

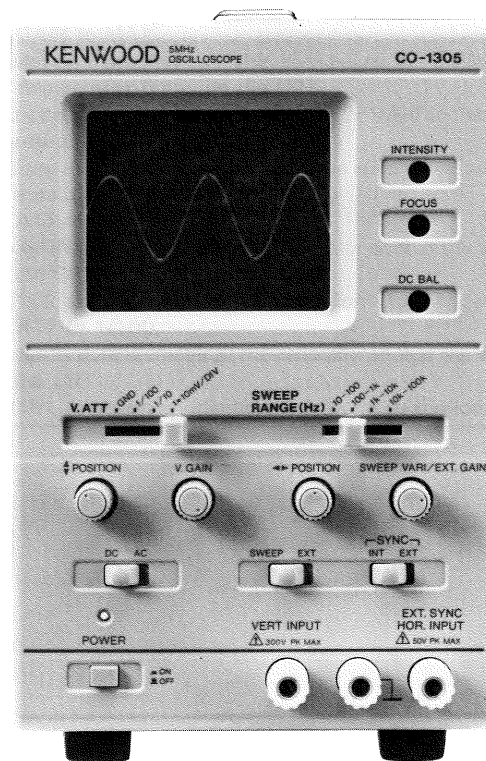
KENWOOD

5 MHz OSCILLOSCOPE

# CO-1305

## SERVICE MANUAL

KENWOOD CORPORATION



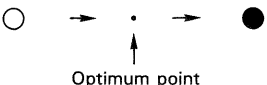
## WARNING

The following instructions are for use by qualified personnel only. To avoid electric shock, do not perform any servicing other than contained in the operating instructions unless you are qualified to do so.

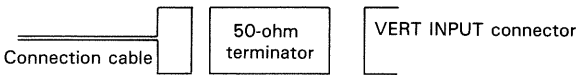
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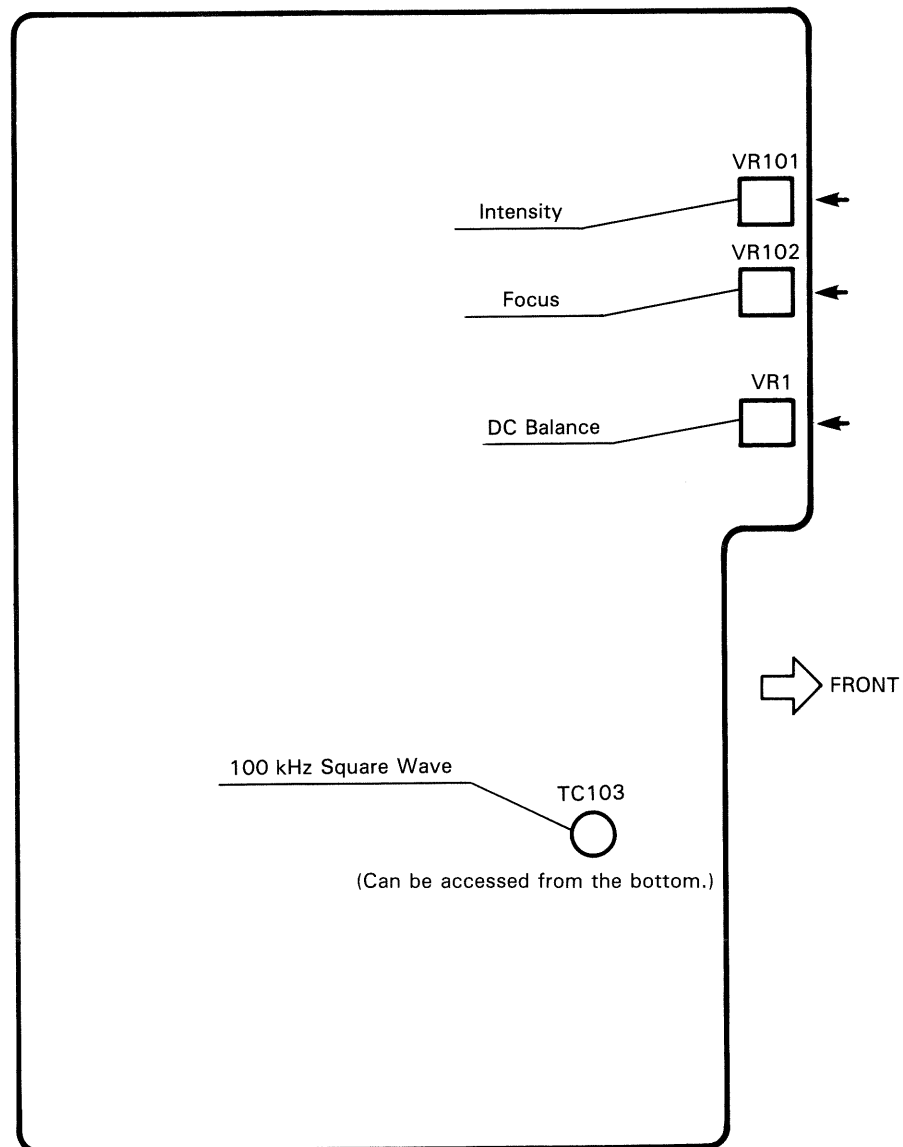
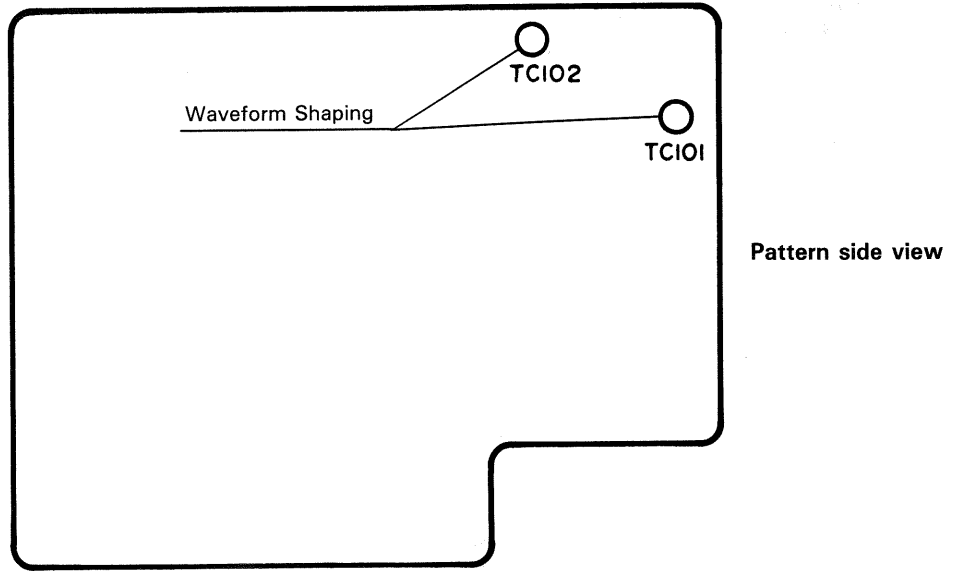
# ADJUSTMENT

Item	Adjustment VR (TC)	P. C. B	Procedure
Focus	VR102 (FRONT PANEL)	X65-1450-00	<ol style="list-style-type: none"> <li>1. Set SWEEP-EXT to EXT.</li> <li>2. Move the spot to the center of CRT by operating the V.POSI and H.POSI controls.</li> <li>3. Rotate the FOCUS potentiometer on the front panel with an alignment tool, and confirm that the spot varies as shown in the illustration below.</li> </ol> <div style="text-align: center; margin: 10px 0;">  <p style="margin: 0;">Optimum point</p> </div> <ol style="list-style-type: none"> <li>4. Adjust to position the spot on the optimum point.</li> </ol>
Trace Rotation	REAR PANEL		<ol style="list-style-type: none"> <li>1. Set SWEEP-EXT to SWEEP.</li> <li>2. Move the spot to the center of CRT by operating the V.POSI and H.POSI controls.</li> <li>3. Loosen two screws located at the rear, insert a (+) screwdriver into the hole located at the center and adjust so that the illumination line is aligned with the horizontal line.</li> <li>4. Secure the two screws on the rear panel with a screwdriver, paying attention not to tilt the aligned trace.</li> </ol>
DC Balance	VR1 (FRONT PANEL)		<ol style="list-style-type: none"> <li>1. Adjust VR1 with an alignment tool so that the trace does not move when the V.GAIN potentiometer is rotated between MIN ← → MAX with another hand.</li> </ol>
Waveform Shaping	TC102 TC101	X65-1450-00	<ol style="list-style-type: none"> <li>1. Switch the AC-DC switch to DC.</li> <li>2. Connect the calibrator cable to the VERT INPUT connector.</li> <li>3. Set V.ATT to 1 = 10 mV.</li> <li>4. Switch V.GAIN to MAX.</li> <li>5. Set the calibrator frequency to 1 kHz, then adjust the GAIN potentiometer so that the trace swings over 6 div. on the CRT.</li> <li>6. Synchronize the waveform by operating SWEEP VARI so that the waveform comes to an easy-to-observe position.</li> <li>7. The waveform at this time is assumed as the ideal waveform. Confirm that there is no abnormality with the waveform.</li> <li>9. Switch V.ATT to 1/10.</li> <li>10. Adjust the GAIN potentiometer of the calibrator so that the waveform swings over 6 div. on the CRT.</li> <li>11. Adjust TC102 to obtain an identical waveform to the ideal waveform.</li> <li>12. Switch V.ATT to 1/100.</li> <li>13. Adjust the GAIN potentiometer of the calibrator so that the waveform swings over 6 div. on the CRT.</li> <li>14. Adjust TC101 to obtain an identical waveform to the ideal waveform.</li> </ol>

# ADJUSTMENT

Item	Adjustment VR (TC)	P. C. B	Procedure
100 kHz Square Wave	TC103	X65-1450-00	<p>(The procedure can be started with the same condition as No. 7.)</p> <ol style="list-style-type: none"> <li>1. Set V.ATT to 1 = 10 mV.</li> <li>2. Connect a 50-ohm terminator to the cable end which is to be connected to the VERT INPUT connector.</li> </ol> <div style="text-align: center; margin: 10px 0;">  <p style="margin: 0;"> <span style="display: inline-block; border-bottom: 1px solid black; width: 80px; margin-right: 5px;"></span> <span style="border: 1px solid black; padding: 2px 5px; margin-right: 10px;">50-ohm terminator</span> <span style="border: 1px solid black; padding: 2px 5px;">VERT INPUT connector</span> </p> </div> <ol style="list-style-type: none"> <li>3. Set the calibrator frequency to 100 kHz, then adjust the GAIN potentiometer of the calibrator so that the trace swings over 6 div. on the CRT.</li> <li>4. Switch SWEEP RANGE between 10 k and 100 k, and synchronize the waveform by operating SWEEP VARI so that the waveform comes to an easy-to-observe position.</li> <li>5. Adjust TC103 to optimize the positive-going section (overshoot) of the square wave.</li> <li>6. Switch V.ATT to 1/10.</li> <li>7. Adjust the GAIN potentiometer of the calibrator so that the trace swings over 6 div. on the CRT.</li> <li>8. Confirm that the positive-going section (overshoot) of the square wave complies with the specification.</li> <li>9. Switch V.ATT to 1/100.</li> <li>10. Adjust the GAIN potentiometer of the calibrator so that the trace swings over 6 div. on the CRT.</li> <li>11. Confirm that the positive-going section (overshoot) of the square wave complies with the specification.</li> </ol>

# ADJUSTMENT



# PARTS LIST

## CO-1305

### Y71-1190-00

REF. NO	PARTS NO	NAME & DESCRIPTION
	A01-1287-02	CASE
	A10-1479-12	CHASSIS
	A13-0994-03	FRAME
	A22-0899-03	SUB PANEL
	A63-0095-13	MOLDED PANEL ASS'Y
	A63-0096-02	MOLDED PANEL
	B20-0938-04	DIAL SCALE
	B41-2047-04	CAUTION LABEL
	B42-3819-05	SERIAL NO. PLATE
	B42-3820-05	LABEL, SMALL
	B63-0150-00	INSTRUCTION MANUAL; ENG. / JAP.
	E21-0678-05	TERMINAL
	E21-0679-05	TERMINAL
	E30-1851-05	POWER CORD ASS'Y (JIS)
	E30-1852-05	POWER CORD ASS'Y (CEE)
	E30-1853-05	POWER CORD ASS'Y (SAA)
	E30-1854-05	POWER CORD ASS'Y (UL/CSA)
	E30-1868-05	POWER CORD ASS'Y (BS)
	F05-2516-05	FUSE (6X32MM) 0.25A/250V
	F05-2518-05	FUSE (5X20MM) T250MA/250V
	F05-5013-05	FUSE (6X32MM) 0.5A/250V
	F20-3006-04	INSULATOR
	G13-0068-04	CUSHION
	H10-2873-02	FOAMED STYRENE PAD, FRONT
	H10-2874-02	FOAMED STYRENE PAD, REAR
	H20-1725-04	VINYL COVER
	H53-0099-04	CARTON BOX
	J02-0363-04	RUBBER FOOT, REAR
	J21-4827-04	BAND, CRT
	J21-4828-04	BRACKET, CRT
	J42-0083-05	BUSHING; FOR 2-CORE AC CORD
	J42-0085-05	BUSHING; FOR 3-CORE AC CORD
	K01-0058-25	HANDLE
	K23-0811-03	KNOB (4 USED)
	K27-0504-04	BUTTON; POWER
	K27-0537-04	KNOB, FOR LEVER SWITCH
	K27-3614-04	KNOB
	L01-9995-15	POWER TRANSFORMER
	N09-0718-05	SCREW, SEMS PAN HD M3X6
	N09-0739-05	SCREW, SEMS BINDING TAPTITE 3X8
	N09-0742-04	SCREW, SEMS PAN HD M3X8
	N09-4508-04	SCREW, SEMS PAN HD M3X14
	N10-2030-41	NUT, HEX M3
	N14-0620-05	FLANGE NUT M4
	N17-1030-41	LOCK WASHER M3
	N30-3010-41	SCREW, PAN HD M3X10
	N33-4014-41	SCREW, OVAL HD M4X14
	N89-3008-41	SCREW, BINDING TAPTITE 3X8
	X65-1450-00	OVERALL UNIT
	75ARB31	CRT
D109	LN322GP	LED

## OVERALL UNIT

### X65-1450-00

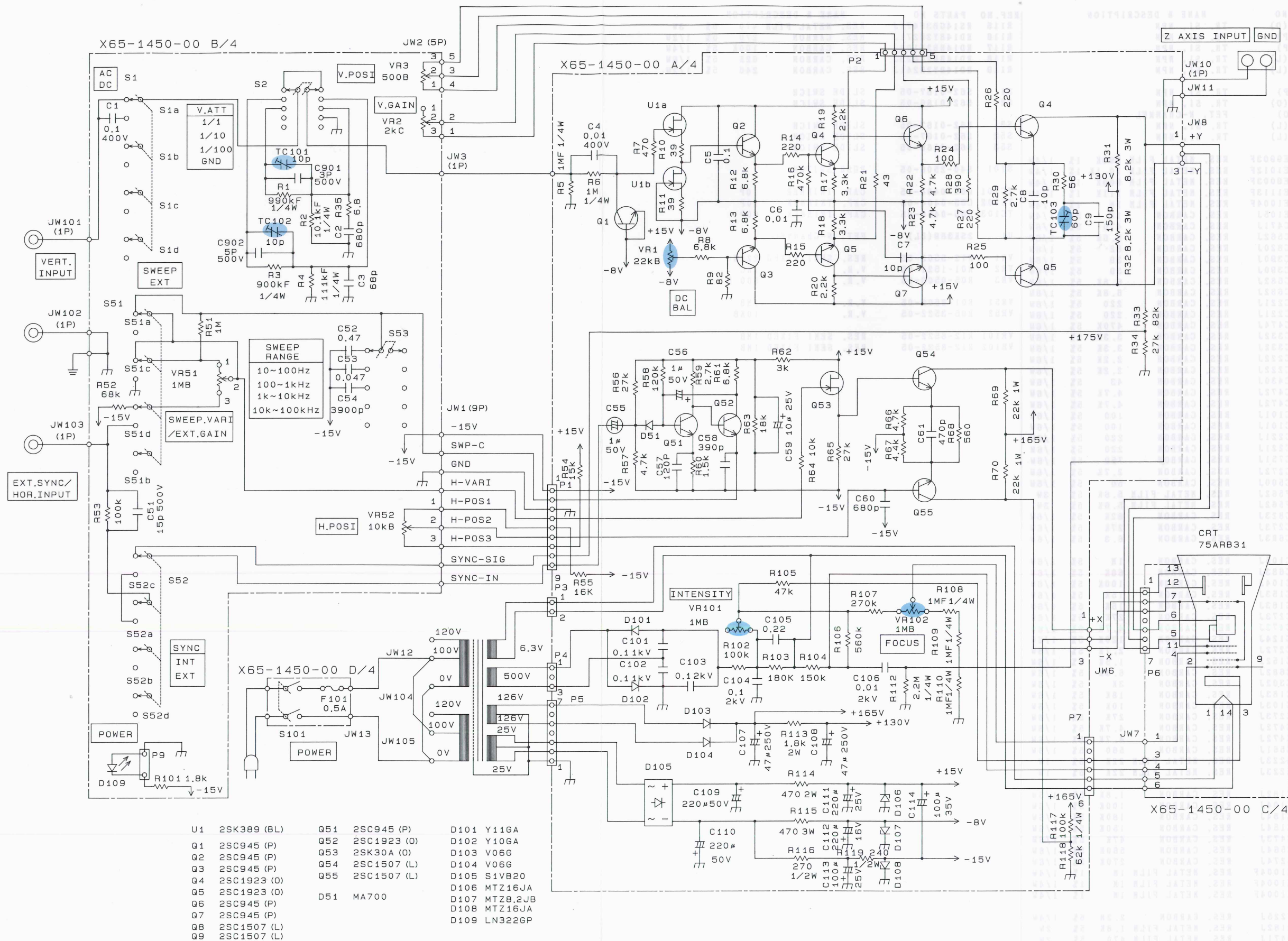
REF. NO	PARTS NO	NAME & DESCRIPTION
	E01-0103-05	CRT SOCKET
	E23-0149-05	GND TERMINAL
	E31-2170-05	JUMPING WIRE
	J13-0041-05	FUSE HOLDER
	J73-0235-02	PCB (UNMOUNTED)
C1	C91-2555-05	CAP. CERAMIC 0.1 10% 400V
C2	CC93FCH1H681J	CAP. CERAMIC 680P 5% 50V
C3	CC45FCH1H680J	CAP. CERAMIC 68P 5% 50V
C4	C91-2556-05	CAP. CERAMIC 0.01 10% 400V
C5	CQ92FM1H104K	CAP. MYLAR 0.1 10% 50V
C6	CK45FB1H103K	CAP. CERAMIC 0.01 10% 50V
C7	CC45FSL1H100D	CAP. CERAMIC 10P 5% 50V
C8	CC45FSL1H100D	CAP. CERAMIC 10P 5% 50V
C9	CC45FCH1H151J	CAP. CERAMIC 150P 5% 50V
C51	CC45SL2H150J	CAP. CERAMIC 15P 5% 500V
C52	CF92FV1H474J	CAP. POLYESTER 0.47 5% 50V
C53	CQ92FM1H473K	CAP. MYLAR 0.047 10% 50V
C54	CQ92FM1H392K	CAP. MYLAR 3900P 10% 50V
C55	CE04FW1H010M	CAP. ELECTRO 1 20% 50V
C56	CE04EW1H010M	CAP. ELECTRO 1 20% 50V
C57	CC45FSL1H121J	CAP. CERAMIC 120P 5% 50V
C58	CC45FCH1H121J	CAP. CERAMIC 120P 5% 50V
C59	CE04EW1E100M	CAP. ELECTRO 10 20% 25V
C60	CC45FSL1H681J	CAP. CERAMIC 680P 5% 50V
C61	CC45FSL1H471J	CAP. CERAMIC 470P 5% 50V
C62	NO USE	
C63	CC45FCH1H271J	CAP. CERAMIC 270P 5% 50V
C101	C91-0506-05	CAP. OIL 0.1 10% 1KV
C102	C91-0506-05	CAP. OIL 0.1 10% 1KV
C103	C91-0509-05	CAP. OIL 0.1 10% 2KV
C104	C91-0509-05	CAP. OIL 0.1 10% 2KV
C105	CF92FV1H224J	CAP. POLYESTER 0.22 5% 50V
C106	C91-0571-05	CAP. CERAMIC 0.01 2KV
C107	CE04W2E470M	CAP. ELECTRO 47 20% 250V
C108	CE04W2E470M	CAP. ELECTRO 47 20% 250V
C109	CE04EW1H221M	CAP. ELECTRO 220 20% 50V
C110	CE04EW1H221M	CAP. ELECTRO 220 20% 50V
C111	CE04EW1E221M	CAP. ELECTRO 220 20% 25V
C112	CE04EW1C221M	CAP. ELECTRO 220 20% 15V
C113	CE04EW1E101M	CAP. ELECTRO 100 20% 25V
C114	CE04EW1V101M	CAP. ELECTRO 100 20% 35V
C901	CC45CH2H030C	CAP. CERAMIC 3P 0.25P 500V
C902	CC45CH2H050C	CAP. CERAMIC 5P 0.25P 500V
D51	MA700	DIODE
D101	Y10GA	DIODE
D102	Y10GA	DIODE
D103	V06G	DIODE
D104	V06G	DIODE
D105	S1VB20	DIODE
D106	MTZ16JA	DIODE, ZENER 15V
D107	MTZ8.2JB	DIODE, ZENER 8.1V
D108	MTZ16JA	DIODE, ZENER 15V
JW1	E38-0725-05	WIRE ASS'Y; PANEL TO MAIN 9P
JW2	E38-0724-05	WIRE ASS'Y; PANEL TO MAIN 7P
JW6	E38-0723-15	WIRE ASS'Y; V. H TO CRT
JW7	E38-0722-05	WIRE ASS'Y; HIGH VOLTAGE TO CRT
P1	E40-5066-05	PIN CONNECTOR 9P
P2	E40-3242-05	PIN CONNECTOR 7P
P3	E40-3237-05	PIN CONNECTOR 2P
P4	E40-3238-05	PIN CONNECTOR 3P
P5	E40-3242-05	PIN CONNECTOR 7P
P6	E40-3242-05	PIN CONNECTOR 7P
P7	E40-3241-05	PIN CONNECTOR 6P
P8	E40-0305-05	PIN CONNECTOR 3P
P9	E40-0218-05	PIN CONNECTOR 2P
Q1	2SC945(P)	TR. SI, NPN
Q2	2SC945(P)	TR. SI, NPN
Q3	2SC945(P)	TR. SI, NPN
Q4	2SC1923(O)	TR. SI, NPN

# PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION	REF. NO	PARTS NO	NAME & DESCRIPTION
Q5	2SC1923(O)	TR. SI, NPN	R115	RS14GB3F471J	RES. METAL FILM 470 5% 3W
Q6	2SC945(P)	TR. SI, NPN	R116	RD14BY2H271J	RES. CARBON 270 5% 1/2W
Q7	2SC945(P)	TR. SI, NPN	R117	RD14BB2E104J	RES. CARBON 100K 5% 1/4W
Q8	2SC1507(L)	TR. SI, NPN	R118	RD14BB2C623J	RES. CARBON 62K 5% 1/6W
Q9	2SC1507(L)	TR. SI, NPN	R119	RD14BY2H241J	RES. CARBON 240 5% 1/2W
Q51	2SC945(P)	TR. SI, NPN	S1	S62-0167-05	SLIDE SWICH
Q52	2SC1923(O)	TR. SI, NPN	S2	S62-0166-05	SLIDE SWICH
Q53	2SK30A(O)	FET, N-CHANNEL	S51	S62-0167-05	SLIDE SWICH
Q54	2SC1507(L)	TR. SI, NPN	S52	S62-0167-05	SLIDE SWICH
Q55	2SC1507(L)	TR. SI, NPN	S53	S62-0166-05	SLIDE SWICH
R1	RN14BK2E9903F	RES. METAL FILM 990K 1% 1/4W	S101	S40-2506-05	PUSH SWITCH
R2	RN14BK2E1012F	RES. METAL FILM 10.1K 1% 1/4W	TC101	C05-0404-05	CAP. TRIMMER 10P
R3	RN14BK2E9003F	RES. METAL FILM 900K 1% 1/4W	TC102	C05-0404-05	CAP. TRIMMER 10P
R4	RN14BK2E1113F	RES. METAL FILM 111K 1% 1/4W	TC103	C05-0456-05	CAP. TRIMMER 60P
R5	RN14BK2E1004F	RES. METAL FILM 1M 1% 1/4W	U1	2SK389(BL)	FET, N-CHANNEL
R6	RD14BB2E105J	RES. CARBON 1M 5% 1/4W	VR1	R12-3503-05	RES. SEMI FIXED 22KB
R7	RD14BB2C471J	RES. CARBON 470 5% 1/6W	VR2	R01-1521-05	V.R. 2KC
R8	RD14BB2C562J	RES. CARBON 5.6K 5% 1/6W	VR3	R05-0503-05	V.R. 500 B
R9	RD14BB2C820J	RES. CARBON 82 5% 1/6W	VR51	R01-8506-05	V.R. 1MB
R10	RD14BB2C390J	RES. CARBON 39 5% 1/6W	VR52	R05-3522-05	V.R. 10KB
R11	RD14BB2C390J	RES. CARBON 39 5% 1/6W	VR101	R12-8522-05	RES. SEMI FIXED 1MB
R12	RD14BB2C682J	RES. CARBON 6.8K 5% 1/6W	VR102	R12-8522-05	RES. SEMI FIXED 1MB
R13	RD14BB2C682J	RES. CARBON 6.8K 5% 1/6W			
R14	RD14BB2C221J	RES. CARBON 220 5% 1/6W			
R15	RD14BB2C221J	RES. CARBON 220 5% 1/6W			
R16	RD14BB2C474J	RES. CARBON 470K 5% 1/6W			
R17	RD14BB2C332J	RES. CARBON 3.3K 5% 1/6W			
R18	RD14BB2C332J	RES. CARBON 3.3K 5% 1/6W			
R19	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W			
R20	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W			
R21	RD14BB2C430J	RES. CARBON 43 5% 1/6W			
R22	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W			
R23	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W			
R24	RD14BB2C101J	RES. CARBON 100 5% 1/6W			
R25	RD14BB2C101J	RES. CARBON 100 5% 1/6W			
R26	RD14BB2C221J	RES. CARBON 220 5% 1/6W			
R27	RD14BB2C221J	RES. CARBON 220 5% 1/6W			
R28	RD14BB2C751J	RES. CARBON 750 5% 1/6W			
R29	RD14BB2C272J	RES. CARBON 2.7K 5% 1/6W			
R30	RD14BB2C500J	RES. CARBON 50 5% 1/6W			
R31	RS14GB3F562J	RES. METAL FILM 5.6K 5% 3W			
R32	RS14GB3F562J	RES. METAL FILM 5.6K 5% 3W			
R33	RD14BB2C823J	RES. CARBON 82K 5% 1/6W			
R34	RD14BB2C273J	RES. CARBON 27K 5% 1/6W			
R35	RD14BB2C6R3J	RES. CARBON 6.3 5% 1/6W			
R51	RD14BB2C105J	RES. CARBON 1M 5% 1/6W			
R52	RD14BB2C683J	RES. CARBON 68K 5% 1/6W			
R53	RD14BB2C104J	RES. CARBON 100K 5% 1/6W			
R54	RD14BB2C153J	RES. CARBON 15K 5% 1/6W			
R55	RD14BB2C163J	RES. CARBON 16K 5% 1/6W			
R56	RD14BB2C273J	RES. CARBON 27K 5% 1/6W			
R57	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W			
R58	RD14BB2C124J	RES. CARBON 120K 5% 1/6W			
R59	RD14BB2C272J	RES. CARBON 2.7K 5% 1/6W			
R60	RD14BB2C152J	RES. CARBON 1.5K 5% 1/6W			
R61	RD14BB2C682J	RES. CARBON 6.8K 5% 1/6W			
R62	RD14BB2C302J	RES. CARBON 3K 5% 1/6W			
R63	RD14BB2C183J	RES. CARBON 18K 5% 1/6W			
R64	RD14BB2C103J	RES. CARBON 10K 5% 1/6W			
R65	RD14BB2C273J	RES. CARBON 27K 5% 1/6W			
R66	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W			
R67	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W			
R68	RD14BB2C561J	RES. CARBON 560 5% 1/6W			
R69	RS14GB3A223J	RES. METAL FILM 22K 5% 1W			
R70	RS14GB3A223J	RES. METAL FILM 22K 5% 1W			
R101	RD14BB2C182J	RES. CARBON 1.8K 5% 1/6W			
R102	RD14BB2C104J	RES. CARBON 100K 5% 1/6W			
R103	RD14BB2C184J	RES. CARBON 180K 5% 1/6W			
R104	RD14BB2C154J	RES. CARBON 150K 5% 1/6W			
R105	RD14BB2C473J	RES. CARBON 47K 5% 1/6W			
R106	RD14BB2C564J	RES. CARBON 560K 5% 1/6W			
R107	RD14BB2C274J	RES. CARBON 270K 5% 1/6W			
R108	RN14BK2E1004F	RES. METAL FILM 1M 1% 1/4W			
R109	RN14BK2E1004F	RES. METAL FILM 1M 1% 1/4W			
R110	RN14BK2E1004F	RES. METAL FILM 1M 1% 1/4W			
R111	NO USE				
R112	RD14BB2E225J	RES. CARBON 2.2M 5% 1/4W			
R113	RS14GB3D182J	RES. METAL FILM 1.8K 5% 2W			
R114	RS14GB3D471J	RES. METAL FILM 470 5% 2W			

# SCHEMATIC DIAGRAM

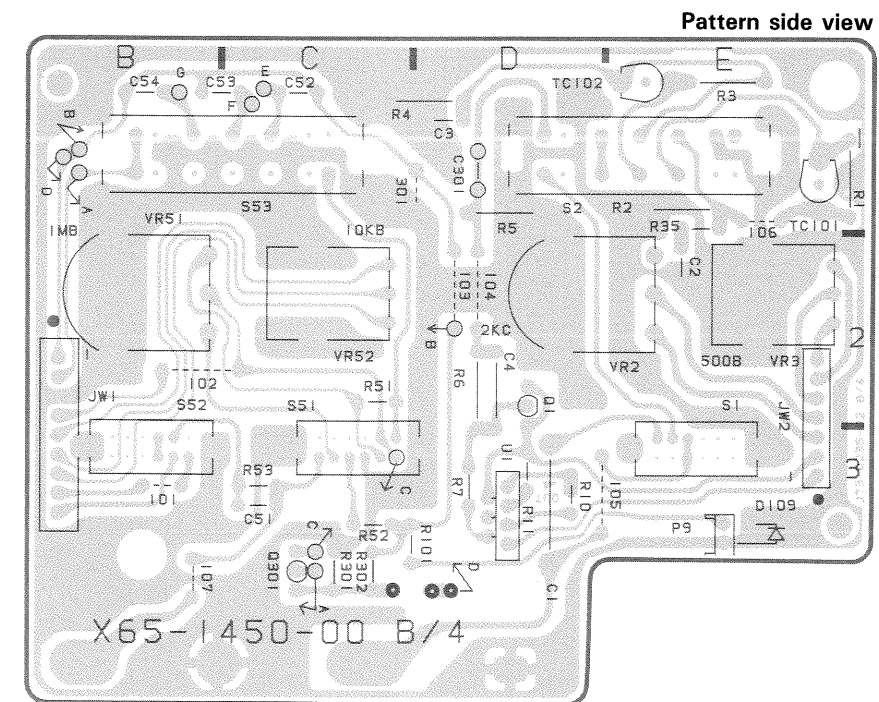
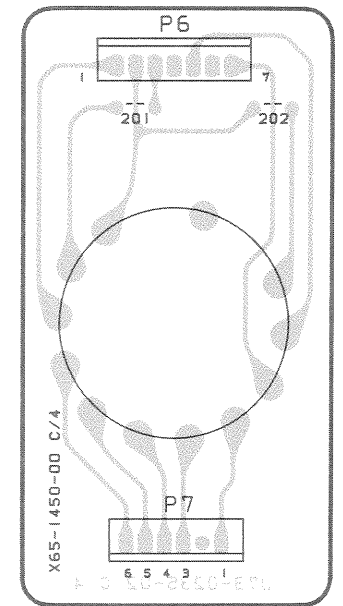
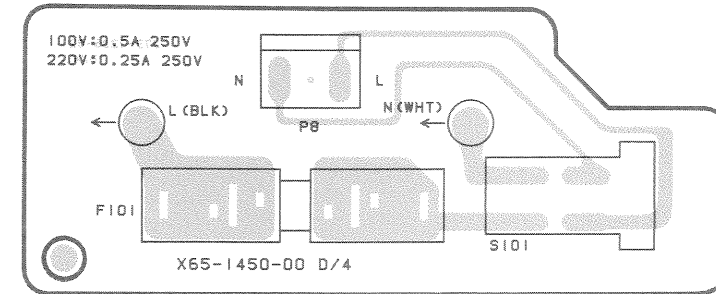
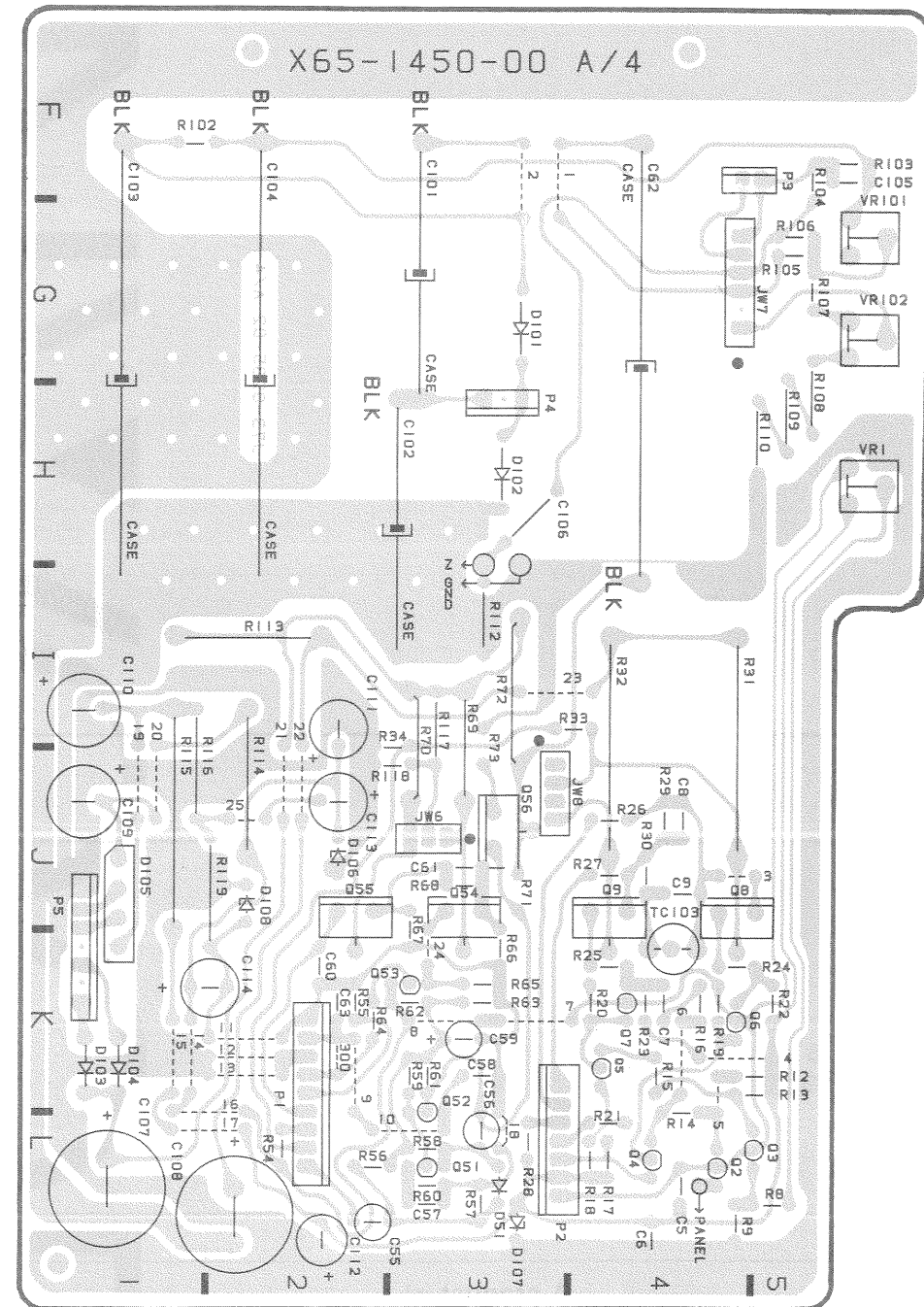
PARTS LIST





# P.C. BOARD

OVERALL UNIT (X65-1450-00)



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A product of  
**KENWOOD CORPORATION**  
2-5, 1-chome, Shibuya, Shibuya-ku, Tokyo 150, Japan

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B51-1108-00 (MC)