LPS15 Active LPS15.3Active LPS SUB Active

AMPLIFIED LOUDSPEAKER SYSTEM

# SERVICE MANUAL

Schematic Diagrams



Amplified Loudspeaker System LPS 15 Active Amplified Loudspeaker System LPS 15.3 Active Amplified Loudspeaker System LPS SUB Plus Active Bias Adjustements Chart

Spare Parts List

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Service must be carried out by qualified personnel only. Any tampering carried out by unqualified personnel during the guarantee period will forfeit the right to guarantee.

For a correct operation of the instrument, after having switched off, be careful to wait at least 3 seconds before switching on again. To improve the device's specifications, the schematic diagrams may be subject to change without prior notice.

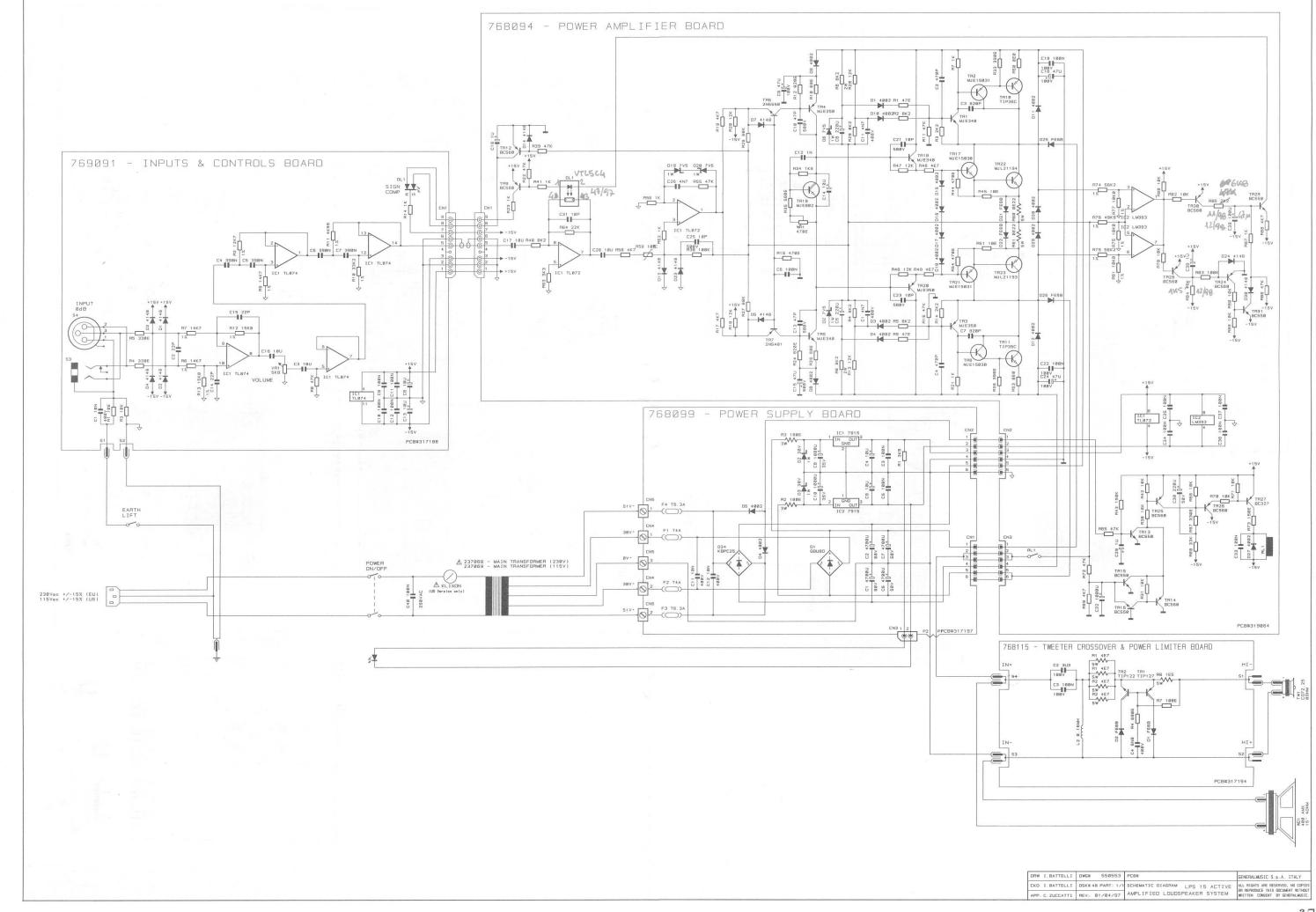
All components marked by this symbol have special safety characteristics, when replacing any of these components use only manufacturer's specified parts.

The  $(\mu)$  micro symbol of capacitance value is substituted by U. The  $(\Omega)$  omega symbol of resistance value is substituted by E. The electrolytic capacitors are 25Vdc rated voltage unless otherwise specified. All resistors are 1/8W unless otherwise specified. All switches shown in the "OFF" position. All DC voltages measured to ground with a voltmeter 20KOhm/V.

- ← Soldering point.
- Male connector
- > Female connector.
- M/F faston connector.
- Flag joined with one or more flags with the same signal name inscribed.
- ♦ Supply voltage.
- Logic supply ground.
- ∆ Analog supply ground.
- → Signal ground.
- Earth ground.



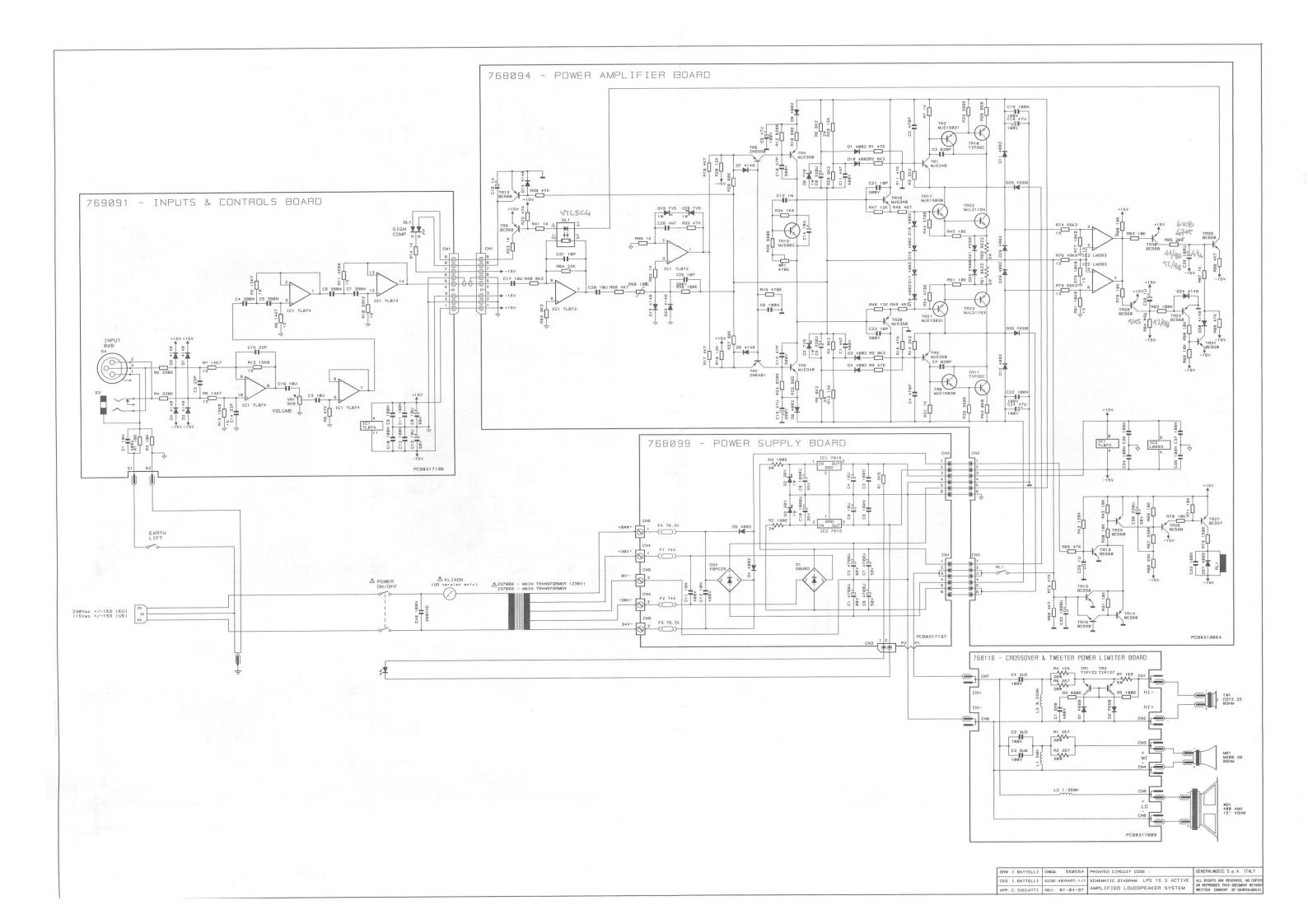


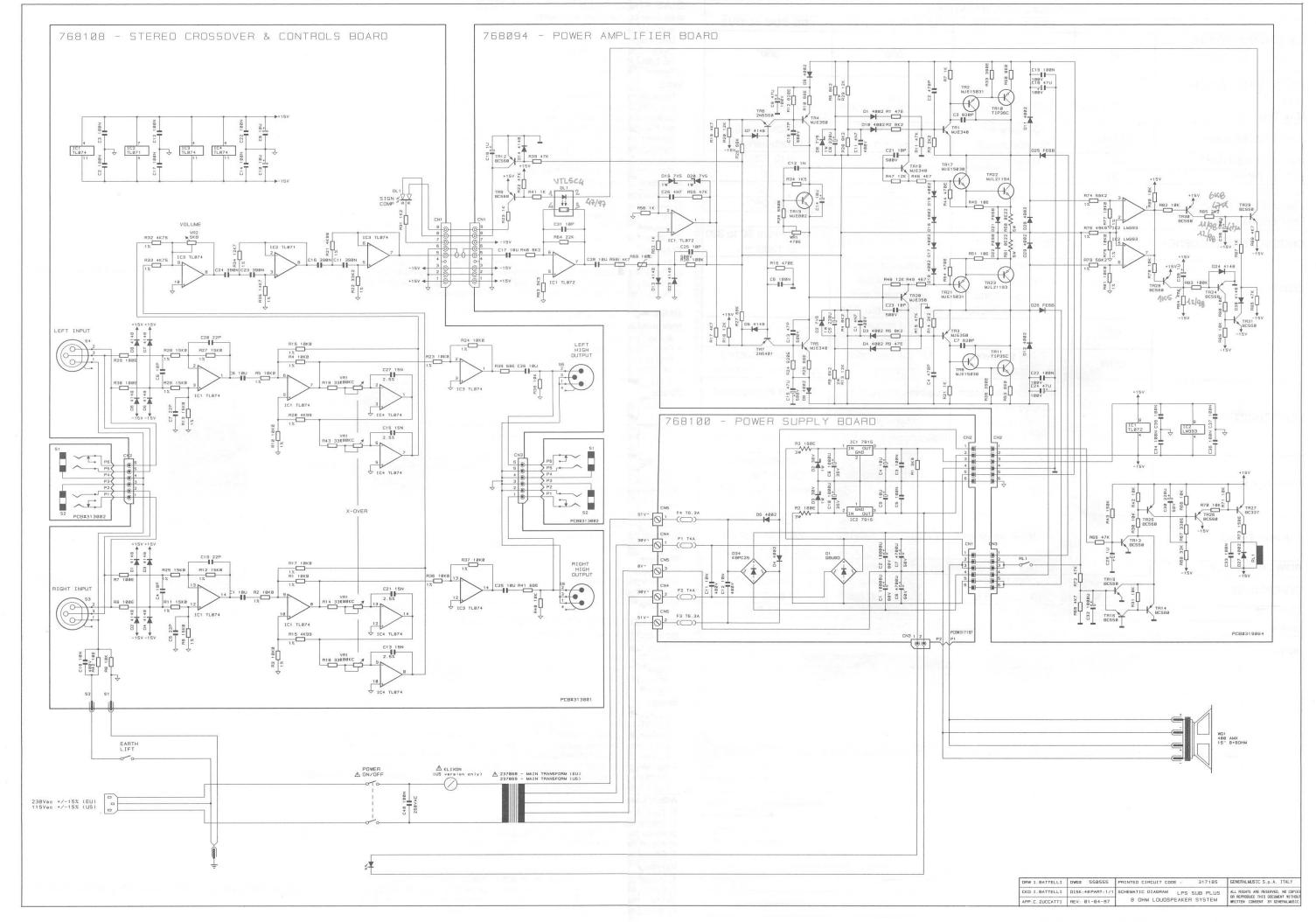


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		ECHNICAL SPECIFICAT	Section 19	LDC CUD ACTIVE
HIE DINIAMIC DOWED		LPS 15 ACTIVE	LPS 15,3 ACTIVE	LPS SUB ACTIVE
IHF DINAMIC POWER Tone burst 10%/20ms Max THD 0.1%	W	350*	350*	350*
EIA OUTPUT POWER 1KHz Max THD 1%	W	300*	300*	300*
INPUT IMPEDANCE	Kohms	30(balanced) 15(unbalanced)	30(balanced) 15(unbalanced)	30(balanced) 15(unbalanced)
INPUT SENSITIVITY	dB	0 (0.775V)	0 (0.775V)	0 (0.775V)
SPL at 1W/1m	dB	99	103	96
MAX SPL	dB	123	125	122
FREQUENCY RESPONSE	Hz(-10dB)	55-18000	45-18000	45-250
DISPERSION (OxV)	0	60x40	90x60	
CROSSOVER FREQUENCY	Hz	3500 at 12dB/ott.	650, 3500 at 12dB/ott.	Variabile from 80 to 320 at 12dB/ott.
COMPONENTS	HIGH	Compression tweeter with elliptical waveguide and electronic protection.	Compression tweeter with elliptical waveguide and electronic protection.	
	MID		8" mid frequency speaker	
	LOW	15" low frequency speaker	15" low frequency speaker	15" low frequency speaker with twin coil.
CONSTRUCTION		Cabinet in chipboard covered with PVC. Metal grid. Polypropylene corners.	Cabinet in chipboard covered with PVC. Metal grid. Polypropylene corners.	Cabinet in chipboard covered with PVC.  Metal grid. Polypropylene corners.
CONTROLS		Volume control SIGN/COMP LED	Volume control SIGN/COMP LED	Volume control XOVER frequency control SIGN/COMP LED
CONNECTIONS		XLR+JACK (in pannel)	XLR+JACK (in pannel)	2XLR-F + JACK 2XLR-M + JACK (input+output L&R)
POWER SUPPLY		see labe	on the apparatus	
DIMENSIONS	mm (LxAxP)	470x610x425	530x690x425	505x570x515
DIMENSIONS	in.(WxHxD)	18.6x24x16.8	20.8x27.2x16.8	19.8x22.4x20.8
WEIGHT	Kg - lbs.	31-68,2	37-81,4	32-70,5
Notes:		* values measured	with anti-clipping not in	sert
Notes:				

# **BIAS ADJUSTMENT - LPS 15 ACTIVE**

#### Instruments, materials and tools:

- Audio Generator
- Dual Trace Oscilloscope
- Digital Voltmeter (or Multimeter)
- 4E 200W Resistor
- Temperature Meter

#### Setup:

- Remove the Power Amplfier Board from the chassis keeping in connections with transformer and diode bridge;
- turn VR1 clockwise up to end-stroke;
- connect the audio generator to the input and set it to output 1KHz sinusoidal signal;
- put the volume potentiometer at its maximum level;
- connect the 4E 200W resistor to the amplifier output instead of the speaker;
- connect the oscilloscope probe on the load (setting 20V/div., 1ms/div);
- insert the temperature sensor through the interstice between the heat-sink and R59 (PTC);
- insert the voltmeter terminals across R60.

#### Adjustement Procedure

- 1) Turn on the amplifier.
- 2) Set the input signal to obtain 0dB (0.775Vms).
- 3) When the temperature has reaches about 50°C set the signal input to minimum (0 or -00).
- 4) Adjust the trimmerVR1 to read a voltage of 10mV ±0.05mV on the multimeter.
- 5) Check that the voltage across the R61 resistor has the same value.

#### Veryfing:

- 1) Increase the input level to obtain an output voltage about of 0.5Vpp.
- 2) Check with the oscilloscope that the output signal is without a cross-talk distortion and eventually slightly adjust the VR1 position until distortion disappears.

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- 3) The voltage value across the R60 and R61 resistors must not exceed 15mV.
- 4) Re-connect the speaker instead of the 4E 200W resistor.

#### **BIAS ADJUSTMENT - LPS 15.3 ACTIVE**

# Instruments, materials and tools:

- Audio Generator
- Dual Trace Oscilloscope
- Digital Voltmeter (or Multimeter)
- 4E 200W Resistor
- Temperature Meter

# Setup:

- Remove the Power Amplfier Board from the chassis keeping in connections with transformer and diode bridge;
- turn VR1 clockwise up to end-stroke;
- connect the audio generator to the input and set it to output 1KHz sinusoidal signal;
- put the volume potentiometer at its maximum level;
- connect the 4E 200W resistor to the amplifier output instead of the speaker;
- connect the oscilloscope probe on the load (setting 20V/div., 1ms/div);
- insert the temperature sensor through the interstice between the heat-sink and R59 (PTC);
- insert the voltmeter terminals across R60.

### Adjustement Procedure

- 1) Turn on the amplifier.
- 2) Set the input signal to obtain 0dB (0.775Vms).
- 3) When the temperature has reaches about 50°C set the signal input to minimum (0 or -\infty).
- 4) Adjust the trimmerVR1 to read a voltage of 10mV ±0.05mV on the multimeter.
- 5) Check that the voltage across the R61 resistor has the same value.

#### Veryfing:

- 1) Increase the input level to obtain an output voltage about of 0.5Vpp.
- 2) Check with the oscilloscope that the output signal is without a cross-talk distortion and eventually slightly adjust the VR1 position until distortion disappears.
- 3) The voltage value across the R60 and R61 resistors must not exeed 15mV.
- 4) Re-connect the speaker instead of the 4E 200W resistor

# **BIAS ADJUSTMENT - LPS SUB ACTIVE**

# Instruments, materials and tools:

- Audio Generator
- Dual Trace Oscilloscope
- Digital Voltmeter (or Multimeter)
- 4E 200W Resistor
- Temperature Meter

# Setup:

- Remove the Power Amplfier Board from the chassis keeping in connections with transformer and diode bridge;
- turn VR1 clockwise up to end-stroke;
- connect the audio generator to the input and set it to output 1KHz sinusoidal signal;
- put the volume potentiometer at its maximum level;
- connect the 4E 200W resistor to the amplifier output instead of the speaker;
- connect the oscilloscope probe on the load (setting 20V/div., 1ms/div);
- insert the temperature sensor through the interstice between the heat-sink and R59 (PTC):
- insert the voltmeter terminals across R60.

# Adjustement Procedure

- 1) Turn on the amplifier.
- 2) Set the input signal to obtain 0dB (0.775Vms).
- 3) When the temperature has reaches about 50°C set the signal input to minimum (0 or -00).
- 4) Adjust the trimmerVR1 to read a voltage of 10mV ±0.05mV on the multimeter.
- 5) Check that the voltage across the R61 resistor has the same value.

- 1) Increase the input level to obtain an output voltage about of 0.5Vpp.
- 2) Check with the oscilloscope that the output signal is without a cross-talk distortion and eventually slightly adjust the VR1 position until distortion disappears.
- 3) The voltage value across the R60 and R61 resistors must not exeed 15mV.
- 4) Re-connect the speaker instead of the 4E 200W resistor.

#### SPARE PARTS - LPS 15 Active

# ACCESSORIES

887069 Signal Cable (15m) 277305 Owner's Manual

VARIOUS 667594 Power Amplifer Panel 659027 Cyl. Knob White Cap 237068 350W Transformer (EU) 237069 350W Transformer (US) 190133 Lateroid Insulator For Screw Block 110614 Mains Socket 110291 Power Switch 110029 T4A Fuse 5x20mm (EU) 110018 T6.3A Fuse 5x20mm (EU) 110037 T6.3A Fuse 6.3x32mm (US) 110036 T4A Fuse 6.3x32mm (US) 080607 Kbpc25 25a 200V Bridge Rec Dio

717044 Wooden Part

667631 Metal Grid

347341 Elliptical Horn 347287 Plastic Handle

347286 Plastic Setted Handle 347263 Plastic Flange

347187 Plastic Grip 229034 8 ohm Tweeter

227045 15" Woofer 210215 Adhesive Rubber

130297 Mains Cord (EU) 130283 Mains Cord (US)

# Crossover & Tweeter Power Limiter Board

768115	Cr	ossover & Tweeter Power Limiter Board (PCB#317194)
230536	*	0.16mh 1mm Crossover Coil
090559	*	TIP122 TO220 Npn Darlington Transistor
090558	*	TIP127 TO220 Pnp Darlington Transistor
080171	*	Fe6b 6a 100V Fast Recovery Diode

#### Inputs & Controls Board

768091	*	Inputs & Controls Board (PCB#317186)
141187	**	XLR Female Horizontal Connector
140929	**	9 Contacts Vert Male Connector
140217	**	Horizontal Jack Stereo Slim Socket
100084	**	TL074 Quad J-Fet Operational Amplifier
080734	**	Led 2.5x5mm Rect Diff Red-Grn
080103	**	1N4148 100mA 75V Signal Diode
074570	**	5K lin. 31 clicks Potentiometer
042665	**	33K2 1/4w 1% Metalized Film Resistor
042625	**	15K0 1/4w 1% Metalized Film Resistor
042621	**	14K7 1/4w 1% Metalized Film Resistor
042614	**	12K7 1/4w 1% Metalized Film Resistor
042565	**	4K99 1/4w 1% Metalized Film Resistor

### Power Supply Board

768099	*	Power Supply Board (PCB#317197)	
140917	**	2 Contacts Vert Male Connector	
140081	**	H 2c P=10 Terminal Block	
140069	**	H 3c P=10mm Terminal Block	
110119	**	Fuse Clip 10A max (EU) (US)	
100060	**	7815 +15V 1A Voltage Regulator	
100049	**	7915 -15v 1a Voltage Regulator	
080606	**	GBU8D 8A Rectifier Diodes Bridge	
080342	**	30V 1w 5% Zener Diode	
080156	**	1N4002 1A 100V Rectifier Diode	
030722	**	1000u 35v 20% Vert Electrolytic Capacitor	
030560	**	4700u 80v 20% Snap-In Electrolytic Capacitor	
030555	**	4700u 50V 20% Snap-In Electrolytic Capacitor	

#### 350W Power Amplifer Board

768094	*	350W Power Amplifer Board (PCB#318094)	
757942	**	Photores Coupler	
140929	**	9 Contacts Vert Male Connector	
140927	**	24 Contacts Vert Male Strip	
110316	**	Relay 24V / 1 Switch no 16A 250V	Vanish de de
100904	**	LM393 Dual Comparator	
100061	**	TL072 Dual J-Fet Operational Amplifier	***********
090917	**	MJE350 TO126 Pnp Transistor	Communica
090916	**	MJE340 TO126 Npn Transistor	
090201	**	2n5401 To92 Pnp Transistor	economico.
090200	**	2n5550 To92 Npn Transistor	
090194	**	BC560 TO92 LN Pnp Transistor	178775.224
090183	**	Bc550 To92 Ln Npn Transistor	

090153	**	BC327 TO92 Pnp Transistor
080245	**	7V5 1w 5% Zener Diode
080171	**	Fe6b 6a 100V Fast Recovery Diode
080156	**	1N4002 1A 100V Rectifier Diode
080103	**	1N4148 100mA 75V Signal Diode
070105	**	470e 20% Vertical Linear Trimmer
)42695	**	56K2 1/4w 1% Metalized Film Resistor
)42605	**	10K0 1/4w 1% Metalized Film Resistor
30715	**	1000u 6v3 20% Vert Electrolytic Capacitor
30565	**	220u 25V 20% Vert Electrolytic Capacitor
30564	**	220u 50V 20% Vert Electrolytic Capacitor
10595	**	100n 50V -20+80% Ceramic Cap. Multilayer
10462	**	1n 50V 10% CL2 Ceramic Capacitor
90924	*	Mjl21194 To264 Npn Transistor
90923	*	Mjl21193 To264 Pnp Transistor
90920	*	Mje803 To126 Npn Darl Transistor
90919	*	Mje15031 To220 Pnp Transistor
90918	*	MJE15030 TO220 Npn Transistor
90863	*	TIP36C TO218 Pnp Transistor
90862	*	TIP35C TO218 Npn Transistor

# SPARE PARTS - LPS 15.3 Active

080821 \* Ptc 90 Pth59f04be222ts

## ACCESSORIES

887069 Signal Cable (15m) 277305 Owner's Manual

667594 Power Amplifer Panel

### VARIOUS

659027 Cyl. Knob White Cap 237068 350W Transformer (EU) 237069 350W Transformer (US) 190133 Lateroid Insulator For Screw Block 110614 Mains Socket 110291 Power Switch 110029 T4A Fuse 5x20mm (EU) 110018 T6.3A Fuse 5x20mm (EU) 110037 T6.3A Fuse 6.3x32mm (US) 110036 T4A Fuse 6.3x32mm (US) 080607 Kbpc25 25a 200V Bridge Rec Dio 667632 Metal Grid 347341 Elliptical Horn 347287 Plastic Handle 347286 Plastic Setted Handle 347263 Plastic Flange 347187 Plastic Grip 229034 8 ohm Tweeter 228009 8" Speaker

227044 15" Woofer

210215 Adhesive Rubber 277305 Owner's Manual 130297 Mains Cord (EU)

130283 Mains Cord (US)

# Crossover & Tweeter Power Limiter Board

768116	Cr	ossover & Tweeter Power Limiter Board (PCB#317009)
230548	*	2mh 0.82mm Crossover Coil
230546	*	1.35mh 1mm Crossover Coil
230537	*	0.22mh 0.75mm Crossover Coil
090559	*	TIP122 TO220 Npn Darlington Transistor
090558	*	TIP127 TO220 Pnp Darlington Transistor
080171	*	Fe6b 6a 100V Fast Recovery Diode

# Inputs & Controls Board

768091	*	Inputs & Controls Board (PCB#317186)
141187	**	XLR Female Horizontal Connector
140929	**	9 Contacts Vert Male Connector
140217	**	Horizontal Jack Stereo Slim Socket
100084	**	TL074 Quad J-Fet Operational Amplifier
080734	**	Led 2.5x5mm Rect Diff Red-Grn
080103	**	1N4148 100mA 75V Signal Diode
074570	**	5K lin. 31 clicks Potentiometer
042665	**	33K2 1/4w 1% Metalized Film Resistor
042625	**	15K0 1/4w 1% Metalized Film Resistor
042621	**	14K7 1/4w 1% Metalized Film Resistor
042614	**	12K7 1/4w 1% Metalized Film Resistor
042565	**	4K99 1/4w 1% Metalized Film Resistor

# Power Supply Board

68099	*	350W Power Supply Board (PCB#317197)
40917	**	2 Contacts Vert Male Connector

140081	**	H 2c P=10 Terminal Block
40069	**	H 3c P=10mm Terminal Block
110119	**	Fuse Clip 10A max (EU) (US)
00060	**	7815 +15V 1A Voltage Regulator
00049	**	7915 -15v 1a Voltage Regulator
080606	••	GBU8D 8A Rectifier Diodes Bridge
080342	**	30V 1w 5% Zener Diode
080156	**	1N4002 1A 100V Rectifier Diode
30722	••	1000u 35v 20% Vert Electrolytic Capacitor
30560	**	4700u 80v 20% Snap-In Electrolytic Capacitor
030555	••	4700u 50V 20% Snap-In Electrolytic Capacitor

### Power Amplifer Board

768094	*	Power Amplifer Board (PCB#318094)
757942	**	Photores Coupler
40929	**	9 Contacts Vert Male Connector
140927	**	24 Contacts Vert Male Strip
110316	**	Relay 24V / 1 Switch no 16A 250V
100904	**	LM393 Dual Comparator
100061	**	TL072 Dual J-Fet Operational Amplifier
090917	**	MJE350 TO126 Pnp Transistor
090916	••	MJE340 TO126 Npn Transistor
090201	**	2n5401 To92 Pnp Transistor
090200	**	2n5550 To92 Npn Transistor
090194	**	BC560 TO92 LN Pnp Transistor
090183	**	Bc550 To92 Ln Npn Transistor
090153	**	BC327 TO92 Pnp Transistor
080245	**	7V5 1w 5% Zener Diode
080171	**	Fe6b 6a 100V Fast Recovery Diode
080156	**	1N4002 1A 100V Rectifier Diode
080103	**	1N4148 100mA 75V Signal Diode
070105	**	470e 20% Vertical Linear Trimmer
042695	**	56K2 1/4w 1% Metalized Film Resistor
042605	**	10K0 1/4w 1% Metalized Film Resistor
030715	**	1000u 6v3 20% Vert Electrolytic Capacitor
030565	••	220u 25V 20% Vert Electrolytic Capacitor
030564	**	220u 50V 20% Vert Electrolytic Capacitor
010595	**	100n 50V -20+80% Ceramic Cap. Multilayer
010462	**	1n 50V 10% CL2 Ceramic Capacitor
090924	*	Mjl21194 To264 Npn Transistor
090923	*	Mjl21193 To264 Pnp Transistor
090920		Mje803 To126 Npn Darl Transistor
090919	*	Mje15031 To220 Pnp Transistor
090918		MJE15030 TO220 Npn Transistor
090863	٠	TIP36C TO218 Pnp Transistor
090862	*	TIP35C TO218 Npn Transistor
080821		Ptc 90 Pth59f04be222ts

#### SPARE PARTS - LPS SUB Plus

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AC	CESS	ORIES

887069 Signal Cable (15m) 277305 Owner's Manual

# VARIOUS

VARIOU	9
659027	Cyl. Knob White Cap
659026	Cyl. Knob Orange Cap
237068	350W Transformer (EU)
237069	350W Transformer (US)
210215	Adhesive Rubber
190133	Lateroid Insulator For Screw Block
177475	Transformer Shield
110614	Mains Socket
110291	Power Switch
110029	T4A Fuse 5x20mm (EU)
110018	6.3A Fuse 5x20mm (EU)
110037	T6.3A Fuse 6.3x32mm (US)
110036	T4A Fuse 6.3x32mm (US)
080607	Kbpc25 25a 200V Bridge Rec Dio
717046	Wooden Part
667633	Metal Grid
347287	Plastic Handle
347286	Plastic Setted Handle
347263	Plastic Flange
347187	Plastic Grip
227050	15" Speaker
210215	Adhesive Rubber
130297	Mains Cord (EV)
130283	Mains Cord (US)

# Inputs & Controls Board

768109	*	Inputs & Controls Boards (PCB#313002)
140217	**	Horizontal Jack Stereo Slim Socket

768108	*	Inputs & Controls Boards (PCB#313001)
141187	**	XLR Female Horizontal Connector
141186	**	XLR Male Horizontal Connector
140929	**	9 Contacts Vert Male Connector
140908	**	6 Contacts Vert Male Small Connector
100084	**	TL074 Quad J-Fet Operational Amplifier
100019	**	TI071 Ln J-Fet Op Amp
080734	**	Led 2.5x5mm Rect Diff Red-Grn
080103	**	1N4148 100mA 75V Signal Diode
074570	**	5K lin. 31 clicks Potentiometer
042665	**	33K2 1/4w 1% Metalized Film Resistor
042625	**	15K0 1/4w 1% Metalized Film Resistor
042621	**	14K7 1/4w 1% Metalized Film Resistor
042614	**	12K7 1/4w 1% Metalized Film Resistor
042605	**	10K0 1/4w 1% Metalized Film Resistor
042565	**	4K99 1/4w 1% Metalized Film Resistor
042564	**	4K75 1/4w 1% Metalized Film Resistor
030247	**	10u 25V 20% Vert Electrolytic Bipolar Capacitor
030245	**	10u 50V 20% Vert Electrolytic Capacitor

#### Power Supply Board

140917 ** 2 Contacts Vert Male Connector 140081 ** H 2c P=10 Terminal Block 140069 ** H 3c P=10mm Terminal Block	
140069 ** H 3c P=10mm Terminal Block	
110119 ** Fuse Clip 10A max (EU) (US)	
100060 ** 7815 +15V 1A Voltage Regulator	
100049 ** 7915 -15v 1a Voltage Regulator	
080606 ** GBU8D 8A Rectifier Diodes Bridge	
080342 ** 30V 1w 5% Zener Diode	
080156 ** 1N4002 1A 100V Rectifier Diode	
030722 ** 1000u 35v 20% Vert Electrolytic Capacitor	
030555 ** 4700u 50V 20% Snap-In Electrolytic Capacitor	

768094	Po	wer Amplifer Board (PCB#319064)	
757942		Photores Coupler	
140929		9 Contacts Vert Male Connector	
140927		24 Contacts Vert Male Strip	
110316	*	Relay 24V / 1 Switch no 16A 250V	
100904	*	LM393 Dual Comparator	
100061	*	TL072 Dual J-Fet Operational Amplifier	
090917	*	MJE350 TO126 Pnp Transistor	
090916	٠	MJE340 TO126 Npn Transistor	
090201	*	2n5401 To92 Pnp Transistor	
090200	*	2n5550 To92 Npn Transistor	
090194	*	BC560 TO92 LN Pnp Transistor	
090183	*	Bc550 To92 Ln Npn Transistor	
090153	*	BC327 TO92 Pnp Transistor	
080245	*	7V5 1w 5% Zener Diode	
080171		Fe6b 6a 100V Fast Recovery Diode	
080156	*	1N4002 1A 100V Rectifier Diode	
080103		1N4148 100mA 75V Signal Diode	
070105	*	470e 20% Vertical Linear Trimmer	
042695	*	56K2 1/4w 1% Metalized Film Resistor	
042605	*	10K0 1/4w 1% Metalized Film Resistor	
030715	*	1000u 6v3 20% Vert Electrolytic Capacitor	
030565	*	220u 25V 20% Vert Electrolytic Capacitor	
030564	*	220u 50V 20% Vert Electrolytic Capacitor	
010595	*	100n 50V -20+80% Ceramic Cap. Multilayer	
010462	*	1n 50V 10% CL2 Ceramic Capacitor	
090924	*	Mjl21194 To264 Npn Transistor	
090923	*	Mjl21193 To264 Pnp Transistor	
090920	*	Mje803 To126 Npn Darl Transistor	
090919	*	Mje15031 To220 Pnp Transistor	
090918	*	MJE15030 TO220 Npn Transistor	
090863	٠	TIP36C TO218 Pnp Transistor	
090862	*	TIP35C TO218 Npn Transistor	
080821	•	Ptc 90 Pth59f04be222ts	

Notes:			
Each spare pa	art is single quantity unless otherwise specified		
Asterisk prefix	explanation:		
Omitted	= First level spare part.		
One asterisk	= Second level, part of previous listed first level part.		
Two asterisk	= Third level, part of previous listed second level part.		
Three asterisk	( =		
Any request for	not above mentioned part must encompass specific description including:		
1) Model nam	e,		
2) Section,			
3) Module cod	le,		
4) Reference	name,		
5) Quantity nu	imber.		