

Cybernet

ImageTwo RC

Stereo Main Amplifier

A2-RC

Service Manual

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Specifications

Power output (rated minimum RMS sine wave power output 20 Hz to 20 kHz, both channels driven, 0.05% total harmonic distortion)	40W per channel (8 Ohm) 45W per channel (4 Ohm) BTL 120W
Dynamic headroom	1.4 dB (8 Ohm)
Total harmonic distortion, rated power over 20 to 20,000 Hz	0.05% (8 Ohm)
SMPTE intermodulation distortion	0.05%
Frequency response	10 to 100,000 Hz, ±3 dB
Input sensitivity	1V
S/N	100 dB
Input impedance	47 kOhm
Damping factor	50 (8 Ohm)
Load impedance	
Stereo operation A or B	4 to 16 Ohm
Stereo operation A and B	8 to 16 Ohm
BTL operation A or B	8 to 16 Ohm
BTL operation A and B	16 Ohm
Power consumption	200W
Power supply	AC 220V 50/60 Hz
Dimensions (W x H x D)	400 x 118 x 225 mm

Instruction Information

Features

The Cybernet Image-II with Remote Control System is a unique, sophisticated high-fidelity stereo system that combines a high quality separate pre- and main-amplifier P2-RC and A2-RC, a front-loader logic controlled stereo cassette deck with Dolby* noise reduction system C2-RC, a high-sensitivity digital PLL synthesized AM/FM stereo tuner T2-RC, and a handy battery-operated remote control transmitter X2-RC. The model A2-RC is specifically designed to conform with other matching components into a complete stereo system. It features the following:

- Direct-coupled OCL power amplifier stage.
- Remote-controllable power on/off from X2-RC transmitter.
- Electronically controlled power transistor protection.
- BTL monophonic operation possible, delivering double output power.
- Contains the power supply for all other matching components.

* TM Dolby Laboratories.

Amplifier Connections

Refer to pictorial connection diagram.

Connection to P2-RC Preamplifier. Very Important: Do not turn on the power switch until all inter-component connections have been completed, or power supply electronics in the main amplifier will be damaged.

The main amplifier is connected to the preamplifier P2-RC by means of one cable terminated with a 8-pin plug. No other additional connections are necessary. This cable feeds power

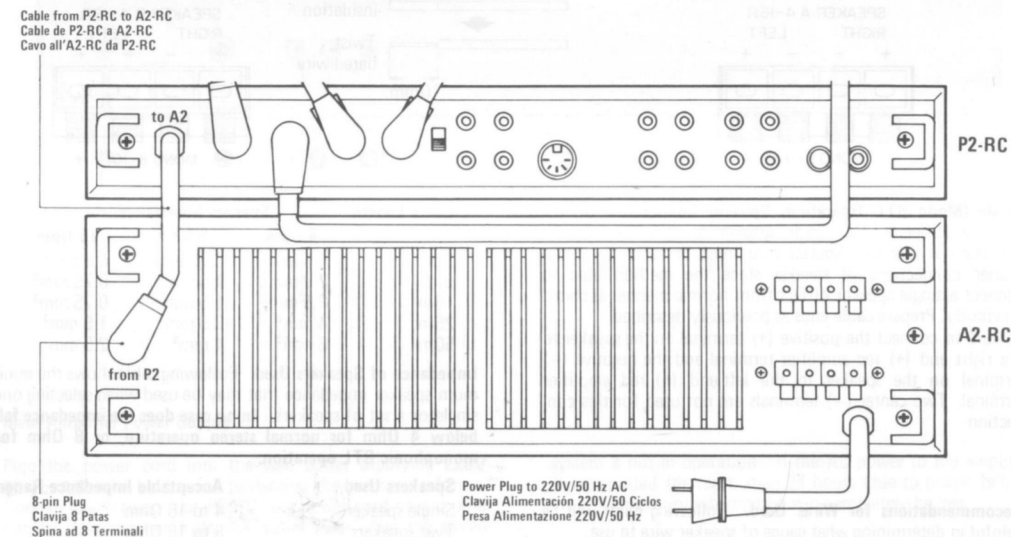
Installation

Installation of your main amplifier is not complicated. However, the following guidelines must be followed for satisfactory performance and ease of operation of the unit.

Do not remove the cover — there are no user serviceable parts inside the unit. Refer servicing only to the qualified personnel. The equipment must not be exposed to excessive dust, moisture, or direct sources of heat or sunlight.

To clean the cabinet, wipe with a cloth soaked in a neutral cleaner or a polishing cloth. Do not use benzine or thinner which will damage the cabinet finish.

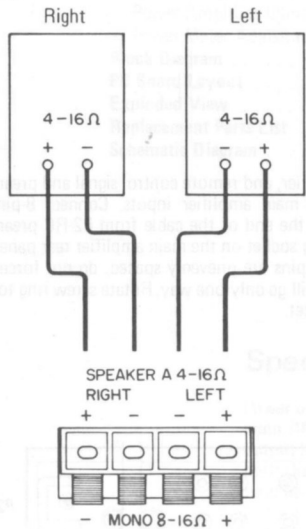
If mounted where ventilation may be restricted, care must be taken to provide a minimum opening of approximately 320 square-cm, for free air movement, in and out of the cabinet to the room.



Speakers

We suggest you first position the speakers in their selected locations in the room before connecting them to A2-RC. This will enable you to cut an adequate length of speaker cable for connection to each speaker. Make each cable a meter longer than necessary to permit changing of speaker locations slightly. Check the cable for some sort of marking which distinguishes one conductor from another. In some cables, one wire is silver-colored, the other copper-colored. In other cases, the insulation over one wire may have a raised rib or line on it to differentiate this conductor from the adjacent one. By properly identify the conductors at each end of a cable, you will be able to make sure that each terminal on a speaker is connected to the proper terminal on the amplifier. This will ensure correct phasing of the speakers in the system, providing optimum imaging and best bass response.

Stereo Speaker Connection

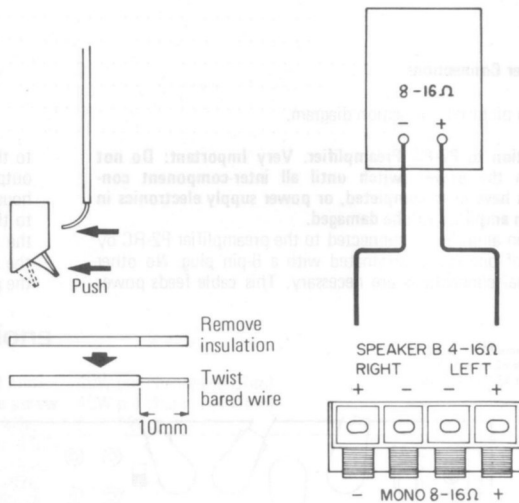


Single (Mono BTL Operation) Speaker Connection. On the main amplifier A2-RC, single speaker termination for BTL operation is possible. Special care must be taken to ensure proper connections of speaker since the method used to connect a single speaker differs from normal manner as stated previously. Prepare cable ends as previously described. Be sure to connect the positive (+) terminal on the speaker to the right end (+) red amplifier terminal and the negative (-) terminal on the speaker to the left end (+) red amplifier terminal. Two center (-) terminals are not used for this connection.

Recommendations for Wires Used. Following chart will be helpful in determining what gauge of speaker wire to use.

Normal (Stereo) Speaker Connections. Prepare cable lead. Remove approximately 10 mm of insulation from its end and twist the bare strands of exposed wire together. The illustration on next page shows the method used to connect a set of speakers (2 speakers for stereo) to the amplifier. To connect a lead prepared as stated, press the lever on the terminal and insert the bared section of the lead into the opening as shown. When the lever is released, the lead will be held securely. Be sure to observe correct polarity; the positive (+) terminal on the speaker must be connected to the (+) amplifier terminal (red) and the negative terminal on the speaker connected to the (-) amplifier terminal (black) in each case. The second set of speakers are likewise connected to Speakers-B terminals.

Mono BTL Speaker Connection



Cable Length	Speaker Impedance		
	4 Ohm	8 Ohm	16 Ohm
2m	1.5 mm ²	0.75 mm ²	0.5 mm ²
5m	2.5 mm ²	1.5 mm ²	0.75 mm ²
10m	2.5 mm ²	1.5 mm ²	0.75 mm ²
25m	4 mm ²	2.5 mm ²	1.5 mm ²
50m	6 mm ²	4 mm ²	2.5 mm ²

Impedance of Speakers Used. Following table shows the minimum speaker impedance that may be used when selecting one single or a set of speakers. **In no case does the impedance fall below 4 Ohm for normal stereo operation, or 8 Ohm for monophonic BTL operation.**

Speakers Used	Acceptable Impedance Range
Single speaker	4 to 16 Ohm
Two speakers	8 to 16 Ohm

Circuit Description

Function of Controls

1 Power Switch. Depress to turn power on. This switches in the whole stereo system simultaneously. As you will see in X2-RC Owner's Manual, it is essential to set this switch depressed when you wish to remote-control the power on/off from X2-RC transmitter.

2 Headphone Jack. Accepts a plug from a stereo headphone for private listening. Headphone listening is not possible in BTL operation.

Since the signal is always fed to this jack regardless of the Speaker Selector switch selection, it is recommended that the headphone plug be disconnected when not in use to avoid possible overload.

3 Speaker Selector Switches A/B. Permit you to select the speaker listening conditions.

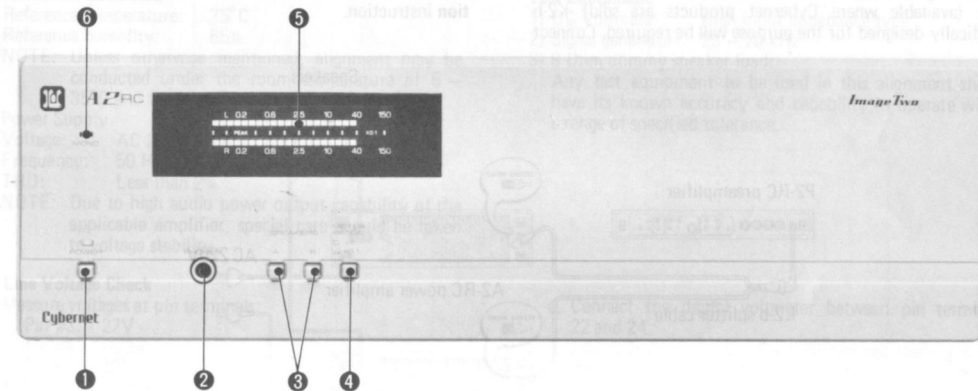
Depressing the **Speakers-A** switch will connect the sound output to the speakers attached to the **Speakers-A** output terminals, and depressing the **Speakers-B** switch will connect the sound output to the speakers attached to the **Speakers-B**

output terminals. You may depress both switches to connect the sound output simultaneously to the speakers attached to the **Speakers-A** and **Speakers-B** output terminals. When both switches are released, all speakers are silenced and the sound output is connected only to the headphones plugged into the **Phones** jack.

4 Meter Range Switch. When depressed, reduces the power level indicator range to 1/10 time. May be used when listening with low sound levels.

5 Power Level Indicators. The main amplifier audio output power can be read on the left (upper) and right (lower) channel indicators. These indicators give direct readout of output power level when the amplifier is connected to a pair of 8 Ohm speakers. As the output level increases, the indicators advance i.e., 0.2, 0.6, . . . 40 (W). This fluorescent type level indicator can indicate very short high level pulses which conventional pointer type meters cannot follow.

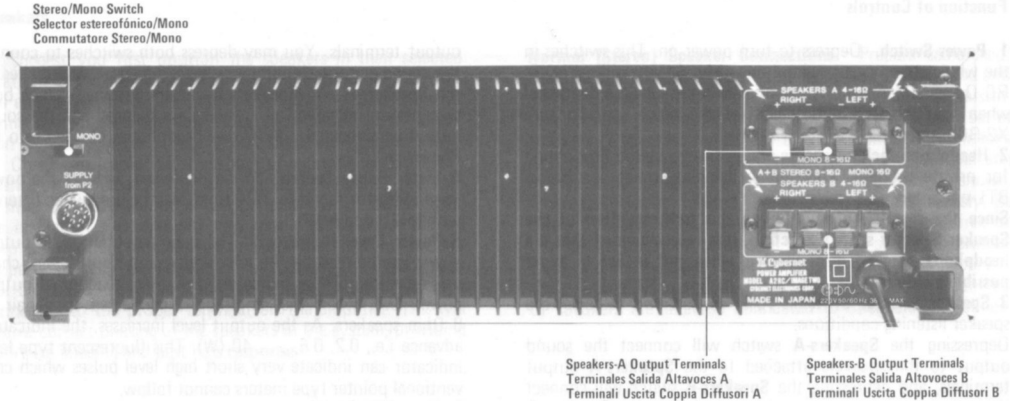
6 Mono (BTL) Indicator. Lights up during BTL operation.



Main Amplifier Power Supply

Plug the power cord into the wall outlet supplying **220V 50 Hz AC**. To be sure of protecting the memory information in the preamplifier P2-RC, the power cord plug should not be disconnected from the outlet even when the stereo

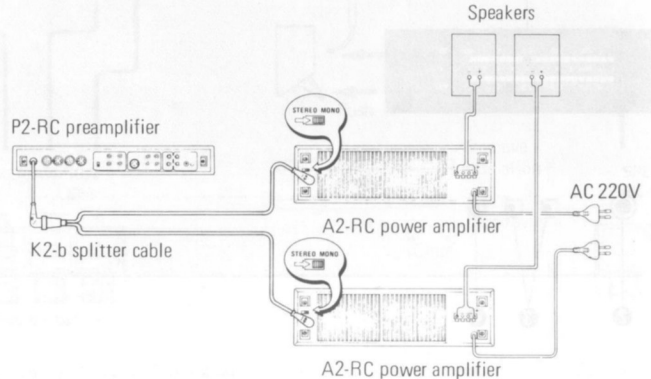
system is not in operation. If the AC power to the amplifier is interrupted for more than 24 hours (due to power failure, etc.), the memory information will completely be lost.



Mono BTL Amplifier Operation

The diagram below shows an example of the very high power stereo setting by using BTL feature of A2-RC. To complete this setting, two sets of A2-RC main amplifier and a splitter-cable (available where Cybernet products are sold) K2-b specifically designed for the purpose will be required. Connect

the splitter-cable as shown and set the **Stereo/Mono** switches on both main amplifier to **Mono**. Speakers should be attached to each A2-RC in accordance with the **Single Speaker Connection** instruction.



Trouble Shooting Guide

The following guide is intended as an aid in correcting problems encountered when setting up the stereo system. Although the suggested remedy might seem quite elementary, it may be sufficient to make corrections without returning the unit to your dealer.

Problem	Suggested Remedy
Amplifier inoperative when power switched on.	Check if power cord is correctly plugged to powered outlet.

Indicator lights up but no output, any mode of operation.	Check speaker cables for loose or shorted connection.
No output one channel.	Exchange speaker cables to determine if problem is in speaker cables.
Malphased sound output from speakers with excessive loudness.	Check rear panel Mono-Stereo switch for proper setting.

Circuit Description

- 1. Power Amplifier**
The power amplifier consists of a differential amplifier Q1, transistors Q3, Q5, Q7 and power transistors Q1 and Q3. The circuitry employed is a standard type pure complementary, so no description may be necessary. Transistors Q9 and Q11, each of which is connected to the emitter of the power transistors Q1 and Q3, respectively, operates as a power transistor protection circuit by short-circuiting the Q5 and Q7 base circuit through their emitter-collector circuits when excessive current flows the power transistors.
- 2. Speaker Protection Circuit**
The amplifier is equipped with a speaker protection circuit consisting of Q13, Q14 and Q15. This circuit operates as follows: Now assume a positive DC voltage is developed at the speaker terminals, then the voltage (current) flows to the emitter-base circuit of the Q13 through R43 and R45, and this makes Q13 conductive, then Q14 is turned on and the relay K2 is bypassed (speaker switch is opened). Next, when a negative voltage is developed, the cathode voltage of D15 falls to negative and the base bias current

flows through R46 and emitter of Q13. Then Q13 is turned on and the relay K2 is bypassed in the similar way. The transistor Q16 is a time constant circuit which delays operation of the speaker relay K2 to eliminate pop sound which will be caused during power on-off operation.

- 3. Power Switch**
The power of the amplifier is controlled by two transistors Q23 and Q22, which in turn control the power relay K1. To turn the power on, Q23 must be biased by connecting the PC board terminals 7 and 6 together.

- 4. Power Meter Circuit**
The power meter circuits consists of a meter amplifier U1, voltage regulator Q1 and Q2, and two meter drive ICs U2 and U3. A fraction of audio power output is obtained from the speaker output terminals and applied to the pin 4 (pin 6) of the meter amplifier U1 through a coupling capacitor C2 (C1) and the amplified output is developed at pin 2 (pin 8) and applied to the U3 (U2) to drive the power meter unit(s).

Service Information

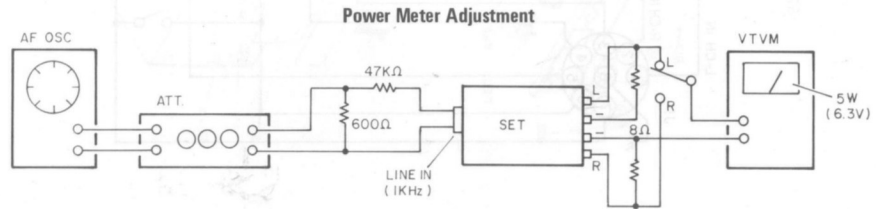
- Measurement Condition**
- Reference temperature: 25°C
 - Reference humidity: 65%
- NOTE: Unless otherwise mentioned, alignment may be conducted under the room temperature of 5 – 35°C and the room humidity of 45 – 85%.
- Power Supply**
Voltage: AC 220V ± 1%
Frequency: 50 Hz ± 2%
THD: Less than 2%
NOTE: Due to high audio power output capability of the applicable amplifier, special care should be taken to voltage stability.

- Test Equipment**
- DC Voltmeter: High input impedance type
 - Signal generator: 20 – 20 kHz
 - 8 Ohm dummy speaker load:
- Any test equipment to be used in this alignment should have its known accuracy and capability to operate within a range of specified tolerance.

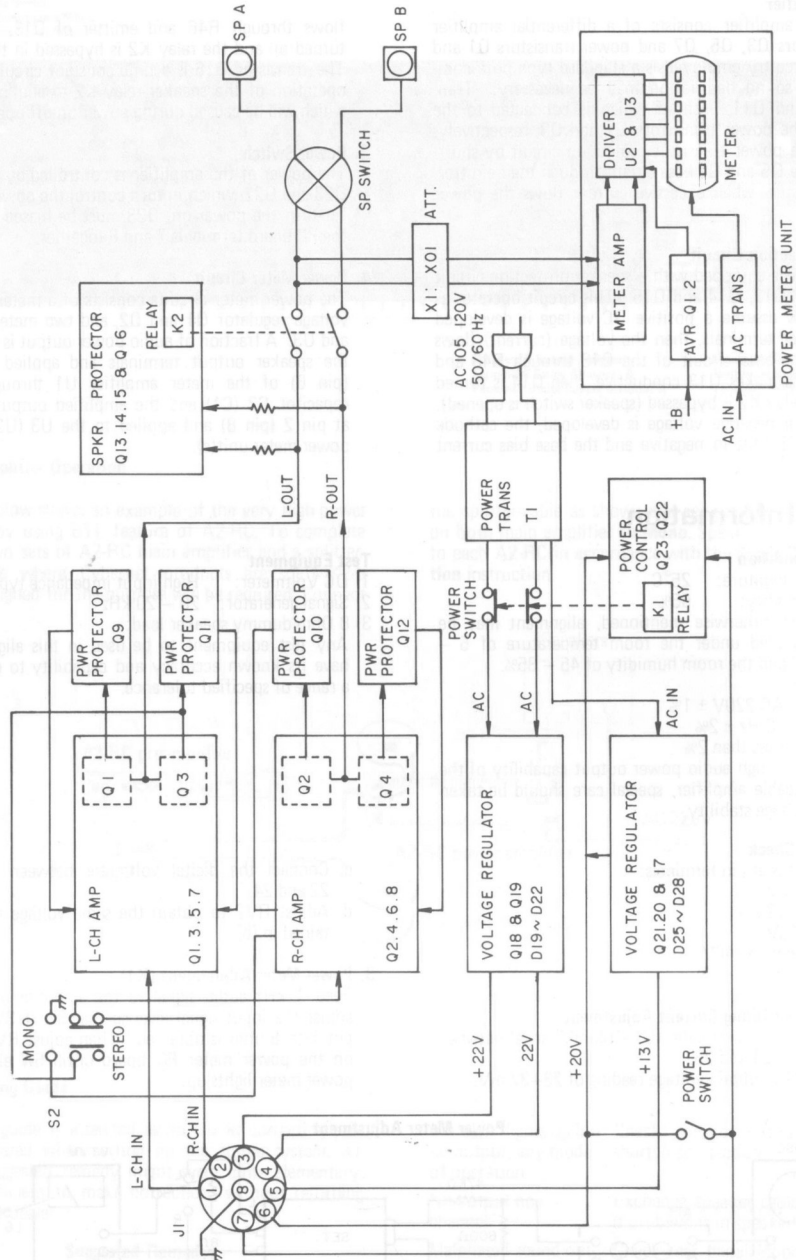
- 1. Line Voltage Check**
Measure voltages at pin terminals:
Pin #3: 22V
Pin #4: -22V
Pin #5: 13V
Pin #13: approx. 40V
Pin #15: approx. -40V
- 2. Power Amplifier Idling Current Adjustment**
 - Connect a digital voltmeter (50–100 mV range) between pin terminals 21 and 23.
 - Adjust RV1 to obtain voltage reading of 23–37 mV.

- Connect the digital voltmeter between pin terminals 22 and 24.
- Adjust RV2 to obtain the same voltage reading as obtained in (b).

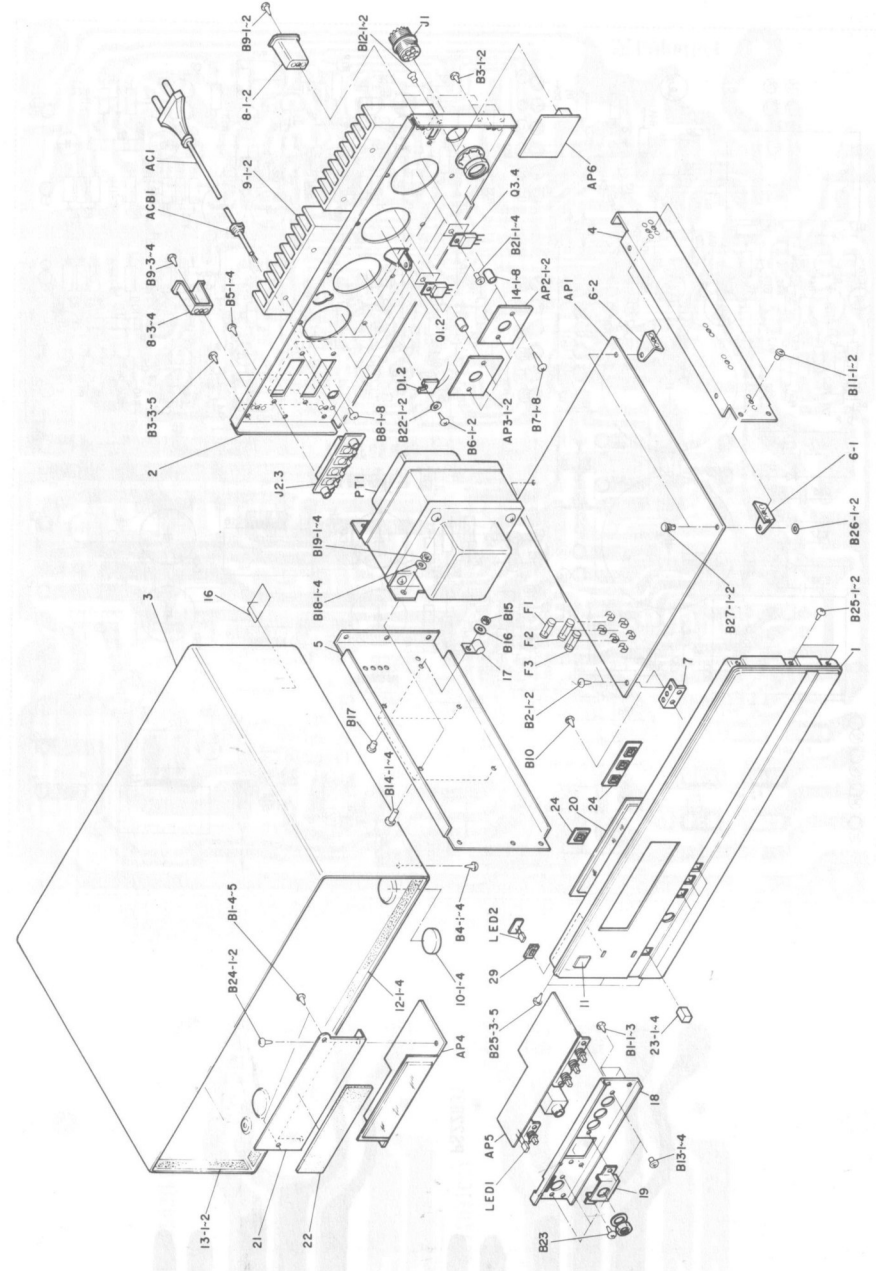
- 3. Power Meter Adjustment (X1)**
Feed 1 kHz audio signal to the amplifier input jack and adjust the input signal level so that 5W (6.3V) power output into 8 ohm is obtained. Then adjust RV1 (and RV2) on the power meter PC board until 5W element of the power meter lights up.

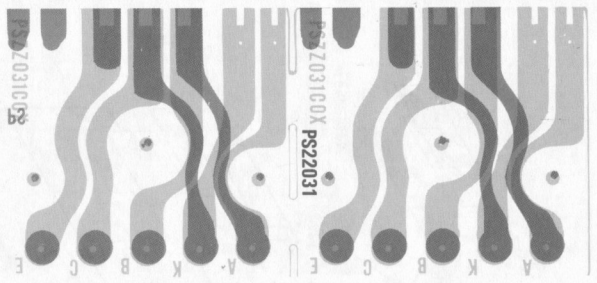
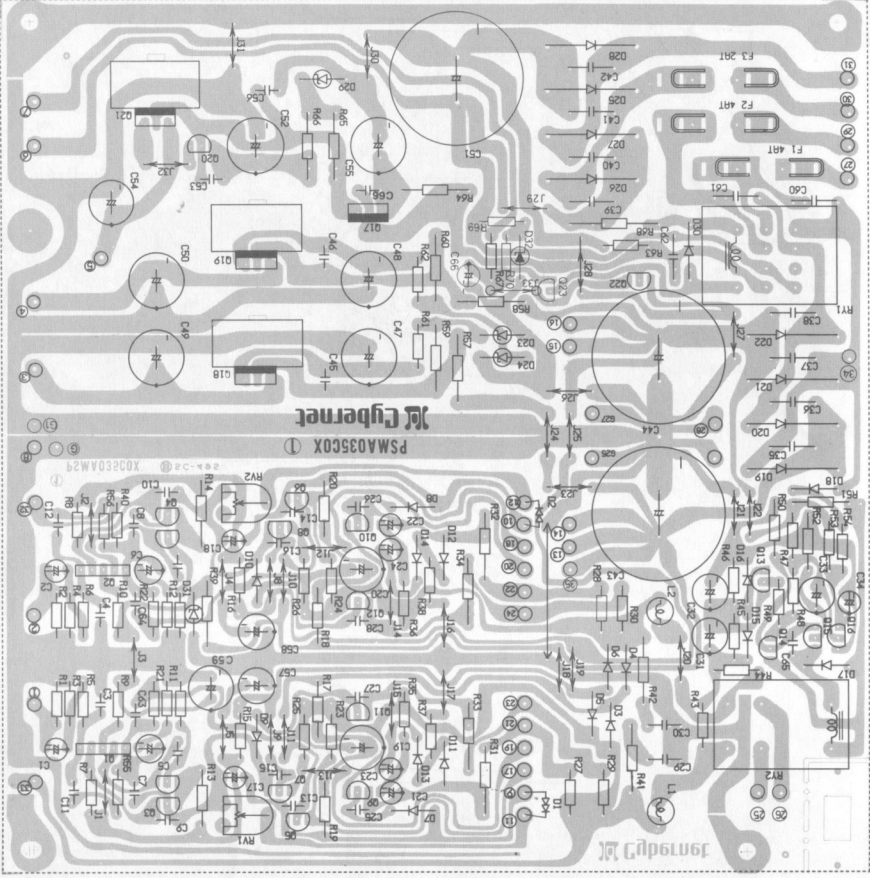
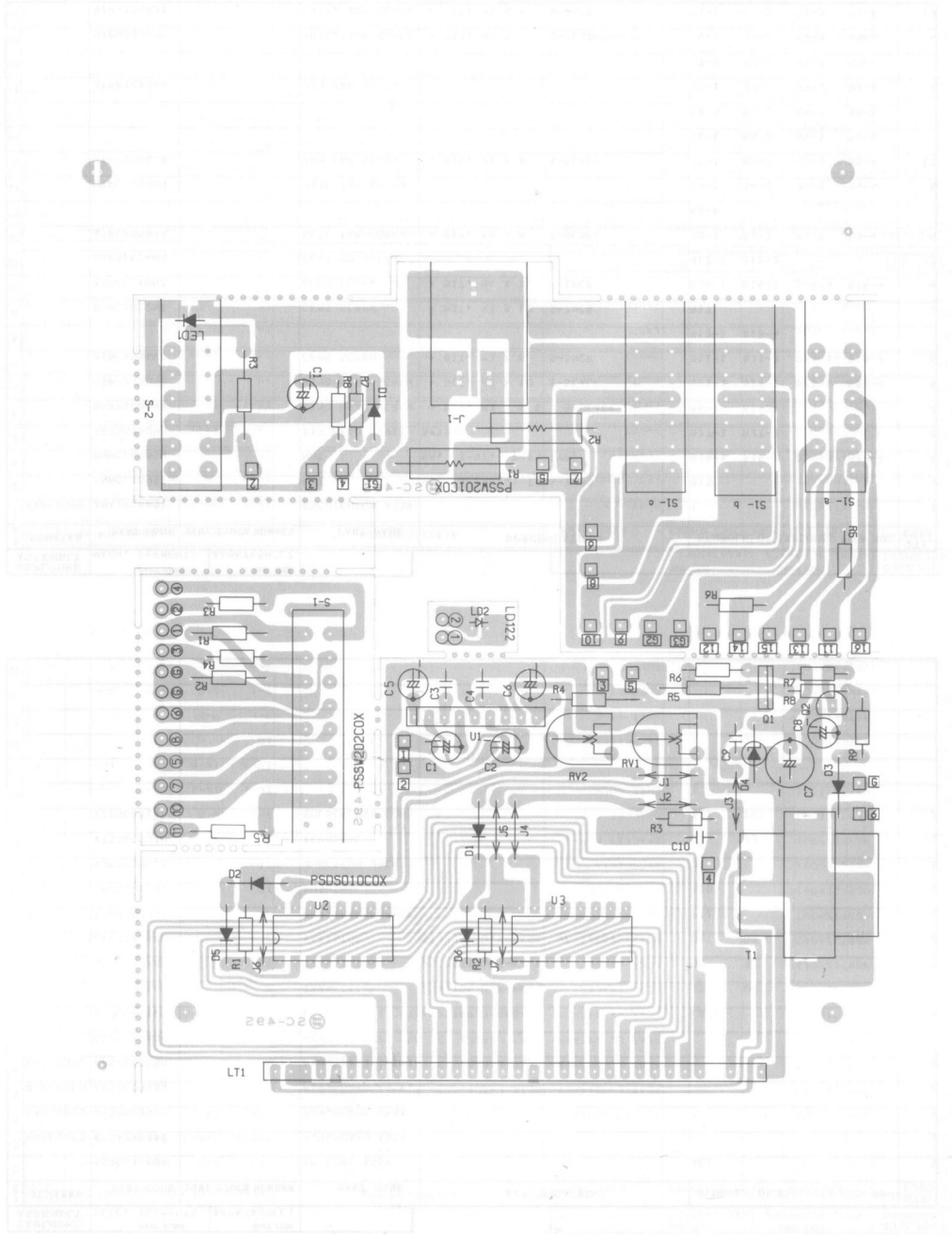


Block Diagram



Exploded View





Replacement Parts List

PC Board Layout

EXPLODED ASSEMBLY	PART NAME		PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	ELEC. ELEMENTS	AAB67ASMCL1						
REMARKS	PART CODE							
1		ACAC035EEA			AC CORD ASSY		AC1	1
2	EXPLODED	APSA2RC001			P.W. BOARD ASSY			1
3	EXPLODED	APSM4035C0			P.W. BOARD ASSY			1
4	EXPLODED	AP5Z7031AA			P.W. BOARD ASSY			2
5	EXPLODED	AP5Z7031BA			P.W. BOARD ASSY			2
6		GA2RC00A04			WIRES KIT			1
7		GLBLN217RN			L.E.D. LN217RP RED		LED1	1
8		QTA1104XAD			TRANSISTOR 2SA1104 D,Y-RANK		Q3 Q4	2
9		QTC2579XAD			TRANSISTOR 2SC2579 D,Y-RANK		Q1 Q2	2
10		QVESTV3HXD			VARISTOR STV-3M D,Y-RANK VF 1.60V-1.74V		D1 D2	2
11		TPV955004Y			PWR. TRANSFORMER		PT1	1
12		VM270NB004			BUSHING		ACB1	1
13		YJF085001Z			JUNCTION JACK		J1	1
14		YTS045007U			TERMINAL		J2 J3	2
15		ZZZ0000154			SOLDERLESS CONN		ZZ1 ZZ2	2

EXPLODED ASSEMBLY	PART NAME		PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	MECH. ELEMENTS	AAB67ASMCL2						
REMARKS	PART CODE							
1							B1-5 B10 B23 B25-1	
2							B25-2 B25-3 B25-4 B25-5	
3		BTPX3008BZ			I.T BT SCREW	+ BIT, M3 X 8 S-ZNCR	B2-1 B2-2	2
4		BWM30A095N			FLAT L. WASHER	FLAT LARGE, 3 M/M S-NI	B16	1
5		BWM30A085Z			FLAT L. WASHER	FLAT LARGE, 3 M/M S-ZNCR	B26-1 B26-2	2
6		BWM307055Z			FLAT L. WASHER	FLAT LARGE, 3 M/M S-ZNCR	B22-1 B22-2	2
7		BWM40A095N			FLAT L. WASHER	FLAT LARGE, 4 M/M S-NI	B18-1 B18-2 B18-3 B18-4	4
8		B8B415X003			SIDE BRACKET		4	1
9		B8B715E011			REAR PANEL		2	1
10		B8B725Z042			SIDE BRACKET		5	1
11		B8B875M007			COVER		3	1
12		MC2315X001			PHONE BRACKET		19	1
13		ME11XCC001			BADGE,CYS		11	1
14		ML3215N001			BRACKET PHB-B		7	1
15		ML3215Z013			BRACKET PHB		6-1 6-2	2
16		MT2545Z002			CURL BUSH		14-1 14-2 14-3 14-4	8
17							14-5 14-6 14-7 14-8	
18		MU7415X002			SW BRACKET		18	1
19		MX764AA001			HEAT SINK		9-1 9-2	2
20		VB4325B001			SUPPORT		8-1 8-2 8-3 8-4	4
21		VF1725X004			BUTTON GUIDE		24	1

EXPLODED ASSEMBLY	PART NAME		PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	MECH. ELEMENTS	AAB67ASMCL2						
REMARKS	PART CODE							
1	EXPLODED	AMA2RC001			ESCUTCHEON ASSY		1	1
2		BNHCL30N5Z			NUT	M3, S-ZNCR, THIN-TYPE	B15	1
3		BNHCL40NSN			NUT	M4, S-NI, THIN-TYPE	B19-1 B19-2 B19-3 B19-4	4
4		BRP3055QNB			PAN HEAD RIVET	3MX5.5	B27-1 B27-2	2
5		BSPB3008NB			BIND HEAD SCREW	+ BIT, M3 X 8 S-BLACK	B6-1 B6-2	2
6		BSPB3010NB			BIND HEAD SCREW	+ BIT, M3 X 10 S-BLACK	B21-1 B21-2 B21-3 B21-4	4
7		BSPC3006NZ			CEMS SCREW	+ BIT, M3 X 6 S-ZNCR	B11-1 B11-2 B13-1 B13-2	6
8							B13-3 B13-4	
9		BSPC3012NZ			CEMS SCREW	+ BIT, M3 X 12 S-ZNCR	B17	1
10		BSPC4010NZ			CEMS SCREW	+ BIT, M4 X 10 S-ZNCR	B14-1 B14-2 B14-3 B14-4	4
11		BSP32604NB			FLAT HD SCREW		B12-1 B12-2	2
12		BTPL3008B3			NAIL TAP SCREW	+ BIT, M3 X 8 S-BLACK	B3-1 B3-2 B3-3 B3-4	5
13							B3-5	
14		BTPL3008B4			NAIL TAP SCREW		B4-1 B4-2 B4-3 B4-4	4
15		BTPP3008AB			PAN TAP SCREW	+ BIT, M3 X 8 S-BLACK	B5-1 B5-2 B5-3 B5-4	12
16							B6-1 B6-2 B6-3 B6-4	
17							B6-5 B6-6 B6-7 B6-8	
18		BTPP3020AB			PAN TAP SCREW		B7-1 B7-2 B7-3 B7-4	8
19							B7-5 B7-6 B7-7 B7-8	
20		BTPW3008BB			FRAS. TAP SCREW	+ BIT, M3 X 8 S-BLACK	B9-1 B9-2 B9-3 B9-4	4
21		BTPW3008BZ			FRAS. TAP SCREW	+ BIT, M3 X 8 S-ZNCR	B1-1 B1-2 B1-3 B1-4	12

EXPLODED ASSEMBLY	PART NAME		PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	MECH. ELEMENTS	AAB67ASMCL2						
REMARKS	PART CODE							
1		VN2115M009			BUTTON B		23-1 23-2 23-3 23-4	4
2		V5228RB001			LED SPONGE		29	1
3		V5417NN003			CLAMPER		17	1
4		V5615YB002			SHEET		13-1 13-2	2
5		V5708YF001			FOOT		10-1 10-2 10-3 10-4	4
6		V5758AK001			PLATE		20	1
7		V5815YB001			SHEET		12-1 12-2 12-3 12-4	4
8		VVL511GE08			LABEL		16	1
9		VVL611GE05			LABEL		31	1

EXPLODED ASSEMBLY	PART NAME		PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	ESCUTCHEON ASSY	A1A2RC001						
REMARKS	PART CODE							
1		MEB7DAM0J5			ESCUTCHEON		1-D	1
2		MEB7DAX001			ESCUTCHEON		1-A	1
3		MEB7PAX021			ESCUTCHEON		1-C	1
4		MEB7XAX001			ESCUTCHEON		1-B	1
5								
1		KPA2RC0E01			INNER CARTON			1

EXPLODED ASSEMBLY		PART NAME	PART CODE	STOCK NO.					
REMARKS		PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.			QTY USED
1	EXPLODED	AP505010AD		P.W.BOARD ASSY					1
2	EXPLODED	AP55W201AD		P.W.BOARD ASSY					1
3	EXPLODED	AP55W202AA		P.W.BOARD ASSY					1
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
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19									
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EXPLODED ASSEMBLY		PART NAME	PART CODE	STOCK NO.						
REMARKS		PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.			QTY USED	
1		RD25PJ473X		CARBON FILM R.	0.25W 47K OHM 5%	R8				1
2		RGHARJ181B		M-OXIDE FILM R.		R4				1
3		RG1ARJ181B		M-OXIDE FILM R.		R5				1
4		RPJNB22201		SEMI FIXED VR.		RV1	RV2			2
5		THG24B001W		HEATER TRANS.		T1				1
6		V5627RB001		SPONGE		22				1
7		ZL24FW17XA		F L INDICATOR		LT1				1
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										

EXPLODED ASSEMBLY		PART NAME	PART CODE	STOCK NO.						
REMARKS		PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.			QTY USED	
1		BTP43008Z		BRAS. TAP SCREW	+ BIT, M3 X 8 S-ZNCR	B24-1	B24-2			2
2		CEVE101ALX		ELYT. CAPACITOR		C7				1
3		CEVE470ALX		ELYT. CAPACITOR		C6				1
4		CEVG010ALX		ELYT. CAPACITOR		C1	C2	C5		3
5		CEVG2R2ALX		ELYT. CAPACITOR		C8				1
6		CKF84732FT		CERAMIC CAP.	0.047MFD 50V -20, +80% F	C10	C9			2
7		CQMB682KTH		MYLAR CAPACITOR	6800PF 50V -10, +10%	C3	C4			2
8		ML752SX001		FL BRACKET		21				1
9		PSA2RC00CX		PRINTED W.BOARD						1
10		PS05010C0X		PRINTED W.BOARD						1
11		QDSEM1ZXX0		SILICON DIODE	EMIZ SANKEN	03				1
12		QD5HA150KN		SILICON DIODE	HA150 VF 1.2V+VR 35V NO-RANK 24MIN	01	02	05	06	4
13		QDZ180EB3A		ZENER DIODE	RD18EB3 VZ 17.42-18.33V	04				1
14		QQM07319AT		I.C.	TA7318P-2	U1				1
15		QQM12010AB		IC	HA12010	U2	U3			2
16		QTC1685XDN		TRANSISTOR	2SC1685 R,S-RANK	Q2				1
17		QTC1826X8D		TRANSISTOR	2SC1826 O, Y-RANK NO ACCESSORIES	Q1				1
18		RD25PJ104X		CARBON FILM R.	0.25W 100K OHM 5%	R1	R2	R3		3
19		RD25PJ152X		CARBON FILM R.	0.25W 1.5K OHM 5%	R6				1
20		RD25PJ220X		CARBON FILM R.	0.25W 22 OHM 5%	R7				1
21		RD25PJ472X		CARBON FILM R.	0.25W 4.7K OHM 5%	R9				1

EXPLODED ASSEMBLY		PART NAME	PART CODE	STOCK NO.						
REMARKS		PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.			QTY USED	
1		BTP43008AZ		BRAS. TAP SCREW	+ BIT, M3 X 8 S-ZNCR	B1-1	B1-2	B1-3	B2-1	5
2						B2-2				1
3		CC0B181K0M		CERAMIC CAP.	180PF 50V -10, +10% SL	C70				1
4		CCF3331K0T		CERAMIC CAP.	330PF 50V -10, +10% SL	C11	C12	C3	C4	4
5		CCG8020C0T		CERAMIC CAP.	SL 2PF 50V -0.25, +0.25PF	C63	C64			2
6		CCG8030C0T		CERAMIC CAP.	SL 3PF 50V -0.25, +0.25PF	C7	C8			2
7		CCG8101K0T		CERAMIC CAP.	100PF 50V -10, +10% SL	C13	C14	C15	C16	4
8		CCG8220K0T		CERAMIC CAP.	22PF 50V -10, +10% SL	C10	C9			2
9		CEAD101ALX		ELYT. CAPACITOR	100MFD 16V	C54				1
10		CEAD102ALX		ELYT. CAPACITOR	1000MFD 16V	C52				1
11		CEAE101ALX		ELYT. CAPACITOR	100MFD 25V	C49	C50			2
12		CEAE221ALX		ELYT. CAPACITOR	220MFD 25V	C47	C48	C55		3
13		CEAE470ALX		ELYT. CAPACITOR	47MFD 25V	C19	C20	C59		3
14		CEAF220ALX		ELYT. CAPACITOR	22MFD 35V	C33				1
15		CEQ1E68202		ELYT. CAPACITOR		C51				1
16		CEQ1G82202		ELYT. CAPACITOR		C43	C44			2
17		CEVC101ALX		ELYT. CAPACITOR		C31	C32			2
18		CEVC470ALX		ELYT. CAPACITOR		C5	C6			2
19		CEVD220ALX		ELYT. CAPACITOR		C66				1
20		CEVE2R2ALX		ELYT. CAPACITOR		C34				1
21		CEVE4R7ALX		ELYT. CAPACITOR		C21	C22	C23	C24	4

EXPLODED ASSEMBLY	PART NAME		PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	P.W.B. BOARD ASSY	AP5MA035CD					C1	C17	C18	C2	
1	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	C35	C36	C37	C38		
1		CEVG010ALX		ELYT. CAPACITOR		C39	C40	C41	C42		
2		CEVG100ALX		ELYT. CAPACITOR		C60	C61	C62			
3		CKDE103PEM		CERAMIC CAP.	0.01MFD 500V -0, +100% F	C25	C26	C27	C28		
4						C56	C65				
5						C45	C46	C53			
6		CKF9223ZFT		CERAMIC CAP.	0.022MFD 50V -20, +80% F	C29	C30				
7		CKFB473ZFT		CERAMIC CAP.	0.047MFD 50V -20, +80% F	L1	L2				
8		CKG3551KBT		CERAMIC CAP.	560PF 50V -10, +10% B	H51	H52				
9		CQMC563KEH		MYLAR CAPACITOR		H53					
10		LA3LE1024A		CHOKE COIL		H54					
11		MU232AD002		HEAT SINK							
12		MU622AD002		HEAT SINK							
13		MU622AD003		HEAT SINK							
14		MW201B5001		TERMINAL							39
15		MW401CX002		SHORT JUMPER							1
16		MW401CX006		SHORT JUMPER	10MM						30
17		PSMA035C0X		PRINTED W. BOARD							1
18		QDSGP25GAG		SILICON DIODE	GP25GA 400V A-RANK	D19	D20	D21	D22		4
19		QDSN4448XZ		SILICON DIODE	1H4448 VRM 100V NO-RANK	D10	D11	D12	D13		11
20						D14	D15	D16	D18		
21						D7	D8	D9			

EXPLODED ASSEMBLY	PART NAME		PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	P.W.B. BOARD ASSY	AP5MA035CD					R1	R2	R7	R8	
1	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	R10	R43	R44	R69		
1		RD25PJ154X		CARBON FILM R.	0.25W 150K OHM 5%	R9					2
2		RD25PJ182X		CARBON FILM R.	0.25W 1.8K OHM 5%	R68					4
3		RD25PJ223X		CARBON FILM R.	0.25W 22K OHM 5%	R37	R38	R45	R46		4
4						R21	R22	R40			3
5		RD25PJ224X		CARBON FILM R.	0.25W 220K OHM 5%	R47					1
6		RD25PJ332X		CARBON FILM R.	0.25W 3.3K OHM 5%	R61	R62				2
7		RD25PJ333X		CARBON FILM R.	0.25W 33K OHM 5%	R67					1
8		RD25PJ394X		CARBON FILM R.	0.25W 390K OHM 5%	R55	R56				2
9		RD25PJ471X		CARBON FILM R.	0.25W 470 OHM 5%	R54					1
10		RD25PJ472X		CARBON FILM R.	0.25W 4.7K OHM 5%	R3	R4	R53			3
11		RD25PJ560X		CARBON FILM R.	0.25W 56 OHM 5%	R33	R34				2
12		RD25PJ682X		CARBON FILM R.	0.25W 6.8K OHM 5%	R31	R32				2
13		RD25PJ683X		CARBON FILM R.	0.25W 68K OHM 5%	R15	R16				2
14		RD25TJ301X		CARBON FILM R.	0.25W 300 OHM 5%	R27	R28	R29	R30		4
15		RD25TJ331X		CARBON FILM R.	0.25W 330 OHM 5%	R52					1
16		RD25TJ5R6X		CARBON FILM R.	0.25W 5.6 OHM 5%	R17	R18				2
17		RF02QKR47B		WIRE WOUND R.		R50					1
18		RGHANJ101B		M-OXIDE FILM R.	1/2W 100 OHM 5%	R19	R20				2
19		RGHANJ222B		M-OXIDE FILM R.	1/2W 2.2K OHM 5%						
20		RGHANJ272B		M-OXIDE FILM R.	1/2W 2.7K OHM 5%						
21		RGHANJ472B		M-OXIDE FILM R.	1/2W 4.7K OHM 5%						

EXPLODED ASSEMBLY	PART NAME		PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	P.W.B. BOARD ASSY	AP5MA035CD					D17	D25	D26	D27	
1	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	D28	D3	D30	D4		
1		QDSRA1ZXKD		SILICON DIODE	RA1Z NO-RANK	D5	D6				10
2						D23	D24	D31			
3						D29					
4		QDZRD22ECA		ZENER DIODE	RD22EC VZ 22-24.5 C-RANK	D32					3
5		QDZ150EB1A		ZENER DIODE	RD15EB1 VZ 13.44-14.13V	D11	Q12				1
6		QDZ5R6EB3A		ZENER DIODE	RD5R6EB3 VZ 5.61-5.91V	Q13	Q16				1
7		QTA0720XB8N		TRANSISTOR	25A720 Q,R-RANK	Q7	Q8				2
8		QTA0733XDA		TRANSISTOR	25A733 P,Q-RANK	Q1	Q2				2
9		QTA0768XB0		TRANSISTOR	25A768 Q,Y-RANK	Q14	Q15	Q20			2
10		QTA0794XAN		TRANSISTOR	25A794 Q,R-RANK	Q10	Q22	Q9			2
11		QTA0798XEE		TRANSISTOR	25A798 F,G-RANK BREAK VOLTAGE 70V	Q5	Q6				2
12		QTC0945AEA		TRANSISTOR	25C945A P,Q-RANK	Q23					3
13		QTC1319XDN		TRANSISTOR	25C1318 Q,R-RANK	Q17	Q18	Q21			3
14		QTC1567XAN		TRANSISTOR	25C1567 Q,R-RANK	Q3	Q4				2
15		QTC1685XAN		TRANSISTOR	25C1685 Q,R-RANK	Q23					1
16		QTC1826XB0		TRANSISTOR	25C1826 Q,Y-RANK NO ACCESSORIES	Q17	Q18	Q21			3
17		QTC1885XAN		TRANSISTOR	25C1885 R,S-RANK	Q3	Q4				2
18		RD25PJ101X		CARBON FILM R.	0.25W 100 OHM 5%	R35	R36	R66			3
19		RD25PJ102X		CARBON FILM R.	0.25W 1K OHM 5%	R5	R6				2
20		RD25PJ104X		CARBON FILM R.	0.25W 100K OHM 5%	R49					1
21		RD25PJ124X		CARBON FILM R.	0.25W 120K OHM 5%	R48					1

EXPLODED ASSEMBLY	PART NAME		PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	P.W.B. BOARD ASSY	AP5MA035CD					R23	R24	R25	R26	
1	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	R59	R60				
1		RGHARJ151B		M-OXIDE FILM R.		R39					4
2		RGHARJ152B		M-OXIDE FILM R.		R65					2
3		RGHARJ152B		M-OXIDE FILM R.		R65					1
4		RGHARJ221B		M-OXIDE FILM R.		R13	R14				1
5		RGHARJ330B		M-OXIDE FILM R.		R51					2
6		RGHARJ391B		M-OXIDE FILM R.		R68					1
7		RGHARJ820B		M-OXIDE FILM R.		RV1	RV2				1
8		RPJNB33102		SEMI-FIXED VR.		R57	R58				2
9		RXHARJ100B		M-OXIDE FILM R.		R64					2
10		RXHARJ5R6B		M-OXIDE FILM R.		R41	R42				1
11		RX1ARJ5R6B		M-OXIDE FILM R.		N01					2
12		WTH00TEEXX		SOLID WIRE		FH1	FH2	FH3	FH4		1
13		YHFOP0001Z		FUSE HOLDER		FH5	FH6				6
14						F3					1
15		ZFBQ20203A		FUSE		F1	F2				1
16		ZFBQ40203A		FUSE		K2					2
17		ZRA244102Z		RELAY		K1					1
18		ZRA438105U		RELLEY							1
19											
20											
21											

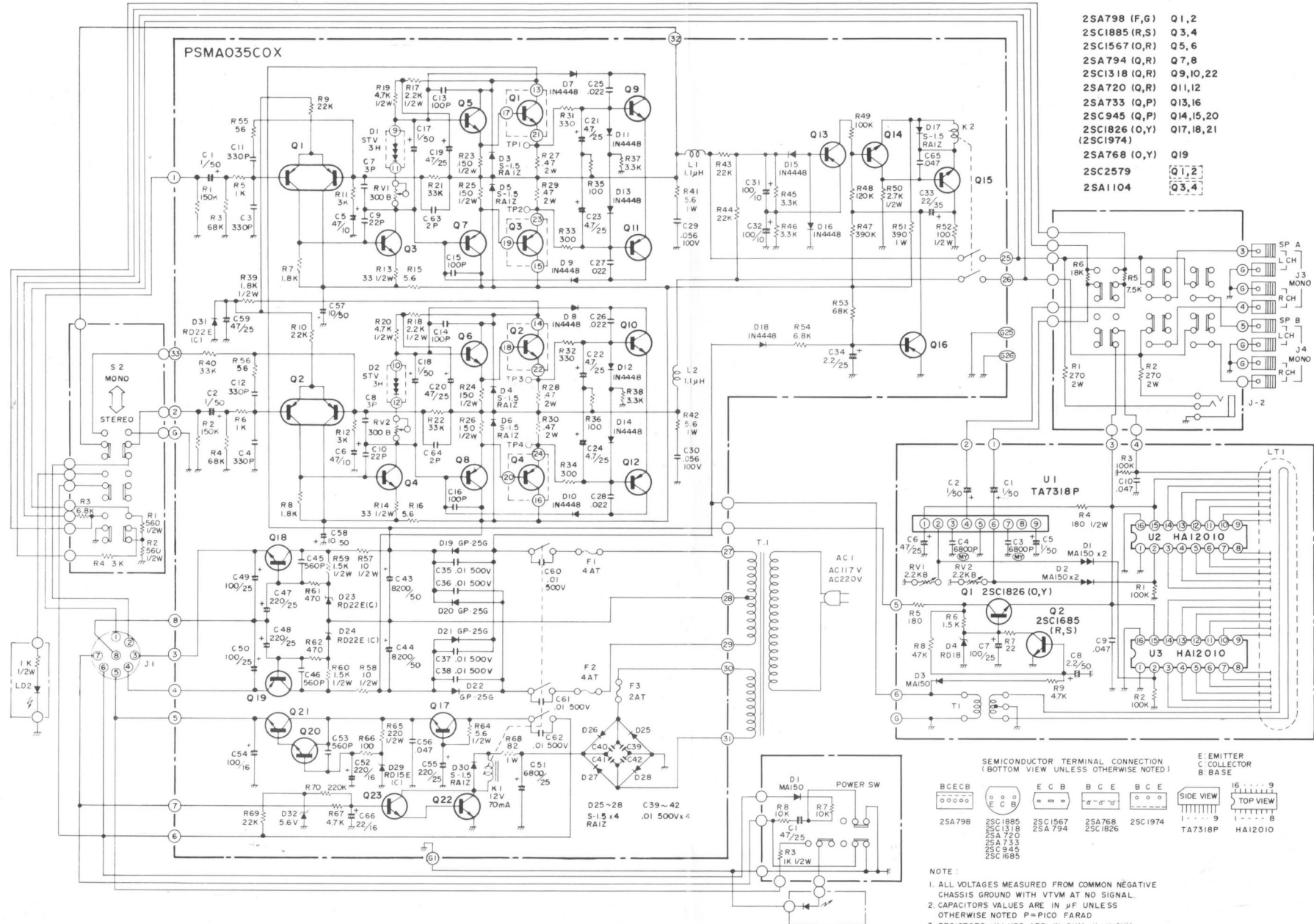
EXPLODED ASSEMBLY		PART NAME		PART CODE					
REMARKS		P.W. BOARD ASSY		AP55W201AD					
LINE #	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.		QTY USED	
1		CEVE470ALX		ELYT. CAPACITOR		C1		1	
2		P55W201COX		PRINTED W. BOARD				1	
3		QDSMA150XN		SILICON DIODE	MA150 VF 1.2V,VR 35V NO-RANK 24MIN	D1		1	
4		RD25PJ103X		CARBON FILM R.	0.25W 10K OHM 5%	R7	R8	2	
5		RD25PJ183X		CARBON FILM R.	0.25W 18K OHM 5%	R6		1	
6		RD25PJ752X		CARBON FILM R.	0.25W 7.5K OHM 5%	R5		1	
7		RGHARJ102B		M-OXIDE FILM R.		R3		1	
8		RG2ARJ271B		M-OXIDE FILM R.		R1	R2	2	
9		SP01AAX50A		PUSH SWITCH		S2		1	
10		SP03CAX08A		PUSH SWITCH		S1		1	
11		YJS035024Z		PHONE JACK		J1		1	
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									

EXPLODED ASSEMBLY		PART NAME		PART CODE					
REMARKS		P.W. BOARD ASSY		AP57Z031AA					
LINE #	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.		QTY USED	
1		P57Z031COX		PRINTED W. BOARD				1	
2		YZA2000004		3P U TERMINAL		Y1		1	
3									
4									
5									
6									
7									
8									
9									
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21									

EXPLODED ASSEMBLY		PART NAME		PART CODE					
REMARKS		P.W. BOARD ASSY		AP55W272AA					
LINE #	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.		QTY USED	
1		P5LD121COX		PRINTED W. BOARD				1	
2		P5LD122COX		PRINTED W. BOARD				1	
3		P55W202COX		PRINTED W. BOARD				1	
4		QLBLN317GN		LED	LN317GP GREEN	LED2		1	
5		RD25PJ302X		CARBON FILM R.	0.25W 3K OHM 5%	R4		1	
6		RD25PJ682X		CARBON FILM R.	0.25W 6.8K OHM 5%	R3		1	
7		RGHARJ102B		M-OXIDE FILM R.		R5		1	
8		RGHARJ561B		M-OXIDE FILM R.		R1	R2	2	
9		SS060203ZA		SLIDE SWITCH		S1		1	
10		WTHC57ELXX		SOLID WIRE		N046		1	
11		WTH021ELXX		SOLID WIRE		N050		1	
12		WTH132ELXX		SOLID WIRE		N044		1	
13		WTH144ELXX		SOLID WIRE		N028		1	
14		WTH232ELXX		SOLID WIRE		N045		1	
15		WTH446ELXX		SOLID WIRE		N031		1	
16		WTH520ELXX		SOLID WIRE		N047		1	
17		WTH617ELXX		SOLID WIRE		N048		1	
18		WTH817ELXX		SOLID WIRE		N049		1	
19		WUGP65EEEX		HI-WRAP WIRE		N060		1	
20		WUG039EKXX		HI-WRAP WIRE		N061		1	
21									

EXPLODED ASSEMBLY		PART NAME		PART CODE					
REMARKS		P.W. BOARD ASSY		AP57Z031BA					
LINE #	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.		QTY USED	
1		P57Z031COX		PRINTED W. BOARD				1	
2		YZA3500003		5P U TERMINAL		Y1		1	
3									
4									
5									
6									
7									
8									
9									
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18									
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20									
21									

Schematic Diagram



- 2SA798 (F,G) Q1,2
- 2SC1885 (R,S) Q3,4
- 2SC1567 (O,R) Q5,6
- 2SA794 (Q,R) Q7,8
- 2SC1318 (Q,R) Q9,10,22
- 2SA720 (Q,R) Q11,12
- 2SA733 (Q,P) Q13,16
- 2SC945 (Q,P) Q14,15,20
- 2SC1826 (O,Y) Q17,18,21
- (2SC1974)
- 2SA768 (O,Y) Q19
- 2SC2579 Q1,2
- 2SA1104 Q3,4

SEMICONDUCTOR TERMINAL CONNECTION (BOTTOM VIEW UNLESS OTHERWISE NOTED)

Part	Terminal 1	Terminal 2	Terminal 3	Terminal 4	Terminal 5	Terminal 6	Terminal 7	Terminal 8	Terminal 9
2SA798	B	C	E	C	B	E	C	C	E
2SC1885	C	B	E	C	B	E	C	C	E
2SC1567	E	C	B	E	C	B	E	C	C
2SA768	B	C	E	C	B	E	C	C	E
2SC1974	B	C	E	C	B	E	C	C	E
2SA720	C	B	E	C	B	E	C	C	E
2SA733	C	B	E	C	B	E	C	C	E
2SC945	C	B	E	C	B	E	C	C	E
2SC1685	C	B	E	C	B	E	C	C	E

SIDE VIEW: 1 2 3 4 5 6 7 8 9
 TOP VIEW: 1 2 3 4 5 6 7 8 9

- NOTE:
- ALL VOLTAGES MEASURED FROM COMMON NEGATIVE CHASSIS GROUND WITH VTVM AT NO SIGNAL.
 - CAPACITORS VALUES ARE IN μ F UNLESS OTHERWISE NOTED P=PICO FARAD
 - RESISTORS VALUES ARE IN OHM K=K OHM
 - * ADJUSTED (TYPICAL VALUE SHOWN)

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