AVALON SERIES

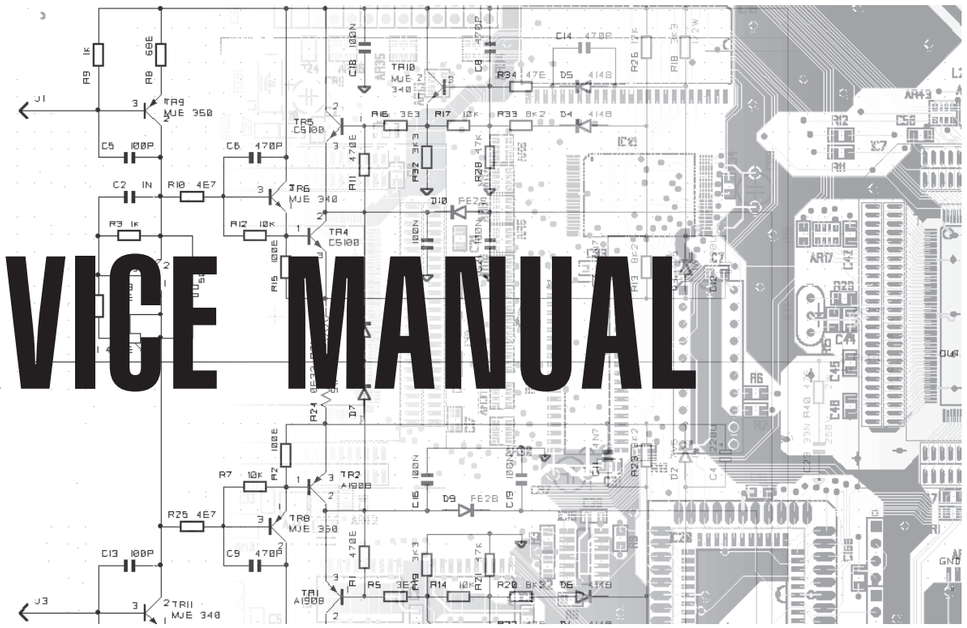
LOUDSPEAKER SYSTEMS

active

AV 12 HP

AV 15 HP

SERVICE MANUAL



GENERALMUSIC®

CODE: 270254

Index

Warnings

Notice

Service must be carried out by qualified personnel only.Any tampering carried out by unqualified personnel during the guarante e 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 (μ) micro symbol of capacitance value is substituted by U.
The (Ω) omega symbol of resistance value is substituted by E.
The electrolytic capacitors are 25Vdc rated voltage unless otherwise specified.
All resistors are 1/8Ω 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.
- Supply voltage.
- Test point.
- Flag joined with one or more flags with the same signal name inscribed.
- Logic supply ground.
- Analog supply ground.
- Chassis ground.
- Earth ground.

ATTENTION

Observe precautions when handling electrostatic sensitive devices.

Address

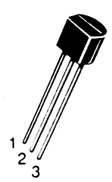
GENERALMUSIC S.p.A. Sales Division: 47842 S.Giovanni in Marignano (RN) ITALY - Via delle Rose, 12 - tel. 0541/959511 - fax 0541/957404
GENERALMUSIC on the NET: http://www.generalmusic.com

AVALON • TECHNICAL SPECIFICATIONS

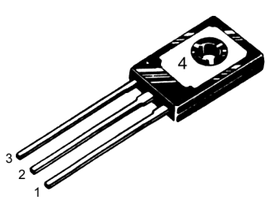
		AV-12 HP	AV-15 HP
LOUDSPEAKER SPECIFICATIONS			
COMPONENTS	*High* *Low*	1" tweeter with phasing plug and EWT™ horn 12" woofer	1" compression driver with EWT™ horn 15" woofer
CONSTRUCTION		High density polyetylene enclosure + polyetylenic foam - Protection metal grid	
DIMENSIONS	*mm (WxHxD)*	436x616x420	500x706x490
WEIGHT (passive / active)	*kg*	18.5	26
AMPLIFIER SPECIFICATIONS			
POTENZA D'USCITA IHF **(Burst 10% 20 ms, Max THD 0,1%)**	*High* *Low*	60W 250W	80W 400W
MIC INPUT	*sensitivity* *gain* *impedance*	from -15 to -45 dB 30dB 1Kohm	
EQUALIZER	*HIGH* *MID* *LOW*	+/- 6dB @ 10KHz +/- 6dB @ 1000Hz +/- 6dB @ 100Hz	
LINE INPUT	*sensitivity* *impedence*	+4 dB 30 kOhm (balanced) - 15 kOhm (unbalanced)	
ACTIVE CROSSOVER	*Hz*	3.5 kHz @ 24-18 dB /oct.	2.5 kHz @ 24-12 dB /oct.
DISTORSION	*%*	<0.02 (THD+Noise)	
CONTROLS		Volume - MIC gain - 3-band EQ - Shield on/off	
DISPLAY		SIGNAL/COMP LED - POWER ON LED	
CONNECTIONS		COMBO + XLR-M (input + output) XLR-F (MIC input)	
POWER SUPPLY		230Vac 50/60Hz	
SYSTEM SPECIFICATIONS			
SENSITIVITY (SPL 1W/1m)	*dB*	98	100
MAX SPL continuous	*dB*	121	125
MAX SPL peak	*dB*	124	128
FREQUENCY RESPONSE	*Hz (-10dB)*	70-20000	60-20000
DISPERSION (OxV)	°	60x40	60x40

Transistor Packages

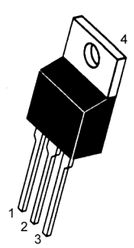
TO92
2SC1815, 2SA1015:
1=Emitter
2=Collector
3=Base
2N5401, 2N5551:
1=Emitter
2=Base
3=Collector



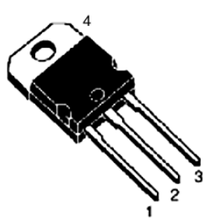
TO126
MJE340, MJE350, MJE802:
1=Emitter
2=Collector
3=Base
4=Collector



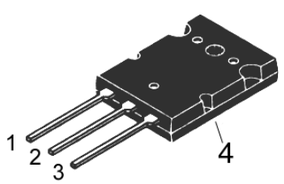
TO220
MJE15030,MJE15031:
1=Base
2=Collector
3=Emitter
4=Collector

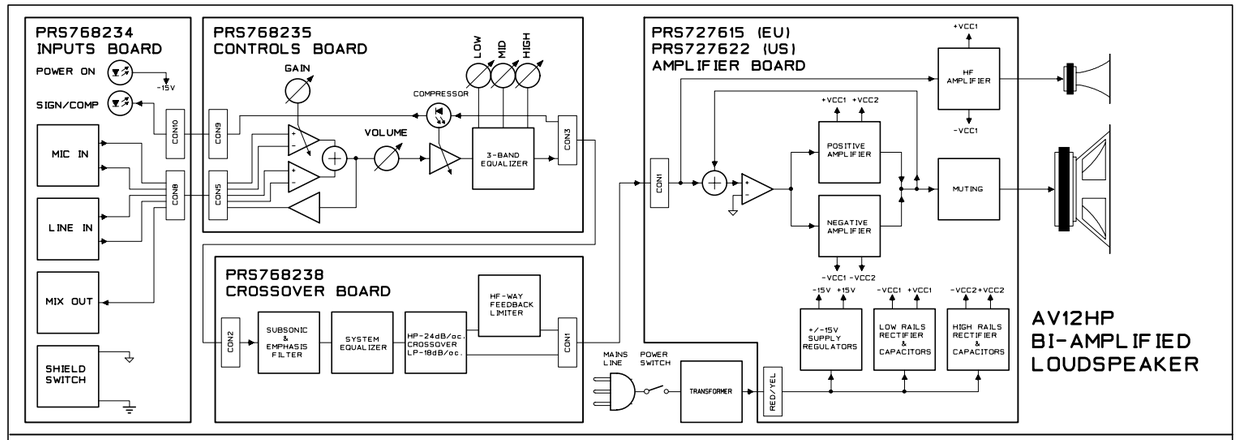


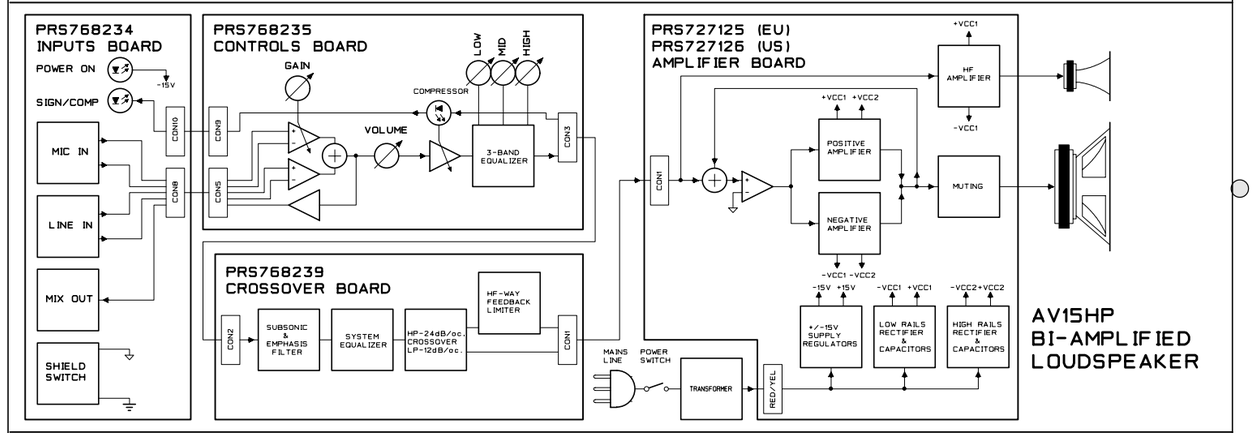
TO218
TIP35C,TIP36C:
1=Base
2=Collector
3=Emitter
4=Collector



TO264
2SC5200, 2SA1943:
1=Base
2=Collector
3=Emitter
4=Collector







DRW G.BOCCATO	DWG# 550680	PCB#	GENERALMUSIC S.p.A. ITALY
CKD G.RICCI	DATE 15/05/01	SCHEMATIC DIAGRAM AVALON HP ACTIVE BLOCK DIAGRAMS	
APP. R.MAGALOTTI	REV: A		

TEST PROCEDURES & ADJUSTMENTS

These procedures are relative to the ACTIVE versions (amplified loudspeakers) only.

Precaution

- To prevent short circuit during any test, **the oscilloscope must be EARTH insulated**, this occurs because some test require to connect its probe to the amplifier output, non-compliance may cause damages to oscilloscope inputs circuitry.
- Before removing or installing any modules and connectors, **disconnect the amplifier from AC MAINS** and measure the DC supply voltages across each of the power suppliy capacitors. If your measurement on any of the caps is greater than 10Vdc, connect a 100Ω 10W resistor across the applicable caps to discharge them for your safety. Remember to remove the discharge resistor immediately after discharging caps. **Do not power up the amplifier with the discharge resistor connected**.
- Read these notes entirely before proceeding to any operation. These notes are not comprehensive of all damages that possibly occur, but includes some specifically advices, checks and adjustments relative to this amplified speaker.
- **Do not check the amplifier with the speaker connected use only an appropriate load resistor.**

Remarks

- The LOW amplifier is powered with a dual bipolar DC rail configuration with low and high voltages; one positive and one negative low rail (+/-Vcc1) and one positive and one negative high rail (+/-Vcc2).
- The HIGH amplifier is powered with the low rail (+/-Vcc1) only.

Visual Check

- Check the speakers for any damaging (cone-breaking, interruption or further).
- Before proceed to supply the amplifier check visually the internal assembly, if appears an evident damage find the most possible reasons that cause it.
- Check the wiring cables for possible interruptions or shorts.
- If the damage has burnt a printed circuit board don't try to repair it, replace with a new one.

Test Instruments

- Audio Generator
- Dual Trace Oscilloscope
- Digital Multimeter
- Temperature Meter
- 4Ω 500W, 8Ω 150W, 100Ω 10W resistors
- Variac (0÷250Vac)

AV12HP Amplified Loudspeaker

The following adjustment and notes are relative to this model only.

TECHNICAL SPECIFICATIONS

Power Requirements:	(230Vac±10% 50Hz)	210VA
Max Low Out Power*:	(4Ω)	250W
Max High Out Power*:	(8Ω)	60W
Low Limited Out**:	(4Ω)	88Vpp
High Limited Out**:	(8Ω)	44Vpp
Frequency Response	(amplifier+speaker)	70Hz÷20kHz
Frequency X-Over	(Low/High)	3500Hz
Line In Sensitivity:	(+4dB)	1.229V_{RMS}
Input Impedance:	(balanced)	30KΩ
	(unbalanced)	15KΩ
Voltage Gain:	(average)	30±1dB
IMD:	(SMPTE 60Hz/7KHz 4:1)	<0.1%
THD:	(THD+N)	<0.1%
S/N Ratio:	(unweighted)	>100dB

* Note: measured with the IHF standard method and limiters not operative.

**Note: measured just before the limiters became active.

Setup

- Connect the Variac between the mains and the amplifier and set it at zero voltage.
- Turn full clockwise the VOLUME potentiometer.
- Set the TONE controls at centre.
- Connect the audio generator to the channel input and set it to 500Hz 775mV_{RMS} (0dB) sinusoidal signal.
- The procedures that follow must be executed subsequently in the order specified.

Supply Check

- Remove the transformer secondary fuses (located on SUPPLY board), set the Variac to the nominal mains voltage, check with the Multimeter the AC supply voltages:

  F1-F2=84±2Vac

  F3-F4=44±1.5Vac.
- Re-set the Variac at zero voltage, turn off the amplifier and put the fuses back on its holders.
- Connect the oscilloscope probe CH1 to the LOW output, before RL1, set it to 20V/div. 1mS/div.
- Set up the Variac slowly monitoring the the oscilloscope screen, it should display the sinusoidal input signal amplified with no distortions and without DC voltage, if a distortion occur or the protection trips check the AMPLIFIER board as suggested in the ADVICES section.
- Finally verify the DC supplies:

Q117 emitter pin 3 (+Vcc2)	=+58±2Vdc
D124 anode (+Vcc1)	=+30±1.5Vdc
D122 cathode (-Vcc1)	=-30±1.5Vdc
Q112 emitter pin 3 (-Vcc2)	=-58±2Vdc
U104 pin 3	=+15±1Vdc
U105 pin 3	=-15±1Vdc

- If one or more voltages don't correspond, check the rectifiers, capacitors and transformers disconnecting them from circuitry, refer to schematics.

LOW Amplifier Check

- Verify, with the Multimeter, the insulation between the heatsink and the transistors collectors.
- Verify, with the Multimeter, the PTC resistor value, it must be between 50Ω and 200Ω.
- **SETUP:**

  Connect the CH1 scope clip to LOW OUT - (GND).

  Connect the CH1 probe tip to LOW OUT +.

  Connect the CH2 probe tip to U102 pin 1 and set its sensitivity at 5V/div.

  Set the LEVEL potentiometer full clockwise.

  The load resistor is disconnected.
- **INITIAL TEST:**

  Increase slowly the Variac. The channel output signals must be symmetrical respect the GND without visible distortion and oscillation as shown in *Fig.3 Trace A* (*Trace B* shown the amplifier 2nd stage input). If there is a distortion read the section ADVICES.
- **HIGH RAIL CHECK:**

  Connect the CH2 probe tip to D124 cathode and set its sensitivity at 20V/div. When the output signal (Positive half-wave) is less than 24V_{PEAK} the voltage on D124 cathode must remain constant at 30V, when the output signal exceeds 24V_{PEAK} the voltage must follow the output signal with 6V offset (see *Fig.4 Trace B*), to check the negative high rail connect the probe to D122 anode (see *Fig.4 Trace C*).
- Connect the 4Ω 500W load on the output and repeat the INITIAL and HIGH RAIL checks.
- **SIGN/COMP SENSOR CHECK:**

  Set the VOLUME pot. to minimum, set the scope timebase at 1V/div. 1mS/div., then increase the level and check the SIGNAL/COMP led activity: it must turn on (green light) when the amplifier output is higher than 1V_{PEAK}. Set the scope at 20V/div. and increase the level, check the led: it must change from green to red colour when the amplifier output signal is 44±2V_{PEAK}, increasing the input level the output signal must keep the same level, this is due to the limiter-compression circuitry.
- **BIAS ADJUSTMENT:**

  Place the temperature sensor between heatsink and the PTC.

  With resistive load connected wait until the temperature reaches 50°c.

  Set the generator level at zero, connect the Multimeter across the R188 resistor, then adjust VR100 trimmer to read 5±0.5mVdc.

  Verify the same voltage across R189.
- **BANDWIDTH CHECK:**

  Set the generator level at -10dB (0,245V_{RMS}).

  Set the VOLUME pot. to maximum, sweeping the frequency the output level change accordingly the Fig.1 curve 1B, the curves 1A and 1C represent the +/-6dB tone controls excursion.
- **SIGNAL TO NOISE RATIO CHECK:**

  Disconnect the audio generator and short the input (pin 1,2,3 of XLR socket shorted) the output signal (noise) must be less than 1mV.

HIGH Amplifier Check

- This amplifier is made with a monolithic IC with short circuit and overload protections built in, check with the Multimeter the insulation between heatsink and its case which is connected to -Vcc1.

  Set the generator at 10KHz 0dB, connect the CH2 probe tip of the oscillo-

scope to the HIGH + output and set it at 10V/div. 50μS/div.

The oscilloscope screen must show a sinusoidal wave limited at 22V_{PEAK} this is due at the HF feedback limiter circuitry.

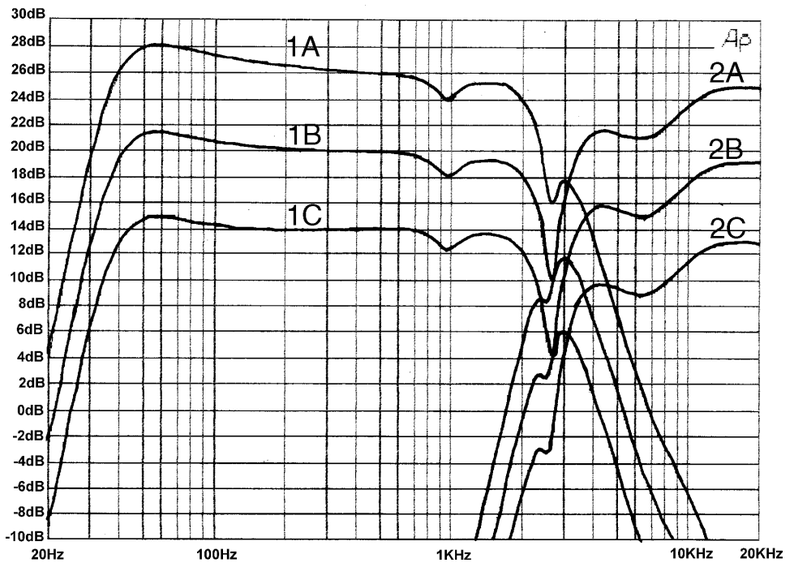
Repeat the measurement with the 8Ω 150W attached.

- **BANDWIDTH CHECK:**

Set the generator level at -10dB (0,245V_{RMS}).

Set the VOLUME pot. to maximum, sweeping the frequency the output level change accordingly the Fig.1 curve 2B, the curves 2A and 2C represent the +/-6dB tone controls excursion.

Fig. 1



AV15HP Amplified Loudspeaker

The following adjustment and notes are relative to this model only.

TECHNICAL SPECIFICATIONS

Power Requirements:	(230Vac±10% 50Hz)	370VA
Max Low Out Power*:	(4Ω)	400W
Max High Out Power*:	(8Ω)	80W
Low Limited Out**:	(4Ω)	100Vpp
High Limited Out**:	(8Ω)	44Vpp
Frequency Response	(amplifier+speaker)	60Hz÷20kHz
Frequency X-Over	(Low/High)	2500Hz
Line In Sensitivity:	(+4dB)	1.229V_{RMS}
Input Impedance:	(balanced)	30KΩ
	(unbalanced)	15KΩ
Voltage Gain:	(average)	30±1dB
IMD:	(SMPTE 60Hz/7KHz 4:1)	<0.1%
THD:	(THD+N)	<0.1%
S/N Ratio:	(unweighted)	>100dB

* Note: measured with the IHF standard method and limiters not operative.

**Note: measured just before the limiters became active.

Setup

- Connect the Variac between the mains and the amplifier and set it at zero voltage.
- Turn full clockwise the VOLUME potentiometer.
- Set the TONE controls at centre.
- Connect the audio generator to the channel input and set it to 500Hz 775mV_{RMS} (0dB) sinusoidal signal.
- The procedures that follow must be executed subsequently in the order specified.

Supply Check

- Remove the transformer secondary fuses (located on SUPPLY board), set the Variac to the nominal mains voltage, check with the Multimeter the AC supply voltages:

  F1-F2=102±2Vac

  F3-F4=52±1.5Vac.
- Re-set the Variac at zero voltage, turn off the amplifier and put the fuses back on its holders.
- Connect the oscilloscope probe CH1 to the LOW output, before RL1, set it to 20V/div. 1mS/div.
- Set up the Variac slowly monitoring the the oscilloscope screen, it should display the sinusoidal input signal amplified with no distortions and without DC voltage, if a distortion occur or the protection trips check the AMPLIFIER board as suggested in the ADVICES section.
- Finally verify the DC supplies:

Q117 emitter pin 3 (+Vcc2)	=+70±2Vdc
D124 anode (+Vcc1)	=+35±1.5Vdc
D122 cathode (-Vcc1)	=-35±1.5Vdc
Q112 emitter pin 3 (-Vcc2)	=-70±2Vdc
U104 pin 3	=+15±1Vdc
U105 pin 3	=-15±1Vdc

- If one or more voltages don't correspond, check the rectifiers, capacitors and transformers disconnecting them from circuitry, refer to schematics.

LOW Amplifier Check

- Verify, with the Multimeter, the insulation between the heatsink and the transistors collectors.
- Verify, with the Multimeter, the PTC resistor value, it must be between 50Ω and 200Ω.
- **SETUP:**

  Connect the CH1 scope clip to LOW OUT - (GND).

  Connect the CH1 probe tip to LOW OUT +.

  Connect the CH2 probe tip to U102 pin 1 and set its sensitivity at 5V/div.

  Set the LEVEL potentiometer full clockwise.

  The load resistor is disconnected.
- **INITIAL TEST:**

  Increase slowly the Variac. The channel output signals must be symmetrical respect the GND without visible distortion and oscillation as shown in *Fig.3 Trace A* (*Trace B* shown the amplifier 2nd stage input). If there is a distortion read the section ADVICES.
- **HIGH RAIL CHECK:**

  Connect the CH2 probe tip to D124 cathode and set its sensitivity at 20V/div.

  When the output signal (Positive half-wave) is less than 29V_{PEAK} the voltage on D124 cathode must remain constant at 35V, when the output signal exceeds 29V_{PEAK} the voltage must follow the output signal with 6V offset (see *Fig.4 Trace B*), to check the negative high rail connect the probe to D122 anode (see *Fig.4 Trace C*).
- Connect the 4Ω 500W load on the output and repeat the INITIAL and HIGH RAIL checks.
- **SIGN/COMP SENSOR CHECK:**

  Set the VOLUME pot. to minimum, set the scope timebase at 1V/div. 1mS/div., then increase the level and check the SIGNAL/COMP led activity: it must turn on (green light) when the amplifier output is higher than 1V_{PEAK}. Set the scope at 20V/div. and increase the level, check the led: it must change from green to red colour when the amplifier output signal is 50±2V_{PEAK}, increasing the input level the output signal must keep the same level, this is due to the limiter-compression circuitry.
- **BIAS ADJUSTMENT:**

  Place the temperature sensor between heatsink and the PTC.

  With resistive load connected wait until the temperature reaches 50°c.

  Set the generator level at zero, connect the Multimeter across the R188 resistor, then adjust VR100 trimmer to read 5±0.5mVdc.

  Verify the same voltage across R189.
- **BANDWIDTH CHECK:**

  Set the generator level at -10dB (0,245V_{RMS}).

  Set the VOLUME pot. to maximum, sweeping the frequency the output level change accordingly the Fig.2 curve 1B, the curves 1A and 1C represent the +/-6dB tone controls excursion.
- **SIGNAL TO NOISE RATIO CHECK:**

  Disconnect the audio generator and short the input (pin 1,2,3 of XLR socket shorted) the output signal (noise) must be less than 1mV.

HIGH Amplifier Check

- This amplifier is made with a monolithic IC with short circuit and overload protections built in, check with the Multimeter the insulation between heatsink and its case which is connected to -Vcc1.

  Set the generator at 10KHz 0dB, connect the CH2 probe tip of the oscilloscope to the HIGH + output and set it at 10V/div. 50μS/div.

  The oscilloscope screen must show a sinusoidal wave limited at 20V_{PEAK} this is due at the HF feedback limiter circuitry.

  Repeat the measurement with the 8Ω 150W attached.
- **BANDWIDTH CHECK:**

  Set the generator level at -10dB (0,245V_{RMS}).

  Set the VOLUME pot. to maximum, sweeping the frequency the output level change accordingly the Fig.2 curve 2B, the curves 2A and 2C represent the +/-6dB tone controls excursion.

Advices

- If you have determinate that the problem is a short on a rail, you must check the output transistors to determine which transistor devices are bad.

  Use a soldering iron to lift one leg of each emitter pin and measure the emitter-collector resistance on each device.

  Unsolder and lift one leg of each base pin and check the base-collector resistance of each transistor and replace any that measure as a short.

  If all the transistors are OK, unsolder and lift one leg of each diode and check them.

Check the circuit board for open foil traces.

Use the Multimeter as Ohm-meter to check the resistors, particularly the base and emitter resistors of damaged transistor.

- If the input sinewave appears to be distorted during the negative cycle, you can assume that the problem is located somewhere in the circuitry of the positive low rail.

  If the positive cycle appears distorted, you can assume that the problem is in the circuitry of the negative low rail.

- If the high rails appear distorted or are not modulating as shown in figure, then the problem probably exists somewhere in the circuitry of the respective (+ or -) defective high rail. Refer to the schematics.

Figures

Fig. 2

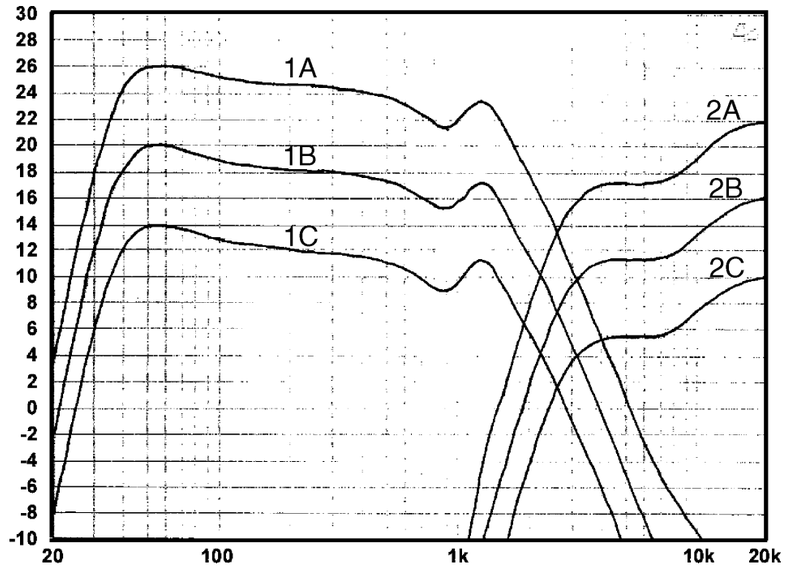


Fig. 3

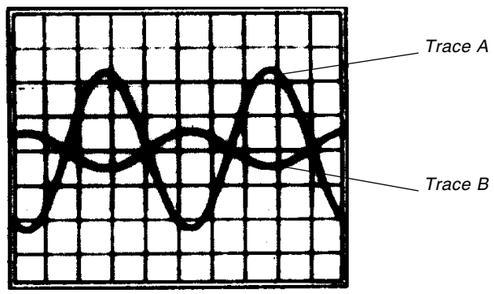
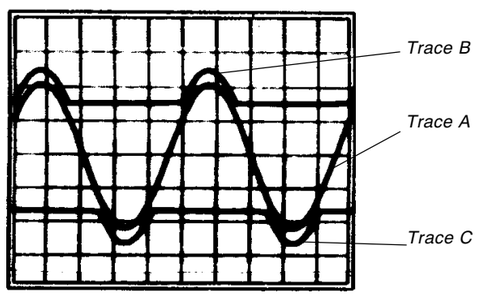


Fig. 4



PRS768238 - Crossover Filter Board

SIGNAL DETECTOR

SUBSONIC & EMPHASIS FILTER

CLIP DETECTOR

HF FEEDBACK LIMITER

SYSTEM EQUALIZER

HP-24dB/oct. 3500Hz

LP-18dB/oct. 3500Hz

Pcb#313079

PRS727615 - 250+60W Amplifier Board (EU)

HF RECTIFIER

LF RECTIFIER

HIGH OUT

LOW OUT

BIAS ADJ

DC-OFFSET DETECTOR

MUTING

Pcb#313080

PRS768234 Inputs Board

MIC IN

LINE IN

SHIELD

OUT

COMP SIGNAL

POWER ON

Pcb#313077

PRS768235 - Controls Board

MIC-PRE

GAIN

MIX

VOLUME

COMPRESSOR

TONE CONTROLS

HIGH

MID

LOW

Pcb#313078

⚠23708I - 230Vac 210W Transformer (EU)

MAINS CABLE

MAINS INLET

MAINS SWITCH

KLIXON S01-T100°C

42Vac

22Vac

0Vac

22Vac

42Vac

DRW G.BOCCATO	DWG# 550681	PCB# 313077, 313078, 313079, 313080	GENERALMUSIC S.p.A. ITALY
CKD G.RICCI	DATE 27/05/01	SCHEMATIC DIAGRAM AV12HP	
APP. R.MAGALOTTI	REV: A	POWER AMPLIFIER	

PRS768239 - Crossover Filter Board

SIGNAL DETECTOR

SUBSONIC & EMPHASIS FILTER

CLIP DETECTOR

HF FEEDBACK LIMITER

SYSTEM EQUALIZER

HP-24dB/oct. 2500Hz

LP-12dB/oct. 2500Hz

Pcb#313079

PRS727616 - 400+80W Amplifier Board (EU)

HF RECTIFIER

LF RECTIFIER

BIAS ADJ

DC-OFFSET DETECTOR

MUTING

Pcb#313080

PRS768234 Inputs Board

Pcb#313077

PRS768235 - Controls Board

COMPRESSOR

TONE CONTROLS

MIX

VOLUME

Pcb#313078

⚠237083 - 230Vac 370W Transformer (EU)

DRW G.BOCCATO	DWG# 550682	PCB# 313077, 313078, 313079, 313080	GENERALMUSIC S.p.A. ITALY
CKD G.RICCI	DATE 27/05/01	SCHEMATIC DIAGRAM AV15HP	ALL RIGHTS ARE RESERVED. NO COPIES OR REPRODUCE THIS DOCUMENT WITHOUT WRITTEN CONSENT BY GENERALMUSIC.
APP. R.MAGALOTTI	REV: A	POWER AMPLIFIER	

Spare Part List

Code		Description

Accessories

370534		“Lem” Adhesive Logo
277363		Owner’s Manual (English-Italian)
130274		Mains Cable (EU)
130276		Mains Cable (US)

AV-12A HP

PRS737123		**250+60W Amplifier Assembly (EU)**
PRS768238	*	**Crossover Filter Board (Pcb#313079)**
MDL145039	**	9 Contacts Vert Male Connector
100084	**	TL074 Quad J-Fet Operational Amplifier
100061	**	TL072 Dual J-Fet Operational Amplifier
090194	**	BC560C TO92 LN Pnp Transistor
080103	**	1N4148 100mA 75V Signal Diode
PRS768235	*	**Controls Board (Pcb#313078)**
MDL145039	**	9 Contacts Vert Male Connector
MDL145033	**	3 Contacts Vert Male Connector
100084	**	TL074 Quad J-Fet Operational Amplifier
100061	**	TL072 Dual J-Fet Operational Amplifier
PRS090000	**	A1015GR TO92 LN Pnp Transistor
080901	**	VTL5C4 Analog Optoisolator
075602	**	10KC RK16 Hor Rotary Potentiometer K15C41
074573	**	10KB RK16 Rotary Potentiometer K15C
074564	**	5KB RK16 Hor Rotary Potentiometer K15C41
PRS768234	*	**Inputs Board (Pcb#313077)**
141189	**	Hor Female XLR-Jack Socket (NCJ6FK-H Neutrik)
141187	**	Hor Female XLR Socket (NC3FAH Neutrik)
141186	**	Hor Male XLR Socket (NC3MAH Neutrik)
MDL145039	**	9 Contacts Vert Male Connector
MDL145033	**	3 Contacts Vert Male Connector
110267	**	1sw 2pos Horizontal Slider Switch
PRS090000	**	A1015GR TO92 LN Pnp Transistor
PRS090001	**	C1815GR TO92 LN Npn Transistor
080743	**	3mm Wide Diffused Green Led
080742	**	3mm Wide Diffused Red-Grn Led
080293	**	15V 1W 5% Zener Diode
PRS727615	*	**250+60W Amplifier Board (Pcb#313080) (EU)**
778158	**	Speakers Cables Assembly
MDL145039	**	9 Contacts Vert Male Connector
110316	**	Relay 24V / 1 Switch no 16A 250V
100965	**	TDA7294 70W Audio Amplifier with Mute
100061	**	TL072 Dual J-Fet Operational Amplifier
100019	**	TL071 LN J-Fet Operational Amplifier
090917	**	MJE350 TO126 Pnp Transistor
090916	**	MJE340 TO126 Npn Transistor
090201	**	2N5401 TO92 Pnp Transistor
090200	**	2N5550 TO92 Npn Transistor
PRS090000	**	A1015GR TO92 LN Pnp Transistor
PRS090001	**	C1815GR TO92 LN Npn Transistor
090867	**	BD140 TO126 Pnp Transistor
080606	**	GBU8D 8A Rectifier Diodes Bridge
080245	**	7V5 1W 5% Zener Diode
080171	**	UF60 or FE6B 6A 100V Fast Recovery Diode
080156	**	1N4002 1A 100V Rectifier Diode
080103	**	1N4148 100mA 75V Signal Diode
030560	**	4700u 80v 20% Snap-In Electrolytic Capacitor
030555	**	4700u 50V 20% Snap-In Electrolytic Capacitor
340154	**	TO3P/TO218 Mica Washer
340079	**	TO220 Mica Washer
340078	**	TO220 Insulated Bush
PRS237081	**	230Vac 210W Transformer (EU)
180734	**	T4A Adhesive Label
177757	**	Heatsink
150314	**	6.3mm Faston Insulator
120841	**	6.3mm Female Brassed Faston
120833	**	25.4mm Threaded Spacer
120831	**	17.6mm Threaded Spacer
120827	**	10mm Threaded Spacer
120522	**	4mm Black Spring Washer
120521	**	3mm Black Spring Washer
120463	**	4.3x12.5x1 Black Washer
120451	**	3.2x7x0.5 Black Washer
120119	**	M4x16tc Black Screw
120118	**	M4x10tc Black Screw
120029	**	M3x6tc Black Screw
120005	**	M3x10tc Screw
110029	**	T4A Fuse 5x20mm (EU)
100060	**	7815 +15V 1A Voltage Regulator
100049	**	7915 -15V 1A Voltage Regulator
090920	**	MJE802 TO126 Npn Darl Transistor
090919	**	MJE15031 TO220 Pnp Transistor
090918	**	MJE15030 TO220 Npn Transistor
PRS090013	**	2SC5200 TO264 Npn Transistor
PRS090014	**	2SA1943 TO264 Pnp Transistor
090863	**	TIP36C TO218 Pnp Transistor
090862	**	TIP35C TO218 Npn Transistor
080821	**	Ptc 100° PTH9L04BD222TS2F330 Murata
080607	**	KBPC2502 25A 200V Rectifier Diode Bridge
020491	**	100nF 10% 250Vac Polyester Capacitor
667726	*	Panel
210268	*	Panel Gasket
210212	*	Slider Switch Adhesive Gasket
180707	*	GND Symbol Adhesive Label
177748	*	“Z” Metal Support
150298	*	100x2.5mm Nylon Cable Tie
120972	*	M3x30mm Spacer Screw
120672	*	M4 Screw Fixing
120582	*	M3 Black Nut
120521	*	3mm Black Spring Washer
120482	*	4mm Black Shakeproof Washer
120481	*	3mm Black Shakeproof Washer
120256	*	B2.9x9.5tsp Black Screw
120096	*	M4x10tsp Black Screw
120029	*	M3x6tc Black Screw
120025	*	M3x10tsp Black Screw
120003	*	M3x8tc Black Screw
110614	*	Mains Socket
110291	*	16A 250Vac Bipolar Power Switch
727628		**Horn Assembly**
657283	*	EWT(TM) Black Elliptical Horn
229038	*	**1" 8ohm Horn Compression Driver**
229035	**	**1" 8ohm Diaphgram for 229038 Driver**
210267	*	Gasket between Horn and Box
210211	*	Gasket between Tweeter and Horn
177123	*	Driver Support
120346	*	WL4x20tc Black Screw
120106	*	M5x10tsp Black Screw
667735		Speaker Net
667702		Handle
659027		White Pot Knob
659026		Orange Pot Knob
657271		Box
227056		**12" 4ohm Woofer Speaker**
210272		Speaker Filler (400gr/m² 30x50x4cm)
210217		Black Sealer (specify mt)
180673		“Lem” Adhesive Label
177713		Handle Fixing Counter-plate
120964		M4i M5e x17.5mm Threaded Pin
120907		8/8 - 5/16 Staple
120461		5.3x10x1 Black Washer
120411		WL3.5x20tt Black Screw
120148		M5x65tbl Screw
120147		M4x10tt Black Screw
120121		M5x12tc Black Screw
120102		M4x30tsp Black Screw

AV-15A HP

PRS737125		**400+80W Amplifier Assembly (EU)**
PRS768239	*	**Crossover Filter Board (Pcb#313079)**
MDL145039	**	9 Contacts Vert Male Connector
100084	**	TL074 Quad J-Fet Operational Amplifier
100061	**	TL072 Dual J-Fet Operational Amplifier
090194	**	BC560C TO92 LN Pnp Transistor
080103	**	1N4148 100mA 75V Signal Diode
PRS768235	*	**Controls Board (Pcb#313078)**
MDL145039	**	9 Contacts Vert Male Connector
MDL145033	**	3 Contacts Vert Male Connector
100084	**	TL074 Quad J-Fet Operational Amplifier
100061	**	TL072 Dual J-Fet Operational Amplifier
PRS090000	**	A1015GR TO92 LN Pnp Transistor
080901	**	VTL5C4 Analog Optoisolator
075602	**	10KC RK16 Hor Rotary Potentiometer K15C41
074573	**	10KB RK16 Rotary Potentiometer K15C
074564	**	5KB RK16 Hor Rotary Potentiometer K15C41
PRS768234	*	**Inputs Board (Pcb#313077)**
141189	**	Hor Female XLR-Jack Socket (NCJ6FK-H Neutrik)
141187	**	Hor Female XLR Socket (NC3FAH Neutrik)
141186	**	Hor Male XLR Socket (NC3MAH Neutrik)
MDL145039	**	9 Contacts Vert Male Connector
MDL145033	**	3 Contacts Vert Male Connector
110267	**	1sw 2pos Horizontal Slider Switch
PRS090000	**	A1015GR TO92 LN Pnp Transistor
PRS090001	**	C1815GR TO92 LN Npn Transistor
080743	**	3mm Wide Diffused Green Led
080742	**	3mm Wide Diffused Red-Grn Led
080293	**	15V 1W 5% Zener Diode
PRS727616	*	**400+80W Amplifier Board (Pcb#313080) (EU)**
778158	**	Speakers Cables Assembly
MDL145039	**	9 Contacts Vert Male Connector
110316	**	Relay 24V / 1 Switch no 16A 250V
100965	**	TDA7294 70W Audio Amplifier with Mute
100061	**	TL072 Dual J-Fet Operational Amplifier
100019	**	TL071 LN J-Fet Operational Amplifier
090917	**	MJE350 TO126 Pnp Transistor
090916	**	MJE340 TO126 Npn Transistor
090201	**	2N5401 TO92 Pnp Transistor
090200	**	2N5550 TO92 Npn Transistor
PRS090000	**	A1015GR TO92 LN Pnp Transistor
PRS090001	**	C1815GR TO92 LN Npn Transistor
090867	**	BD140 TO126 Pnp Transistor
080245	**	7V5 1W 5% Zener Diode
080171	**	UF60 or FE6B 6A 100V Fast Recovery Diode
080156	**	1N4002 1A 100V Rectifier Diode
080103	**	1N4148 100mA 75V Signal Diode
030560	**	4700u 80v 20% Snap-In Electrolytic Capacitor
030555	**	4700u 50V 20% Snap-In Electrolytic Capacitor
340154	**	TO3P/TO218 Mica Washer
340079	**	TO220 Mica Washer
340078	**	TO220 Insulated Bush
PRS237083	**	230Vac 370W Transformer (EU)
177758	**	Unavailable as spare part
150314	**	6.3mm Faston Insulator
120841	**	6.3mm Female Brassed Faston
120833	**	25.4mm Threaded Spacer
120831	**	17.6mm Threaded Spacer
120827	**	10mm Threaded Spacer
120522	**	4mm Black Spring Washer
120521	**	3mm Black Spring Washer
120463	**	4.3x12.5x1 Black Washer
120451	**	3.2x7x0.5 Black Washer
120119	**	M4x16tc Black Screw
120118	**	M4x10tc Black Screw
120029	**	M3x6tc Black Screw
120006	**	M3x14tc Black Screw
120005	**	M3x10tc Screw
110018	**	T6.3A Fuse 5x20mm (EU)
100060	**	7815 +15V 1A Voltage Regulator
100049	**	7915 -15V 1A Voltage Regulator
PRS090013	**	2SC5200 TO264 Npn Transistor
PRS090014	**	2SA1943 TO264 Pnp Transistor
090920	**	MJE802 TO126 Npn Darl Transistor
090919	**	MJE15031 TO220 Pnp Transistor
090918	**	MJE15030 TO220 Npn Transistor
090863	**	TIP36C TO218 Pnp Transistor
090862	**	TIP35C TO218 Npn Transistor
080821	**	Ptc 100° PTH9L04BD222TS2F330 Murata
080609	**	GBPC2502W 25A 200V Rectifier Diode Bridge
080606	**	GBU8D 8A Rectifier Diodes Bridge
020491	**	100nF 10% 250Vac Polyester Capacitor
667727	*	Panel
210269	*	Panel Gasket
210212	*	Slider Switch Adhesive Gasket
180707	*	GND Symbol Adhesive Label
177750	*	Unavailable as spare part
150298	*	100x2.5mm Nylon Cable Tie
120972	*	M3x30mm Spacer Screw
120672	*	M4 Screw Fixing
120582	*	M3 Black Nut
120521	*	3mm Black Spring Washer
120482	*	4mm Black Shakeproof Washer
120481	*	3mm Black Shakeproof Washer
120256	*	B2.9x9.5tsp Black Screw
120096	*	M4x10tsp Black Screw
120029	*	M3x6tc Black Screw
120025	*	M3x10tsp Black Screw
120003	*	M3x8tc Black Screw
110614	*	Mains Socket
110291	*	16A 250Vac Bipolar Power Switch
727629		**Horn Assembly**
657283	*	EWT(TM) Black Elliptical Horn
229036	*	**1" 8ohm Horn Compression Driver**
229039	**	**1" 8ohm Diaphgram for 229036 Driver**
210267	*	Gasket between Horn and Box
210211	*	Gasket between Tweeter and Horn
177712	*	Unavailable as spare part
120346	*	WL4x20tc Black Screw
120106	*	M5x10tsp Black Screw
667736		Speaker Net
667703		Handle
659027		White Pot Knob
659026		Orange Pot Knob
657272		Box
227058		**15" 4ohm Woofer Speaker**
210272		Speaker Filler (400gr/m² 30x50x4cm)
210217		Black Sealer (specify mt)
180673		“Lem” Adhesive Label
177713		Handle Fixing Counter-plate
120966		M4/6.5x8 Ferrule
120965		M4i M5e x24mm Threaded Pin
120907		8/8 - 5/16 Staple
120461		5.3x10x1 Black Washer
120148		M5x65tbl Screw
120147		M4x10tt Black Screw
120121		M5x12tc Black Screw
120102		M4x30tsp Black Screw

Note:

- All dimensions are in mm unless otherwise specified.
- The screw description is defined as follows:
  type of screw + diameter + X + length + type of head
  where type of screw is one of these:
  M = Metric thread
  B = Self-tapping screw for metal
  WL = Self-tapping screw for wood
  and type of head is one of these:
  tc = cylinder Phillips head
  ts = flared Phillips head
  tt = rounded Phillips head
  te = hexagonal nut head
  tsp = flat flared Phillips head
  tce = cylinder Allen hexagonal head
- The washer description is defined as follow:
  hole diameter + X + external diameter + X + thick
- Each spare part 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 name,
  2) Section name,
  3) Module code,
  4) Reference name,
  5) Quantity number.

SKK768238 - Crossover Filter Board

SIGNAL DETECTOR

SUBSONIC & EMPHASIS FILTER

CLIP DETECTOR

HF FEEDBACK LIMITER

SYSTEM EQUALIZER

HP-24dB/oct. 2500Hz

LP-18dB/oct. 2400Hz

Pcb#313079

SKK727615 - 250+60W Amplifier Board (EU)

HF RECTIFIER

LF RECTIFIER

DC-OFFSET DETECTOR

MUTING

BIAS ADJ

HIGH OUT + -

LOW OUT + -

Pcb#313080

SKK768234 Inputs Board

MIC IN

LINE IN

SHIELD

OUT

COMP SIGNAL

POWER ON

Pcb#313077

SKK768235 - Controls Board

MIC-PRE

GAIN

MIX

VOLUME

COMPRESSOR

TONE CONTROLS

HIGH

MID

LOW

Pcb#313078

⚠237081 - 230Vac 210W Transformer (EU)

⚠ MAINS CABLE

⚠ MAINS INLET

⚠ MAINS SWITCH

KLIXON 501-T100°C

42Vac 22Vac 0Vac 22Vac 42Vac

DRW G.BOCCATO	DWG# 550706	PCB# 313077, 313078, 313079, 313080	GENERALMUSIC S.p.A. ITALY
CKD G.RICCI	DATE 05/07/02	SCHEMATIC DIAGRAM AV12HP	
APP. R.MAGALOTTI	REV: A	POWER AMPLIFIER 2nd VER. (SKK)	

SKK768239 - Crossover Filter Board

SIGNAL DETECTOR

SUBSONIC & EMPHASIS FILTER

CLIP DETECTOR

HF FEEDBACK LIMITER

SYSTEM EQUALIZER

HP-24dB/oct. 2800Hz

LP-12dB/oct. 1650Hz

Pcb#313079

SKK727616 - 400+80W Amplifier Board (EU)

HF RECTIFIER

LF RECTIFIER

DC-OFFSET DETECTOR

MUTING

BIAS ADJ

HIGH OUT + -

LOW OUT + -

Pcb#313080

SKK768234 Inputs Board

MIC IN

LINE IN

SHIELD

OUT

COMP SIGNAL

POWER ON

Pcb#313077

SKK768235 - Controls Board

MIC-PRE

GAIN

MIX

VOLUME

COMPRESSOR

TONE CONTROLS

HIGH

MID

LOW

Pcb#313078

⚠237083 - 230Vac 370W Transformer (EU)

MAINS CABLE

MAINS INLET

MAINS SWITCH

KLIXON S01-T100°C

51Vac

26Vac

0Vac

26Vac

51Vac

DRW G.BOCCATO	DWG# 550707	PCB# 313077, 313078, 313079, 313080	GENERALMUSIC S.p.A. ITALY
CKD G.RICCI	DATE 05/07/02	SCHEMATIC DIAGRAM AV15HP	
APP. R.MAGALOTTI	REV: A	POWER AMPLIFIER 2nd VER. (SKK)	

SKK768236 - Crossover Filter Board

SIGNAL DETECTOR

SUBSONIC & EMPHASIS FILTER

CLIP DETECTOR

HF FEEDBACK LIMITER

SYSTEM EQUALIZER

HP-24dB/oct. 6400Hz

LP-12dB/oct. 2600Hz

Pcb#313079

SKK768233 - Inputs & Controls Board

INPUT

LINK

EARTH LIFT

VOLUME

POWER ON

SIGNAL

COMP

Pcb#313076

SKK727614 - 180+40W Amplifier Board (EU)

HF RECTIFIER

LF RECTIFIER

HIGH OUT

LOW OUT

BIAS ADJ

DC-OFFSET DETECTOR

MUTING

237079 - 230Vac 160W Transformer (EU)

MAINS CABLE

MAINS INLET

MAINS SWITCH

Pcb#313080

DRW G.BOCCATO	DWG# 550708	PCB# 313076, 313079, 313080	GENERALMUSIC S.p.A. ITALY
CKD G.RICCI	DATE 05/07/02	SCHEMATIC DIAGRAM AV12FLEX	
APP. R.MAGALOTTI	REV: A	POWER AMPLIFIER (5KK)	

SKK768237 - Crossover Filter Board

SIGNAL DETECTOR

SUBSONIC & EMPHASIS FILTER

CLIP DETECTOR

HF FEEDBACK LIMITER

SYSTEM EQUALIZER

HP-24dB/oct. 3900Hz

LP-6dB/oct, 2800Hz

Pcb#313079

SKK768233 - Inputs & Controls Board

INPUT

LINK

EARTH LIFT

VOLUME

POWER ON

SIGNAL

COMP

Pcb#313076

SKK727615 - 250+60W Amplifier Board (EU)

HF RECTIFIER

LF RECTIFIER

BIAS ADJ

DC-OFFSET DETECTOR

MUTING

HIGH OUT

LOW OUT

227072 - 5" 4ohm Woofer Speaker

229038 - 1" 8ohm Horn Compression Driver

⚠237081 - 230Vac 210W Transformer (EU)

MAINS CABLE

MAINS INLET

MAINS SWITCH

KLIXON 501-T100 °C

42Vac

22Vac

0Vac

22Vac

42Vac

Pcb#313080

DRW G.BOCCATO	DWG# 550709	PCB# 313076, 313079, 313080	GENERALMUSIC S.p.A. ITALY
CKD G.RICCI	DATE 05/07/02	SCHEMATIC DIAGRAM AV15FLEX	
APP. R.MAGALOTTI	REV: A	POWER AMPLIFIER (5KK)	