



SERVICE MANUAL

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WORLD HEADQUARTERS CANADA

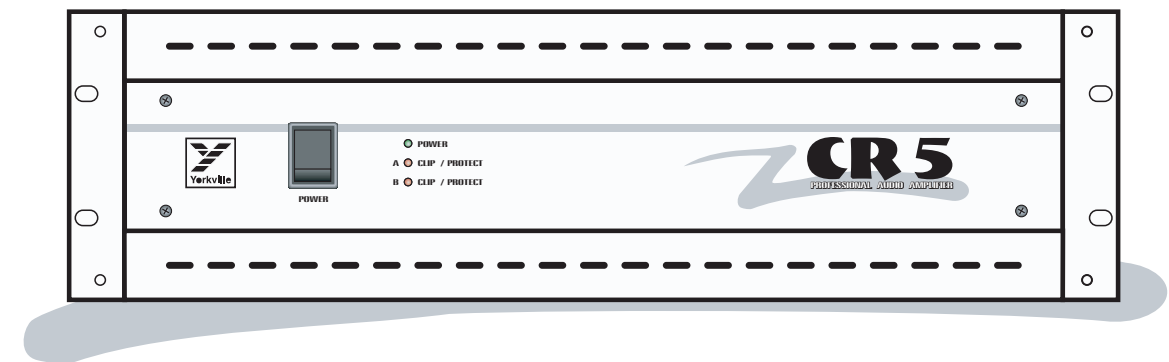
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Printed in Canada



IMPORTANT SAFETY INSTRUCTIONS



INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS.

INSTRUCTIONS RELATIVES AU RISQUE DE FEU, CHOC ÉLECTRIQUE, OU BLESSURES AUX PERSONNES.

CAUTION:
TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

AVIS:
N'ENLEVEZ PAS LE COUVERT (OU LE PANNEAU ARRIERE). NE CONTIENT AUCUNE PIECE REPARABLE PAR L'UTILISATEUR.
CONSULTEZ UN TECHNICIEN QUALIFIE POUR L'ENTRETIEN.

Read Instructions:

The **Owner's Manual** should be read and understood before operation of your unit. Please, save these instructions for future reference.

Packaging:

Keep the box and packaging materials, in case the unit needs to be returned for service.

Warning:

When using electric products, basic precautions should always be followed, including the following:

Power Sources:

Your unit should be connected to a power source only of the voltage specified in the owners manual or as marked on the unit. This unit has a polarized plug. Do not use with an extension cord or receptacle unless the plug can be fully inserted. Precautions should be taken so that the grounding scheme on the unit is not defeated.

Hazards:

Do not place this product on an unstable cart, stand, tripod, bracket or table. The product may fall, causing serious personal injury and serious damage to the product. Use only with cart, stand, tripod, bracket, or table recommended by the manufacturer or sold with the product. Follow the manufacturer's instructions when installing the product and use mounting accessories recommended by the manufacturer.

The apparatus should not be exposed to dripping or splashing water; no objects filled with liquids should be placed on the apparatus.

Terminals marked with the "lightning bolt" are hazardous live; the external wiring connected to these terminals require installation by an instructed person or the use of ready made leads or cords.

No naked flame sources, such as lighted candles, should be placed on the apparatus.

Power Cord:

The AC supply cord should be routed so that it is unlikely that it will be damaged. If the AC supply cord is damaged **DO NOT OPERATE THE UNIT.**

Service:

The unit should be serviced only by qualified service personnel.

Veillez lire le manuel:

Il contient des informations qui devraient étre comprises avant l'opération de votre appareil. Conservez S.V.P. ces instructions pour consultations ultérieures

Emballage:

Conservez la boite au cas ou l'appareil devait étre retourner pour réparation.

Warning:

Attention: Lors de l'utilisation de produits électrique, assurez-vous d'adhérer à des précautions de bases incluant celle qui suivent:

Alimentation:

L'appareil ne doit étre branché qu'à une source d'alimentation correspondant au voltage spécifié dans le manuel ou tel qu'indiqué sur l'appareil. Cet appareil est équipé d'une prise d'alimentation polarisée. Ne pas utiliser cet appareil avec un cordon de raccordement à moins qu'il soit possible d'insérer complètement les trois lames. Des précautions doivent étre prises afin d'éviter que le système de mise à la terre de l'appareil ne soit désengagé.

Hazard:

Ne pas placer cet appareil sur un chariot, un support, un trépied ou une table instables. L'appareil pourrait tomber et blesser quelqu'un ou subir des dommages importants. Utiliser seulement un chariot, un support, un trépied ou une table recommandés par le fabricant ou vendus avec le produit. Suivre les instructions du fabricant pour installer l'appareil et utiliser les accessoires recommandés par le fabricant.

Il convient de ne pas placer sur l'appareil de sources de flammes nues, telles que des bougies allumées.

L'appel ne doit pas étre exposé à des égouttements d'eau ou des éclaboussures et qu'aucun objet rempli de liquide tel que des vases ne doit étre placé sur l'appareil.

Les dispositifs marqués d'une symbole "d'éclair" sont des parties dangereuses au toucher et que les câblages extérieurs connectés à ces dispositifs de connection extérieure doivent étre effectués par un opérateur formé ou en utilisant des cordons déjà préparés.

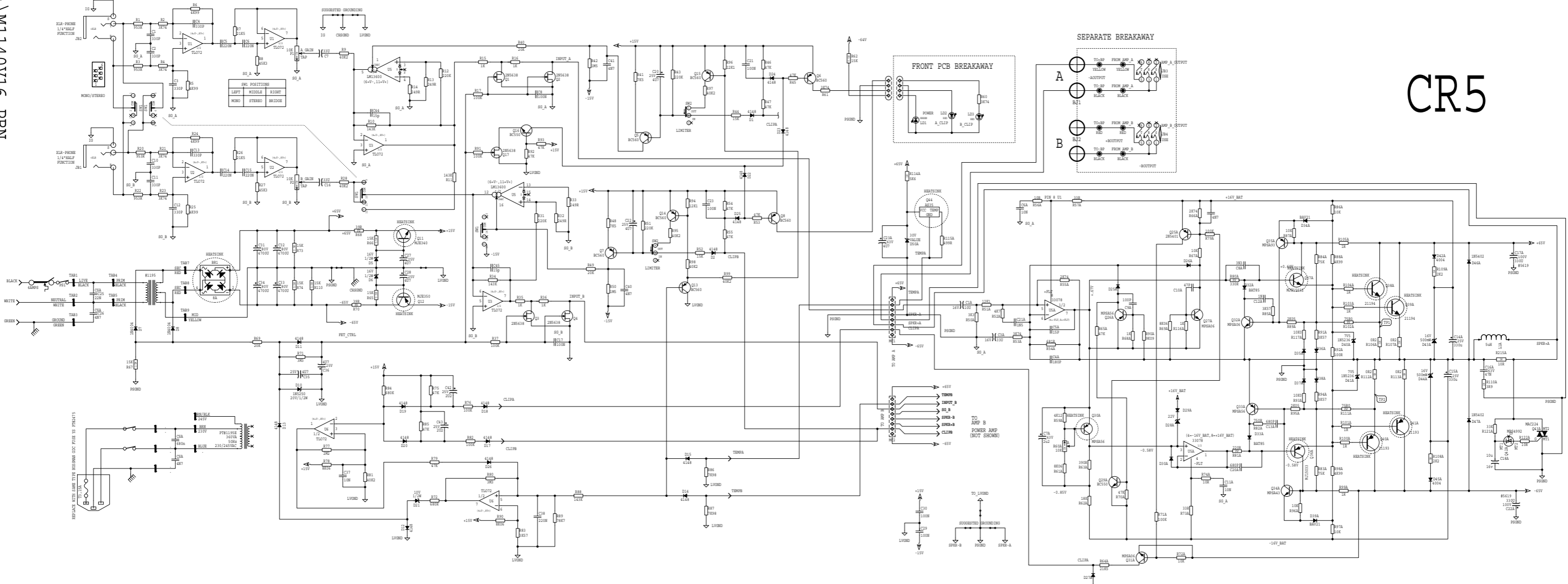
Cordon d'alimentation:

Évitez d'endommager le cordon d'alimentation. **N'UTILISEZ PAS L'APPAREIL** si le cordon d'alimentation est endommagé.

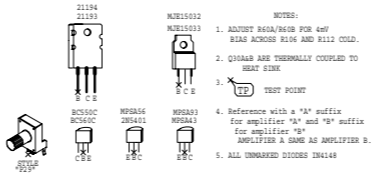
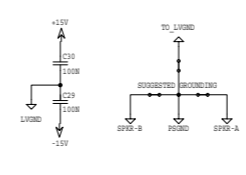
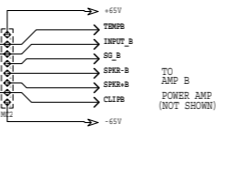
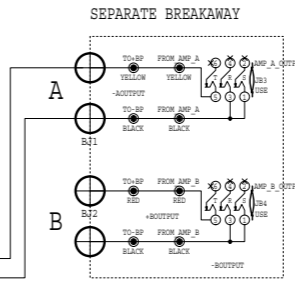
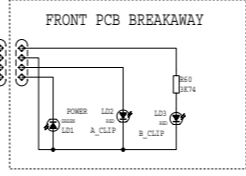
Service:

Consultez un technicien qualifié pour l'entretien de votre appareil.

YS No.	Description	Qty.	YS No.	Description	Qty.
6405	RED 3MM LED 1V7 5MA BRT	2	4599	22AWG SOLID SC WIR T&R JMP	90
6408	GRN 3MM LED 1V9 5MA FROSTED	1	5299	24AWG SOLID SC WIR RAD JMP	8
6419	BRIDGE 35A 400V WIRE LEAD G13504	1	4715	5.0W 0R20 5% BLK RES	8
6425	BAV21 200V 0A25 DIODE T&R	4	4877	1/4W 1R 5%FLAME PROOF T&R RES	12
6825	1N4148 75V 0A45 DIODE T&R	34	4748	2.0W 3R9 5% T&R	2
6438	1N4004 400V 1A0 DIODE T&R	6	4686	1.0W 10R 5%FLAME PROOF T&R RES	2
6827	1N5402 200V 3A0 DIODE	4	4875	1/4W 10R 5% T&R RES	6
6733	BAT85 30V 0A2 DIODE SCHTKYT&R	4	4816	1/4W 33R 5% T&R RES	4
6488	1N5236BRL 7V5 0W5 ZENER 5% T&R	4	4607	1/8W 39R 2%FLAME PROOF T&R RES	2
6461	1N5240BRL 10V0 0W5 ZENER 5% T&R	1	4608	1/8W 75R 2%FLAME PROOF T&R RES	4
6824	1N5246B 16V0 0W5 ZENER 5% T&R	6	4852	1/4W 100R 5% T&R RES	2
6465	1N5250B 20V0 0W5 ZENER 5% T&R	1	4645	1/8W 220R0 1%FLAME PROOF T&R RES	2
6463	1N5251BRL 22V0 0W5 ZENER 5% T&R	2	4770	1/4W 249R 1% T&R RES	4
6466	1N5256B 30V0 0W5 ZENER 5% T&R	2	6204	1/4W 332R0 1%FLAME PROOF T&R RES	2
5101	BC550C TO92 NPN TRAN T&R TB	3	4872	1/4W 390R 5% T&R RES	2
5102	BC560C TO92 PNP TRAN T&R TB	7	5029	1/4W 499R 1% T&R RES	2
5103	MPSA06 TO92 NPN TRAN T&R TA	6	4743	1/4W 681R0 0.1%*** T&R RES	2
5104	MPSA56 TO92 PNP TRAN T&R TA	6	4873	1/4W 680R 5% T&R RES	1
5108	2N5401 TO92 PNP TRAN T&R TA	2	4758	1/4W 953R 1% T&R RES	4
5109	MPSA43 TO92 NPN TRAN TA	2	4823	1/4W 1K 5% T&R RES	1
5110	MPSA93 TO92 PNP TRAN TA	2	4981	1/4W 1K 5%MINI T&R RES	7
5119	2N5638 TO92 NCH JFET T&R TC	9	4919	1/4W 2K05 1%-NO SUBS- T&R RES	6
6808	MJE15032 TO220 NPN TRAN TE	2	4693	5.0W 2K2 5% BLK RES	4
6809	MJE15033 TO220 PNP TRAN TE	2	4764	1/4W 2K740 0.1%*** T&R RES	4
6873	MJE340 TO126 NPN TRAN TG	1	4826	1/4W 3K3 5% T&R RES	2
6874	MJE350 TO126 PNP TRAN TG	1	5022	1/4W 3K57 1% T&R RES	7
6988	MJL21194 TO3P NPN TRAN TK	4	5028	1/4W 3K74 1% T&R RES	8
6991	MJL21193 TO3P PNP TRAN TK	4	4774	1/4W 4K12 1% T&R RES	2
6840	MC33078P IC DUAL OP AMP	2	4982	1/4W 4K7 5%MINI T&R RES	2
6882	TL072CP IC FET DUAL OP AMP	4	4639	1/4W 4K99 1% T&R RES	8
6745	LM13600N IC XCONDUCTANCE AMP	1	4685	1.0W 5K6 5% T&R RES	2
5190	MBS4992 TO92 8V5 DIAC	2	4887	1/4W 7K5 5% T&R RES	2
6444	MAC224-4 TO220 40A TRIAC 200V	2	4787	1/4W 7K960 0.1%*** T&R RES	2
6478	AS35FN-TO92 TEMPERATURE SENSOR	2	5004	1/4W 8K06 1% T&R RES	6
5817	15P 100V 2%CAP T&R RAD CER.2"NPO	4	5027	1/4W 9K09 1% T&R RES	2
5203	47P 100V 2%CAP T&R RAD CER.2"NPO	2	4800	1/4W 10K0 1% T&R RES	4
5199	100P 100V 2%CAP T&R RAD CER.2"NPO	2	4829	1/4W 10K 5% T&R RES	8
5415	180P 100V 2%CAP T&R RAD .2"	2	4983	1/4W 10K 5%MINI T&R RES	4
5211	330P 100V 5%CAP T&R RAD CER.2"NPO	8	4773	1/4W 12K1 1% T&R RES	4
5816	680P 100V 5%CAP T&R RAD CER.2"NPO	4	4630	1/2W 15K 5% T&R RES	7
5206	1N 400V 5%CAP T&R RAD .2"FLM	2	4830	1/4W 15K 5% T&R RES	2
5273	1N5 200V 5%CAP T&R RAD CER.2"NPO	2	4831	1/4W 18K 5% T&R RES	2
5428	3N3 50V 10%CAP T&R BEAD Y5R	2	4885	1/4W 20K 5% T&R RES	2
5209	4N7 250V 5%CAP T&R RAD .2"FLM	4	6123	1/4W 20K0 1%MINI MF T&R RES	1
6451	4N7 250V 20%CAP BLK Y 10MM AC	1	4777	1/4W 21K5 1% T&R RES	4
5204	10N 100V 10%CAP T&R RAD .2"FLM	5	4840	1/4W 33K 5% T&R RES	2
6435	22N 275V 20%CAP BLK X2 15MM AC	1	5009	1/4W 40K2 1% T&R RES	7
5224	47N 100V 10%CAP T&R RAD .2"FLM	2	4908	1/4W 45K3 1% T&R RES	2
5228	100N 100V 5%CAP T&R RAD .2"FLM	5	4834	1/4W 47K 5% T&R RES	13
5314	100N 50V 10%CAP T&R BEAD X7R	1	6119	1/4W 47K 5%MINI T&R RES	2
5231	220N 63V 10%CAP T&R RAD .2"FLM	5	4760	1/4W 75K 5% T&R RES	4
5257	2U2 63V 20%CAP T&R RAD .2"EL	4	5007	1/4W 78K7 1% T&R RES	1
5259	4U7 63V 20%CAP T&R RAD .2"EL	8	4838	1/4W 100K 5% T&R RES	5
5281	10U 16V 20%CAP T&R RAD .2"NP	4	6120	1/4W 100K 5%MINI T&R RES	4
5961	33U 16V 20%CAP T&R RAD .2"NP	4	5026	1/4W 143K 1% T&R RES	4
5883	220U 100V 20%CAP BLK 12X21MM EL	4	4841	1/4W 220K 5% T&R RES	2
5630	330U 25V 20%CAP BLK 10X13MM EL	4	6126	1/4W 220K 5%MINI T&R RES	2
5896	4700U 80V 20%CAP BLK 25X50MM ELS	4	4880	1/4W 680K 5% T&R RES	1
4497	10K B LIN 9MM HORIZONTAL P29	2	4820	1/4W 1M5 5% T&R RES	2
4520	10K TRIM POT	2	4845	1/4W 2M2 5% T&R RES	1
2417	6.00 AMP CIRCUIT BREAKER .250 TAB	1	4846	1/4W 3M3 5% T&R RES	2
3819	5UH COIL 18AWG R000 AIR CORE	2	3565	10" 4C-28AWG RIBBON CABLE 0.1"	1
3410	RED ON LEFT DUAL BINDING POST TPP5	1	3619	4.75 8C-22AWG RIB 3/4" NOTCH 156	2
3415	RED ON RIGHT DUAL BINDING POST TPP5	1	8741	4-40 X 1/2 PAN PH MS JS500	6
3498	1/4" JCK PCB MT HORZ	2	8827	4-40 X 1/2 FLAT PH TAPTITE JS500	4
3417	6-32 SCREW TERMINAL PC MOUNT	1	8832	6-32 X 1/4 PAN PH TAPTITE JS500	1
3405	TERMINAL STRIP 5P #6 SCREW	1	8801	6-32 X 3/8 PAN PH TAPTITE JS500	14
3416	1/4"XLR PCB MT VERT COMBO	2	8829	6-32 X 3/8 FLAT PH TAPTITE BO#4 HEA	29
3501	B52200F006 COMP WASH #4 SMALL	6	8806	6-32 X 1/2 PAN PH TAPTITE JS500	2
3745	DUAL XSISTOR PBL SPRING PLATE ZN	4	8828	6-32 X 3/4 PAN PH TAPTITE JS500	6
3806	RECTANGULAR WASHER FOR TRANS SUPPRT	4	8874	8-32 X 1" PAN PHIL TAPTITE JS500	8
3801	5/8" BUMPER BUTTON BLACK	4	8911	10-16 X 1/2 TYPE B HEX W/SLOT BL	16
8661	BUTTON KNOB FLAT GREY	1	8821	10-16 X 1 3/32 TYPE B HEX W/SLOT BL	4
3481	8 3/18 SJT AC LINE CORD 250 CLIPS	1	8740	5/16-18 X 3 GRD 5 HEX BOLT JS500	1
3834	HEYCO #1214 STRAIN RELIEF	1	3744	SNAP IN .375 SPACER RICHCO	6
3521	SIDE ENTRY PCB CONN .156 8POS	2	3741	.5 SPACER ID-.171 OD-.25 #912-500	2
3538	24 PIN BREAKAWAY LOCK .156	0.67	3743	SNAP ON 0.5" SPACER RICHCO	8
5989	4 CIR CABLE HOLDER .098	2	8657	6-32 X 3/8" HEX SPACER ALUMINUM	1
8793	4-40 HEX NUT ZINC	6	8667	SHOULDER WASHER SWS-229 LENGTH 1/8	4
8800	6-32 KEPS NUT ZINC	10	8818	3/4 OD X 5/16 ID X .08 THICK WASHER	1
8854	6-32 X 1/4 HEX NUT ZINC	1	3436	DPDT PUSH SW PCMT H BREAK B4 MAKE	1
8797	5/16-18 KEPS NUT JS500	1	3587	DPDT ROKR SW QUIK 250*AC/PWR ON-OFF	1
3846	TO220 THERMO PAD LARGE HOLE 56359B	2	3705	4P3T SLID SW PCMT H	1
3866	ELASTOMER PAD TSIL 3 1.2X6.0	2	1195	CR5 120VAC 60HZ XFMR	1
3870	TO220 MICA PAD LARGE HOLE PRE-GREA	4			
8581	CUSTOM PBL TRANSISTOR SPACER	4			
4597	22AWG STRAN TC WIR JMP	70			

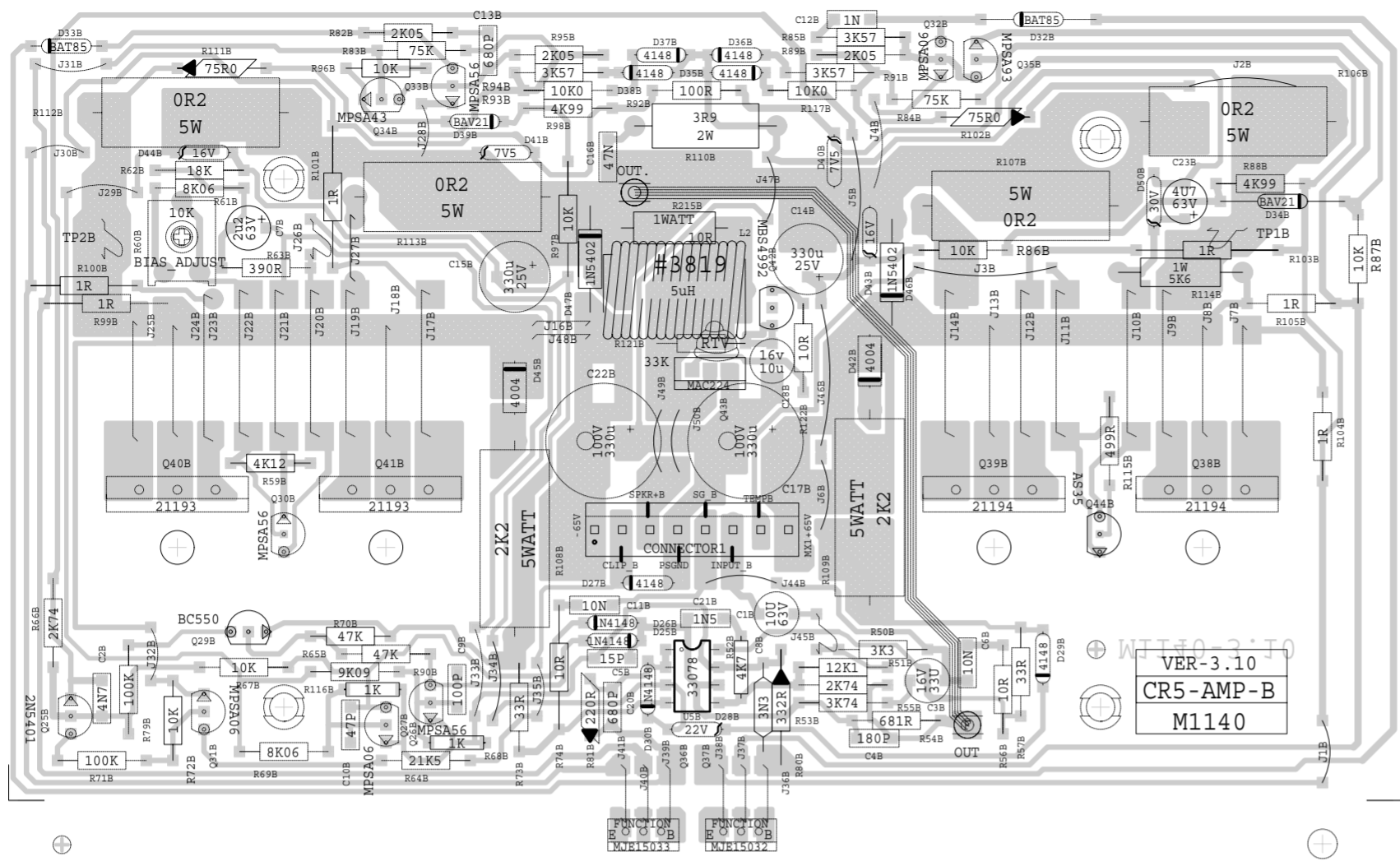


CR5

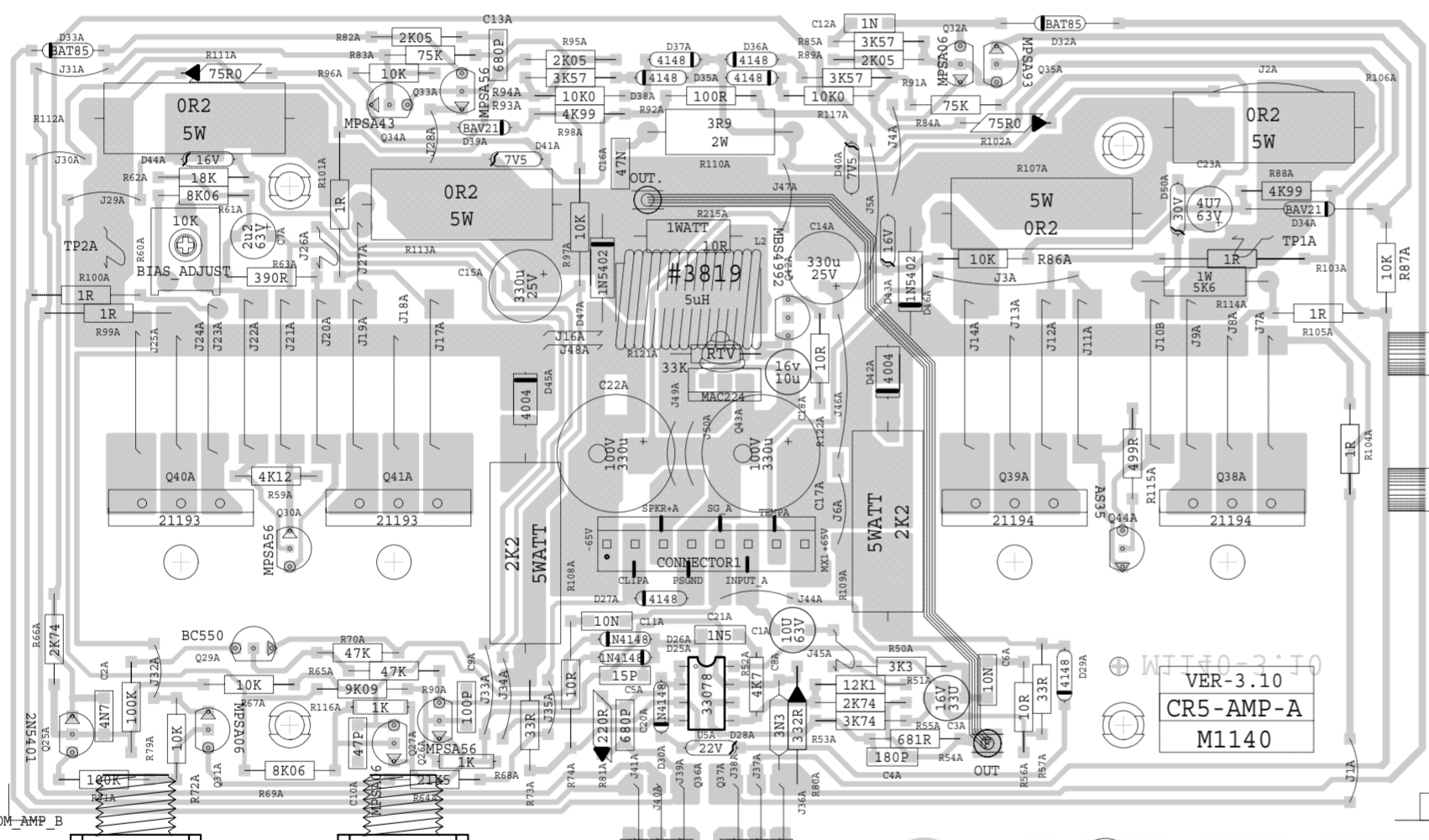


M1140.SCH DATABASE HISTORY

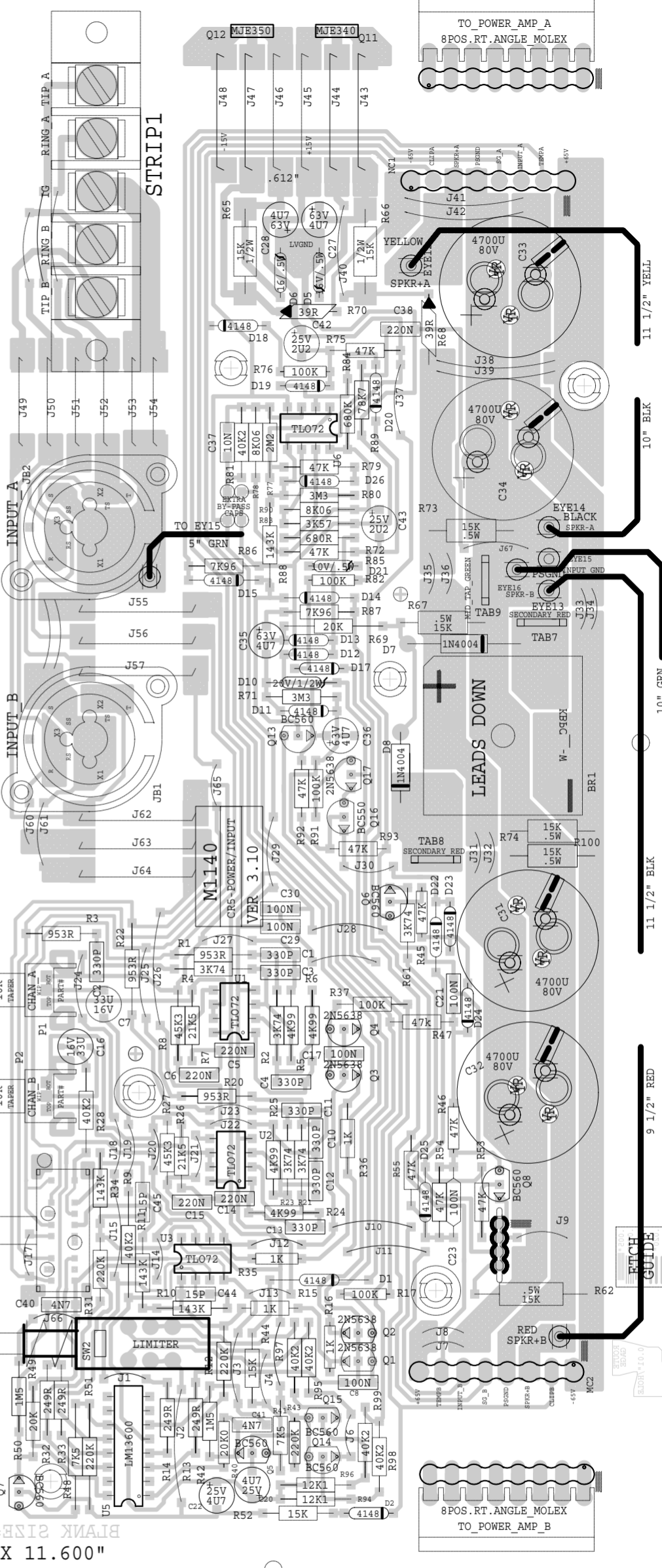
#	DATE	VER#	DESCRIPTION OF CHANGE
1	04/08/99	1.10	ADD HEATSINK SYMBOL
2	NOV/04/99	1.20	PC#6129 ADD C44, C45
3	NOV/11/99	1.30	PC#6131 R30_C185->R305_R31_10K->3K57
4	3/20/00	1.40	R305A, R100A, R101A, R103A, R104A, R105A
5	3/20/00	1.40	1/4WFP TO 1/4W
6	DEC/20/00	1.50	PC#6317 CE FUSE T3A->T3, 15A
7	FEB/05/02	1.60	PC#6403 C17A-C22A_220U->330U
8			
9			
10			



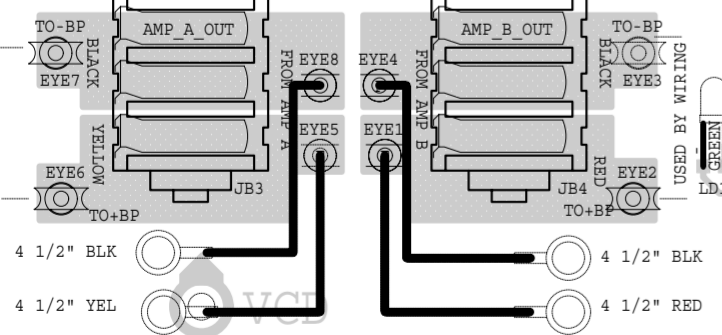
VER-3.10
CR5-AMP-B
M1140



VER-3.10
CR5-AMP-A
M1140



M1140
CR5-POWER/INPUT
VER 3.10



ASSEMBLY M1140-3.10
PCB MECH M1140-3.10
PRODUCTION NOTES

BLANK SIZE=13.250" X 11.600"

M1140.PCB DATA BASE HISTORY

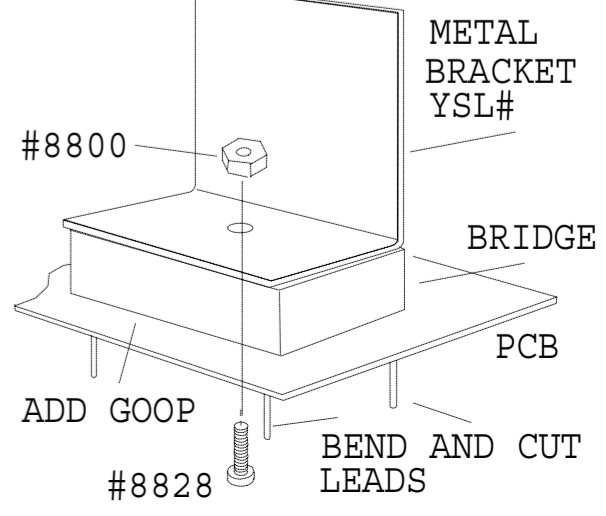
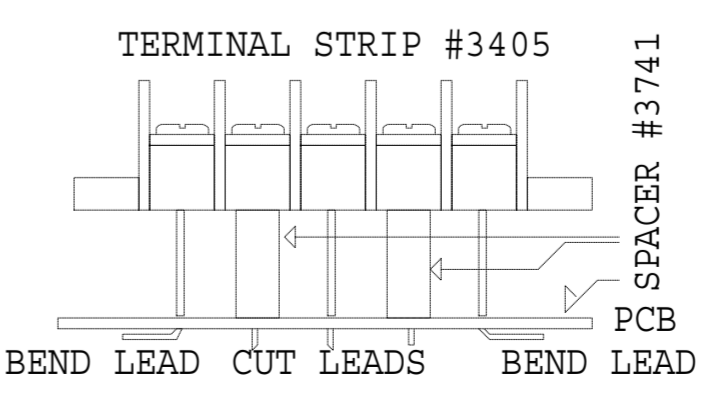
MODEL(S) :- CR5

#	DATE	VER#	DESCRIPTION OF CHANGE
1	SEP/28/99	2.00	PC#6121 R90 21K5->8K06_R83_10K0->->3K57 C37/D18 MOVED
2			PC#6123 TERMINAL STRIP A-B SWAPPED
3			PC#6129 ADD 15P_C44/C45 ACROSS R10/R34
4			FIX SHORT JUMPER TO NUT ADD ROUT
5	DEC/01/99	3.00	RTV SLOTS-C17A/B-C22A/B-
6			PC#6403_C22A/B-C17A/B_220u->330u
7	FEB/05/02	3.10	N
8			N
9			N
10			N
11			N

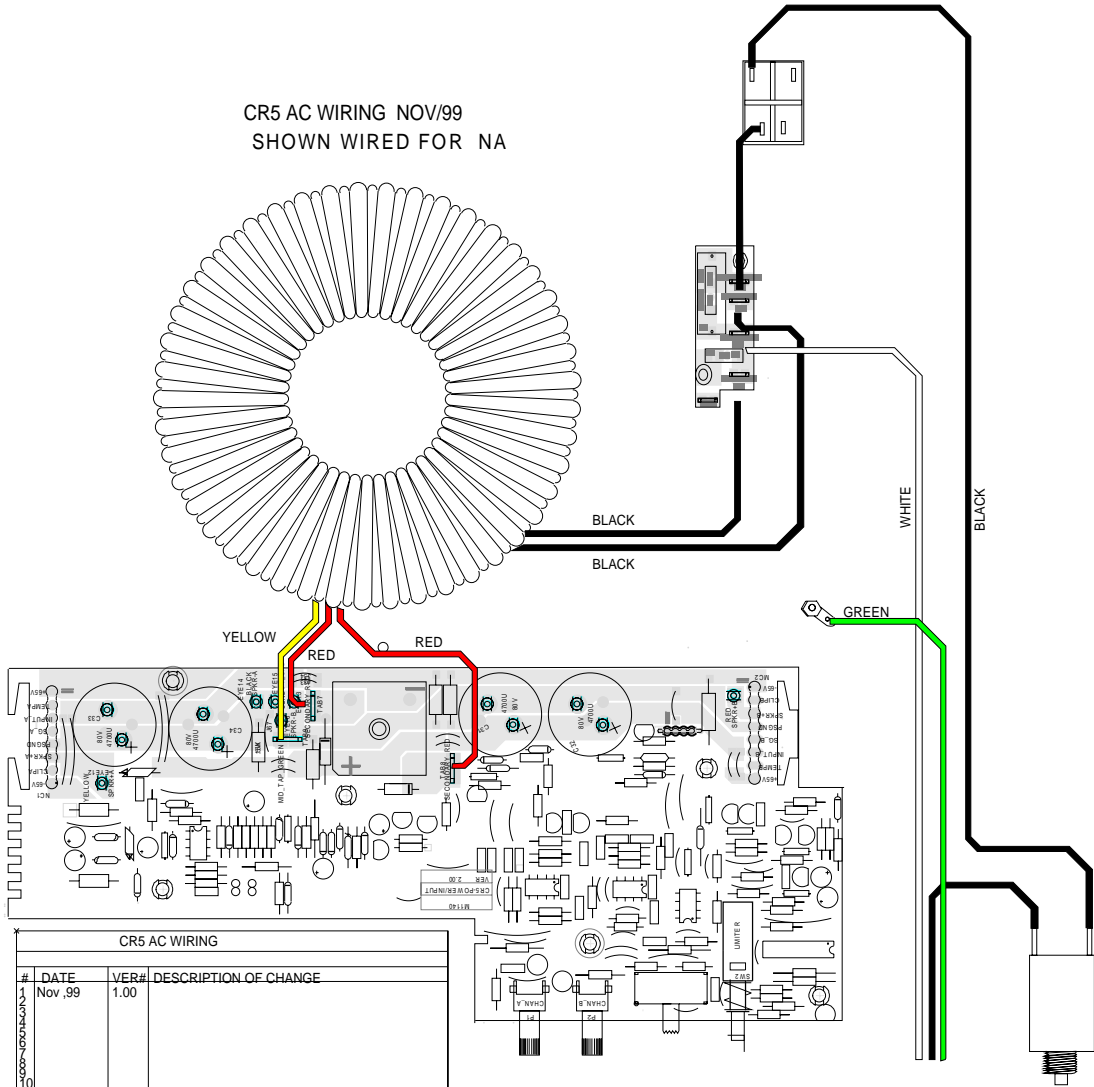
M1140.PCB POT LIST

MODEL(S) :- CR5

REF	FUNCTION	PART#	KNOB	AS OF
P1	CHAN-A/GAIN	#4497	NO-KNOB	DEC/99
P2	CHAN-B/GAIN	#4497	NO-KNOB	DEC/99
P3			K	N
P4			K	N
P5			K	N
P6			K	N

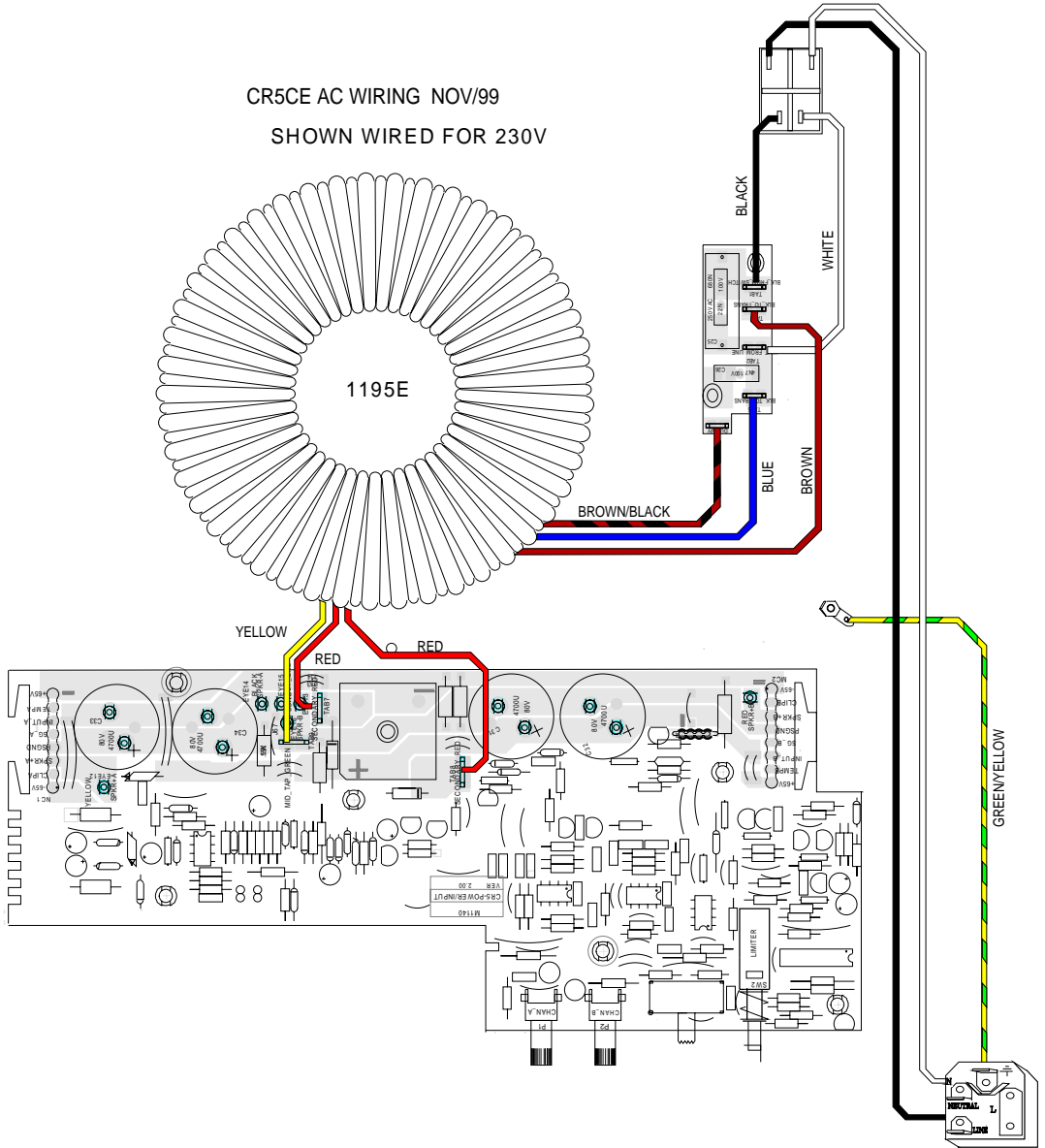


CR5 AC WIRING NOV/99
 SHOWN WIRED FOR NA



CR5 AC WIRING		
#	DATE	VER.# DESCRIPTION OF CHANGE
1	Nov, 99	1.00

CR5CE AC WIRING NOV/99
SHOWN WIRED FOR 230V



CR5CE AC WIRING NOV/99
SHOWN WIRED FOR 245V

