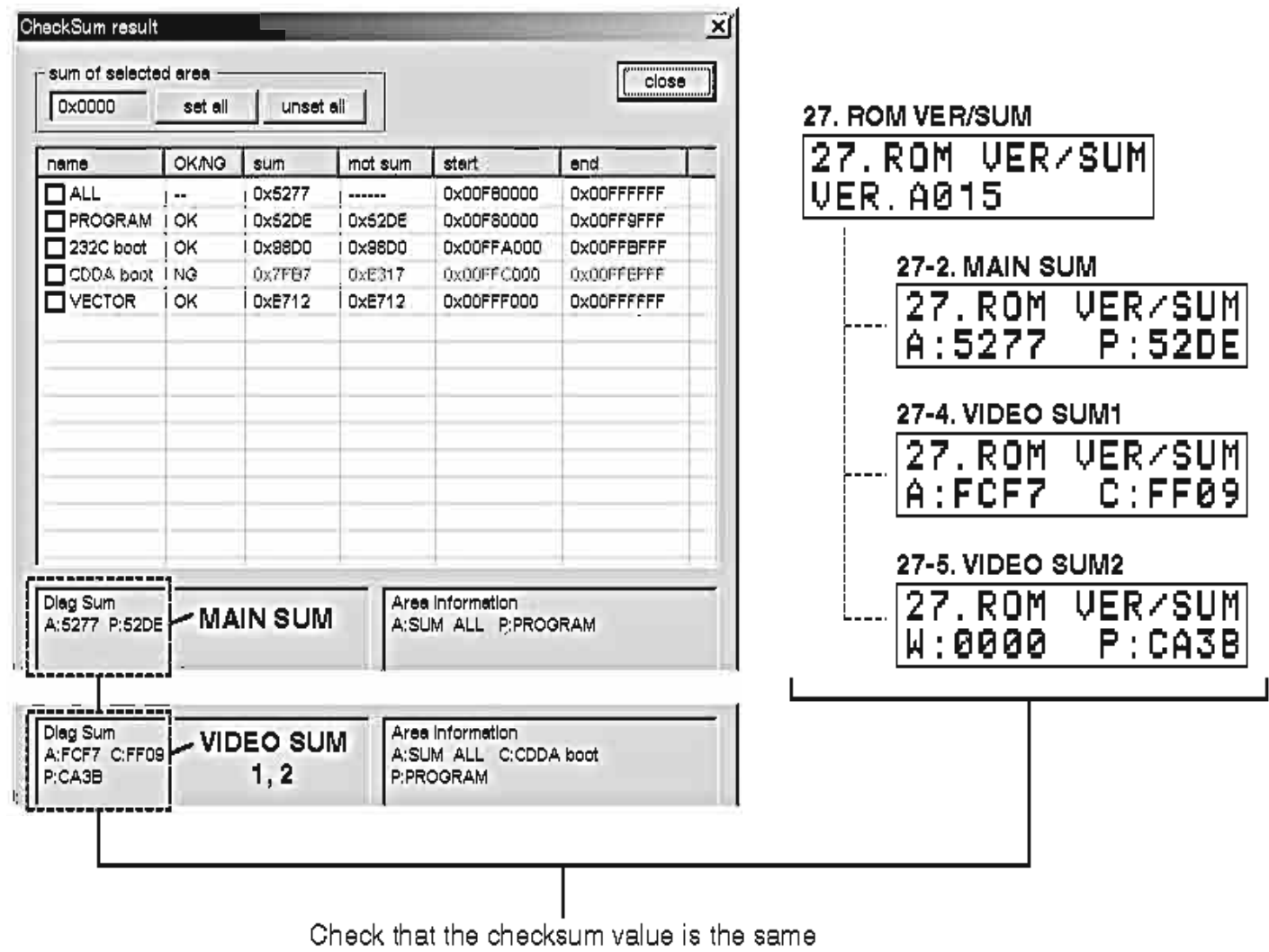
Press this button



During downloading

9. Check the checksum.
- When writing is completed, the checksum is displayed in the box located at the lower left of "CheckSum result".
- a. Disconnect the power cable of main unit from the AC outlet.
 - b. Connect the power cable of main unit to the AC outlet. Start the DIAG function of the main unit and check that the checksum value is the same.

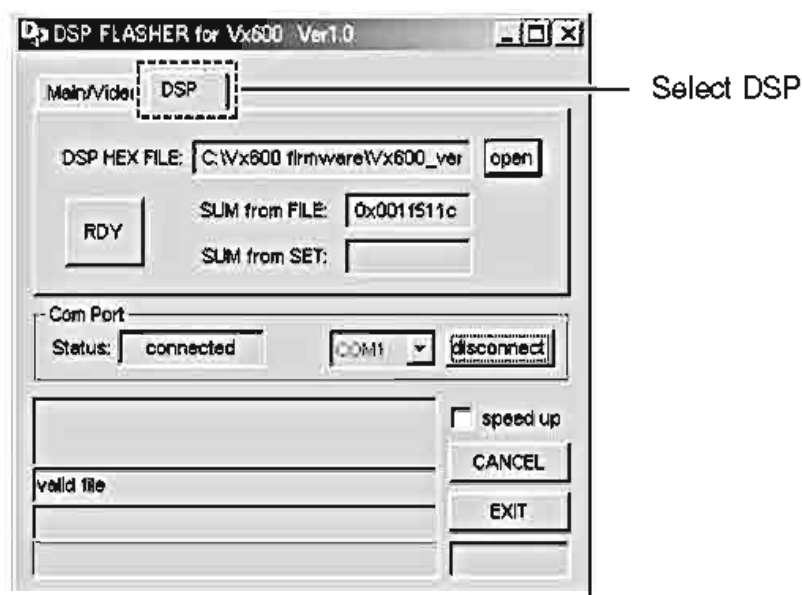
The procedure is completed when the same version as shown below is obtained.



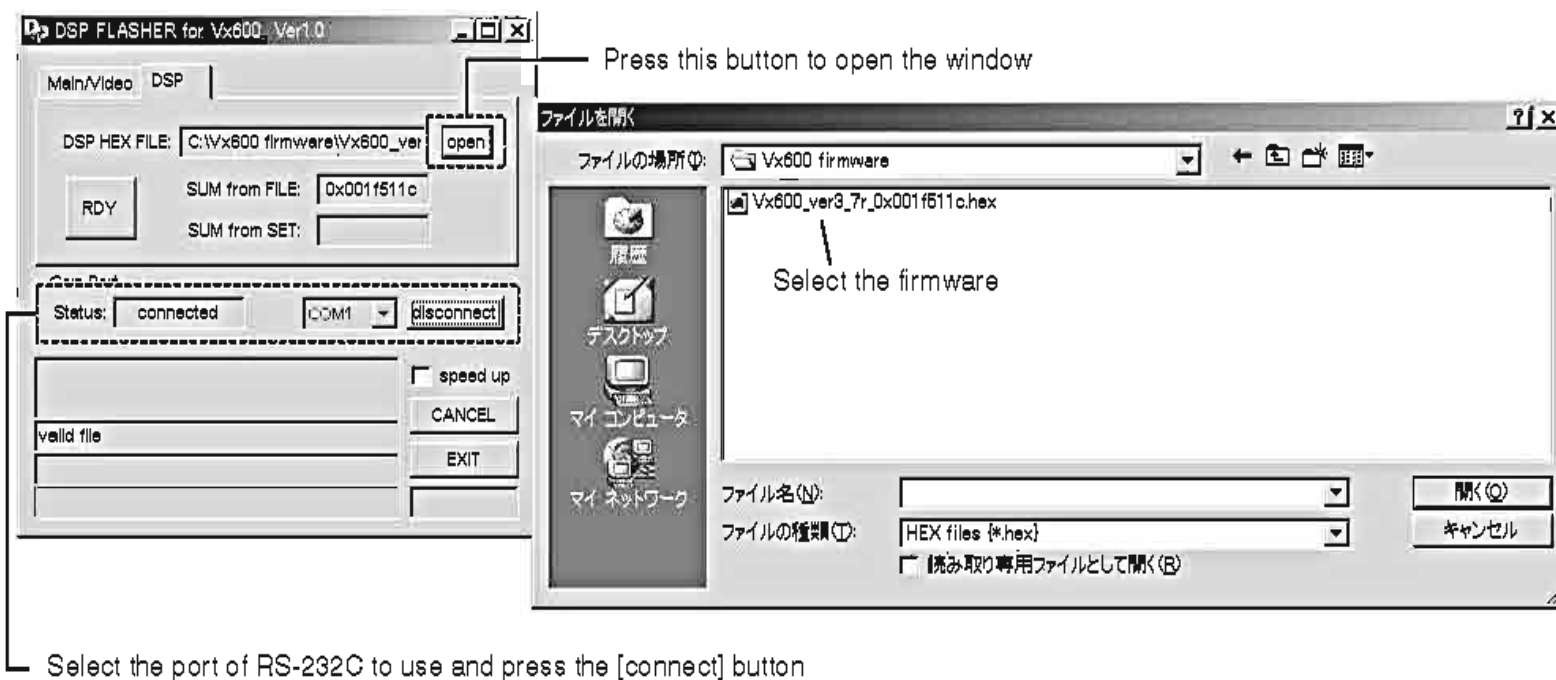
* If there is a difference, perform the procedure again starting from step "3.Start up DSP_FLASHER_Vx600.exe".

Writing of DSP

1. Install DSP_FLASHER_Vx600.exe into the PC.
2. Connect the RS232C terminal of the main unit to the PC's RS232C terminal with the RS232C cross cable. (Fig. 1)
3. Start up DSP_FLASHER_Vx600.exe.
Then the screen shown below is displayed.



4. Select "DSP" Tag.
5. Select the data to be transmitted and Com Port.
 - **DSP HEX FILE**
Select "Vx600_verX_XX_0XXXXXXXXX.hex".
 - **Com Port**
Select the port of RS-232C to use and press the [connect] button.
(Com Port Status changes to "connected")



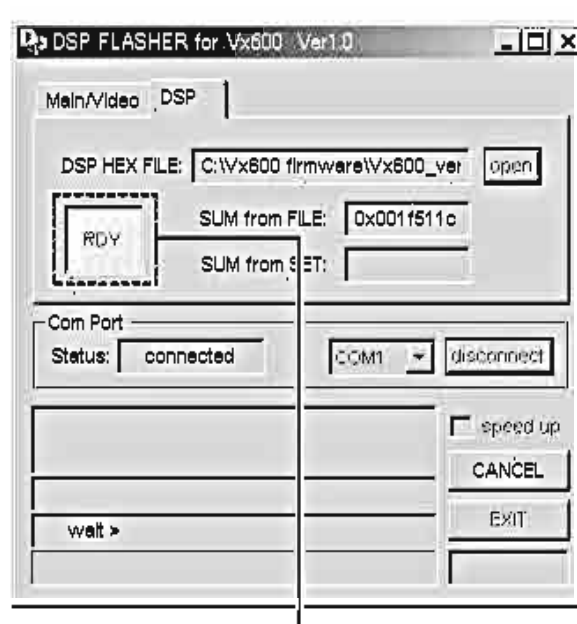
6. Connect the power cable of main unit to the AC outlet. While pressing the “PRESET/TUNING ►” key and “A/B/C/D/E” key of the main unit, press the “MASTER ON/OFF” key to activate the DIAG function.
 - a. Using the “PROGRAM” knob of the main unit, select the DIAG menu in the figure below.

24. FLASH 232C
MAIN

- b. Using the “PRESET/TUNING ►” key of the main unit, select the DIAG sub-menu in the figure below.

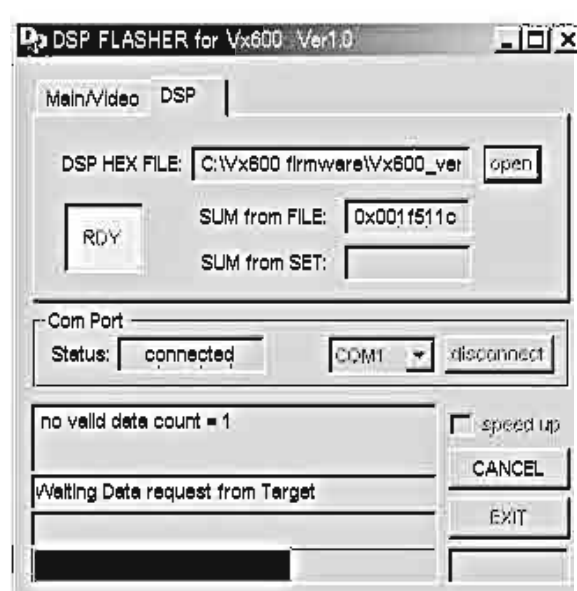
24. FLASH 232C
TI

7. Press the [RDY] button.



Press this button

8. Press the “STRAIGHT” key of the main unit.
The writing function starts.



During downloading

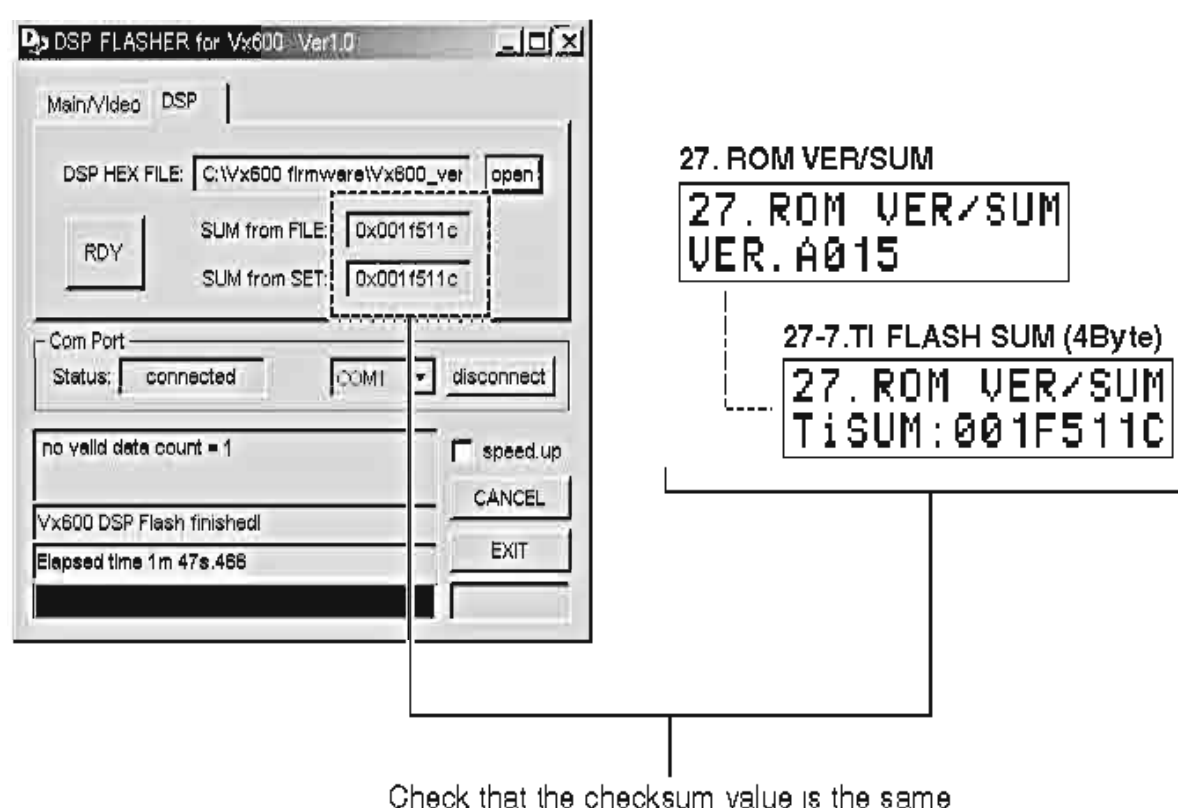
- * When writing is completed, the power to the main unit is automatically turned OFF/ON.

9. Check the checksum.

After downloading successfully, the value of "SUM from SET" is displayed.

Start the DIAG function of the main unit and check that the checksum value is the same.

The procedure is completed when the same version as shown below is obtained.



Check that the checksum value is the same

- * If there is a difference, perform the procedure again starting from step "3.Start up DSP_FLASHER_Vx600.exe".

■ SELF DIAGNOSIS FUNCTION (DIAG)

There are 27 DIAG menu items, each of which has sub-menu items. Listed in the table below are menu items and sub-menu items.

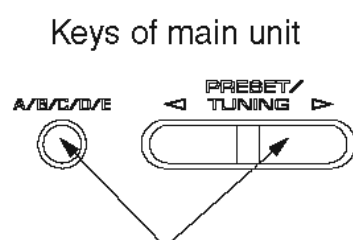
No	DIAG MENU	SUB MENU
1	DA60Y-YSS930 1. DA60Y-YSS930 MARGIN	1. MARGIN 2. FULL BIT
2	BYPASS 2. BYPASS ANALOG BYPASS	1. ANALOG BYPASS 2. DSP BYPASS
3	RAM THROUGH 3. RAM THROUGH MARGIN	1. MARGIN 2. FULL BIT
4	HDMI AUDIO 4. SPDIF	1. SPDIF 2. Multi 3. DSD (Not applied to this model.) 4. DSD Direct (Not applied to this model.)
5	SPEAKERS SET 5. SPEAKERS SET FRONT: SML 0dB	1. FRONT: SMALL 0dB 2. CENTER: NONE 3. LFE/B: FRNT 4. Pres Mix: 5ch 5. FATT1 GAIN 6. FATT2 GAIN 7. Surr B: MUTE 8. Surr L/R: MUTE 9. Surr NONE 10. ZoneOn Zone Amp Tone: MAX 11. ZoneOn Zone Amp Tone: MIN
6	Multi INPUT 6. Multi INPUT 6ch INPUT_6Ω	1. 6ch INPUT_6 ohms 2. 8ch INPUT_6 ohms 3. 6ch INPUT_8 ohms 4. 8ch INPUT_8 ohms 5. TMP TEST
7	MIC CHECK 7. MIC CHECK --- db	1. MIC CHECK
8	STRAIGHT DISPLAY CHECK 8. STRAIGHT DISPLAY CHECK	1. STRAIGHT (Initial display) 2. VFD DISP OFF (All segments OFF) 3. VFD DISP ALL (All segments ON 100%) 4. VFD DIMMER (All segments ON 50%) 5. CHECK PATTERN (ON in lattice)
9	MANUAL TEST 9. MANUAL TEST TEST ALL	1. TEST ALL 2. TEST FRNT L 3. TEST CENTER 4. TEST FRNT R 5. TEST SURR R 6. TEST SB R 7. TEST SB L 8. TEST SURR L 9. TEST PRES L 10. TEST PRES R 11. TEST LFE
10	RS-232C 10. RS-232C TX DATA: NG	1. TX DATA 2. HARD FLOW
11	FACTORY PRESET 11. FAC PRESET PRESET INH	1. PRESET INH (memory initialization inhibited) 2. PRESET RSRV (memory initialized)
12	AD DATA CHECK 12. AD CHECK DC: 021	1. DC 2. PS1/PS2 3. TM1/TM2 4. RECOUT SEL (Not applied to this model.)

No	DIAG MENU	SUB MENU
		5. POWER LIMITER
		6. LIMIT
		7. FAN
		8. MODEL
		9. DESTINATION
		10. PANEL KEY (K0/K1)
13	XM STATUS 13. XM STATUS 1k - 1dB/44	1. 1k -1dB /44.1k
		2. 1k -61dB /44.1k
		3. Mute /44.1k
		4. XM Tone /44.1k
		5. ISO Tone /44.1k
		6. 1k -1dB /32k
		7. 1k -61dB /32k
		8. Mute /32k
		9. XM Tone /32k
		10. ISO Tone /32k
		11. XM/DT Bus Power: OFF
14	IF STATUS (Not applied to this model.) 14. IF STATUS IS1: 3300020000	1. IS 1 (5Byte)
		2. IS 2 (3Byte)
		3. CS 1 (5Byte)
		4. CS 2 (5Byte)
		5. CS 3 (4Byte)
		6. BS 1 (2Word)
		7. BS 2 (2Word)
		8. BS 3 (2Word)
		9. BS 4 (2Word)
		10. BS 5 (2Word)
		11. BS 6 (2Word)
		12. BS 7 (2Word)
		13. BS 8 (2Word)
		14. BS 9 (2Word)
		15. BS 10 (2Word)
		16. TI 1 (5Byte)
		17. TI 2 (1Byte)
		18. MTT (5Byte)
15	PROTECTION SETTING (Not applied to this model.) 15. PROTECTION PS_Lo: 0076	1. PS_Lo
		2. PS_Hi
		3. DC_Lo
		4. DC_Hi
		5. FUN_0
		6. FUN_1
		7. FUN_2
		8. FUN_3
		9. FUN_4
		10. FUN_5
		11. TEMP
		12. PL_8_M_L
		13. PL_8_M_H
		14. PL_8_N_L
		15. PL_8_N_H
		16. PL_6_M_L
		17. PL_6_M_H
		18. PL_6_N_L
		19. PL_6_N_H
16	PROTECTION HIST.	1. LAST:
		2. HIST1:

No	DIAG MENU	SUB MENU
	16. PROTE HIST. LAST:	3. HIST2: 4. HIST3:
17	DSP CHECK 17. DSP CHECK TI BUS: NoEr	1. TI BUS 2. YSS-930 BUS
18	D-VIDEO CHK 18. DVIDEO CHK ALL: OK	1. ALL Check 2. Micom/Flash Check 3. I2C Read Check 4. YGV Bus Check (Not applied to this model.)
19	HDMI INFO 19. HDMI INFO HMN: HTR-5990	1. HDMI Model Name 2. HDMI Product ID 3. HDMI Vendor Name
20	HDMI SELECT 20. HDMI SELECT HDMI NONE	1. HDMI NONE: No Connect 2. HDMI IN 1: HDMI IN 1 Port 3. HDMI IN 2: HDMI IN 2 Port
21	HDMI UPCONV 21. HDMI UPCONV HDMI DECODER	1. HDMI Decoder 2. HDMI YGV (Not applied to this model.) 3. HDMI I/P 4. HDMI 720p (Not applied to this model.) 5. HDMI 1080i (Not applied to this model.)
22	VIDEO 22. VIDEO DIGITAL COMP	1. DIGITAL THR COMP 2. DIGITAL THR CVBS 3. DIGITAL THR Y/C 4. DIGITAL BYPASS 5. ANALOG BYPASS 6. TEST PATTERN 1 7. TEST PATTERN 2 8. VIDEO INFO
23	BUS CHECK (Not applied to this model.) 23. BUS CHECK TI FLASH R	1. TI FLASH READ 2. TI FLASH WRITE 3. TI SDRAM READ 4. TI SDRAM WRITE 5. YGV READ 6. YGV WRITE
24	FLASH 232C 24. FLASH 232C MAIN	1. MAIN 2. VIDEO 3. TI
25	SET INFO 25. SET INFO MODEL: 5990	1. MODEL: 5990 2. DEST.: J, UC, R, T, K, A, BG, L
26	SOFT SW 26. SOFT SW SW MODE : PCB	1. SW MODE: PCB/FNC 2. VIDEO FORMAT: NTSC/PAL 3. AAC EXIST: EXIST/NOT 4. CSII EXIST: EXIST/NOT 5. RDS EXIST: EXIST/NOT 6. XM EXIST: EXIST/NOT 7. TMP TEST J/UC/RL 8. TMP TEST UCKTABG 9. TMP TEST RL
27	ROM VER/SUM 27. ROM VER/SUM VER. A015	1. MAIN VERSION 2. MAIN SUM 3. VIDEO VERSION 4. VIDEO SUM 1 5. VIDEO SUM 2 6. TI FLASH VERSION 7. TI FLASH SUM (4Byte) 8. XM VERSION

• Starting DIAG

Press the "MASTER ON/OFF" key while simultaneously pressing those two keys of the main unit as indicated in the figure below.



Turn on the power while pressing these keys.

• Starting DIAG in the protection cancel mode

If the protection function works and causes hindrance to trouble diagnosis, cancel the protection function as described below, and it will be possible to enter the DIAG mode. (The protection functions other than the excess current detect function will be disabled.)

Press the "MASTER ON/OFF" key while simultaneously pressing those two keys indicated in the figure above. At this time, keep pressing those two keys for 3 seconds or longer.

In this mode, the "SLEEP" segment of the FL display of the main unit flashes to indicate that the mode is DIAG mode with the protection functions disabled.

CAUTION!

Using this product with the protection function disabled may cause damage to itself. Use special care for this point when using this mode.

• Canceling DIAG

- ① Before canceling DIAG, execute setting for PRESET of DIAG menu No.11 (Memory initialization inhibited or Memory initialized).
 - * In order to keep the user memory stored, be sure to select PRESET INHIBIT (Memory initialization inhibited). Any protection history will remain in memory.
- ② Turn off the power by pressing the "MASTER ON/OFF" key of the main unit or the "STANDBY" key of the remote control.

• Display provided when DIAG started

The FL display of the main unit displays the protection function history data and the version (1 alphabet) and the DIAG menu (sub-menu MARGIN of DIAG menu No.1 DA60Y-YSS930) a few seconds later.

When there is no history of protection function:

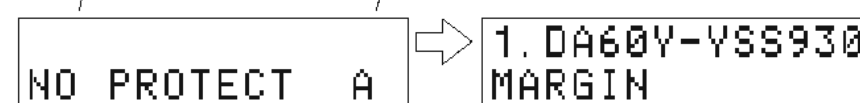
Opening message

DIAG menu display

When there is no history of protection function

Version (1 alphabet)

After a few seconds



When there is a history of protection function:

When there is a history of protection function due to excess current

Version (1 alphabet)

I PROTECT A

Cause: An excessive current flowed through the power amplifier.

Turning on the power without correcting the abnormality will cause the protection function to work immediately and the power supply will instantly be shut off.

Note)

- Applying the power to a unit without correcting the abnormality can be dangerous and cause additional circuit damage.
- The output transistors in each amplifier channel should be checked for damage before applying any power.
- Amplifier current should be monitored by measuring across the emitter resistors for each channel.

When there is a history of protection function due to abnormal voltage in the power supply section

PSx PRT:000 A
Version (1 alphabet)
A/D conversion value of voltage

Cause: The voltage in the power supply section is abnormal.

Supplementary information: The abnormal voltage is displayed in based on 5V as 255.

Turning on the power without correcting the abnormality will cause the protection function to work 1 second later and the power supply will be shut off.

When there is a history of protection function due to abnormal DC output

DC PRT:000 A
Version (1 alphabet)
A/D conversion value of voltage

Cause: DC output of the power amplifier is abnormal.

Supplementary information: The abnormal voltage is displayed in based on 5V as 255.

Turning on the power without correcting the abnormality will cause the protection function to work 3 seconds later and the power supply will be shut off.

When there is a history of protection function due to excessive heat sink temperature

TMPx PRT:000 A
Version (1 alphabet)
A/D conversion value of voltage

Cause: The temperature of the heat sink is excessive.

Supplementary information: The abnormal voltage is displayed in based on 5V as 255.

Turning on the power without correcting the abnormality will cause the protection function to work 1 second later and the power supply will be shut off.

- * Additional causes of protection can be due to loose connections, associated components, CPU, etc.
- * For the protection voltage value, refer to DIAG menu No.12 described later.

• History of protection function

When the protection function has worked, its history is stored in memory with a backup. Even if no abnormality is noted while servicing the unit, an abnormality which has occurred previously can be defined as long as the backup data has been stored.

The history of the protection function is cleared when DIAG is cancelled by selecting PRESET RESERVED (Memory initialized) of DIAG menu No. 11 or when the backup data is erased.

• Display during menu operation

During the DIAG mode, the monitor screen shows the wall paper and the function at work among following functions as a short message.

- Input selection, multi channel input
- Muting
- Speaker relay A/B
- Master volume

The FL display of the main unit shows the function at work. The displayed contents are described in the later section on detailed functions.

• Operation procedure of DIAG menu and SUB-MENU

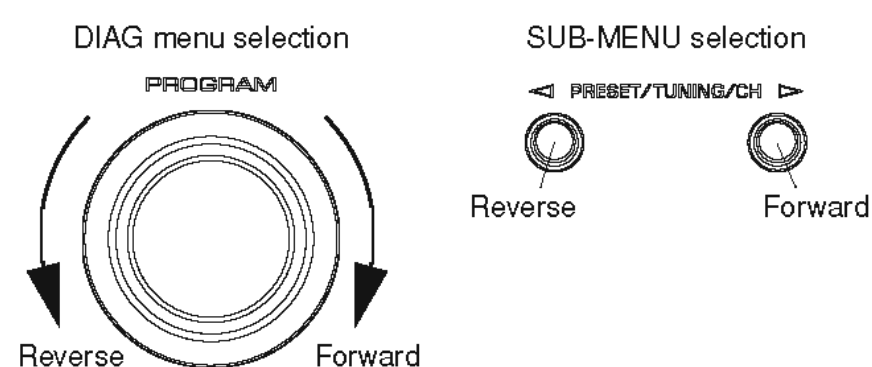
There are 27 MENU items, each of which has some SUB-MENU items.

DIAG menu selection

Select the menu using PROGRAM knob.

SUB-MENU selection

Select the sub-menu using ▷ (Forward) and ◁ (Reverse) keys of PRESET/TUNING.



• Functions in DIAG mode

In addition to the DIAG menu items, functions as listed below are available.

- Input selection, Multi channel input
 - Center/Rear/Rear center/Sub-woofer level adjustment
 - Muting
 - Speaker relay A/B
 - Power on/off
 - Master volume
- * Functions related to the tuner and the set menu are not available.
- * It is possible to confirm Menu No.14 IF STATUS while keeping the signal process (operation status) of each DIAG menu by using the "AUDIO SELECT" key of the main unit.

• Initial settings used to start DIAG

The following initial settings are used when starting DIAG. When DIAG is canceled, these settings are restored to those before starting DIAG.

- Master volume: -20dB
- Input: DVD (MULTI CHANNEL INPUT OFF)
- Effect level: 0dB
- Audio mute: OFF
- Speaker relay A/B: ON
- Speaker setting: LARGE / BASS OUT = BOTH
- DIAG menu: DA60Y-YSS930 (1. MARGIN)

• Details of DIAG menu

With full-bit output specified in some modes, it is possible to execute 0dBFS output without head margin in each channel.

1. DA60Y-YSS930

This function is for YSS930 only. Main DSP of YSS930 is selected for FRONT output. Using the sub-menu, it is possible to select 0dB output level or full-bit output.

MARGIN

- The signal is output including the head margin.

```
1. DA60Y-YSS930
MARGIN
```

INPUT: DVD ANALOG

SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+18.5 dBm	+12.5 dBm	+12.5 dBm	+12.5 dBm	-∞	-6.0 dBm

FULL BIT

- The signal is output in digital full bit without including the head margin.
- The SWFR signal is output but not in digital full bit.

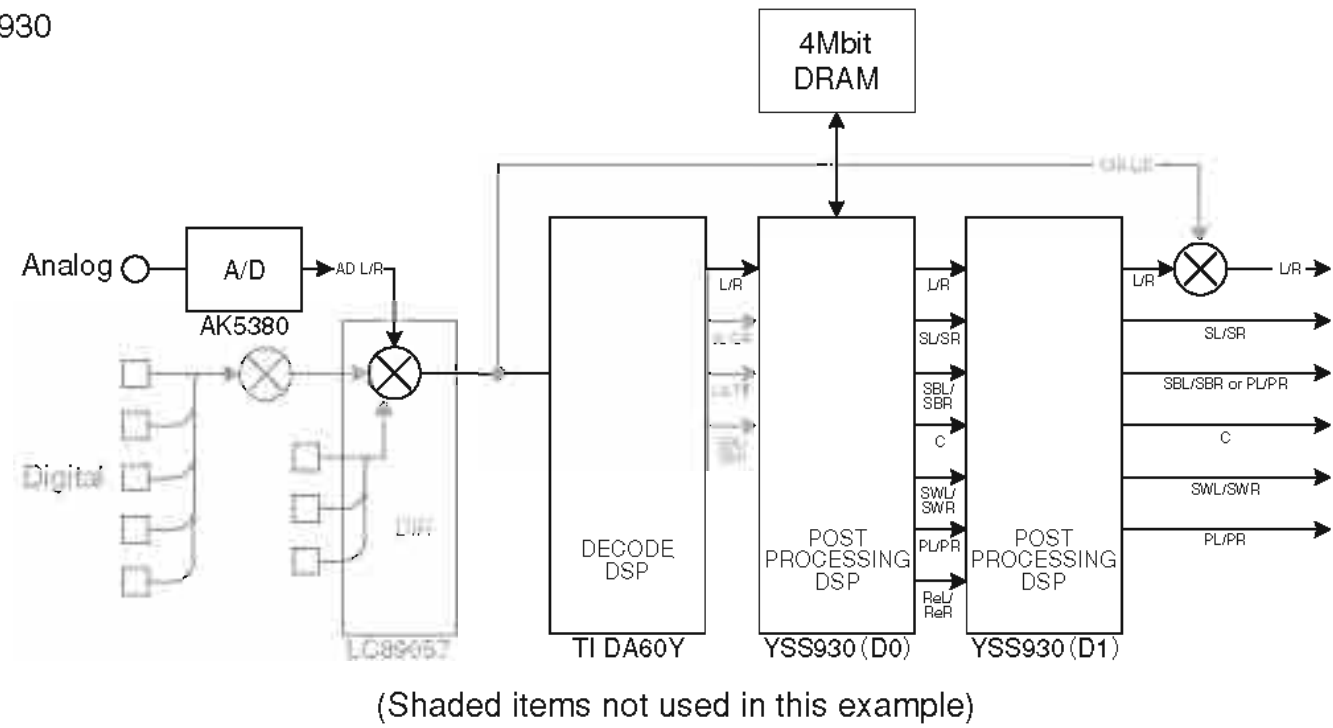
```
1. DA60Y-YSS930
FULL BIT
```

INPUT: DVD ANALOG

SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+18.5 dBm	+12.5 dBm	+12.5 dBm	+12.5 dBm	-∞	-6.0 dBm

DA60Y-YSS930
(ANALOG)



2. BYPASS

ANALOG BYPASS

2. BYPASS
ANALOG BYPASS

INPUT: DVD ANALOG
SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+18.5 dBm	-∞	-∞	-∞	-∞	-∞

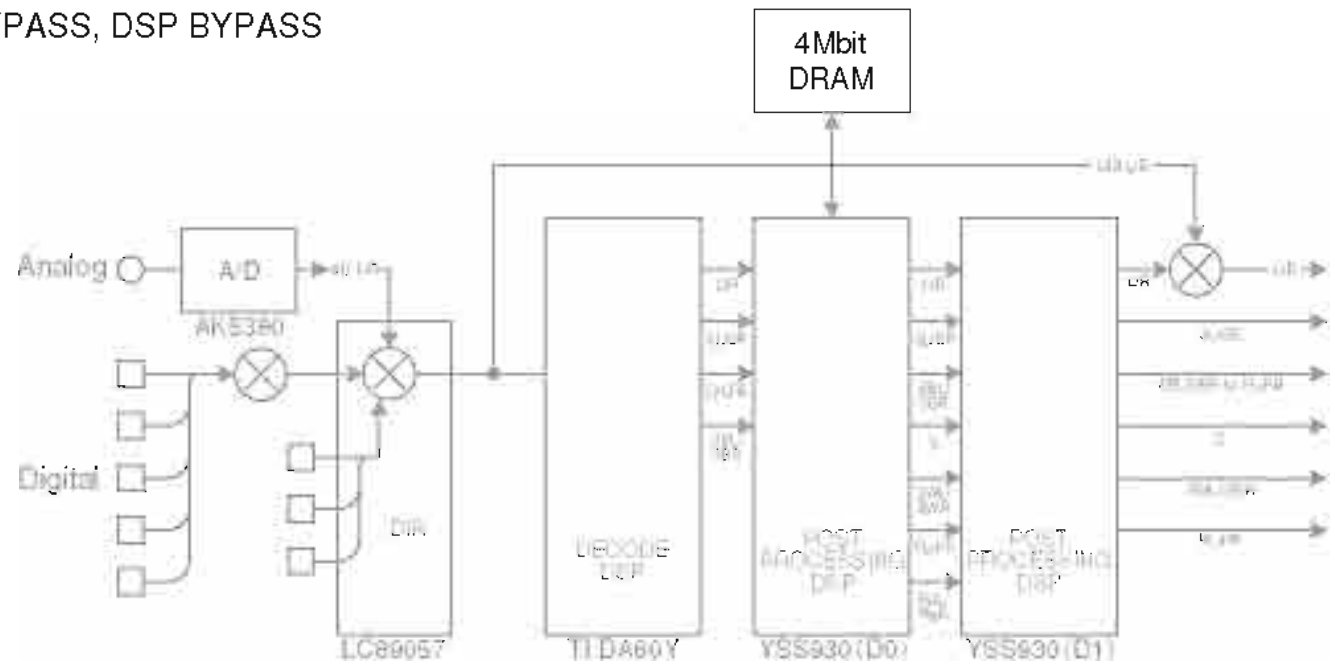
DSP BYPASS

2. BYPASS
DSP BYPASS

INPUT: DVD ANALOG
SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

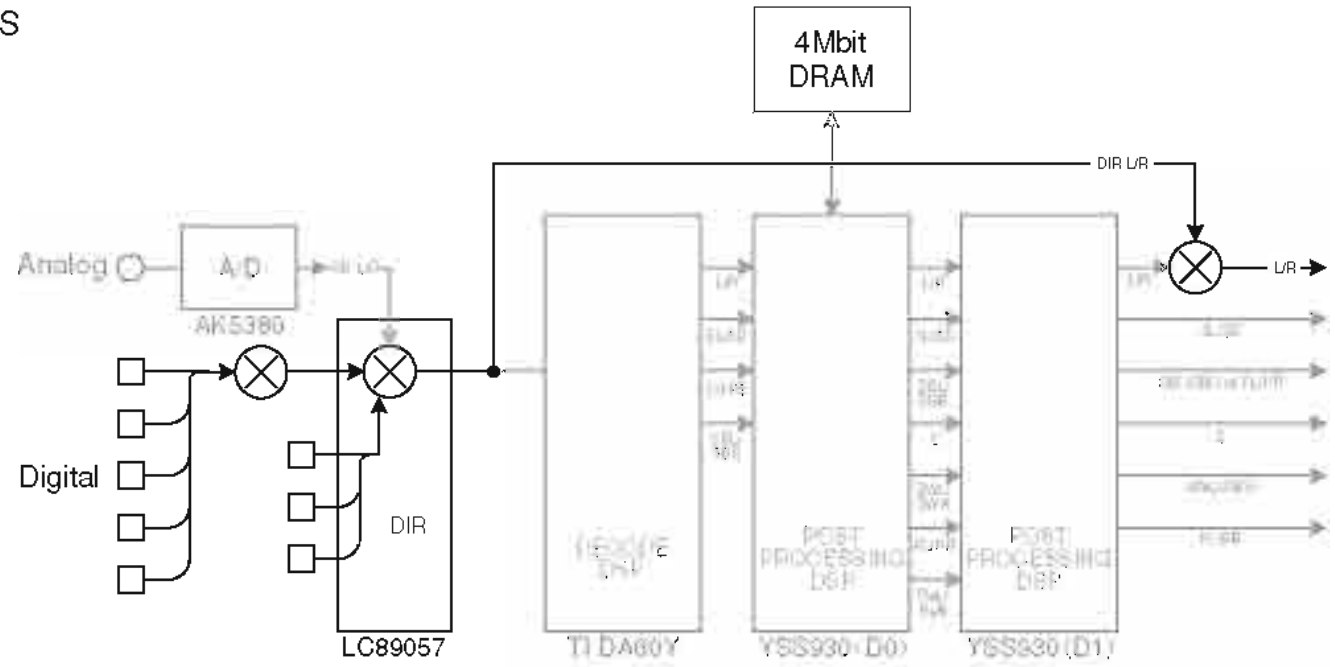
Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+18.5 dBm	-∞	-∞	-∞	-∞	-∞

ANALOG BYPASS, DSP BYPASS
(ANALOG)



(Shaded items not used in this example)

DSP BYPASS
(DIGITAL)



(Shaded items not used in this example)

3. RAM THROUGH

Using the sub-menu, it is possible to select the full-bit output at 0dB output level.

MARGIN

3. RAM THROUGH
MARGIN

INPUT: DVD ANALOG
SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Each ch, -20 dBm	+6.5 dB	+18.5 dBm	+12.5 dBm	+12.5 dBm	+12.5 dBm	-∞	-6.0 dBm

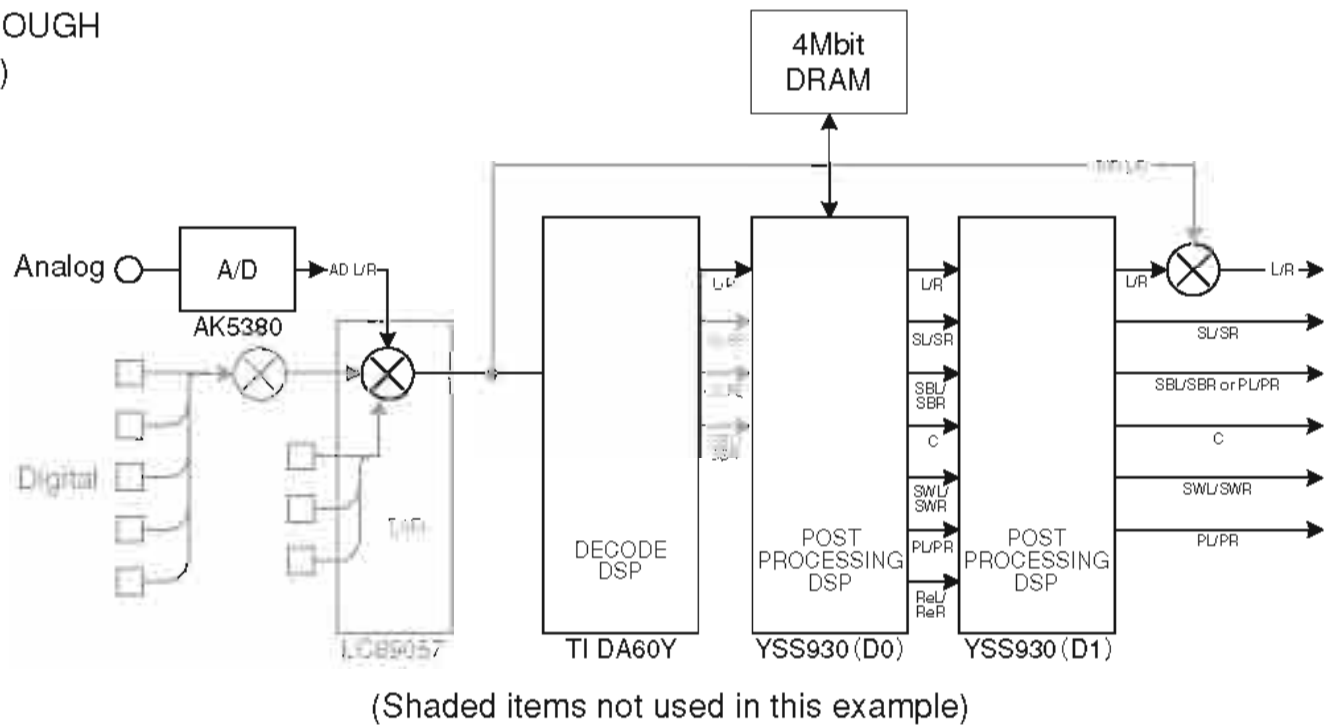
- FULL BIT
- MAIN -9dB

3. RAM THROUGH
FULL BIT

INPUT: DVD ANALOG
SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+18.5 dBm	+12.5 dBm	+12.5 dBm	+12.5 dBm	-∞	-6.0 dBm

RAM THROUGH
(ANALOG)



4. HDMI AUDIO

The signals input to HDMI IN1 and IN2 are selected by the sub-menu and output.

SPDIF

Only SPDIF is output.

4.
SPDIF

Multi

Only Multi (DVD-AUDIO) is output.

4.
Multi

DSD

Not applied to this model.

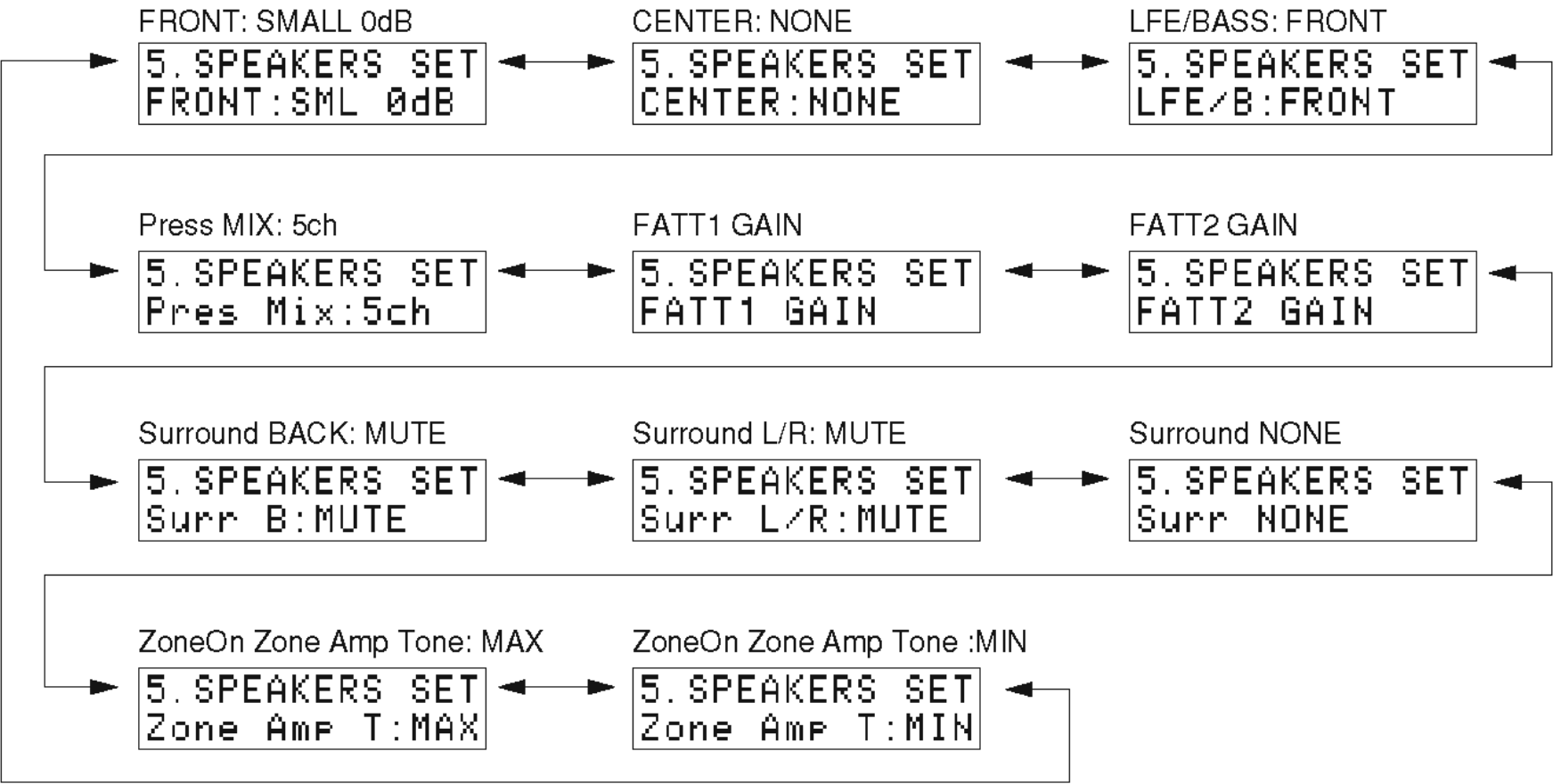
4.
DSD

DSD Direct
Not applied to this model.

4.
DSD Direct

5. SPEAKERS SET

The input signal is automatically identified in the order of dts→DOLBY DIGITAL→AAC→PCM→Analog.
There are 11 sub-menu items as follows. The signals output from the DSP block are the same as sub-menu MARGIN of DIAG menu No.1 DA60Y-YSS930.



The analog switch settings for each sub-menu are as shown in the table below.

SUB MENU	FRONT L/R	CENTER	SURROUND L/R	SURROUND BACK L/R	LFE/BASS
1. FRONT: SMALL 0dB	SMALL	LARGE	LARGE	LARGE	SWFR
2. CENTER: NONE	LARGE	NONE	LARGE	LARGE	SWFR
3. LFE/B: FRNT	LARGE	SMALL	SMALL	SMALL	FRONT
4. Pres Mix: 5ch	LARGE	LARGE	LARGE	LARGE	SWFR
5. FATT1 GAIN	LARGE	LARGE	LARGE	LARGE	SWFR
6. FATT2 GAIN	LARGE	LARGE	LARGE	LARGE	SWFR
7. Surr B: MUTE	LARGE	LARGE	LARGE	NONE	SWFR
8. Surr L/R: MUTE	LARGE	LARGE	NONE	LARGE	SWFR
9. Surr NONE	LARGE	LARGE	NONE	NONE	SWFR
10. ZoneOn Zone Amp Tone: MAX	LARGE	LARGE	NONE	NONE	SWFR
11. ZoneOn Zone Amp Tone: MIN	LARGE	LARGE	NONE	NONE	SWFR

LARGE: This mode is used with a speaker with high bass reproduction performance (a large unit). Full bandwidth signals are output.

SMALL: This mode is used with a speaker with low bass reproduction performance (a small unit). The signals of 90Hz or less are mixed into the channel specified by LFE/BASS.

NONE: This mode is used with no center speaker. The center content is reduced by 3dB and distributed to FRONT L/R.

SWFR: LFE of 5.1ch signal or LFE/BASS lower than 90Hz is output through SUBWOOFER OUT.

FRONT: LFE of 5.1ch signal or LFE/BASS lower than 90Hz is distributed to FRONT L/R.

INPUT: DVD ANALOG

SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level: Both ch, -20 dBm

Volume: +6.5 dB

SUB MENU	SPEAKER OUT					SUBWOOFER OUTPUT
	FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
1. FRONT: SMALL 0dB	+18.5 dBm	+12.5 dBm	+12.5 dBm	+12.5 dBm	-∞	-2.5 dBm
2. CENTER: NONE	+6.5 dBm	-∞	+12.5 dBm	+12.5 dBm	-∞	-6.0 dBm
3. LFE/B: FRNT	+25.0 dBm	+5.0 dBm	+3.5 dBm	+3.5 dBm	-∞	-∞
4. Pres Mix: 5ch	+13.5 dBm	+12.5 dBm	+12.5 dBm	+12.5 dBm	-∞	-6.0 dBm
5. FATT1 GAIN	+19.0 dBm	+12.5 dBm	+12.5 dBm	+12.5 dBm	-∞	-6.0 dBm
6. FATT2 GAIN	+18.5 dBm	+12.5 dBm	-∞	+12.5 dBm	-∞	-6.0 dBm
7. Surr B: MUTE	+18.5 dBm	+12.5 dBm	-∞	-∞	+12.5 dBm	-6.0 dBm
8. Surr L/R: MUTE	+18.5 dBm	+12.5 dBm	-∞	+12.5 dBm	-∞	-6.0 dBm
9. Surr NONE	+13.0 dBm	+12.5 dBm	-∞	-∞	+12.5 dBm	-6.0 dBm
10. ZoneOn Zone Amp Tone: MAX	+18.5 dBm	+12.5 dBm	-∞	-∞	-∞	-6.0 dBm
11. ZoneOn Zone Amp Tone: MIN	+18.5 dBm	+12.5 dBm	-∞	-∞	-∞	-6.0 dBm

6. Multi INPUT

It is possible to select the 6ch/8ch input and 6 ohms/8 ohms by using the SUB menu.

6CH INPUT_6 ohms

```
6.Multi INPUT
6ch INPUT_6Ω
```

INPUT: MULTI CH INPUT

SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+19.0 dBm	+13.0 dBm	+13.0 dBm	-∞	-∞	-6.5 dBm

8CH INPUT_6 ohms

```
6.Multi INPUT
8ch INPUT_6Ω
```

INPUT: MULTI CH INPUT

SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+19.0 dBm	+13.0 dBm	+13.0 dBm	+12.5 dBm	-∞	-6.5 dBm

6CH INPUT_8 ohms

```
6.Multi INPUT
6ch INPUT_8Ω
```

INPUT: MULTI CH INPUT

SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+19.0 dBm	+13.0 dBm	+13.0 dBm	-∞	-∞	-6.5 dBm

8CH INPUT_8 ohms

```
6.Multi INPUT
8ch INPUT_8Ω
```

INPUT: MULTI CH INPUT

SPEAKER OUT: 1kHz, SUBWOOFER OUTPUT: 50Hz

Input level	Volume	SPEAKER OUT					SUBWOOFER OUTPUT
		FRONT	CENTER	SURROUND	SURROUND BACK	PRESENCE	
Both ch, -20 dBm	+6.5 dB	+19.0 dBm	+13.0 dBm	+13.0 dBm	+12.5 dBm	-∞	-6.5 dBm

TMP TEST

Perform the fan drive test.

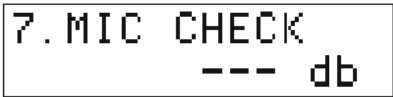
Operation is changed using the "STRAIGHT" key.

```
6.Multi INPUT
255000058059 _
```

_: OFF
L: LOW
M: MID
H: HIGH

7. MIC CHECK

The signals inputted through the microphone are output via A/D - D/A.



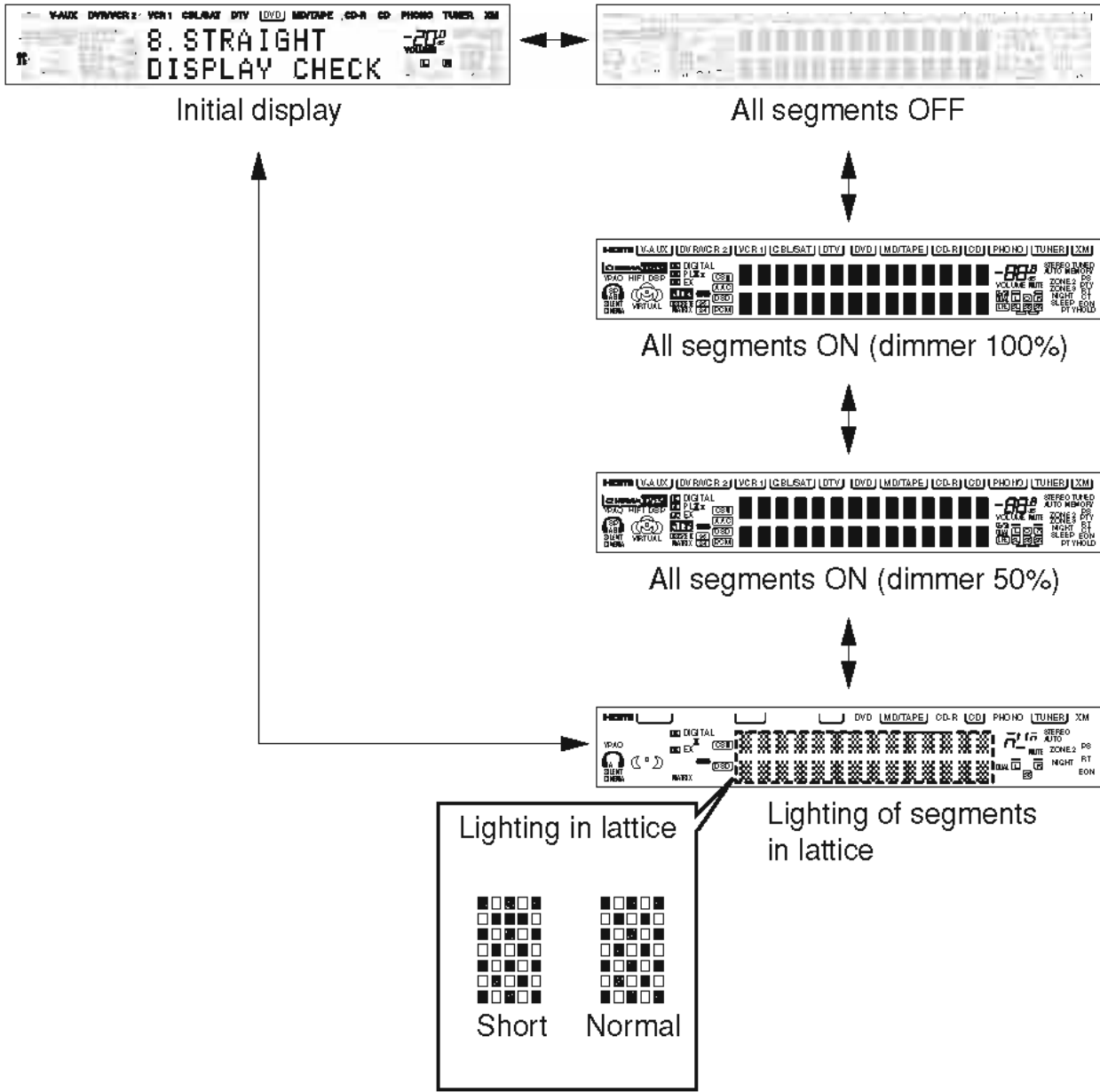
8. STRAIGHT / DISPLAY CHECK

Use this program to check the FL display section and image control section. When checking the image control section, prepare a monitor, component video cable, S video cable and video pin cable and connect them.

Using the sub-menu operation, the display status of the FL display section and image control section varies as shown below.

For audio signal processing, use EFFECT OFF (L/R output by using ANALOG MAIN BYPASS).

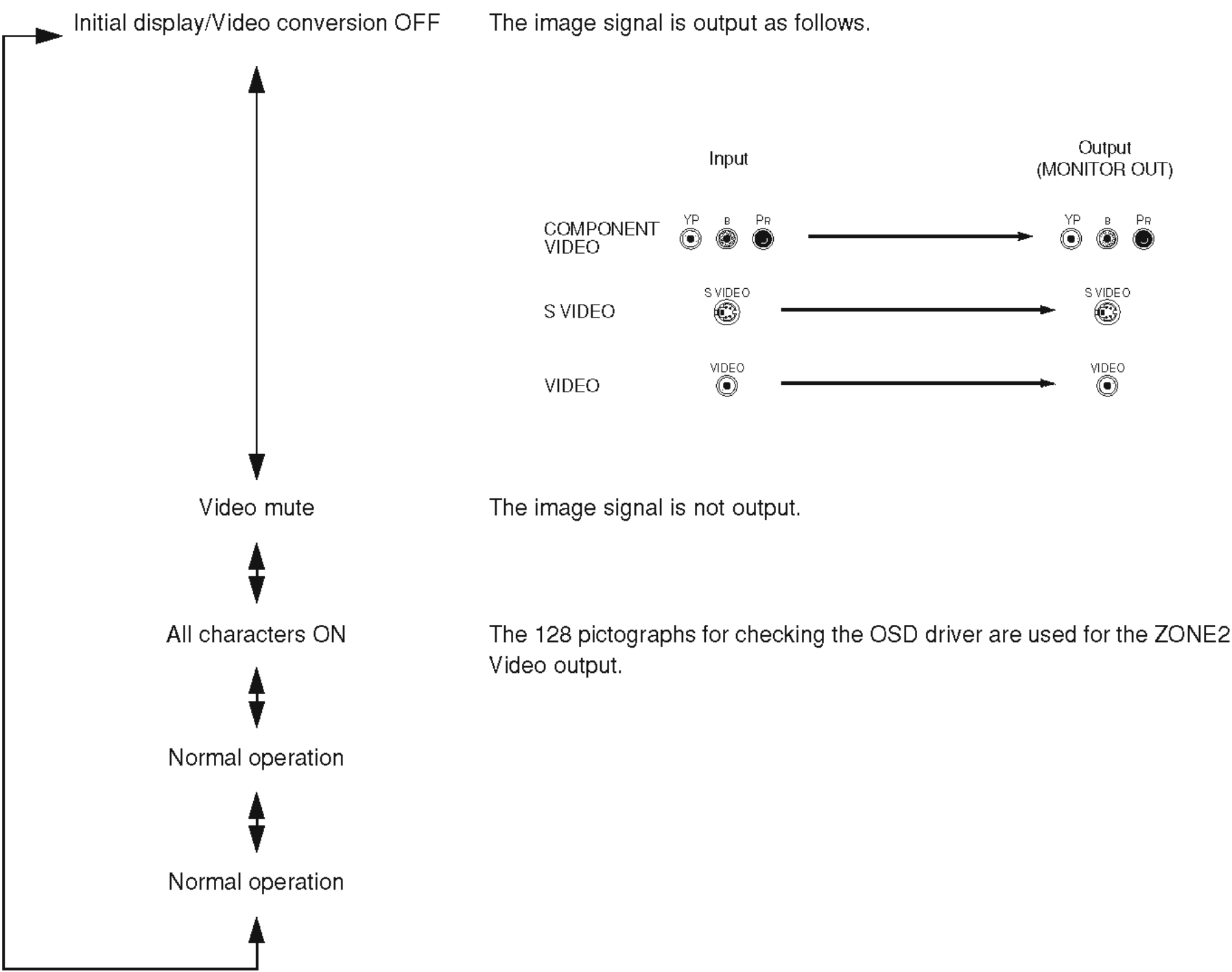
Checking FL display section



Segment conditions of the FL driver and the FL tube are checked by turning ON and OFF all segments. Next, the operation of the FL driver is checked by using the dimmer control. Then a short between segments next to each other is checked by turning ON and OFF all segments alternately (in lattice). (In the above example, the segments in the second row from the top are shorted.)

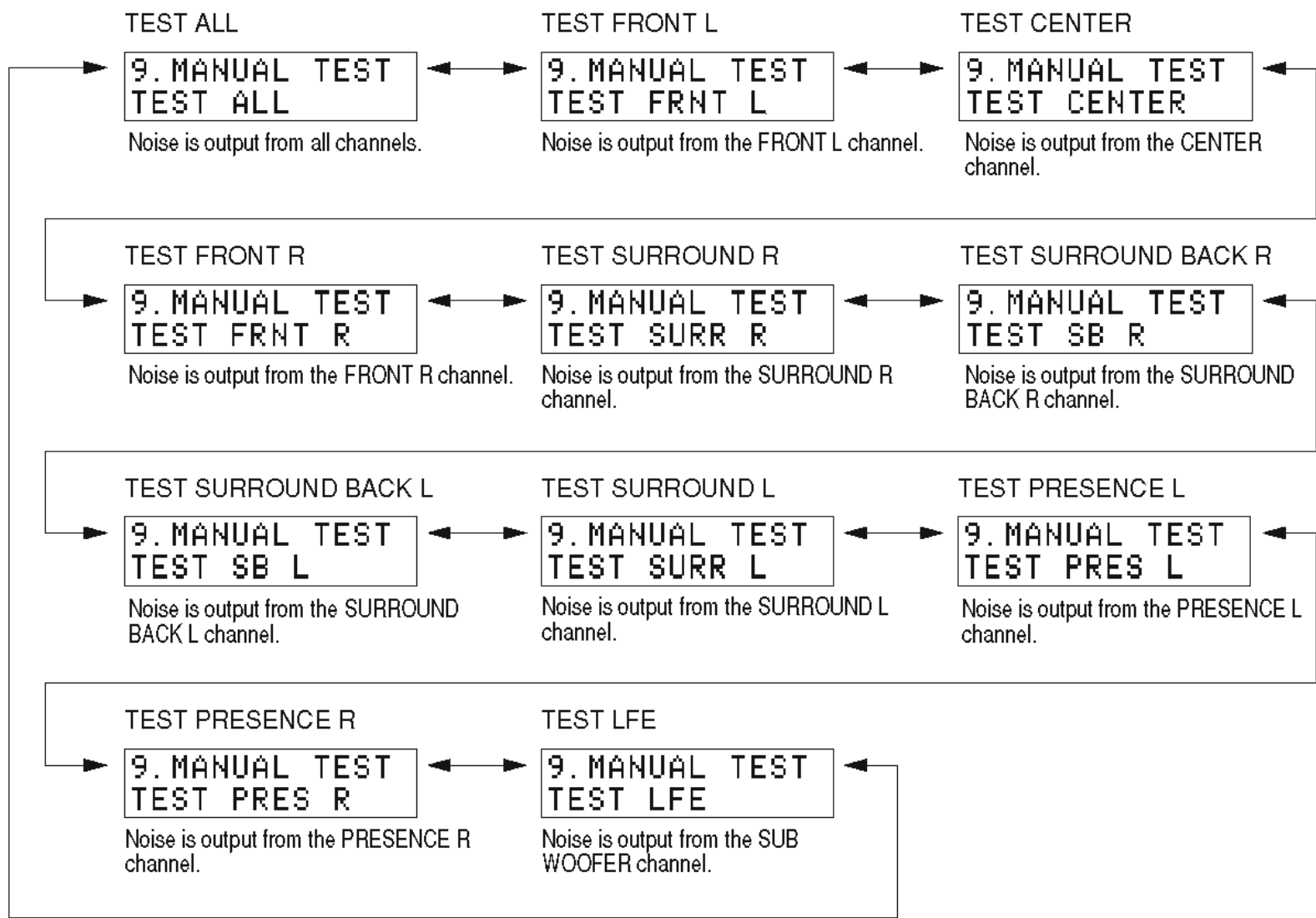
Check of the Video control circuit. (Monitor out)

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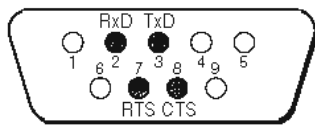
9. MANUAL TEST

The noise generator with a built-in DSP outputs the test noise through the channels specified by the sub-menu. The noise frequency for LFE is 35 to 250 Hz. Other than that, the center frequency is 800Hz.



10. RS-232C

This menu is used to check transmission of the data and the flow port of the hardware. With the power turned off, short between pins No.2 (Rx/D) and No.3 (Tx/D), and between pins No.7 (RTS) and No.8 (CTS) of the RS-232C terminal. (Be sure to turn off the power when shorting the pins.) Start DIAG and select the menu. There are two sub-menu items.



TX DATA

The sub-menu is used to check transmission of the test data. "OK" appears when the data is transmitted properly and "NG" when it is not. In this mode, NULL command transmission is continued after the test command is transmitted.

10. RS-232C
TX DATA: NG

HARD FLOW

This sub-menu is used to check operation of the flow port of the hardware. "OK" appears when the check result is satisfactory and "NG" when it is not.

10. RS-232C
HARD FLOW: NG

11. FACTORY PRESET

This menu is used to reserve and inhibit initialization of the back-up RAM. The signals are processed using EFFECT OFF. (The L/R signal is output using ANALOG MAIN BYPASS.)

11. FAC PRESET
PRESET INH



11. FAC PRESET
PRESET RSRV

PRESET INHIBIT (Initialization inhibited)

RAM initialization is not executed. Select this sub-menu to protect the values set by the user.

PRESET RESERVED (Initialization reserved)

Initialization of the back-up RAM is reserved. (Actually, initialization is executed the next time that the power is turned on.) Select this sub-menu to reset to the original factory settings or to reset the RAM. Any protection history will be cleared.

CAUTION: Before setting to the PRESET RESERVED, write down the existing preset memory content of the Tuner in a table as shown below. (This is because setting to the PRESET RESERVED will cause the user memory content to be erased.)

Preset group	P1	P2	P3	P4	P5	P6	P7	P8
A								
B								
C								
D								
E								

• PRESET STATIONS

STATION		FM FACTORY PRESET DATA (MHz)
PAGE	NO.	U, C
A/C/E	1	87.5
	2	90.1
	3	95.1
	4	98.1
	5	107.9
	6	88.1
	7	106.1
	8	107.9

STATION		AM FACTORY PRESET DATA (kHz)
PAGE	NO.	U, C
B/D	1	630
	2	1080
	3	1440
	4	530
	5	1710
	6	900
	7	1350
	8	1400

12. AD DATA CHECK

This menu is used to display the A/D conversion value of the main Microprocessor which detects panel keys of the main unit and protection functions in using the sub-menu. During signal processing, the condition before execution is maintained.

When K0/K1 menu is selected, keys become non-operable due to detection of the values of all keys. However, it is possible to advance to the next sub-menu by turning the VOLUME of the main unit. When using this function, note that turning the VOLUME more than 1 click would cause the volume value to change.

* The figures in the diagram are given as reference only.

DC (protection detection)

DC: DC detect protection value (Normal value: 3 to 33)

* If DC is out of the normal value range, the protection function works to turn off the power.

(Reference voltage: 5V=255)

```
12. AD CHECK
DC: 021
```

PS1/PS2 (Power supply voltage protection detection)

Power supply voltage protection value (Normal value: PS1: 76 to 106, PS2: 62 to 97)

PS1: Detects $\pm B1$, $\pm B2$, $\pm B4$, $\pm B5$, $\pm 12V$, $+5D1$, $+5D2$, $+5V2$, $+5V3$, $+5VBUS$ and $+2.5D$.

PS2: Detects $+9V$, $\pm 5V$ and $+7V$.

* If PS is out of the normal value range, the protection function works to turn off the power.

(Reference voltage: 5V=255)

```
12. AD CHECK
PS1: 091 PS2: 079
```

TM1/TM2 (temperature detection)

Temperature detected value

(Normal value: 20 to 182)

TM1: Detects the temperatur of the front heat sink.

TM2: Detects the temperatur of the rear heat sink.

(Reference voltage: 5V=255)

```
12. AD CHECK
TM1: 059 TM2: 060
```

RECOUT SEL (Select position)

Not applied to this model.

```
12. AD CHECK
RECOUT: 244
```

POWER LIMITER (Power limiter detection)

Power limiter detection value

The voltage value of pin No. 141 of IC301 is displayed, using 5V/255 as standard.

Based on the input voltage value of pin No. 141 of IC301, the output of pins No. 3 of IC301 is controlled.

```
12. AD CHECK
PLIMIT: 000
```

LIMIT

Limiter control value

The voltage at 3 pin of IC301 is displayed with 5V/255 as a standard.

```
12. AD CHECK
LIMIT: 255
```

FAN

Fan control value

The voltage at 4 pin of IC301 is displayed with 5V/255 as a standard.

```
12. AD CHECK
FAN: 000
```

FUN DRIVE	Value
OFF	0
LOW	184
MID	214
HIGH	255

MODEL

Model detection value

(Reference voltage: 5V=255)

```
12. AD CHECK
MODEL: 255
```

MODEL	Value
RX-V2600/DSP-AX2600	0
RX-V1600/DSP-AX1600	124
HTR-5990	255

DESTINATION

Destination detection value

(Reference voltage: 5V=255)

```
12. AD CHECK
DEST: 027
```

DESTINATION	Value
J	0
U, C	27
R	81
T	102

DESTINATION	Value
K	127
A	152
B, G	208
L	229

PANEL KEY (K0/K1)

(Panel key of main unit) [Remote control code: –]

A/D of the key fails to function properly when the standard value is deviated by ± 8 . In this case, check the constant of partial pressure resistor, solder condition, etc. Refer to table 1.

(Reference voltage: 5V=255)

```
12. AD CHECK
K0:255 K1:255
```

[Table 1]

Display	K0	K1
0+4	TONE CONTROL	ZONE CONTROL
26±4	STRAIGHT / EFFECT	A/B/C/D/E
51±4	TUNING MODE	AUDIO SELECT
77±4	MEMORY	SPEAKERS A
104±4	FM/AM	SPEAKERS B
129±4	PRESET/EDIT	PURE DIRECT
154±4	PRESET/TUNING▷	—
179±4	◁ PRESET/TUNING	—
205±4	—	—
230±4	—	—
255	KEY OFF	KEY OFF

13. XM STATUS

The output check of XM Radio Antenna is executed.

1k -1dB/44.1k

The test tone (1kHz, -1dB/44.1kHz) is output.

```
13. XM STATUS
1k - 1dB/44
```

1k -61dB/44.1k

The test tone (1kHz, -61dB/44.1kHz) is output.

```
13. XM STATUS
1k -61dB/44
```

Mute /44.1k

Nothing is output.

```
13. XM STATUS
Mute /44
```

XM Tone/44.1k

The XM tone (44.1kHz) is output.

```
13. XM STATUS
XM Tone/44
```

ISO Tone/44.1k

The ISO tone (44.1kHz) is output.

```
13. XM STATUS
ISO Tone/44
```

1k -1dB/32k

The test tone (1kHz, -1dB/32kHz) is output.

```
13. XM STATUS
1k - 1dB/32
```

1k -61dB/32k

The test tone (1kHz, -61dB/32kHz) is output.

```
13. XM STATUS
1k -61dB/32
```

Mute /32k

Nothing is output.

```
13. XM STATUS
Mute /32
```

XM Tone/32k

The XM tone (32kHz) is output.

```
13. XM STATUS
XM Tone/32
```

ISO Tone/32k

The ISO tone (32kHz) is output.

```
13. XM STATUS
ISO Tone/32
```

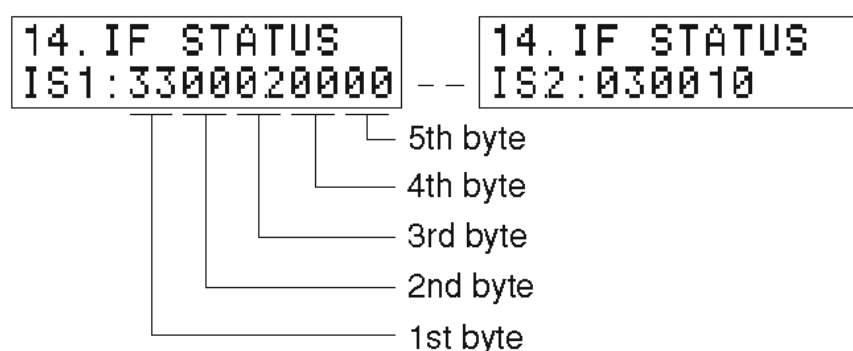
XM/DT Bus Power: OFF

The power of XM module is turned off.

```
13. XM STATUS
Bus Power:OFF
```

14. IF STATUS (Input function status)

Not applied to this model.

IS1, 2 (Inside status)

<1st byte> Digital input/output setting value

Upper 4 bits: REC OUT selected /

lower 4 bits: INPUT selected

Value	Choice	Preset name
0	NONE	
1	OPT A	V-AUX
2	OPT B	CD
3	OPT C	DVD
4	OPT D	D-TV
6	OPT F	CBL/SAT
8	COAX A	CD
9	COAX B	DVD
A	COAX C	DVR/VCR2

<2nd byte> Fs information of reproduction signal

Display	00	01	02	03	04	05	06	0A	0B	0C	0D
Fs (kHz)	Analog	32	44.1	48	64	88.2	96	Unknown NRM	Unknown DBL	Unknown QUAD	Not defined

<3rd byte> Audio code mode information of reproduction signal

Display	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D
Audio Code	1+1	1/0	2/0	3/0	2/1	3/1	2/2	3/2	2/3	3/3	OVER 6.1	MULTI PCE	Unknown	Unknown

<4th byte> Format information of reproduction signal

*1: Analog processing used for digital reproduction is not possible because of a commercial bit or 4-ch audio reason.

Display	Signal format
00	Analog (Unlock)
01	Incorrect Digital (*1)
10	PCM Audio
20	Digital Data
21	IEC1937 Data
22	None PCM
23	Unknown
50	dts
51	Red dts
54	dts-ES MATRIX
58	dts-ES DISCRETE
5C	dts-ES (Both flag)
60	AAC
C0	Dolby Digital
C1	D.D. Karaoke
C4	D.D.6.1 (D.D.EX)

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<5th byte> Signal processing status information
*2: With digital signals other than 32kHz, 44.1kHz and 48kHz, through processing method is used for reproducible signals.

bit7	MUTE request	bit3	—
bit6	Red dts flashing	bit2	Through & bypass (*2)
bit5	6.1/EX processing	bit1	—
bit4	FULL MUTE (ON: 1)	bit0	dts analog mute

CS1~3 (Channel status):

14. IF STATUS CS1:FFFFFFFF	--	14. IF STATUS CS3:FF325400
-------------------------------	----	-------------------------------

BS1~10:

14. IF STATUS BS1:0000000000	--	14. IF STATUS BS10:000000
---------------------------------	----	------------------------------

TI1~2:

14. IF STATUS TI1:0808000600	--	14. IF STATUS TI2:00
---------------------------------	----	-------------------------

MTT:

14. IF STATUS MTT:00180018FF

Byte No.	Function
1	Mute condition
2	Factor of the last mute
3	Error count of YSS930-FSCNT
4	Mute count by YSS930-FSCNT
5	Error factor of down load of CS49329

15. PROTECTION SETTING
Not applied to this model.

PS_Lo:

15. PROTECTION PS_Lo: 0076

PS_Hi:

15. PROTECTION PS_Hi: 0106

DC_Lo:

15. PROTECTION DC_Lo: 0003

DC_Hi:

15. PROTECTION DC_Hi: 0033

FAN_0~5:

15. PROTECTION FAN_0: 0063	--	15. PROTECTION FAN_5: 0069
-------------------------------	----	-------------------------------

TEMP:

15. PROTECTION TEMP : 0090

PL_8_M_L:

15. PROTECTION PL_8_M_L:0160	15. PROTECTION PL_6_M_L:0150
---------------------------------	---------------------------------

15. PROTECTION PL_8_M_H:0189	15. PROTECTION PL_6_M_H:0180
---------------------------------	---------------------------------

15. PROTECTION PL_8_N_L:0160	15. PROTECTION PL_6_N_L:0150
---------------------------------	---------------------------------

15. PROTECTION PL_8_N_H:0189	15. PROTECTION PL_6_N_H:0180
---------------------------------	---------------------------------

16. PROTECTION HIST.

The history of protection function is displayed.

After selecting the sub-menu, press the "STRAIGHT" key, and the history will be erased.

Last

```
16. PROTE HIST.
LAST:
```

History1

```
16. PROTE HIST.
HIST1:
```

History2

```
16. PROTE HIST.
HIST2
```

History3

```
16. PROTE HIST.
HIST3:
```

17. DSP CHECK

Whether the bus of DSP P.C.B. is connected properly or not is self-diagnosed.

TI BUS

TI (IC512) data bus check is executed.

```
17. DSP CHECK
TI BUS:NoEr
```

YSS-930 BUS

YSS-930 (IC516, IC518) data bus check is executed.

```
17. DSP CHECK
YSS BUS:NoEr
```

Display	Description
WAIT	Bus is being checked.
NoEr	No error detected.
DATA	Data bus shorted or open.
RSCS	/RAS or /CAS shorted, or open.
ADDR	Address bus shorted or open.

18. D-VIDEO CHECK

Whether the bus of D-VIDEO P.C.B. is connected properly or not is self-diagnosed.

ALL Check

The synthetic judgment result is displayed.

OK : No error detected

NG : An error is detected

No Check : Detection is not executed

```
18. DVIDEO CHK
ALL:OK
```

Microprocessor/Flash Check

The data bus check of Microprocessor (IC501) and Flash (IC507) is executed.

OK : No error detected

NG : An error is detected

```
18. DVIDEO CHK
M:OK F:OK
```

I2C Read Check

The Line check of I2C is executed.

OK : 0

NG : 1

```
18. DVIDEO CHK
I2C:00000000
```

Error detection of IC505
 Error detection of IC504
 Error detection of IC503
 Error detection of IC308
 Error detection of IC309
 Error detection of IC310 or IC304
 Error detection of IC310 or IC303

YGV BUS Check

Not applied to this model.

```
18. DVIDEO CHK
YGV:NoError
```

19. HDMI INFORMATION

HDMI Model Name

The model name of this unit written in HDMI module is displayed.

```
19.HDMI INFO
HMN:HTR-5990
```

HDMI Product ID

The product ID of this unit written in HDMI module is displayed.

```
19.HDMI INFO
HPI:3103
```

HDMI Vendor Name

The vendor name (YAMAHA) of this unit written in the HDMI module is displayed.

```
19.HDMI INFO
HVN:YAMAHA
```

20. HDMI SELECT

HDMI NONE: No Connect

Neither HDMI IN 1 terminal nor HDMI IN 2 terminal is selected for input.

```
20.HDMI SELECT
HDMI NONE
```

HDMI IN 1: HDMI IN 1 Port

The HDMI device connected to HDMI IN 1 terminal is selected for input and HDMI is reproduced. With the audio input terminal selection set to HDMI (Fix), SPDIF or I2S is selected automatically according to the audio format which is used for HDMI input. Support Audio is set to "others".

```
20.HDMI SELECT
HDMI IN 1
```

HDMI IN 2: HDMI IN 2 Port

The HDMI device connected to HDMI IN 2 terminal is selected for input and HDMI is reproduced. With the audio input terminal selection set to HDMI (Fix), SPDIF or I2S is selected automatically according to the audio format which is used for HDMI input. Support Audio is set to "others".

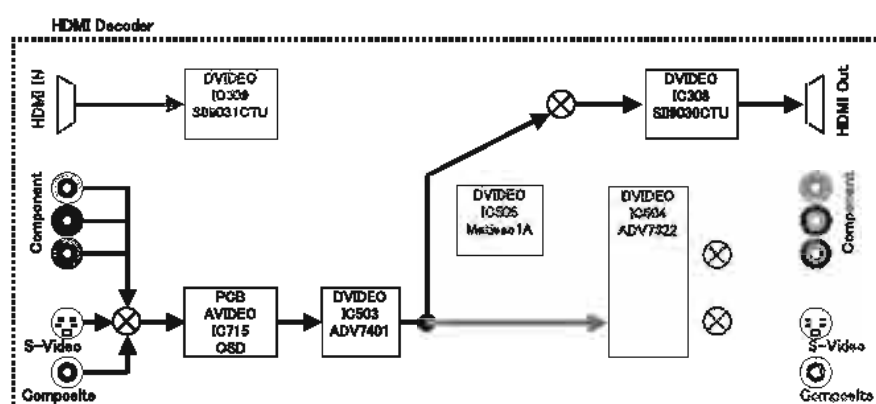
```
20.HDMI SELECT
HDMI IN 2
```

21. HDMI UPCONV

The image signal to converted and output to HDMI OUT as follows.

HDMI Decoder

```
21.HDMI UPCONV
HDMI DECODER
```



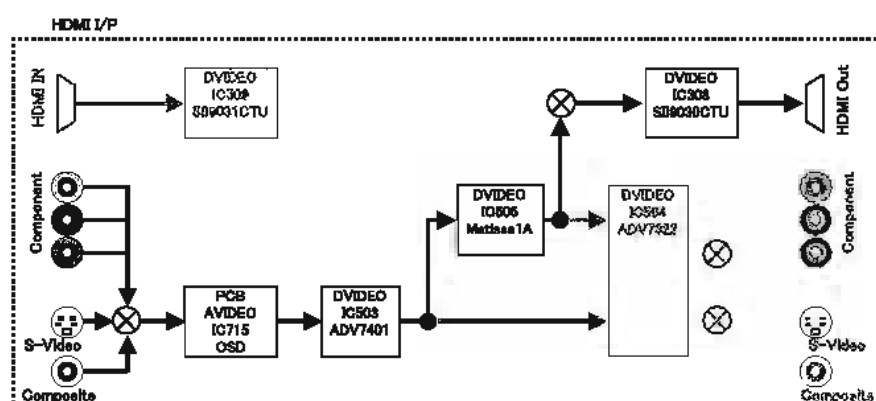
HDMI YGV

Not applied to this model.

```
21.HDMI UPCONV
HDMI YGV
```

HDMI I/P

```
21.HDMI UPCONV
HDMI I/P
```



HDMI 720p

Not applied to this model.

```
21.HDMI UPCONV
*HDMI 720P
```

HDMI 1080i

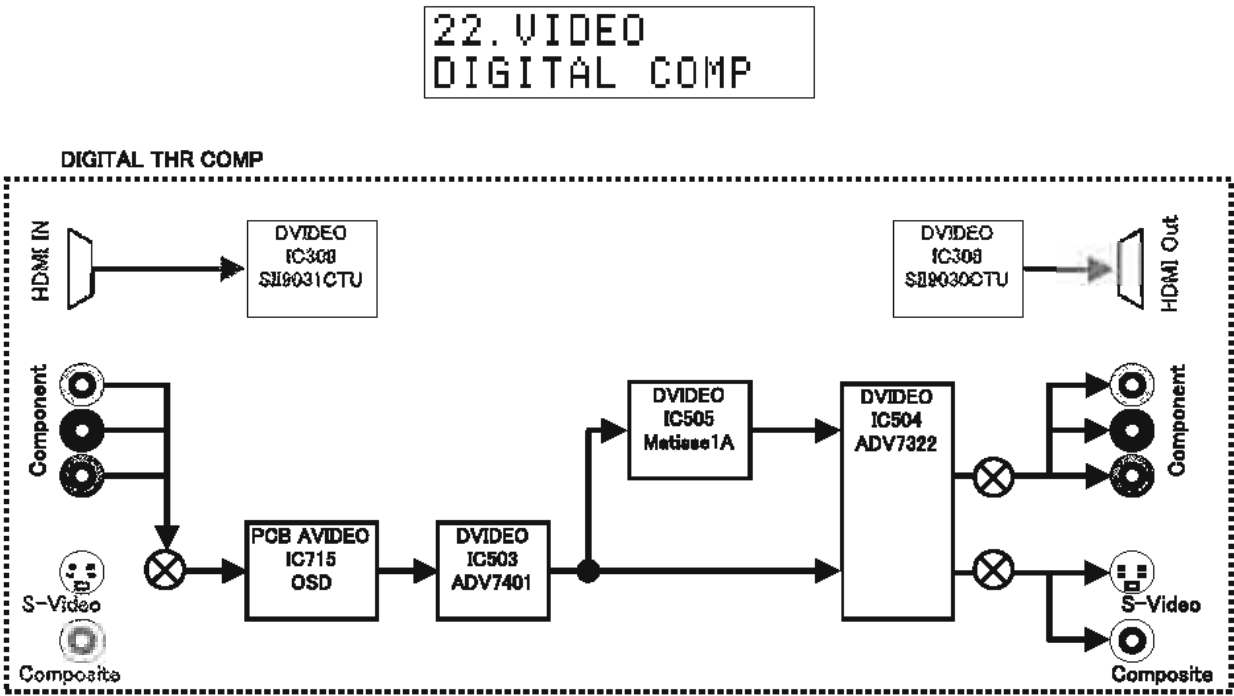
Not applied to this model.

```
21.HDMI UPCONV
*HDMI 1080i
```

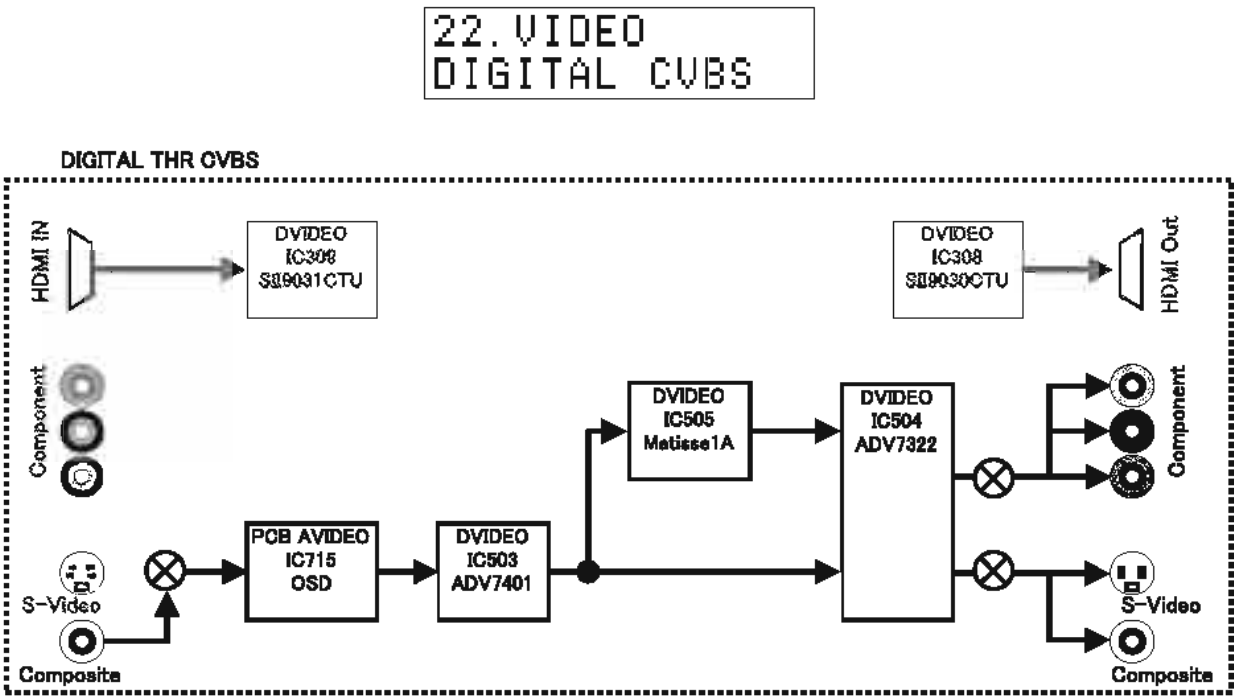
22. VIDEO

The image signal to converted and output as follows.

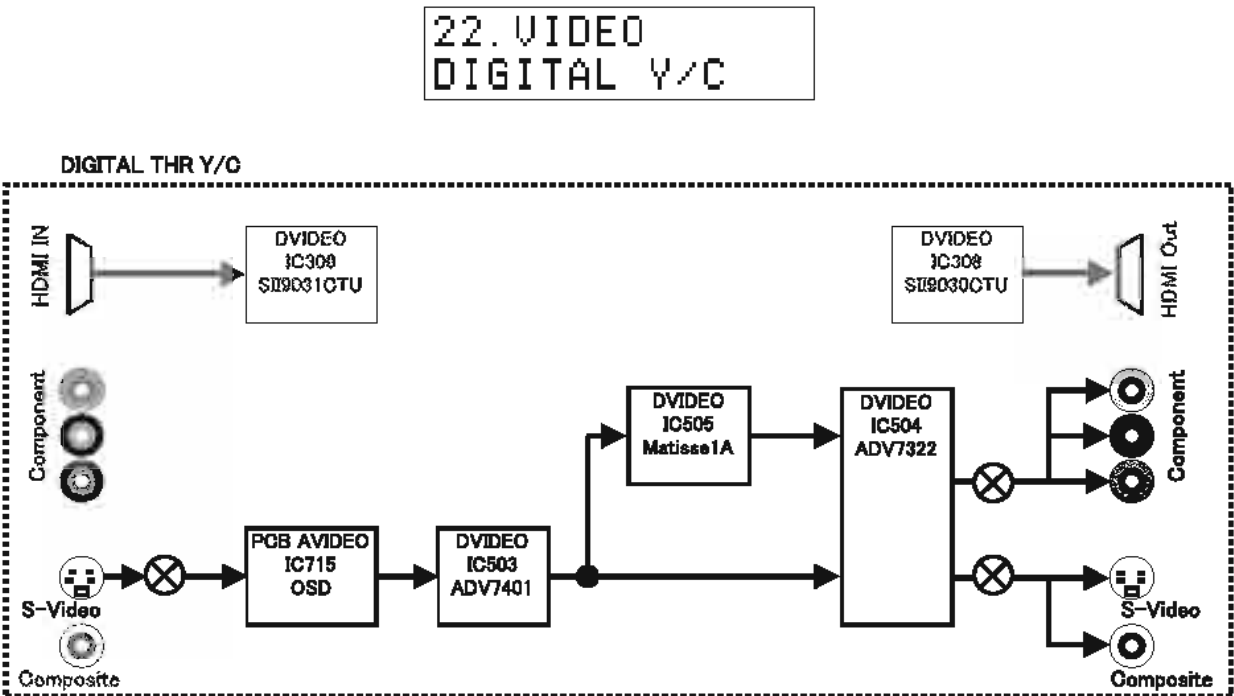
DIGITAL THR COMP



DIGITAL THR CVBS

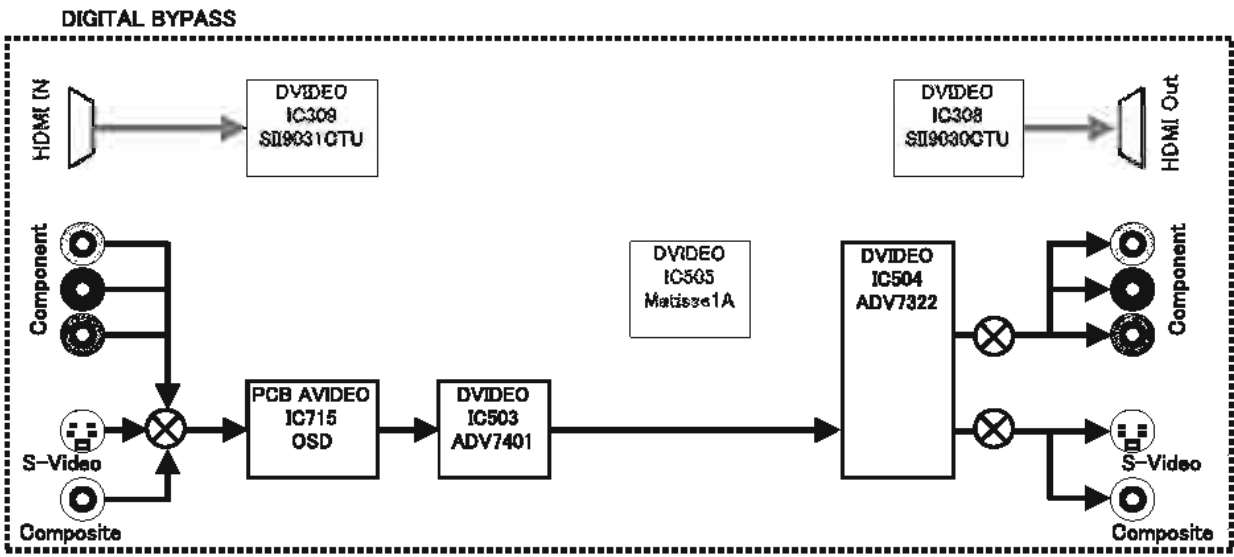


DIGITAL THR Y/C



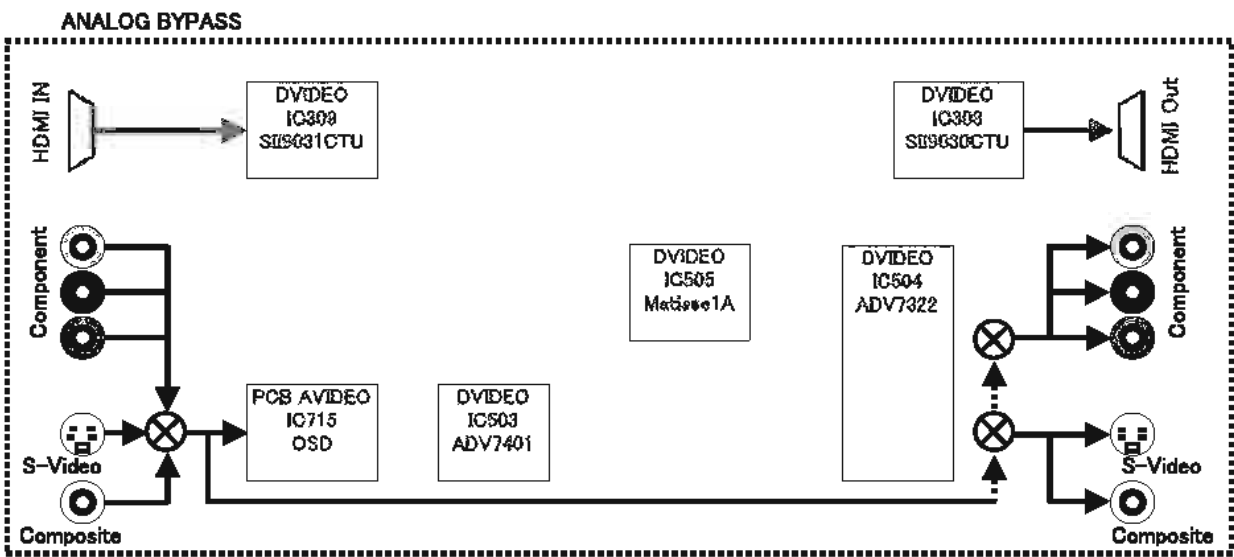
DIGITAL BYPASS

22.VIDEO
DIGITAL BYPASS



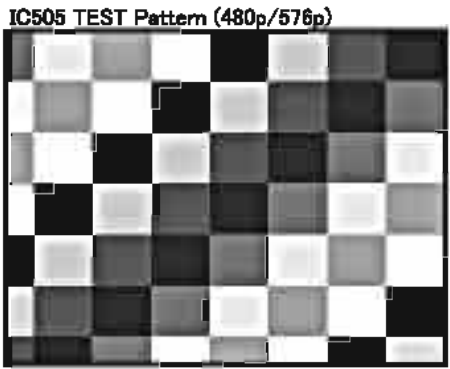
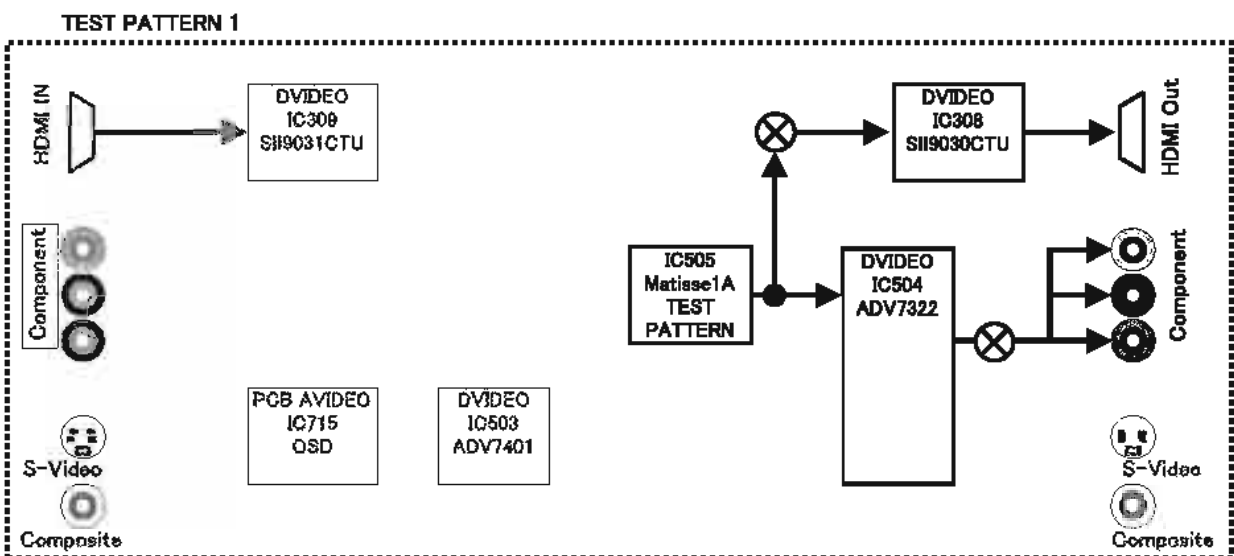
ANALOG BYPASS

22.VIDEO
ANALOG BYPASS

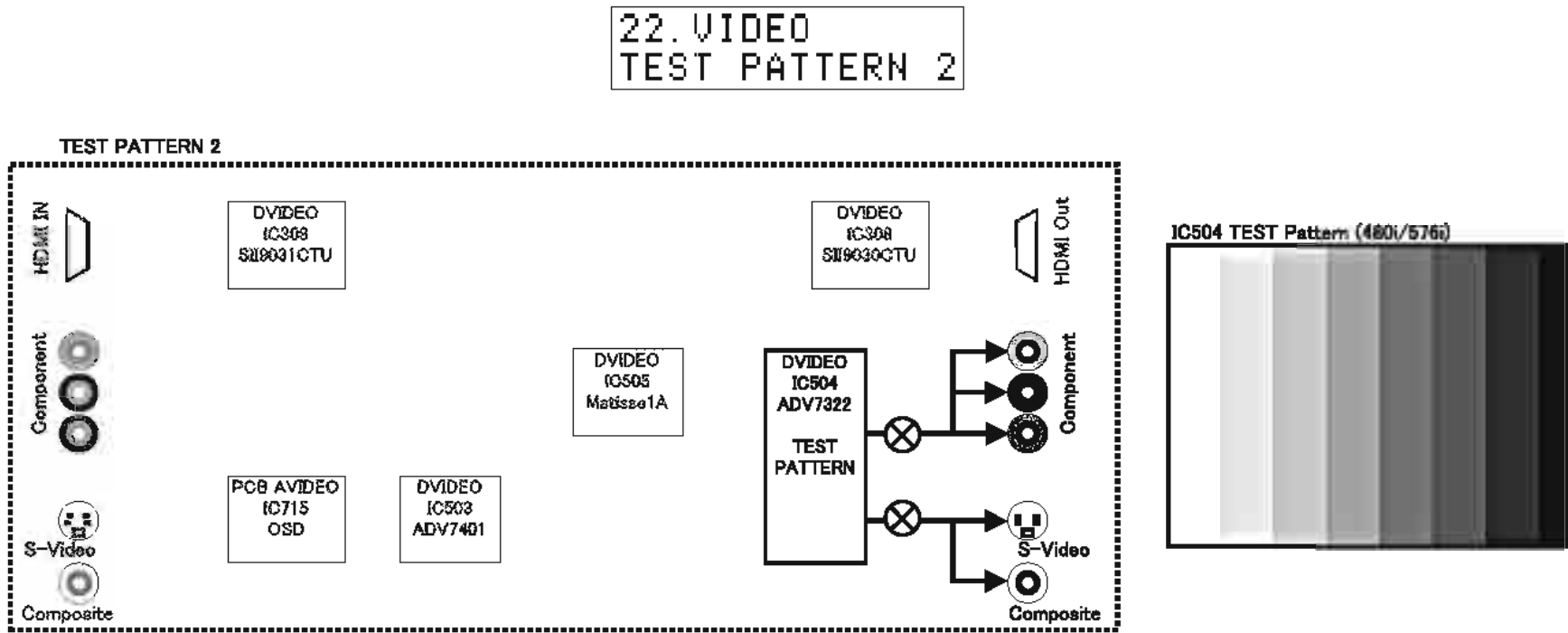


TEST PATTERN 1

22.VIDEO
TEST PATTERN 1



TEST PATTERN 2



VIDEO INFO

22.VIDEO
VIDEO INFO

23. BUS CHECK

Not applied to this model.

TI FLASH READ

23.BUS CHECK
TI FLASH R

TI FLASH WRITE

23.BUS CHECK
TI FLASH W

TI SDRAM READ

23.BUS CHECK
TI SDRAM R

TI SDRAM WRITE

23.BUS CHECK
TI SDRAM W

YGV READ

23.BUS CHECK
YGV BUS R

YGV WRITE

23.BUS CHECK
YGV BUS W

24. FLASH 232C

Select this when writing the firmware.

MAIN

Writing of MAIN.

```
24.FLASH 232C
MAIN
```

VIDEO

Writing of VIDEO.

```
24.FLASH 232C
VIDEO
```

TI

Writing of DSP.

```
24.FLASH 232C
TI
```

25. SET INFO

The information on the model and destination is displayed.

MODEL: 5990

```
25.SET INFO
MODEL:5990
```

DEST.: J, UC, R, T, K, A, BG, L

J, UC, R, T, K, A, BG or L is displayed.

```
25.SET INFO
DEST.:J
```

26. SOFT SW

This menu is used to switch the function settings on P.C.B. through the software so as to activate the product.

The protection function follows the P.C.B. settings. When connected to AC or in the maker preset state, the unit is initialized to the P.C.B. setting. Display of each function after initialization varies depending on settings on P.C.B.. The operation mode can be changed by selecting the sub-menu and then using the "STRAIGHT" key.

SW MODE: PCB/SOFT

PCB or SOFT can be selected.

```
26.SOFT SW
SW MODE : PCB
```

VIDEO FORMAT: NTSC/PAL

NTSC or PAL can be selected.

NTSC (U, C, R, K, J models)

PAL (T, A, B, G, L models)

```
26.SOFT SW
TV FORMAT:
```

AAC EXIST: EXIST/NOT

EXIST or NOT can be selected.

EXIST (J model)

NOT (U, C, R, T, K, A, B, G, L models)

```
26.SOFT SW
AAC:NOT
```

CSII EXIST: EXIST/NOT

EXIST or NOT can be selected.

EXIST (J model)

NOT (U, C, R, T, K, A, B, G, L models)

```
26.SOFT SW
CSII:NOT
```

RDS EXIST: EXIST/NOT

EXIST or NOT can be selected.

EXIST (B, G models)

NOT (U, C, R, T, K, A, L, J models)

```
26.SOFT SW
RDS:NOT
```

XM EXIST: EXIST/NOT

EXIST or NOT can be selected.
EXIST (U, C models)
NOT (R, T, K, A, B, G, L, J models)

26. SOFT SW
XM:EXIST

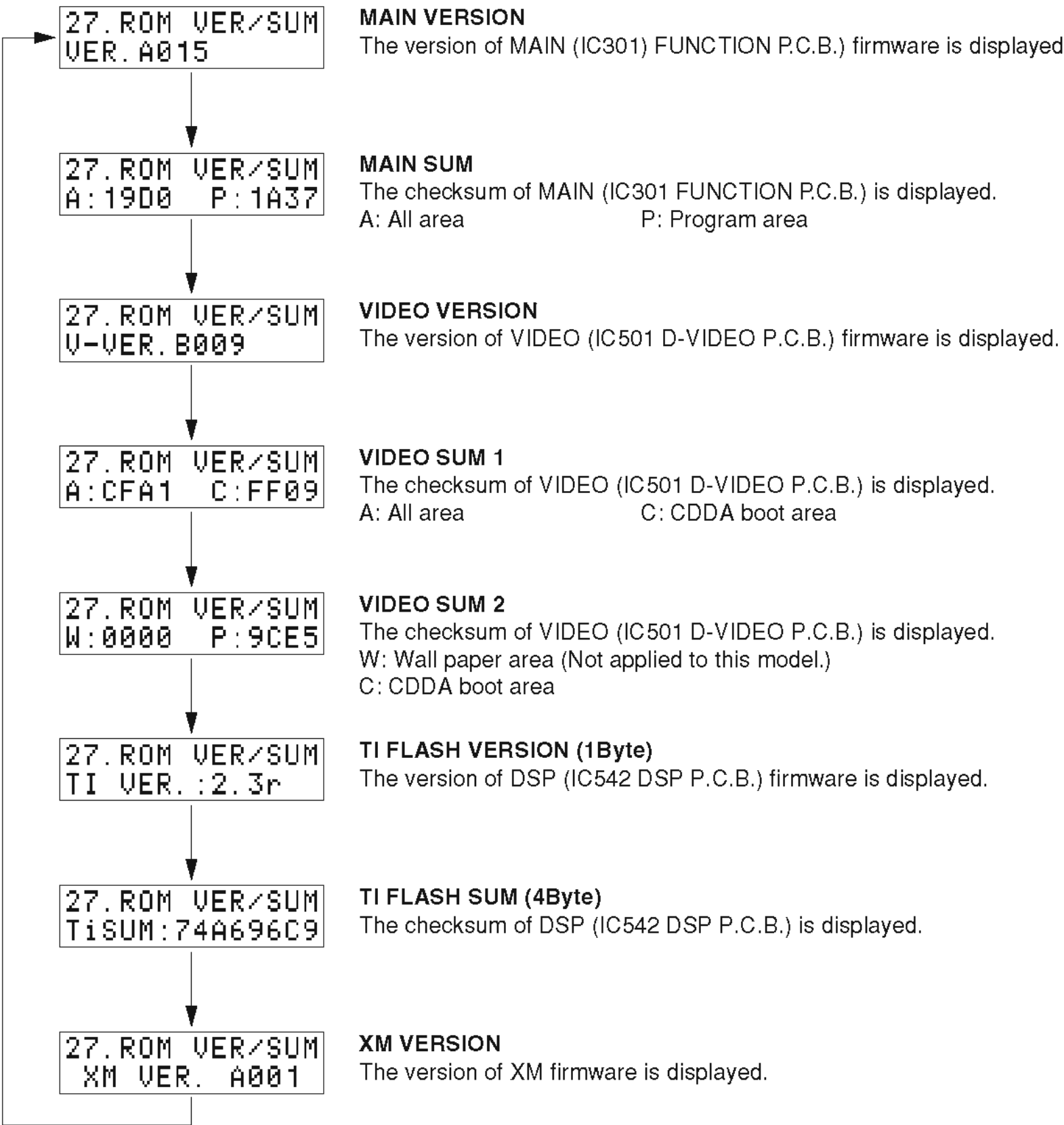
TMP TEST J/UC/RL

J, UC or RL can be selected.
J (J model)
UC (U, C, T, K, A, B, G models)
RL (R, L models)

26. SOFT SW
TMP TEST UC

27. ROM VER/SUM

The version and checksum are displayed. The signal is processed using EFFECT OFF. The checksum is obtained by adding the data at every 8 bits for each program area and expressing the result as a 4-figure hexadecimal data.



■ AMP ADJUSTMENT

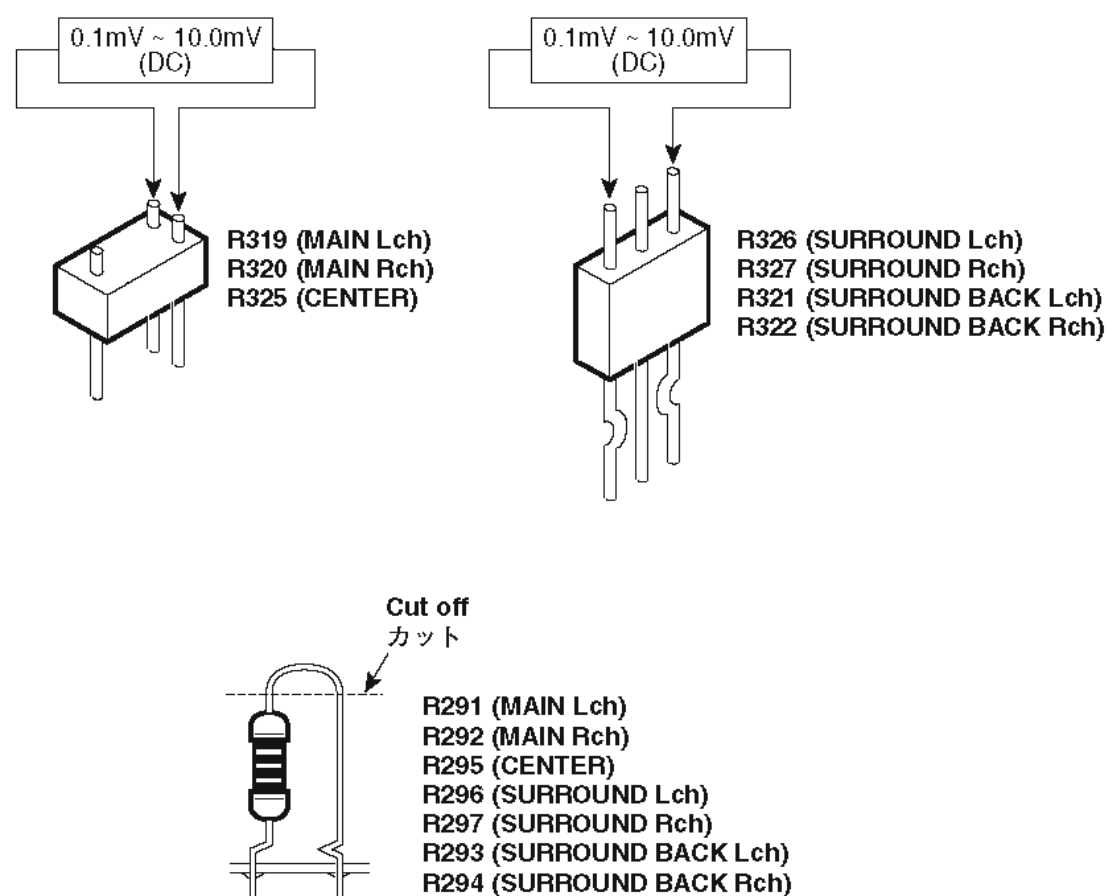
Confirmation of Idling Current of Amp Unit

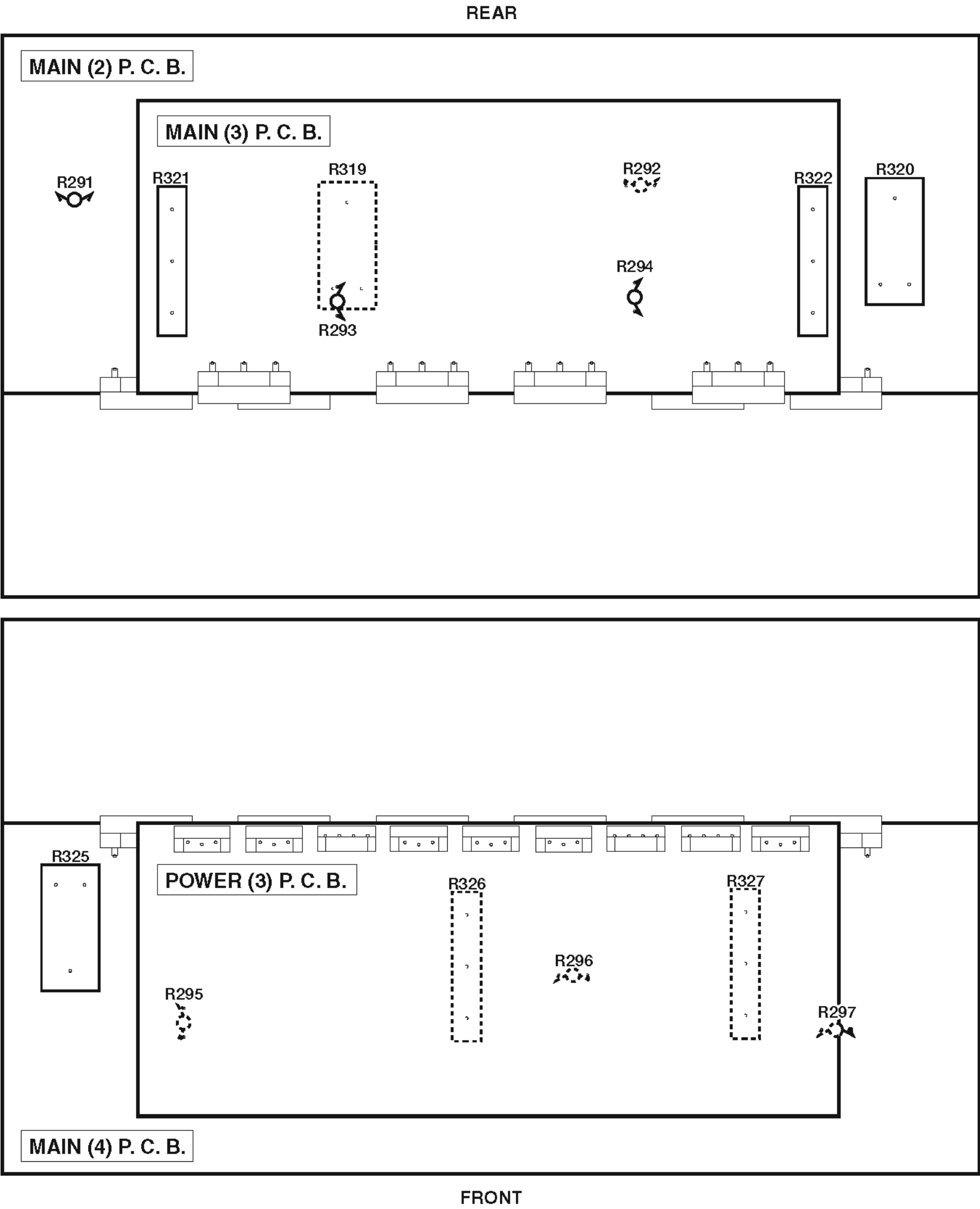
- Right after power is turned on, confirm that the voltage across the terminals of R319 (MAIN Lch), R320 (MAIN Rch), R325 (CENTER), R326 (SURROUND Lch), R327 (SURROUND Rch), R321 (SURROUND BACK Lch), R322 (SURROUND BACK Rch) are between 0.1mV and 10.0mV.
- If it exceeds 10.0mV, open (cutoff) R291 (MAIN Lch), R292 (MAIN Rch), R295 (CENTER), R296 (SURROUND Lch), R297 (SURROUND Rch), R293 (SURROUND BACK Lch), R294 (SURROUND BACK Rch) and reconfirm the voltage.

Attention

If the idle current exceeds 10.0mV after an amplifier repair, first check for a defective component before cutting the bias resistor.

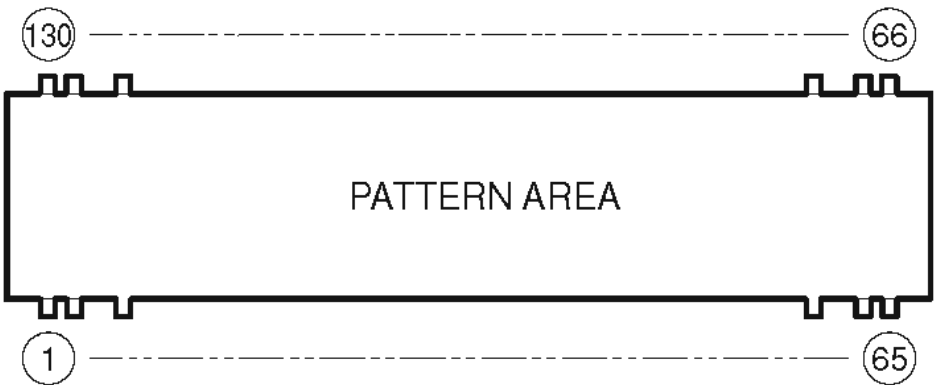
- Confirm that the voltage is 0.2 mV ~ 15.0 mV after 60 minutes.





■ DISPLAY DATA

● V600 : HNA-16ML10T (WF875800)



● PIN CONNECTION

Pin No.	130	129	128	127	126	125	124	123	122	121	120	119	118	117	116	115	114	113	112	111	110	109	108	107	106	105	104	103	102	101	100	99
Connection	F1	F1	NP	NP	P35A	P34A	P33A	P32A	P31A	P30A	P29A	P28A	P27A	P26A	P25A	P24A	P23A	P22A	P21A	P20A	P19A	P18A	P17A	P16A	P15A	P14A	P13A	P12A	P11A	P10A	P9A	P8A

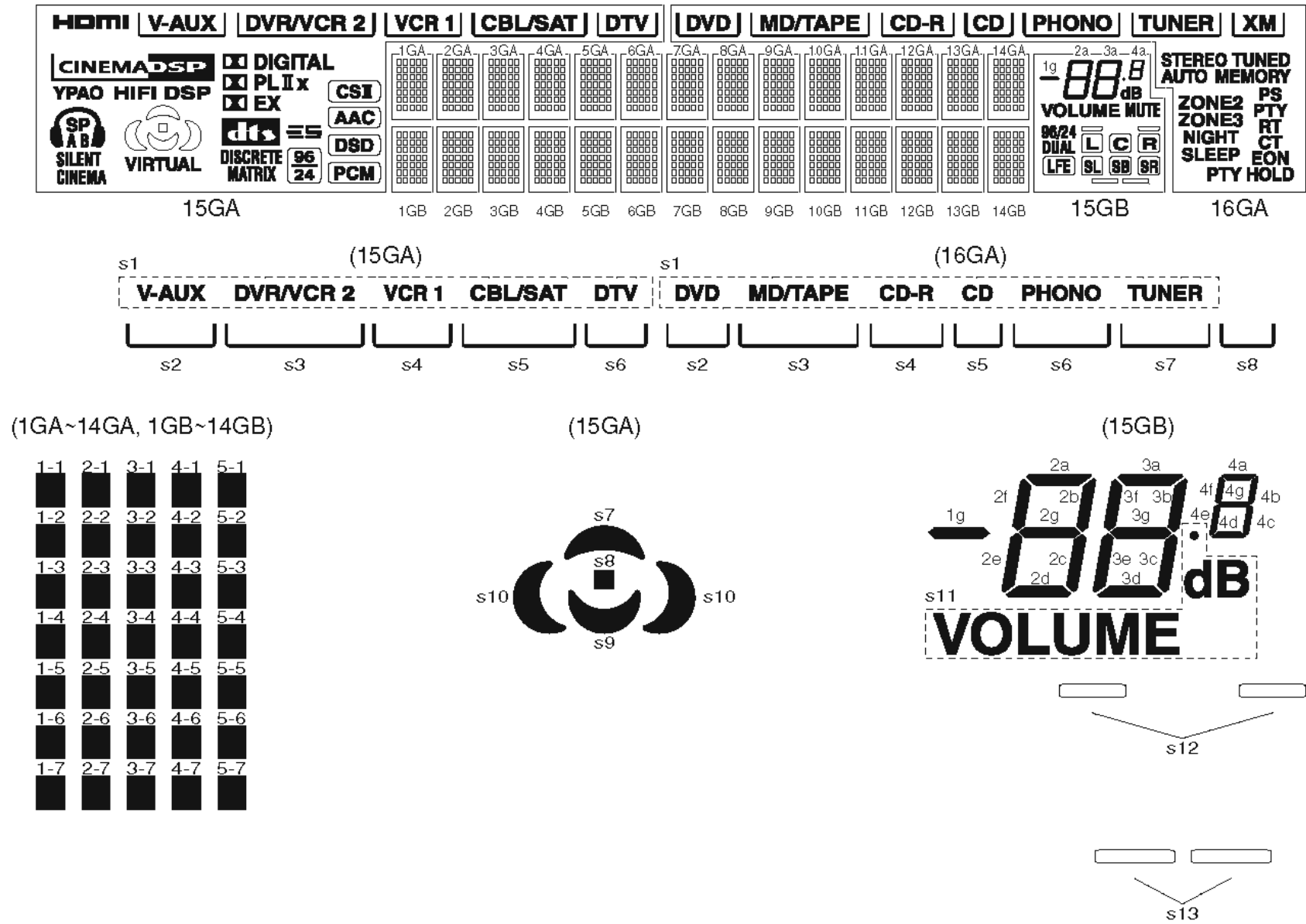
Pin No.	98	97	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66
Connection	P7A	P6A	P5A	P4A	P3A	P2A	P1A	NX	NX	NX	NX	NX	NX	16GA	15GA	14GA	13GA	12GA	11GA	10GA	9GA	8GA	7GA	6GA	5GA	4GA	3GA	2GA	1GA	NP	NP	F2	F2

Pin No.	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
Connection	P8B	P9B	P10B	P11B	P12B	P13B	P14B	P15B	P16B	P17B	P18B	P19B	P20B	P21B	P22B	P23B	P24B	P25B	P26B	P27B	P28B	P29B	P30B	P31B	P32B	P33B	P34B	P35B	NP	NP	F2	F2

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
Connection	F1	F1	NP	NP	1GB	2GB	3GB	4GB	5GB	6GB	7GB	8GB	9GB	10GB	11GB	12GB	13GB	14GB	15GB	NX	NX	NX	NX	NX	NX	NX	P1B	P2B	P3B	P4B	P5B	P6B	P7B

Note: 1) F1, F2 Filament pin 2) 1GA~16GA, 1GB~15GB Grid pin 3) P1A~P35A, P1B~P35B Anode pin 4) NP No pin 5) NX No extended pin

● GRID ASSIGNMENT



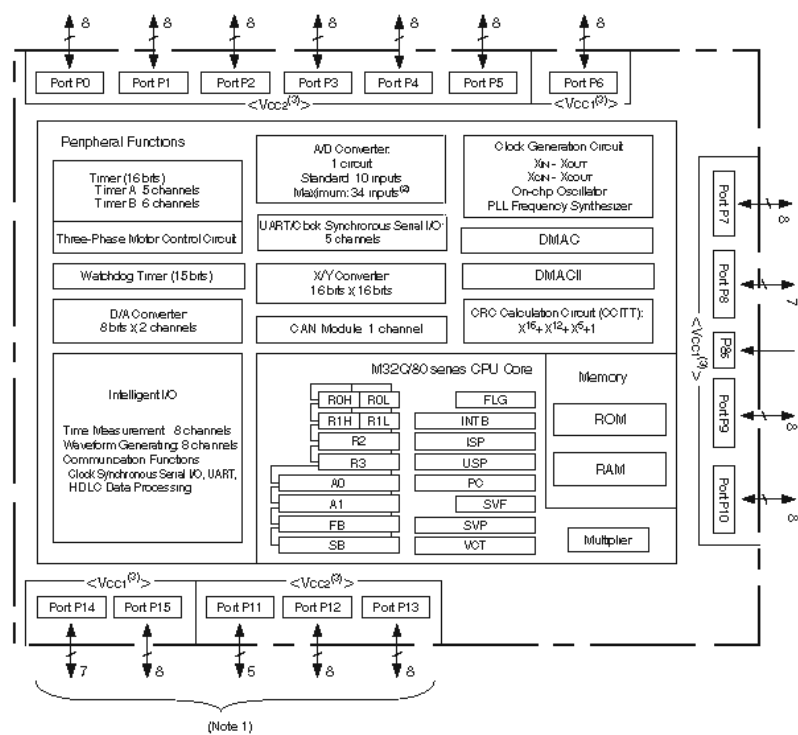
● ANODE CONNECTION

	1GA~14GA	15GA	16GA
P1A	1-1	HDMI	s1
P2A	2-1	s1	s2
P3A	3-1	s2	s3
P4A	4-1	s3	s4
P5A	5-1	s4	s5
P6A	1-2	s5	s6
P7A	2-2	s6	s7
P8A	3-2	CINEMA DSP	s8
P9A	4-2	YPAO	STEREO
P10A	5-2	HIFI DSP	TUNED
P11A	1-3		AUTO
P12A	2-3	SP	MEMORY
P13A	3-3	A	ZONE2
P14A	4-3	B	ZONE3
P15A	5-3	SILENT CINEMA	NIGHT
P16A	1-4	s7	SLEEP
P17A	2-4	s8	PS
P18A	3-4	s9	PTY
P19A	4-4	s10	RT
P20A	5-4	VIRTUAL	CT
P21A	1-5	DIGITAL	EON
P22A	2-5	PL	PTY HOLD
P23A	3-5	I	XM
P24A	4-5	x	
P25A	5-5	EX	
P26A	1-6	dts	
P27A	2-6	ES	
P28A	3-6	DISCRETE	
P29A	4-6	MATRIX	
P30A	5-6	96/24	
P31A	1-7	CSI	
P32A	2-7	AAC	
P33A	3-7	DSD	
P34A	4-7	PCM	
P35A	5-7		

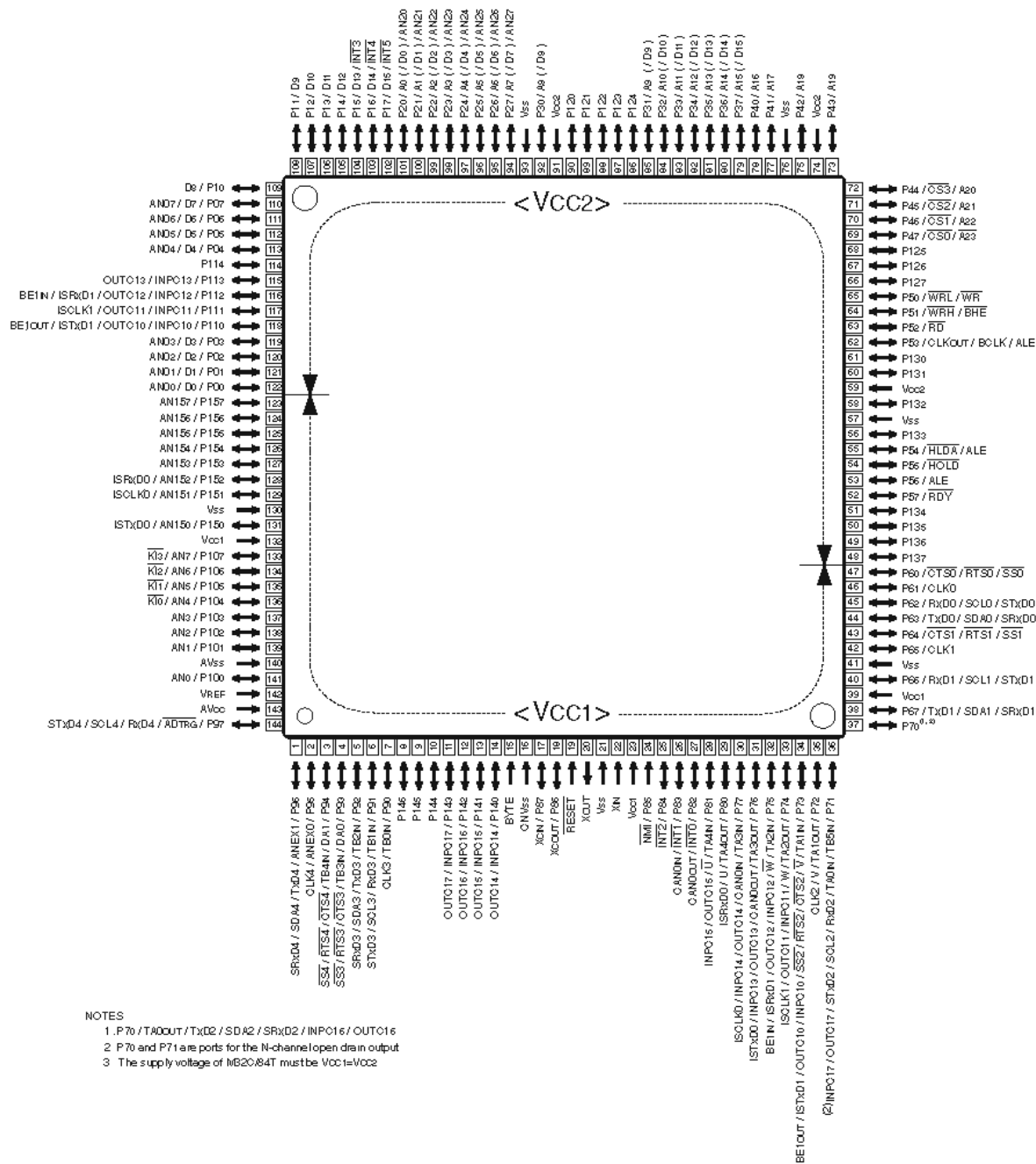
	1GB~14GB	15GB
P1B	1-1	1g
P2B	2-1	2a
P3B	3-1	2b
P4B	4-1	2c
P5B	5-1	2d
P6B	1-2	2e
P7B	2-2	2f
P8B	3-2	2g
P9B	4-2	3a
P10B	5-2	3b
P11B	1-3	3c
P12B	2-3	3d
P13B	3-3	3e
P14B	4-3	3f
P15B	5-3	3g
P16B	1-4	4a
P17B	2-4	4b
P18B	3-4	4c
P19B	4-4	4d
P20B	5-4	4e
P21B	1-5	4f
P22B	2-5	4g
P23B	3-5	s11
P24B	4-5	MUTE
P25B	5-5	96/24
P26B	1-6	DUAL
P27B	2-6	LFE
P28B	3-6	L
P29B	4-6	C
P30B	5-6	R
P31B	1-7	SL
P32B	2-7	SB
P33B	3-7	SR
P34B	4-7	s12
P35B	5-7	s13

IC DATA

IC301: M30845FJGP (FUNCTION P.C.B)
16-bit Microprocessor



NOTES
1. Ports P11 to P15 are provided in the 144-pin package only.
2. Included in the 144-pin package only.
3. The supply voltage of M32G84T (High-reliability version) must be Vcc1=Vcc2.



NOTES
1. P70/TXOUT/TX/D2/SDA2/SRX/D2/INP016/OUT016
2. P70 and P71 are ports for the N-channel open drain output
3. The supply voltage of M32G84T must be Vcc1=Vcc2

IC301: M30845FJGP (FUNCTION P.C.B)
16-bit Microprocessor

No.	Port Name	Terminal Name (P.C.B.)	I/O			Function
			PowerOn	Standby	MCUSleep [OFF]	
1	TXD4	TXDH (MtoV)	SO	O	O	Data transmits to VIDEO_CPU
2	CLK4	CLKH	SO	O	O	Clock transmits to VIDEO_CPU
3	DA1	LIMIT	DA	O	O	Limiter control output
4	DA0	FAN	DA	O	O	Temperature control FAN control output
5	SDA3/TXD3/TB2in	HDIMT	TMR	O	O	HDMI MUTE input
6	SCL3/RXD3/TB1in	/EN232C	I	O	O	VIDEO_CPU 232C communication line enable control
7	TB0in	HRES	TMR	O	O	VIDEO_CPU response return input
8	P146	/ICH	O	O	O	VIDEO_CPU reset
9	P145	HREQ	TMR	O	O	VIDEO_CPU transmission demand input
10	P144	DMT	O	O	O	Digital FULL MUTE (HI=MUTE)
11	P143	/CSDAC3	O	O	O	
12	P142	/CSDAC2	O	O	O	* Chip enable for S, C, SW2chDAC (Reserve)
13	P141	/CSDAC1	O	O	O	2shDAC (PCM1791A) * Chip enable for 6
14	P140	/CSY	O	O	O	* Chip enable for YSS930 (#0 / #1 Common)
15	BYTE	BYTE	MCU	MCU	MCU	External data bus width change: 16 bit
16	CNVss	CNVss	MCU	MCU	MCU	Processor mode selection: Single chip mode/Hi: To boot mode with a built-in flash/At the time of hard reset: It is to boot mode at P50=H, P55=L, and CNVss=H
17	P87	/ICD	O	O	O	DIR initial clear
18	P86	/ICTI	O	O	O	TI initial clear
19	RESET	RESET	MCU	MCU	MCU	
20	Xout	Xout	MCU	MCU	MCU	
21	Vss	Vss	MCU	MCU	MCU	
22	Xin	Xin	MCU	MCU	MCU	
23	Vcc	Vcc	MCU	MCU	MCU	
24	NMI	NMI	IRQ	I	I	
25	INT2	REM1	IRQ	IRQ	IRQ	Remote control pulse input 1
26	INT1	REM2	IRQ	IRQ	IRQ	Remote control pulse input 2/Remote control pulse input for zone remote control
27	INT0	RXDR	IRQ	IRQ	IRQ	RS232C/YDC reception detection
28	TA4in	/VSYNC	TMR	O	O	Vertical sync pulse INT
29	P80	/CSTI	O	O	O	Chip enable for TI decoder DSP DA601
30	TA3in/P77	TIBUSY	I	O	O	TI BUSY detection/CDDA write-in DATA input
31	P76	SPIRDY	I / I	O / O	O / O	DA601 GP0(0): TI DA601 Serial Ready / DRI WCK output: DIR WCK input (WCK input for CDDA writing)
32	TA2in	/INTTI	TMR	O	O	TI (DA601) interruption
33	P74	/CSDIR	O	O	O	Chip enable for DIR
34	TA1in	/INTDIR	TMR	O	O	DIR interruption
35	P72/CLK2/TA1out	BT232C	I / I	I / I	O / O	RS232C flash write-in mode detection / MULTI CH INPUT key detection
36	P71/RxD2/SC02	DRXM	SI	O	O	DABIC IC RxD (XM data reception) / 1.5k pull up to +5SPC
37	P70/TxD2/SDA2	DTXM	SO	O	O	DABIC IC TxD / 1.5k pull up to +5SPC
38	P67/TxD1	TXDR	SO / SO	SO / SO	O / SO	RS232C: Usual RS-232C asynchronous communication data output / YDC: Transmitting terminal for AF220
39	Vcc	Vcc	MCU	MCU	MCU	
40	P66/RxD1	RXDR	SI / SI	SI / SI	SI [O] / SI	Usual RS-232C asynchronous communication data input / At the time of 232C driver OFF, since driver output is set to HiZ, it is LowFix processing / Transmitting terminal for AF220
41	Vss	Vss	MCU	MCU	MCU	
42	P65/CLK1	RTS / CLKF	SO / SO	SO / SO	O / SO	Usual RS-232C asynchronous communication RTS output / Clock input for AF220
43	P64/CTS1/RTS1/	CTS / YDCBUSY	I / O	I / O	I [O] / O	Usual RS-232C asynchronous communication CTS input / At the time of 232C driver OFF, since driver output is set to HiZ, it is LowFix processing / BUSY output for AF220
44	P63/TxD0	TXDD	SO	O	O	Serial data output to DIR, TI (DA601), YSS930, and DAC / DIR/ YSS: 4M, LSBF/TI: 1M, MSBF
45	P62/RxD0	RXDD	SI	O	O	Serial data reception to DIR, TI (DA601), YSS930, and DAC / DIR/YSS: 4M, LSBF/TI: 1M, MSBF
46	P61/CLK0	CLKD	SO	O	O	Serial Clock output to DIR, TI (DA601), YSS930, and DAC

IC301: M30845FJGP (FUNCTION P.C.B)
16-bit Microprocessor

No.	Port Name	Terminal Name	I/O			Function
			PowerOn	Standby	MCUSleep [AC OFF]	
47	P60		O	O	O	
48	P137	VRB	I	O	O	Volume Rotary B
49	P136	VRA	I	O	O	Volume Rotary A
50	P135	PGB	I	O	O	PROGRAM Rotary B
51	P134	PGA	I	O	O	PROGRAM Rotary A
52	P57/RDY	SCKA	O	O	O	Clock output for audio select IC
53	P56/RAS	SDTA	O	O	O	Data output for audio select IC / NJU: Transmitting dock 10us, MSB first
54	P55/HOLD	CEL	O	O	O	JRC analog SW IC CE1
55	P54/HLDA	CET	O	O	O	JRC analog SW IC CE2
56	P133	/HPMT	O	O	O [O]	Headphone MUTE control
57	Vss	Vss	MCU	MCU	MCU	
58	P132	/FATT	O	O	O	FRONT attenuate output PL/PR MIXH
59	Vcc	Vcc	MCU	MCU	MCU	
60	P131	/MIC	I	O	O	MIC detection / 220k Pull Down
61	P130	/HP	I	O	O	Headphone detection / 100k Pull Up to +5SPC
62	P53/BCLK	CKEV	O	O	O	EVOL serial transmitting clock
63	P52/RD	DTEV	O	O	O	EVOL serial transmitting data / Clock speed 1M, MSB first
64	P51/WRH	/CEEV	O	O	O	EVOL CE
65	P50/WRL	XMPWR	O	O	O	XM Radio power supply control
66	P127	/FMTSW	O	O	O [O]	Full Mute SWL/SWR/SW MONO
67	P126	/FMTC	O	O	O [O]	Full Mute Center
68	P125	/FMST	O	O	O [O]	Full Mute SL/SR
69	P47/CS0	/FMFT	O	O	O [O]	Full Mute FL/FR/SBL/SBR
70	P46/CS1	/ICFL	O	O	O	FL driver initial clear
71	P45/CS2	CEF2	O	O	O	FL enable 1
72	P44/CS3	CEF1	O	O	O	FL enable 2
73	P43/A19	ISB	I	O	O	Input selector Rotary B
74	Vcc	Vcc	MCU	MCU	MCU	
75	P42/A18	ISA	I	O	O	Input selector Rotary A
76	Vss	Vss	MCU	MCU	MCU	
77	P41/A17	PSWA	I	I	O	INT5: After [a SSW input] logic Key distinction
78	P40/A16	PSWB	I	I	O	INT5: After [a SSW input] logic Key distinction
79	P37/A15	SRYA	O	O	O	MAIN A SP RELAY
80	P36/A14	SRYB	O	O	O	MAIN B SP RELAY
81	P35/A13	SRYC	O	O	O	CENTER SP RELAY
82	P34/A12	SRYSB	O	O	O	SURROUND BACK SP RELAY
83	P33/A11	SRYSP	O	O	O	Presence/Zone SP RELAY
84	P32/A10	SRYSR	O	O	O	SURROUND/ZONE SP RELAY
85	P31/A9	FANLK	I	O	O	FAN lock detection / 100k Pull Up to +5M2
86	P124	PRY	O	O	O	Power relay control
87	P123	/ST	I	O	O	TUNER STEREO detection input / Pull Up to +5SPC
88	P122	TUNED	I	O	O	TUNER TUNED input / Pull Up +5SPC
89	P121	TUCE	O	O	O	PLL Chip select for TUNER
90	P120	/TMUTE	O	O	O	TUNER Mute output / Logic reversal according to Tr at a FUNCTION P.C.B.
91	Vcc		MCU	MCU	MCU	
92	P30/A8	PDLED	O	O	O	PureDirect LED
93	Vss		MCU	MCU	MCU	
94	AN27/P27/A7		O	O	O	
95	AN26/P26/A6		O	O	O	
96	AN25/P25/A5	/Z2MT	O	O	O [O]	Zone2 MUTE control
97	AN24/P24/A4	/Z3MT	O	O	O [O]	Zone3 MUTE control
98	AN23/P23/A3	/ICXM	O	O	O	DABIC IC reset (U model)
		—	O	O	O	(C, R, T, K, A, B, L, J models)
		RDSE	O	O	O	RDS Enable (G model)
99	AN22/P22/A2	RDATA2	O	O	O	Recout SW2 control (ROHM) data / Clock speed: 20us, MSBF
100	AN21/P21/A1	RLCK2	O	O	O	Recout SW2 control (ROHM) clock
101	AN20/P20/A0	PRI	I	O	O	Current protection detection / 100k Pull Down
102	P17/D15/INT5	PSW	IRQ	IRQ	IRQ	Main, Zone2, and 3 Power key interruption
103	P16/D14/INT4	SSW	IRQ	IRQ	IRQ	System power SW (Push lock SW)
104	P15/D13/INT3	PDET	IRQ	IRQ	IRQ	Power detect detection / At a SUPTR P.C.B., it is 100k Pull Up to 5M2

IC301: M30845FJGP (FUNCTION P.C.B)
16-bit Microprocessor

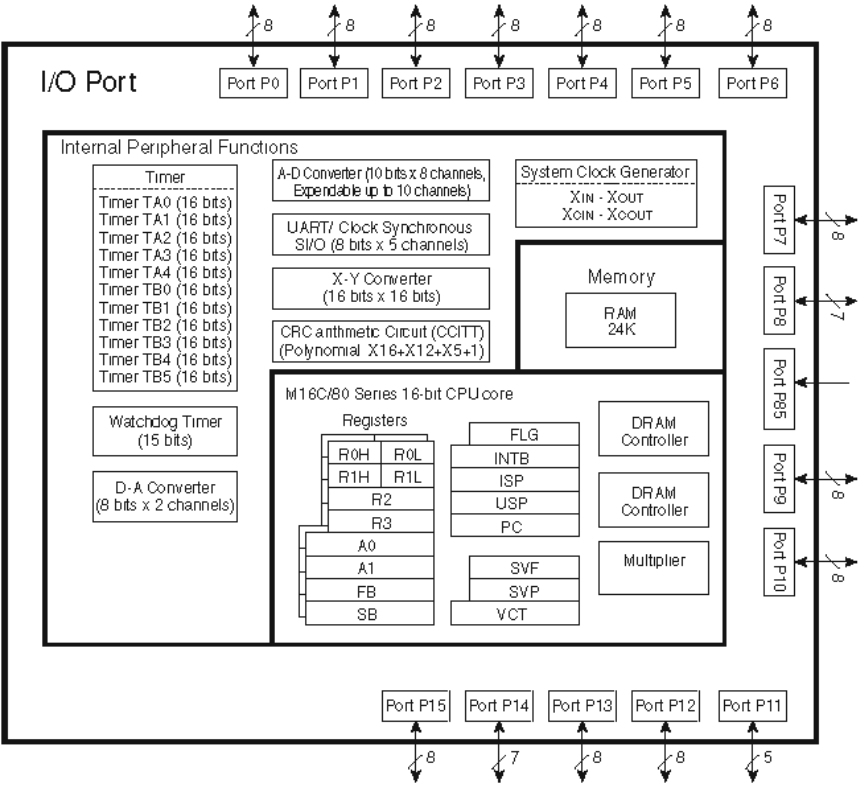
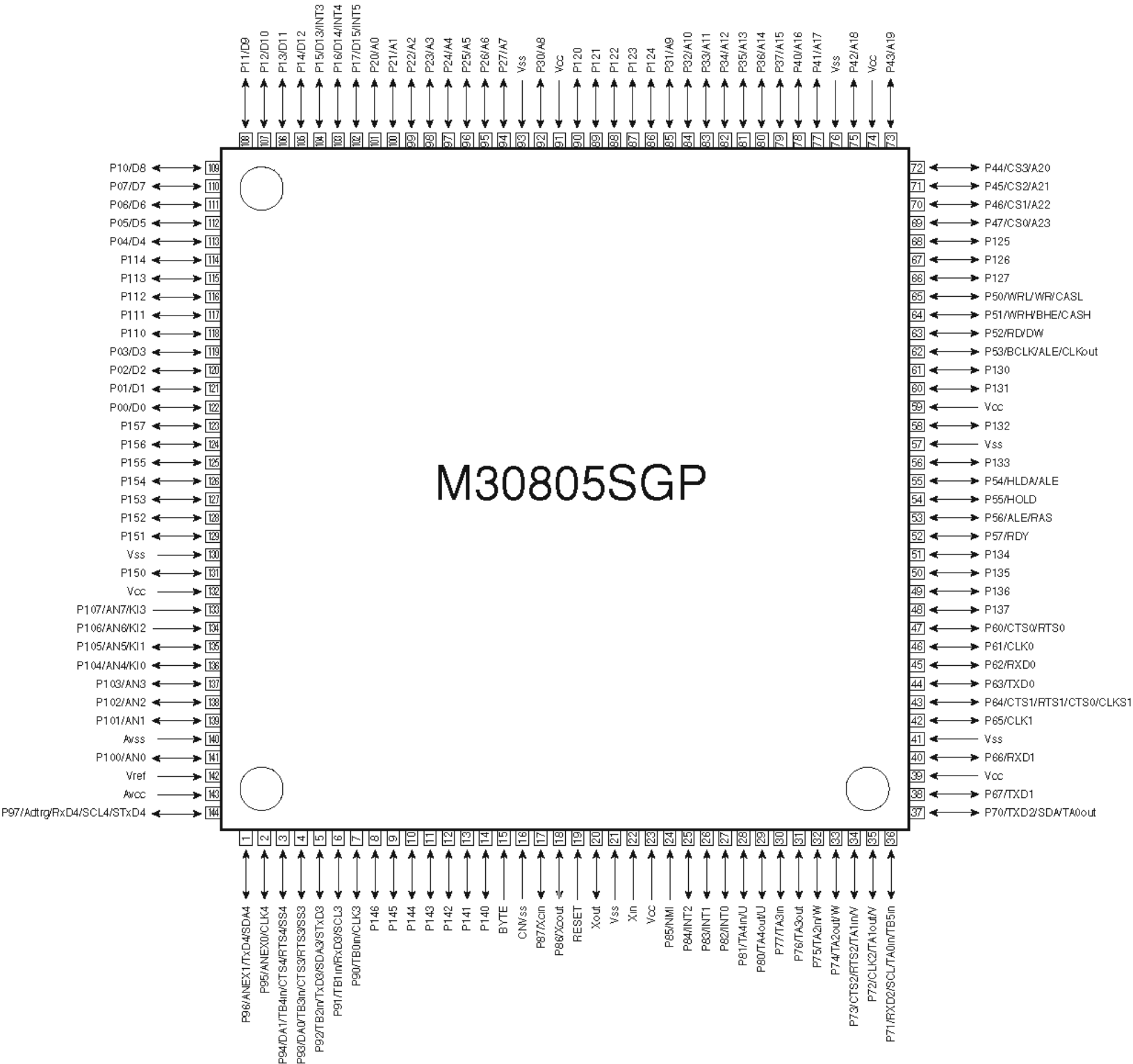
No.	Port Name	Terminal Name	I/O			Function
			PowerOn	Standby	MCUSleep [AC OFF]	
105	P14/D12	SPC	O	O	O [O]	+5SPC Power supply ON/OFF control. (L=ON/H=OFF: Standby power requirement reduction sake) / Usually, Low fixes is standby power requirement reduction (MCUSleep) by making it HI, after the processing accompanying standby is completed. (An extended port and extended A/D do not operate at the time of HI.) / The time of AC IN and MCUSleep, please hold HighFix until there is a Power On input.
106	P13/D11	TRG1	O	O	O	DC TRIGGER output 1
107	P12/D10	TRG2	O	O	O	DC TRIGGER output 2
108	P11/D9		O	O	O	
109	P10/D8	VPOWER	O	O	O	VIDEO power supply control / At the time of Pure Direct is Low (VIDEO OFF)
110	P07/AN07/D7	VMT	O	O	O	Video output MUTE / Power ON/OFF / At the time PureDirect ON/OFF, this port is logic reversed in ON * Tr.
111	P06/AN06/D6	VBOOT	O	O	O	VIDEO_CPU boot enable
112	P05/AN05/D5	232PWR	O	O	O	232C driver ON/OFF control
113	P04/AN04/D4	BTSEL	O	O	O	VIDEO_CPU boot mode select
114	P114	RDATA	O	O	O	Recout SW1 control (ROHM) data / Clock speed: 20us, MSBF
115	P113	RLCK	O	O	O	Recout SW1 control (ROHM) clock
116	P112/ISRXD1	PLLR	I	O	O	PLL reception for TUNER / Reception clock 20us / LSB first
117	P111/ISCLK1	TUCK	O	O	O	PLL clock output for TUNER
118	P110/ISTXD1	TUDA	O	O	O	PLL data output for TUNER / Transmitting clock 4us / LSB first
119	P03/AN03/D3	CKZEV	O	O	O	EVOL serial transmitting clock for ZONE
120	P02/AN02/D2	DTZEV	O	O	O	EVOL serial transmitting data for ZONE / Clock speed: 1M, MSB first
121	P01/AN01/D1	/ICZEV	O	O	O	EVOL1 Reset for ZONE
122	P00/AN00/D0	/CEZEV1	O	O	O	EVOL1 CE for ZONE
123	AN157/P157	/CEZEV2	O	O	O	EVOL2 CE for ZONE
124	AN156/P156	REC	AD	O	O	AD REC OUT SEL taking in
125	AN155/P155	KEY0	AD	O	I [O]	Key0 AD value taking in
126	AN154/P154	KEY1	AD	O	I [O]	Key1 AD value taking in
127	AN153/P153	/OSDCE	O	O	O	OSD CE
128	AN152/P152/ISRXD0	RDS	I	O	O	RDS Rx D
129	AN151/P151/ISCLK0	SCKN	O	O	O	NONE AUDIO clock output (FL/RDS/OSD) / FL: 2us clock, MSBF RDS: 20us clock, LSBF
130	Vss	Vss	MCU	MCU	MCU	
131	AN150/P150/ISTXD0	SDTN	O	O	O	NONE AUDIO data output (FL/RDS/OSD)
132	Vcc	Vcc	MCU	MCU	MCU	
133	P107/AN7	DEST	AD	O	I [O]	Model distinction is based on AD value. / Waiting for after [AD input port setup] 1msec is carried out at the time of AD taking in at the time of Power On.
134	P106/AN6	MODEL	AD	O	I [O]	Model distinction is based on AD value. / Waiting for after [AD input port setup] 1msec is carried out at the time of AD taking in at the time of Power On.
135	P105/AN5	THM1	AD	O	I [O]	AD temperature detection detection 1
136	P104/AN4	THM2	AD	O	I [O]	AD temperature detection detection 2
137	P103/AN3	PRD	AD	O	O	Power amplifier DC protection detection
138	P102/AN2	PRV	AD	O	O	Power supply protection detection 1
139	P101/AN1	PRVS	AD	O	O	Power supply protection detection 2 (Power supply turned off by Pure Direct)
140	Avss	AVSS	MCU	MCU	MCU	
141	P100/AN0	PLMT	AD	O	O	AD Power Limiter detection
142	Vref	VREF	MCU	MCU	MCU	
143	Avcc	AVCC	MCU	MCU	MCU	
144	RXD4	RXDH	SI	O	O	Data reception from VIDEO_CPU

Key Input (A-D) Pull-Up Resistance 10 k-ohms

Ohm	0	+1.2k	+1.2k	+1.8k	+2.7k	+3.3k	+4.7k	+8.2k
V	~ 0.26	~ 0.75	~ 1.22	~ 1.76	~ 2.28	~ 2.75	~ 3.24	~ 3.75
KEY0	TONE CONTROL	STRAIGHT EFFECT	TUNING MODE	MEMORY	FM/AM	PRESET/TUNING EDIT	PRESET/TUNING >	PRESET/TUNING <
KEY1	ZONE CONTROL	A/B/C/D/E	AUDIO SELECT	SPEAKERS A	SPEAKERS B	PURE DIRECT	—	—

IC501: M30805SGP (D-VIDEO P.C.B)
16-bit Microprocessor

HTR-5990



IC501: M30805SGP (D-VIDEO P.C.B)
16-bit Microprocessor

No.	Port Name	Terminal Name (P.C.B.)	I/O [OFF]	Function
1	P96/SDA4	SDAL	SIO	I2C SDA Input/Output signal (for 100kHz device)
2	P95/CLK4		O	
3	P94/TB4in	DACSEL	DA	DAC fs Select
4	P93/TB3in		O	
5	P92/SDA3	SDAH	SIO	I2C SDA Input/Output signal (for HDMI device)
6	P91/SCL3	SCLH	SO	I2C SCL Output signal (for HDMI device)
7	P90/TB0in		O	
8	P146		O	Terminal for monitors for development
9	P145		O	Terminal for monitors for development
10	P144		O	Terminal for monitors for development
11	P143		O	Terminal for monitors for production inspection
12	P142		O	Terminal for monitors for production inspection
13	P141		O	Terminal for monitors for production inspection
14	P140		O	Terminal for monitors for production inspection
15	BYTE		MCU	Data bus width setup: Set as 16bit=Low
16	CNVSS		MCU	Processor mode: Set as Hi
17	P87		O	
18	P86	BOOT (/EN232)	I [O]	YDC boot signal input/232C line opening demand (Video -> Main)
19	/RESET	/RES	MCU	Reset signal input
20	XOUT		MCU	Ceramic vibrator 10MHz
21	Vss		MCU	GND
22	XIN		MCU	Ceramic vibrator 10MHz
23	Vcc		MCU	3.3V
24	P85/NMI		I	No used
25	P84/INT2	/REM	IRQ	For development
26	P83/INT1	/INTAD	IRQ	Interruption signal from ADV7401
27	P82/INT0	/INTH	IRQ	HDMI Tx/Rx interruption
28	P81/TA4in	VS	I	HDMI VSYNC input (Reserve for frequency distinction)
29	P80/TA4out		O	
30	P77/TA3in		[I]	Starting option
31	P76/TA3out		[I]	Starting option
32	P75/TA2in	HDMINT	O	HDMI interruption demand
33	P74/TA2out	232PWR	I	232C transceiver notice input of a shutdown
34	P73/TA1in		O	
35	P72/CLK2		O	
36	P71/SCL2	SCLV	SI	I2C SCL output signal (for Video devices)
37	P70/SDA2	SDAV	SO	I2C SDA Input/Output signal (for Video devices)
38	P67/TxD1	TXD1	SO	Serial I/F for writing YDC / Serial I/F for writing debug
39	Vcc		MCU	3.3V
40	P66/RxD1	RXD1	SI	Serial I/F for writing YDC / Serial I/F for writing debug
41	Vss		MCU	GND
42	P65/CLK1	RTS1	O	Serial I/F for writing YDC/232C
43	P64/CTS1	CTS1	I	Serial I/F for writing YDC/232C
44	P63/TxD0	VtoM	SO	MAIN microcomputer I/F SPI
45	P62/RxD0	MtoV	SI	MAIN microcomputer I/F SPI
46	P61/CLK0	MCLK	SI	MAIN microcomputer I/F SPI
47	P60/CTS0/RTS0	MRES	O	MAIN microcomputer I/F RES output signal
48	P137	MREQ	O	MAIN microcomputer I/F REQ output signal
49	P136		O	
50	P135	SPIRDY	I	Word clock input for writing CDDA
51	P134	SPIDAT	I	Data input for writing CDDA
52	P57/RDY	/RDY	I	YGV/WAIT signal input
53	P56/ALE/RAS		O	No used
54	P55/HOLD		I	No used
55	P54/HLDA/ALE		O	No used
56	P133	PSENB	O	HDMI Power Signal Enable
57	Vss		MCU	GND
58	P132	DDCENB	O	HDMI DDC Enable control
59	Vcc		MCU	3.3V

IC501: M30805SGP (D-VIDEO P.C.B)
16-bit Microprocessor

No.	Port Name	Terminal Name (P.C.B.)	I/O [OFF]	Function
60	P131	HPD1ENB	O	HDMI HPD1 Enable control
61	P130	HPD0ENB	O	HDMI HPD0 Enable control
62	P53/BCLK		O	No used
63	P52/RD/DW	/RD	BUS	BUS I/F
64	P51/WRH/BHE		BUS	BUS I/F
65	P50/WRL/WR	/WR	BUS	BUS I/F
66	P127		O	
67	P126		O	
68	P125		O	
69	P47/CS0/A23		BUS	
70	P46/CS1/A22		BUS	
71	P45/CS2/A21		BUS	FLASH A20/NC2, YGV A21
72	P44/CS3/A20		BUS	FLASH A19/NC1, YGV A20
73	P43/A19		BUS	FLASH A18, YGV A19
74	Vcc		MCU	3.3V
75	P42/A18		BUS	FLASH A17, YGV A18
76	Vss		MCU	GND
77	P41/A17		BUS	FLASH A16, YGV A17
78	P40/A16		BUS	FLASH A15, YGV A16
79	P37/A15		BUS	FLASH A14, YGV A15
80	P36/A14		BUS	FLASH A13, YGV A14
81	P35/A13		BUS	FLASH A12, YGV A13
82	P34/A12		BUS	FLASH A11, YGV A12
83	P33/A11		BUS	FLASH A10, YGV A11
84	P32/A10		BUS	FLASH A9, YGV A10
85	P31/A9		BUS	FLASH A8, YGV A9
86	P124	YGVDET	I	Pull down: No YGV
87	P123	VTEST1	O	Self inspection result is outputted for production inspection (Video)
88	P122	VTEST2	O	Self inspection result is outputted for production inspection (Video)
89	P121	VTEST3	O	Self inspection result is outputted for development (Video)
90	P120	VTEST4	O	Self inspection result is outputted for development (Video)
91	Vcc		MCU	3.3V
92	P30/A8		BUS	FLASH A7, YGV A8
93	Vss		MCU	GND
94	P27/A7		BUS	FLASH A6, YGV A7
95	P26/A6		BUS	FLASH A5, YGV A6
96	P25/A5		BUS	FLASH A4, YGV A5
97	P24/A4		BUS	FLASH A3, YGV A4
98	P23/A3		BUS	FLASH A2, YGV A4
99	P22/A2		BUS	FLASH A1, YGV A2
100	P21/A1		BUS	FLASH A0, YGV A1
101	P20/A0		BUS	No used
102	P17/D15/INT5	D15	BUS	Data bus
103	P16/D14/INT4	D14	BUS	Data bus
104	P15/D13/INT3	D13	BUS	Data bus
105	P14/D12	D12	BUS	Data bus
106	P13/D11	D11	BUS	Data bus
107	P12/D10	D10	BUS	Data bus
108	P11/D9	D9	BUS	Data bus
109	P10/D8	D8	BUS	Data bus
110	P07/D7	D7	BUS	Data bus
111	P06/D6	D6	BUS	Data bus
112	P05/D5	D5	BUS	Data bus
113	P04/D4	D4	BUS	Data bus
114	P114	/ICP	O	IC signal to PD0280B. Cancels after Clock supply.
115	P113	/AUPH	O	Video course (Decoder output) to HDMI ON/OFF
116	P112		O	
117	P111	/ICY	O	IC signal to YGV619
118	P110	/ICV	O	IC signal to Video system device

IC501: M30805SGP (D-VIDEO P.C.B)
16-bit Microprocessor

No.	Port Name	Terminal Name (P.C.B.)	I/O [OFF]	Function
119	P03/D3	D3	BUS	Data Bus
120	P02/D2	D2	BUS	Data Bus
121	P01/D1	D1	BUS	Data Bus
122	P00/D0	D0	BUS	Data Bus
123	P157	/AUPS	O	Video course (Scaler output) to HDMI ON/OFF
124	P156	/AUPP	O	Video course (MS1A output) to HDMI ON/OFF
125	P155	/AUPI	O	Video course (480i output) to HDMI ON/OFF
126	P154	/OSDCEV	O	Chip enable output to OSD
127	P153	BDEN	O	Enable for BD7851 control
128	P152	BDLT	O	Latch for BD7851 control
129	P151	SDTV	O	Data for BD7851 control
130	Vss		MCU	GND
131	P150	SCKV	O	Clock for BD7851 control
132	Vcc		MCU	3.3V
133	P107/AN7	/MTMON	O	MUTE to the monitor out from a Video microcomputer
134	P106/AN6	/MTZ2	O	MUTE to the ZONE2 out from a Video microcomputer
135	P105/AN5	Reserve	O	
136	P104/AN4	SVDET	I	S input detection
137	P103/AN3	VBOOT	I	Enable to boot mode
138	P102/AN2	BTSEL	I	Boot mode select
139	P101/AN1	Reserve	I	
140	Avss		MCU	GND
141	P100/AN0		O	
142	Vref		MCU	3.3V
143	Avcc		MCU	3.3V
144	P97/SCL4	SCLL	SO	I2C SCL output signal (for 100kHz device)

MEMO

PIN CONNECTION DIAGRAM

• ICS

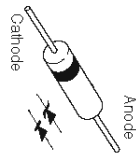
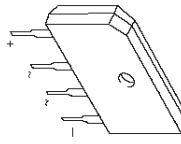
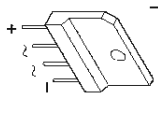
LM61CIZ	NUM2391DL1-25 NUM2845DL1-33 NUM2885DL1-18 NUM2885DL1-33	NUM79M05FA	PQ012FZ01ZPH PQ025EZ5MZR	PQ05RD11
PQ05RD21 PQ30RV21	μPC2905AT-E1-AZ	μPC29M33T-E1-AZ	μPC37M31TJ-E1-AZ	24LC04BTJ/SN NE5532DR
BA15218F	LE50ABD NUM2068MD-TE2 PCA9540BDP	PST9242NR SN74AHC1G08DCKR SN74AHC1T1G125DCKR SN74AHC1T1G32DCKR SN74AHC1G125DCKR SN74AHC1G125DCKR SN74AHC1G125DCKR	RH5RE58AA-T1-FA	ADM222ARZ
SN74AHC2G04HDCR SN74CBT3306PWR TK15420M μPC4570G2 SN74AHC2G125DCUR	NUM2581M SN74AHC108PWR SN74AHC108PWR SN74AHC108PWR SN74AHC108PWR SN74AHC108PWR SN74AHC108PWR SN74AHC108PWR	AK4384ET CD4051BNSR LA7104M MM74HC4051SXX MM74HC4053SXX SN74ALS15NSR TC74VHC153FT		
TC4013BP TC74HCU04AFEL	SN74AHC1245PWR SN74LV245APWR SN74AHC245APWR SN74LV245APWR	LC74781JM-9798 YAC526-EZE2	PCM1791ADBR PCM1804DBR	LC75348M NJU7311AM NJU7312AM NJU7313AM TA1318AF
BD3841FS	LA73050-TLM-E LA73053-TLM-E LA73054-TLM-E	BD7851FP-E2	MSM514260E-60US	
MX29LV400BC-70G	F2602E-01 YAC523-EVR2		NJW1321FP1	

LC89057W-VF4A-E	MX29LV320ABTC-90	W9816G6CH-7	ADV7322KSTZ M66003-0131FP

SI9030	ADV7401BSTZ-80 YSS930	M3080SSGP M3084FJGP MATISSE SI9031

D60YA003BPYP225

• Diodes

1N4002S 1SS133 1SS244 1T2 H2S24-1 H2S242TD H2S3B1TD MTZJ10B MTZJ13A MTZJ33B MTZJ4.7C MTZJ5.1B MTZJ5.1C MTZJ6.8B MTZJ7.5C		1SS355 1SS380 MA8043-L MA8051-M MA8062-M MA8068-L MA8100-L MA8130-M RB500V-40 RB501V-40	UDZ5.1B UDZS3.9BTE-17 UDZS5.6BTE-17		
D2SBA20		D15XB20 D4SBS4-4101		S1NB20 S1NB60	

• Transistors

2SA1015 2SA949 2SA970 2SC1815 2SC2229 2SC2240 2SC2878		2SD1915F		2SA1837 2SB1257 2SB1274 2SB941 2SC3852 2SC4793 2SD2014		2SA1492 2SC3856		μPA672T-11-A 1 Source 1 (S1) 2 Drain 1 (D1) 3 Drain 2 (D2) 4 Source 2 (S2) 5 Drain 2 (D2) 6 Drain 1 (D1)	2SK3850 4 Drain 1 Gate 2 Drain 3 Source	
2SA1036KT146 2SA1037K 2SC2412K 2SC3326 2SC3878K 2SC3906K 2SC4081 2SD1938F		2N7002-NL 2SK208 2SK2158-T2B-A 5HP01C-TB-E		DTA114EKA DTA144EKA DTC114EKA DTC144EKA		DTC144ESA-TP		2SA1708 2SC4488		2SK246 S, G, D