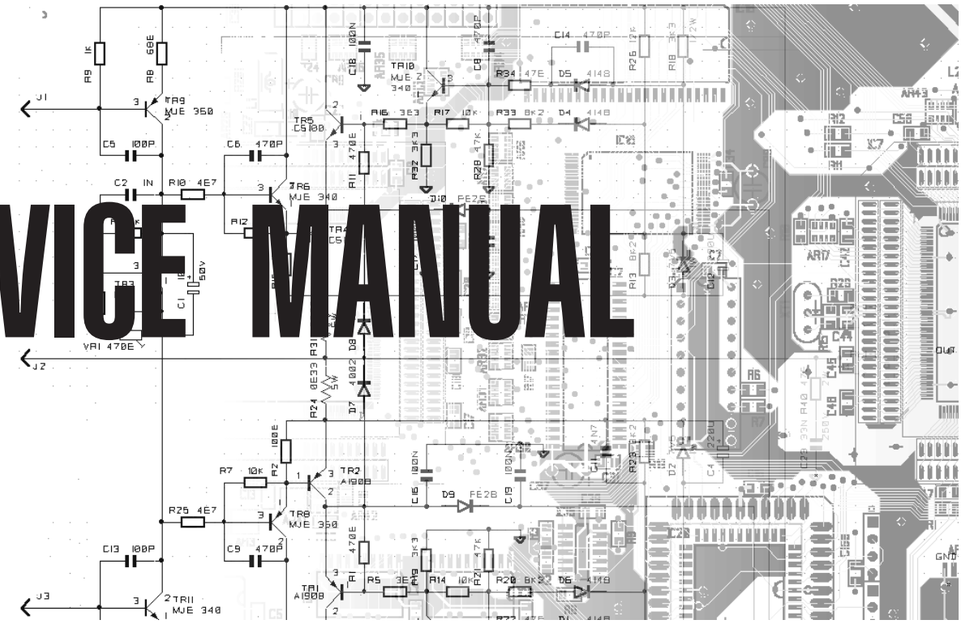
PERFORMANCE SERIES

passive

PFM 10X
PFM 10.2
PFM 12.2
PFM 15.2
PFM 15.3
PFM 15S

active

PFM 10.2A
PFM 12.2A
PFM 15.2A
PFM 15.3A
PFM 15SA
PFM 8MA
PFM 12.2MA
PFM 15.2MA



SERVICE MANUAL

GENERALMUSIC®

CODE: 270249

Index

Warnings

Notice

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 (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 1/8W 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.
- 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
Phone +39(0)541/959511 - Fax +39(0)541/957404 - GENERALMUSIC on the NET: http://www.generalmusic.com

PERFORMANCE • TECHNICAL SPECIFICATIONS

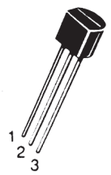
		PFM 10.2	PFM 12.2	PFM 15.2	PFM 15.3	PFM 15.2MA	PFM 12.2MA	PFM 8MA	PFM 15S
LOUDSPEAKER SPECIFICATIONS									
COMPONENTS	*High*	Niobium horn tweeter with polycarbonate diaphragm							
	Mid				6" midrange			8" wide-range	
	Low	10" woofer	12" woofer	15" woofer	15" woofer	15" woofer	12" woofer		15" woofer
POWER HANDLING (EIA RS-426A)	*W continuous*	100	150	250	250	250	150	100	350
	W peak	200	300	500	500	500	200	200	700
IMPEDANCE	*Ohms*	8	8	4 / 8	4 / 8				8
PASSIVE CROSSOVER	*Hz*	5 kHz 6 dB/oct.	5 kHz 6 dB/oct.	4 kHz 6 dB/oct.	0.8/ 5 kHz 12 / 6 dB/oct.	4 kHz 6 dB/oct.	5 kHz 6 dB/oct.		230 Hz 12 / 6 dB/oct.
CONNECTIONS (passive versions)		2 x JACK (input + link)							3 x JACK (input + link + out)
CONSTRUCTION		Chipboard covered with blue carpet							
DIMENSIONS	*mm (WxHxD)*	340x458x285	390x508x325	458x578x405	482x608x405	460x580x410	390x508x325	305x395x275	478x508x478
WEIGHT (passive / active)	*kg*	9 / 12	11.5 / 15.5	16.5 / 21.5	19.5 / 24.5	21.5	15	11.5	19.5 / 24.5
AMPLIFIER SPECIFICATIONS (active versions)									
EIA OUTPUT POWER (1kHz, max THD 1%)	*W*	100	150	250	230 + 80	250	150	100	350
INPUT SENSITIVITY	*dB (V)*	0 (0.775V)							
INPUT IMPEDANCE	*kohms*	30 (balanced) - 15 (unbalanced)							
ACTIVE CROSSOVER	*Hz*				2 kHz 18 dB/oct.				From 80 to 320 @ 12db/oct.
DISTORSION	*%*	<0.02 (THD+Noise)							
CONTROLS		Volume - Shield on/off							Volume - Shield on/off XOVER frequency
CONNECTIONS		XLR-F + JACK (input + link)							JACK + XLR-F (in) JACK + XLR-M (out)
POWER SUPPLY		See label on the apparatus							
SYSTEM SPECIFICATIONS									
SENSITIVITY (SPL 1W/1m)	*dB*	96	97	98	98	98	97	95	94
MAX SPL continuous	*dB*	113	116	119	121	119	116	114	118
MAX SPL peak	*dB*	116	119	122	127	122	119	117	121
FREQUENCY RESPONSE	*Hz (-10dB)*	60 - 20k	55 - 20k	48 - 20k	45 - 20k	48 - 20k	55 - 20k	65 - 20k	40 - 300
DISPERSION (OxV)	°	90 x 60	90 x 60	90 x 60	90 x 60	90 x 60	90 x 60	90 x 90	

Transistor Packages

TO92

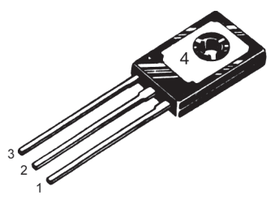
BC547, BC557:
1=Collector
2=Base
3=Emitter

2N5401, 2N5550
1=Emitter
2=Base
3=Collector



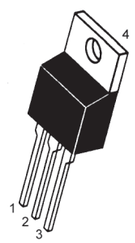
TO126

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



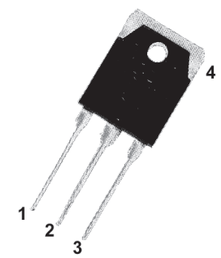
TO220

TIP41C, TIP42C:
1=Base
2=Collector
3=Emitter
4=Collector



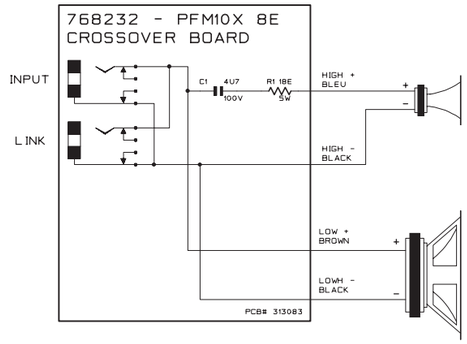
TO3P

2SC3284, 2SA1303:
1=Base
2=Collector
3=Emitter
4=Collector



PFM10X 8ohm

SPECIFICATION	
WAYS	2
XOVER FREQ.	5KHz
SLOPE HP	6dB/Oct.
POWER rms	100W
POWER max	200W
IMPEDANCE (nominal)	8ohm

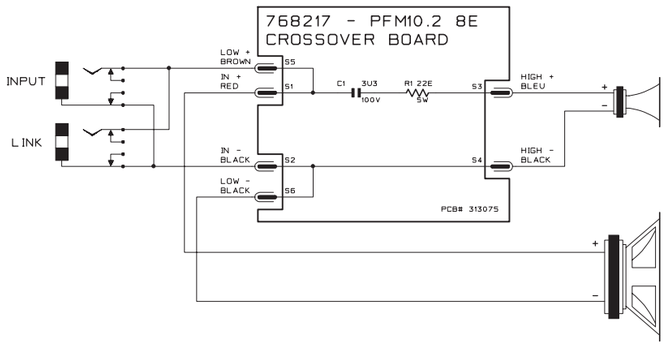


229044 - 12ohm Piezoelectric Horn Tweeter

227064 - 10" 8ohm Woofer Speaker

PFM10.2 8ohm

SPECIFICATION	
WAYS	2
XOVER FREQ.	5KHz
SLOPE HP	6dB/Oct.
POWER rms	100W
POWER max	200W
IMPEDANCE (nominal)	8ohm

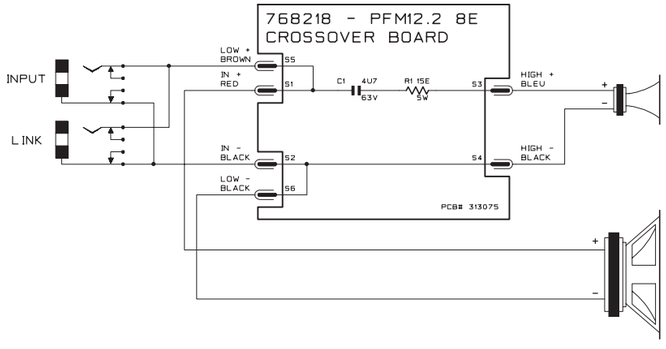


229043 - 12ohm Piezoelectric Horn Tweeter

227064 - 10" 8ohm Woofer Speaker

PFM12.2 8ohm

SPECIFICATION	
WAYS	2
XOVER FREQ.	5KHz
SLOPE HP	6dB/Oct.
POWER rms	150W
POWER max	300W
IMPEDANCE (nominal)	8ohm

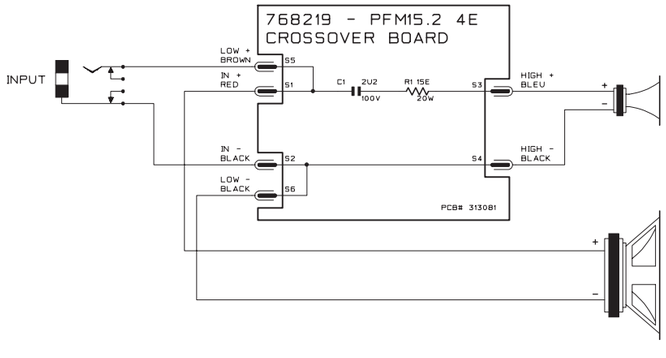


229043 - 12ohm Piezoelectric Horn Tweeter

227065 - 12" 8ohm Woofer Speaker

PFM15.2 4ohm

SPECIFICATION	
WAYS	2
XOVER FREQ.	4KHz
SLOPE HP	6dB/Oct.
POWER rms	250W
POWER max	500W
IMPEDANCE (nominal)	4ohm

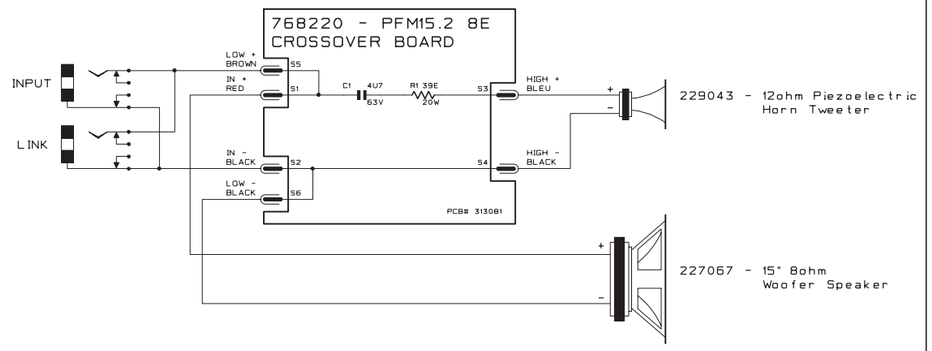


229043 - 12ohm Piezoelectric Horn Tweeter

227066 - 15" 4ohm Woofer Speaker

PFM15.2 8ohm

SPECIFICATION	
WAYS	2
XOVER FREQ.	4KHz
SLOPE HP	6dB/Oct.
POWER rms	250W
POWER max	500W
IMPEDANCE (nominal)	8ohm

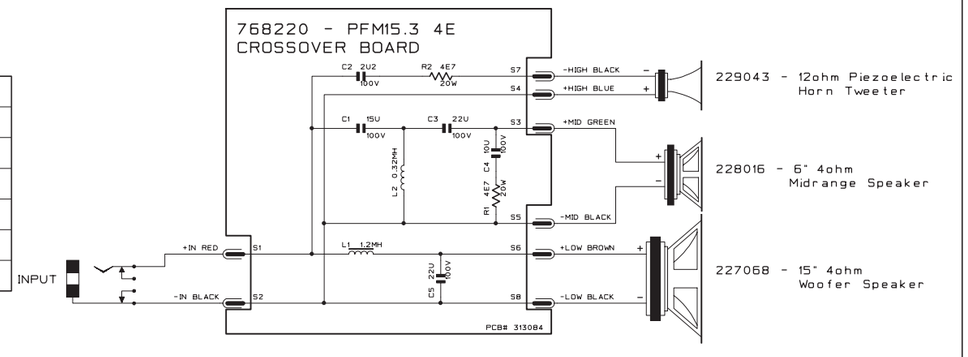


229043 - 12ohm Piezoelectric Horn Tweeter

227067 - 15" 8ohm Woofer Speaker

PFM15.3 4ohm

SPECIFICATION	
WAYS	3
XOVER FREQ.	800Hz-5KHz
SLOPE HP	12-6dB/Oct.
POWER rms	250W
POWER max	500W
IMPEDANCE (nominal)	4ohm



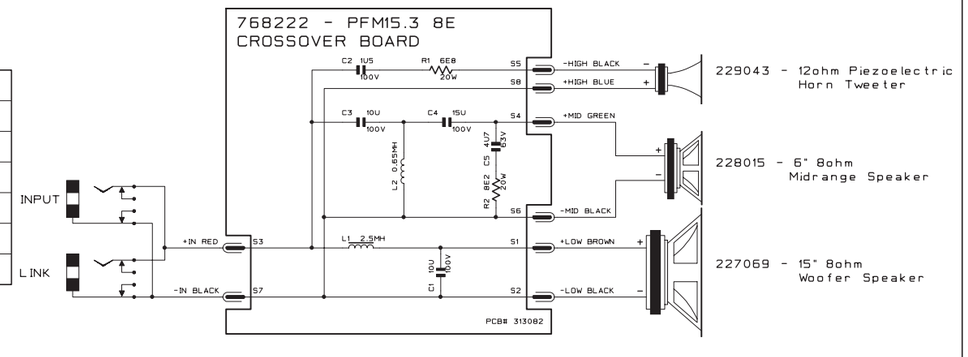
229043 - 12ohm Piezoelectric Horn Tweeter

228016 - 6" 4ohm Midrange Speaker

227058 - 15" 4ohm Woofer Speaker

PFM15.3 8ohm

SPECIFICATION	
WAYS	3
XOVER FREQ.	800Hz-5KHz
SLOPE	12-6dB/Oct.
POWER rms	250W
POWER max	500W
IMPEDANCE (nominal)	8ohm



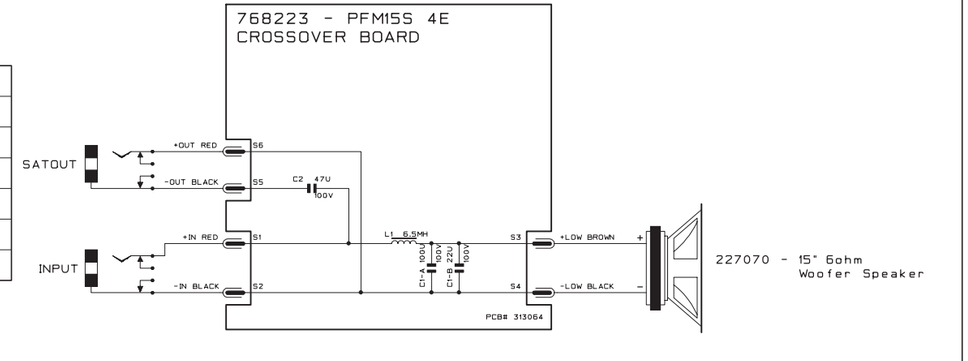
229043 - 12ohm Piezoelectric Horn Tweeter

228015 - 6" 8ohm Midrange Speaker

227069 - 15" 8ohm Woofer Speaker

PFM15S 4ohm

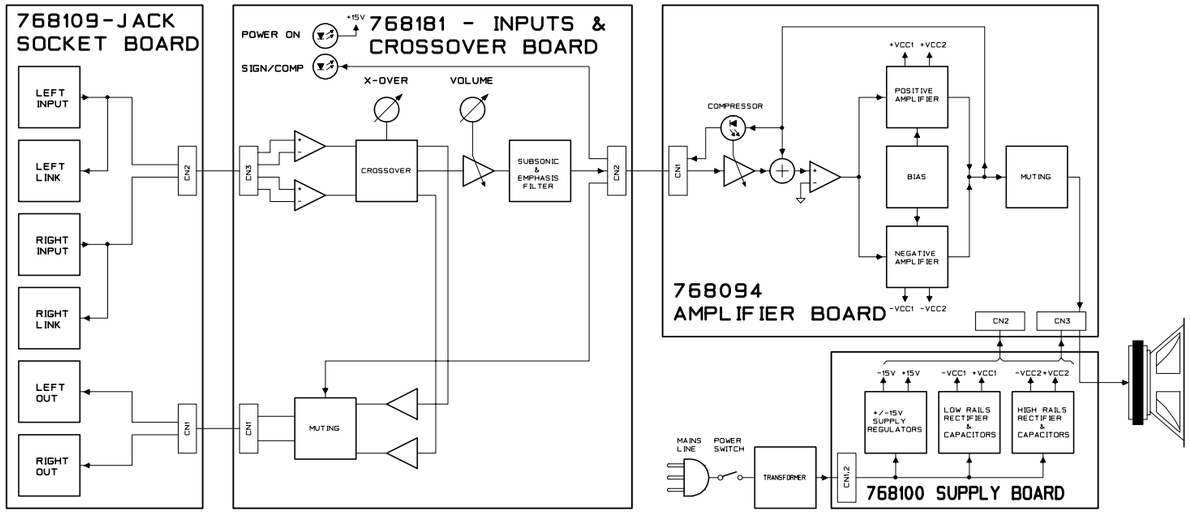
SPECIFICATION	
WAYS	1
XOVER FREQ.	230Hz
SLOPE HP	12-6dB/Oct.
POWER rms	350W
POWER max	700W
IMPEDANCE (nominal)	4ohm

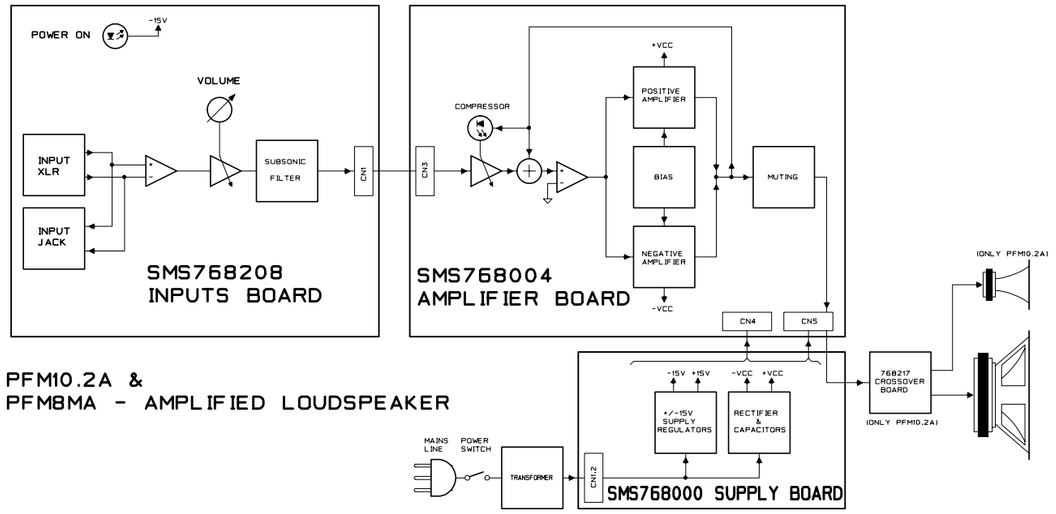


227070 - 15" 6ohm Woofer Speaker

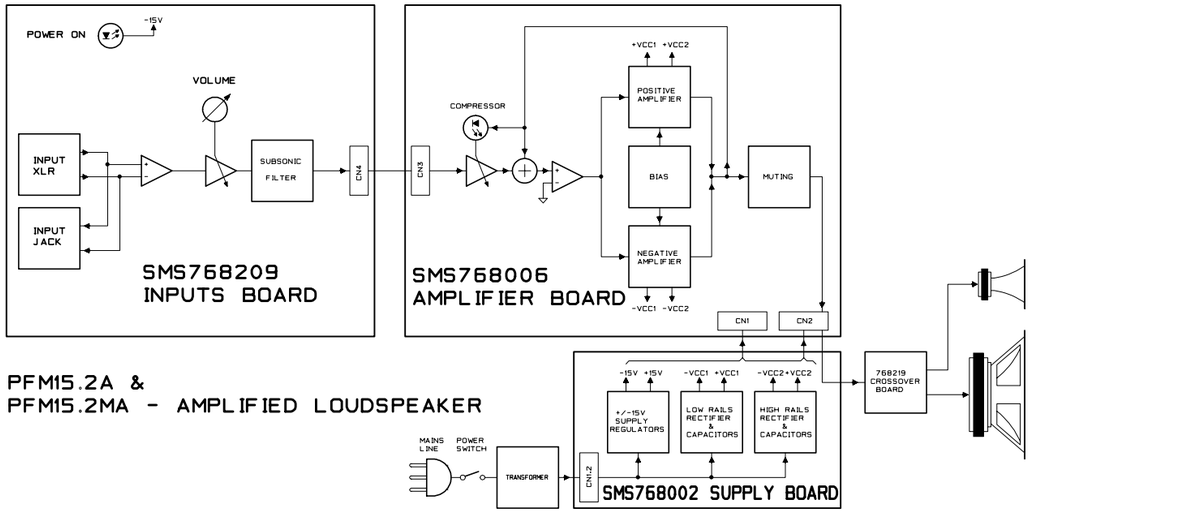
DRW G.BOCCATO	DWG# 550647	PCB# 313075 313081 313084 313064	GENERALMUSIC S.p.A. ITALY
CKD R.MAGALOTTI	DATE 23/10/2000	SCHEMATIC DIAGRAM PFM series PASSIVE	
APP. R.FALCONI	REV: A		

PFM15SA - AMPLIFIED SUBWOOFER SPEAKER - BLOCK DIAGRAM

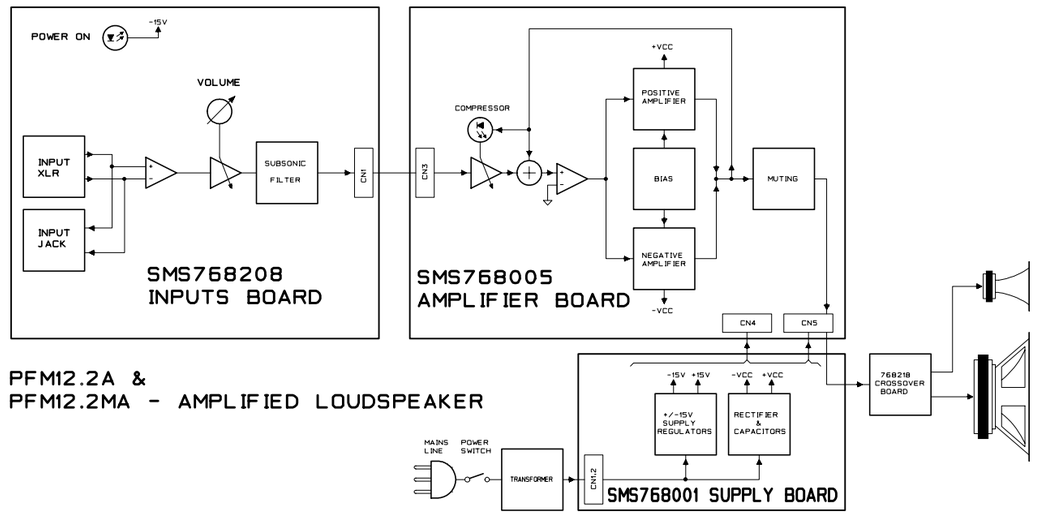




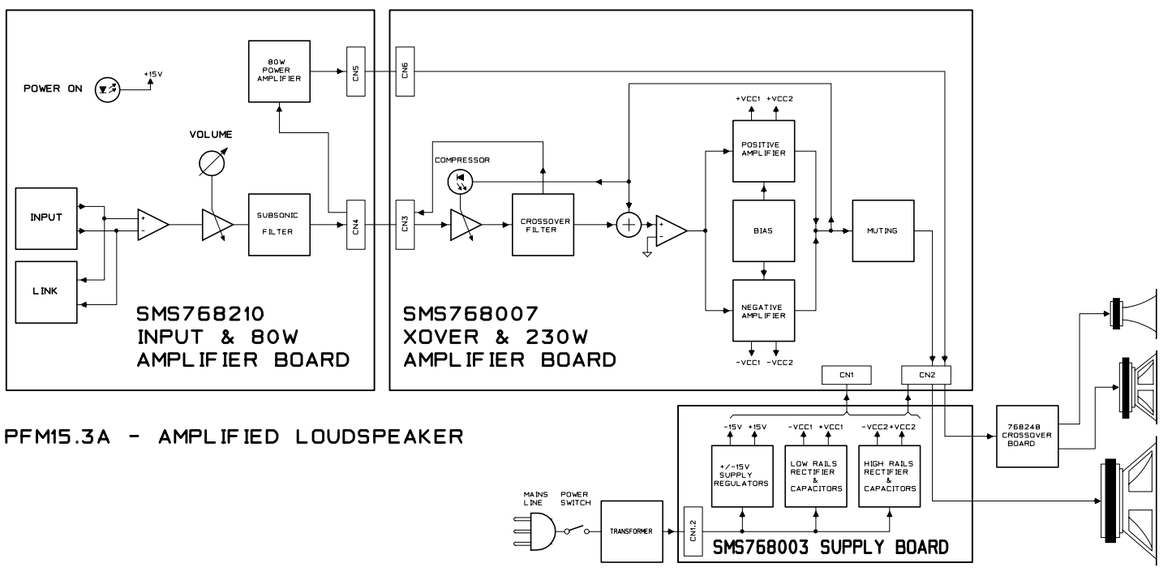
PFM10.2A &
PFM8MA - AMPLIFIED LOUDSPEAKER



PFM15.2A &
PFM15.2MA - AMPLIFIED LOUDSPEAKER



PFM12.2A &
PFM12.2MA - AMPLIFIED LOUDSPEAKER



PFM15.3A - AMPLIFIED LOUDSPEAKER

DRW G.BOCCATO	DWG# 550652	PCB#	GENERALMUSIC S.p.A. ITALY
CKD G.RICCI	DSK# 6 PART: 1/1	SCHEMATIC DIAGRAM PFM SERIES ACTIVE	
APP. R.FALCONI	REV: 09/10/00	BLOCK DIAGRAMS	

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.**

Visual Check

- Check the speakers for any damaging (cone-breaking, interruption or so).
- 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
- 8Ω 500W, 4Ω 500W, 100Ω 10W resistors
- Variac (0÷250Vac)

PFM10.2A-PFM8MA Amplified Loudspeaker

The following adjustment and notes are relative to these models only.

Technical Specifications

Dimensions:	PFM10.2A (WxHxD)	340x458x285mm
Dimensions:	PFM8MA (WxHxD)	305x395x275mm
Weight:	PFM10.2A	12Kg
Weight:	PFM8MA	11.5Kg
Power Requirements:	(230Vac±10% 50Hz)	150VA
	(115Vac±10% 50/60Hz)	150VA
Output Power*:	(8Ω)	90W
Max.Undistorted Out*:	(8Ω)	76Vpp
Sensitivity:	PFM10.2A (1W/1m)	96dB$_{SPL}$
Sensitivity:	PFM8MA (1W/1m)	95dB$_{SPL}$
Max SPL:	PFM10.2A (continuous)	113dB$_{SPL}$
	PFM10.2A (peak)	116dB$_{SPL}$
Max SPL:	PFM8MA (continuous)	114dB$_{SPL}$
	PFM8MA (peak)	117dB$_{SPL}$
Frequency Response	(amplifier+speaker)	60Hz÷20kHz
	(only amplifier -3dB)	10Hz÷60kHz
Input Sensitivity:	(0dB)	0.775V$_{RMS}$
Input Impedance:	(balanced)	30KΩ
	(unbalanced)	15KΩ
Voltage Gain:		31±1dB
IMD:	(SMPTE 60Hz/7KHz 4:1)	<0.1%
THD:	(THD+N)	<0.1%
S/N Ratio:	(unweighted)	>100dB

*Note: measured with the limiter enabled.

Setup

- Connect the Variac between the mains and the amplifier and set it at zero voltage.
- Connect the audio generator to the channel input and set it to 1kHz 775mV$_{RMS}$ (0dB) sinusoidal signal.
- Place the temperature sensor between heatsink and the PTC (TH1).
- Connect the CH1 scope GND clip to CN4 pin 1 (SGND terminal) and the probe tip to R50 side RL1 (PWR out), set it to 20V/div. 1mS/div.
- Connect the CH2 probe tip to R58 side C28 and set its sensitivity at 0.2V/div.
- Set the LEVEL potentiometer full clockwise.
- The load resistor is disconnected.
- 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=71±2Vac
- Re-set the Variac at zero voltage, turn off the amplifier and put the fuses back on its holders.
- Set up the Variac slowly monitoring the Outputs with the oscilloscope CH1 connected, it should display the sinusoidal input signal amplified with no distortions, if a distortion occur or the protection trips, turn off the amplifier and check the AMPLIFIER board as suggested in the ADVICES section.
- Finally verify the DC supplies on SUPPLY board:

  CN4 pin 2 (+Vcc1) =+50±2Vdc
  CN5 pin 1-2 (-Vcc1) =-50±2Vdc
  CN4 pin 4 =+15±1Vdc
  CN4 pin 5 =-15±1Vdc
- If one or more voltages don't correspond, check the rectifiers, capacitors and transformers disconnecting them from circuitry, refer to schematics.

Channel Check

- Verify, with the Multimeter, the insulation between the heatsink and the transistors collectors.
- Verify, with the Multimeter, the PTC resistor value (TH1), it must be between 50Ω and 200Ω.
- **VOLTAGE AMPLIFIER TEST:**

  Increase slowly the Variac. The channel output signals must be symmetrical respect the GND without visible distortion and oscillation. If there is a distortion read the section ADVICES.
- **CURRENT AMPLIFIER TEST:**

  Connect the 8Ω 500W load on the output and repeat the test.
- **LIMITER CHECK:**

  Increase the input signal of 10 dB and verify the output voltage and wave shape remain constant.
- **BIAS ADJUSTMENT:**

  With resistive load connected wait until the temperature reach 50°c. Set the generator level at zero, connect the Multimeter across the R50 and R53 resistors, then adjust VR1 trimmer to read 5±0.1mVdc.
- **BANDWIDTH CHECK:**

  Switch alternatively the generator frequency to 100Hz and 10kHz, no level changes must be detectable respect 1kHz.

  Switch the generator frequency to 30Hz and verify the output level decreases about 4.5dB, respect to 1 KHz level.
- **OFFSET SENSOR CHECK:**

  Set the Variac to zero voltage output, disconnect resistive load from the amplifier output, connect temporarily (by means of a suitable conductor wire) CN4 pin 4 (+15Vdc) to R72 side RL1, the protection circuitry (Q14,15,16) detect the DC voltage and open the output relay (RL1) within 3 seconds approx.

  Remove the connection, wait until the relay switch on and after some seconds repeat the check with -15Vdc (available on CN4 pin 5), the protection circuitry must open the relay again.
- **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.

PFM12.2A-PFM12.2MA Amplified Loudspeaker

The following adjustment and notes are relative to these models only.

Technical Specifications

Dimensions:	PFM12.2A (WxHxD)	390x508x325mm
Dimensions:	PFM12.2MA (WxHxD)	390x508x325mm
Weight:	PFM12.2A	15.5Kg
Weight:	PFM12.2MA	15Kg
Power Requirements:	(230Vac±10% 50Hz)	180VA
	(115Vac±10% 50/60Hz)	180VA
Output Power*:	(8Ω)	136W
Max.Undistorted Out*:	(8Ω)	93Vpp

Sensitivity:	(1W/1m)	97dB$_{SPL}$
Max SPL:	(continuous)	116dB$_{SPL}$
	(peak)	119dB$_{SPL}$
Frequency Response	(amplifier+speaker)	55Hz÷20kHz
	(only amplifier -3dB)	10Hz÷60kHz
Input Sensitivity:	(0dB)	0.775V$_{RMS}$
Input Impedance:	(balanced)	30KΩ
	(unbalanced)	15KΩ
Voltage Gain:		33±1dB
IMD:	(SMPTE 60Hz/7KHz 4:1)	<0.1%
THD:	(THD+N)	<0.1%
S/N Ratio:	(unweighted)	>100dB

*Note: measured with the limiter enabled.

Setup

- Connect the Variac between the mains and the amplifier and set it at zero voltage.
- Connect the audio generator to the channel input and set it to 1kHz 775mV$_{RMS}$ (0dB) sinusoidal signal.
- Place the temperature sensor between heatsink and the PTC (TH1).
- Connect the CH1 scope GND clip to CN4 pin 1 (SGND terminal) and the probe tip to R50 side RL1 (PWR out), set it to 20V/div. 1mS/div.
- Connect the CH2 probe tip to R58 side C28 and set its sensitivity at 0.2V/div.
- Set the LEVEL potentiometer full clockwise.
- The load resistor is disconnected.
- 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=90±2Vac
- Re-set the Variac at zero voltage, turn off the amplifier and put the fuses back on its holders.
- Set up the Variac slowly monitoring the Outputs with the oscilloscope CH1 connected, it should display the sinusoidal input signal amplified with no distortions, if a distortion occur or the protection trips, turn off the amplifier and check the AMPLIFIER board as suggested in the ADVICES section.
- Finally verify the DC supplies on SUPPLY board:

  CN4 pin 2 (+Vcc1) =+63±2Vdc
  CN5 pin 1-2 (-Vcc1) =-63±2Vdc
  CN4 pin 4 =+15±1Vdc
  CN4 pin 5 =-15±1Vdc
- If one or more voltages don't correspond, check the rectifiers, capacitors and transformers disconnecting them from circuitry, refer to schematics.

Channel Check

- Verify, with the Multimeter, the insulation between the heatsink and the transistors collectors.
- Verify, with the Multimeter, the PTC resistor value (TH1), it must be between 50Ω and 200Ω.
- **VOLTAGE AMPLIFIER TEST:**

  Increase slowly the Variac. The channel output signals must be symmetrical respect the GND without visible distortion and oscillation. If there is a distortion read the section ADVICES.
- **CURRENT AMPLIFIER TEST:**

  Connect the 8Ω 500W load on the output and repeat the test.
- **LIMITER CHECK:**

  Increase the input signal of 10 dB and verify the output voltage and wave shape remain constant.
- **BIAS ADJUSTMENT:**

  With resistive load connected wait until the temperature reach 50°c. Set the generator level at zero, connect the Multimeter across the R50 and R53 resistors, then adjust VR1 trimmer to read 5±0.1mVdc.
- **BANDWIDTH CHECK:**

  Switch alternatively the generator frequency to 100Hz and 10kHz, no level changes must be detectable respect 1kHz.

  Switch the generator frequency to 30Hz and verify the output level decreases about 4.5dB, respect to 1 KHz level.
- **OFFSET SENSOR CHECK:**

  Set the Variac to zero voltage output, disconnect resistive load from the amplifier output, connect temporarily (by means of a suitable conductor wire) CN4 pin 4 (+15Vdc) to R72 side RL1, the protection circuitry (Q14,15,16) detect the DC voltage and open the output relay (RL1) within 3 seconds approx.

  Remove the connection, wait until the relay switch on and after some seconds repeat the check with -15Vdc (available on CN4 pin 5), the protection circuitry must open the relay again.
- **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.

PFM15.2A - PFM15.2MA Amplified Loudspeaker

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

Remarks

- The power supply utilizes 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).

Technical Specifications

Dimensions:	(WxHxD)	458x578x405mm
Weight:		21,5Kg
Power Requirements:	(230Vac±10% 50Hz)	250VA
	(115Vac±10% 50/60Hz)	250VA
Output Power*:	(4Ω)	250W
Max.Undistorted Out*:	(4Ω)	89Vpp
Sensitivity:	(1W/1m)	98dB$_{SPL}$
Max SPL:	(continuous)	119dB$_{SPL}$
	(peak)	122dB$_{SPL}$
Frequency Response	(amplifier+speaker)	48Hz÷20kHz
	(only amplifier -3dB)	10Hz÷60kHz
Input Sensitivity:	(0dB)	0.775V$_{RMS}$
Input Impedance:	(balanced)	30KΩ
	(unbalanced)	15KΩ
Voltage Gain:		32±1dB
IMD:	(SMPTE 60Hz/7KHz 4:1)	<0.1%
THD:	(THD+N)	<0.1%
S/N Ratio:	(unweighted)	>100dB

*Note: measured with the limiter enabled.

Setup

- Connect the Variac between the mains and the amplifier and set it at zero voltage.
- Connect the audio generator to the channel input and set it to 1kHz 775mV$_{RMS}$ (0dB) sinusoidal signal.
- Place the temperature sensor between heatsink and the PTC (TH1).
- Connect the CH1 scope GND clip to CN1 pin 1 (SGND terminal) and the probe tip to R60 side RL1 (PWR out), set it to 20V/div. 1mS/div.
- Connect the CH2 probe tip to D22 cathode and set its sensitivity at 20V/div.
- Set the LEVEL potentiometer full clockwise.
- The load resistor is disconnected.
- 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=90±2Vac
  F4-F5=52±1.5Vac.
- Re-set the Variac at zero voltage, turn off the amplifier and put the fuses back on its holders.
- Set up the Variac slowly monitoring the Outputs with the oscilloscope CH1 and CH2 connected, it should display the sinusoidal input signal amplified with no distortions, if a distortion occur or the protection trips check the AMPLIFIER board as suggested in the ADVICES section.
- Finally verify the DC supplies on SUPPLY board:

  CN1 pin 2 (+Vcc2) =+63±2Vdc
  CN2 pin 3 (+Vcc1) =+36±1.5Vdc
  CN2 pin 1 (-Vcc1) =-36±1.5Vdc
  CN2 pin 2 (-Vcc2) =-63±2Vdc
  CN1 pin 4 =+15±1Vdc
  CN1 pin 5 =-15±1Vdc
- If one or more voltages don't correspond, check the rectifiers, capacitors and transformers disconnecting them from circuitry, refer to schematics.

Channel Check

- Verify, with the Multimeter, the insulation between the heatsink and the transistors collectors.
- Verify, with the Multimeter, the PTC resistor value (TH1), it must be between 50Ω and 200Ω.
- **LOW RAIL VOLTAGE AMPLIFICATION TEST:**

  Increase slowly the Variac. The channel output signals must be symmetrical respect the GND without visible distortion and oscillation as shown in *Fig.1 Trace A* (*Trace B* shown the amplifier 2nd stage input R58 side C28). If there is a distortion read the section ADVICES.
- **HIGH RAIL VOLTAGE AMPLIFICATION TEST:**

  When the output signal (Positive half-wave) is less than 29Vp the voltage on D22 cathode must remain constant at 35V, when the output signal exceeds 29Vp the voltage must follow the output signal with 6V offset (see *Fig.2 Trace B*), to check the negative high rail connect the probe to D26 anode (see *Fig.2 Trace C*).
- **LOAD CURRENT TEST:**

  Connect the 4Ω 500W load on the output and repeat the LOW RAIL and HIGH RAIL tests.
- **LIMITER CHECK:**

  Increase the input signal of 10 dB and verify the output voltage and wave shape remain constant.
- **BIAS ADJUSTMENT:**

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

  Set the level at zero, connect the Multimeter across the resistors R60, then adjust VR1 trimmer to read 12±0.1mVdc.
- **BANDWIDTH CHECK:**

  Switch alternatively the generator frequency to 100Hz and 10kHz, no level changes must be detectable respect 1kHz.

  Switch the generator frequency to 30Hz and verify the output level decreases about 4.5dB, respect to 1 KHz level.
- **OFFSET SENSOR CHECK:**

  Set the Variac to zero voltage output, disconnect resistive load from the amplifier output, connect temporarily (by means of a suitable conductor wire) CN1 pin 4 (+15Vdc) to R72 side RL1, the protection circuitry (Q14,15,16) detect the DC voltage and open the output relay (RL1) within 3 seconds approx.

  Remove the connection, wait until the relay switch on and after some seconds repeat the check with -15Vdc (available on CN1 pin 5), the protection circuitry must open the relay again.
- **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.

PFM15.3A Amplified Loudspeaker

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

Remarks

- This is a bi-amplified speaker, the more powerful amplifier is for the low frequency range (woofer), the less powerful amplifier is for the high frequency range (midrange and tweeter).
- The power supply of the first amplifier utilizes 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 second amplifier is supplied by means the onlylow rail (+/-Vcc1).

Technical Specifications

Dimensions:	(WxHxD)	482x608x405mm
Weight:		24.5Kg
Power Requirements:	(230Vac±10% 50Hz)	310VA
	(115Vac±10% 50/60Hz)	310VA
Output Power*:	(4Ω/8Ω)	230W/80W
Max. Undistorted Out*:	(4Ω/8Ω)	85Vpp/71Vpp
Sensitivity:	(1W/1m)	98dB$_{SPL}$
Max SPL:	(continuous)	121dB$_{SPL}$
	(peak)	127dB$_{SPL}$
Frequency Response	(both amps+speakers)	45Hz÷20kHz
	(only amplifiers -3dB)	10Hz÷60kHz
Input Sensitivity:	(0dB)	0.775V$_{RMS}$
Input Impedance:	(balanced)	30KΩ
	(unbalanced)	15KΩ
Voltage Gain:		32±1dB
IMD:	(SMPTE 60Hz/7KHz 4:1)	<0.1%
THD:	(THD+N)	<0.1%
S/N Ratio:	(unweighted)	>100dB

*Note: measured with the limiter enabled.

Setup

- Connect the Variac between the mains and the amplifier and set it at zero voltage.
- Connect the audio generator to the channel input and set it to 2kHz 775mV$_{RMS}$ (0dB) sinusoidal signal.
- Place the temperature sensor between heatsink and the PTC (TH1).
- Connect the CH1 scope GND clip to CN1 pin 1 (SGND terminal) and the probe tip to R60 side RL1 (LF PWR out), set it to 20V/div. 1mS/div.
- Connect the CH2 probe tip to R260 side IC202 (HF PWR out) and set its sensitivity at 20V/div.
- Set the LEVEL potentiometer full clockwise.
- The load resistor is disconnected.
- 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=86±2Vac

  F4-F5=62±1.5Vac.
- Re-set the Variac at zero voltage, turn off the amplifier and put the fuses back on its holders.
- Set up the Variac slowly monitoring the Outputs with the oscilloscope CH1 and CH2 connected, it should display the sinusoidal input signal amplified with no distortions, if a distortion occur or the protection trips check the AMPLIFIER board as suggested in the ADVICES section.
- Finally verify the DC supplies on SUPPLY board:

  CN1 pin 2 (+Vcc2) =+60±2Vdc
  CN2 pin 3 (+Vcc1) =+43±1.5Vdc
  CN2 pin 1 (-Vcc1) =-43±1.5Vdc
  CN2 pin 2 (-Vcc2) =-60±2Vdc
  CN1 pin 4 =+15±1Vdc
  CN1 pin 5 =-15±1Vdc
- If one or more voltages don't correspond, check the rectifiers, capacitors and transformers disconnecting them from circuitry, refer to schematics.

Low Frequency Channel Check

- Verify, with the Multimeter, the insulation between the heatsink and the transistors collectors.
- Verify, with the Multimeter, the PTC resistor value (TH1), it must be between 50Ω and 200Ω.
- Set the audio generator to 500Hz 775mV$_{RMS}$ (0dB) sinusoidal signal.
- Connect the CH2 probe tip to D22 cathode and set its sensitivity at 20V/div.
- **LOW RAIL VOLTAGE AMPLIFICATION TEST:**

  Increase slowly the Variac. The channel output signals must be symmetrical respect the GND without visible distortion and oscillation as shown in *Fig.1 Trace A* (*Trace B* shown the amplifier 2nd stage input R58 side C28). If there is a distortion read the section ADVICES.
- **HIGH RAIL VOLTAGE AMPLIFICATION TEST:**

  When the output signal (Positive half-wave) is less than 34Vp the voltage on D22 cathode must remain constant at 40V, when the output signal exceeds 34Vp the voltage must follow the output signal with 6V offset (see *Fig.2 Trace B*), to check the negative high rail connect the probe to D26 anode (see *Fig.2 Trace C*).
- **LOAD CURRENT TEST:**

  Connect the 4Ω 500W load on the output and repeat the LOW RAIL and HIGH RAIL tests.
- **LIMITER CHECK:**

  Increase the input signal of 10 dB and verify the output voltage and wave shape remain constant.
- **BIAS ADJUSTMENT:**

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

  Set the level at zero, connect the Multimeter across the resistors R60, then adjust VR1 trimmer to read 6±0.1mVdc.
- **BANDWIDTH CHECK:**

  Disconnect the load. Set the generator at -10dB, sweeping the generator frequency from 10Hz to 10kHz the level changes accordingly *Fig.3 Trace 1a*.
- **OFFSET SENSOR CHECK:**

  Set the Variac to zero voltage output, disconnect resistive load from the amplifier output, connect temporarily (by means of a suitable conductor wire) CN1 pin 4 (+15Vdc) to R72 side RL1, the protection circuitry (Q14,15,16) detect the DC voltage and open the output relay (RL1) within 3 seconds approx.

  Remove the connection, wait until the relay switch on and after some

seconds repeat the check with -15Vdc (available on CN1 pin 5), the protection circuitry must open the relay again.

- **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 Frequency Channel Check

- Verify, with the Multimeter, the insulation between the heatsink and the TDA7294 case.
- Set the audio generator to 5KHz 775mV$_{RMS}$ (0dB) sinusoidal signal.
- Connect the CH2 probe tip to R260 side IC202 (HF PWR out) and set its sensitivity at 20V/div. 200µS/div.
- **VOLTAGE AMPLIFICATION TEST:**

  Increase slowly the Variac. The channel output signals must be symmetrical respect the GND without visible distortion and oscillation. If there is a distortion replace the TDA7294.
- **LOAD CURRENT TEST:**

  Connect the 8Ω 500W load on the output and repeat the test.
- **LIMITER CHECK:**

  Increase the input signal of 10 dB and verify the output voltage and wave shape remain constant.
- **BANDWIDTH CHECK:**

  Disconnect the load. Set the generator at -10dB, sweeping the generator frequency from 10Hz to 10kHz the level changes accordingly *Fig.3 Trace 1b*.
- **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.

PFM15SA Amplified Subwoofer

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

Remarks

- The power supply utilizes 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).

Technical Specifications

Dimensions:	(WxHxD)	478x508x478mm
Weight:		24.5Kg
Power Requirements:	(230Vac±10% 50Hz)	350VA
	(115Vac±10% 50/60Hz)	350VA
Output Power*:	(4Ω)	350W
Max. Undistorted Out*:	(4Ω)	105Vpp
Sensitivity:	(1W/1m)	94dB$_{SPL}$
Max SPL:	(continuous)	118dB$_{SPL}$
	(peak)	121dB$_{SPL}$
Frequency Response	(filter+ampl.+speaker)	50Hz÷320Hz
	(only amplifier -3dB)	10Hz÷60KHz
Input Sensitivity:	(0dB)	0.775V$_{RMS}$
Input Impedance:	(balanced)	30KΩ
	(unbalanced)	15KΩ
Voltage Gain:	(@150Hz)	33±1dB
IMD:	(SMPTE 60Hz/7KHz 4:1)	<0.1%
THD:	(THD+N)	<0.1%
S/N Ratio:	(unweighted)	>100dB

Setup

- Connect the Variac between the mains and the amplifier and set it at zero voltage.
- Turn full clockwise the LEVEL and X-OVER potentiometers.
- Connect the audio generator to the channel R input and set it to 150Hz 775mV$_{RMS}$ (0dB) sinusoidal signal.
- Place the temperature sensor between heatsink and the PTC (R59).
- Connect the CH1 scope GND clip to CN2 pin 6 (SGND terminal) and the probe tip to R72 side RL1 (PWR out), set its sensitivity at 20V/div. 10mS/div.
- Connect the CH2 probe tip to D25 cathode and set its sensitivity at 20V/div.
- The load resistor is disconnected.
- 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=60±1.5Vac.
- Re-set the Variac at zero voltage, turn off the amplifier and put the fuses back on its holders.
- Set up the Variac slowly monitoring the Outputs with the oscilloscope CH1 connected, it should display the sinusoidal input signal amplified with no distortions, if a distortion occur check the AMPLIFIER board as suggested in the ADVICES section.
- If the protection trips, turn off the amplifier, wait some minutes and disconnect the supplies from the amplifier module (CN2, CN3 on AMPLIFIER board), continue to check the supplies.
- Finally verify the DC supplies on SUPPLY board:

  CN2 pin 5 (+Vcc2) =+71±2Vdc

  CN3 pin 1 (+Vcc1) =+42±1.5Vdc

  CN3 pin 5-6 (-Vcc1) =-42±1.5Vdc

  CN3 pin 4 (-Vcc2) =-71±2Vdc

  CN2 pin 3 =+15±1Vdc

  CN2 pin 2 =-15±1Vdc
- If one or more voltages don't correspond, check the rectifiers, capacitors and transformers disconnecting them from circuitry, refer to schematics.

Channels Check

- Verify, with the Multimeter, the insulation between the heatsink and the transistors collectors.
- Verify, with the Multimeter, the PTC resistor value (R59), it must be between 50Ω and 200Ω.
- **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.1 Trace A* (*Trace B* shown the amplifier 2nd stage input R58 side C28). If there is a distortion read the section ADVICES.
- **HIGH RAIL CHECK:**

  When the output signal (Positive half-wave) is less than 34Vp the voltage on D25 cathode must remain constant at 40V, when the output signal exceeds 40Vp the voltage must follow the output signal with 6V offset (see *Fig.2 Trace B*), to check the negative high rail connect the probe to D26 anode (see *Fig.2 Trace C*).
- **LOAD CURRENT TEST:**

  Connect the 4Ω 500W load on the output and repeat the INITIAL and HIGH RAIL checks.
- **SIGN/COMP SENSOR CHECK:**

  Set the LEVEL 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 1Vp.

  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±2Vp, increasing the input level the output signal must keep the same level, this is due to the limiter-compression circuitry (IC2, DL1, IC1).
- **BIAS ADJUSTMENT:**

  With the load connected wait until the temperature reach 50°c.

  Set the generator level at zero, connect the Multimeter across the resistors R60, then adjust VR1 trimmer to read 15±0.1mVdc.
- **BANDWIDTH CHECK:**

  The bandwidth of the amplifier board only is linear within the audio range (20Hz-20kHz), but in this case is limited by the X-OVER circuitry on CONTROLS & CROSSOVER board.

  Figure 4 and 5 show the LowPass and the HighPass response, check the correspondance with it for some frequency values (50,100,150,300 for example).
- **OFFSET SENSOR CHECK:**

  Set the Variac to zero voltage output, disconnect resistive load from the amplifier output, connect temporarily (by means of a suitable conductor wire) CN2 pin 3 (+15Vdc) to R72 side RL1, the protection circuitry (TR14,15,16) detect the DC voltage and open the output relay (RL1) within 3 seconds approx.

  Remove the connection, wait until the relay switch on and after some seconds repeat the check with -15Vdc (available on CN2 pin 2), the protection circuitry must open the relay again.
- **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.

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.

Before reassembling the amplifier and before deliver it to the user, it is a goal verify its reliability with the following checks:

Reliability Check

- Switch off the amplifier, or leaving it switched on but operating with greatest caution, carefully shake the boards and connections inside it using an insulated tool (for example the handle of a screwdriver) to find wrong contacts and so on.
- Turn on the amplifier and verify that it operates correctly.

Burn in Check

- Connect the appropriate load resistor to the output and a noise signal generator to the input, set it to pink noise with a 3:1 of crest factor and 0dB max level is preferrable otherwise use a standard pink noise generator.
- Leave the amplifier switched on for some hour and finally check its correct functionality after the test.

Figures

Figure 1 and 2 show the right shape of the traces but not their real levels, refer to the levels mentioned in the chapter of appropriate amplified loudspeaker.

Figure 3 shows the frequency response of the PFM15.3A crossover.

Figure 4 and 5 show the frequency response of the PFM15SA crossover.

Fig. 1

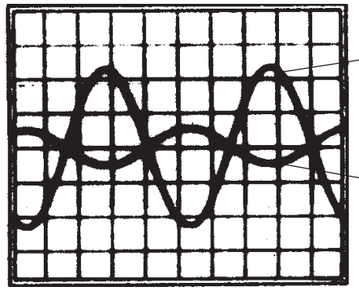


Fig. 2

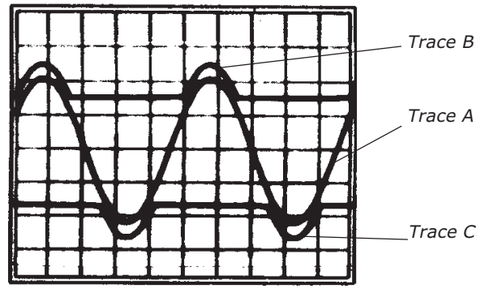


Fig. 3

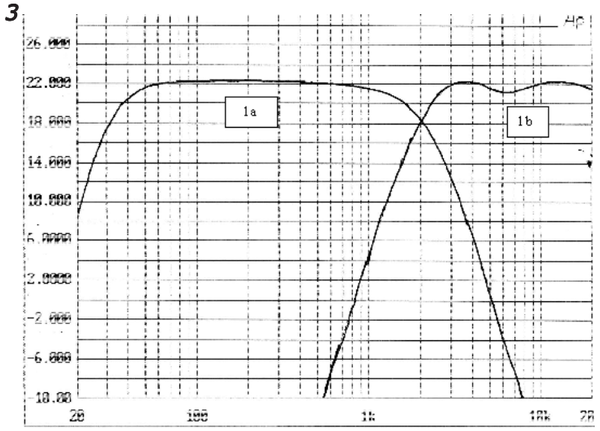


Fig. 4

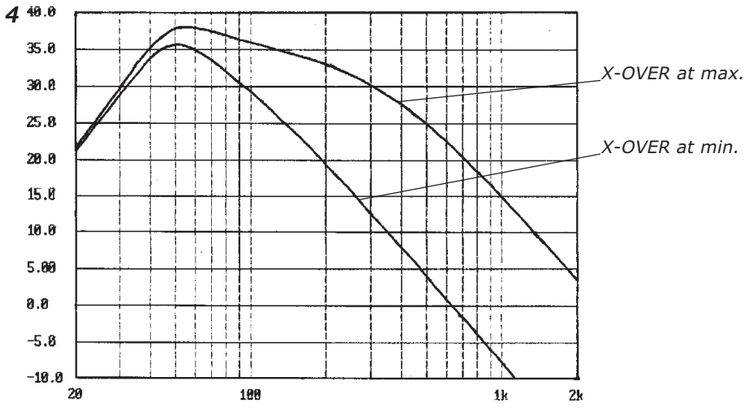
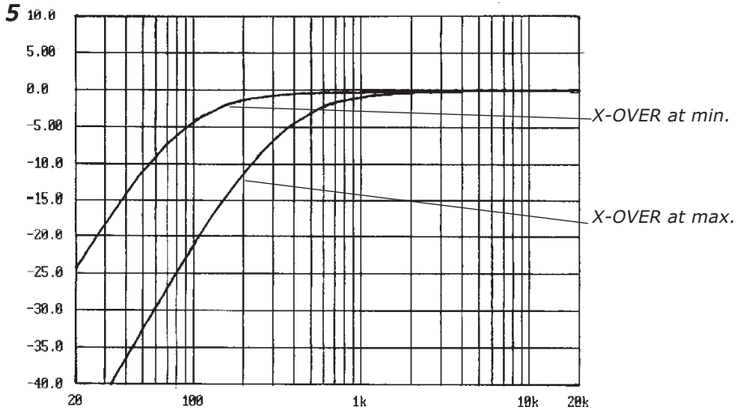
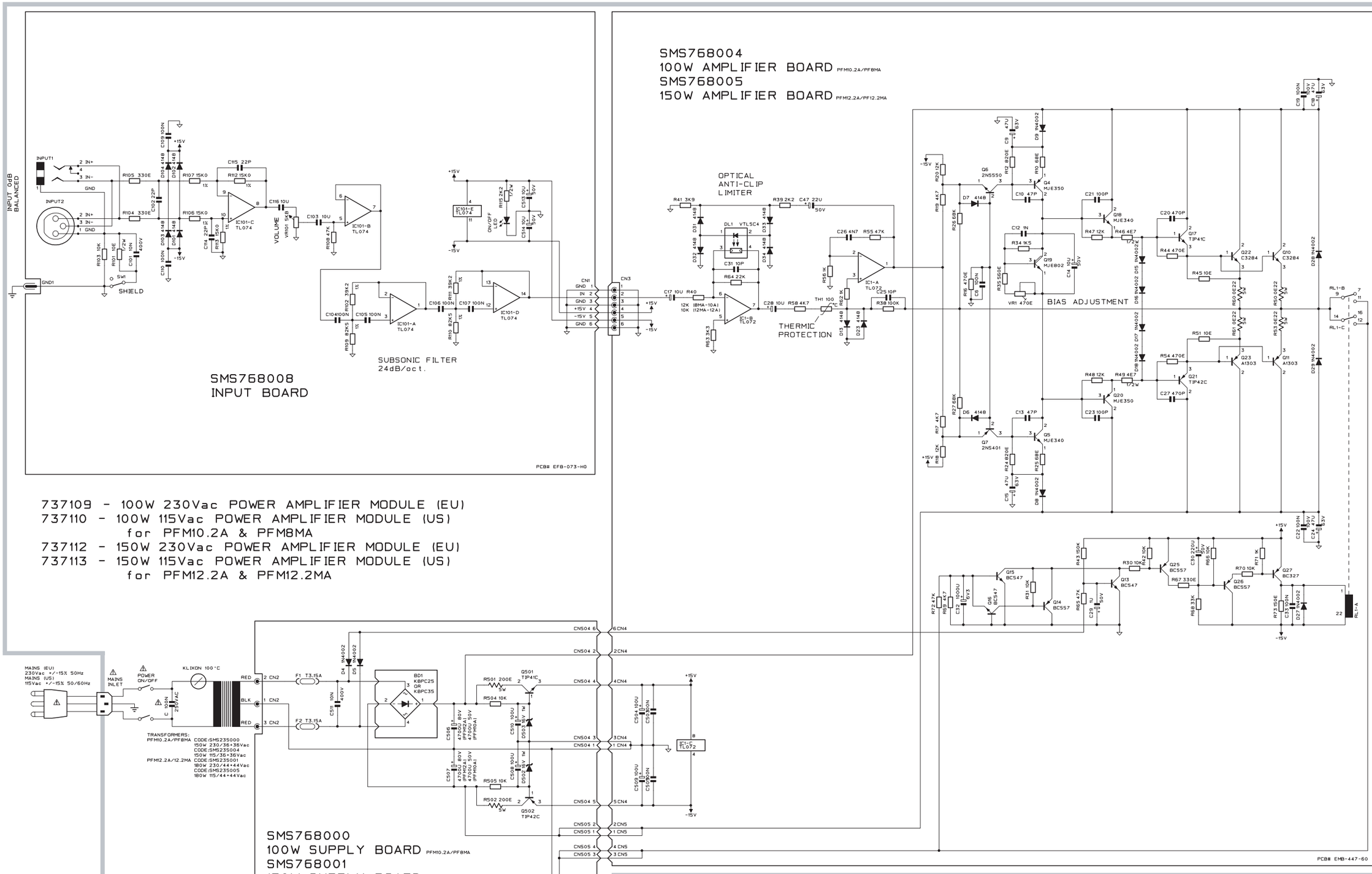


Fig. 5



SMS768004
100W AMPLIFIER BOARD PFM10.2A/PFM8MA
SMS768005
150W AMPLIFIER BOARD PFM12.2A/PF12.2MA



737109 - 100W 230Vac POWER AMPLIFIER MODULE (EU)
737110 - 100W 115Vac POWER AMPLIFIER MODULE (US)
for PFM10.2A & PFM8MA
737112 - 150W 230Vac POWER AMPLIFIER MODULE (EU)
737113 - 150W 115Vac POWER AMPLIFIER MODULE (US)
for PFM12.2A & PFM12.2MA

DRW G.BOCCATO	DWG# 550648	PCB# EFB-073 EMB-447 EMB-449 313075	GENERALMUSIC S.p.A. ITALY
CKD G.RICCI R.MAGALOTTI	DATE 12-10-2000	SCHEMATIC DIAGRAM PFM10.2A PFM12.2A PFM8MA PFM12.2MA	ALL RIGHTS ARE RESERVED. NO COPIES OR REPRODUCE THIS DOCUMENT WITHOUT WRITTEN CONSENT BY GENERALMUSIC.
APP. R.FALCONI	REV: A		

SMS768009
INPUT BOARD

INPUT 0dB BALANCED

INPUT1 2 IN+ 3 IN- GND

INPUT2 2 IN+ 3 IN- GND

SHIELD

GND1

SW1

R103 10K R101 10E 2W C101 100N 100V

R104 330E R105 330E

C102 22P C110 100N C109 100N

D104 4148 D102 4148 D103 4148 D101 4148

+15V -15V

R106 15K0 1% R107 15K0 1%

C115 22P R112 15K0 1%

C114 22P 1% R113 15K0 1%

IC101-C TL074

C116 10U

VOLUME VR101 5K0

C103 10U R108 47K

IC101-B TL074

C104 100N R102 39K2 1% R103 82K5 1%

C105 100N

IC101-A TL074

C106 100N R111 39K2 1% R110 82K5 1%

C107 100N

IC101-D TL074

R115 2K2

DLED ON

IC101-E TL074

C513 10U 50V C514 10U 50V

CN4 GND 1 +15V 2 -15V 3 IN 4 NC 5 GND 6

SUBSONIC FILTER 24dB/oct.

PCB# EFB-074-H0

737113 - 250W 230Vac POWER AMPLIFIER MODULE (EU)
737114 - 250W 115Vac POWER AMPLIFIER MODULE (US)
for PFM15.2A & PFM15.2MA

SMS768006 - 250W AMPLIFIER BOARD

R72 47K R68 47K C32 1000U 6V3 Q15 BC547 Q16 BC547 R31 10K Q14 BC557

R65 47K C29 1U 50V Q13 BC547

R43 150K R42 10K R30 10K Q25 BC557 C30 220U 50V R66 10K R67 330E R68 33K Q26 BC557 -15V

R70 10K R71 10K Q27 BC327 +15V

R73 150E D27N4002 C33 100N -15V RL1-A

C9 47U 100V D9 1N4002

Q6 2N5550 R121 820E R10 68E R6 8K2 R29 12K

D1 1N4002 R1 47E D10 1N4002 R2 8K2

R20 12K R19 4K7 -15V D7 4148 R26 68K

D24 TVS 1W C10 220P D28 TVS 1W C8 220U 50V R28 8K2 C11 4N7 100V

C12 IN R34 1K5 Q19 MJE802 C14 10U VR1 470E R35 560E

BIAS ADJUSTMENT

C2 470P R7 1K R33 390E Q10 A1303 Q2 TIP42C C19 10N C18 100U 50V

C3 4N7 Q1 MJE340 D11 IN4002

C21 100P R11 47K R3 2K2 Q18 MJE340 R47 12K R46 4E7 1/2W

D14 IN4002 R44 470E Q17 TIP41C Q22 C3284 R45 10E D28 IN4002

D16 IN4002 D22 FE6B

D17 IN4002 R60 0E22 5W R61 0E22 5W

R51 10E D18 IN4002 R54 470E Q21 TIP42C Q23 A1303 D29 IN4002

R48 12K R49 4E7 1/2W Q20 MJE350 C23 100P D26 FE6B

D3 IN4002 R5 8K2 D4 IN4002 R9 47E R15 47K R4 2K2 Q3 MJE350 C7 4N7 Q8 TIP41C Q11 C3284 D12 IN4002

C4 470P R21 1K R36 390E C22 100N C24 100U 50V

R41 1K5 R39 2K2 C47 10U 50V

C26 4N7 R55 47K R56 1K IC1-A TL072 C25 47P R38 100K

D31 4148 D32 4148 D33 4148 D34 4148 DL1 VTL5C4 C31 10P R64 22K

R58 4K7 TH1 100 T1 RH2 1K D13 4148 D23 4148 C40 47P

C28 10U THERMIC PROTECTION

CN3 1 GND 2 +15V 3 -15V 4 IN 5 NC 6 GND

C17 10U R40 12K IC1-B TL072 R63 3K3

OPTICAL ANTI-CLIP LIMITER

R16 470E C20 100N

R27 68K D5 4148 Q7 2N5401 R8 12K R7 4K7

D25 TVS 1W C13 220P C5 220U 50V R4 8K2 C1 4N7 400V Q5 MJE340

R24 820E R25 68E R8 8K2 R13 12K C15 47U 100V D8 1N4002

RL1-B RL1-C

CN501 6 CN1 VOK
CN501 2 CN1 +Vcc2
CN502 3 CN2 +Vcc1
CN501 4 CN1 +15V
CN501 3 CN1 GND
CN501 1 CN1
CN501 5 CN1 -15V
CN502 1 CN2 -Vcc1
CN502 2 CN2 -Vcc2
CN502 5 CN2 LOW PWR OUT
CN502 6 CN2
CN502 4 CN2
CN504 1
CN504 2
CN505 1
CN505 2

PCB# EMB-456-60

PCB# EMB-450-H0

SMS768002
250W SUPPLY BOARD

MAINS (EU) 230Vac +/-15% 50Hz
MAINS (US) 115Vac +/-15% 50/60Hz

MAINS INLET

POWER ON/OFF

KLIXON 100°C

C 100N 250VAC

CN503 4 F2 T5A
CN503 1 F5 T5A
CN503 3 F4 T5A
CN503 2 F1 T5A
CN503 5

RED YEL BLK YEL RED

TRANSFORMERS:
PFM15.2A
CODE:SMS235002
250W 230/45+45-26+26Vac
CODE:SMS235006
250W 115/45+45-26+26Vac

D505 1N4002 D504 1N4002

BD2 KBPC25 BD1 KBL02

C511 10N 400V C512 10N 400V

C502 4700U 80V C507 2200U 80V 50V C501 4700U 80V C506 2200U 80V 50V

R501 330E 5W Q501 TIP41C R504 10K C510 100U 16V D502 C504 100U 16V C509 100U 16V D503 C508 100U 16V R505 10K R502 330E 5W Q502 TIP42C

C503 100N C505 100N

IC1-C TL072

768219 - PFM15.2A 4E
XOVER BOARD

LOW + BROWN S5
IN + RED S1
IN - BLACK S2
LOW - BLACK S6

C01 2U2 100V 15E 20W R01 S3 S4

HIGH + BLEU
HIGH - BLACK

PCB# 313081

229043
12ohm Horn Tweeter

227066
15" 4ohm Woofer

DRW G. Boccato	DWG# 550649	PCB# EMB-456-60 EMB-450-H0 EMB-462-H0 313075	GENERALMUSIC S.p.A. ITALY
CKD G.Ricci R.Magalotti	DATE 19/10/00	SCHEMATIC DIAGRAM PFM15.2A/PFM15.2MA	
APP.R. Falconi	REV: A		

SMS768010
INPUT & 80W AMPLIFIER BOARD

SMS768007 - XOVER & 230W AMPLIFIER BOARD

737115 - 310W 230Vac POWER AMPLIFIER MODULE (EU)
737116 - 310W 115Vac POWER AMPLIFIER MODULE (US)
for PFM15.3A

SMS768003
230+80W SUPPLY BOARD

768248 - PFM15.3A
XOVER BOARD

229043
12ohm Horn Tweeter

228015
6" 8ohm Midrange

227068
15" 4ohm Woofer

DRW G. Boccato	DWG# 550650	PCB# EMB-456-60 EMB-450-H0 EMB-462-H0 313075	GENERALMUSIC S.p.A. ITALY
CKD G.Ricci R.Magalotti	DATE 18/10/00	SCHEMATIC DIAGRAM PFM15.3A	ALL RIGHTS ARE RESERVED. NO COPIES OR REPRODUCE THIS DOCUMENT WITHOUT WRITTEN CONSENT BY GENERALMUSIC.
APP. R. Falconi	REV: A		

768181 - STEREO CROSSOVER & CONTROLS

768094 - 350W POWER AMPLIFIER BOARD

768100 - POWER SUPPLY BOARD

PCB#313002

PCB#313042

PCB#317197

PCB#319064

NOTE: The power stage is inverting.

LEFT INPUT

RIGHT INPUT

VOLUME

X-OVER

LEFT HIGH OUTPUT

RIGHT HIGH OUTPUT

SIGN COMP

BIAS ADJ

EARTH LIFT

POWER ⚠ ON/OFF

⚠ KLIXON

POWER ON

230Vac +/-15% 50/60Hz(EU)
115Vac +/-15% 50/60Hz(US)

⚠ 237068 - TRANSFORMER 230VAC 350W (EU)
237069 - TRANSFORMER 115VAC 350W (US)

227070 - 6OHM 15" WOOFER SPEAKER.

DRW I.BATTELLI	DWG# 550651	PCB# 313002 - 319064/1 - 317197 - 313042	GENERALMUSIC S.p.A. ITALY
CKD G.BOCCATO	DSK# PART:1/1	SCHEMATIC DIAGRAM	
APP.R.FALCONI	REV: 23-10-00	PFM 15SA	

Spare Part List

Code		Description

Optional Accessories

887069		15mt Jack-Jack Signal Cable
950860		SC20 Metal Telescopic stand
950199		SC30 Alluminium Telescopic stand
950978		SC31 Alluminium Telescopic stand

PASSIVE LOUDSPEAKERS

Accessories

277357		Owner's Manual (PFM 10X only)
277343		Owner's Manual

PFM-10X 8 Ohm

727613		**Input Sockets Assembly**
768232	*	PFM-10X Crossover Board (Pcb#313083)
778154	**	Cables Assembly
140226	**	Jack Horizontal M-F Socket
060281	**	18E 5W 10% Wire Resistor
030171	**	4u7 63V 20% Axial Electrolytic Bipolar Capacitor
347401	*	Input Sockets Panel
180693	*	"Input" Adhesive Plate
717079		**Speaker Box**
667708		Speaker Net
347204		Jack Socket Cap
229044		**12ohm Piezoelectric Tweeter**
227064		**10" 8ohm Woofer Speaker**
210217		Black Sealer (specify mt)
180662		"Lem" Adhesive Blue Plate
120482		4mm Black Shakeproof Washer
120414		WL3.5x35tt Black Screw
120411		WL3.5x20tt Black Screw
370534		"Lem" Adhesive Logo

PFM-10.2 8 Ohm

778150		Speakers Cables Assembly
768217		**PFM-10.2 Crossover Board (Pcb#313075)**
210215	*	Adhesive Rubber Foam 10x1.9mm (Specify mt)
120857	*	Vertical Male Faston 6.3mm
060275	*	15E 5W 10% Wire Resistor
030171	*	4u7 63V 20% Axial Electrolytic Bipolar Capacitor
060294	*	22E 5W 10% Wire Resistor
030160	*	3u3 100V 20% Axial Electrolytic Bipolar Capacitor
727610		**Input Sockets Panel**
778149	*	Input Cables Assembly
140193	**	Jack Mono Socket
667715	*	Input Panel
120541	*	16x9x1.6 Washer for Jack
717067		**Speaker Box Assembly**
430072	*	PFM-10.2 Covered Wooden Speaker Box
347396	*	Belt Handle
340270	*	25x12mm Rubber Foot
177325	*	Suspension Flange
120664	*	M6 4-tips Lock Nut
120662	*	M5 4-tips Lock Nut
120661	*	M4 4-tips Lock Nut
120455	*	4,2x9x2 Washer
120346	*	WL4x20tc Black Screw
120111	*	M6x25tsp Black Screw
120102	*	M4x30tsp Black Screw
667708		Speaker Net
347204		Jack Socket Cap
229043		**12ohm Piezoelectric Horn Tweeter**
227064		**10" 8ohm Woofer Speaker**
210273		Speaker Filler (400gr/m² 50x50x4cm)
210217		Black Sealer (specify mt)
180662		"Lem" Adhesive Blue Plate
120483		5mm Black Shakeproof Washer
120461		5.3X10X1 Black Washer
120414		WL3.5x35tt Black Screw
120411		WL3.5x20tt Black Screw
120364		WL3.5x12tt Black Screw
120124		M5x30tc Black Screw

PFM-12.2 8 Ohm

778150		Speakers Cables Assembly
768218		**PFM-12.2 Crossover Board (Pcb#313075)**
210215	*	Adhesive Rubber Foam 10x1.9mm (Specify mt)
120857	*	Vertical Male Faston 6.3mm
061265	*	15E 20W 5% Wire Resistor
030095	*	2u2 100V 20% Axial Electrolytic Bipolar Capacitor
727609		**Input Sockets Panel**
778148	*	Input Cables Assembly
140193	**	Jack Mono Socket
667714	*	Input Panel
717069		**Speaker Box Assembly**
430074	*	PFM-12.2 Covered Wooden Speaker Box
347395	*	Plastic Handle
340270	*	25x12mm Rubber Foot
177325	*	Suspension Flange
120664	*	M6 4-tips Lock Nut
120662	*	M5 4-tips Lock Nut
120463	*	4.3x12.5x1 Black Washer
120411	*	WL3.5x20tt Black Screw
120346	*	WL4x20tc Black Screw
120111	*	M6x25tsp Black Screw
667710		Speaker Net
229043		**12ohm Piezoelectric Horn Tweeter**
227066		**15" 4ohm Woofer Speaker**
210274		Speaker Filler (400gr/m² 100x50x4cm)
210217		Black Sealer (specify mt)
180662		"Lem" Adhesive Blue Plate
120483		5mm Black Shakeproof Washer
120461		5.3X10X1 Black Washer
120414		WL3.5x35tt Black Screw
120411		WL3.5x20tt Black Screw
120364		WL3.5x12tt Black Screw
120124		M5x30tc Black Screw

PFM-15.2 4 Ohm

778150		Speakers Cables Assembly
768219		**PFM-15.2 4ohm Crossover Board (Pcb#313081)**
210215	*	Adhesive Rubber Foam 10x1.9mm (Specify mt)
120857	*	Vertical Male Faston 6.3mm
061265	*	15E 20W 5% Wire Resistor
030095	*	2u2 100V 20% Axial Electrolytic Bipolar Capacitor
727609		**Input Sockets Panel**
778148	*	Input Cables Assembly
140193	**	Jack Mono Socket
667714	*	Input Panel
717069		**Speaker Box Assembly**
430074	*	PFM-15.2 Covered Wooden Speaker Box
347395	*	Plastic Handle
340270	*	25x12mm Rubber Foot
177325	*	Suspension Flange
120664	*	M6 4-tips Lock Nut
120662	*	M5 4-tips Lock Nut
120463	*	4.3x12.5x1 Black Washer
120411	*	WL3.5x20tt Black Screw
120346	*	WL4x20tc Black Screw
120111	*	M6x25tsp Black Screw
667710		Speaker Net
229043		**12ohm Piezoelectric Horn Tweeter**
227067		**15" 8ohm Woofer Speaker**
210274		Speaker Filler (400gr/m² 100x50x4cm)
210217		Black Sealer (specify mt)
180662		"Lem" Adhesive Blue Plate
120483		5mm Black Shakeproof Washer
120461		5.3X10X1 Black Washer
120414		WL3.5x35tt Black Screw
120411		WL3.5x20tt Black Screw
120364		WL3.5x12tt Black Screw
120124		M5x30tc Black Screw

PFM-15.2 8 Ohm

778150		Speakers Cables Assembly
768220		**PFM-15.2 8ohm Crossover Board (Pcb#313081)**
210215	*	Adhesive Rubber Foam 10x1.9mm (Specify mt)
120857	*	Vertical Male Faston 6.3mm
061311	*	39E 20W 5% Wire Resistor
030171	*	4u7 63V 20% Axial Electrolytic Bipolar Capacitor
727610		**Input Sockets Panel**
778149	*	Input Cables Assembly
140193	**	Jack Mono Socket
667715	*	Input Panel
120541	*	16x9x1.6 Washer for Jack
717069		**Speaker Box Assembly**
430074	*	PFM-15.2 Covered Wooden Speaker Box
347395	*	Plastic Handle
340270	*	25x12mm Rubber Foot
177325	*	Suspension Flange
120664	*	M6 4-tips Lock Nut
120662	*	M5 4-tips Lock Nut
120463	*	4.3x12.5x1 Black Washer
120411	*	WL3.5x20tt Black Screw
120346	*	WL4x20tc Black Screw
120111	*	M6x25tsp Black Screw
667711		Speaker Net
229043		**12ohm Piezoelectric Horn Tweeter**
227067		**15" 8ohm Woofer Speaker**
210274		Speaker Filler (400gr/m² 100x50x4cm)
210217		Black Sealer (specify mt)
180662		"Lem" Adhesive Blue Plate
120483		5mm Black Shakeproof Washer
120461		5.3X10X1 Black Washer
120414		WL3.5x35tt Black Screw
120411		WL3.5x20tt Black Screw
120364		WL3.5x12tt Black Screw
120124		M5x30tc Black Screw

PFM-15.3 4 Ohm

778151		Speakers Cables Assembly
768221		**PFM-15.3 4ohm Crossover Board (Pcb#313084)**
230593	*	1.2mH 1mm Crossover Core Coil
230540	*	0.32mH 1mm Crossover Coil
210215	*	Adhesive Rubber Foam 10x1.9mm (Specify mt)
177220	*	Core Coil Support
120857	*	Vertical Male Faston 6.3mm
120581	*	M3 Black Self-Locking Nut
120003	*	M3x8tc Black Screw
061207	*	4E7 20W 5% Wire Resistor
030248	*	10u 100V 20% Axial Electrolytic Bipolar Capacitor
020982	*	15u 100V 10% MKT Polyester Capacitor
020981	*	22u 100V 10% MKT Polyester Capacitor
020700	*	2u2 100V 10% MKT Polyester Capacitor
727609		**Input Sockets Panel**
778148	*	Input Cables Assembly
140193	**	Jack Mono Socket
667714	*	Input Panel
717070	*	Speakers Box Assembly
430075	*	PFM-15.3 Covered Wooden Speaker Box
347395	*	Plastic Handle
340270	*	25x12mm Rubber Foot
177325	*	Suspension Flange
120664	*	M6 4-tips Lock Nut
120662	*	M5 4-tips Lock Nut
120463	*	4.3x12.5x1 Black Washer
120411	*	WL3.5x20tt Black Screw
120346	*	WL4x20tc Black Screw
120111	*	M6x25tsp Black Screw
667711		Speaker Net
229043		**12ohm Piezoelectric Horn Tweeter**
228016		**6" 4ohm Midrange Speaker**
227068		**15" 4ohm Woofer Speaker**
210274		Speaker Filler (400gr/m² 100x50x4cm)
210217		Black Sealer (specify mt)
180662		"Lem" Adhesive Blue Plate
120483		5mm Black Shakeproof Washer
120482		4mm Black Shakeproof Washer
120461		5.3X10X1 Black Washer
120414		WL3.5x35tt Black Screw
120411		WL3.5x20tt Black Screw
120364		WL3.5x12tt Black Screw
120124		M5x30tc Black Screw

PFM-15.3 8 Ohm

778151		Speakers Cables Assembly
768222		**PFM-15.3 8ohm Crossover Board (Pcb#313082)**
230551	*	2.5mH 1mm Crossover Core Coil
230543	*	0.65mH 1mm Crossover Coil
210215	*	Adhesive Rubber Foam 10x1.9mm (Specify mt)
177220	*	Core Coil Support
120857	*	Vertical Male Faston 6.3mm
120581	*	M3 Black Self-Locking Nut
120003	*	M3x8tc Black Screw
061231	*	8E2 20W 5% Wire Resistor
061221	*	6E8 20W 5% Wire Resistor
030171	*	4u7 63V 20% Axial Electrolytic Bipolar Capacitor
020982	*	15u 100V 10% MKT Polyester Capacitor
020979	*	10u 100V 10% MKT Polyester Capacitor
020695	*	1u5 100V 10% MKT Polyester Capacitor
727610		**Input Sockets Panel**
778149	*	Input Cables Assembly
140193	**	Jack Mono Socket
667715	*	Input Panel
120541	*	16x9x1.6 Washer for Jack
717070		**Speakers Box Assembly**
430075	*	PFM-15.3 Covered Wooden Speaker Box
347395	*	Plastic Handle
340270	*	25x12mm Rubber Foot
177325	*	Suspension Flange
120664	*	M6 4-tips Lock Nut
120662	*	M5 4-tips Lock Nut
120463	*	4.3x12.5x1 Black Washer
120411	*	WL3.5x20tt Black Screw
120346	*	WL4x20tc Black Screw
120111	*	M6x25tsp Black Screw
667711		Speaker Net
347204		Jack Socket Cap
229043		**12ohm Piezoelectric Horn Tweeter**
228015		**6" 8ohm Midrange Speaker**
227069		**15" 8ohm Woofer Speaker**
210274		Speaker Filler (400gr/m² 100x50x4cm)
210217		Black Sealer (specify mt)
180662		"Lem" Adhesive Blue Plate
120483		5mm Black Shakeproof Washer
120482		4mm Black Shakeproof Washer
120461		5.3X10X1 Black Washer
120414		WL3.5x35tt Black Screw
120411		WL3.5x20tt Black Screw
120364		WL3.5x12tt Black Screw
120124		M5x30tc Black Screw

PFM-15S 4 Ohm

841208		Cables Assembly
768223		**PFM-15S Crossover Board (Pcb#313064)**
		the service support is made only by replacement the entire board
727611		**Input Sockets Panel**
778149	*	Input Cables Assembly
140193	**	Jack Mono Socket
778148	*	Input Cables Assembly
140193	**	Jack Mono Socket
667716	*	Input Panel
120541	*	16x9x1.6 Washer for Jack
717071		**Speakers Box Assembly**
657265	*	d=90 l=70mm Black Duct
430076	*	PFM-15S Covered Wodden Speaker Box
347395	*	Plastic Handle
340270	*	25x12mm Rubber Foot
177325	*	Suspension Flange
120664	*	M6 4-tips Lock Nut
120662	*	M5 4-tips Lock Nut
120455	*	4,2x9x2 Washer
120411	*	WL3.5x20tt Black Screw
120346	*	WL4x20tc Black Screw
120111	*	M6x25tsp Black Screw
667712		Speaker Net
347204		Jack Socket Cap
227070		**15" 6ohm Woofer Speaker**
210274		Speaker Filler (400gr/m² 100x50x4cm)
210217		Black Sealer (specify mt)
210215		Adhesive Rubber Foam 10x1.9mm (Specify mt)
180662		"Lem" Adhesive Blue Plate
120483		5mm Black Shakeproof Washer
120461		5.3X10X1 Black Washer
120414		WL3.5x35tt Black Screw
120411		WL3.5x20tt Black Screw
120364		WL3.5x12tt Black Screw
120124		M5x30tc Black Screw

ACTIVE LOUDSPEAKERS

Legend	
US =	Specify United States Version
EU =	Specify Europe Version

Accessories

277351		Owner's Manual
130297		Mains Cable (EU)
130283		Mains Cable (US)

PFM-10.2A

778150		Speakers Cables Assembly
768217		**PFM-10.2 Crossover Board (Pcb#313075)**
210215	*	Adhesive Rubber Foam 10x1.9mm (Specify mt)
120857	*	Vertical Male Faston 6.3mm
060294	*	22E 5W 10% Wire Resistor
030160	*	3u3 100V 20% Axial Electrolytic Bipolar Capacitor
737109		**100W 230Vac Power Amplifier Module (EU)**
737110		**100W 115Vac Power Amplifier Module (US)**
SMS768008	*	**Input Board (Pcb# EFB-073-H0)**
SMS141000	**	XLR Female Socket
SMS110000	**	Dual Slider Switch
140217	**	Jack Slim Horizontal S-F Socket
100084	**	TL074 Quad J-Fet Operational Amplifier
080743	**	Led 3mm Wide Diffused Green
074570	**	5K 31steps Linear Potentiometer
042715	**	82K5 1/4W 1% Metalized Film Resistor
042672	**	39K2 1/4W 1% Metalized Film Resistor
042625	**	15K0 1/4W 1% Metalized Film Resistor
SMS768004	*	**100W Amplifier Board (Pcb# EMB-447-60)**
SMS090003	**	2SA1303 TO3P Pnp Transistor
SMS090002	**	2SC3284 TO3P Npn Transistor
SMS090001	**	TIP42C TO220 Pnp Transistor
SMS090000	**	TIP41C TO220 Npn Transistor
110307	**	Relay 24V / 2 Switch 5A 250Vac
100061	**	TL072 Dual J-Fet Operational Amplifier
090920	**	MJE802 TO126 Npn Darl Transistor
090917	**	MJE350 TO126 Pnp Transistor
090916	**	MJE340 TO126 Npn Transistor
090201	**	2N5401 TO92 Pnp Transistor
090200	**	2N5550 TO92 Npn Transistor
090194	**	BC560C TO92 LN Pnp Transistor (BC557C Equivalent)
090183	**	BC550C TO92 LN Npn Transistor (BC547C Equivalent)
090153	**	BC327 TO92 Pnp Transistor
080901	**	VTL5C4 Analog Optoisolator
080821	**	Ptc 90 PTH59F04BE222TS
080156	**	1N4002 1A 100V Rectifier Diode
080103	**	1N4148 100mA 75V Signal Diode
060051	**	0E22 5W 5% Wire Resistor
030715	**	1000u 6v3 20% Vert Electrolytic Capacitor
SMS768000	*	**100W Supply Board (Pcb# EMB-449-H0)**
110119	**	Fuse Clip 10A max (EU) (US)
080292	**	16V 1W 5% Zener Diode
080156	**	1N4002 1A 100V Rectifier Diode
060413	**	220E 5W 10% Resistor
030555	**	4700u 50V 20% Snap-In Electrolytic Capacitor
667738	*	Amplifier Panel/Chassis
SMS235000	*	**150W 230Vac Transformer (EU)**
SMS235004	*	**150W 115Vac Transformer (US)**
110614	*	Mains Socket
110285	*	4A 250Vac Bipolar Power Switch
110003	*	T3.15A Fuse 5x20mm (EU)
110061	*	T3.15A Fuse 6.3x32mm (US)
080607	*	KBPC25 25A 200V Rectifier Diode Bridge
020491	*	100nF 10% 250Vac Polyester Capacitor
717072		**Speaker Box Assembly**
430077	*	PFM-10.2A Covered Wooden Speaker Box
347396	*	Belt Handle
340270	*	25x12mm Rubber Foot
177325	*	Suspension Flange
120664	*	M6 4-tips Lock Nut
120662	*	M5 4-tips Lock Nut
120661	*	M4 4-tips Lock Nut
120455	*	4,2x9x2 Washer
120411	*	WL3.5x20tt Black Screw
120111	*	M6x25tsp Black Screw
120102	*	M4x30tsp Black Screw
667708		Speaker Net
659027		White Pot Knob
229043		**12ohm Piezoelectric Horn Tweeter**
227064		**10" 8ohm Woofer Speaker**
210273		Speaker Filler (400gr/m² 50x50x4cm)
210217		Black Sealer (specify mt)
180662		"Lem" Adhesive Blue Plate
120483		5mm Black Shakeproof Washer
120461		5.3X10X1 Black Washer
120414		WL3.5x35tt Black Screw
120411		WL3.5x20tt Black Screw
120364		WL3.5x12tt Black Screw
120124		M5x30tc Black Screw

PFM-12.2A

778150		Speakers Cables Assembly
768218		**PFM-12.2 Crossover Board (Pcb#313075)**
210215	*	Adhesive Rubber Foam 10x1.9mm (Specify mt)
120857	*	Vertical Male Faston 6.3mm

060275	*	15E 5W 10% Wire Resistor
030171	*	4u7 63V 20% Axial Electrolytic Bipolar Capacitor
737111		**150W 230Vac Power Amplifier Module (EU)**
737112		**150W 115Vac Power Amplifier Module (US)**
SMS768008	*	**Input Board (Pcb# EFB-073-H0)**
SMS141000	**	XLR Female Socket
SMS110000	**	Dual Slider Switch
140217	**	Jack Slim Horizontal S-F Socket
100084	**	TL074 Quad J-Fet Operational Amplifier
080743	**	Led 3mm Wide Diffused Green
074570	**	5K 31steps Linear Potentiometer
042715	**	82K5 1/4W 1% Metalized Film Resistor
042672	**	39K2 1/4W 1% Metalized Film Resistor
042625	**	15K0 1/4W 1% Metalized Film Resistor
SMS768005	*	**150W Amplifier Board (Pcb# EMB-447-60)**
SMS090003	**	2SA1303 TO3P Pnp Transistor
SMS090002	**	2SC3284 TO3P Npn Transistor
SMS090001	**	TIP42C TO220 Pnp Transistor
SMS090000	**	TIP41C TO220 Npn Transistor
110307	**	Relay 24V / 2 Switch 5A 250Vac
100061	**	TL072 Dual J-Fet Operational Amplifier
090920	**	MJE802 TO126 Npn Darl Transistor
090917	**	MJE350 TO126 Pnp Transistor
090916	**	MJE340 TO126 Npn Transistor
090201	**	2N5401 TO92 Pnp Transistor
090200	**	2N5550 TO92 Npn Transistor
090194	**	BC560C TO92 LN Pnp Transistor (BC557C Equivalent)
090183	**	BC550C TO92 LN Npn Transistor (BC547C Equivalent)
090153	**	BC327 TO92 Pnp Transistor
080901	**	VTL5C4 Analog Optoisolator
080821	**	Ptc 90 PTH59F04BE222TS
080156	**	1N4002 1A 100V Rectifier Diode
080103	**	1N4148 100mA 75V Signal Diode
060051	**	0E22 5W 5% Wire Resistor
030715	**	1000u 6v3 20% Vert Electrolytic Capacitor
SMS768001	*	**150W Supply Board (Pcb# EMB-449-H0)**
SMS090001	**	TIP42C TO220 Pnp Transistor
SMS090000	**	TIP41C TO220 Npn Transistor
110119	**	Fuse Clip 10A max (EU) (US)
080292	**	16V 1W 5% Zener Diode
080156	**	1N4002 1A 100V Rectifier Diode
060413	**	220E 5W 10% Resistor
030560	**	4700u 80v 20% Snap-In Electrolytic Capacitor
667738	*	Amplifier Panel/Chassis
SMS235001	*	**180W 230Vac Transformer (EU)**
SMS235005	*	**180W 115Vac Transformer (US)**
110061	*	T3.15A Fuse 6.3x32mm (US)
110003	*	T3.15A Fuse 5x20mm (EU)
110614	*	Mains Socket
110285	*	4A 250Vac Bipolar Power Switch
080607	*	KBPC25 25A 200V Rectifier Diode Bridge
020491	*	100nF 10% 250Vac Polyester Capacitor
717073		**Speaker Box Assembly**
430078	*	PFM-12.2A Covered Wooden Speaker Box
347396	*	Belt Handle
340270	*	25x12mm Rubber Foot
177325	*	Suspension Flange
120664	*	M6 4-tips Lock Nut
120662	*	M5 4-tips Lock Nut
120661	*	M4 4-tips Lock Nut
120455	*	4,2x9x2 Washer
120411	*	WL3.5x20tt Black Screw
120111	*	M6x25tsp Black Screw
120102	*	M4x30tsp Black Screw
667709		Speaker Net
659027		White Pot Knob
229043		**12ohm Piezoelectric Horn Tweeter**
227065		**12" 8ohm Woofer Speaker**
210273		Speaker Filler (400gr/m² 50x50x4cm)
210217		Black Sealer (specify mt)
180662		“Lem” Adhesive Blue Plate
120483		5mm Black Shakeproof Washer
120461		5.3X10X1 Black Washer
120414		WL3.5x35tt Black Screw
120411		WL3.5x20tt Black Screw
120364		WL3.5x12tt Black Screw
120124		M5x30tc Black Screw

PFM-15.2A

778150		Speakers Cables Assembly
768219		**PFM-15.2 4ohm Crossover Board (Pcb#313081)**
210215	*	Adhesive Rubber Foam 10x1.9mm (Specify mt)
120857	*	Vertical Male Faston 6.3mm
061265	*	15E 20W 5% Wire Resistor
030095	*	2u2 100V 20% Axial Electrolytic Bipolar Capacitor
737113		**250W 230Vac Power Amplifier Module (EU)**
737114		**250W 115Vac Power Amplifier Module (US)**
SMS768009	*	**Input Board (Pcb# EFB-074-H0)**
SMS141000	**	XLR Female Socket
SMS110000	**	Dual Slider Switch
141102	**	6 Contacts Vert Male Connector
140217	**	Jack Slim Horizontal S-F Socket
100084	**	TL074 Quad J-Fet Operational Amplifier
080743	**	Led 3mm Wide Diffused Green
074570	**	5K 31steps Linear Potentiometer
042715	**	82K5 1/4W 1% Metalized Film Resistor
042672	**	39K2 1/4W 1% Metalized Film Resistor
042625	**	15K0 1/4W 1% Metalized Film Resistor
SMS768006	*	**250W Amplifier Board (Pcb# EMB-456-60)**
SMS090003	**	2SA1303 TO3P Pnp Transistor
SMS090002	**	2SC3284 TO3P Npn Transistor
SMS090001	**	TIP42C TO220 Pnp Transistor
SMS090000	**	TIP41C TO220 Npn Transistor
110316	**	Relay 24V / 1 Switch no 16A 250V
100061	**	TL072 Dual J-Fet Operational Amplifier
090920	**	MJE802 TO126 Npn Darl Transistor
090917	**	MJE350 TO126 Pnp Transistor
090916	**	MJE340 TO126 Npn Transistor
090201	**	2N5401 TO92 Pnp Transistor
090200	**	2N5550 TO92 Npn Transistor
090194	**	BC560C TO92 LN Pnp Transistor
090183	**	BC550C TO92 LN Npn Transistor
090153	**	BC327 TO92 Pnp Transistor
080901	**	VTL5C4 Analog Optoisolator
080821	**	Ptc 90 PTH59F04BE222TS
080156	**	1N4002 1A 100V Rectifier Diode
080103	**	1N4148 100mA 75V Signal Diode
060051	**	0E22 5W 5% Wire Resistor
030715	**	1000u 6v3 20% Vert Electrolytic Capacitor
SMS768002	*	**250W Supply Board (Pcb# EMB-450-H0)**
SMS090001	**	TIP42C TO220 Pnp Transistor
SMS090000	**	TIP41C TO220 Npn Transistor
SMS030000	**	2200uF 50VL 18x36mm TWSS Rubycon
110119	**	Fuse Clip 10A max (EU) (US)
080606	**	GBU8D 8A Rectifier Diodes Bridge
080292	**	16V 1W 5% Zener Diode
080156	**	1N4002 1A 100V Rectifier Diode
060413	**	220E 5W 10% Resistor
030560	**	4700u 80v 20% Snap-In Electrolytic Capacitor
667739	*	Amplifier Panel/Chassis
SMS235002	*	**250W 230Vac Transformer (EU)**
SMS235006	*	**250W 115Vac Transformer (US)**
110614	*	Mains Socket
110291	*	16A 250Vac Bipolar Power Switch
110020	*	T5A Fuse 5x20mm (EU)
110021	*	T5A Fuse 6.3x32mm (US)
080608	*	KBPC3502 35A 200V Rectifier Diode Bridge
020491	*	100nF 10% 250Vac Polyester Capacitor
717074		**Speaker Box Assembly**
430079	*	PFM-15.2A Covered Wooden Speaker Box
347395	*	Plastic Handle
340270	*	25x12mm Rubber Foot
177325	*	Suspension Flange
120664	*	M6 4-tips Lock Nut
120662	*	M5 4-tips Lock Nut
120661	*	M4 4-tips Lock Nut
120463	*	4.3x12.5x1 Black Washer
120411	*	WL3.5x20tt Black Screw
120346	*	WL4x20tc Black Screw
120111	*	M6x25tsp Black Screw
667710		Speaker Net
659027		White Pot Knob
229043		**12ohm Piezoelectric Horn Tweeter**
227066		**15" 4ohm Woofer Speaker**
210274		Speaker Filler (400gr/m² 100x50x4cm)
210217		Black Sealer (specify mt)
180662		“Lem” Adhesive Blue Plate
120483		5mm Black Shakeproof Washer
120461		5.3X10X1 Black Washer
120414		WL3.5x35tt Black Screw
120411		WL3.5x20tt Black Screw
120364		WL3.5x12tt Black Screw
120124		M5x30tc Black Screw
120059		M4x25tc Black Screw

PFM-15.3A

778150		Speakers Cables Assembly
768248		**PFM-15.3A Crossover Board (Pcb#313075)**
210215	*	Adhesive Rubber Foam 10x1.9mm (Specify mt)
120857	*	Vertical Male Faston 6.3mm
060214	*	4E7 5W 10% Wire Resistor
030095	*	2u2 100V 20% Axial Electrolytic Bipolar Capacitor
737115		**230+80W 230Vac Power Amplifier Module (EU)**
737116		**230+80W 115Vac Power Amplifier Module (US)**
SMS768010	*	**Input & 80W Amplifier Board (Pcb# EMB-462-H0)**
SMS141000	**	XLR Female Socket
SMS110000	**	Dual Slider Switch
141102	**	6 Contacts Vert Male Connector
140217	**	Jack Slim Horizontal S-F Socket
100965	**	TDA7294 80W Audio Amplifier with Mute
100084	**	TL074 Quad J-Fet Operational Amplifier
080743	**	Led 3mm Wide Diffused Green
074570	**	5K 31steps Linear Potentiometer
042715	**	82K5 1/4W 1% Metalized Film Resistor
042672	**	39K2 1/4W 1% Metalized Film Resistor
042625	**	15K0 1/4W 1% Metalized Film Resistor
SMS768007	*	**Xover & 230W Amplifier Board (Pcb# EMB-456-60)**
SMS090003	**	2SA1303 TO3P Pnp Transistor
SMS090002	**	2SC3284 TO3P Npn Transistor
SMS090001	**	TIP42C TO220 Pnp Transistor
SMS090000	**	TIP41C TO220 Npn Transistor
110316	**	Relay 24V / 1 Switch no 16A 250V
100061	**	TL072 Dual J-Fet Operational Amplifier
090920	**	MJE802 TO126 Npn Darl Transistor
090917	**	MJE350 TO126 Pnp Transistor
090916	**	MJE340 TO126 Npn Transistor
090201	**	2N5401 TO92 Pnp Transistor
090200	**	2N5550 TO92 Npn Transistor
090194	**	BC560C TO92 LN Pnp Transistor (BC557C Equivalent)
090183	**	BC550C TO92 LN Npn Transistor (BC547C Equivalent)
090153	**	BC327 TO92 Pnp Transistor
080901	**	VTL5C4 Analog Optoisolator
080821	**	Ptc 90 PTH59F04BE222TS
080156	**	1N4002 1A 100V Rectifier Diode
080103	**	1N4148 100mA 75V Signal Diode
060051	**	0E22 5W 5% Wire Resistor
030715	**	1000u 6v3 20% Vert Electrolytic Capacitor
SMS768003	*	**230+80W Supply Board (Pcb# EMB-450-H0)**
SMS090001	**	TIP42C TO220 Pnp Transistor
SMS090000	**	TIP41C TO220 Npn Transistor
SMS030000	**	2200uF 50VL 18x36mm TWSS Rubycon
110119	**	Fuse Clip 10A max (EU) (US)
080606	**	GBU8D 8A Rectifier Diodes Bridge
080292	**	16V 1W 5% Zener Diode
080156	**	1N4002 1A 100V Rectifier Diode
060432	**	330E 5W 10% Resistor
030560	**	4700u 80v 20% Snap-In Electrolytic Capacitor
667739	*	Amplifier Panel/Chassis
SMS235003	*	**310W 230Vac Transformer (EU)**
SMS235007	*	**310W 115Vac Transformer (US)**
110614	*	Mains Socket
110291	*	16A 250Vac Bipolar Power Switch
110018	*	T6.3A Fuse 5x20mm (EU)
110037	*	T6.3A Fuse 6.3x32mm (US)
080608	*	KBPC3502 35A 200V Rectifier Diode Bridge
020491	*	100nF 10% 250Vac Polyester Capacitor
717075		**Speaker Box Assembly**
430080	*	PFM-15.3A Covered Wooden Speaker Box
347395	*	Plastic Handle
340270	*	25x12mm Rubber Foot
177325	*	Suspension Flange
120664	*	M6 4-tips Lock Nut
120662	*	M5 4-tips Lock Nut
120661	*	M4 4-tips Lock Nut
120463	*	4.3x12.5x1 Black Washer
120411	*	WL3.5x20tt Black Screw
120346	*	WL4x20tc Black Screw
120111	*	M6x25tsp Black Screw
667711		Speaker Net
659027		White Pot Knob
229043		**12ohm Piezoelectric Horn Tweeter**
228015		**6" 8ohm Midrange Speaker**
227068		**15" 4ohm Woofer Speaker**
210274		Speaker Filler (400gr/m² 100x50x4cm)
210217		Black Sealer (specify mt)
180662		“Lem” Adhesive Blue Plate
120483		5mm Black Shakeproof Washer
120482		4mm Black Shakeproof Washer
120461		5.3X10X1 Black Washer
120453		4.2x9x0.8 Black Washer
120414		WL3.5x35tt Black Screw
120411		WL3.5x20tt Black Screw
120364		WL3.5x12tt Black Screw
120346		WL4x20tc Black Screw
120124		M5x30tc Black Screw
120059		M4x25tc Black Screw

PFM-15SA

737090		**350W 230Vac Power Amplifier Module (EU)**
737091		**350W 115Vac Power Amplifier Module (US)**
778134	*	Cables Assemblies
080716	**	Led 5mm 60deg Diffused Green
768181	*	**Inputs & Crossover Board (PCB#313042)**
141187	**	Hor Female XLR Socket (NC3FAH Neutrik)
141186	**	Hor Male XLR Socket (NC3MAH Neutrik)
140929	**	9 Contacts Vert Male Connector
140908	**	6 Contacts Vert Male Small Connector
120857	**	Vertical Male Faston 6.3mm
110305	**	Relay 12V / 2 Switch 1A 250V
100084	**	TL074 Quad J-Fet Operational Amplifier
080734	**	Led 2.5x5mm Rect Diff Red-Grn
080293	**	15V 1W 5% Zener Diode
080103	**	1N4148 100mA 75V Signal Diode
075820	**	4x100K Alog Potentiometer Alps RK1631410
074570	**	5K 31steps Linear Potentiometer
042730	**	115K 1/4W 1% Metalized Film Resistor
042625	**	15K0 1/4W 1% Metalized Film Resistor
042605	**	10K0 1/4w 1% Metalized Film Resistor
042585	**	6K81 1/4w 1% Metalized Film Resistor
042565	**	4K99 1/4w 1% Metalized Film Resistor
022024	**	100n 2.5% 100V MKP Polypropylene Capacitor
022014	**	15n 2.5% 100V MKP Polypropylene Capacitor
768109	*	**Jack Sockets Board (PCB#313002)**
778111	**	6 Contacts Female Cable
140217	**	Jack Stereo Slim Horizontal Socket
727562	*	**Power Amplifier Assembly**
768100	**	**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
080293	***	15V 1W 5% Zener Diode
080156	***	1N4002 1A 100V Rectifier Diode
060403	***	180E 3W 10% Resistor
030884	***	10000U 80V 20% Snap-In Electrolytic Capacitor
030555	***	4700u 50V 20% Snap-In Electrolytic Capacitor
768094	**	**Power Amplifier Board (PCB#319064)**
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	***	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
080901	***	VTL5C4 Analog Optoisolator
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
060591	***	8K2 2W 10% Resistor
060051	***	0E22 5W 5% Wire Resistor
042695	***	56K2 1/4w 1% Metalized Film Resistor
042687	***	49K9 1/4w 1% Metalized Film Resistor
042605	***	10K0 1/4w 1% Metalized Film Resistor
030715	***	1000u 6v3 20% Vert Electrolytic Capacitor
030247	***	10u 25V 20% Vert Electrolytic Bipolar Capacitor
340783	**	TO264 Mica Washer
340154	**	TO3/TO218 Mica Washer
340079	**	TO220 Mica Washer
340078	**	TO220 Insulated Bush
177619	**	Heatsink
090924	**	MJL21194 TO264 Npn Transistor
090923	**	MJL21193 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
667673	*	Amplifier Chassis with Panel
659027	*	White Pot Knob
659026	*	Orange Pot Knob
330130	*	Led Bush
237068	*	**Transformer 230Vac 350VA**
237069	*	**Transformer 115Vac 350VA**
210215	*	Adhesive Rubber Foam 10x1.9mm (Specify mt)
190133	*	Lateroid Insulator For Screw Block
110614	*	Mains Socket
110291	*	Power Switch
110029	*	T4A Fuse 5x20mm (EU)
110036	*	T4A Fuse 6.3x32mm (US)
110018	*	T6.3A Fuse 5x20mm (EU)
110037	*	T6.3A Fuse 6.3x32mm (US)
080607	*	KBPC25 25A 200V Rectifier Diode Bridge
020491	*	100nF 10% 250Vac Polyester Capacitor
717076		**Speaker Box Assembly**
657265	*	d=90 l=70mm Black Duct
430081	*	PFM-15SA Covered Wodden Speaker Box
347395	*	Plastic Handle
340270	*	25x12mm Rubber Foot
177325	*	Suspension Flange
120664	*	M6 4-tips Lock Nut
120662	*	M5 4-tips Lock Nut
120661	*	M4 4-tips Lock Nut
120455	*	4,2x9x2 Washer
120411	*	WL3.5x20tt Black Screw
120111	*	M6x25tsp Black Screw
667712		Speaker Net
659027		White Pot Knob
659026		Orange Pot Knob
227070		**15" 6ohm Woofer Speaker**
210274		Speaker Filler (400gr/m² 100x50x4cm)
210217		Black Sealer (specify mt)
210215		Adhesive Rubber Foam 10x1.9mm (Specify mt)
180662		“Lem” Adhesive Blue Plate
120483		5mm Black Shakeproof Washer
120461		5.3X10X1 Black Washer
120414		WL3.5x35tt Black Screw
120124		M5x30tc Black Screw
120059		M4x25tc Black Screw

ACTIVE MONITORS

Legend	
US =	Specify United States Version
EU =	Specify Europe Version

Accessories

277351	Owner’s Manual
130297	Mains Cable (EU)
130283	Mains Cable (US)

PFM-8MA

737109		**100W 230Vac Power Amplifier Module (EU)**
737110		**100W 115Vac Power Amplifier Module (US)**
SMS768008	*	**Input Board (Pcb# EFB-073-H0)**
SMS141000	**	XLR Female Socket
SMS110000	**	Dual Slider Switch
140217	**	Jack Slim Horizontal S-F Socket
100084	**	TL074 Quad J-Fet Operational Amplifier
080743	**	Led 3mm Wide Diffused Green
074570	**	5K 31steps Linear Potentiometer
042715	**	82K5 1/4W 1% Metalized Film Resistor
042672	**	39K2 1/4W 1% Metalized Film Resistor
042625	**	15K0 1/4W 1% Metalized Film Resistor
SMS768004	*	**100W Amplifier Board (Pcb# EMB-447-60)**
SMS090003	**	2SA1303 TO3P Pnp Transistor
SMS090002	**	2SC3284 TO3P Npn Transistor
SMS090001	**	TIP42C TO220 Pnp Transistor
SMS090000	**	TIP41C TO220 Npn Transistor
110307	**	Relay 24V / 2 Switch 5A 250Vac
100061	**	TL072 Dual J-Fet Operational Amplifier
090920	**	MJE802 TO126 Npn Darl Transistor
090917	**	MJE350 TO126 Pnp Transistor
090916	**	MJE340 TO126 Npn Transistor

090201	**	2N5401 TO92 Pnp Transistor
090200	**	2N5550 TO92 Npn Transistor
090194	**	BC560C TO92 LN Pnp Transistor (BC557C Equivalent)
090183	**	BC550C TO92 LN Npn Transistor (BC547C Equivalent)
090153	**	BC327 TO92 Pnp Transistor
080901	**	VTL5C4 Analog Optoisolator
080821	**	Ptc 90 PTH59F04BE222TS
080156	**	1N4002 1A 100V Rectifier Diode
080103	**	1N4148 100mA 75V Signal Diode
060051	**	0E22 5W 5% Wire Resistor
030715	**	1000u 6v3 20% Vert Electrolytic Capacitor
SMS768000	*	**100W Supply Board (Pcb# EMB-449-H0)**
110119	**	Fuse Clip 10A max (EU) (US)
080292	**	16V 1W 5% Zener Diode
080156	**	1N4002 1A 100V Rectifier Diode
060413	**	220E 5W 10% Resistor
030555	**	4700u 50V 20% Snap-In Electrolytic Capacitor
667738	*	Amplifier Panel/Chassis
SMS235000	*	**150W 230Vac Transformer (EU)**
SMS235004	*	**150W 115Vac Transformer (US)**
110614	*	Mains Socket
110285	*	4A 250Vac Bipolar Power Switch
110003	*	T3.15A Fuse 5x20mm (EU)
110061	*	T3.15A Fuse 6.3x32mm (US)
080607	*	KBPC25 25A 200V Rectifier Diode Bridge
020491	*	100nF 10% 250Vac Polyester Capacitor
717077		**Speaker Box Assembly**
430082	*	PFM-8MA Covered Wodden Speaker Box
347396	*	Belt Handle
340270	*	25x12mm Rubber Foot
177325	*	Suspension Flange
120664	*	M6 4-tips Lock Nut
120661	*	M4 4-tips Lock Nut
120455	*	4,2x9x2 Washer
120411	*	WL3.5x20tt Black Screw
120111	*	M6x25tsp Black Screw
120102	*	M4x30tsp Black Screw
667713		Speaker Net
659027		White Pot Knob
227063		**8" 8ohm Speaker**
210272		Speaker Filler (400gr/m² 30x50x4cm)
210217		Black Sealer (specify mt)
180662		“Lem” Adhesive Blue Plate
120482		4mm Black Shakeproof Washer
120414		WL3.5x35tt Black Screw
120411		WL3.5x20tt Black Screw

PFM-12.2MA

778150		Speakers Cables Assembly
768218		**PFM-12.2 Crossover Board (Pcb#313075)**
210215	*	Adhesive Rubber Foam 10x1.9mm (Specify mt)
120857	*	Vertical Male Faston 6.3mm
060275	*	15E 5W 10% Wire Resistor
030171	*	4u7 63V 20% Axial Electrolytic Bipolar Capacitor
737111		**150W 230Vac Power Amplifier Module (EU)**
737112		**150W 115Vac Power Amplifier Module (US)**
SMS768008	*	**Input Board (Pcb# EFB-073-H0)**
SMS141000	**	XLR Female Socket
SMS110000	**	Dual Slider Switch
140217	**	Jack Slim Horizontal S-F Socket
100084	**	TL074 Quad J-Fet Operational Amplifier
080743	**	Led 3mm Wide Diffused Green
074570	**	5K 31steps Linear Potentiometer
042715	**	82K5 1/4W 1% Metalized Film Resistor
042672	**	39K2 1/4W 1% Metalized Film Resistor
042625	**	15K0 1/4W 1% Metalized Film Resistor
SMS768005	*	**150W Amplifier Board (Pcb# EMB-447-60)**
SMS090003	**	2SA1303 TO3P Pnp Transistor
SMS090002	**	2SC3284 TO3P Npn Transistor
SMS090001	**	TIP42C TO220 Pnp Transistor
SMS090000	**	TIP41C TO220 Npn Transistor
110307	**	Relay 24V / 2 Switch 5A 250Vac
100061	**	TL072 Dual J-Fet Operational Amplifier
090920	**	MJE802 TO126 Npn Darl Transistor
090917	**	MJE350 TO126 Pnp Transistor
090916	**	MJE340 TO126 Npn Transistor
090201	**	2N5401 TO92 Pnp Transistor
090200	**	2N5550 TO92 Npn Transistor
090194	**	BC560C TO92 LN Pnp Transistor (BC557C Equivalent)
090183	**	BC550C TO92 LN Npn Transistor (BC547C Equivalent)

090153	**	BC327 TO92 Pnp Transistor
080901	**	VTL5C4 Analog Optoisolator
080821	**	Ptc 90 PTH59F04BE222TS
080156	**	1N4002 1A 100V Rectifier Diode
080103	**	1N4148 100mA 75V Signal Diode
060051	**	0E22 5W 5% Wire Resistor
030715	**	1000u 6v3 20% Vert Electrolytic Capacitor
SMS768001	*	**150W Supply Board (Pcb# EMB-449-H0)**
SMS090001	**	TIP42C TO220 Pnp Transistor
SMS090000	**	TIP41C TO220 Npn Transistor
110119	**	Fuse Clip 10A max (EU) (US)
080292	**	16V 1W 5% Zener Diode
080156	**	1N4002 1A 100V Rectifier Diode
060413	**	220E 5W 10% Resistor
030560	**	4700u 80v 20% Snap-In Electrolytic Capacitor
667738	*	Amplifier Panel/Chassis
SMS235001	*	**180W 230Vac Transformer (EU)**
SMS235005	*	**180W 115Vac Transformer (US)**
110061	*	T3.15A Fuse 6.3x32mm (US)
110003	*	T3.15A Fuse 5x20mm (EU)
110614	*	Mains Socket
110285	*	4A 250Vac Bipolar Power Switch
080607	*	KBPC25 25A 200V Rectifier Diode Bridge
020491	*	100nF 10% 250Vac Polyester Capacitor
717078		**Speaker Box Assembly**
430083	*	PFM-12.2MA Covered Wodden Speaker Box
347396	*	Belt Handle
340270	*	25x12mm Rubber Foot
120662	*	M5 4-tips Lock Nut
120661	*	M4 4-tips Lock Nut
120455	*	4,2x9x2 Washer
120411	*	WL3.5x20tt Black Screw
120102	*	M4x30tsp Black Screw
667709		Speaker Net
659027		White Pot Knob
229043		**12ohm Piezoelectric Horn Tweeter**
227065		**12" 8ohm Woofer Speaker**
210273		Speaker Filler (400gr/m² 50x50x4cm)
210217		Black Sealer (specify mt)
180662		“Lem” Adhesive Blue Plate
120483		5mm Black Shakeproof Washer
120461		5.3X10X1 Black Washer
120414		WL3.5x35tt Black Screw
120411		WL3.5x20tt Black Screw
120364		WL3.5x12tt Black Screw
120124		M5x30tc Black Screw

PFM-15.2MA

778150		Speakers Cables Assembly
768219		**PFM-15.2 4ohm Crossover Board (Pcb#313081)**
210215	*	Adhesive Rubber Foam 10x1.9mm (Specify mt)
120857	*	Vertical Male Faston 6.3mm
061265	*	15E 20W 5% Wire Resistor
030095	*	2u2 100V 20% Axial Electrolytic Bipolar Capacitor
737113		**250W 230Vac Power Amplifier Module (EU)**
737114		**250W 115Vac Power Amplifier Module (US)**
SMS768009	*	Input Board (Pcb# EFB-074-H0)
SMS141000	**	XLR Female Socket
SMS110000	**	Dual Slider Switch
141102	**	6 Contacts Vert Male Connector
140217	**	Jack Slim Horizontal S-F Socket
100084	**	TL074 Quad J-Fet Operational Amplifier
080743	**	Led 3mm Wide Diffused Green
074570	**	5K 31steps Linear Potentiometer
042715	**	82K5 1/4W 1% Metalized Film Resistor
042672	**	39K2 1/4W 1% Metalized Film Resistor
042625	**	15K0 1/4W 1% Metalized Film Resistor
SMS768006	*	**250W Amplifier Board (Pcb# EMB-456-60)**
SMS090003	**	2SA1303 TO3P Pnp Transistor
SMS090002	**	2SC3284 TO3P Npn Transistor
SMS090001	**	TIP42C TO220 Pnp Transistor
SMS090000	**	TIP41C TO220 Npn Transistor
110316	**	Relay 24V / 1 Switch no 16A 250V
100061	**	TL072 Dual J-Fet Operational Amplifier
090920	**	MJE802 TO126 Npn Darl Transistor
090917	**	MJE350 TO126 Pnp Transistor
090916	**	MJE340 TO126 Npn Transistor
090201	**	2N5401 TO92 Pnp Transistor
090200	**	2N5550 TO92 Npn Transistor
090194	**	BC560C TO92 LN Pnp Transistor (BC557C Equivalent)
090183	**	BC550C TO92 LN Npn Transistor (BC547C Equivalent)
090153	**	BC327 TO92 Pnp Transistor

080901	**	VTL5C4 Analog Optoisolator
080821	**	Ptc 100° PTH9L04BD222TS2F330 Murata
080156	**	1N4002 1A 100V Rectifier Diode
080103	**	1N4148 100mA 75V Signal Diode
060051	**	0E22 5W 5% Wire Resistor
030715	**	1000u 6v3 20% Vert Electrolytic Capacitor
SMS768002	*	**250W Supply Board (Pcb# EMB-450-H0)**
SMS090001	**	TIP42C TO220 Pnp Transistor
SMS090000	**	TIP41C TO220 Npn Transistor
SMS030000	**	2200uF 50VL 18x36mm TWSS Rubycon
110119	**	Fuse Clip 10A max (EU) (US)
080606	**	GBU8D 8A Rectifier Diodes Bridge
080292	**	16V 1W 5% Zener Diode
080156	**	1N4002 1A 100V Rectifier Diode
060413	**	220E 5W 10% Resistor
030560	**	4700u 80v 20% Snap-In Electrolytic Capacitor
SMS235002	*	**250W 230Vac Transformer (EU)**
SMS235006	*	**250W 115Vac Transformer (US)**
110614	*	Mains Socket
110291	*	16A 250Vac Bipolar 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)
080608	*	KBPC3502 35A 200V Rectifier Diode Bridge
020491	*	100nF 10% 250Vac Polyester Capacitor
717080		**Speaker Box Assembly**
430085	*	PFM-15.2MA Covered Wooden Speaker Box
347396	*	Belt Handle
340270	*	25x12mm Rubber Foot
120662	*	M5 4-tips Lock Nut
120661	*	M4 4-tips Lock Nut
120341	*	WL4x20tt Black Screw
120102	*	M4x30tsp Black Screw
667710		Speaker Net
659027		White Pot Knob
229043		**12ohm Piezoelectric Horn Tweeter**
227066		**15" 4ohm Woofer Speaker**
210274		Speaker Filler (400gr/m² 100x50x4cm)
210217		Black Sealer (specify mt)
180662		"Lem" Adhesive Blue Plate
120483		5mm Black Shakeproof Washer
120461		5.3X10X1 Black Washer
120414		WL3.5x35tt Black Screw
120411		WL3.5x20tt Black Screw
120364		WL3.5x12tt Black Screw
120124		M5x30tc Black Screw
120059		M4x25tc Black Screw
370534		"Lem" Adhesive Logo

Note:

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.