

# ENERGY 3

HIGH PERFORMANCE POWER AMPLIFIER

## SERVICE MANUAL *Schematic Diagrams*



CODE: 277.251



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### Notice

Service must be carried out by qualified operators: any tampering done by unqualified operator during the guarantee period will forfeit the right to guarantee.

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

### Schematic Notes

△ 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  $1/8\Omega$ unless otherwise specified.  
All switches show in "OFF" position. All DC voltages measured to ground with a voltmeter 20KOhm/V.

- |   |  |   |                       |
|---|--|---|-----------------------|
| ← | Solder point.  | ↑ | Supply voltage.       |
| ● | Male connector.  | ↓ | Logic supply ground.  |
| ○ | Female connector.  | ↓ | Analog supply ground. |
| — | M/F faston connector.  | ↓ | Signal ground.        |
| □ | Test point.  | ↓ | Chassis ground.       |
| — | Flag joined with one more flags with the same signal name inscribed. |   |                       |



### ATTENTION

Observe precautions when handling electrostatic sensitive devices.

# ENERGY 3 · TECHNICAL SPECIFICATIONS

## POWER SPECIFICATIONS

IHF dinamic power	2 Ω 4Ω 8Ω 4Ω bridged 8Ω bridged 16Ω bridged	1500W 1500W 900W 3000W 3000W 1750W
Tone burst 10%/20ms		
max THD 0.1%		
Both channels driven		
Both channels driven		
FTC output power	2 Ω 4Ω 8Ω 4Ω bridged 8Ω bridged 16Ω bridged	1100W 1200W 750W 2200W 2500W 1500W
20Hz-20KHz		
max THD 0.1%		
Both channels driven		
EIA output power	2 Ω 4Ω 8Ω 4Ω bridged 8Ω bridged 16Ω bridged	1100W (1200W single channel) 1250W (1400W single channel) 750W (900W single channel)
1kHz		
max THD 1%		
Both channels driven		

## ELECTRICAL SPECIFICATIONS

INPUTS	SENSITIVITY	0dB (0.775V) or +8dB (1.95V)
	IMPEDANCE	30kΩ (balanced) · 15kΩ (unbalanced)
FREQUENCY RESPONSE		20÷20000 Hz (-0.5dB)
PHASE RESPONSE		±15° @ 20 Hz / ±25° @ 20kHz
VOLTAGE GAIN		39dB (±0.5) or 32 dB (±0.5)
SLEW RATE		±27 V/μs
DAMPING FACTOR		>600:1 (@ 1kHz / 8Ω)
CMRR		±90 dB (@ 1kHz)
CROSSTALK		±100 dB (@ 1kHz)
M & NOISE		±100 dB
nl harmonic distortion (THD+N)		≤0.020% @ 1kHz / ≤0.030% 20÷20000Hz
Inter-modulation distortin (IMD)		≤0.020%

PROTECTIONS	POWER SUPPLY	(SMPTE method, 60Hz & 7kHz, 4:1 ratio) Power transformer thermal protection
	AMPLIFIER	Heat sink thermal protection Shot circuit protection Power transistor SOA processor
	SPEAKERS	Delay turn-on Sensor for current on output

CONTROLS	FRONT PANEL	ANTI-CLIPPING ON-OFF switch Signal level control for each channel
	BACK PANEL	STEREO/BIDGE/PARALLEL selector Input sensitivity selector Minimum impedance selector

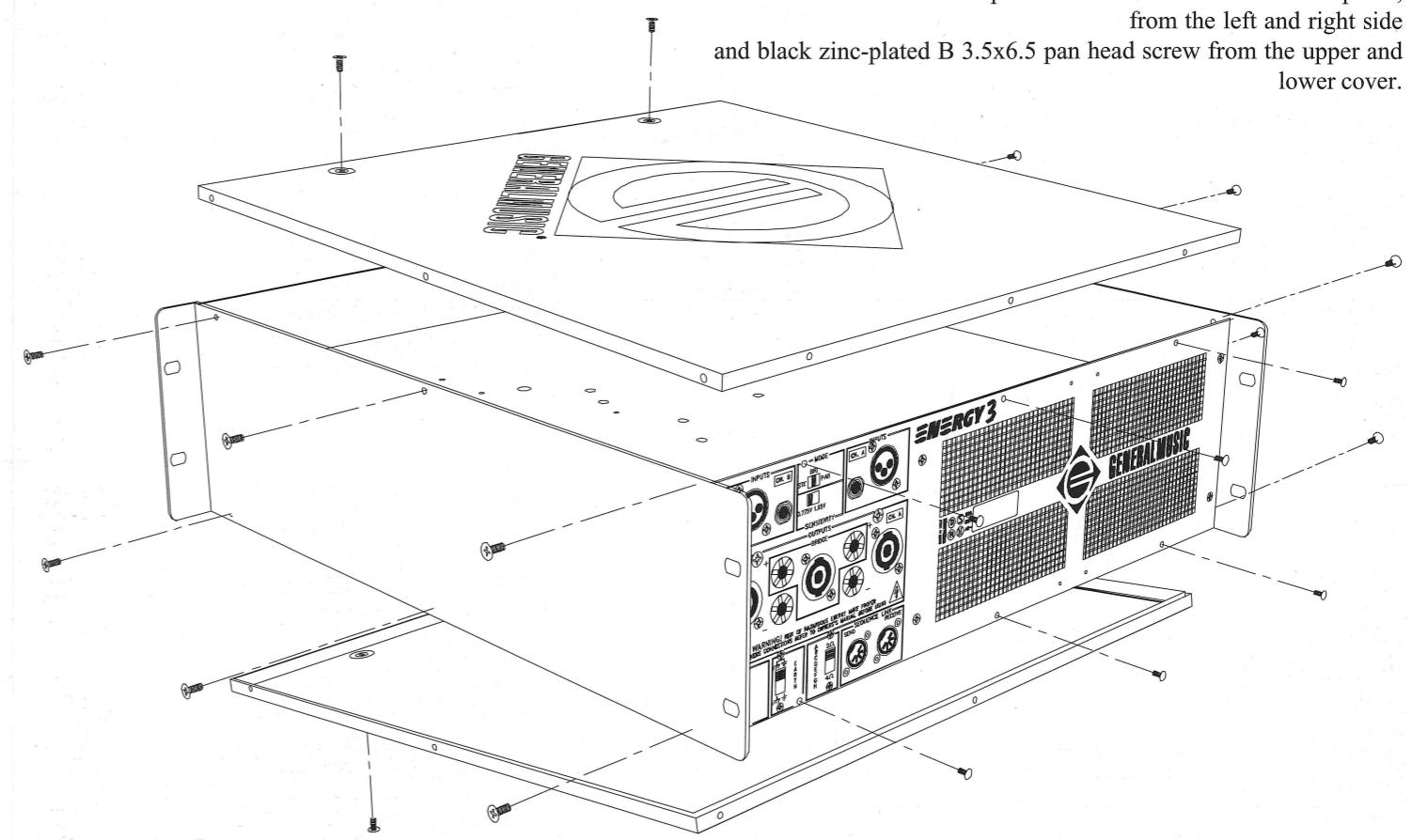
INDICATORS		Earth lift STEREO/BIDGE/PARALLEL: 3 yellow LEDs SIGNAL/CLIP: 1 green/red LED for each channel
------------	--	---

CONNECTORS	INPUT	PROTECT: 1 red LED for each channel 1 XLR-F + 1 JACK in parallel for each channel
	OUTPUT	1 SPEAKON 4-way for each channel 1 SPEAKON 4-way for BRIDGE output 2 binding-post for each channel
	SEQUENCE LINK	2 DIN 5-way for SEND & RECEIVE

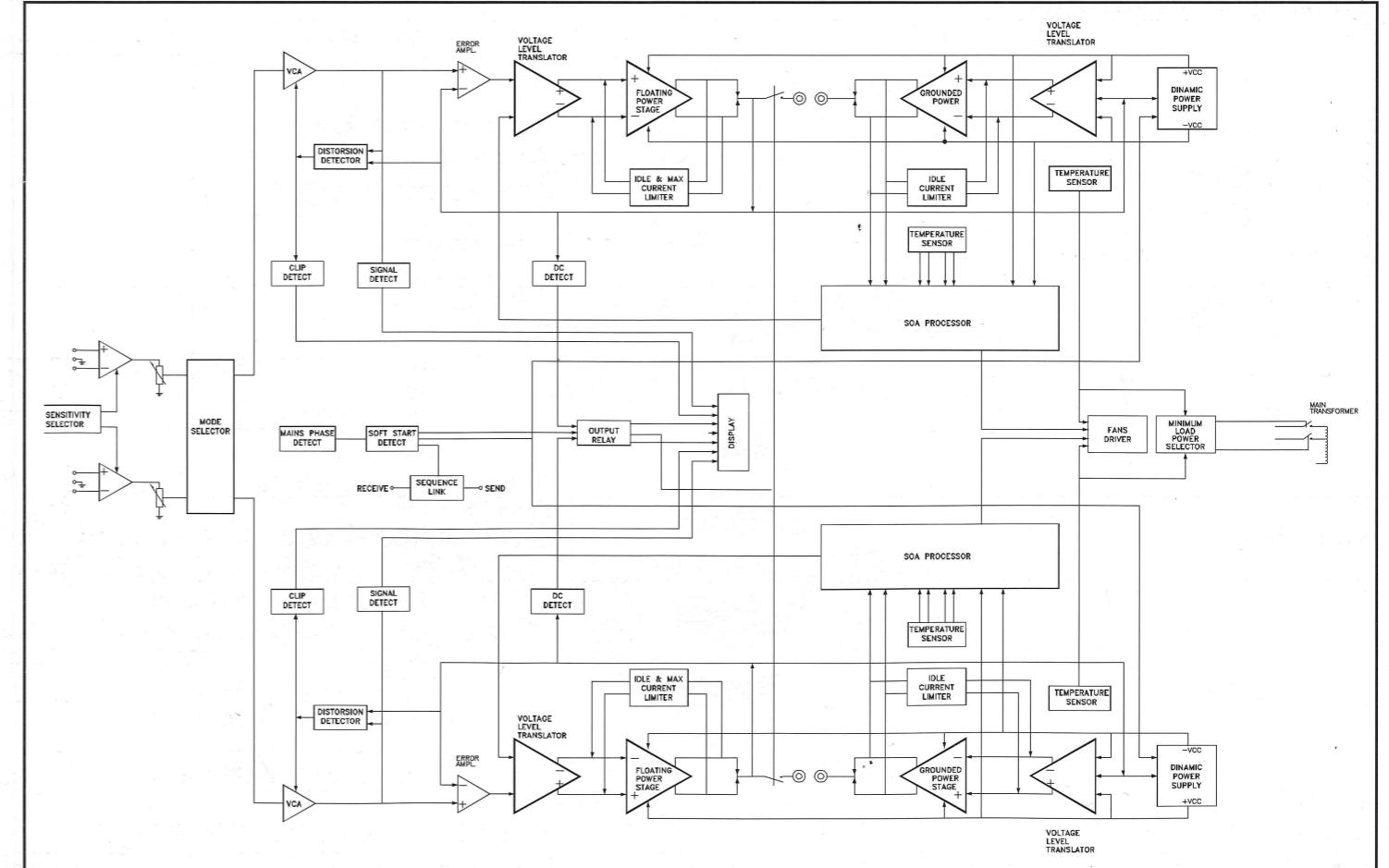
POWER SUPPLY	see label on the apparatus
DIMENSIONS (WxHxD)	483x132.5x507mm / (190.2x52.2x199.6 in.)
WEIGHT	324.5kg / (76 lbs.)

## Opening Instructions

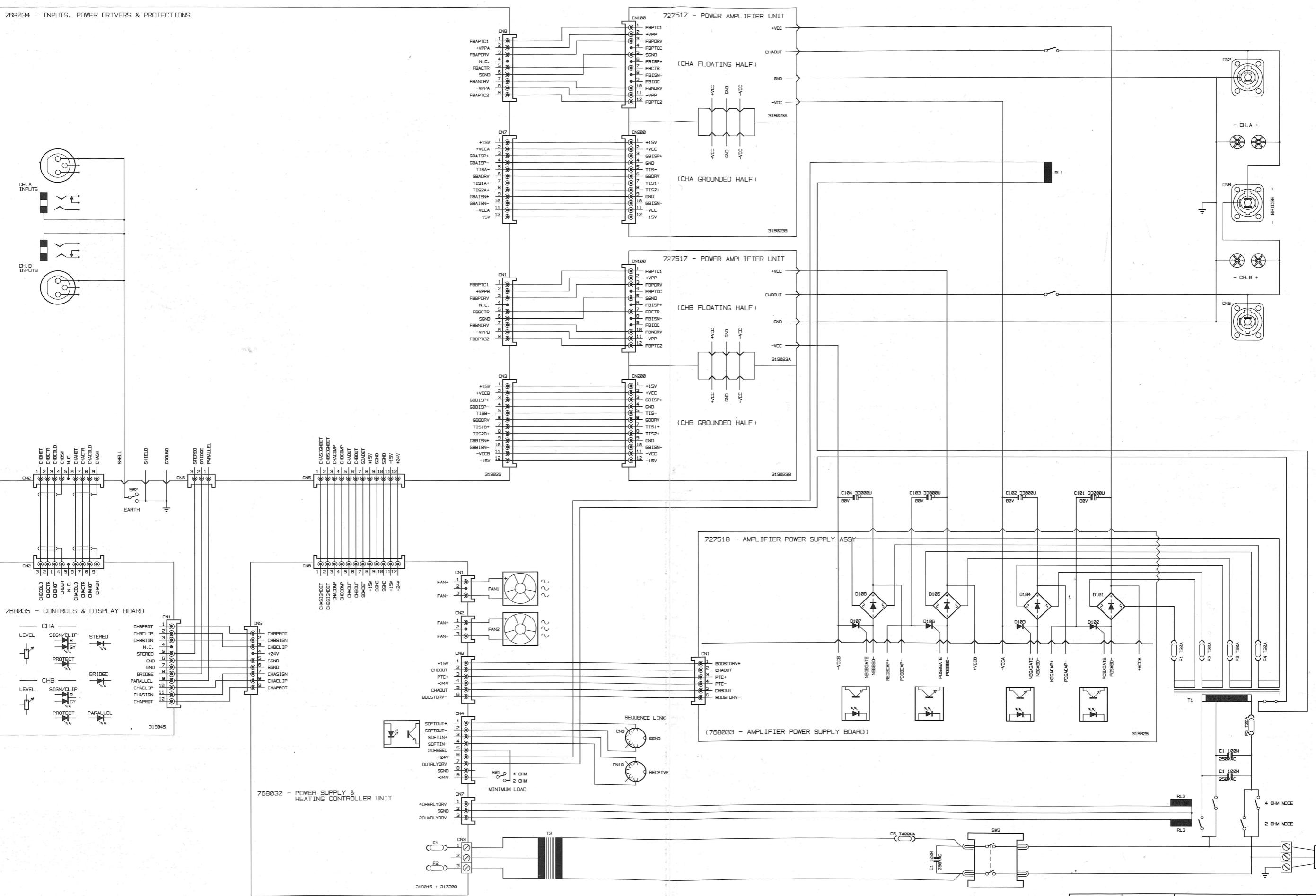
To open the instrument remove black zinc-plated M3x8 screws from the rear panel, from the left and right side and black zinc-plated B 3.5x6.5 pan head screw from the upper and lower cover.

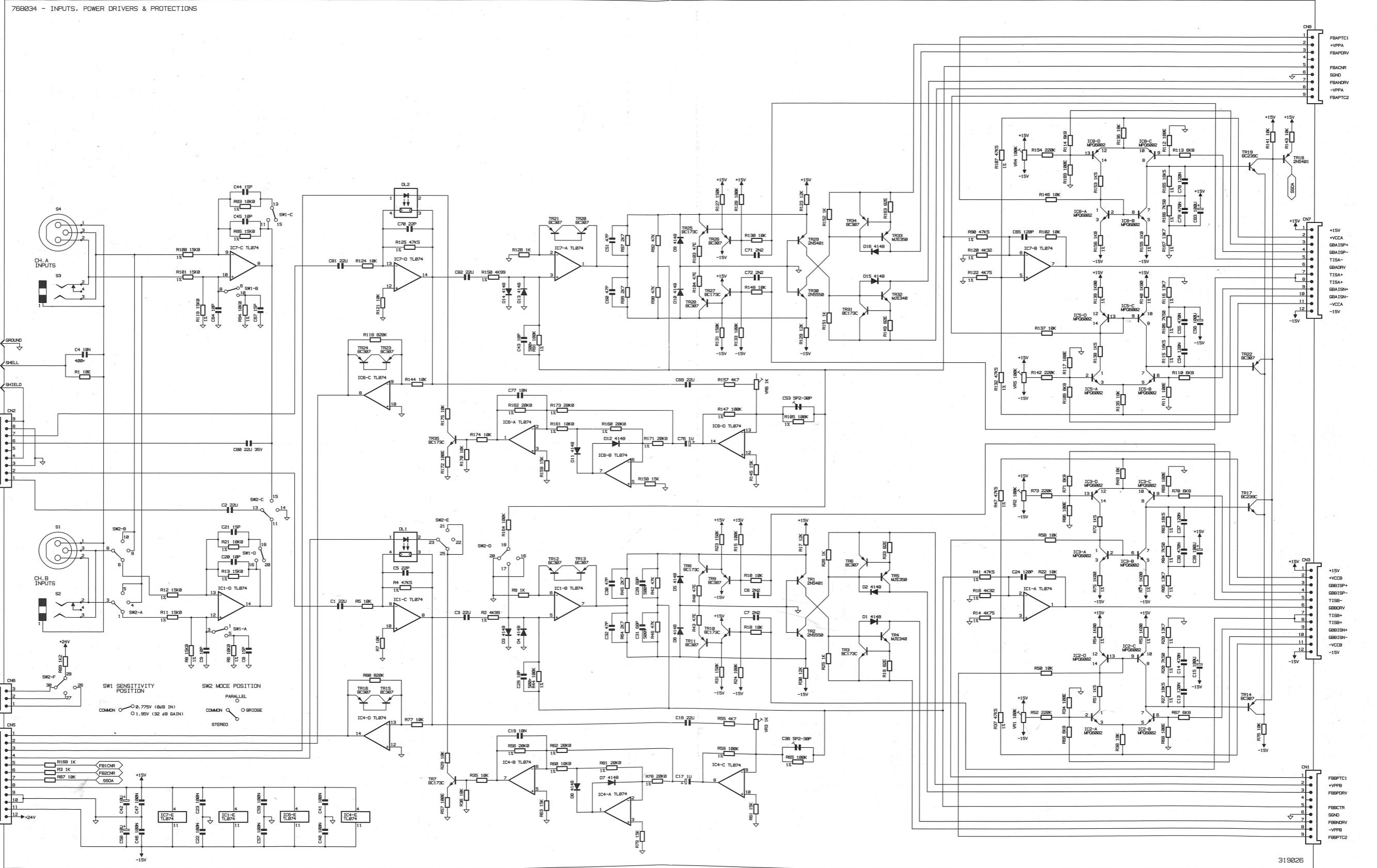


## Block Diagram

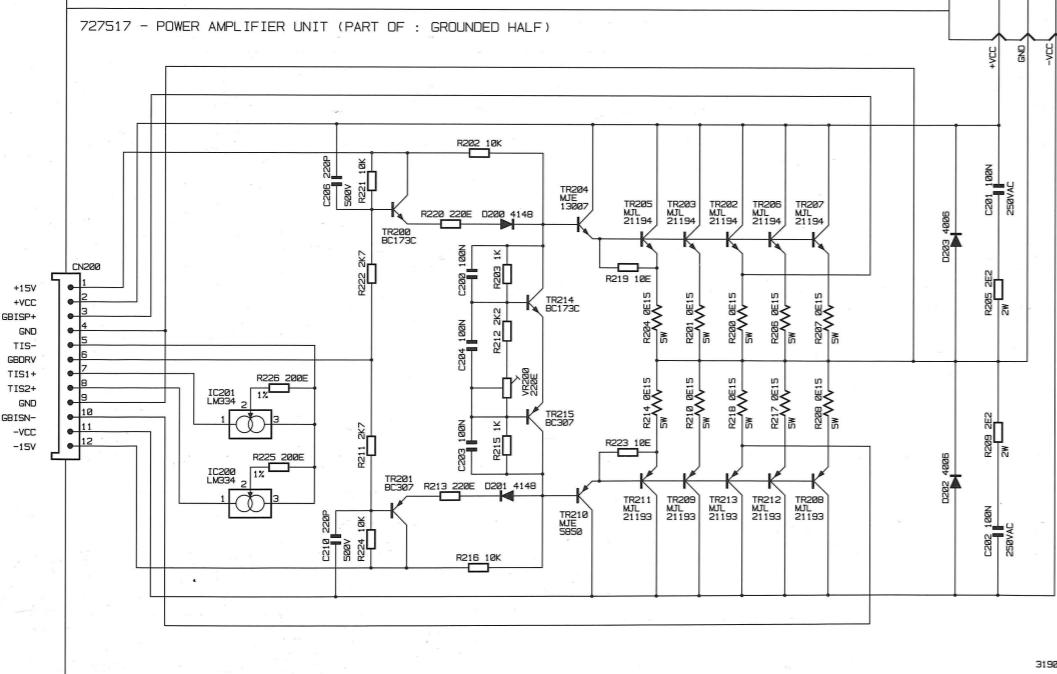
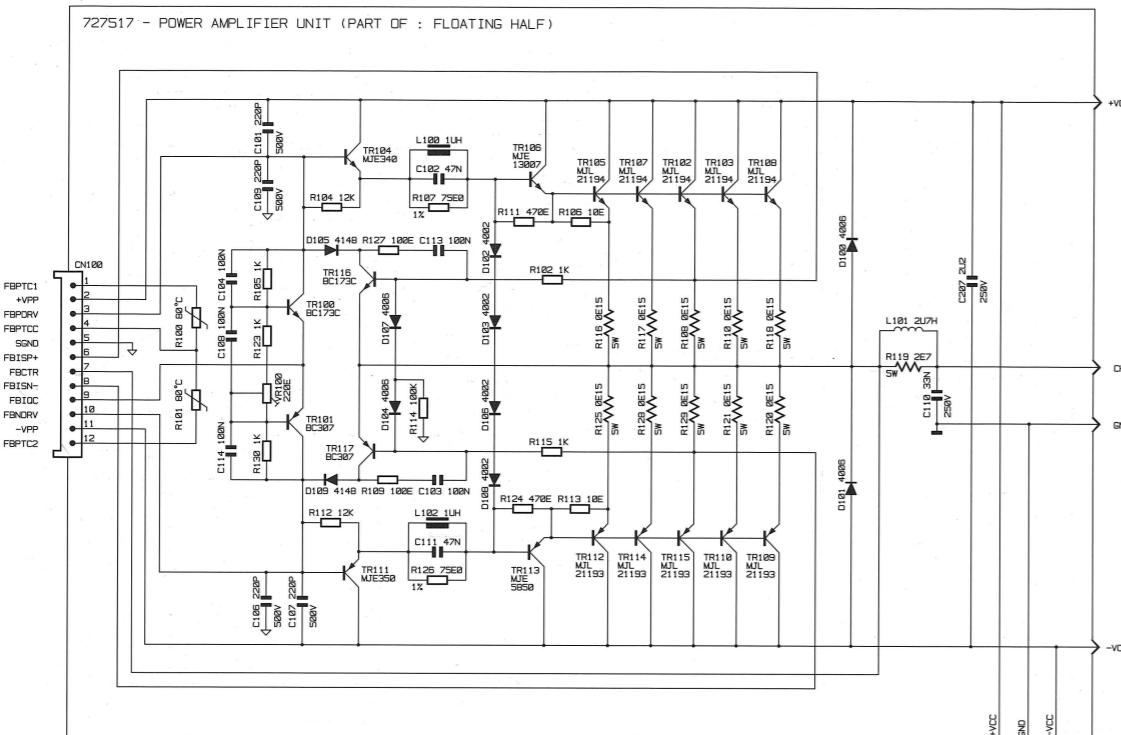


## 768034 - INPUTS, POWER DRIVERS &amp; PROTECTIONS

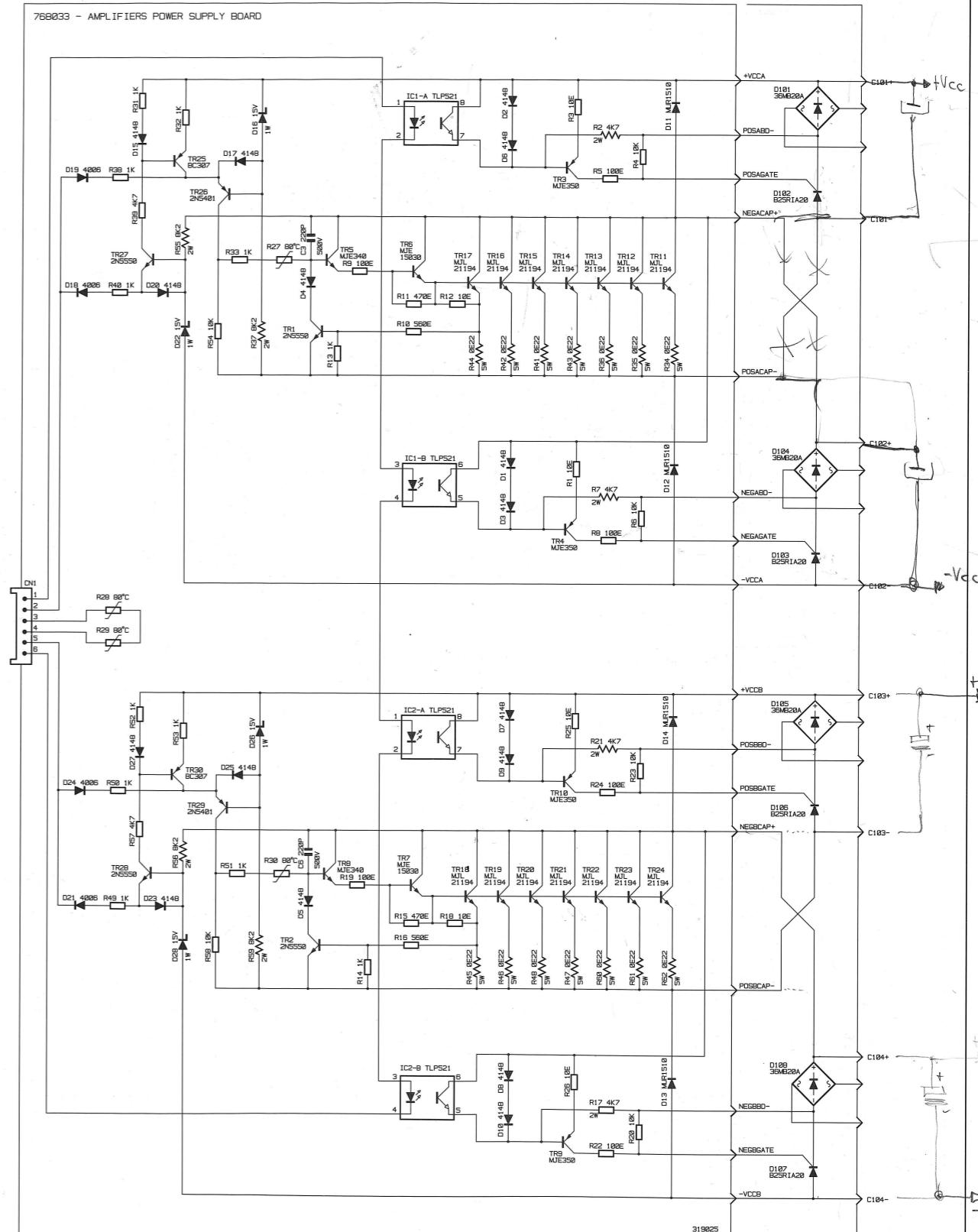




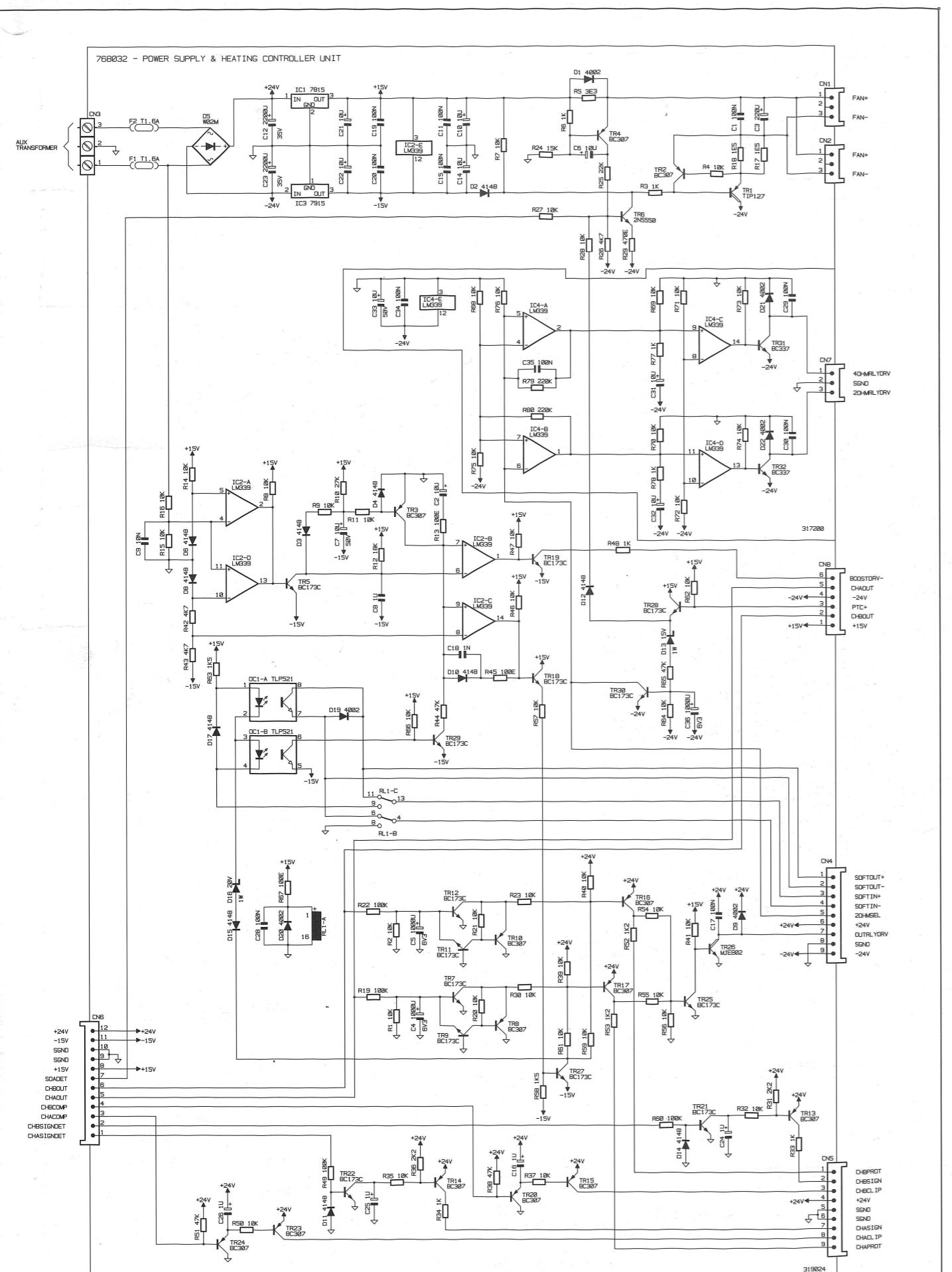
DWG I.BATTELLI DWG# SE 769034 PRINTED CIRCUIT CODE: 319026  
 CKD I.BATTELLI DS# 01 PAGE: 1/1 SCHEMATIC DIAGRAM INPUTS,  
 APP. L.AUOZZI DATE: 15-02-95 POWER DRIVERS & PROTECTIONS  
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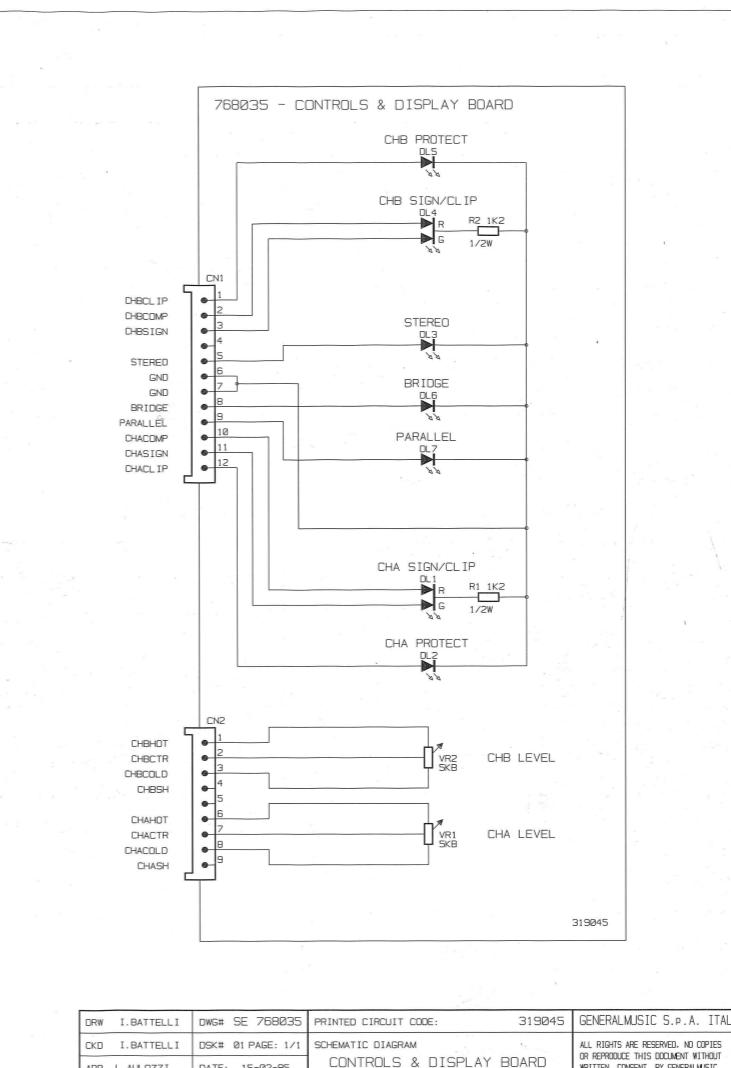
DRW I. BATTELLI DWG# SE 727517 PRINTED CIRCUIT CODE: 319023 GENERALMUSIC S.p.A. ITALY  
 CKD I. BATTELLI DSK# 01 PAGE: 1/1 SCHEMATIC DIAGRAM  
 APP. L. ALLOZZI DATE: 15-02-95 POWER AMPLIFIER UNIT  
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DRW I. BATTELLI DWG# SE 727518 PRINTED CIRCUIT CODE: 319025 GENERALMUSIC S.p.A. ITALY  
 CKD I. BATTELLI DSK# 01 PAGE: 1/1 SCHEMATIC DIAGRAM  
 APP. L. ALLOZZI DATE: 15-02-95 AMPLIFIERS POWER SUPPLY ASSY  
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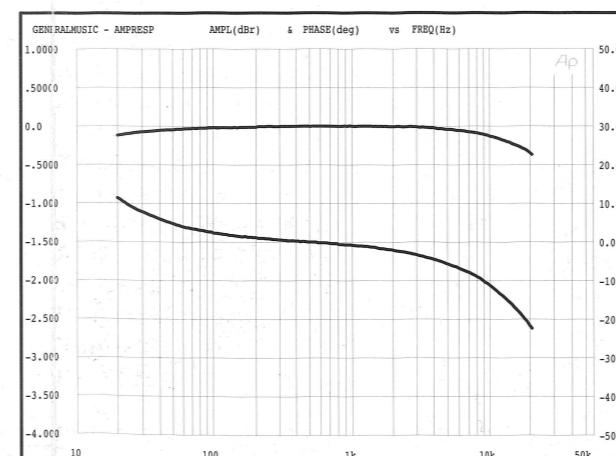


768032 - POWER SUPPLY & HEATING CONTROLLER UNIT  
DRW I. BATTELLI DWG# SE 768032 PRINTED CIRCUIT CODE: 319024-317200  
OKD I. BATTELLI DSK# PAGE: 01/01 Schematic Diagram POWER SUPPLY & HEATING CONTROLLER UNIT  
APP. L. AULIZZI DATE: 15-02-95 GENERALMUSIC S.p.A. ITALY  
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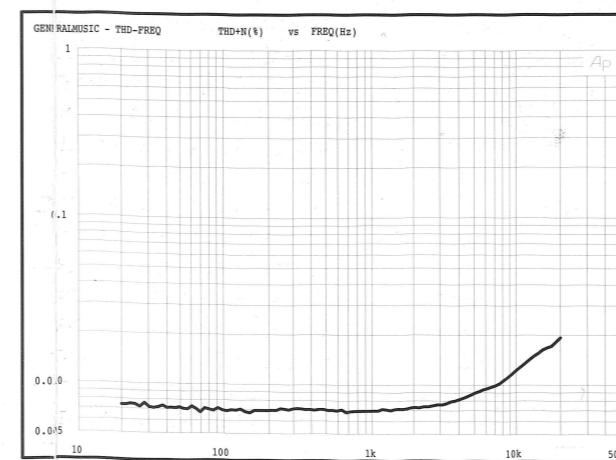


768035 - CONTROLS & DISPLAY BOARD  
DRW I. BATTELLI DWG# SE 768035 PRINTED CIRCUIT CODE: 319045 GENERALMUSIC S.p.A. ITALY  
OKD I. BATTELLI DSK# 01 PAGE: 1/1 Schematic Diagram CONTROLS & DISPLAY BOARD  
APP. L. AULIZZI DATE: 15-02-95 GENERALMUSIC S.p.A. ITALY  
ALL RIGHTS ARE RESERVED. NO COPIES OR REPRODUCE THIS DOCUMENT WITHOUT WRITTEN CONSENT BY GENERALMUSIC.

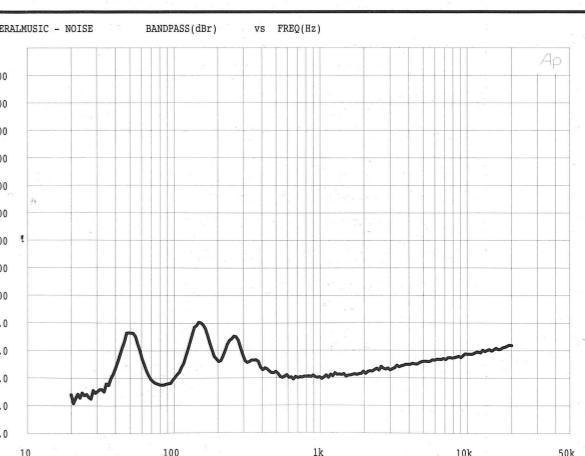
### Curve di Risposta



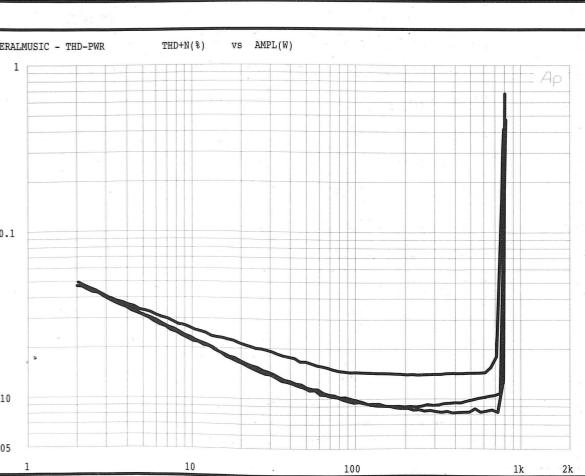
FREQUENCY RESPONSE  
STEREO configuration  
Both channels  
Input level: 0 dB  
Load impedance: 8Ω  
Output power: 5W



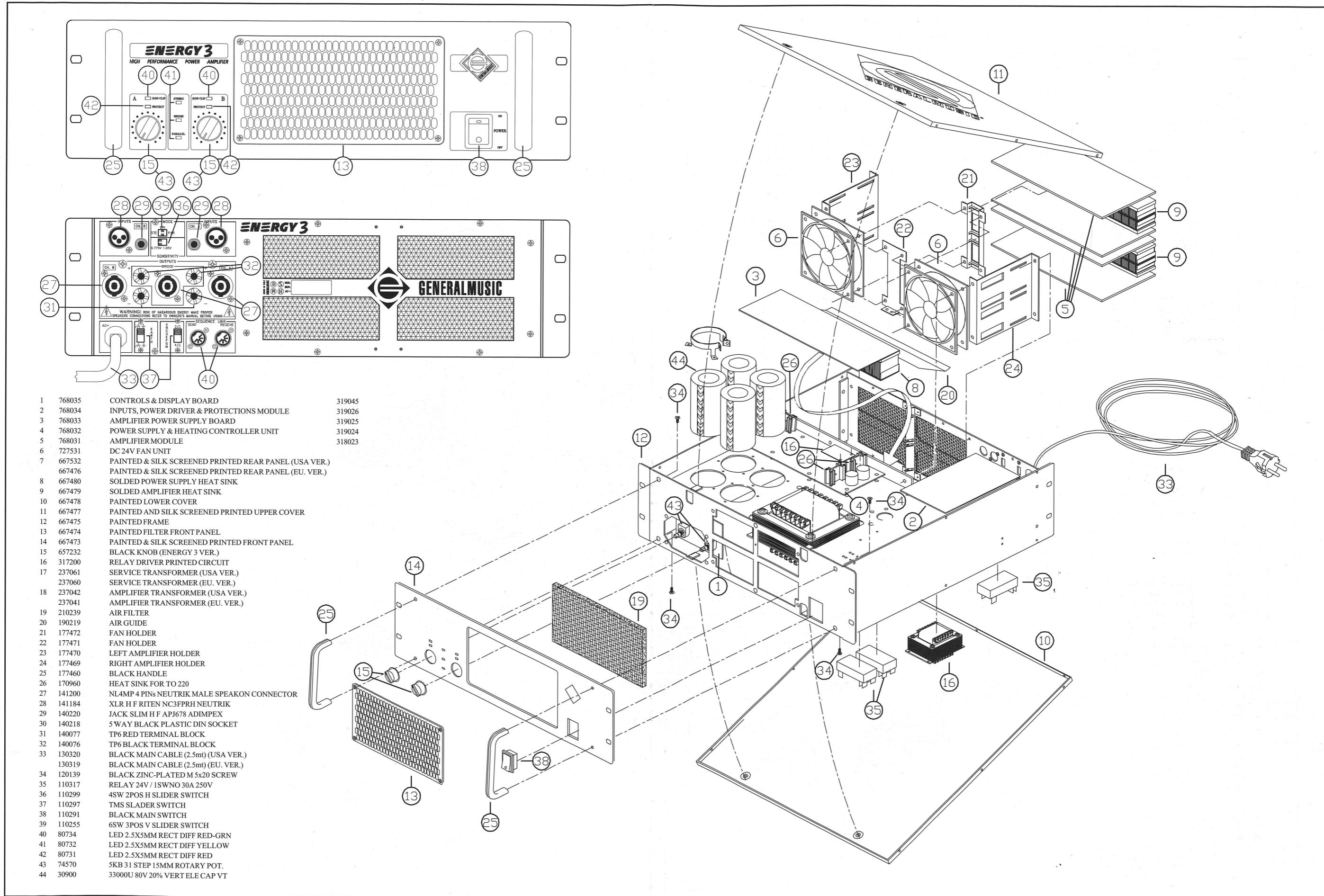
SIGNAL/NOISE ratio  
STEREO configuration  
Both channels  
Input level: 0 dB  
Load impedance: 8Ω



GENERALMUSIC - NOISE BANDPASS(dB) vs FREQ(Hz)  
STEREO configuration  
Both channels  
Input level: 0 dB  
Load impedance: 8Ω



DISTORTION (THD+Noise) v/s OUTPUT POWER  
STEREO configuration  
Both channels  
Input level: 0 dB  
Load impedance: 8Ω



**ACCESSORIES**

277250 OWNER'S MANUAL

**CABINET ASSEMBLY**

768035 CONTROLS & DISPLAY BOARD  
 768034 INPUTS, POWER DRIVER & PROTECTIONS MODULE  
 768032 POWER SUPPLY & HEATING CONTROLLER UNIT  
 768031 AMPLIFIER MODULE  
 768033 AMPLIFIER POWER SUPPLY BOARD  
 667478 PAINTED LOWER COVER  
 667477 PAINTED AND SILK SCREENED PRINTED UPPER COVER  
 667475 PAINTED & SILK SCREENED PRINTED REAR PANEL  
 667532 PAINTED & SILK SCREENED PRINTED REAR PANEL  
 667475 PAINTED FRAME  
 667474 PAINTED FILTER FRONT PANEL  
 667473 PAINTED & SILK SCREENED PRINTED FRONT PANEL  
 237061 SERVICE TRANSFORMER  
 237060 SERVICE TRANSFORMER  
 237042 AMPLIFIER TRANSFORMER  
 237041 AMPLIFIER TRANSFORMER  
 210239 AIR FILTER  
 190219 AIR GUIDE  
 177460 BLACK HANDLE  
 130319 BLACK MAIN CABLE EU. VER. (2.5mt)  
 130317 BLACK MAIN CABLE USA VER. (2.5mt)  
 110317 RELAY 24V / 1SWNO 30A 250V  
 110291 BLACK MAIN SWITCH

**768033 AMPLIFIER POWER SUPPLY UNIT**

319025

667480 SOLDED POWER SUPPLY HEAT SINK  
 558003 MJL21194 NPN 7 TRANSISTOR KIT  
 100929 TLP521-2 DUAL OPTOCOUPLER  
 090918 MJE15030 TO220 NPN TRANSISTOR  
 090917 MJE350 TO126 PNP TRANSISTOR  
 090916 MJE340 TO126 NPN TRANSISTOR  
 090201 2N5401 TO92 PNP TRANSISTOR  
 090200 2N5550 TO92 NPN TRANSISTOR  
 090192 BC307 TO92 PNP TRANSISTOR  
 080820 PTC 80 PTH59F04BF222TS  
 080608 36MB20A 35A 200V BRIDGE REC DIODE  
 080552 B25RIA20 200V 25A SCR THYRIST  
 080293 15V 1W 5% ZENER DIODE  
 080172 MUR1510 15A 100V ULTRAFAST REC DIODE  
 080158 IN4006 1A 800V RECTIFIER DIODE  
 080103 IN4148 100MA 75V SIGNAL DIODE

**727517 POWER AMPLIFIER UNIT**

319023

768031 AMPLIFIER MODULE  
 757942 PHOTORES COUPLER  
 727531 DC 24V FAN UNIT  
 667479 SOLDED AMPLIFIER HEAT SINK  
 558002 MJL21194 NPN 5 TRANSISTOR KIT  
 558001 MJL21193 PNP 5 TRANSISTOR KIT  
 190215 PROTECTION CARD (257X80)  
 177472 FAN HOLDER  
 177471 FAN HOLDER  
 177470 LEFT AMPLIFIER HOLDER  
 177469 RIGHT AMPLIFIER HOLDER  
 110361 DC 24V 120X32 FAN  
 110120 FUSE CLIP 6.3x32  
 110115 FUSE CLIP 5x20  
 110062 T 20A FUSE 6.3X32  
 110004 T 400MA FUSE 5X20  
 100925 LM334 ADJ CURRENT SOURCE TO92  
 090917 MJE350 TO126 PNP TRANSISTOR

090916 MJE340 TO126 NPN TRANSISTOR  
 090915 MJE5850 TO220 PNP TRANSISTOR  
 090914 MJE13007 TO220 NPN TRANSISTOR  
 090192 BC307 TO92 PNP TRANSISTOR  
 090182 BC173C TO92 NPN TRANSISTOR  
 080820 PTC 80 PTH59F04BF222TS  
 080158 IN4006 1A 800V RECTIFIER DIODE  
 080156 IN4002 1A 100V RECTIFIER DIODE  
 080103 IN4148 100MA 75V SIGNAL DIODE  
 042400 200E 1/4W 1% MET.FILM RESISTOR  
 042345 1K00 1/4W 1% MET.FILM RESISTOR  
 EU. VER. 030900 33000U 80V 20% VERT ELE CAP VT  
 USA VER. 021024 100N 63V 10% MKT POLYESTER CAP  
 021020 47N 63V 10% MKT POLYESTER CAP  
 020701 2U2 250V 10% MKT POLYESTER CAP  
 020493 100N 250VAC MKP EMI CAPACITOR  
 020364 33N 250V 10% MKT POLYESTER CAP

**768032 POWER SUPPLY & HEATING CONTROLLER UNIT**

319024

317200 RELAY DRIVER PRINTED CIRCUIT  
 170960 HEAT SINK FOR TO 220  
 110305 RELAY 12V / 2SW 1A 250V  
 110119 FUSECLIP 5X20mm 6.3X32 10A MAX  
 110012 T1.6A FUSE 5X20mm  
 100929 TLP521-2 DUAL OPTOCOUPLER  
 100921 LM339 QUAD VOLTAGE COMPARATOR  
 100060 7815 +15V 1A VOLTAGE REGULATOR  
 100049 7915 -15V 1A VOLTAGE REGULATOR  
 090920 MJE803 TO126 NPN DARL TRANSISTOR  
 090558 TIP127 TO220 PNP DARL TRANSISTOR  
 090242 BC239C TO92 NPN TRANSISTOR  
 090200 2N5550 TO92 NPN TRANSISTOR  
 090192 BC307 TO92 PNP TRANSISTOR  
 090182 BC173C TO92 NPN TRANSISTOR  
 090152 BC337 TO92 NPN TRANSISTOR  
 080302 20V 1W 5% ZENER DIODE  
 080293 15V 1W 5% ZENER DIODE  
 080168 W02M 1.5A 200V BRIDGE REC DIODE  
 080156 IN4002 1A 100V RECTIFIER DIODE  
 080103 IN4148 100MA 75V SIGNAL DIODE  
 030715 1000U 6V3 20% VERT ELECTR CAP  
 030564 220U 50V 20% VERT ELECTR CAP  
 030526 2200U 35V 20% SNAP-IN ELE CAP  
 030245 10U 50V 20% VERT ELECTR CAP  
 030005 1U 50V 20% VERT ELECTR CAP  
 021036 1U 63V 10% MKT POLYESTER CAP  
 021012 10N 63V 10% MKT POLYESTER CAP  
 021000 1N 63V 10% MKT POLYESTER CAP

**768034 INPUTS, POWER DRIVER & PROTECTIONS UNIT**

319026

757942 PHOTORES COUPLER  
 347285 VERTICAL SWITCH ADAPTER  
 141200 NL4MP 4 PINs NEUTRIK MALE SPEAKON CONNECTOR  
 141184 XLR H F RITEN NC3FPRH NEUTRIK  
 140220 JACK SLIM H F APJ678 ADIMPEX  
 110299 4SW 2POS H SLIDER SWITCH  
 110297 TMS SLADER SWITCH  
 110255 6SW 3POS V SLIDER SWITCH  
 100937 6SW 3POS V SLIDER SWITCH  
 100084 TL074 QUAD LN JFET OP AMP  
 090917 MJE350 TO126 PNP TRANSISTOR  
 090916 MJE340 TO126 NPN TRANSISTOR  
 090242 BC239C TO92 NPN TRANSISTOR  
 090201 2N5401 TO92 PNP TRANSISTOR  
 090200 2N5550 TO92 NPN TRANSISTOR

090192 MJE4342 TO218 NPN TRANSISTOR  
 090182 BC173C TO92 NPN TRANSISTOR  
 080103 1N4148 100MA 75V SIGNAL DIODE

050721 820K 1/4W 5% RESISTOR  
 050651 220K 1/4W 5% RESISTOR

042725 100K 1/4W 1% MET.FILM RESISTOR  
 042685 47K5 1/4W 1% MET.FILM RESISTOR

042634 20K0 1/4W 1% MET.FILM RESISTOR

042628 16K5 1/4W 1% MET.FILM RESISTOR

042625 15K0 1/4W 1% MET.FILM RESISTOR

042616 13K7 1/4W 1% MET.FILM RESISTOR

042605 10K0 1/4W 1% MET.FILM RESISTOR

042586 7K50 1/4W 1% MET.FILM RESISTOR

042565 4K99 1/4W 1% MET.FILM RESISTOR

042564 4K75 1/4W 1% MET.FILM RESISTOR

042557 4K32 1/4W 1% MET.FILM RESISTOR

042485 1K00 1/4W 1% MET.FILM RESISTOR

030485 100U 25V 20% VERT ELECTR CAP

030323 22U 35V 20% VERT ELEC BIP CAP

030245 10U 50V 20% VERT ELECTR CAP

030005 1U 50V 20% VERT ELECTR CAP

021032 470N 63V 10% MKT POLYESTER CAP

021025 120N 63V 10% MKT POLYESTER CAP

021004 2N2 63V 10% MKT POLYESTER CAP

020491 100NF 10% 250VAC POLYESTER CAP

020250 10N 400V 10% MKT POLYESTER CAP

**768035 CONTROLS & DISPLAY UNIT**

319045

657232 BLACK KNOB (ENERGY 3 VER.)  
 080734 LED 2.5X5MM RECT DIFF RED-GRN  
 080732 LED 2.5X5MM RECT DIFF YELLOW  
 080731 LED 2.5X5MM RECT DIFF RED  
 074570 5KB 31 STEP 15MM ROTARY POT.