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# CARVER

## Model TFM-15 SERVICE MANUAL

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# 1. IMPORTANT SAFETY INFORMATION

## WARNING.

Any person performing the procedures described in this manual will be exposed to hazardous voltages and the risk of electric shock.

Carver Corporation assumes that any person who removes the cover from the unit has been properly trained in protecting against avoidable injury and shock.

Therefore, the procedures described here are to be performed by qualified electronics service personnel only.

We recommend that the unit be tested only when line isolation is provided by an isolation transformer. The line cord of the unit must be disconnected and the power supply capacitors fully discharged before any components are replaced. Failure to do so may result in severe damage to the unit and the risk of electric shock.

# 2. SPECIFICATIONS

## Power:

100 watts RMS per channel into 8 ohms both channels driven 20-20KHz with no more than 0.1% THD.  
140 watts RMS per channel into 4 ohms both channels driven 20-20KHz with no more than 0.1% THD.  
200 watts dynamic power into 2 ohms

## Frequency Response:

+0, -0.3dB 20-20KHz

## Noise:

110dB A-weighted referenced to rated power

## Gain:

31 dB (with input level controls fully clockwise)

## Input impedance:

30K ohms

## Power Requirements:

120 VAC, 60Hz, USA & Canada

220 VAC, 50Hz, Europe

## Dimensions:

3-5/8" x 19" x 13"

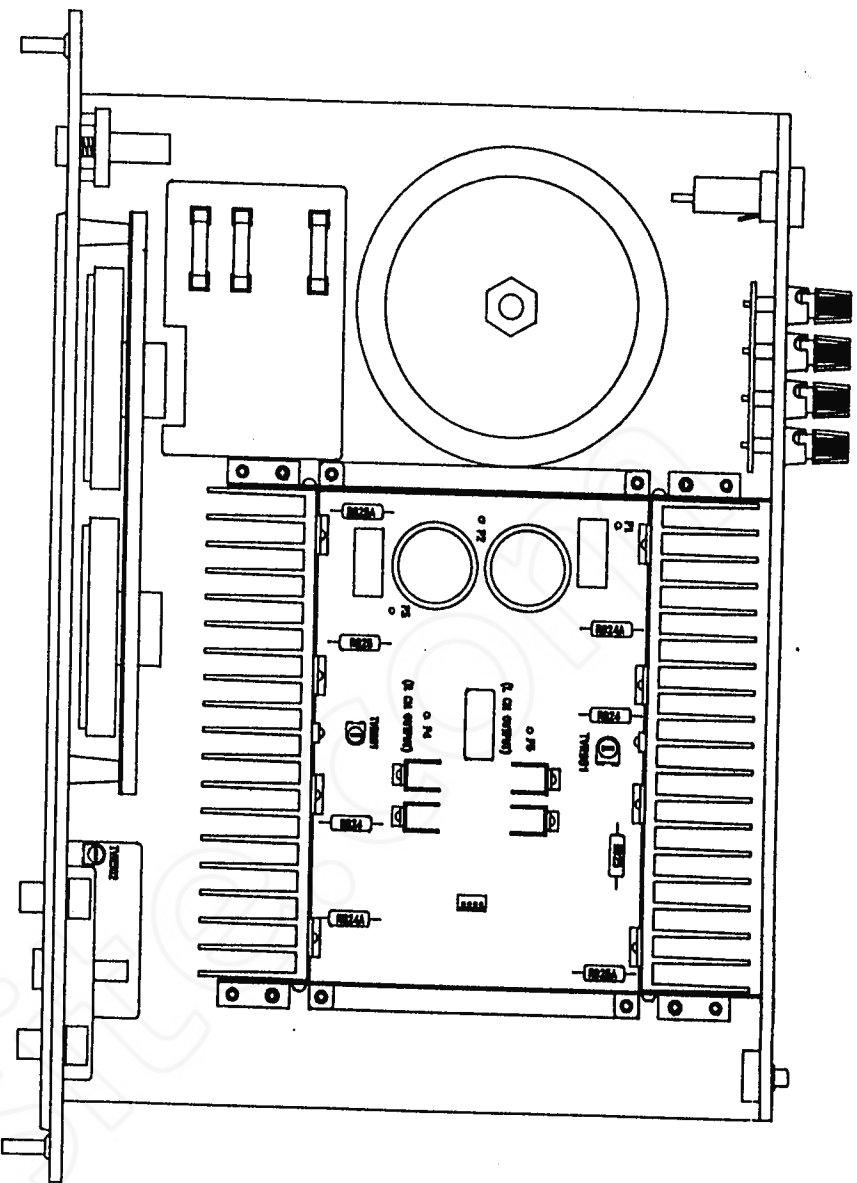
92mm x 482mm x 332mm

## Weight:

17.2 lbs

7.8 kgs

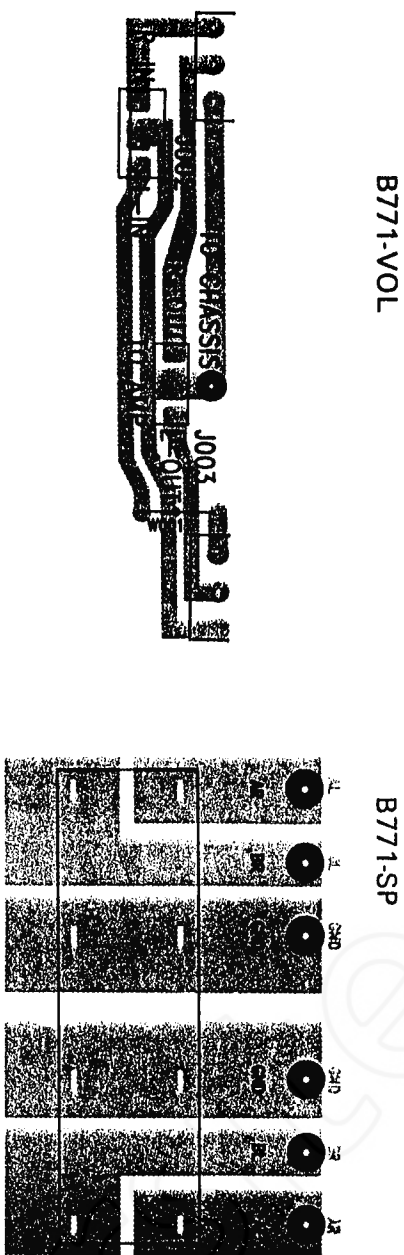
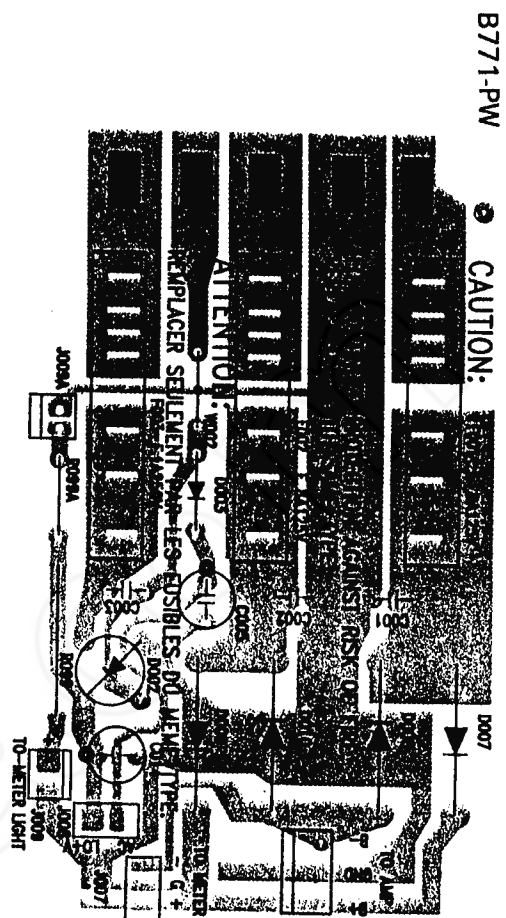
4. ALIGNMENT PROCEDURES



P.C. BOARD 8770-MA ASS'Y

REF. NO.	DESCRIPTION	P/N	QTY
	HEAT SINK H-042 (W) FOR 28C2167, 25A957	76H042W***	4
	HEAT SINK H-216	76H216W***	2
	HOLDER OF HEAT SINK (RIGHT) C-1453	78C1453W**	1
	HOLDER OF HEAT SINK (LEFT) C-1454	78C1454W**	1
	CONNECTOR E-0255	66E0255***	1
	SPRING WASHER 3Ø (V)	88WS03P6***	8
	SCREW CRTS 3x8 (V)	88S70308RY	4
	SCREW CRTS 3x6 (V)	88S70306RY	12
	HEXAGON CRTS 3x15 (V)	88S70315RY	8
	WAFER 5045-2	65S0452***	1
	WAFER 5045-4	65S0454***	1
	PIN 1x1x19	65S10119***	1
	RELAY 12V 5A 2P2C	6112052P2C	3
	COIL 17-1/2T x 6Ø x 1MM	73C17P5061	2
	ALL RESISTORS ARE RATED 5% TOLERANCE AND 1/4W		
	-CARBON RESISTORS T TYPE-		
R820, R820A, R821, R821A	10 ohm	300010C4TJ	
R920, R920A, R921, R921A	10 ohm	300010C4TJ	
R810, R812, R813, R910, R912, R913	150 ohm	300150C4TJ	
R007	220 ohm	300220C4TJ	
R010, R805, R905	470 ohm	300470C4TJ	
R009, R815, R915	1K ohm	300470C4TJ	
R807, R907	1K5 ohm	30001K5C4TJ	
R701, R801, R901	2K2 ohm	30001K5C4TJ	
R803, R804, R903, R904	3K3 ohm	3002K2C4TJ	
R814, R914	3K9 ohm	3003K3C4TJ	
R828, R828A, R928, R928A	4K7 ohm	3003K9C4TJ	
R702	5K8 ohm	3004K7C4TJ	
R004, R005	15K ohm	3005K6C4TJ	
R811, R911, R831, R931	22K ohm	30015K4C4TJ	
R806, R906	33K ohm	30022K4C4TJ	
R006	47K ohm	30033K4C4TJ	
R808, R908	56K ohm	30047K4C4TJ	
R802, R902	100K ohm	30056K4C4TJ	
R008	330K ohm	30100K4C4TJ	
	ALL RESISTORS ARE RATED 5% TOLERANCE AND 1/2W		
	-CARBON RESISTORS T TYPE-		
R832, R932	4.7 ohm	3004P7C2TJ	
R816, R916	300 ohm	300300C2TJ	
	ALL RESISTORS ARE RATED 5% TOLERANCE 2W		
	-METAL RESISTORS T TYPE-		
R830, R930	10 ohm	300010M2TJ	
R824, R824A, R825, R825A	0.33 ohm	300P33M2TJ	
R924, R924A, R925, R925A	0.33 ohm	300P33M2TJ	
	ALL RESISTORS ARE RATED 5% TOLERANCE 2W		
	-CAPACITORS-		
C806, C906, C907, C907	10P/500V	42010500RJ	
C805, C905	30P/500V	42030500RJ	
C808, C908, C810, C910	70P/500V	42070500RJ	
C803, C903	300P/500V	42300500RJ	
C813	.022/50V J	41223050RJ	
C802, C902	150P/50V J	43150050TJ	
C007	33u/16V	43150050TJ	
C701, C702	220u/25V	40033U16RM	
C811, C911	4.7u/25V	40220U25RM	
C006, C804, C904	220u/16V	404P7U25NP	
C801, C901	15000u/50V	4015KUS0RM	
C812, C912	4.7K/160V	444P7UMPEF	
C801A, C901A, C909	0.047K/160V	44473MPED	
C809A, C909, C909A	0.01K/100V	44103100PS	
C001A, C002A	0.01K/100V	44103100PS	
C801B, C901B	0.1K/160V	44104100PS	
C809B, C909B	0.1K/160V	44104160PD	
	PMT T TYPE YELLOW	44104160PT	
	-TRANSISTORS-		
Q801, Q802, Q901, Q902	2SA970	122SA970**	
Q803, Q804, Q903, Q904	2SC2229	122SC2229*	
Q805, Q905	2SA949	122SA949**	
Q004, Q806, Q906	2SC468	122SC468**	
Q807, Q907	2SC2167	122SC2167*	
Q808, Q908	2SA957	122SA957**	
Q001, Q002, Q003, Q701	2SC1815	122SC1815*	
Q813, Q913	2SC1815	122SC1815*	
Q809, Q809A, Q909, Q909A	2SC3519	122SC3519*	
Q810, Q810A, Q910, Q910A	2SA1386	122SA1386*	
	-DIODE-		
D901, D902, D903, D004	1N4148	131N4148TO	
D901, D902, D903	1N4148	131N4148TO	
D005	4.7V/0.5W	132047P95TO	
D701	22V/0.5W	132220P95TO	
D003	1N4002	131N4002TO	
	-COIL-		
TVR801, TVR901	17-1/2T x 6Ø x 1MM	73C17P5061	
	-TVR-		
		311Q2063HS	

- 1-1 DC BALANCE CHECK**
1. Connect a DC voltmeter to the right Speaker A terminals.
  2. Push in the POWER switch and the SPEAKER A switch.
  3. Verify less than +/- 20mV on the meter.
  4. Repeat for the left Speaker A terminals.
- 1-2 IDLING CURRENT CHECK**
- Note: These measurements should be made shortly after turning the amplifier on, while it is relatively cool.
1. Set LEVEL control to minimum (CCW).
  2. Connect a DC voltmeter across R824.
  3. Verify 5mV (+/- 1mV) on the meter. Readjust TVR801 if necessary.
  4. Measure the voltage across R824A, R825 and R825A and verify 5mV (+/- 1mV) across each resistor.
  5. Connect a DC voltmeter across R924.
  6. Verify 5mV (+/- 1mV) on the meter. Readjust TVR901 if necessary.
  7. Measure the voltage across R924A, R925 and R925A and verify 5mV (+/- 1mV) across each resistor.
- 1-3 RELAY OPERATION CHECK**
1. Apply a 1KHz sine wave at 750mV (-2.5dBV) to the LINE input jacks.
  2. Adjust the right LEVEL control so that the output voltage is 27.5Vrms at the right SPEAKER A terminal, with an 8 ohm load.
  3. Short circuit the right SPEAKER A terminals and verify that the relay cuts off immediately.
  4. Repeat for the left SPEAKER A terminals.
- 1-4 METER ADJUSTMENT**
1. Apply a 1KHz sine wave at 500mV (-6dBV) to the LINE input jacks.
  2. Adjust the right LEVEL control to maximum (CW).
  3. Set the METER RANGE switch to the OUT position.
  4. Readjust the input voltage for 20Vrms at the right SPEAKER A terminals, with an 8 ohm load (50W into 8 ohms).
  5. Verify the right meter indicates 50W. Readjust TVR 501 if necessary.
  6. Repeat for the left channel.



P.C. BOARD B771-PW ASS'Y

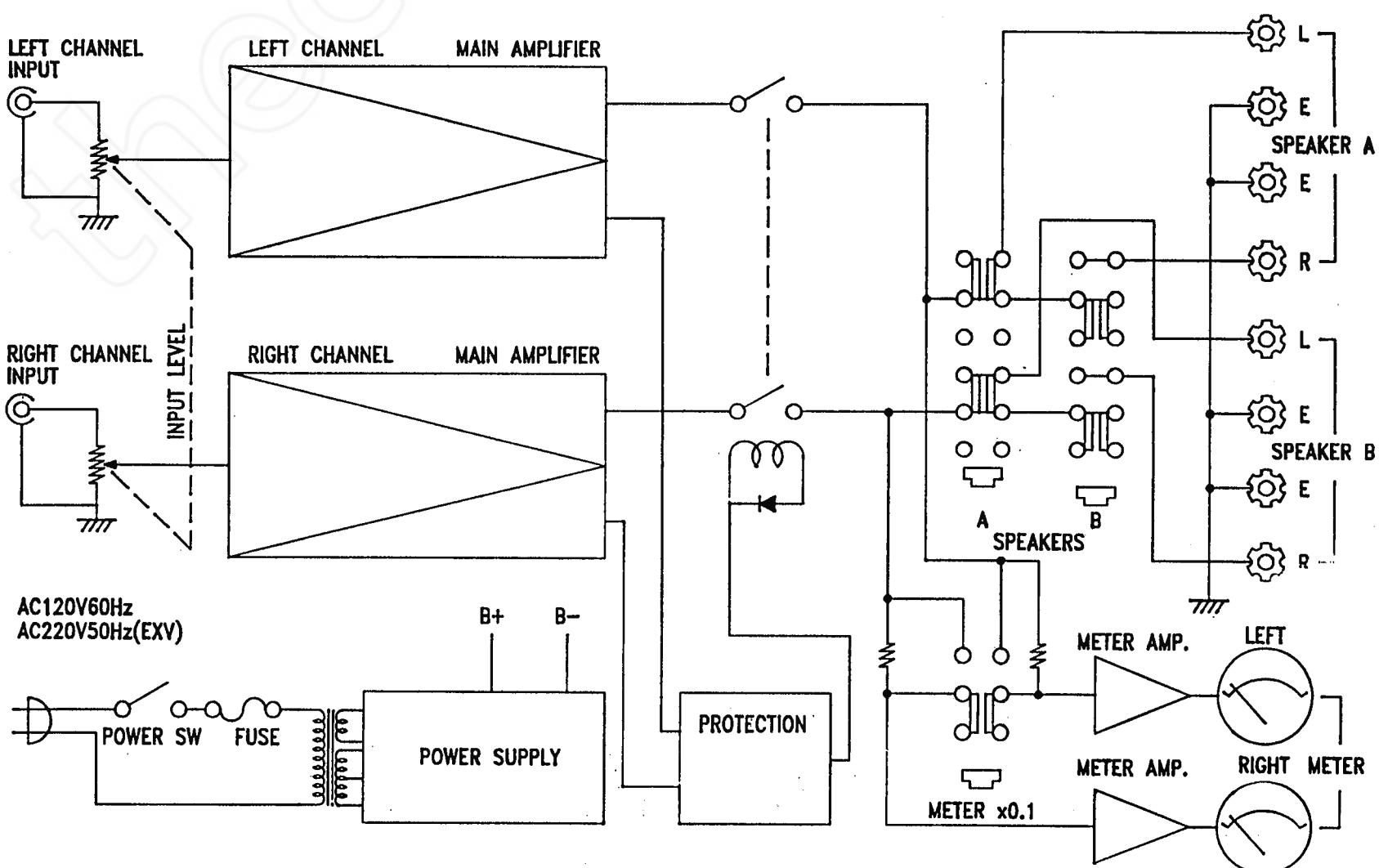
REF. NO.	DESCRIPTION	P/N	QTY
	CONNECTOR E-0319	66E0319***	1
	CONNECTOR E-0324	66E0324***	1
	FUSE HOLDER 6P	67R030UL**	6
	WAFER 5273-3	6652733***	1
	WAFER 5045-2	6650452***	1
-CARBON RESISTORS T TYPE- ALL RESISTORS ARE RATED 5% TOLERANCE AND 1/2W 10 ohm 300010C2TJ			
R099			
-CAPACITORS- C001, C002, C003 .005/500V CERAMIC 42502500RK C003 100U/25V ELEC. 44010U25FRM C014 1000U/25V ELEC. 4401KU24FRM			
-DIODE- D003 1N4004 RECTIFIER 121N4002TO D002 RC-202 BRIDGE RECTIFIER 13RC202*** D007-D010 6A2 RECTIFIER 136A2****			

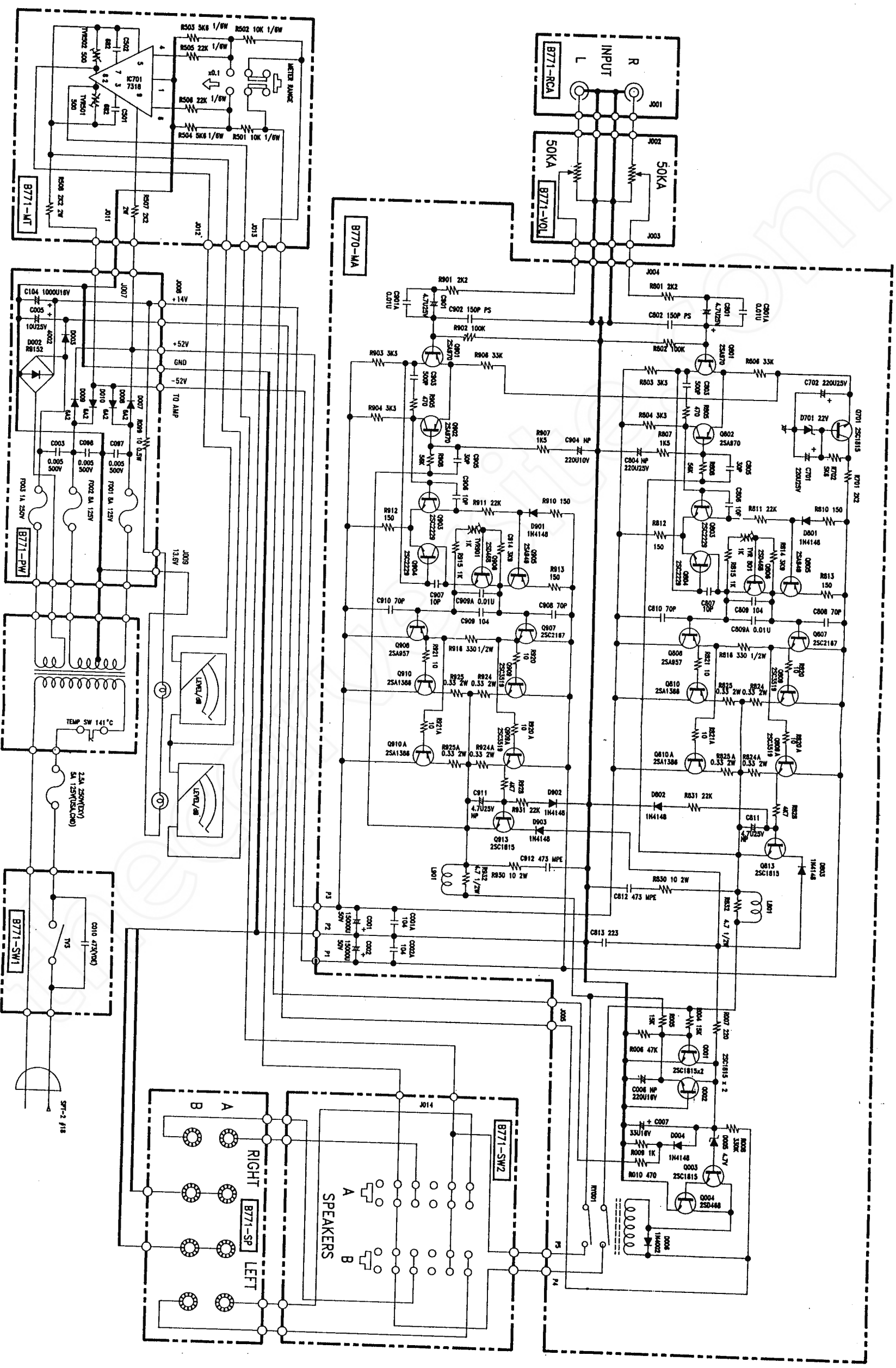
P.C. BOARD B771-VOL ASS'Y

REF. NO.	DESCRIPTION	P/N	QTY
	VR RK163111R382-50KA25KC	3250KA25KC	2
	WAFER 5045-4	6650454***	1
	CONNECTOR E-0316	66E0316***	1
	P.V.C. WIRE #24 90MM	66ED316	1

P.C. BOARD B771-SP ASS'Y

REF. NO.	DESCRIPTION	P/N	QTY
	SPEAKER TERMINAL BDP-208A	555BDP208A	1
	PIN 1X1X19	65010119***	6

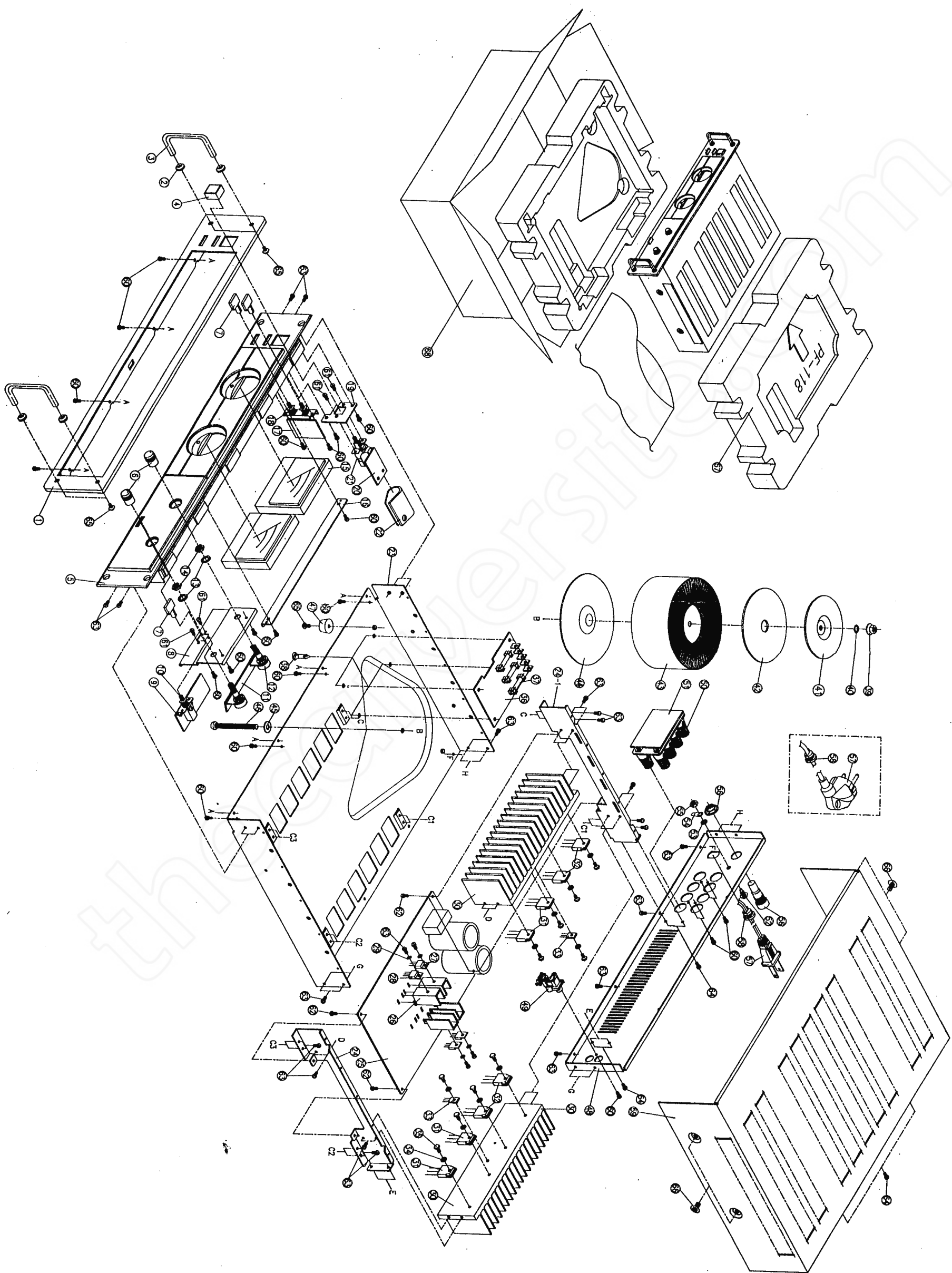




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6. EXPLODED VIEW



# 7. EXPLODED VIEW PARTS LIST

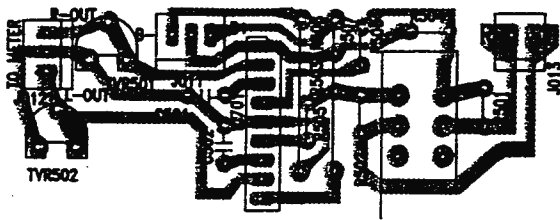
REF. NO.	DESCRIPTION	P/N	QTY	REMARK
1.	AL FRONT PANEL L-324			
2.	AL PAD FOR HOLDER H-214	75L324EBG1	1	
3.	HOLDER H-213	76H214B***	4	
4.	PUSH KNOB KN-260 (B) FOR POWER	76H213B***	2	
5.	PLASTIC FRONT PANEL A-346-1	80260B****	1	
6.	KNOB KB-264 (B)	79A346BHC*	1	
7.	PUSH KNOB KB-263 (B)	80264B****	2	
8.	VR HOLDER C-1445	80263B****	3	
9.	PCB B771-MT	78C1445FEW	1	
10.	PUSH SWITCH SPUF12AA05	60B771MTV0	1	
11.	PCB B771-VOL	20UF12AA05	1	
12.	VR RK163111R382-50KAx25KC	60B771VOLO	1	
13.	WASHER 7φ	3250KA25KC	2	
14.	NUT 7φ	88WF07P14W	1	
15.	AMPERE METER TN-90-8779	88N607W***	1	
16.	METER HOLDER C-1444	64TN908779	2	
17.	PCB B771-SW2	78C1444TEW	1	
18.	PUSH SW SPUN24C201	60B771SW20	1	
19.	POWER SW HOLDER C-1446	20UN24C201	1	
20.	PCB B771-SW1	78C1446FEW	1	
21.	AC SWITCH SDDL1027U-W	60B771SW10	1	
22.	UL TUBE 33φx40	20DLB1027U	1	
23.	BOTTOM CHASSIS C-1451	6233L40VW1	1	
24.	HOLDER OF HEAT SINK (R) C-1453	78C1451FEW	1	
24-1.	HOLDER OF HEAT SINK (L) C-1454	78C1453W**	1	
25.	PCB B770-MA	78C1454W**	1	
26.	HEAT SINK H-042	60B770MAV0	1	
27.	TR. 2SC2167	76H042W***	4	
28.	TR. 2SA957	122SC2167*	2	
29.	WASHER 3φ	122SA957**	2	
30.	HEAT SINK H-216	88WF03P8**	4	
31.	TR. 2SA1386	76H216W***	2	
32.	TR. 2SC3519	122SA1386*	4	
33.	TR. 2SC3423	122SC3519*	4	
34.	GEAR WASHER 3φ	122SC3423*	2	
35.	HEXAGON CRTS 3x15 (Y)	88WG03P6**	10	
36.	PCB B771-PW	88SW0315RY	10	
37.	FUSE 6.3φx31.7x1A	60B771PWV0	1	
	FUSE 6.3φx31.7x8A	59UL001A2F	1	
38.	PLASTIC POST FOR PCB SCB-24	59UL008A1F	2	(B771-PW)
39.	NUT M6	96SCB24***	4	(B771-PW)
40.	TOOTHED LOCK WASHER	88N606W***	1	
41.	CHASSIS SPC. 83m/mx2m/m	88WG0306**	1	
42.	RUBBER 96m/mx14m/mx1.5m/m	7883X2T***	1	
43.	RING TRANSFORMER 120V R54037U212CV	84961415**	1	
	RING TRANSFORMER 220V R54037V212CV	R54037U212	1	
44.	RUBBER 116m/mx14m/mx1.5m/m	R54037V212	1	
45.	WASHER 8x14x1.5	84116145*	1	
46.	CROSS RECESSED HEAD BOLT M65m/m	88WF08014*	1	
47.	FOOT CUSHION 18φx10m/m	88SM0665RB	1	
48.	REAR PANEL C-1452	81018X10**	4	
49.	RCA JACK #202-1	78C1452***	1	
50.	SPEAKER TERMINAL 8DP-208A	552R202***	1	
51.	PCB B771-SP	555BDD208A	1	
52.	GROUND SCREW GRMS 4x10 (W)	60B771SP**	1	
53.	WASHER 4φ	88SW0410RW	1	EXV
54.	SOLDER 4φ	88WF04P101	1	
55.	NUT 4φ	88SF04****	1	
56.	FUSE HOLDER R3-13	88N604W***	1	
	FUSE 6.3φx31.7x5A	67R313UL**	1	
	FUSE 5φx20x3.15A	59U1005A1F	1	
57.	AC CORD SPT-2 #18	59U23P1A2F	1	EXV
	AC CORD 3P VDE	682XPT22B*	1	
58.	BUSHING B-7	682PVDE2B*	1	EXV
	BUSHING 5N4	96B7*****4	1	
59.	UPPER COVER C-1471	965N4****4	1	
60.	PLASTIC SCREW 1/8x9 (B)	7BC1471W**	2	
61.	SCREW CRMS 3x6 (Y)	88SPE809RB	22	
62.	SCREW CRMS 3x8 (Y)	88SM0306RY	4	
63.	SCREW CRTS 3x6 (Y)	88SM0308RY	4	
64.	SCREW CRMS 4x8 (B)	88ST0306RB	4	
65.	SCREW CRMS 4x8 (B)	88ST0306RB	6	
66.	SCREW CRMS 4x6 (B)	88SM0408RB	8	
67.	STYROFOAM PF-118	88SM0406RB	4	
68.	CARTON	90PF118***	2	
69.	OWNER'S MANUAL	93TFM15***	1	
		91TFM15***	1	



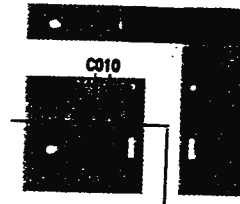


8-3 PC BOARD 771-MT, B771-RCA, B771-SW1, B771-SW2

B771-MT



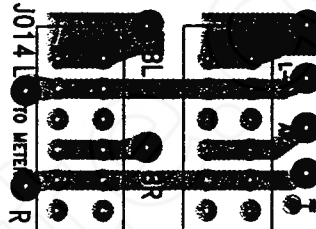
B771-SW1



B771-RCA



B771-SW2



P.C. BOARD B771-MT ASS'Y

REF. NO.	DESCRIPTION	P/N	QTY
	PUSH SWITCH SPUF12AA05	20UP12AA05	1
	WAFER 5045-2	6650452***	1
	WAFER 5045-3	6650453***	2
	-CARBON RESISTORS F TYPE-		
	ALL RESISTORS ARE RATED ±5% TOLERANCE AND 1/4W		
R503, R504	5K6 ohm	3005K6C4TJ	
R501, R502	10K ohm	30010KC4TJ	
R505, R506	22K ohm	30022KC4TJ	
	-METAL RESISTORS T TYPE-		
	ALL RESISTORS ARE RATED ±5% TOLERANCE AND 2W		
R507, R508	2K2 ohm 2W	3002K2M2TJ	
	-CAPACITORS-		
C501, C502	.0068/50V MYLAR	41682250RJ	
	-IC-		
IC701	TA7318	11TA7318**	
	-VARIABLE RESISTORS-		
TVR501, TVR502	500 ohm H TYPE 3 PIN 6φ	31500083HS	

P.C. BOARD B771-RCA ASS'Y

REF. NO	DESCRIPTION	P/N	QTY
	RCA JACK #202-1	552R2021**	1
	CONNECTOR E-D267	66ED267***	1
	P.V.C. WIRE #22 1015		

P.C. BOARD B771-SW1 ASS'Y

REF. NO.	DESCRIPTION	P/N	QTY
	AC SWITCH SDDL81027U-W	20DL81027U	1
	-CAPACITORS-		
C010	.0047/125V UL, VDE	42472250VU	

P.C. BOARD B771-SW2 ASS'Y

REF. NO.	DESCRIPTION	P/N	QTY
	PUSH SW SPUN24C201	20UN24C201	1
	CONNECTOR E-D270	66ED270***	1
	P.V.C. WIRE		1

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