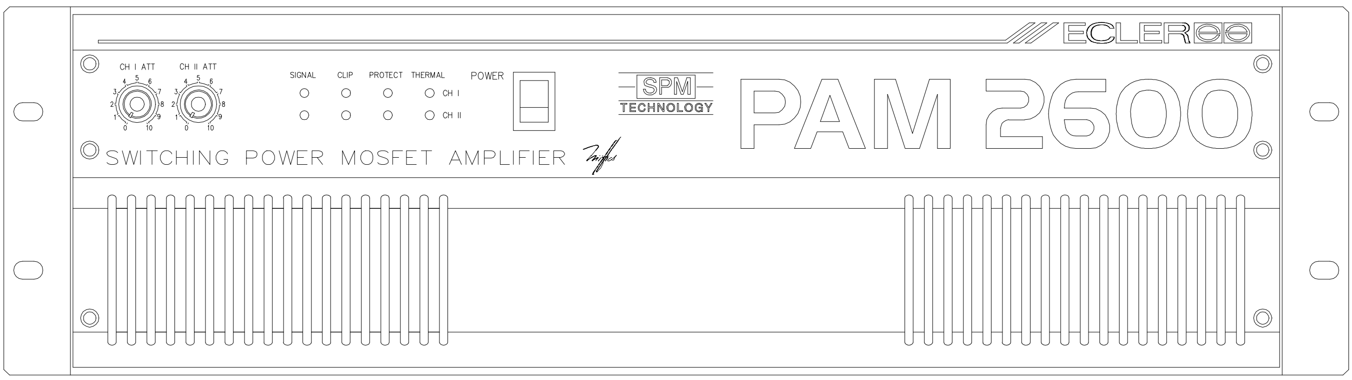
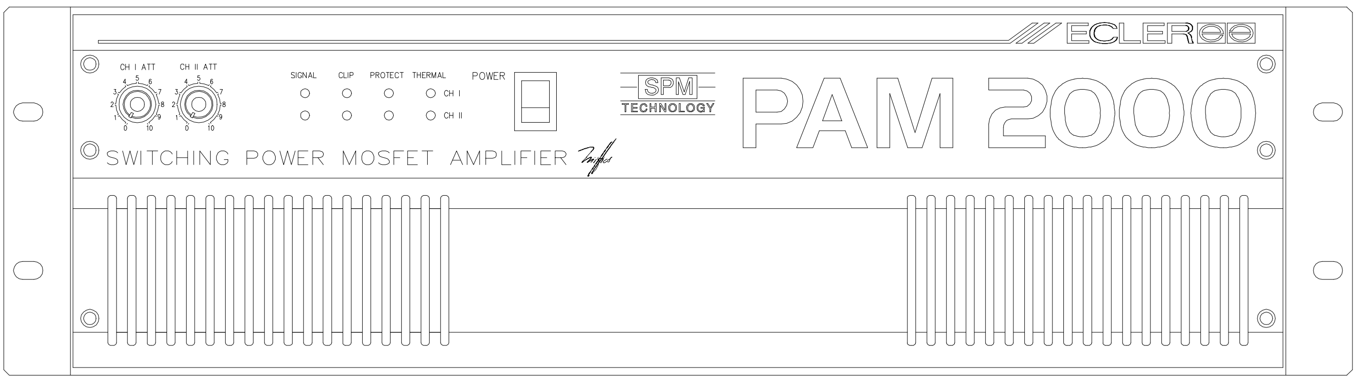
PAM2600/2000

SERVICE MANUAL





ECLER

AUDIO CREATIVE POWER

SERVICE MANUAL PAM2600/2000

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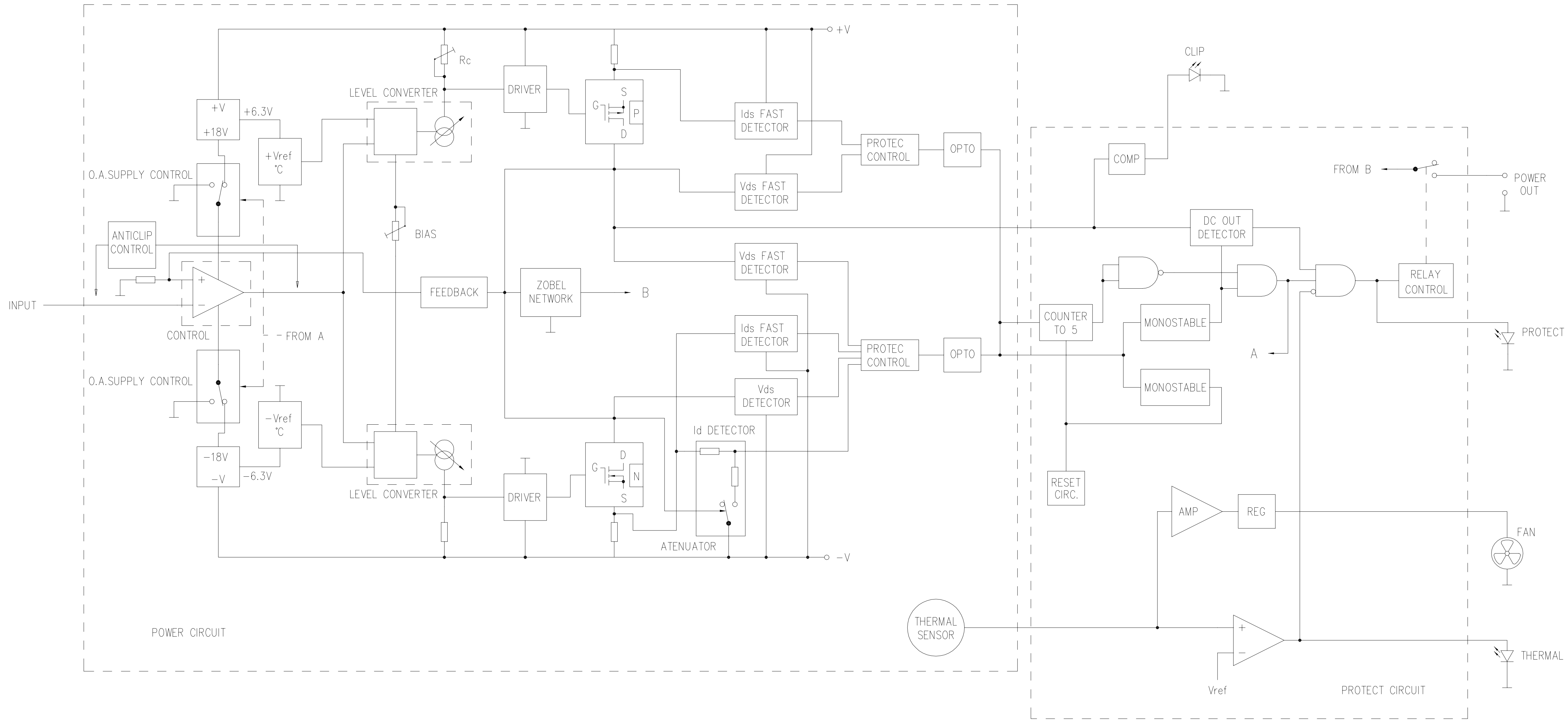
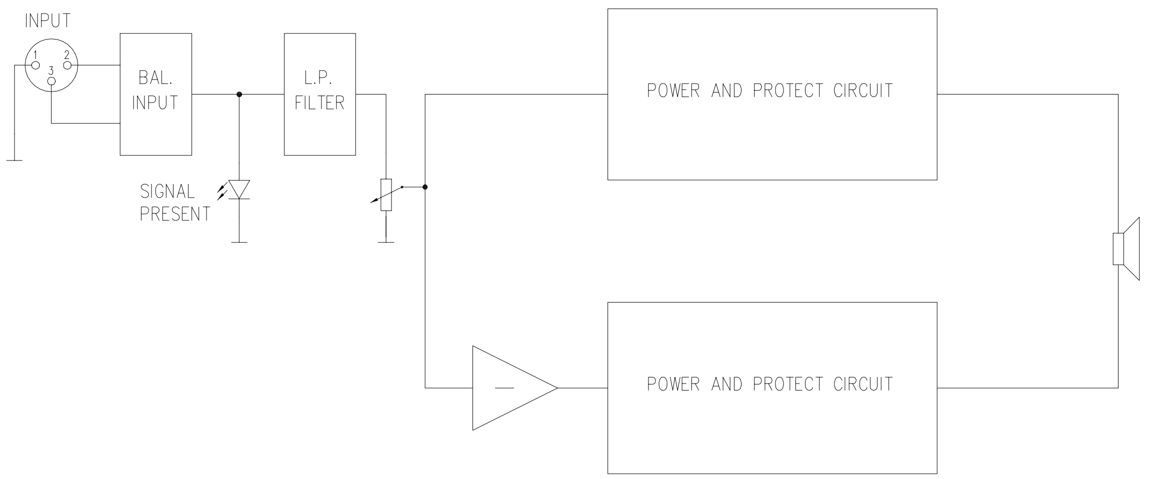




ONE CHANNEL BLOCK DIAGRAM
PAM2000/2600

TITLE: BLOCK DIAGRAM		MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 1 OF 1	
DRAWN: J.QUERALT	DATE: 15.07.95	REPLACES:	DRW. NO. 10.0311 / REV.
CHECKED:	DATE:	REPLACED BY:	

MODULE CIRCUIT 11.0504B OPERATION - DESCRIPTION

The control element is the operational NE5534. This is a very low noise operational, especially designed for very high quality applications in professional audio equipment, control equipment and telephony channel amplifiers.

The operational is internally compensated for a gain equal to or higher than three. Frequency response can be optimized with an external compensation capacity, for several applications (unity gain amplifier, capacitive load, slew-rate, low overshoot, etc...).

Characteristics:

Small-signal bandwidth: 10Mhz
Output drive capability: 600Ω 10V(rms) at Vs=±18V
Input noise voltage: 4nV/ Hz
DC voltage gain: 100000√
AC voltage gain: 6000 at 10KHz
Power bandwidth: 200KHz
Slew-rate: 13V/µs
Supply voltage range: ±3 to ±20V

POWER SUPPLY

The BF871 and BF872 transistors are mounted in a common base configuration, in a current source structure. The current sources have a double function: polarizing the gate-source links in the MOSFETs to the limit of the conduction and moving the voltage variations at the operational output which are refered to ground to voltage variations refered to high voltage power supply. The polarization point is calculated so the voltage dropout in Rc(R112+R111) is the limit voltage of conduction of the MOSFETs (≈2 to 3V), enough to carry the bias current. If we modulate in AC the base-emitter voltage, the Ic and VRc will vary proportionally. In our configuration, as the reference voltage Vref is constant (it is a part of the operational power supply), we add the operational output voltage to the transistors emitter through Re (R107-R108).

The Rc value fixes the source output impedance. We do not recommend to raise it higher than 1KΩ because of frequency response and slew rate reasons. This voltage circuit's gain is, as usual in a common base configuration with Rc/Re emitter resistor, 0.45.

POWER SOURCE STRUCTURE

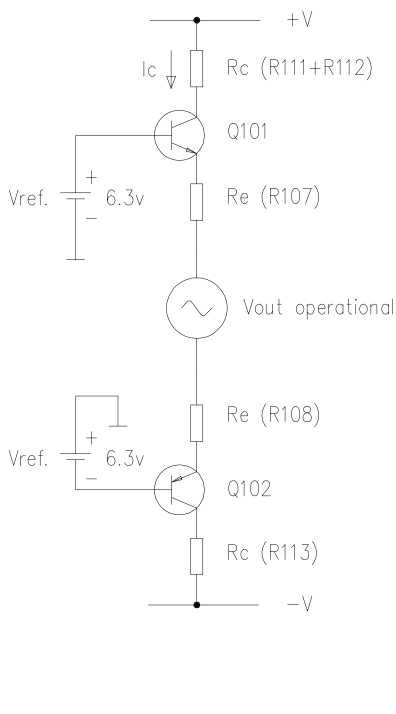


fig. 1

BIAS CURRENT ADJUST

POWER SOURCE STRUCTURE AND BIAS CURRENT ADJUST

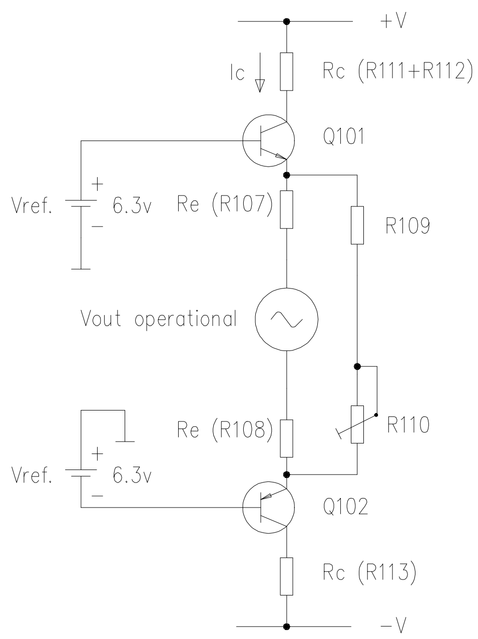


fig. 2

The bias current adjust is performed through the variable resistor connected between the emitters of the current sources R110 (5KΩ). It delivers a supplementary current (it does not go through the operational) which simultaneously increases the voltage which falls in the Rc load resistors.

This is the easiest way of acting with just one adjust over both branches at the same time. In order to adjust the bias current the adjustable resistor must be varied until a current of about 80mA circulates through each MOSFET. So, for instance, for a PAM2600 in which there are six MOSFETs it will be 80 x 6 = 480mA.The bias current depends on the MOSFETs temperature and the stabilizing circuit transistors temperature.

TEMPERATURE STABILIZING CIRCUIT

TEMPERATURE STABILIZING CIRCUIT

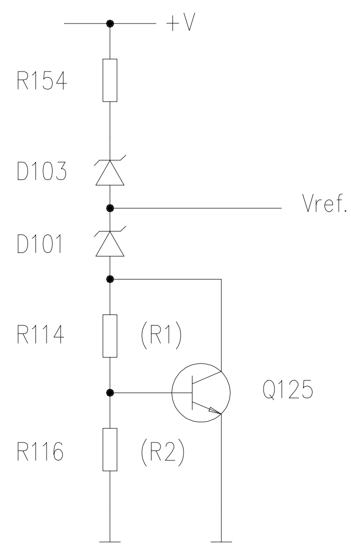


fig. 3

Temperature affects MOSFETs conduction in two different ways: first, the conduction threshold voltage has a negative temperature coefficient; second, the drain-source conduction resistance increases with temperature. Depending on which of the two things is predominating the temperature coefficient of the drain can be positive or negative. In our case, in which the gate-source voltage in the MOSFETs is very low when they conduct, the temperature coefficient of drain current -which is positive- is predominating.

To avoid thermal runaway in the polarizing current we must decrease the gate-source voltage as the MOSFETs get hot. Temperature stabilization is performed by modifying the reference voltage of both sources. If the temperature increases the Vref must decrease so that Ic and VRc decrease and, as a consequence, the gate-source voltage also decreases.

The circuit used is shown in figure 3. The base-emitter Vbe temperature/voltage feature is used to obtain the final result we need. The main idea is adequately choosing R1 and R2 to obtain the right temperature coefficient.

SYMMETRY ADJUST

The threshold voltage varies much, even between MOSFETs of the same kind. When connecting them in parallel we must be careful that they all have the same conduction current if we want equal currents circulating in all of them. If the conduction voltage of P an N channels MOSFETs is not the same they will conduct different currents, even when we apply identical gate-source voltages. As the bias current of the N MOSFETs must be identical to the one of the P MOSFETs the feedback will correct the continuous voltage at the operational output to polarize the MOSFETs with different voltages until both conduct equal currents.

If the operational output is not 0 V its capacitity to give voltage and current is not the same in both senses. To avoid this we must put a symmetry adjust. It is just an adjust which allows to vary the collector resistance of one of the current sources (R111).

The symmetry adjust does not correct the asymmetrical clipping saturation of the power amplifier with real load. This happens because the conduction resistors (Ron) of the MOSFETs N and P are not equal. Channel P has a higher Ron than channel N. This characteristic depends on the MOSFET's physical construction.

SYMMETRY ADJUST AND DRIVER

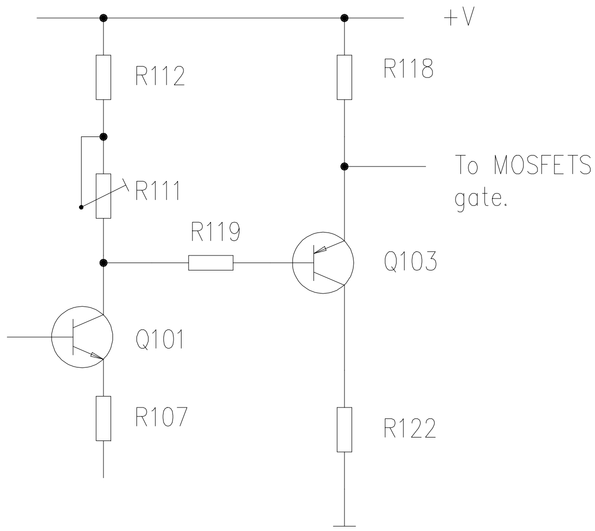


fig. 4

POWER MOSFETs

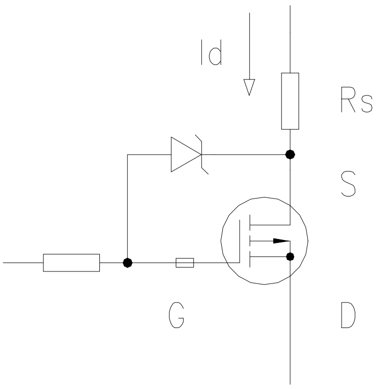
The MOSFETs used are IRFP9240 (P) and IRFP240 (N). They are assembled in a common source configuration so they can be completely saturated.

This kind of configuration has two drawbacks compared to a common drain one: less stability (because of the configuration gain itself) and high output impedance in open loop.

The source resistances (0.22Ω) are needed for the MOSFETs to work in parallel. E.g.: Two MOSFETs excited by the same Vgs voltage (gate-source voltage) of 5V. If they have different transconductance curves (Id function Vgs) they will conduct different drain currents; let's say 1A and 3A. The second one will dissipate more power and will get hotter.

The use of source resistances tends to match the current that each of the MOSFETs connected in parallel is conducting.

This resistance performs a negative feedback on the gate, lowering down the Vgs, relating to the drain current; like this:



Vgs = Vgg - Id*Rs

The higher the Id, the lower the Vgs voltage. The gate is protected by a zener, preventing a possible overload during an unexpected change from overload to real clipping.

Given the high input impedance and the broad frequency response of the MOSFETs there is a high risk of self-oscillations if all gates are excited connected to the same node. Intercalating serial resistances and ferrite beads at the gate this possibility is minimized, because the Q of the LC network made by the inductances and gate-source capacity is reduced.

PROTECTION CIRCUIT

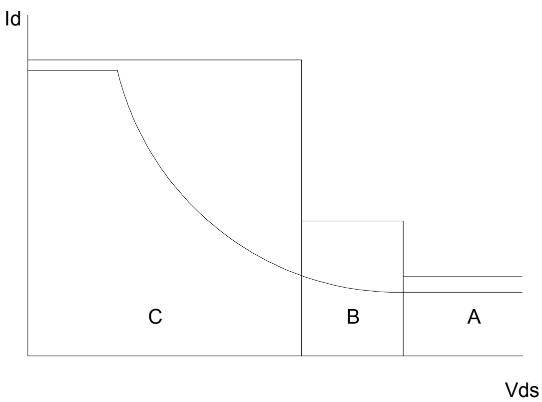
The protection circuit monitors the dissipated power at the MOSFETs stage. It has two basic parts:

MOSFET Id current detection.

MOSFET Vds voltage detection.

The goal is limiting the MOSFET so it works inside an area close to the SOA, as indicated in the figure. We chose channel N because, due to construction reasons, its SOA is lower.

ZONE A. This zone is for very low loads, around 0Ω. As the load voltage is very low, the voltage held by the MOSFET will always be high. The protections should be activated with very low current.



Fast protections and some of the slow ones are working in this zone. The circuit that configures the fast ones is made of: D120, D121, D123, R174, R175, R176, R177, R178, R179, C127, Q122 and Q123 for the N channel. There is also an equivalent circuit in the P channel. These start working when there is a sudden current variation because of a shortcircuit or a transitory. The reaction time -from the exact moment when these things occur to when the current stops circulating through the MOSFETs- is about 80µs.

The time constant is given by C127, R174 and R179 and the load circuit made by the LED diode of the IC104 (opto-coupler).

Please note that in order for the protection to be activated Q122 and Q123 must conduct simultaneously, through which R174 is linked to negative power supply, being C127(1µF) loaded very quickly through this resistance, activating the LED of the opto-coupler, sending a pulse to the protection circuit, which will open the corresponding channel's relay, being this way the output from the power amplifier disconnected from the load (0Ω), in this case. Q122, together with the zeners and the base polarization resistances, configure the voltage detector (this group is in parallel with the Vds voltage of the N MOSFET).

Q123, together with the resistances which make the base divider, configure the current detector (this divider takes its voltage from one of the source resistances of a N MOSFET, which is proportional to the current circulating through itself).

The threshold separating zone A from zone B is determinated by the D125 zener. When this zener stops working and there is no current circulating through it because the Vds voltage is lower (let's remember this circuit is also in parallel with this voltage) or, what is the same, the load voltage grows because it is not 0Ω anymore and has a given value, like 0.5Ω to 1Ω, and the help given by D126 stops so more current will be needed for the shot. We have climbed the first stair of the stairway of the SOA graphic.

When the zeners D124 and D118 stop working because the load voltage goes on growing (values higher than 1Ω) or -what is the same- the Vds decreases, the Q125 transistor does not receive current anymore in its base and so it is shorted, allowing Q124 to enter conduction. This way R172 stays in parallel with the base-emitter of Q121, making up a voltage divider with R173. This divider will climb another stair of the stairway and enter the ZONE C.

The link between the module's protection circuit and the relays' control circuit is made through IC103 and IC104 which are, as mentioned earlier, opto-couplers, just to insulate the existing high voltages at the power amplifying module, ±63V in the case of the PAM2600, and the power supply voltage of the existing logic circuits in the relays' control card.

Once the pulse generated by the protections is detected, the control circuitry resident in the protection card, appart from opening the corresponding relay, returns the signal A.O. SUPPLY CONTROL to the module, which cuts by means of Q119, Q120 and IC102 the operational's power supply.

This is the way to insure a fast and safe cut of the Id current in the MOSFETs (around 80µs time), because they stop receiving their respective reference voltages and, consequently, their Vgs polarization voltages so they are cut. The circuit is shown in figure 9 and its operation is very simple.

When the A.O. SUPPLY CONTROL (+10V) signal appears, the Q119 transistor starts conducting, shortcircuiting to ground the positive power supply of the operational. On the other hand, the signal is also applied to the IC102's LED (opto TIL112 (4N35)), which puts its internal transistor and Q120 into conduction, connecting the negative power supply of the operational to ground.

N CHANNEL FAST PROTECTIONS CIRCUIT

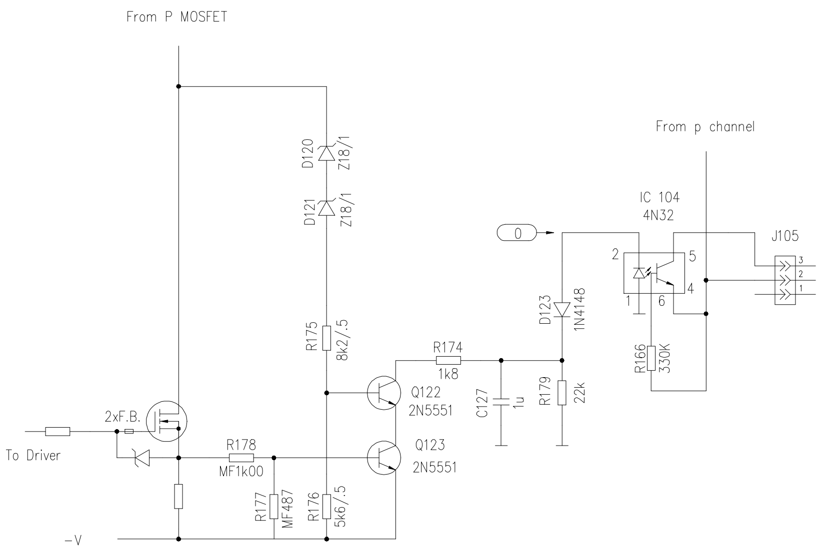


fig. 5

SLOW PROTECTIONS AID CIRCUIT
(A) STEP SOA DIAGRAM

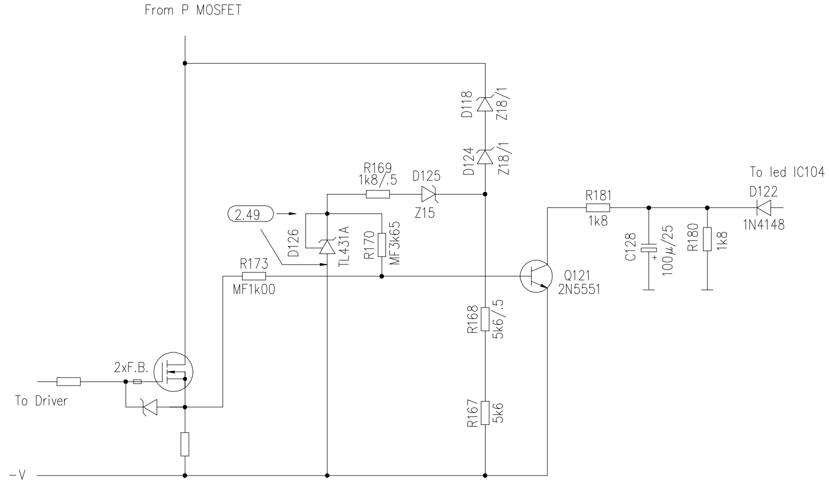


fig. 6

SLOW PROTECTIONS CIRCUIT
(B) STEP SOA DIAGRAM

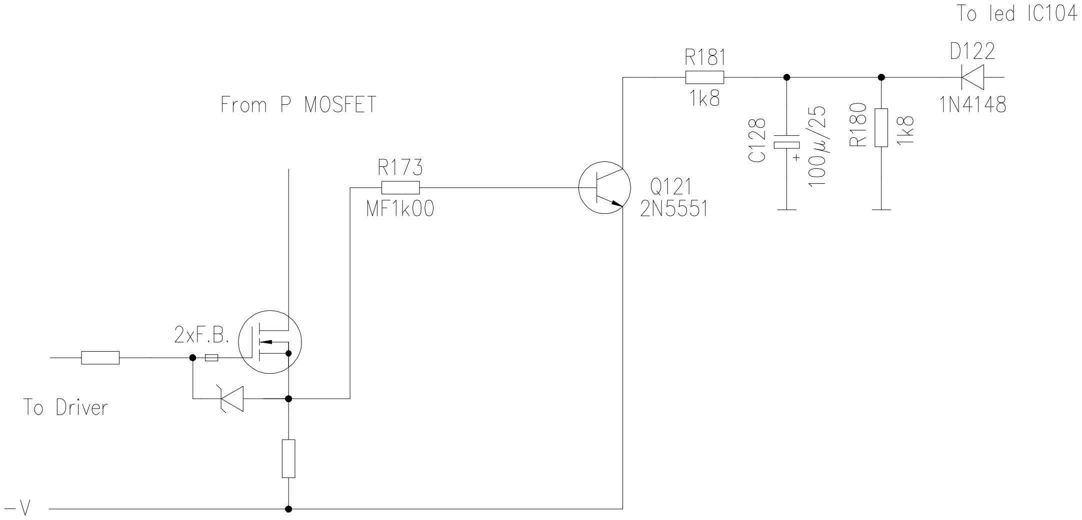


fig. 7

SLOW PROTECTIONS CIRCUIT
(C) STEP SOA DIAGRAM

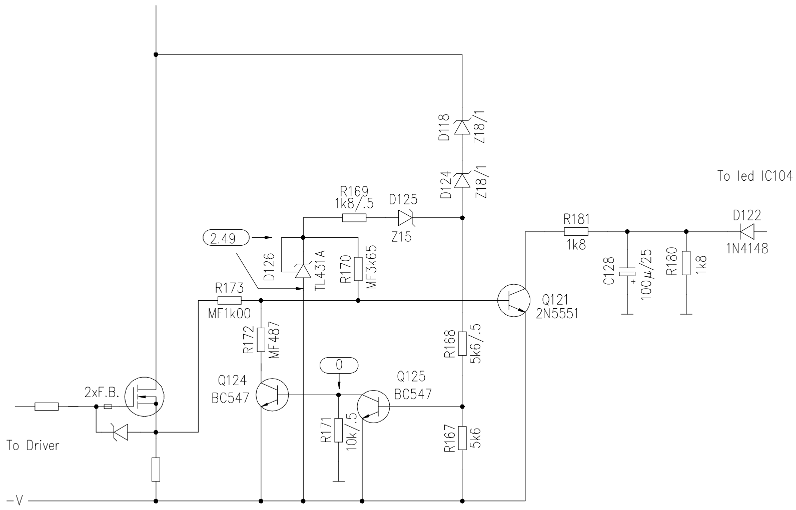


fig. 8

OPERATIONAL AMPLIFIER POWER SUPPLY CONTROL

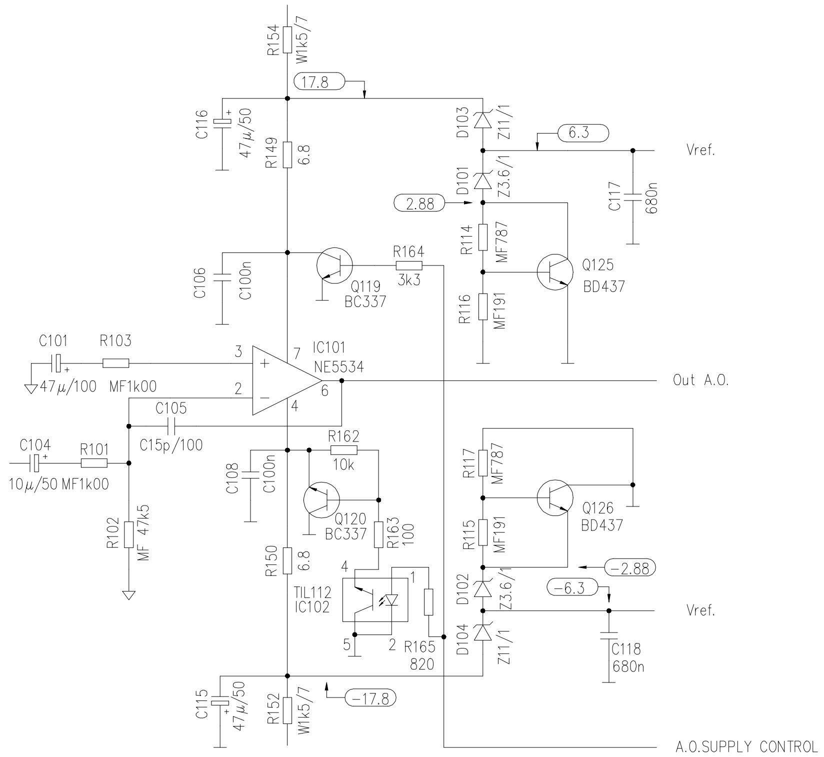


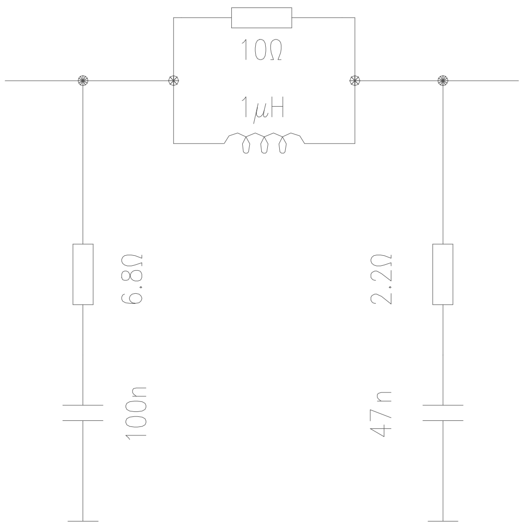
fig. 9

ZOBEL NETWORK

This circuit tries to get a constant load impedance for the power module, in spite of the amplifier's load and frequency, to avoid phase shifting of the feedback signal.

The values have been experimentally calculated through a study with square signal by trying to minimize the power amplifier's ringing with very capacitive loads (2,2μF//4Ω).

The Zobel Network eliminates possible oscillations of the MOSFETs between 5MHz and 10MHz, too. This is why it must be physically placed at the module's output, avoiding long wiring. Great care must be taken for the signal not to be too shifted at the output, because the feedback could turn negative.



FEEDBACK

The whole amplifier is compensated with just one capacity, which places the amplifier's general pole at:

$$Fp = \frac{1}{2*\pi*Rf*Cf} = 140KHz$$

Rf = R106 Cf = C109-C110

PROTECTION CIRCUIT 11.0411 OPERATION - DESCRIPTION

The circuit is configured by:

- A POWER SUPPLY.
- A THERMAL PROBE DC AMPLIFIER.
- A TEMPERATURE DETECTOR.
- A DC OUT DETECTOR PER CHANNEL.
- A CLIP CIRCUIT PER CHANNEL.
- A RESET (TURN OFF/TURN ON) CIRCUIT.
- A BINARY COUNTER PER CHANNEL.
- TWO MONOSTABLE CIRCUITS PER CHANNEL.

The circuit power supply is performed through various sources: +V, module's power supply. This voltage feeds the relays circuit, manual reset circuit and part of the clip circuit. Alternate voltage from a transformer's secondary (manual reset circuit).

There is also a stabilized 10V power supply which feeds the card's circuitry, made of IC301 (7805) plus the zener D302 (Z4.7) 4.7+5 ≈ 10V. We will also need a regulated power supply to get 14Vmax at 0.7A, which can be obtained with IC302 (7805) plus an auxiliary circuitry that will be analysed below.

The cooling fan speed is automatically regulated in relation to the power module's temperature, which is read by a thermal probe (LM35D), jointly linked to the heat sink.

This high sensitivity thermal probe gives variations of 10mV for every °C. This voltage is picked up and amplified by the IC305 (LM358). Of course, there is a probe for each L and R heatsink. The output of both amplifiers is linked through two diodes D304 and D305, making an O gate, whose cathodes go to the regulator, applying the DC of any of them to the regulator. This provides a variable voltage at its output which oscillates from a minimum of approximately 7V for a temperature of 20°C (cold heatsink) to a maximum of 14V for temperatures of 76°C or higher.

The gain of the amplifiers has been calculated for this temperatures window. The maximum voltage allowed by the heatsink in order to work properly is 14V. This maximum is given by the zener D305 (Z9.1/1); as the regulator is a 7805 the voltage will be -as maximum- 9.1+5 = 14.1V. When the zener is not working (not enough voltage) the voltage on the fan will be the output amplifiers', less 0.6V (diodes fall), plus the 5V of the IC302.

POWER SUPPLY AND THERMAL PROBE DC AMPLIFIER

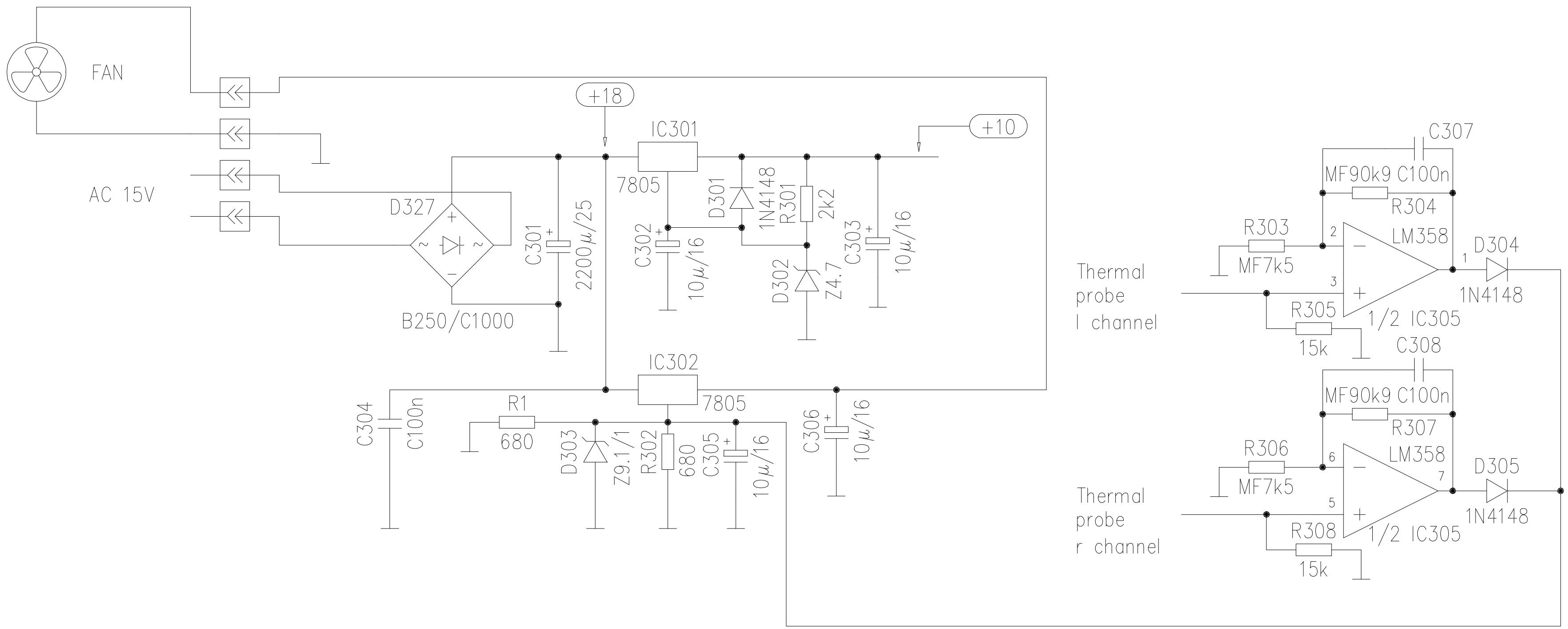


fig. 1

TEMPERATURE DETECTOR

This circuit is calculated to operate over the output relay opening it if any of both modules' temperature excedes 90°C, approximately. It is made with a comparator per channel (L-R), resident in the same IC306. Both share a reference voltage provided by D306 (TL431A), which gives excellent stability at that voltage ±1%. These comparators reveive, like the DC amplifiers, the signal from their probes, comparing them with the Vref.Once this voltage is surpassed by any of both probes, the output of the corresponding comparator is balanced to the power supply (+10V), acting through D307, R318, D308 and R319 over the respective bases of transistors Q301 y Q307, which makes the corresponding relay open. This output is also connected to the THERMAL LEDs, which light up as the relays are open.

Note that each time the relay is open through any of the variables which act upon it the PROTECT LED must light up. The circuit acting over this LED is made of R327, R328, R329, R4, R5 and Q303. When Q302 stops conducting (open relay), Q303 receives its base current through R327, R326, R6 and the relay's coil, putting this transistor into saturation. This way the LED is linked to the power supply (+V) by means of the group of resistances R328, R329, R4 and R5.

TEMPERATURE DETECTOR CIRCUIT

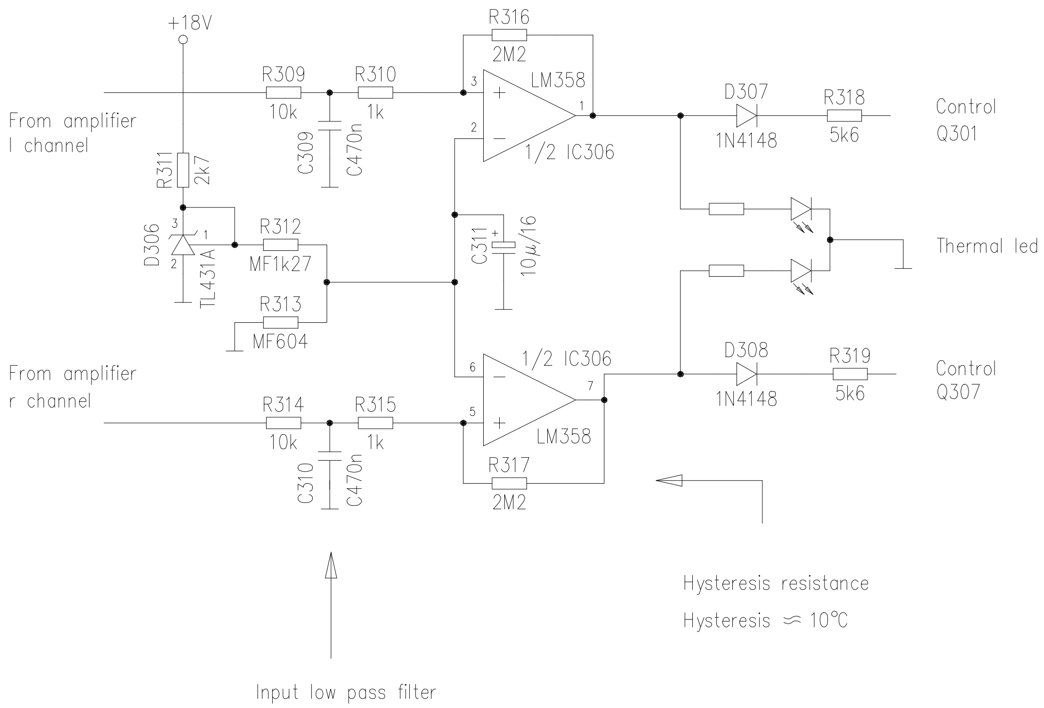


fig. 2

RELE CIRCUIT AND PROTECT LED

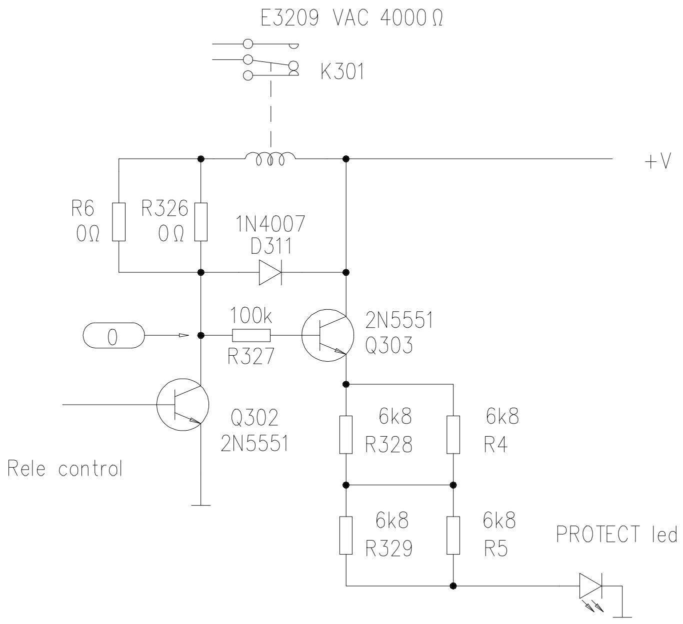


fig. 3

DC OUT CIRCUIT

The circuit shown in the figure corresponds to the DC OUT of channel L. The goal of this circuit is protecting the loudspeakers when, because of a module fail, there is some DC appearing at the output. The voltages indicated in the figure correspond to rest state and they are given by the dividers made of R320-R322 and R332-R323.

The resistances R323-R322 are linked by their extreme to the leg 7(Q) of the monostable IC310 (4538), which has +10V at rest state. On the other hand R320-R321 are linked by their extreme to the L output, which, in these conditions, has 0V respect to ground. If we apply Ohm's Law to these dividers we will obtain the above mentioned voltages.

Let's remember briefly the function of a NOR gate like the HEF4001B.

A	B	C
0	0	1
0	1	0
1	0	0
1	1	0

Let's suppose there is a continuous voltage appearing at the module output, because of any malfunction.

This makes the voltage dividers lose balance, no matter if the above mentioned voltage is positive or negative, the gate goes to 0V, the base Q302 loses the current stream and, as a consequence, the relay K301 opens. The aim of the zeners D309 and D310 is protecting the gates, avoiding the voltage in them to be higher than 8.2V when the voltage is positive and lower than -0.6V when it is negative; as you can see, the zener plays the role of a diode.

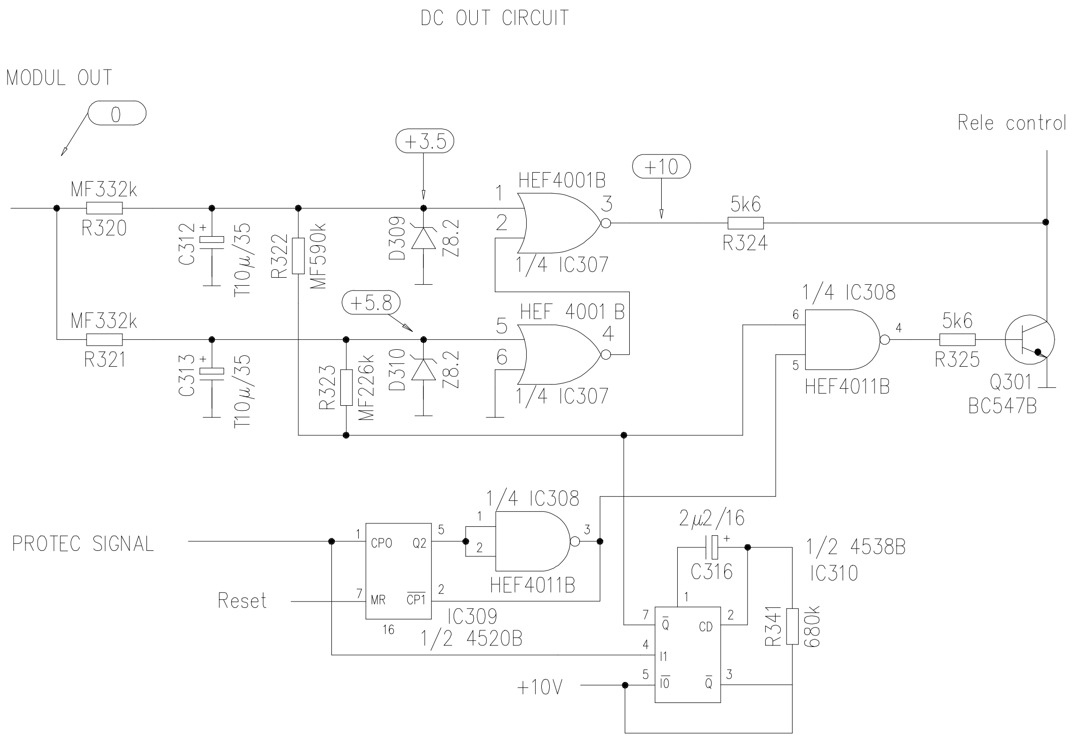


fig. 4

CLIP CIRCUIT

The other half of IC307(4001) is used in the clip circuit. Given that we have two gates more and we just need one for our purposes we will connect them in parallel for a higher output current and a more effective LED lighting up.

The clip threshold or point where we want the LED to light up is determined by the zener D313. In our case it is between 0.5 and 1dB or, what is the same, when the output signal level over the load reaches a value close to that of the power supply (+V), exactly Vout = V - 5.6, moment in which Q304 loses the base-emitter voltage stopping conduction; this makes the zener D312 voltage disappear (0V) and the output from IC307 go to "1" logic (+10V), making the LED light up.

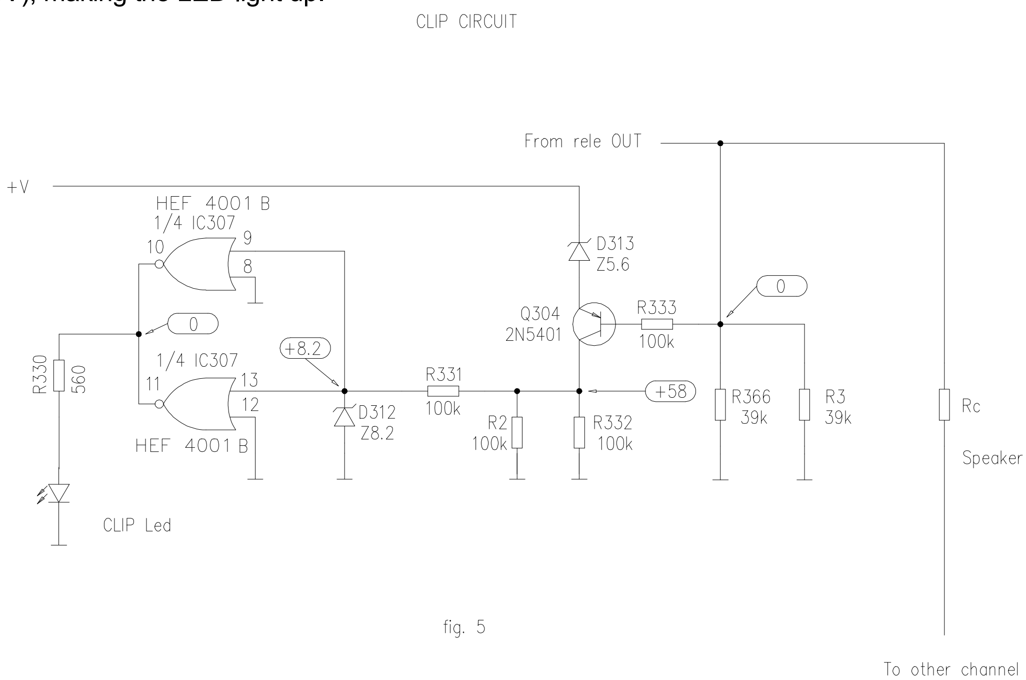


fig. 5

GENERAL RESET CIRCUIT (TURN OFF/TURN ON)

TURN OFF RESET. This circuit starts working when the AC current from the transformer secondary disappears or, what is the same, when we turn the power amplifier off by pushing the power off switch, actually disconnecting it from mains.

Circuit operation: The AC signal present at the anode D321 is rectified by this, attenuated and filtered by R13, R348, R347 and C322, apllying it to the base of Q306, which is conducting into saturation and, as a consequence, Q305 is cut. When this signal disappears Q306 is cut and then Q305 has its base feeded through R345, R346 and R14 from the +V power supply, which has begun to lose voltage -because we have just cut the mains- but, because of the high capacity value of the filter condensers, there is enough time to saturate Q305, which puts the resistances R15 and R344 (50Ω) in parallel with the power supply (+10V) of the logic circuitry, completely discharging the capacities of the circuit, leaving it ready for a new reset pulse -the connection one-, what warranties the new turn-on, even with very short time intervals (.1s) between turn-off and connection pulses.

10V FAST DESCHARGE CIRCUIT

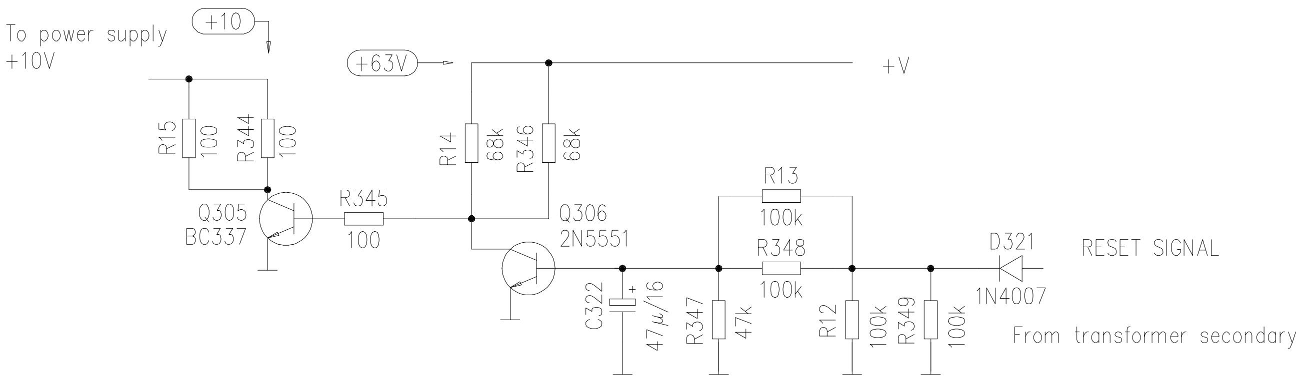


fig. 6

CONNECTION RESET

This is made of C315, R336 and D314. It is the classical reset circuit, used in lots of applications.

In the exact connection moment the condenser C315 is not charged, with a high amount of current circulating through it, or a high voltage in R336. This current decreases as the condenser is charging until it disappears. At the same time, the voltage -in the extremes- of the resistance goes from maximal, in the beginning, to 0V. This way we get a pulse whose duration depends on the time constant RC. The aim of the diode D314 is a fast discharging of C315 during disconnection.

BINARY COUNTER HEF4520

This is a 4-bit double binary counter. Configured in a way in which when there is the binary code equivalent to decimal number 5 at its output -so this is 1 0 0- it is blocked in this position, until it receives a new MR reset pulse. The blocking action is performed by the NAND gate between legs Q2 and CP1. At this state Q2 becomes "H" one logical, the NAND changes its state putting the leg CP1 to "L" zero logical and -as you can see in the table of functions- the mode can not change in this conditions.

CPO	CP1	MR	MODE
↑	H	L	counter advance
L	↓	L	counter advance
↓	X	L	no change
X	↑	L	no change
↑	L	L	no change
H	↓	L	no change
X	X	H	Q0 to Q3=low

The general turn-on reset initializes the counter. Every time it receives a pulse from the module opto-couplers because of a protections shot it is counted. If during an interval of approximately 5 minutes it does not receive any other pulse, the counter will go back to the original zero state, because it receives a new MR reset pulse from the monostable IC311, whose time constant is approximately 5 minutes (R342,C319). This monostable begins counting from the very first pulse received by the counter, because both are linked to the PROTECT SIGNAL from the module and, consequently, activated at the same time.

If during this time interval (about 5 minutes) a minimum of 5 successive pulses are received, these will make the counter block at that position. This translates into a logical "1" at the Q2 leg of the counter, a "0" at the NAND (IC308) output; this zero makes a "1" at the output of the next NAND, giving a result of "0" at the collector of Q301, so Q302 is not conducting and the relay K301 remains open. It will stay this way until the reset from the monostable happens or there is a manual mains disconnection by pushing the power off button.

The reset circuit associated with the monostable is made of C320, D320, R339 and D318 (above we have always been refering to channel L). By means of diodes D317 and D318 we build an "O" gate, with which we apply any of the above mentioned reset pulses to the counter.

BINARY COUNTER CIRCUIT AND
RESET MONOSTABLE CIRCUIT

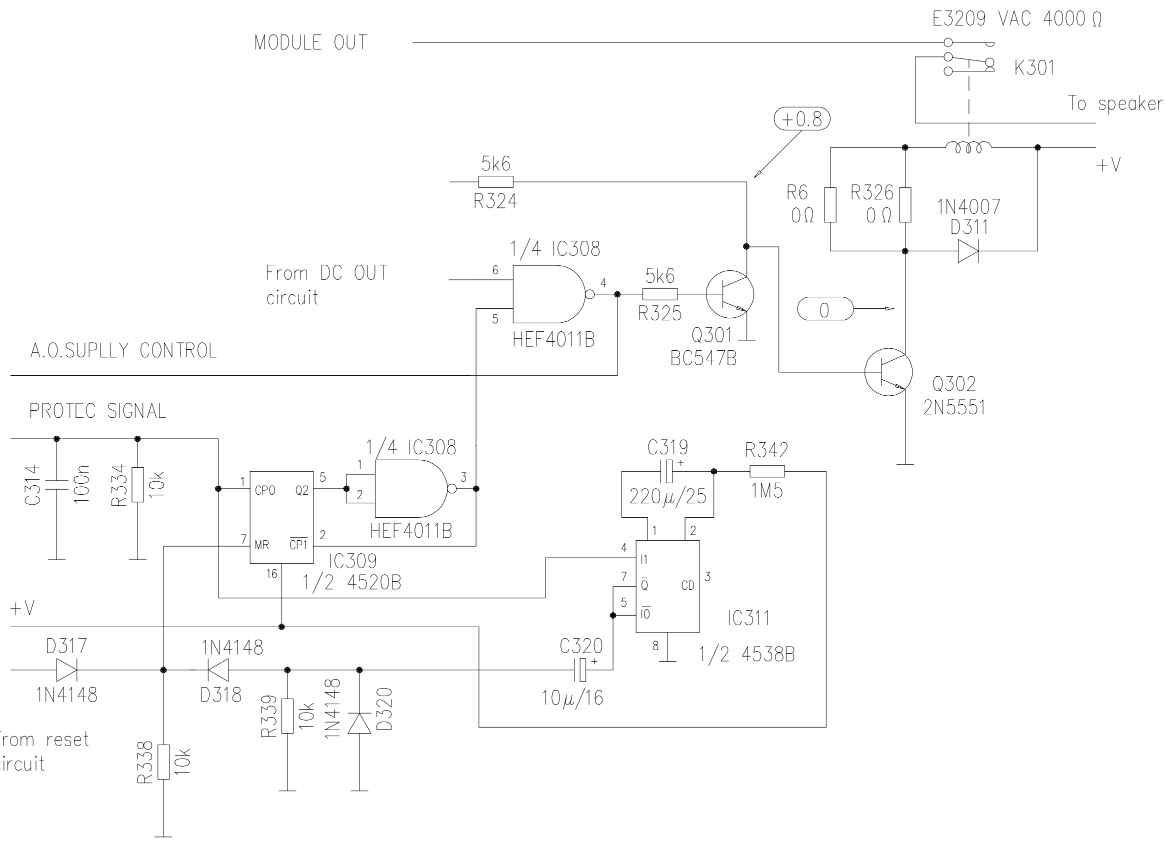


fig. 7

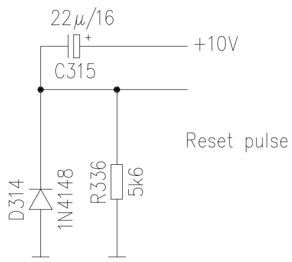


fig. 8

STANDBY MONOSTABLE

The only thing left is the function of the monostable made of IC310 (4538).

Like the counter and the monostable IC311 (4538), this circuit is connected to the PROTECT SIGNAL, too. Its output is "1" in rest state and becomes "0" during an approximate time of 1.3 seconds, which is given by the constant RC of the circuit R341 C316.

This leads to two situations: First, putting a "0" in one of the legs of the NAND (IC308) generates the immediate opening the relay, as we have seen before. On the other hand the voltage divider of the DC OUT circuit is put off balance. The monostable time is calculated to be long enough to unload the capacities of C312 and C313. This way we get a DC OUT circuit initialization as we had done a manual reset (disconnection from mains), causing the tipical turn-on STANDBY time for each of the disconnections of the relays because of the protections shooting. Let's take into account that the system is locked after the fifth disconnection.

STANDBY MONOSTABLE

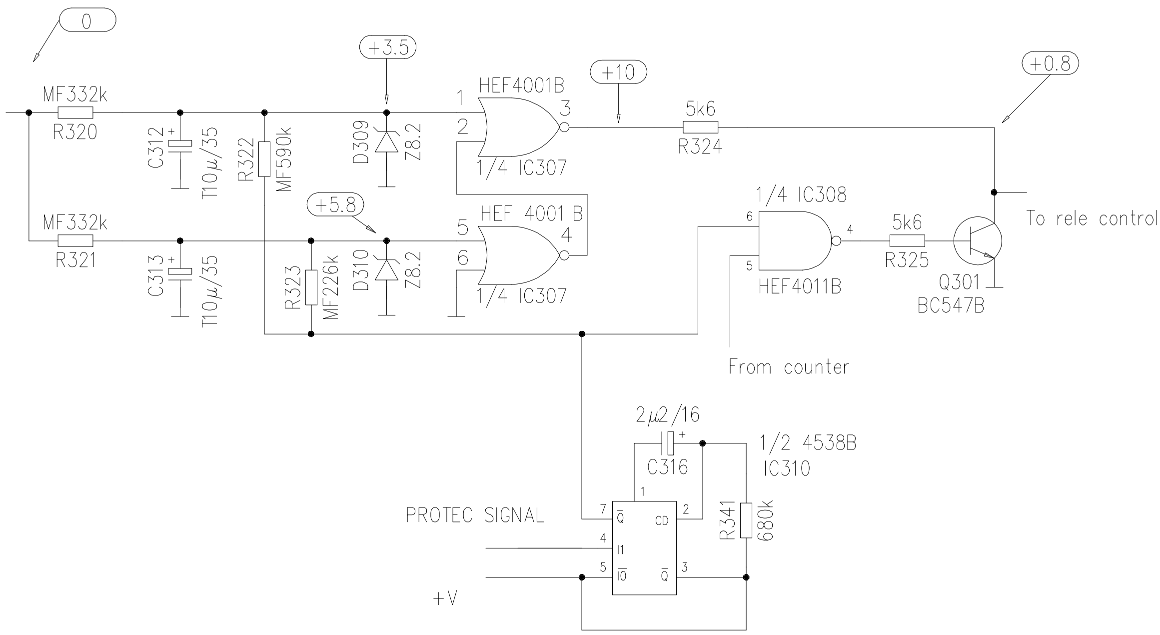
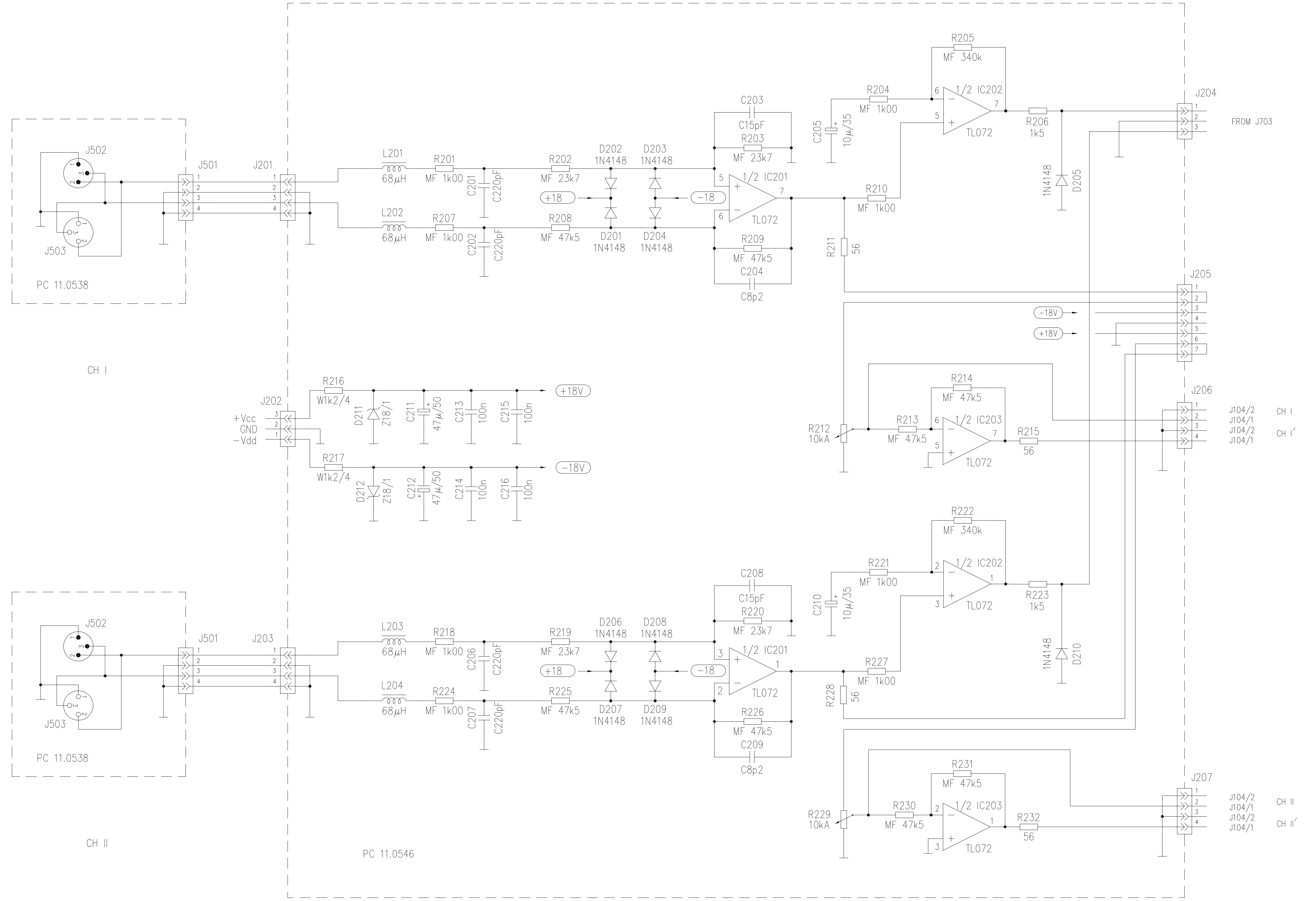
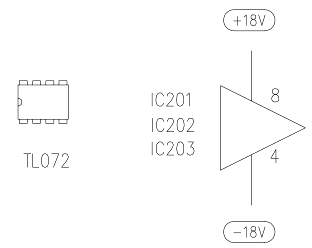


fig. 9

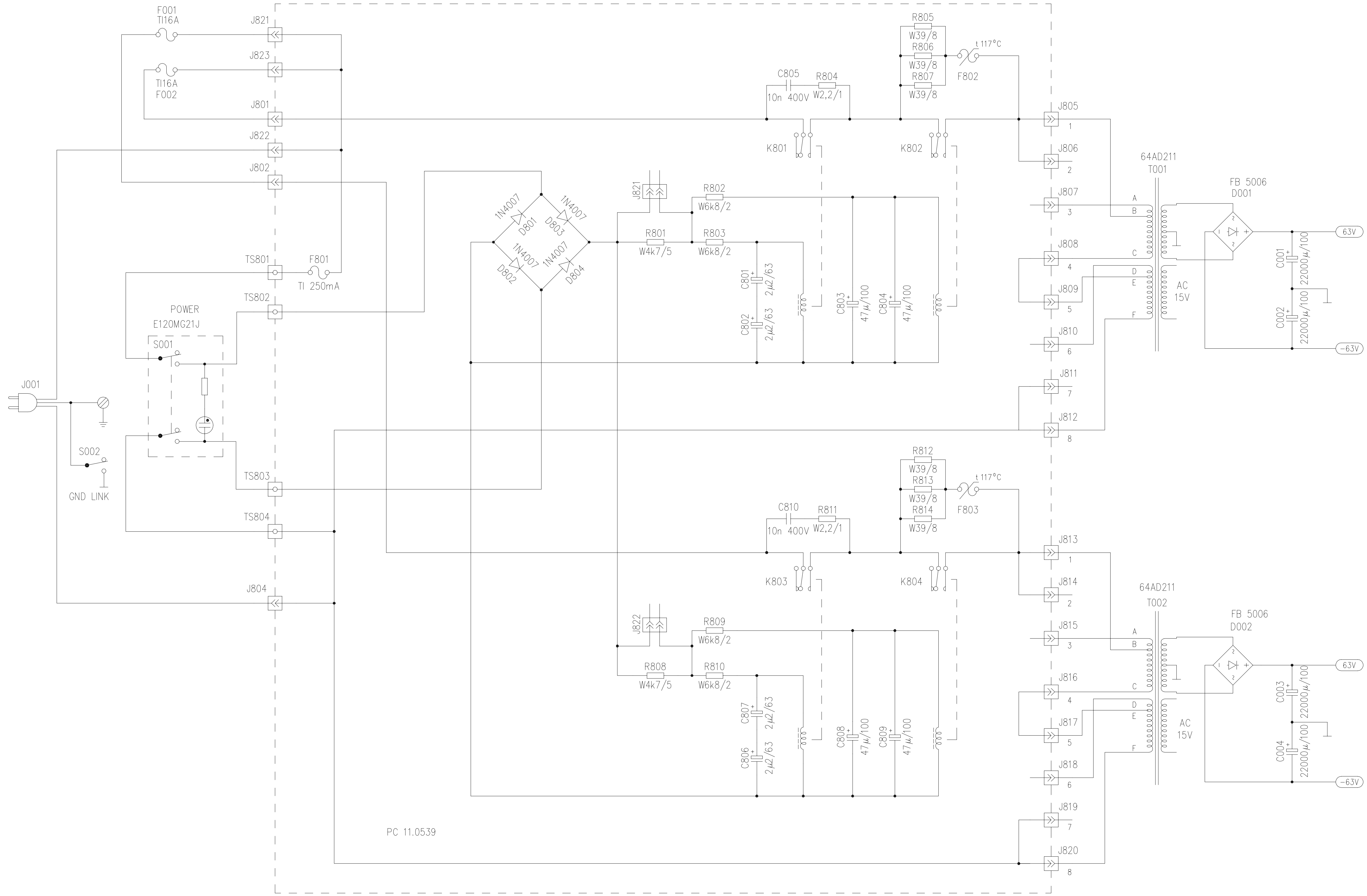


All capacitors 63 V. unless otherwise noted.
Resistors in Ohms. Capacitors in Farads. Inductors in Henries.
All resistors 1/4 W. unless otherwise noted.
See parts list for more information about components.
Part list especifies tolerance and power of the components.

Special schematic abbreviations:
- MF metal film resistor
- W wounded wire resistor
- C ceramic capacitor
- Z zenner diode



TITLE: INPUT CIRCUIT		MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 2 OF 5	
DRAWN: J.QUERALT	DATE: 04.04.95	REPLACES:	DRW. NO. 10.0278 / REV.
CHECKED:	DATE:	REPLACED BY:	

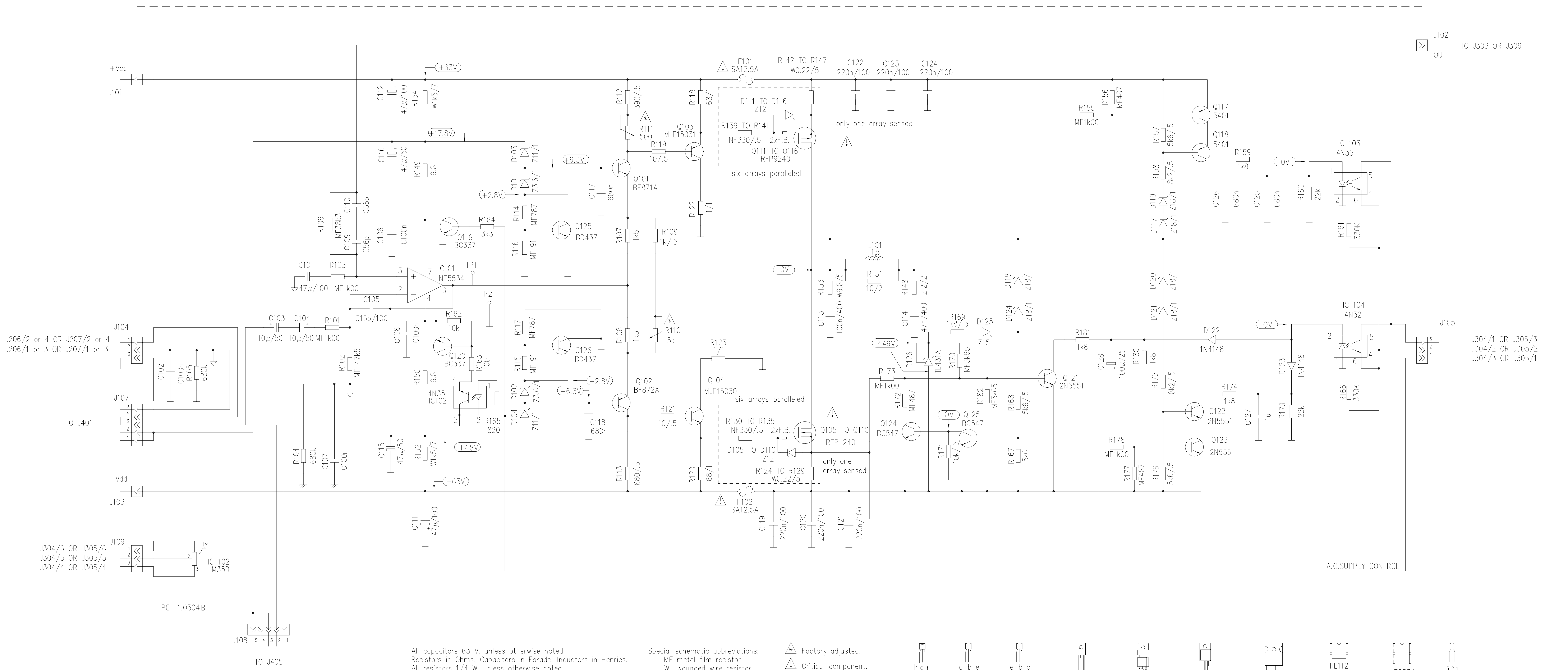


All capacitors 63 V. unless otherwise noted.
Resistors in Ohms. Capacitors in Farads. Inductors in Henries.
All resistors 1/4 W. unless otherwise noted.
See parts list for more information about components.

Special schematic abbreviations:
W wounded wire resistor
C ceramic capacitor

110 V	120 V	220 V	230 V	240 V
1 – B	1 – A	1 – B	1 – A	1 – A
2 – E	2 – D	2 –	2 –	2 –
3 – A	3 – B	3 – A	3 – B	3 – B
4 –	4 –	4 – C	4 – C	4 – C
5 –	5 –	5 – E	5 – E	5 – D
6 – D	6 – E	6 – D	6 – D	6 – E
7 – C	7 – C	7 –	7 –	7 –
8 – F	8 – F	8 – F	8 – F	8 – F
MINI-JUMPER J803 ON		MINI-JUMPER J803 OFF		

TITLE: SOFT START AND POWER CIRCUIT		MODEL: PAM2600	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 1 OF 5	
DRAWN: J.QUERALT	DATE: 05.04.95	REPLACES:	DRW. NO. 10.0280 / REV.
CHECKED:	DATE:	REPLACED BY:	



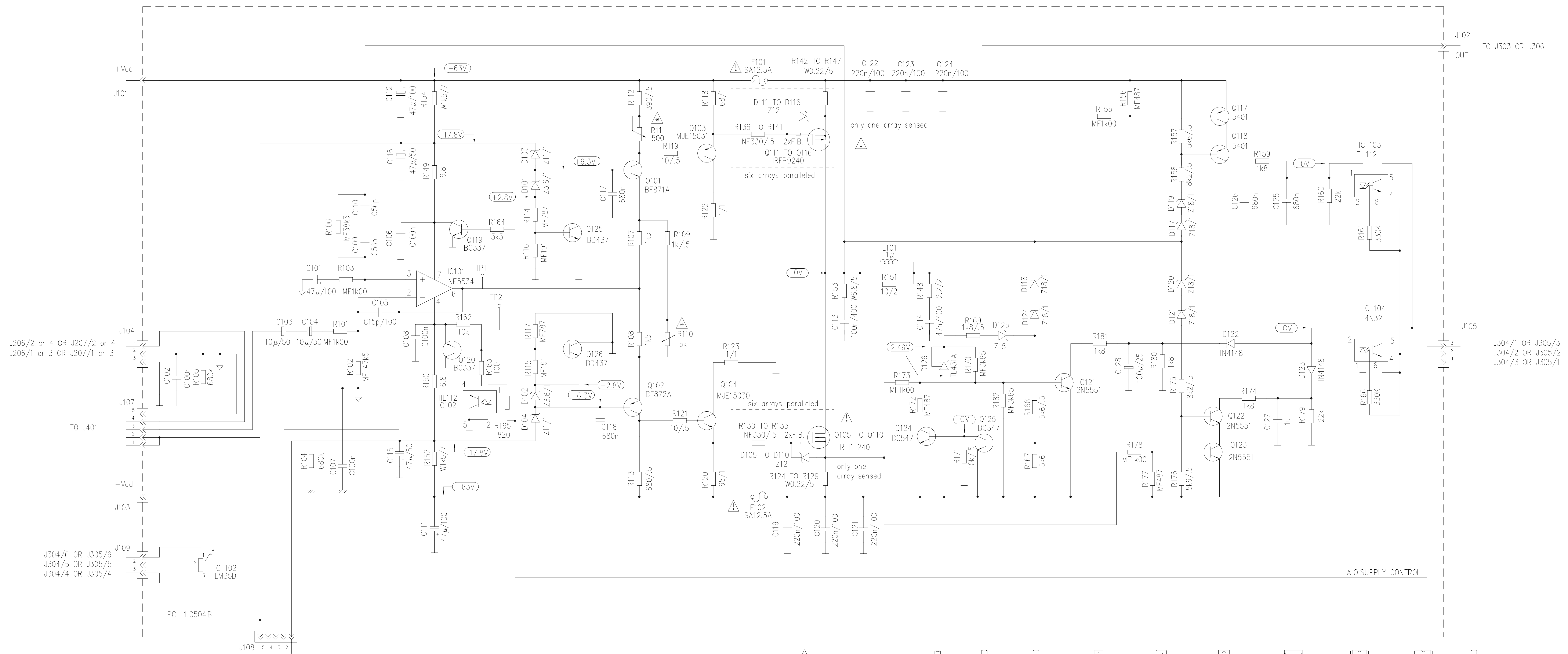
All capacitors 63 V. unless otherwise noted.
Resistors in Ohms. Capacitors in Farads. Inductors in Henries.
All resistors 1/4 W. unless otherwise noted.
See parts list for more information about components.
Part list especifies tolerance and power of the components.

Special schematic abbreviations:
MF metal film resistor
W wounded wire resistor
NF non inflammable resistor
T tantal capacitor
C ceramic capacitor
Z zenner diode

⚠ Factory adjusted.
⚠ Critical component.

k a r TL 431A — c b e 2N5551 2N5401 — e b c BC337 BC547B — e c b BD437 — e c b BF871A BF872A — b c e MJE15031 MJE15030 — G D S IRFP 9240 IRFP 240 — TIL112 4N32 — NE5534 — 3 2 1 LM35D

TITLE: POWER CIRCUIT AND SHORT CIRCUIT PROTECTION SCHEMATIC DIAGRAM	MODEL: PAM2600	ECLER — LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
	SHEET 3 OF 5	
DRAWN: J.QUERALT · DATE: 05.04.95	REPLACES:	DRW. NO. 10.0281 · REV. A
CHECKED: · DATE:	REPLACED BY:	



All capacitors 63 V. unless otherwise noted.
Resistors in Ohms. Capacitors in Farads. Inductors in Henries.
All resistors 1/4 W. unless otherwise noted.
See parts list for more information about components.
Part list especifies tolerance and power of the components.

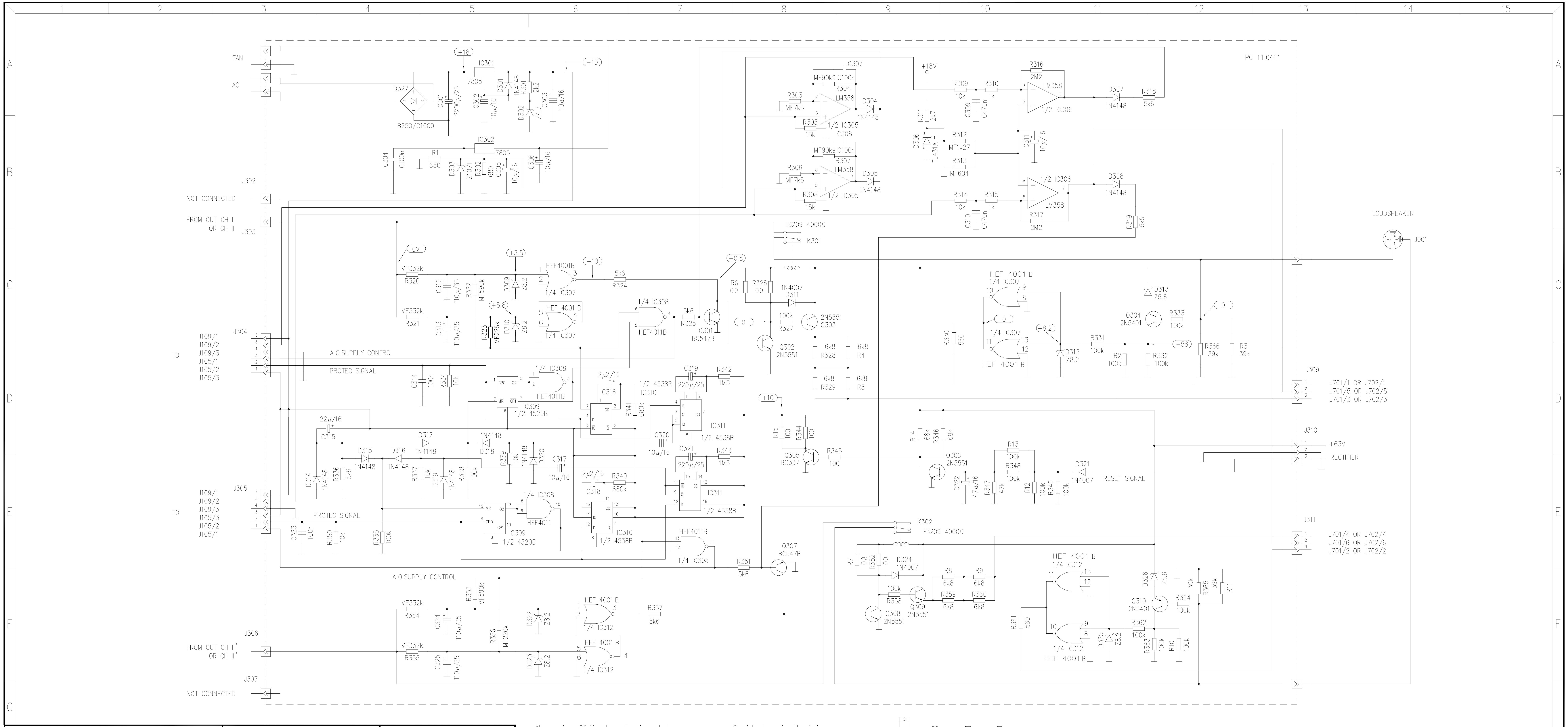
Special schematic abbreviations:
MF metal film resistor
W wounded wire resistor
NF non inflammable resistor
T tantal capacitor
C ceramic capacitor
Z zenner diode

⚠ Factory adjusted.
⚠ Critical component.

k a r TL 431A
c b e 2N5551 2N5401
e b c BC337 BC547B
e c b BD437
e c b BF871A BF872A
b c e MJE15031 MJE15030
G D S IRFP 9240 IRFP 240
TIL112 4N32
NE5534
3 2 1 LM35D

OLD VERSION

TITLE: POWER CIRCUIT AND SHORT CIRCUIT PROTECTION SCHEMATIC DIAGRAM		MODEL: PAM2600 SHEET 3 OF 5	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA	
DRAWN: J.QUERALT	DATE: 05.04.95	REPLACES:	DRW. NO. 10.0281	REV.
CHECKED:	DATE:	REPLACED BY:		



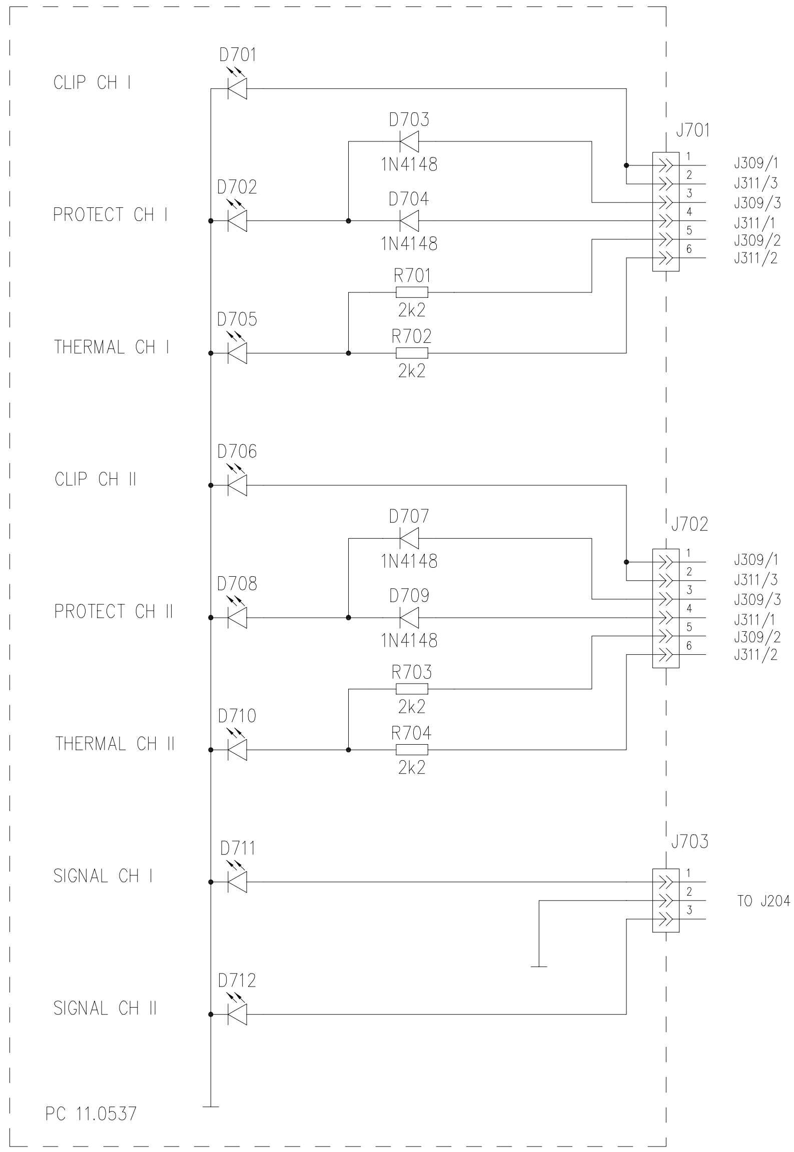
TITLE: PROTECTIONS CIRCUIT	MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA	
	SHEET 4 OF 5		
DRAWN: J.QUERALT	DATE: 05.04.95	REPLACES:	DRW. NO. 10.0282	REV.
CHECKED:	DATE:	REPLACED BY:	

All capacitors 63 V. unless otherwise noted.
Resistors in Ohms. Capacitors in Farads. Inductors in Henries.
All resistors 1/4 W. unless otherwise noted.
See parts list for more information about components.
Part list especifies tolerance and power of the components.

Special schematic abbreviations:
- MF metal film resistor 1%
- W wounded wire resistor
- T tantal capacitor
- C ceramic capacitor
- Z zenner diode

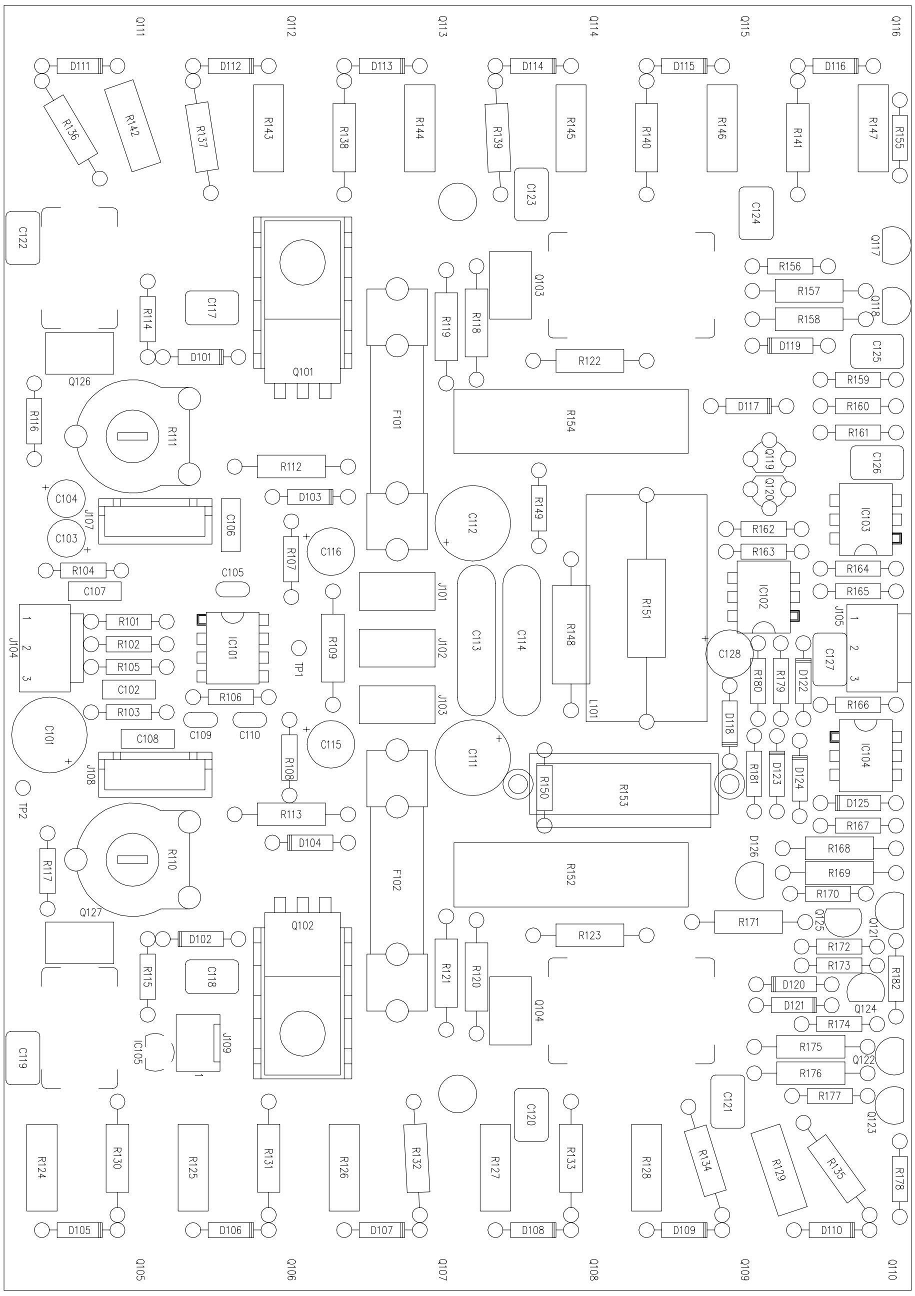
7805 — TL431A — 2N5551 (cbe) — BC 547 / BC 337 (ebc)

C326 C327 C328 C329 C330 C331 — C100n — IC307 IC308 IC309 IC310 IC311 IC312

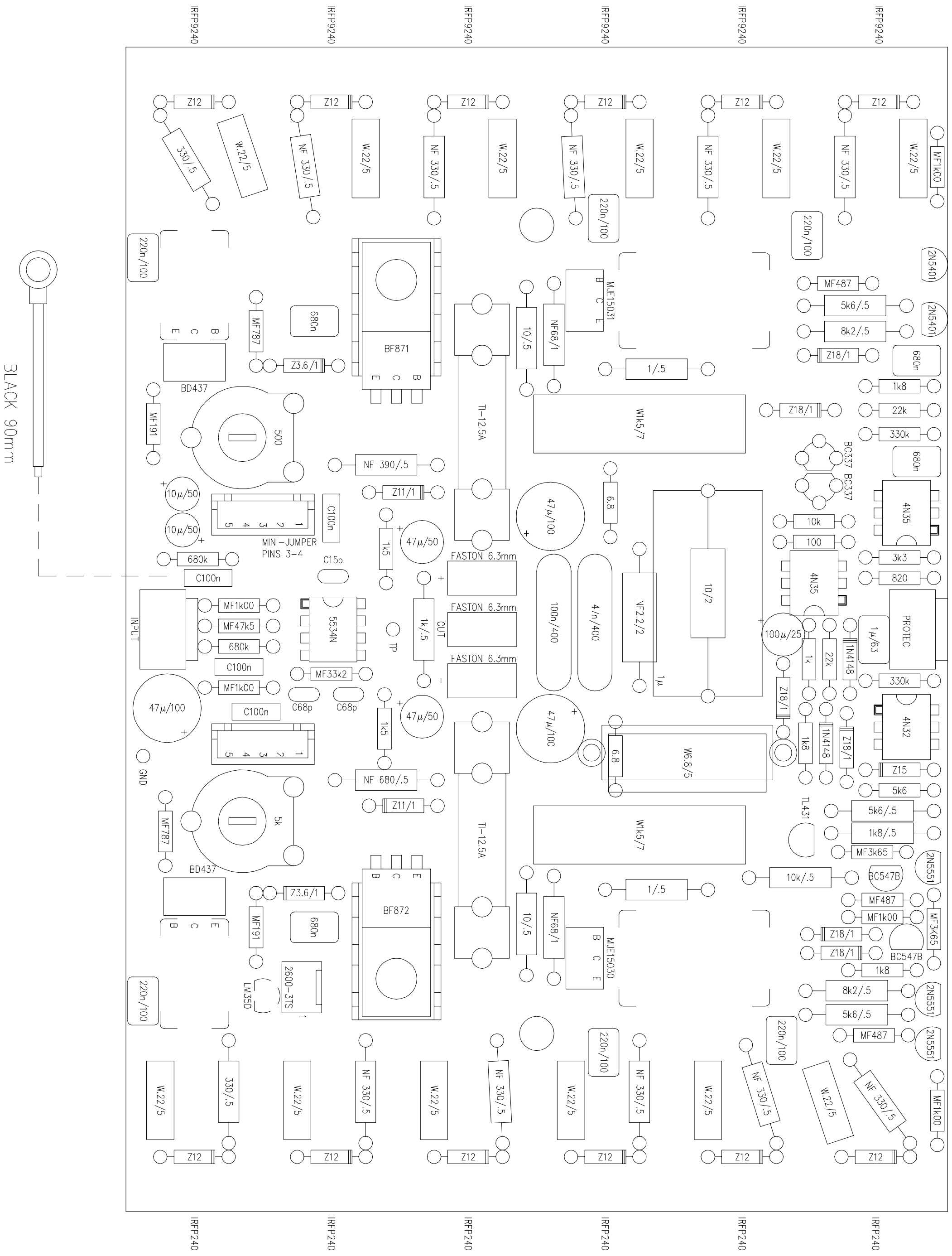


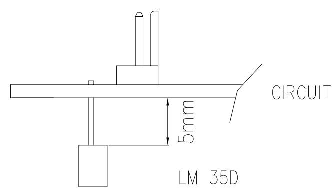
Resistors in Ohms. Capacitors in Farads. Inductors in Henries.
All resistors 1/4 W. unless otherwise noted.
See parts list for more information about components.

TITLE: LED CIRCUIT		MODEL: PAM2600/2000 SHEET 5 OF 5	ECLER LABORATORIO DE ELECTRO–ACUSTICA BARCELONA ESPAÑA
DRAWN: J.QUERALT	DATE: 04.04.95	REPLACES:	DRW. NO. 10.0279
CHECKED:	DATE:	REPLACED BY:	REV.

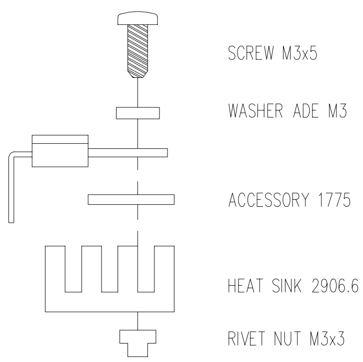


TITLE: POWER CIRCUIT AND SHORT CIRCUIT PROTECTION		MODEL: PAM2600	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 1 OF 6	
DRAWN: J.QUERALT	DATE: 17.10.95	REPLACES:	DRW. NO. 33.0130R/
CHECKED:	DATE:	REPLACED BY:	REV. C

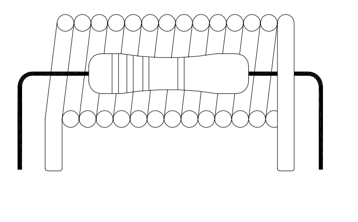




LM 35D ASSEMBLY DETAIL



TRANSISTOR ASSEMBLY DETAIL



RESISTOR AND INDUCTANCE ASSEMBLY DETAIL

TITLE: POWER CIRCUIT AND SHORT CIRCUIT PROTECTION	MODEL: PAM2600 SHEET 1 OF 6	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
DRAWN: J.QUERALT — DATE: 17.10.95	REPLACES:	DRW. NO. 33.0130 V/ — REV. C
CHECKED: — DATE:	REPLACED BY:	

PARTS LIST:	POWER CIRCUIT AND	SHORT CIRCUIT PROTECTION
MODEL:PAM2600	DRW.Nº 33.0130PL	REV : A
DATE: 000621	SHEET 1 OF 4	REPLACED BY:

REFERENCE	VALUE
C101	47μ/100
C102	C100n
C103	10μ/50
C104	10μ/50
C105	C15p
C106	C100n
C107	C100n
C108	C100n
C109	C56p
C110	C56p
C111	47μ/100
C112	47μ/100
C113	100n/400
C114	47n/400
C115	47μ/50
C116	47μ/50
C117	680n
C118	680n
C119	220n/100
C120	220n/100
C121	220n/100
C122	220n/100
C123	220n/100
C124	220n/100
C125	680n
C126	680n
C127	1μ/63
C128	100μ/25
D101	Z3.6/1
D102	Z3.6/1
D103	Z11/1
D104	Z11/1
D105	Z12
D106	Z12
D107	Z12
D108	Z12
D109	Z12
D110	Z12
D111	Z12
D112	Z12
D113	Z12
D114	Z12
D115	Z12
D116	Z12
D117	Z18/1
D118	Z18/1
D119	Z18/1
D120	Z18/1
D121	Z18/1
D122	1N4148
D123	1N4148
D124	Z18/1
D125	Z15
D126	TL431
F101	TI-12.5A
F102	TI-12.5A
IC101	5534N
IC102	4N35

PARTS LIST:	POWER CIRCUIT AND	SHORT CIRCUIT PROTECTION
MODEL:PAM2600	DRW.Nº 33.0130PL	REV : A
DATE: 000621	SHEET 2 OF 4	REPLACED BY:

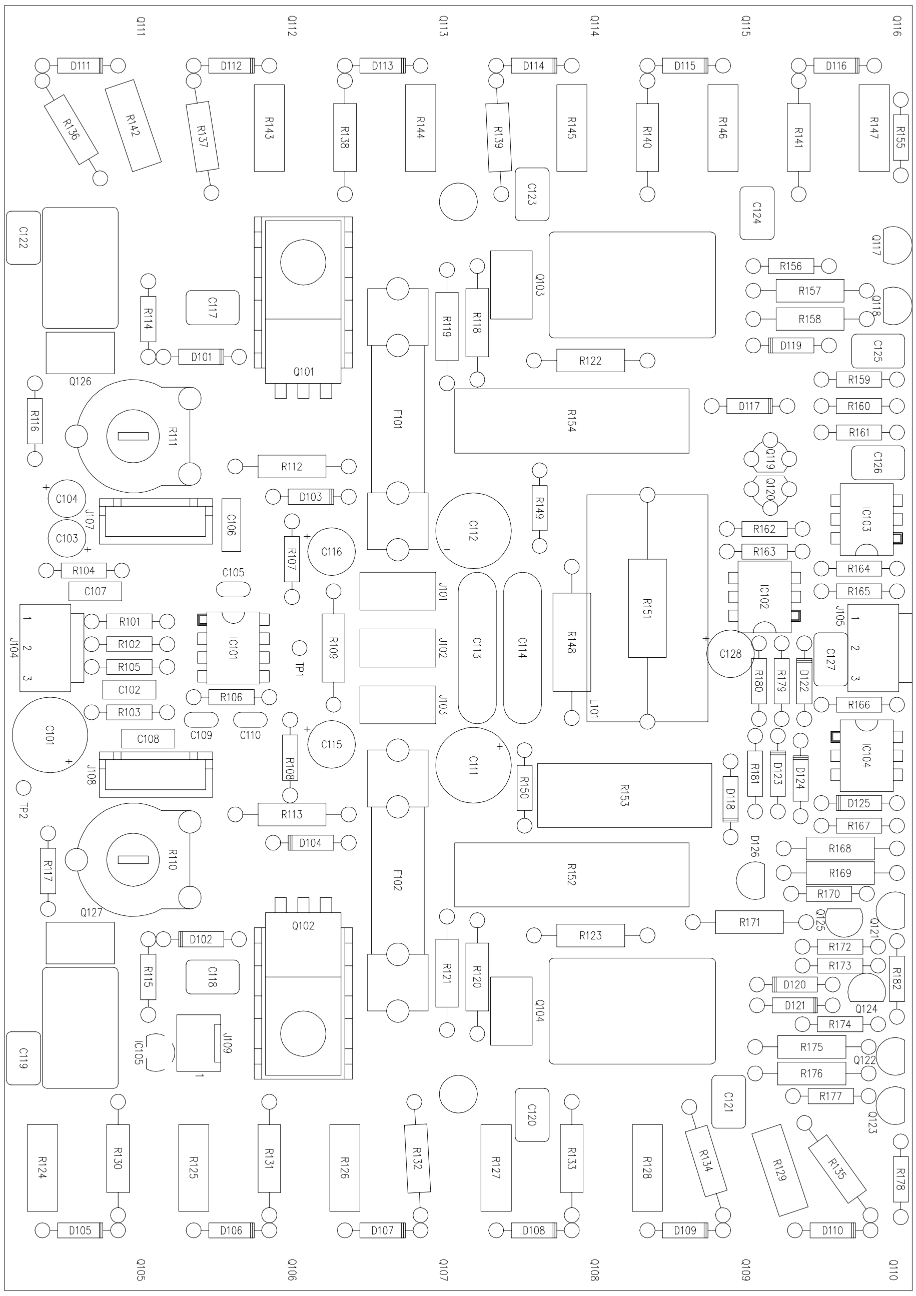
REFERENCE	VALUE
IC103	4N35
IC104	4N32
IC105	LM35D
J101	FASTON 6.3mm
J102	FASTON 6.3mm
J103	FASTON 6.3mm
J104	B3P-VH
J105	B3P-VH
J107	B5B-XH
J108	B5B-XH
J109	2600-3TS
Q101	BF871
Q102	BF872
Q103	MJE15031
Q104	MJE15030
Q105	IRFP240
Q106	IRFP240
Q107	IRFP240
Q108	IRFP240
Q109	IRFP240
Q110	IRFP240
Q111	IRFP9240
Q112	IRFP9240
Q113	IRFP9240
Q114	IRFP9240
Q115	IRFP9240
Q116	IRFP9240
Q117	2N5401
Q118	2N5401
Q119	BC337
Q120	BC337
Q121	2N5551
Q122	2N5551
Q123	2N5551
Q124	BC547B
Q125	BC547B
Q126	BD437
Q127	BD437
R101	MF1k
R102	MF47k5
R103	MF1k00
R104	680k
R105	680k
R106	MF38k3
R107	1k5
R108	1k5
R109	1k/.5
R110	5k
R111	500 Ω
R112	NF390 Ω /.5
R113	NF680 Ω /.5
R114	MF787 Ω
R115	MF191 Ω
R116	MF191 Ω
R117	MF787 Ω
R118	NF68 Ω /1
R119	10 Ω /.5
R120	NF68 Ω /1

PARTS LIST:	POWER CIRCUIT AND	SHORT CIRCUIT PROTECTION
MODEL:PAM2600	DRW.Nº 33.0130PL	REV : A
DATE: 000621	SHEET 3 OF 4	REPLACED BY:

REFERENCE	VALUE
R121	10 Ω /.5
R122	1 Ω /.5
R123	1 Ω /.5
R124	W.22 Ω /5
R125	W.22 Ω /5
R126	W.22 Ω /5
R127	W.22 Ω /5
R128	W.22 Ω /5
R129	W.22 Ω /5
R130	330 Ω /.5
R131	330 Ω /.5
R132	330 Ω /.5
R133	330 Ω /.5
R134	330 Ω /.5
R135	330 Ω /.5
R136	330 Ω /.5
R137	330 Ω /.5
R138	330 Ω /.5
R139	330 Ω /.5
R140	330 Ω /.5
R141	330 Ω /.5
R142	W.22 Ω /5
R143	W.22 Ω /5
R144	W.22 Ω /5
R145	W.22 Ω /5
R146	W.22 Ω /5
R147	W.22 Ω /5
R148	NF2.2 Ω /2
R149	6.8 Ω
R150	6.8 Ω
R151	10 Ω /2
R152	W1k5/7
R153	W6.8 Ω /5
R154	W1k5/7
R155	MF1k00
R156	MF487 Ω
R157	5k6/.5
R158	8k2/.5
R159	1k8
R160	22k
R161	330k
R162	10k
R163	100 Ω
R164	3k3
R165	820 Ω
R166	330k
R167	5k6
R168	5k6/.5
R169	1k8/.5
R170	MF3k65
R171	10k/.5
R172	MF487 Ω
R173	MF1k00
R174	1k8
R175	8k2/.5
R176	5k6/.5
R177	MF487 Ω
R178	MF1k00

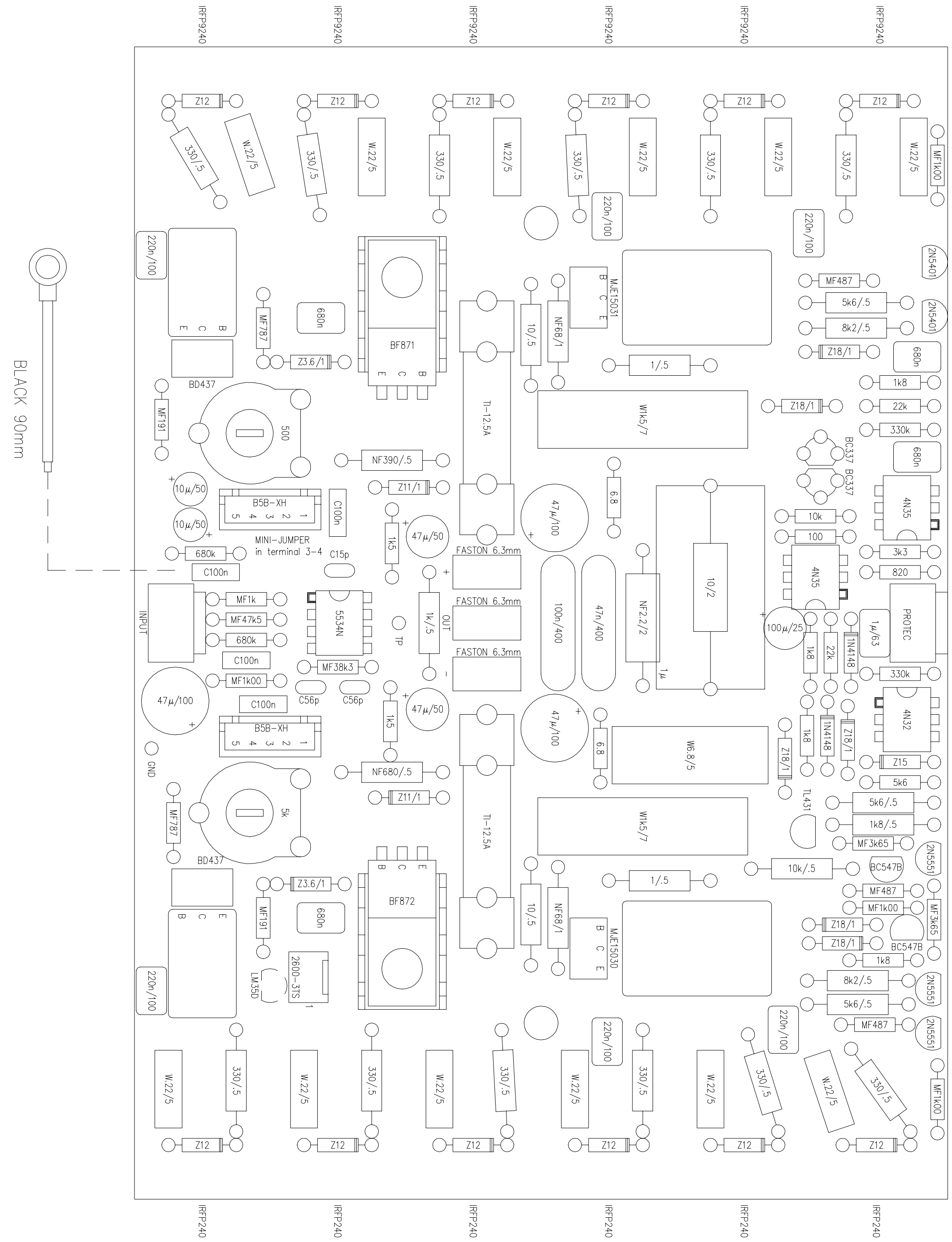
PARTS LIST:	POWER CIRCUIT AND	SHORT CIRCUIT PROTECTION
MODEL:PAM2600	DRW.Nº 33.0130PL	REV : A
DATE: 000621	SHEET 4 OF 4	REPLACED BY:

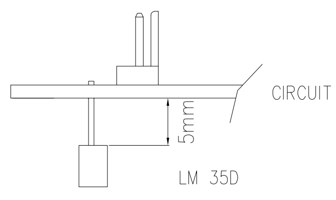
REFERENCE	VALUE
R179	22k
R180	1k8
R181	1k8
R182	MF3k65
PC 11.0504B	PRINTED CIRCUIT
WIRE	BLACK 90mm whit TER.



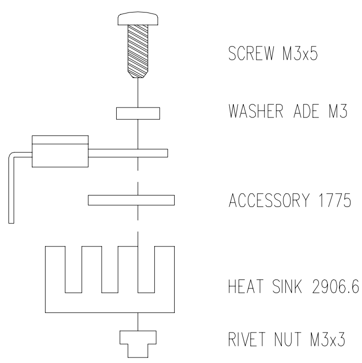
OLD VERSION

TITLE: POWER CIRCUIT AND SHORT CIRCUIT PROTECTION		MODEL: PAM2600	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 1 OF 6	
DRAWN: J.QUERALT	DATE: 17.10.95	REPLACES:	DRW. NO. 33.0130R/ — REV. A
CHECKED:	DATE:	REPLACED BY:	

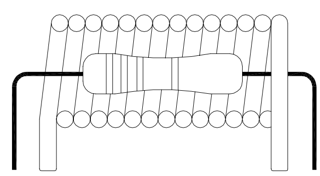




LM 35D ASSEMBLY DETAIL



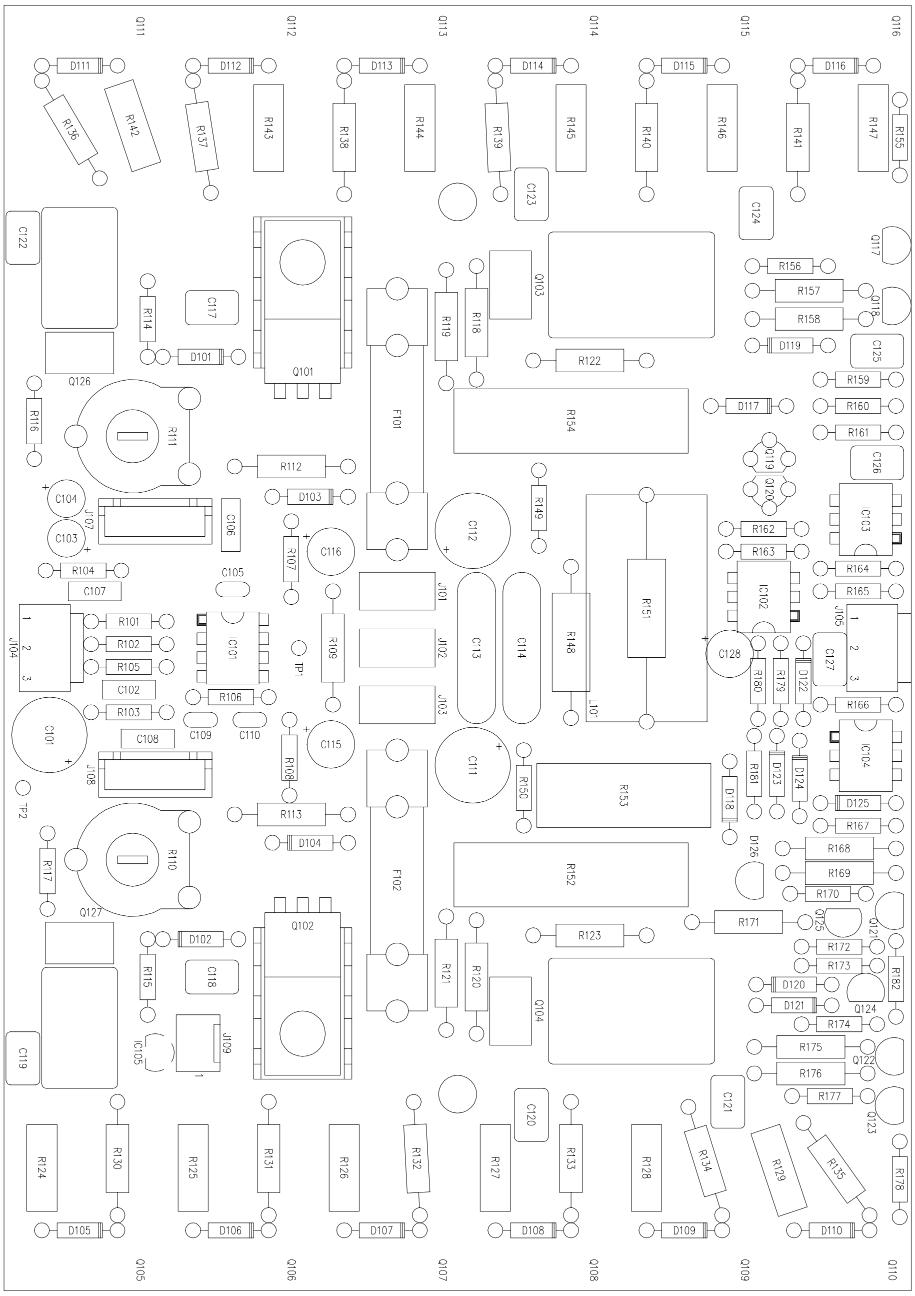
TRANSISTOR ASSEMBLY DETAIL



RESISTOR AND INDUCTANCE ASSEMBLY DETAIL

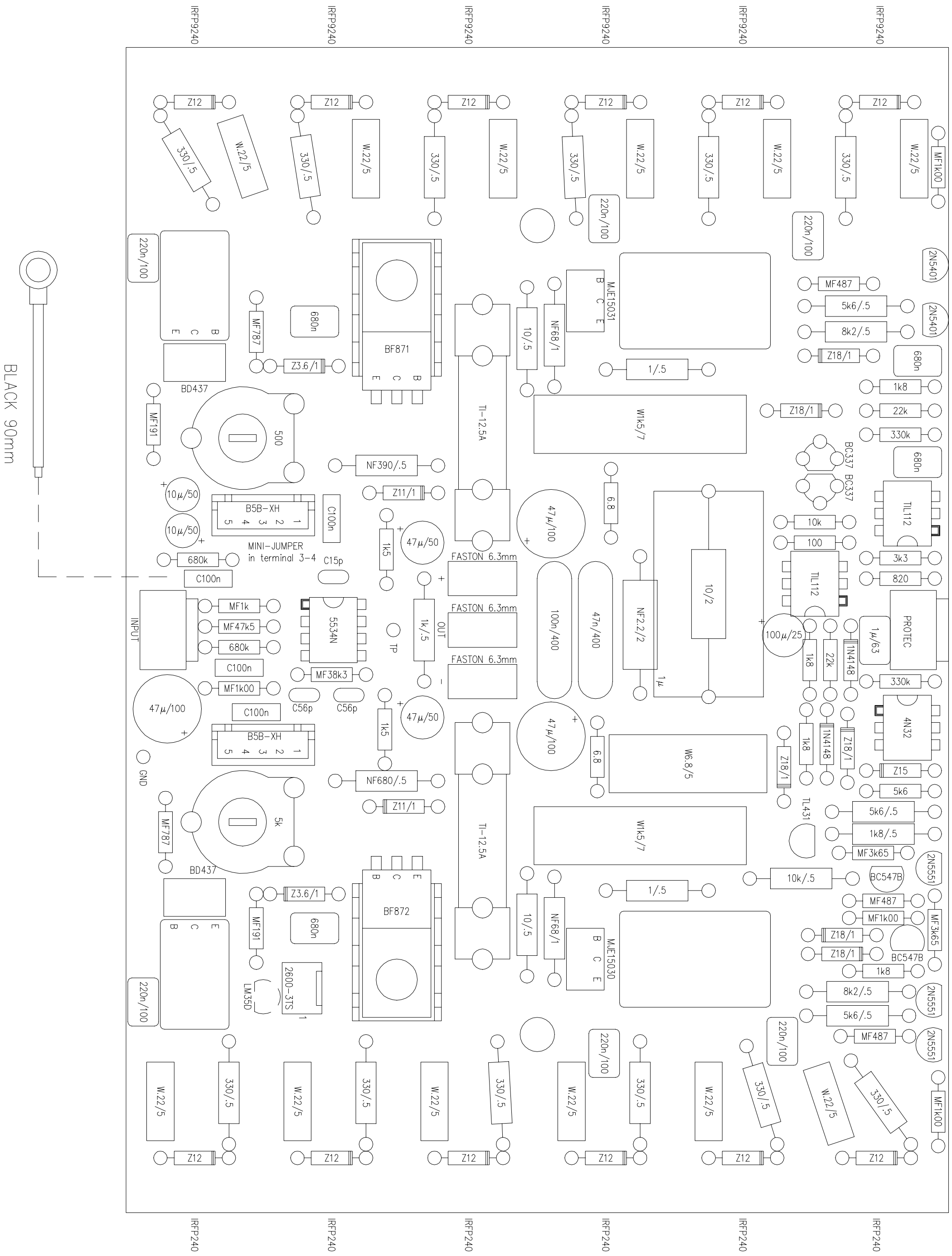
OLD VERSION

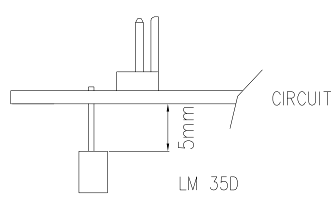
TITLE: POWER CIRCUIT AND SHORT CIRCUIT PROTECTION		MODEL: PAM2600	ECLER — LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 1 OF 6	
DRAWN: J.QUERALT	DATE: 17.10.95	REPLACES:	DRW. NO. 33.0130 V/ — REV. A
CHECKED:	DATE:	REPLACED BY:	



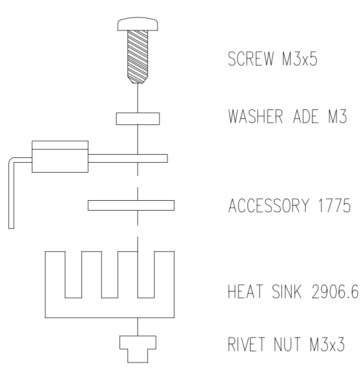
OLD VERSION

TITLE: POWER CIRCUIT AND SHORT CIRCUIT PROTECTION		MODEL: PAM2600	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 1 OF 6	
DRAWN: J.QUERALT	DATE: 17.10.95	REPLACES:	DRW. NO. 33.0130R/
CHECKED:	DATE:	REPLACED BY:	REV.

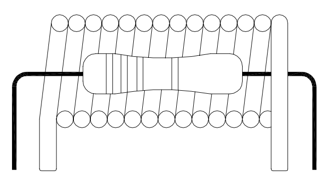




LM 35D ASSEMBLY DETAIL



TRANSISTOR ASSEMBLY DETAIL



RESISTOR AND INDUCTANCE ASSEMBLY DETAIL

OLD VERSION

TITLE: POWER CIRCUIT AND SHORT CIRCUIT PROTECTION		MODEL: PAM2600	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 1 OF 6	
DRAWN: J.QUERALT	DATE: 17.10.95	REPLACES:	DRW. NO. 33.0130 V/ — REV.
CHECKED:	DATE:	REPLACED BY:	

PARTS LIST:	POWER CIRCUIT AND	SHORT CIRCUIT PROTECTION
MODEL:PAM2600	DRW.Nº 33.0130PL	REV :
DATE: 000621	SHEET 1 OF 4	REPLACED BY:

OLD VERSION

REFERENCE	VALUE
C101	47µ/100
C102	C100n
C103	10µ/50
C104	10µ/50
C105	C15p
C106	C100n
C107	C100n
C108	C100n
C109	C56p
C110	C56p
C111	47µ/100
C112	47µ/100
C113	100n/400
C114	47n/400
C115	47µ/50
C116	47µ/50
C117	680n
C118	680n
C119	220n/100
C120	220n/100
C121	220n/100
C122	220n/100
C123	220n/100
C124	220n/100
C125	680n
C126	680n
C127	1µ/63
C128	100µ/25
D101	Z3.6/1
D102	Z3.6/1
D103	Z11/1
D104	Z11/1
D105	Z12
D106	Z12
D107	Z12
D108	Z12
D109	Z12
D110	Z12
D111	Z12
D112	Z12
D113	Z12
D114	Z12
D115	Z12
D116	Z12
D117	Z18/1
D118	Z18/1
D119	Z18/1
D120	Z18/1
D121	Z18/1
D122	1N4148
D123	1N4148
D124	Z18/1
D125	Z15
D126	TL431
F101	TI-12.5A
F102	TI-12.5A
IC101	5534N
IC102	TIL112

PARTS LIST: POWER CIRCUIT AND SHORT CIRCUIT PROTECTION
MODEL:PAM2600 DRW.Nº 33.0130PL REV :
DATE: 000621 SHEET 2 OF 4 REPLACED BY:

OLD VERSION

REFERENCE	VALUE
IC103	TIL112
IC104	4N32
IC105	LM35D
J101	FASTON 6.3mm
J102	FASTON 6.3mm
J103	FASTON 6.3mm
J104	B3P-VH
J105	B3P-VH
J107	B5B-XH
J108	B5B-XH
J109	2600-3TS
Q101	BF871
Q102	BF872
Q103	MJE15031
Q104	MJE15030
Q105	IRFP240
Q106	IRFP240
Q107	IRFP240
Q108	IRFP240
Q109	IRFP240
Q110	IRFP240
Q111	IRFP9240
Q112	IRFP9240
Q113	IRFP9240
Q114	IRFP9240
Q115	IRFP9240
Q116	IRFP9240
Q117	2N5401
Q118	2N5401
Q119	BC337
Q120	BC337
Q121	2N5551
Q122	2N5551
Q123	2N5551
Q124	BC547B
Q125	BC547B
Q126	BD437
Q127	BD437
R101	MF1k
R102	MF47k5
R103	MF1k00
R104	680k
R105	680k
R106	MF38k3
R107	1k5
R108	1k5
R109	1k/.5
R110	5k
R111	500 Ω
R112	NF390 Ω /.5
R113	NF680 Ω /.5
R114	MF787 Ω
R115	MF191 Ω
R116	MF191 Ω
R117	MF787 Ω
R118	NF68 Ω /1
R119	10 Ω /.5
R120	NF68 Ω /1

PARTS LIST:	POWER CIRCUIT AND	SHORT CIRCUIT PROTECTION
MODEL:PAM2600	DRW.Nº 33.0130PL	REV :
DATE: 000621	SHEET 3 OF 4	REPLACED BY:

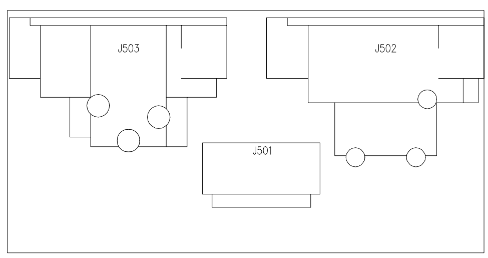
OLD VERSION

REFERENCE	VALUE
R121	10 Ω /.5
R122	1 Ω /.5
R123	1 Ω /.5
R124	W.22 Ω /5
R125	W.22 Ω /5
R126	W.22 Ω /5
R127	W.22 Ω /5
R128	W.22 Ω /5
R129	W.22 Ω /5
R130	330 Ω /.5
R131	330 Ω /.5
R132	330 Ω /.5
R133	330 Ω /.5
R134	330 Ω /.5
R135	330 Ω /.5
R136	330 Ω /.5
R137	330 Ω /.5
R138	330 Ω /.5
R139	330 Ω /.5
R140	330 Ω /.5
R141	330 Ω /.5
R142	W.22 Ω /5
R143	W.22 Ω /5
R144	W.22 Ω /5
R145	W.22 Ω /5
R146	W.22 Ω /5
R147	W.22 Ω /5
R148	NF2.2 Ω /2
R149	6.8 Ω
R150	6.8 Ω
R151	10 Ω /2
R152	W1k5/7
R153	W6.8 Ω /5
R154	W1k5/7
R155	MF1k00
R156	MF487 Ω
R157	5k6/.5
R158	8k2/.5
R159	1k8
R160	22k
R161	330k
R162	10k
R163	100 Ω
R164	3k3
R165	820 Ω
R166	330k
R167	5k6
R168	5k6/.5
R169	1k8/.5
R170	MF3k65
R171	10k/.5
R172	MF487 Ω
R173	MF1k00
R174	1k8
R175	8k2/.5
R176	5k6/.5
R177	MF487 Ω
R178	MF1k00

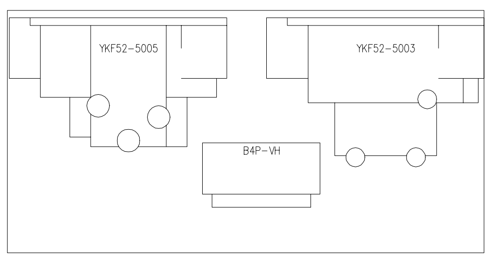
PARTS LIST:	POWER CIRCUIT AND	SHORT CIRCUIT PROTECTION
MODEL:PAM2600	DRW.Nº 33.0130PL	REV :
DATE: 000621	SHEET 4 OF 4	REPLACED BY:

REFERENCE	VALUE
R179	22k
R180	1k8
R181	1k8
R182	MF3k65
PC 11.0504B	PRINTED CIRCUIT
WIRE	BLACK 90mm whit TER.

OLD VERSION



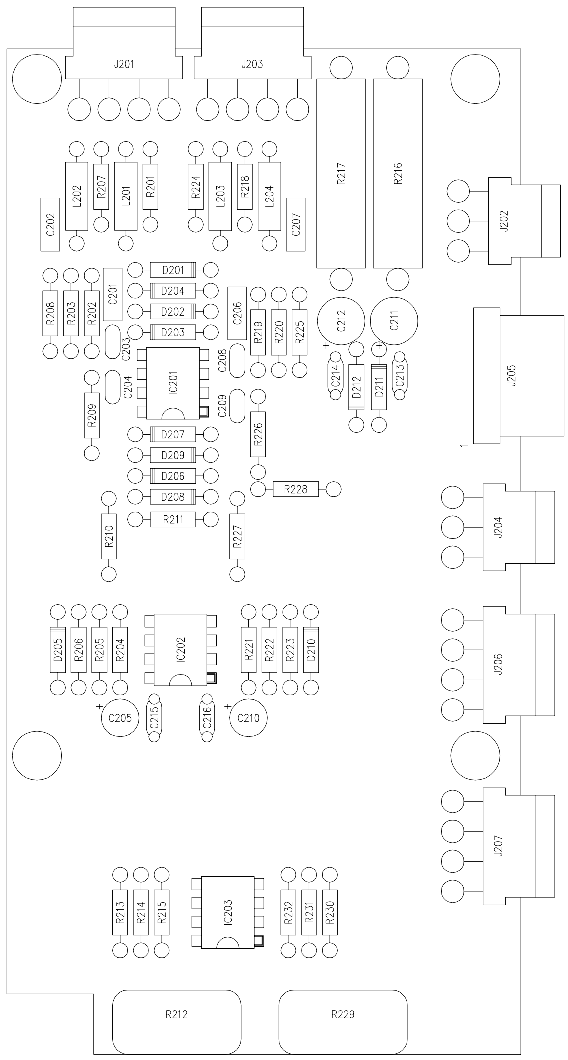
TITLE: INPUT CIRCUIT		MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 2 OF 6	
DRAWN: J.QUERALT	DATE: 05.09.95	REPLACES:	DRW. NO. 33.0127 R/ — REV.
CHECKED:	DATE:	REPLACED BY:	



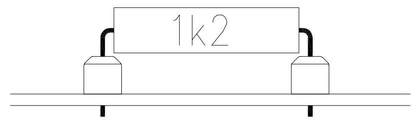
TITLE: INPUT CIRCUIT		MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 2 OF 6	
DRAWN: J.QUERALT	DATE: 05.09.95	REPLACES:	DRW. NO. 33.0127 V/
CHECKED:	DATE:	REPLACED BY:	REV.

PARTS LIST:	INPUT CIRCUIT		
MODEL : PAM2600/2000	DRW. No 33.0127PL		REV:
DATE: 050995	SHEET 1 OF 1	REPLACES:	REPLACED BY:

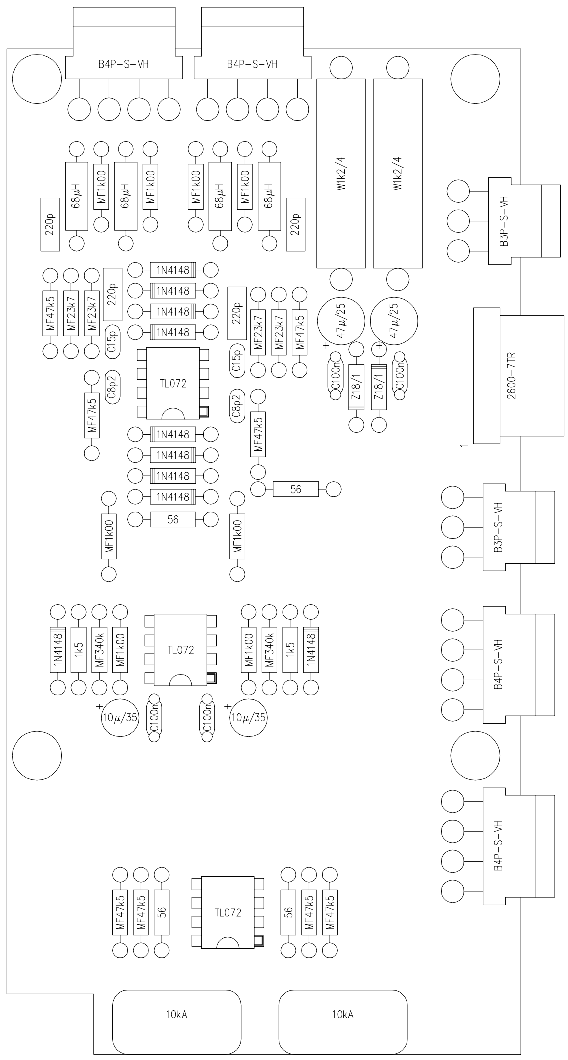
REFERENCE	VALUE
J501	B4P-VH
J502	YKF52-5003
J503	YKF52-5005
PC 11.0538	PRINTED CIRCUIT

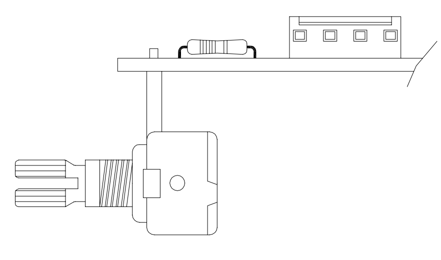


TITLE: POTENCIOMETERS CIRCUIT		MODEL: PAM2600/2000	ECLER
		SHEET 3 OF 6	LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
DRAWN: J.QUERALT	DATE: 150295	REPLACES:	DRW. NO. 33.0128 R/	REV.
CHECKED:	DATE:	REPLACED BY:	



RESISTOR ASSEMBLY DETAIL





POTENTIOMETRO ASSEMBLY DETAIL

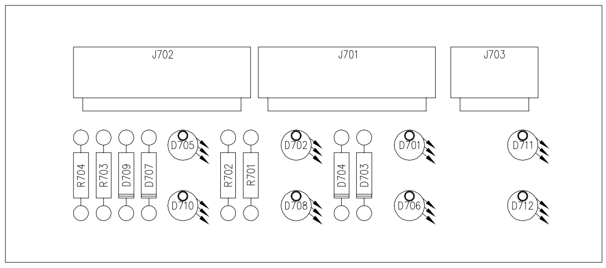
TITLE: POTENCIOMETERS CIRCUIT	MODEL: PAM2600/2000	ECLER
	SHEET 3 OF 6	LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
DRAWN: J.QUERALT — DATE: 150295	REPLACES:	DRW. NO. 33.0128 V/ — REV.
CHECKED: — DATE:	REPLACED BY:	

PARTS LIST: POTENTIOMETERS CIRCUIT
MODEL : PAM2600/2000 DRW. No 33.0128PL REV:
DATE: 150295 SHEET 1 OF 2 REPLACES: REPLACED BY:

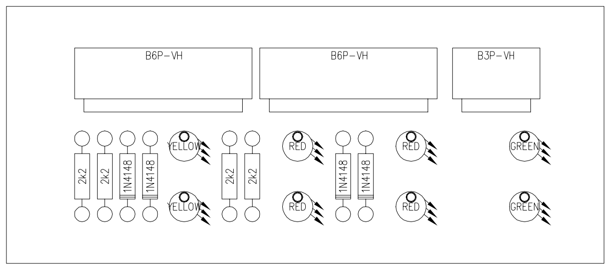
REFERENCE	VALUE
C201	220p
C202	220p
C203	C15p
C204	C8p2
C205	10µ/35
C206	220p
C207	220p
C208	C15p
C209	C8p2
C210	10µ/35
C211	47µ/25
C212	47µ/25
C213	C100n
C214	C100n
C215	C100n
C216	C100n
D201	1N4148
D202	1N4148
D203	1N4148
D204	1N4148
D205	1N4148
D206	1N4148
D207	1N4148
D208	1N4148
D209	1N4148
D210	1N4148
D211	Z18/1
D212	Z18/1
IC201	TL072
IC202	TL072
IC203	TL072
J201	B4P-S-VH
J202	B3P-S-VH
J203	B4P-S-VH
J204	B3P-S-VH
J205	2600-7TR
J206	B4P-S-VH
J207	B4P-S-VH
L201	68µH
L202	68µH
L203	68µH
L204	68µH
R201	MF1k00
R202	MF23k7
R203	MF23k7
R204	MF1k00
R205	MF340k
R206	1k5
R207	MF1k00
R208	MF47k5
R209	MF47k5
R210	MF1k00
R211	56Ω
R212	10kA
R213	MF47k5
R214	MF47k5

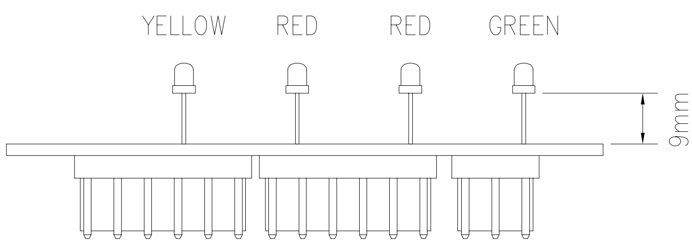
PARTS LIST:	POTENTIOMETERS CIRCUIT		
MODEL : PAM2600/2000	DRW. No 33.0128PL		REV:
DATE: 150295	SHEET 2 OF 2	REPLACES:	REPLACED BY:

REFERENCE	VALUE
R215	56Ω
R216	W1k2/4
R217	W1k2/4
R218	MF1k00
R219	MF23k7
R220	MF23k7
R221	MF1k00
R222	MF340k
R223	1k5
R224	MF1k00
R225	MF47k5
R226	MF47k5
R227	MF1k00
R228	56Ω
R229	10kA
R230	MF47k5
R231	MF47k5
R232	56Ω
PC 11.0546	PRINTED CIRCUIT



TITLE: LED CIRCUIT		MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 4 OF 6	
DRAWN: AMOROS/QUERALT	DATE: 18.05.95	REPLACES:	DRW. NO. 33.0125 R/	REV.
CHECKED:	DATE:	REPLACED BY:	

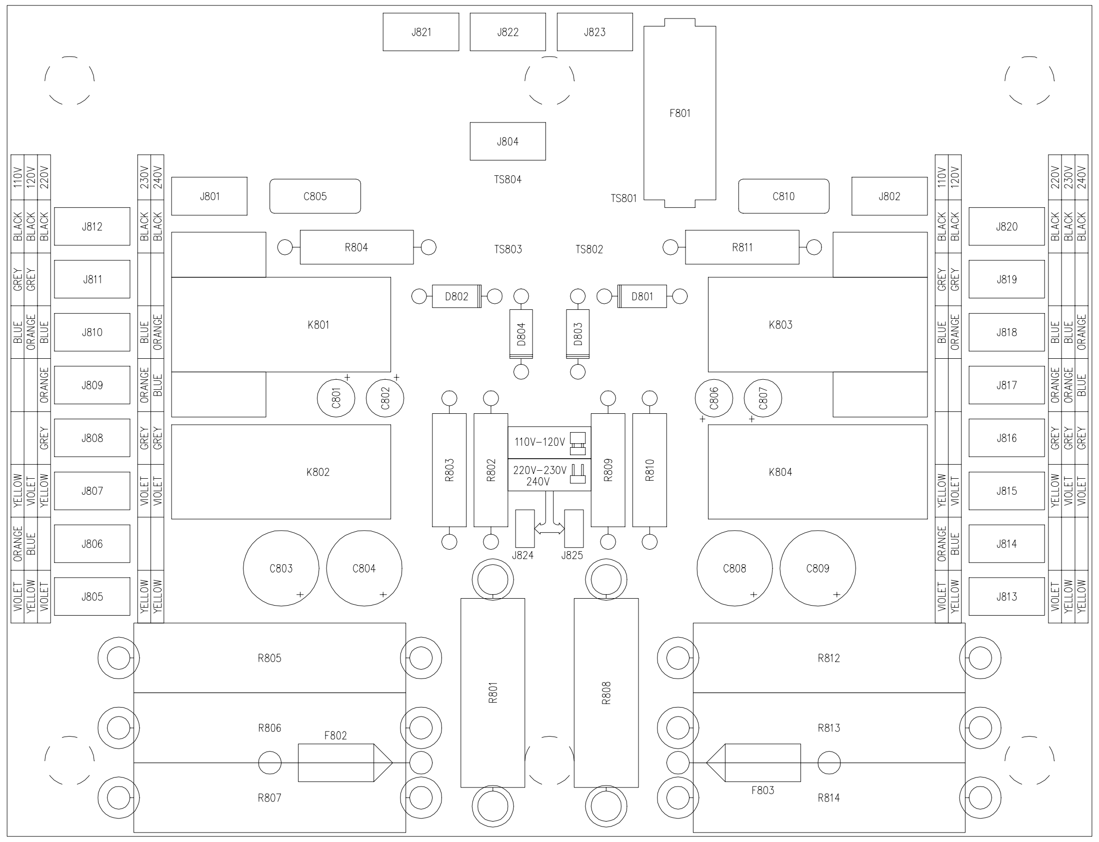




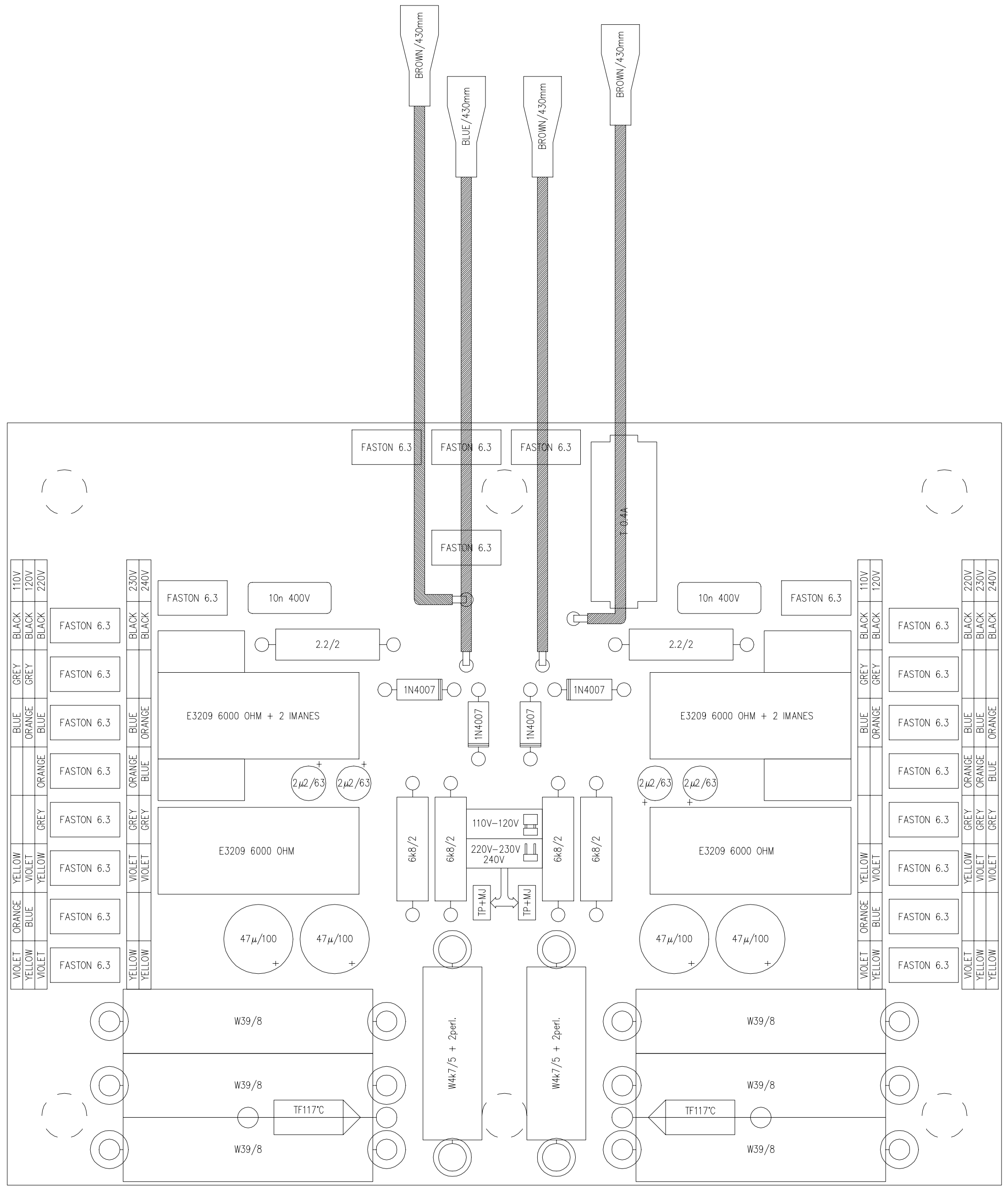
TITLE: LED CIRCUIT		MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO–ACUSTICA BARCELONA ESPAÑA
		SHEET 4 OF 6	
DRAWN: AMOROS/QUERALT	DATE: 18.05.95	REPLACES:	DRW. NO. 33.0125 V/ — REV.
CHECKED:	DATE:	REPLACED BY:	

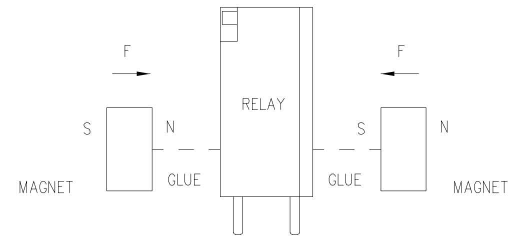
PARTS LIST: LED CIRCUIT
MODEL : PAM2600/2000 DRW. No 33.0125PL REV:
DATE: 180595 SHEET 1 OF 1 REPLACES: REPLACED BY:

REFERENCE	VALUE
D701	RED
D702	RED
D703	1N4148
D704	1N4148
D705	YELLOW
D706	RED
D707	1N4148
D708	RED
D709	1N4148
D710	YELLOW
D711	GREEN
D712	GREEN
J701	B6P-VH
J702	B6P-VH
J703	B3P-VH
R701	2k2
R702	2k2
R703	2k2
R704	2k2
PC 11.0537	PRINTED CIRCUIT

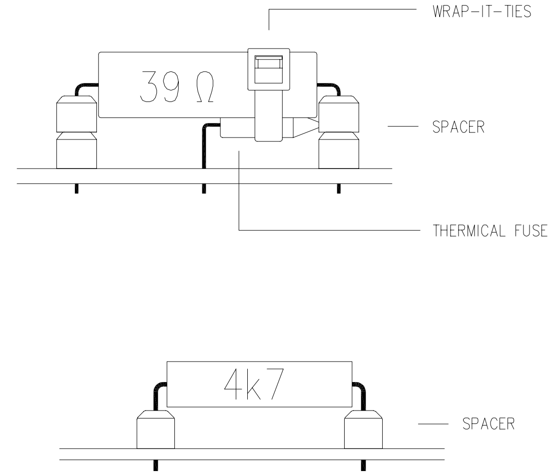


TITLE: SOFT START AND POWER CIRCUIT		MODEL: PAM2600/2000	ECLER — LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 5 OF 6	
DRAWN: J.QUERALT	DATE: 05.09.95	REPLACES:	DRW. NO. 33.0126 R/ T — REV.
CHECKED:	DATE:	REPLACED BY:	





MAGNET ASSEMBLY DETAIL



RESISTANCE ASSEMBLY DETAIL

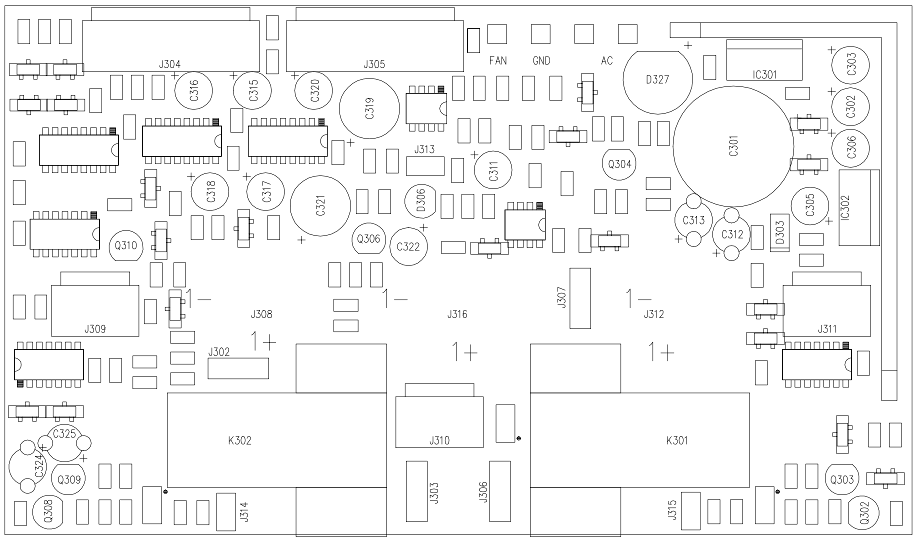
TITLE: SOFT START AND POWER CIRCUIT	MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
	SHEET 5 OF 6	
DRAWN: J.QUERALT — DATE: 05.09.95	REPLACES:	DRW. NO. 33.0126 V/ — REV.
CHECKED: — DATE:	REPLACED BY:	

PARTS LIST:	SOFT START AND POWER CIRCUIT		
MODEL : PAM2600/2000	DRW. No 33.0126PL		REV:
DATE: 050995	SHEET 1 OF 2	REPLACES:	REPLACED BY:

REFERENCE	VALUE
C801	2µ2/63
C802	2µ2/63
C803	47µ/100
C804	47µ/100
C805	10n 400V
C806	2µ2/63
C807	2µ2/63
C808	47µ/100
C809	47µ/100
C810	10n 400V
D801	1N4007
D802	1N4007
D803	1N4007
D804	1N4007
F801	TI 0.25A
F802	TF117°C
F803	TF117°C
J801	FASTON 6.3
J802	FASTON 6.3
J804	FASTON 6.3
J805	FASTON 6.3
J806	FASTON 6.3
J807	FASTON 6.3
J808	FASTON 6.3
J809	FASTON 6.3
J810	FASTON 6.3
J811	FASTON 6.3
J812	FASTON 6.3
J813	FASTON 6.3
J814	FASTON 6.3
J815	FASTON 6.3
J816	FASTON 6.3
J817	FASTON 6.3
J818	FASTON 6.3
J819	FASTON 6.3
J820	FASTON 6.3
J821	FASTON 6.3
J822	FASTON 6.3
J823	FASTON 6.3
J824	2JP+MJ
J825	2JP+MJ
K801	E3209 6000Ω
K802	E3209 6000Ω
K803	E3209 6000Ω
K804	E3209 6000Ω
R801	W4k7/5
R802	6k8/2
R803	6k8/2
R804	2.2Ω/2
R805	W39Ω/8
R806	W39Ω/8
R807	W39Ω/8
R808	W4k7/5
R809	6k8/2
R810	6k8/2
R811	2.2Ω/2

PARTS LIST:	SOFT START AND POWER CIRCUIT	
MODEL : PAM2600/2000	DRW. No 33.0126PL	REV:
DATE: 050995	SHEET 2 OF 2 REPLACES:	REPLACED BY:

REFERENCE	VALUE
R812	W39Ω/8
R813	W39Ω/8
R814	W39Ω/8
WIRE8	BLUE/430mm
WIRE9	BROWN/430mm
WIRE9	BROWN/430mm
WIRE9	BROWN/430mm

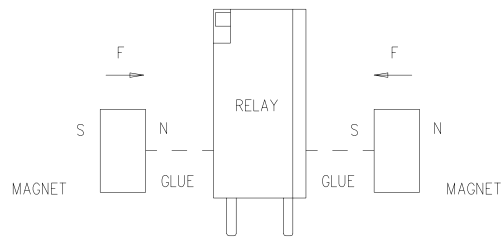


L R

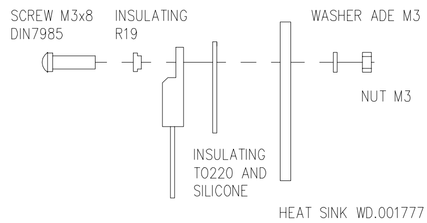
PAM1000-600-300	J314(L)-J315(R)=ON	J313 = OFF
PAM1400	J314(L)-J315(R)=OFF	J313 = OFF
PAM2600-2000	J314(L)-J315(R)=ON	J313 = ON

PRINTED CIRCUIT 11.0625 D

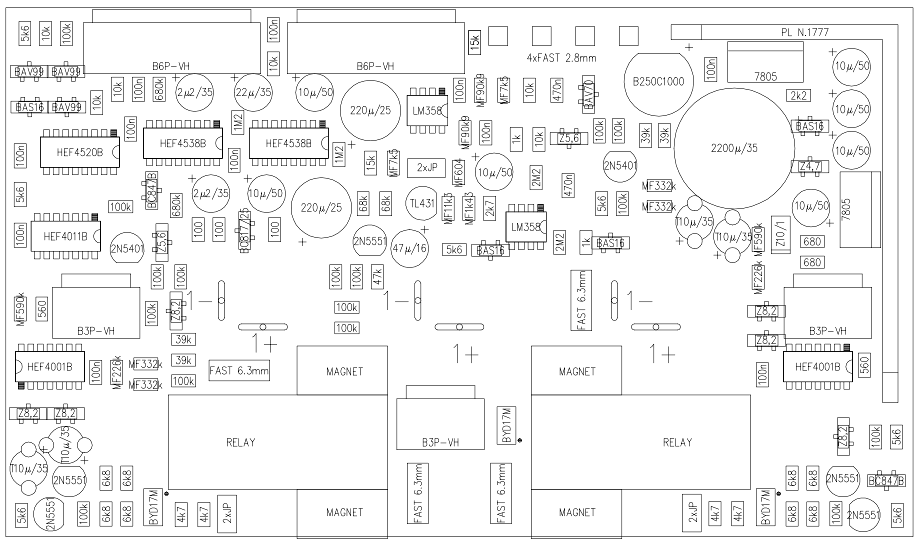
TITLE: PROTECTIONS CIRCUIT	MODEL: PAM2600-2000 1400-1000-600-300	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
	SHEET 1 OF 2	
DRAWN: AMOROS/QUERALT — DATE: 06.05.97	REPLACES:	DRW. NO. 33.0213 R — REV. C
CHECKED: — DATE:	REPLACED BY:	



MAGNET ASSEMBLY DETAIL

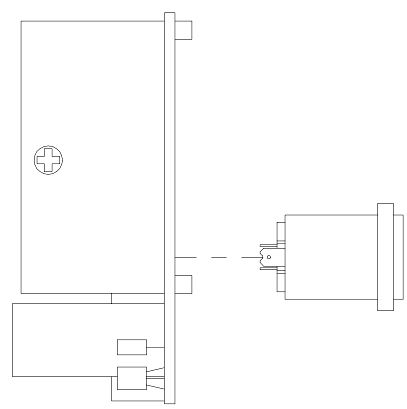


VOLTAGE REGULATOR ASSEMBLY DETAIL

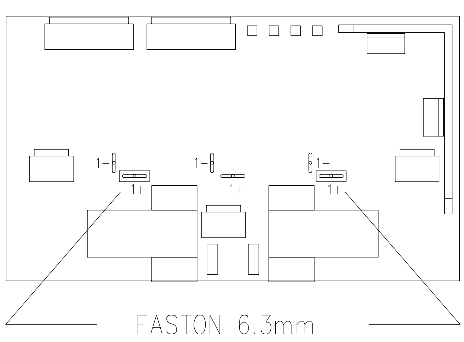


PAM1000-600-300	J314(L)-J315(R)=ON	J313 = OFF
PAM1400	J314(L)-J315(R)=OFF	J313 = OFF
PAM2600-2000	J314(L)-J315(R)=ON	J313 = ON

PAM600-300	RELAY = E 3209/4000 OHM
PAM1400-1000	RELAY = E 3209/6000 OHM
PAM2600-2000	RELAY = E 3209/4000 OHM



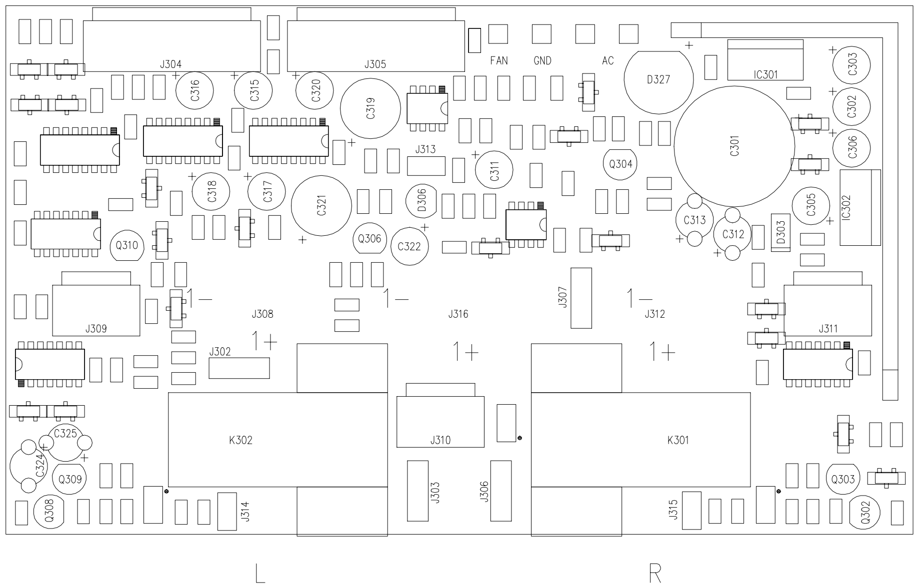
SPEAKON ASSEMBLY DETAIL



Nota: En el caso de las PAM2600-2000 las bases SPEAKON no van montadas y dos faston combian de posicion tal como muestra la figura.

PRINTED CIRCUIT 11.0625 D

TITLE: PROTECTIONS CIRCUIT		MODEL: PAM2600-2000 1400-1000-600-300	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 2 OF 2	
DRAWN: AMOROS/QUERALT	DATE: 06.05.97	REPLACES:	DRW. NO. 33.0213 V
CHECKED:	DATE:	REPLACED BY:	REV. C

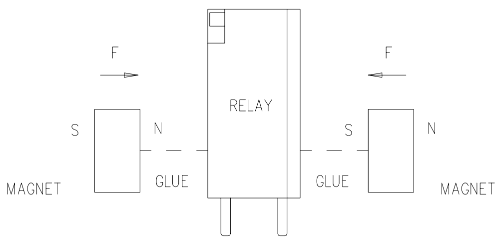


PAM1000-600-300	J314(L)-J315(R)=ON	J313 = OFF
PAM1400	J314(L)-J315(R)=OFF	J313 = OFF
PAM2600-2000	J314(L)-J315(R)=ON	J313 = ON

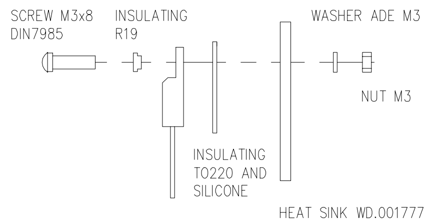
OLD VERSION

PRINTED CIRCUIT 11.0625 C

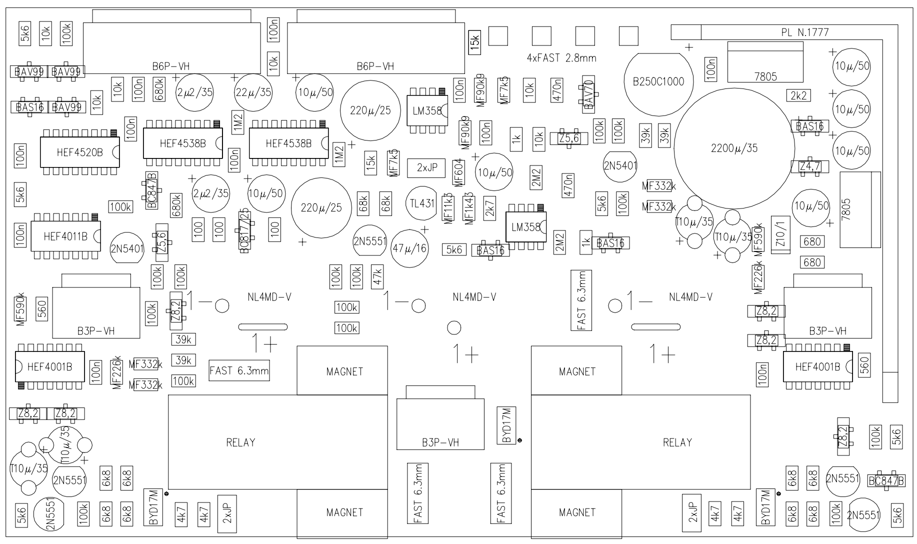
TITLE: PROTECTIONS CIRCUIT	MODEL: PAM2600-2000 1400-1000-600-300	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
	SHEET 1 OF 2	
DRAWN: AMOROS/QUERALT DATE: 06.05.97	REPLACES:	DRW. NO. 33.0213 R
CHECKED: DATE:	REPLACED BY:	REV. B



MAGNET ASSEMBLY DETAIL

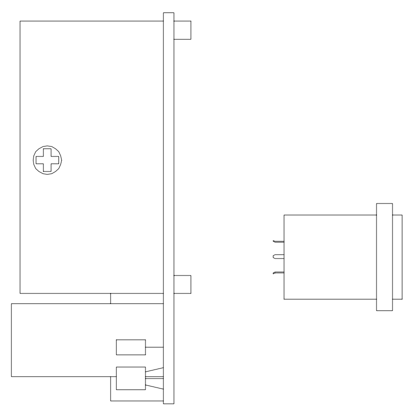


VOLTAGE REGULATOR ASSEMBLY DETAIL

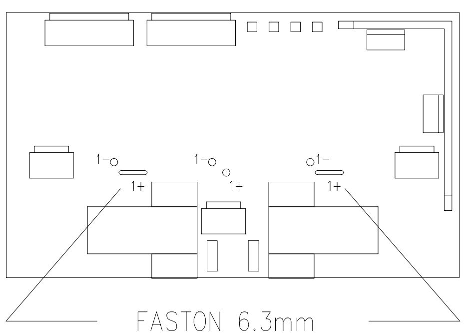


PAM1000-600-300	J314(L)-J315(R)=ON	J313 = OFF
PAM1400	J314(L)-J315(R)=OFF	J313 = OFF
PAM2600-2000	J314(L)-J315(R)=ON	J313 = ON

PAM600-300	RELAY = E 3209/4000 OHM
PAM1400-1000	RELAY = E 3209/6000 OHM
PAM2600-2000	RELAY = E 3209/4000 OHM



SPEAKON ASSEMBLY DETAIL

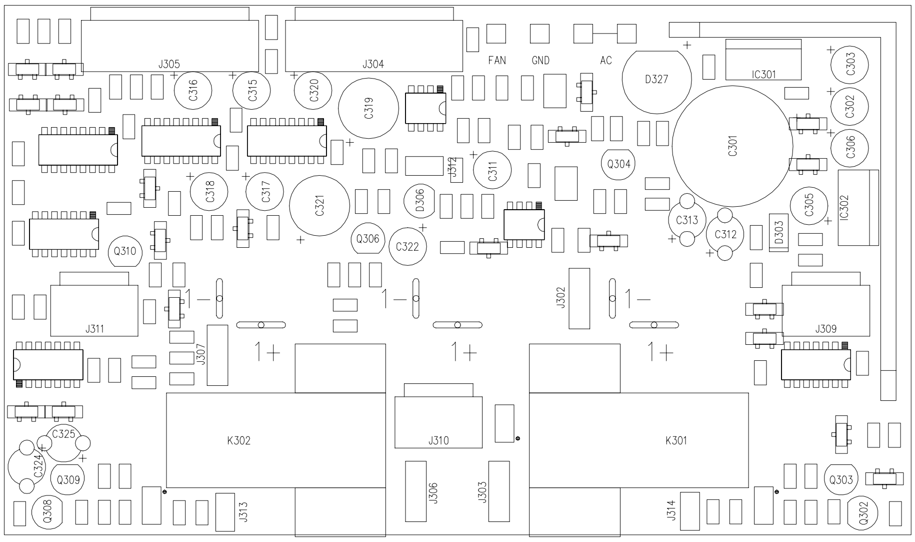


Nota: En el caso de las PAM2600-2000 las bases SPEAKON no van montadas y dos faston combian de posicion tal como muestra la figura.

OLD VERSION

PRINTED CIRCUIT 11.0625 C

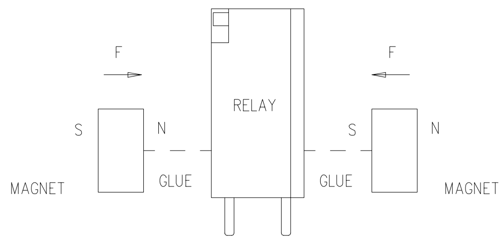
TITLE: PROTECTIONS CIRCUIT	MODEL: PAM2600-2000 1400-1000-600-300	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
	SHEET 2 OF 2	
DRAWN: AMOROS/QUERALT — DATE: 06.05.97	REPLACES:	DRW. NO. 33.0213 V — REV. B
CHECKED: — DATE:	REPLACED BY:	



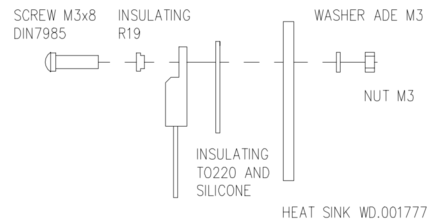
OLD VERSION

PRINTED CIRCUIT 11.0625

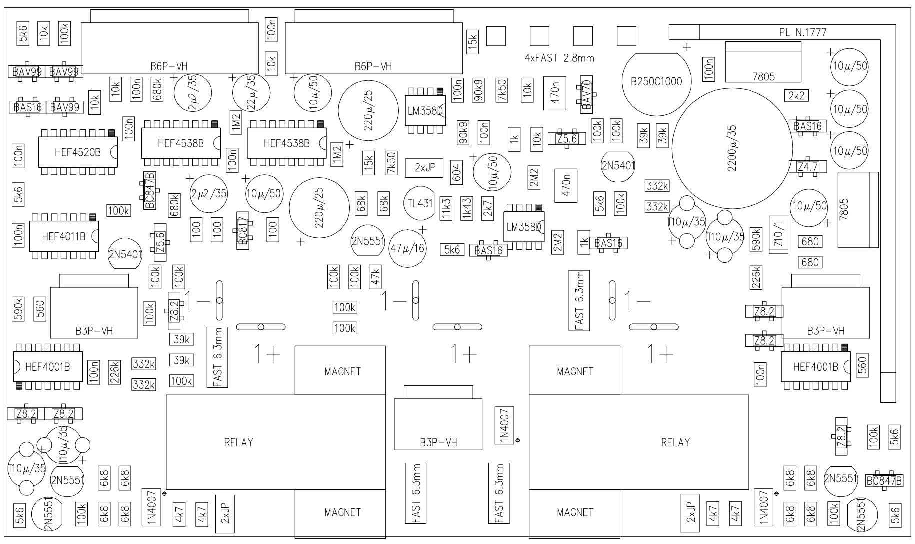
TITLE: PROTECTIONS CIRCUIT	MODEL: PAM2600-2000 1400-1000-600-300	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
	SHEET 1 OF 2	
DRAWN: AMOROS/QUERALT — DATE: 06.05.97	REPLACES:	DRW. NO. 33.0213 R — REV.
CHECKED: — DATE:	REPLACED BY:	



MAGNET ASSEMBLY DETAIL

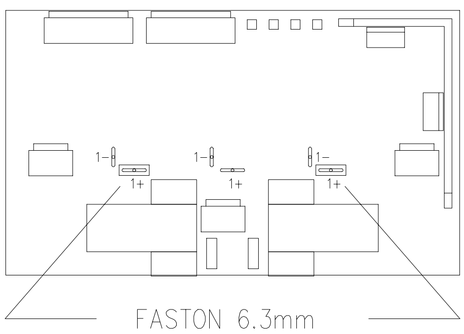


VOLTAGE REGULATOR ASSEMBLY DETAIL

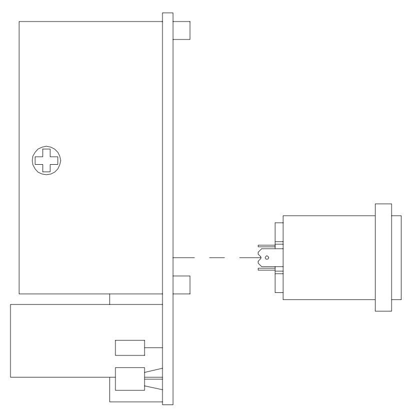


PAM2600–2000	J313–J314 = ON	J312 = ON
PAM1400	J313–J314 = OFF	J312 = OFF
PAM1000–600–300	J313–J314 = ON	J312 = OFF

PAM600–300	RELAY = E 3209/4000 OHM
PAM1400–1000	RELAY = E 3209/6000 OHM
PAM2600–2000	RELAY = E 3209/4000 OHM



FASTON 6.3mm



SPEAKON ASSEMBLY DETAIL

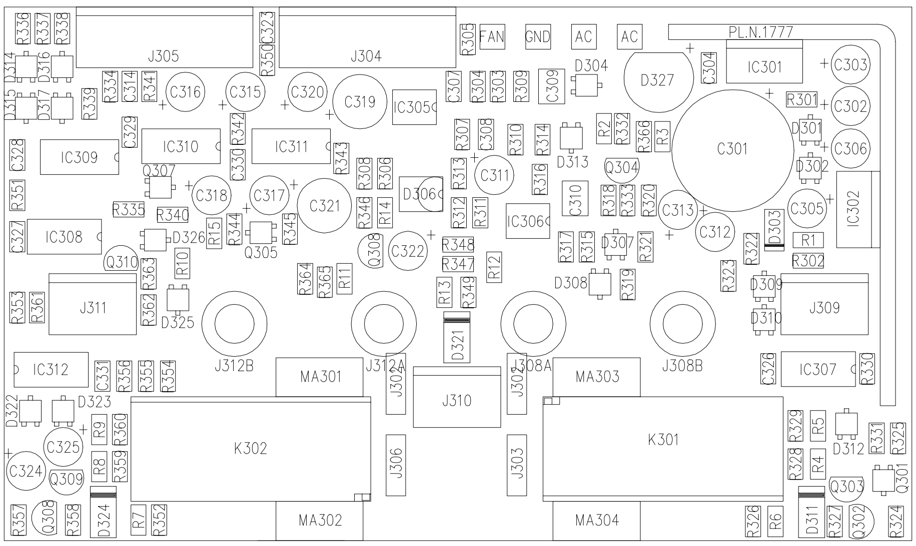
Nota: En el caso de las PAM2600–2000 las bases SPEAKON no van montadas y dos faston combian de posicion tal como muestra la figura.

OLD VERSION

PRINTED CIRCUIT 11.0625

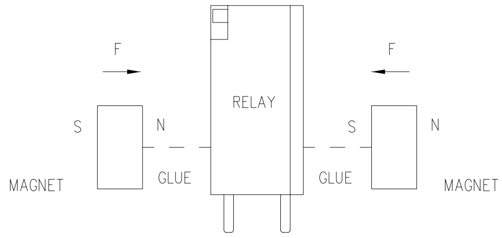
TITLE: PROTECTIONS CIRCUIT		MODEL: PAM2600–2000 1400–1000–600–300	ECLER LABORATORIO DE ELECTRO–ACUSTICA BARCELONA ESPAÑA
		SHEET 2 OF 2	
DRAWN: AMOROS/QUERALT	DATE: 06.05.97	REPLACES:	DRW. NO. 33.0213 V	REV.
CHECKED:	DATE:	REPLACED BY:	

1 2 3 4 5

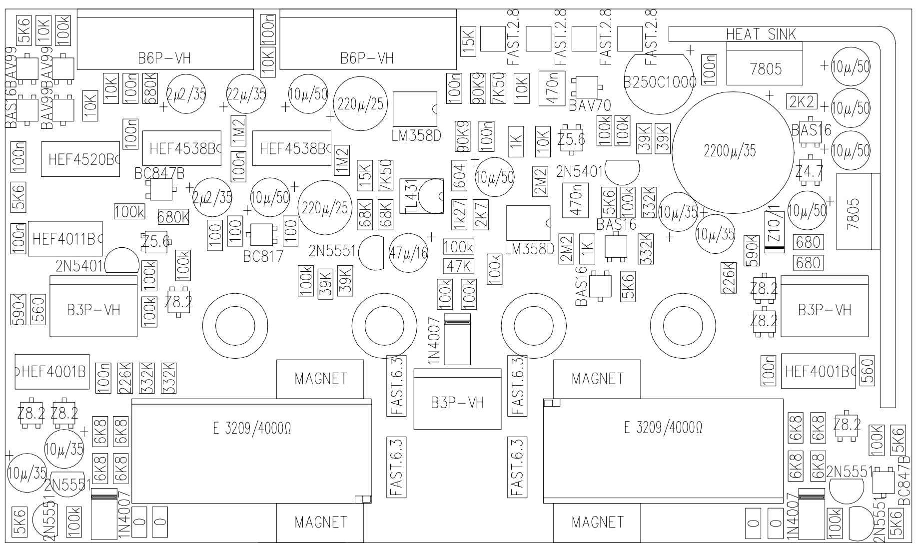


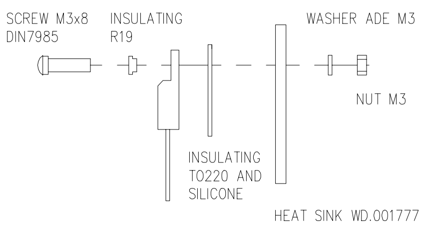
OLD VERSION

TITLE: PROTECTIONS CIRCUIT		MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 6 OF 6	
DRAWN: J.QUERALT	DATE: 07.07.95	REPLACES:	DRW. NO. 33.0123 R/
CHECKED:	DATE:	REPLACED BY:	REV.



MAGNET ASSEMBLY DETAIL





VOLTAGE REGULATOR ASSEMBLY DETAIL

OLD VERSION

TITLE: PROTECTIONS CIRCUIT

MODEL: PAM2600/2000

SHEET 6 OF 6

ECLER

LABORATORIO DE ELECTRO-ACUSTICA
BARCELONA ESPAÑA

DRAWN: J.QUERALT DATE: 07.07.95

CHECKED: DATE:

REPLACES:

REPLACED BY:

DRW. NO. 33.0123 V

REV.

PARTS LIST: PROTECTIONS CIRCUIT
MODEL : PAM2600/2000 DRW. No 33.0123PL REV:
DATE: 070795 SHEET 1 OF 4 REPLACES: REPLACED BY:

OLD VERSION

REFERENCE	VALUE
AC	FAST.2.8
AC	FAST.2.8
C301	2200µ/35
C302	10µ/50
C303	10µ/50
C304	100n
C305	10µ/50
C306	10µ/50
C307	100n
C308	100n
C309	470n
C310	470n
C311	10µ/50
C312	10µ/35
C313	10µ/35
C314	100n
C315	22µ/35
C316	2µ2/35
C317	10µ/50
C318	2µ2/35
C319	220µ/25
C320	10µ/50
C321	220µ/25
C322	47µ/16
C323	100n
C324	10µ/35
C325	10µ/35
C326	100n
C327	100n
C328	100n
C329	100n
C330	100n
C331	100n
D301	BAS16
D302	Z4.7
D303	Z10/1
D304	BAV70
D306	TL431
D307	BAS16
D308	BAS16
D309	Z8.2
D310	Z8.2
D311	1N4007
D312	Z8.2
D313	Z5.6
D314	BAV99
D315	BAS16
D316	BAV99
D317	BAV99
D321	1N4007
D322	Z8.2
D323	Z8.2
D324	1N4007
D325	Z8.2
D326	Z5.6
D327	B250C1000

PARTS LIST:	PROTECTIONS CIRCUIT		
MODEL : PAM2600/2000	DRW. No 33.0123PL		REV:
DATE: 070795	SHEET 2 OF 4	REPLACES:	REPLACED BY:

OLD VERSION

REFERENCE	VALUE
FAN	FAST.2.8
GND	FAST.2.8
IC301	7805
IC302	7805
IC305	LM358D
IC306	LM358D
IC307	HEF4001B
IC308	HEF4011B
IC309	HEF4520B
IC310	HEF4538B
IC311	HEF4538B
IC312	HEF4001B
INSULANT WASHER	R19
INSULANT WASHER	R19
J302	FAST.6.3
J302	FAST.6.3
J303	FAST.6.3
J304	B6P-VH
J305	B6P-VH
J306	FAST.6.3
J309	B3P-VH
J310	B3P-VH
J311	B3P-VH
K301	E 3209/4000Ω
K302	E 3209/4000Ω
MA301	MAGNET
MA302	MAGNET
MA303	MAGNET
MA304	MAGNET
NUT	M3
NUT	M3
PL.N.1777	HEAT SINK
Q301	BC847B
Q302	2N5551
Q303	2N5551
Q304	2N5401
Q305	BC817
Q307	BC847B
Q308	2N5551
Q308	2N5551
Q309	2N5551
Q310	2N5401
R1	680Ω
R10	100k
R11	39K
R12	100k
R13	100k
R14	68K
R15	100Ω
R2	100k
R3	39K
R301	2K2
R302	680Ω
R303	7K50
R304	90K9
R305	15K

PARTS LIST: PROTECTIONS CIRCUIT
MODEL : PAM2600/2000 DRW. No 33.0123PL REV:
DATE: 070795 SHEET 3 OF 4 REPLACES: REPLACED BY:

OLD VERSION

REFERENCE	VALUE
R306	7K50
R307	90K9
R308	15K
R309	10K
R310	1K
R311	2K7
R312	1k27
R313	604Ω
R314	10K
R315	1K
R316	2M2
R317	2M2
R318	5K6
R319	5K6
R320	332K
R321	332K
R322	590K
R323	226K
R324	5K6
R325	5K6
R326	0Ω
R327	100k
R328	6K8
R329	6K8
R330	560Ω
R331	100K
R332	100k
R333	100k
R334	10K
R335	100k
R336	5K6
R337	10K
R338	100k
R339	10K
R340	680K
R341	680K
R342	1M2
R343	1M2
R344	100Ω
R345	100Ω
R346	68K
R347	47K
R348	100k
R349	100k
R350	10K
R351	5K6
R352	0Ω
R353	590K
R354	332K
R355	332K
R356	226K
R357	5K6
R358	100k
R359	6K8
R360	6K8
R361	560Ω

PARTS LIST:	PROTECTIONS CIRCUIT	
MODEL : PAM2600/2000	DRW. No 33.0123PL	REV:
DATE: 070795	SHEET 4 OF 4 REPLACES:	REPLACED BY:

OLD VERSION

REFERENCE	VALUE
R362	100k
R363	100k
R364	100k
R365	39K
R366	39K
R4	6K8
R5	6K8
R6	0Ω
R7	0Ω
R8	6K8
R9	6K8
SCREW	M3X8 DIN7985 NINE
SCREW	M3X8 DIN7985 NINE
WASHER	ADE M3
WASHER	ADE M3

PROFESSIONAL PAM SERIES - TESTING RULES

PRELIMINARY

GROUND LINK Testing.

- Verify that when the switch is at the ON position there is continuity between the chassis ground and the speakers ground terminal and that the opposite happens at the OFF position. Leave it at ON.
- Put the power amplifier in stereo mode.
- We will need a 4000VA variac for our test purposes.
- Take off one of the fuses of the module in which the testing is being made and connect an ammeter (10A DC scale) in its place.
- Put the oscilloscope probe between TP-GND.

SET UP

- Unplug the fuses of the module that we are NOT setting up.
- Connect the power amplifier mains cable to the output of the variac. Set the variac output at 0V.
- Switch the power amplifier on with no load or signal. Turn the variac up progressively step by step until 220V. While mains voltage is growing up make sure the module's current does never exceed 0.8A. Once the circuit is stable make sure the current is 480mA/400mA respectively for PAM2600/ PAM2000 and the symmetry (measured up with the oscilloscope probe) is $\leq$50mV. If your figures do not match these numbers adjust CURRENT (5K) and SYMMETRY (470Ω) untill you get the above mentioned numbers.
- Test the operational amplifier power supply ($\pm$18V) $\pm$1V.
- Put the fuse back in its place into the module (with the power amplifier turned off) and repeat the same procedure for the other channel.

CROSS DISTORTION

By using a signal generator introduce a level of 100mV RMS at 1kHz and make sure there is no cross distortion at the output (attenuators at 0dB position).

MOSFETS CONDUCTION

By using a signal generator introduce a level of 0.5V at 1kHz and load the amplifier with 4ΩCheck that all MOSFETs are conducting approximately the same current level (measure this current with the oscilloscope probe by palcing it on the 0,22Ω source resistances).The maximum conduction difference between MOSFETs should be 100mV. When making this test be sure the oscilloscope ground is not connected to any other place of the circuit when making the reading; just to the 0,22Ω resistance.If you do not follow this rule you could produce a shortcircuit between two points of the circuit and therefore a very important damage.

POWER

- Verify the amplifier's power at 8 and 4Ω.
- Maintain the mains voltage at 220V by means of the variac.
- Check that your own figures match the following at close-to-clip point:

		PAM2600	PAM2000
Vin≈1VRMS/Vo 4Ω	≥	70 Vrms	60.5 Vrms
Vin≈1VRMS/Vo 8Ω	≥	81 Vrms	68 Vrms

FREQUENCY RESPONSE

0.5V input signal.

Verify frequency response at 20Hz/2kHz/20kHz. We must get the same signal output for the actual load at any of the frequencies.Set the frequency at 50kHz; the output level should not decrease more than 1 or 2 dB and there should not be any noticeable distortion.

CLIPPING AT 1kHz

Introduce such a signal that the amplifier is just about to clip.Measure the voltage up at the output (with the actual load) and check that when the voltage decreases between 0.5 and 1 dB the clipping LEDs light down. Check each LED corresponds to its fader.

DC OUT

For this test you must disconnect the load from the amplifier.

Introduce a 1V signal at ≤5Hz with the generator. Turn the output of the generator up untill the protection relays open and close.

OVERHEATING PROTECTION

Disconnect the thermic sensor and shortcircuit the green and violet wires.Check that, first, the THERMAL led of the corresponding channel is lit; second, the fan is operating at maximum speed; and third, the two protection circuit relays are open.Connect again the connector.

Use a soldering iron to heat the thermic sensor lead and check that fan speed increases proportionally to the sensor temperature (do not heat excessively).

Remember that each module has two sensors.

Repeat the process for the other channel.

PROTECTIONS

Disconnect the amplifier from the load and introduce with the signal generator a level of approximately 100mVRMS at 1KHz. Leave the attenuators at 0dB and shortcircuit the left channel output (just for a while) checking the PROTECT LED is lighting up and the relay opens the circuit (you can check this by placinf an oscilloscope probe at the amplifier's output and watching the signal disappear during the STAND BY time in which the protection circuit is working).Repeat the same process for the right channel.

PROFESSIONAL PAM SERIES - QUALITY CONTROL

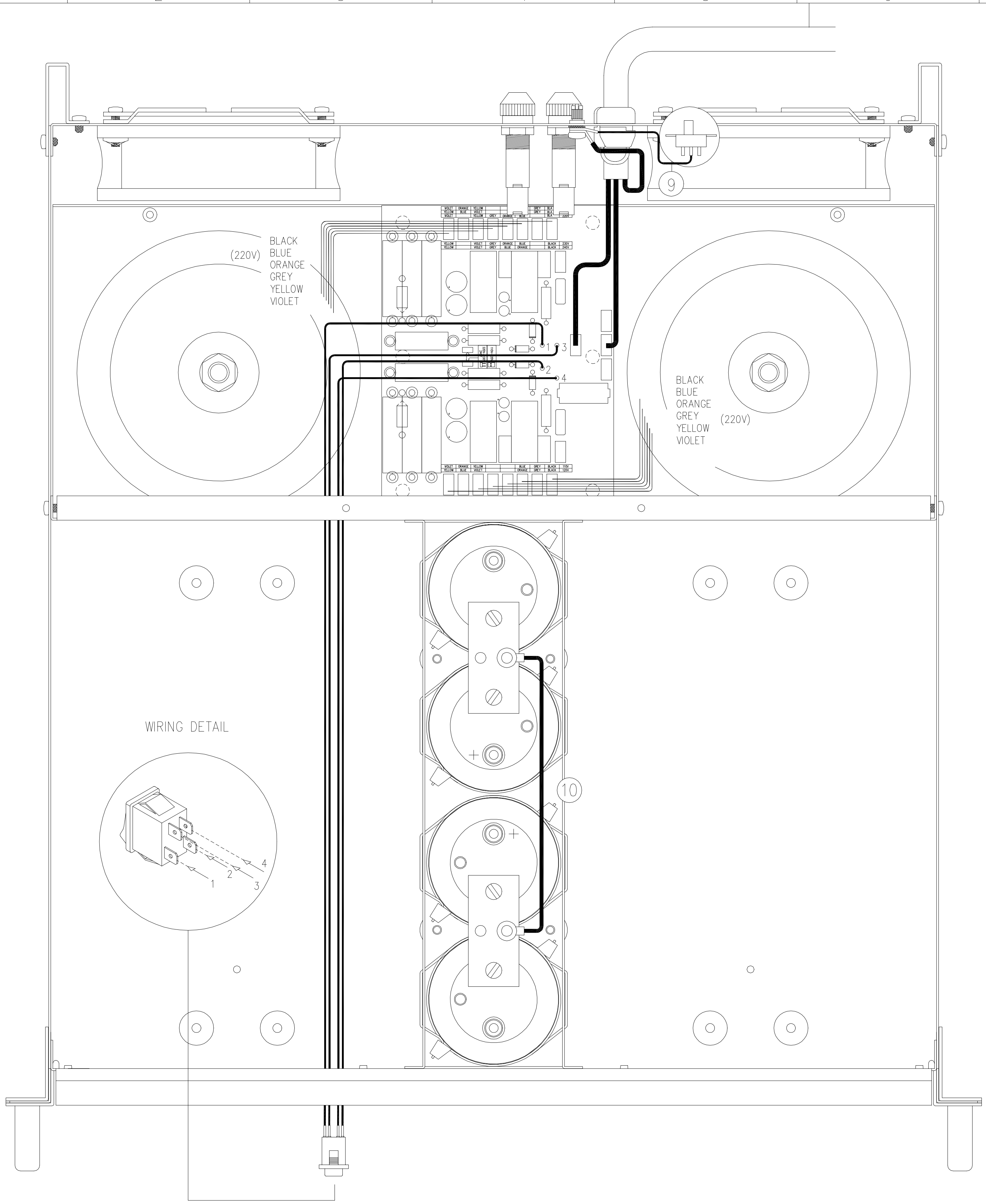
We will use a mixer with balanced output -if possible- and a nominal output level of 1V as the signal source for test purposes.

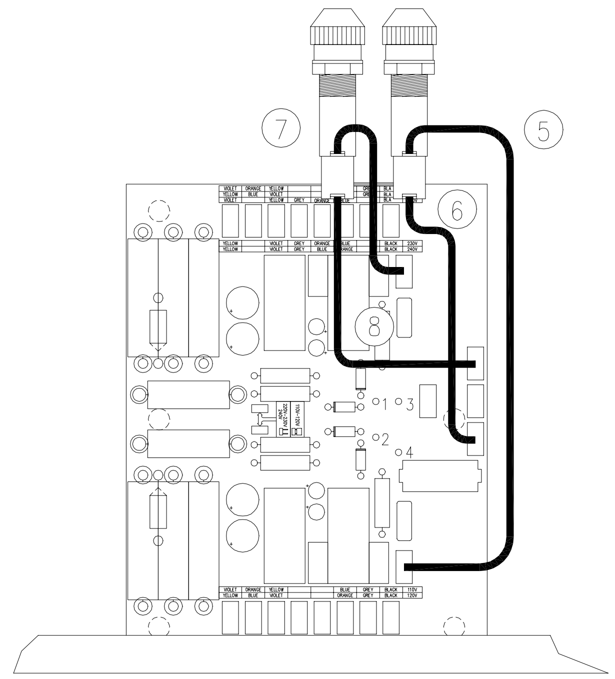
Connect the mixer outputs to the power amplifier inputs. Plug the power amplifier to mains (make sure its specified voltage matches that of mains) and make sure that PROTECT, ON and SIGNAL PRESENT LEDs all light up when you turn on the amplifier by pushing the ON button. Turn up the mixer output level untill the CLIP LEDs light up on the power amplifier. Turn down the mixer output and connect the loudspeakers.

Make an exhaustive test of:

- Sound quality (no distorsions or noises)
- Faders action (fader travel, signal cut at their low end, no scratching or clicking noises and correct stereo channel for each one).
- Cooling fan operation.
- While the power amplifier is working shake it or throw it a table to make sure the output sound goes on playing correctly.
- Shortcircuit the power amplifier output and make sure the corresponding channel's PROTECT LED lights up, the relay opens and the output signal is cut for a short period of time (STAND BY) and returned back into normal operation. Repeat the same procedure four times more and then the STAND BY time should be about 5 minutes. Repeat the same steps for the other channel.

TECHNICAL CHARACTERISTICS	PAM2600	PAM2000
Frequency response at max. power output.	7Hz to 60kHz +0 -1dB	
Harmonic distortion+noise from 20Hz to 20kHz meas.band	<0,02%	<0,02%
Intermodulation distortion (SMPTE) using frequencies of 50Hz and 7kHz at 4:1 ratio, nominal power.	<0,03%	<0,03%
TIM 100	<0,05%	<0,03%
Signal noise ratio from 20Hz to 20kHz Ref.1W/4Ω	>80 dB	>80 dB
To 4Ω nominal power.	>111 dB	>110 dB
Damping factor at 1kHz 8Ω	>140	>140
Slewrate	±98 V/ s	±92 V/ s
Channel crosstalk at 1kHz	>65 dB	>65 dB
Inputs balanced and provided with XLR3. CLIP indicators at -0,3dB	Sensitivity/load	0dBV/1V/47kΩ
Outputs	These are provided with 2 speak on.	
Protections	-Delayed turn-on heavy duty relay with PROTECT indicator ON during standby. -DC:4Hz or DC at 2V,PROTECT INDICATOR. -Thermal:A sensor activates a high temperature detection circuit,channel shut down at 90 ,THERMAL indicator. -Overload:Protection against output short circuit.PROTECT indicator. -Autoreset:Four automatic reset during five minutes in case of short circuit.After this period reset mustbe done manually. -Soft start system. -Varispeed Fan controled according to internal temperature.	
Power requirements 110V,120V 220V,230V,240V AC 50/60Hz	3650 VA	2730 VA
Dimensions Front pannel	482,6x132,5mm	
Chassis	440x132,5x514mm	
Weight	31.2 kg	30.5 kg

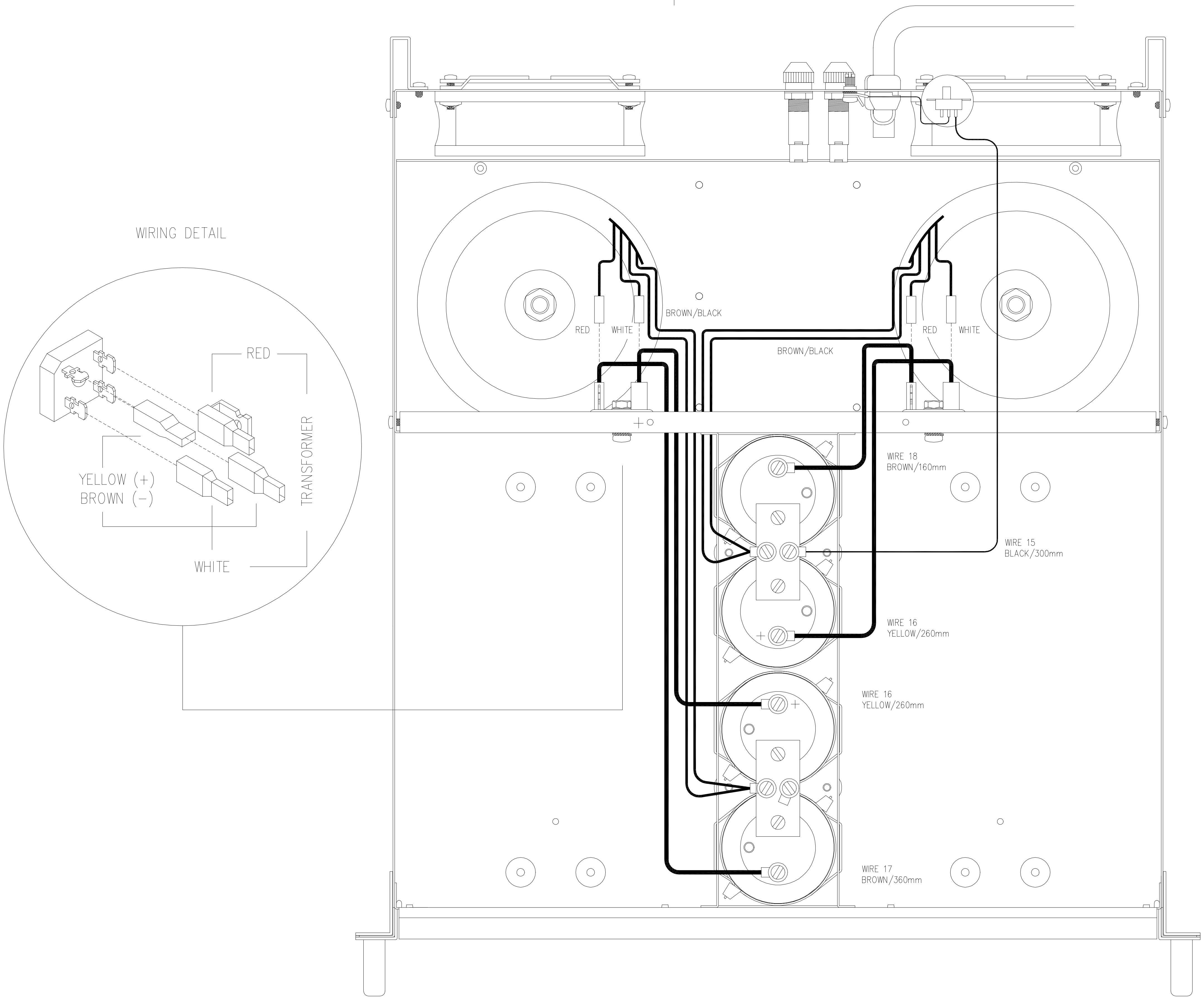




FUSES CONNECTIONS

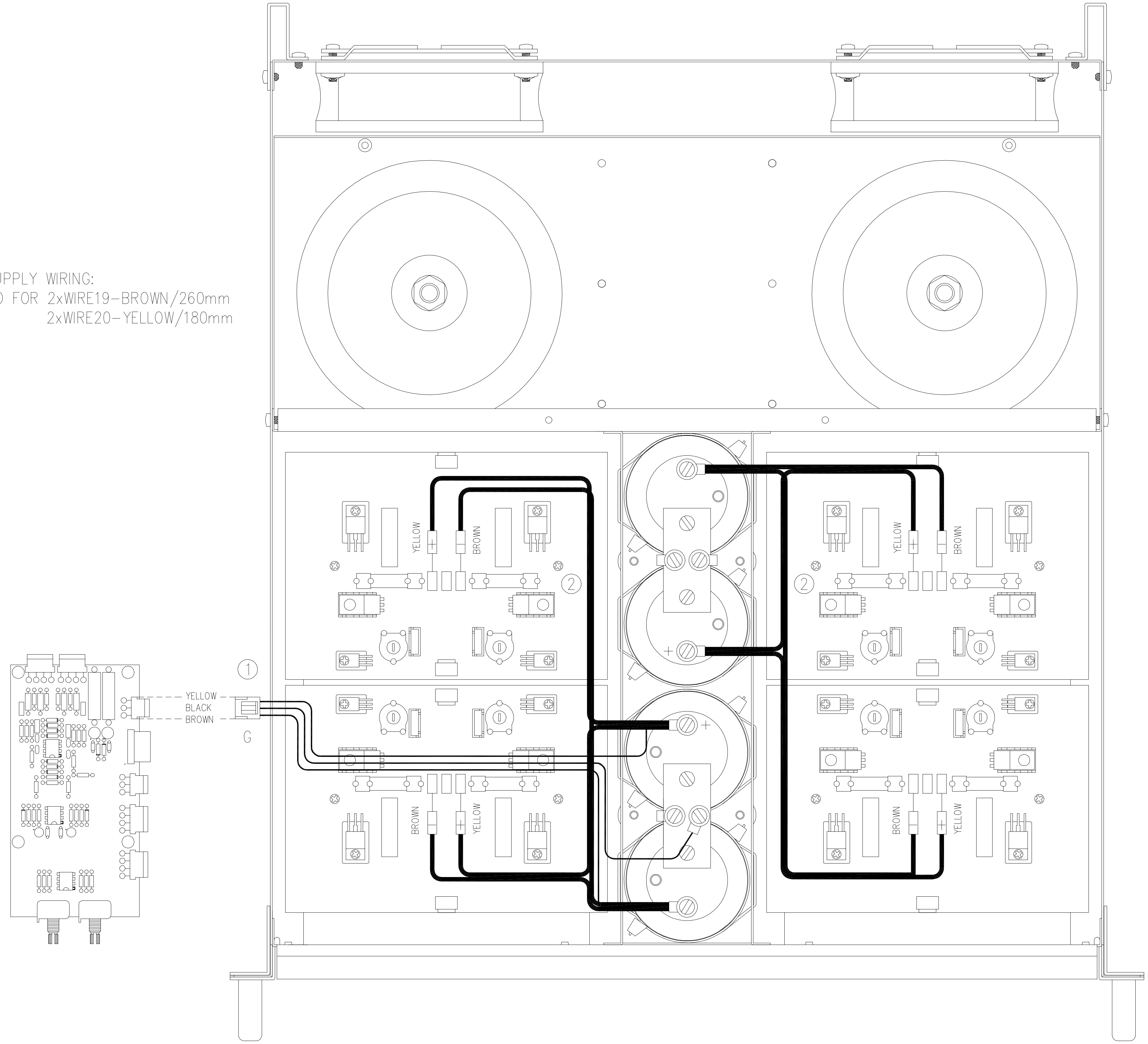
1- WIRE5 -BLUE/430mm
2- WIRE6 -BROWN/340mm
3- WIRE5 -BLUE/430mm
4- WIRE6 -BROWN/340mm
5- WIRE3 -BLUE/120mm
6- WIRE4 -BROWN/120mm
7- WIRE3 -BLUE/120mm
8- WIRE4 -BROWN/120mm
9- WIRE14-BLACK/50mm
10- WIRE 7-BLACK/120mm

TITLE: WIRING DIAGRAM		MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 1 OF 5	
DRAWN: J.QUERALT	DATE: 05.09.95	REPLACES:	DRW. NO. 31.0027 / REV.
CHECKED:	DATE:	REPLACED BY:	

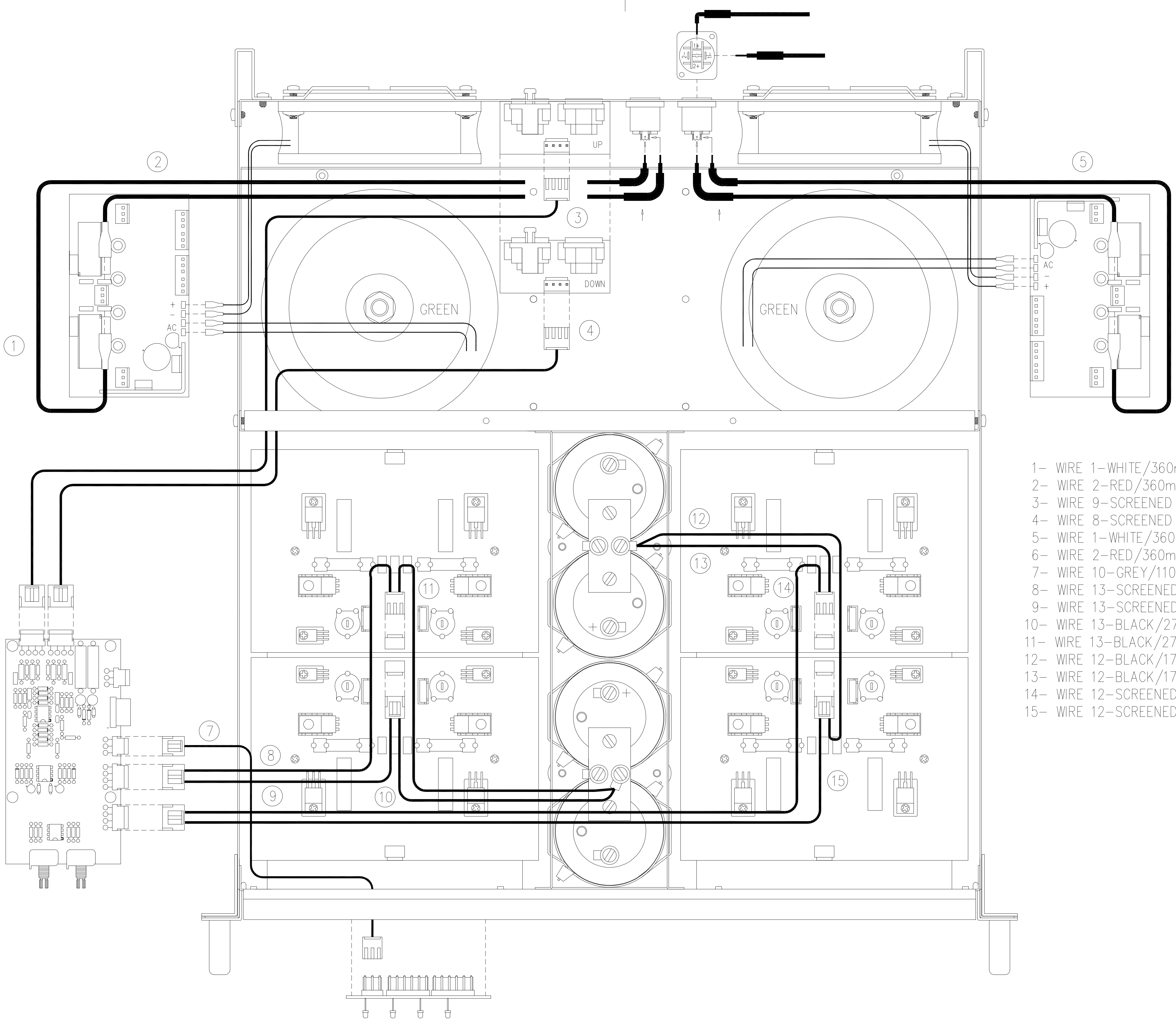


TITLE: WIRING DIAGRAM		MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 2 OF 5	
DRAWN: J.QUERALT	DATE: 05.09.95	REPLACES:	DRW. NO. 31.0028	REV.
CHECKED:	DATE:	REPLACED BY:		

1- WIRE 11
2- POWER SUPPLY WIRING:
COMPOUND FOR 2xWIRE19-BROWN/260mm
2xWIRE20-YELLOW/180mm

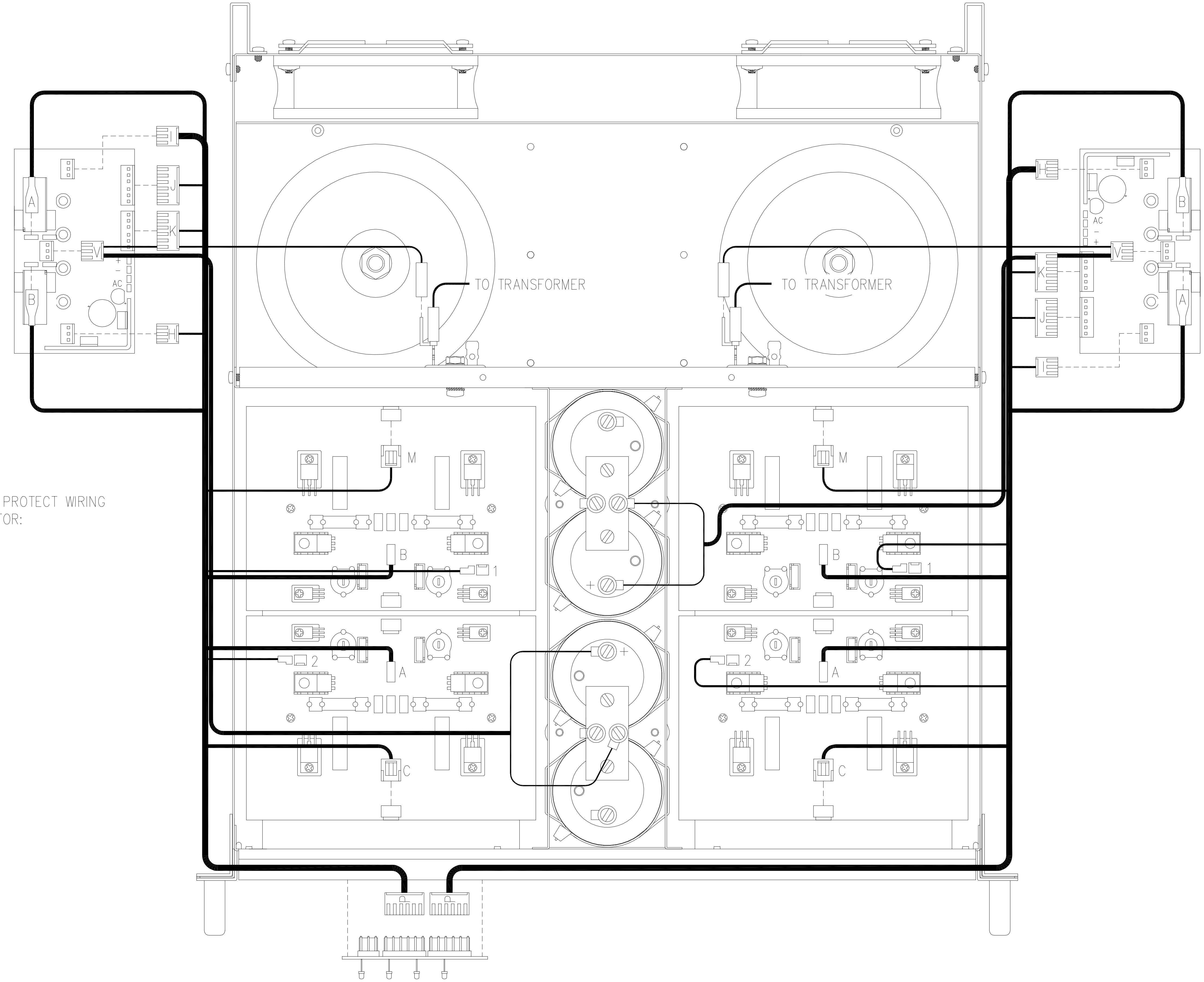


TITLE: WIRING DIAGRAM	MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
	SHEET 3 OF 5	
DRAWN: J.QUERALT DATE: 05.09.95	REPLACES:	DRW. NO. 31.0029 REV.
CHECKED: DATE:	REPLACED BY:	

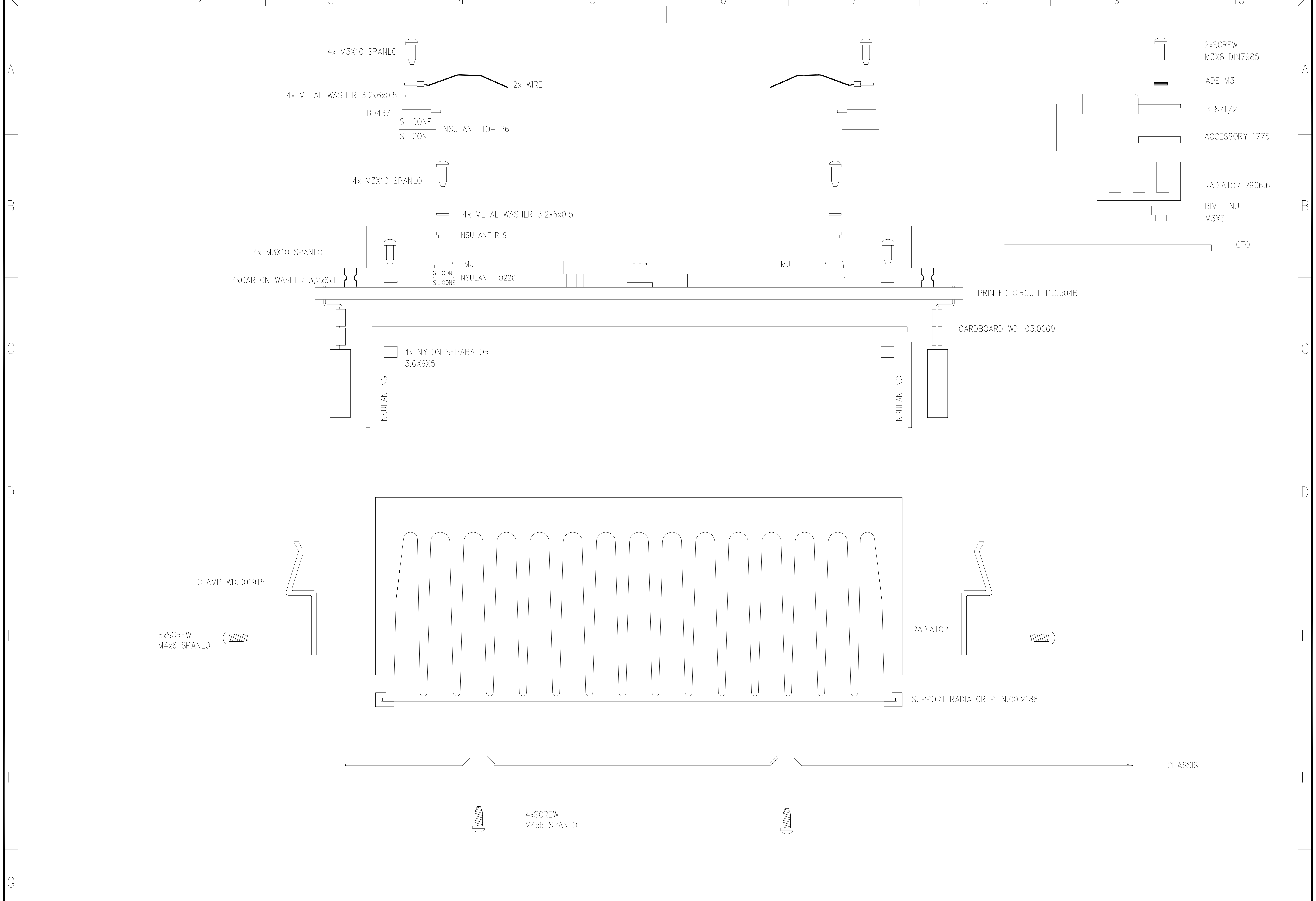


1- WIRE 1-WHITE/360mm
2- WIRE 2-RED/360mm
3- WIRE 9-SCREENED CABLE/460mm
4- WIRE 8-SCREENED CABLE/460mm
5- WIRE 1-WHITE/360mm
6- WIRE 2-RED/360mm
7- WIRE 10-GREY/110mm
8- WIRE 13-SCREENED CABLE/140mm
9- WIRE 13-SCREENED CABLE/130mm
10- WIRE 13-BLACK/270mm
11- WIRE 13-BLACK/270mm
12- WIRE 12-BLACK/170mm
13- WIRE 12-BLACK/170mm
14- WIRE 12-SCREENED CABLE/440mm
15- WIRE 12-SCREENED CABLE/410mm

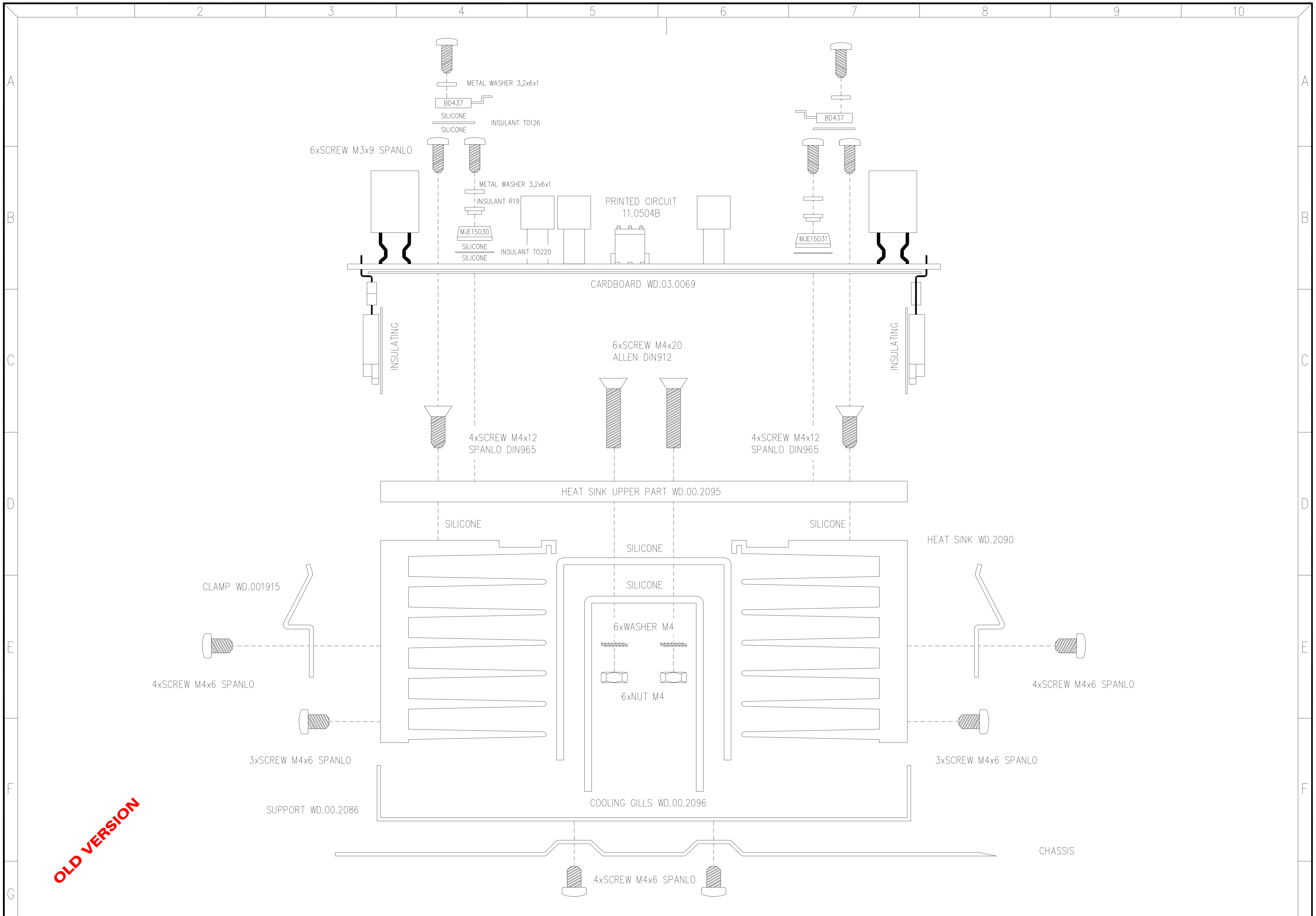
TITLE: WIRING DIAGRAM	MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA	
	SHEET 4 OF 5		
DRAWN: J.QUERALT	DATE: 05.09.95	REPLACES:	DRW. NO. 31.0030	REV.
CHECKED:	DATE:	REPLACED BY:		



TITLE: WIRING DIAGRAM		MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 5 OF 5	
DRAWN: J.QUERALT	DATE: 25.07.95	REPLACES:	DRW. NO. 31.0031 — REV.
CHECKED:	DATE:	REPLACED BY:	



TITLE: ASSEMBLY MODULE		MODEL: PAM2600/2000		ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA	
		SHEET 1 OF 1			
DRAWN: Jordi C.	DATE: 990722	REPLACES:		DRW. NO. 30.0042	REV. B
CHECKED:	DATE:	REPLACED BY:			

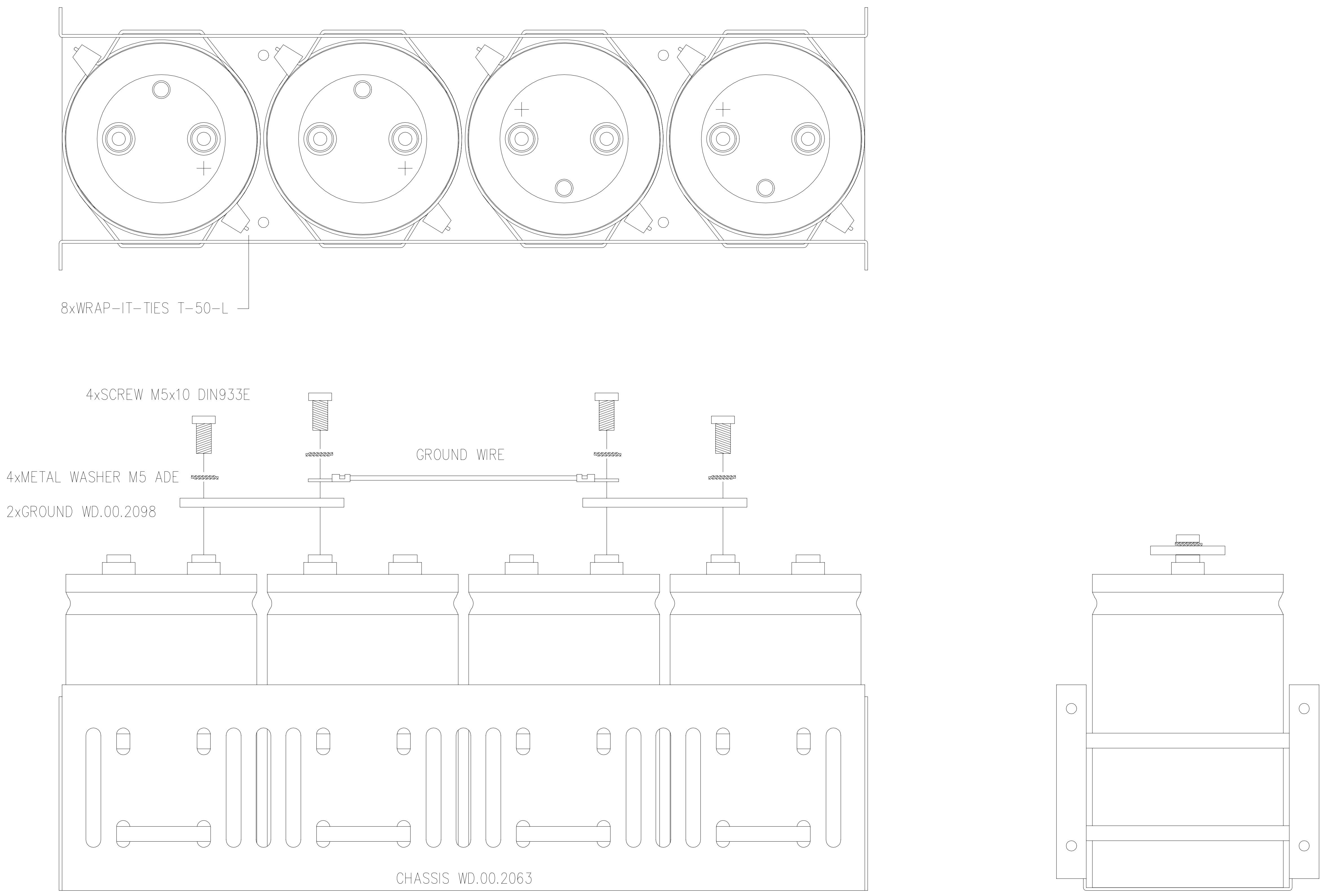


TITLE: MECHANICAL DIAGRAM		MODEL: PAM2600/2200	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 1 OF 5	
DRAWN: J.QUERALT	DATE: 06.07.95	REPLACES:	DRW. NO. 30.0042 · REV.
CHECKED:	DATE:	REPLACED BY:	

PARTS LIST:	MECHANICAL DIAGRAM		
MODEL : PAM2600/2000	DRW. No 30.0042PL		REV:
DATE: 060795	SHEET 1 OF 1	REPLACES:	REPLACED BY:

OLD VERSION

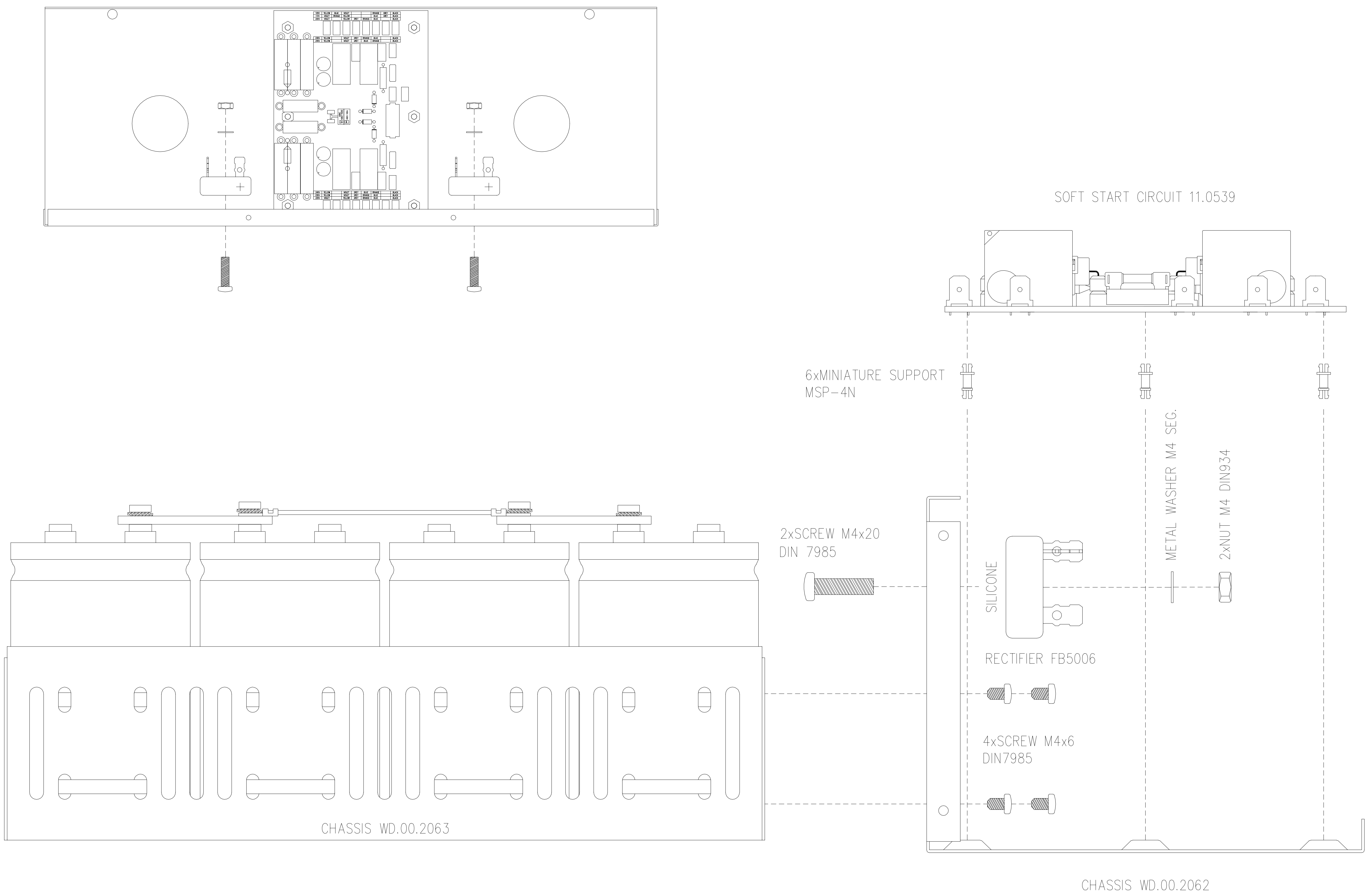
QUANTITY	VALUE
18	SCREW M4x6 SPANLO DIN7985
6	SCREW M4x20 ALLEN DIN912
8	SCREW M4x12 SPANLO DIN965
16	SCREW M3x9 SPANLO DIN7985
8	METAL WASHER 3.2x6x1
4	INSULANT R19
2	CARDBOARD WD.03.0069
2	ASSEMBLED PRINTED CIRCUIT 11.504B
6	NUT M4
6	WASHER M4 ADE
1	HEAT SINK UPPER PART WD.00.2095
2	HEAT SINK WD.2090
1	SUPPORT WD.00.2086
4	CLAMP WD.00.1915
2	COOLING GILLS WD.00.2096
4	INSULANT TO126
4	INSULANT TO220



TITLE: ASSEMBLY FILTER CAPACITOR		MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 2 OF 5	
DRAWN: J.QUERALT	DATE: 13.07.95	REPLACES:	DRW. NO. 30.0043 / REV.
CHECKED:	DATE:	REPLACED BY:	

PARTS LIST:	ASSEMBLY FILTER CAPACITOR	
MODEL : PAM2600/2000	DRW. No 30.0043PL	REV:
DATE: 130796	SHEET 1 OF 1 REPLACES:	REPLACED BY:

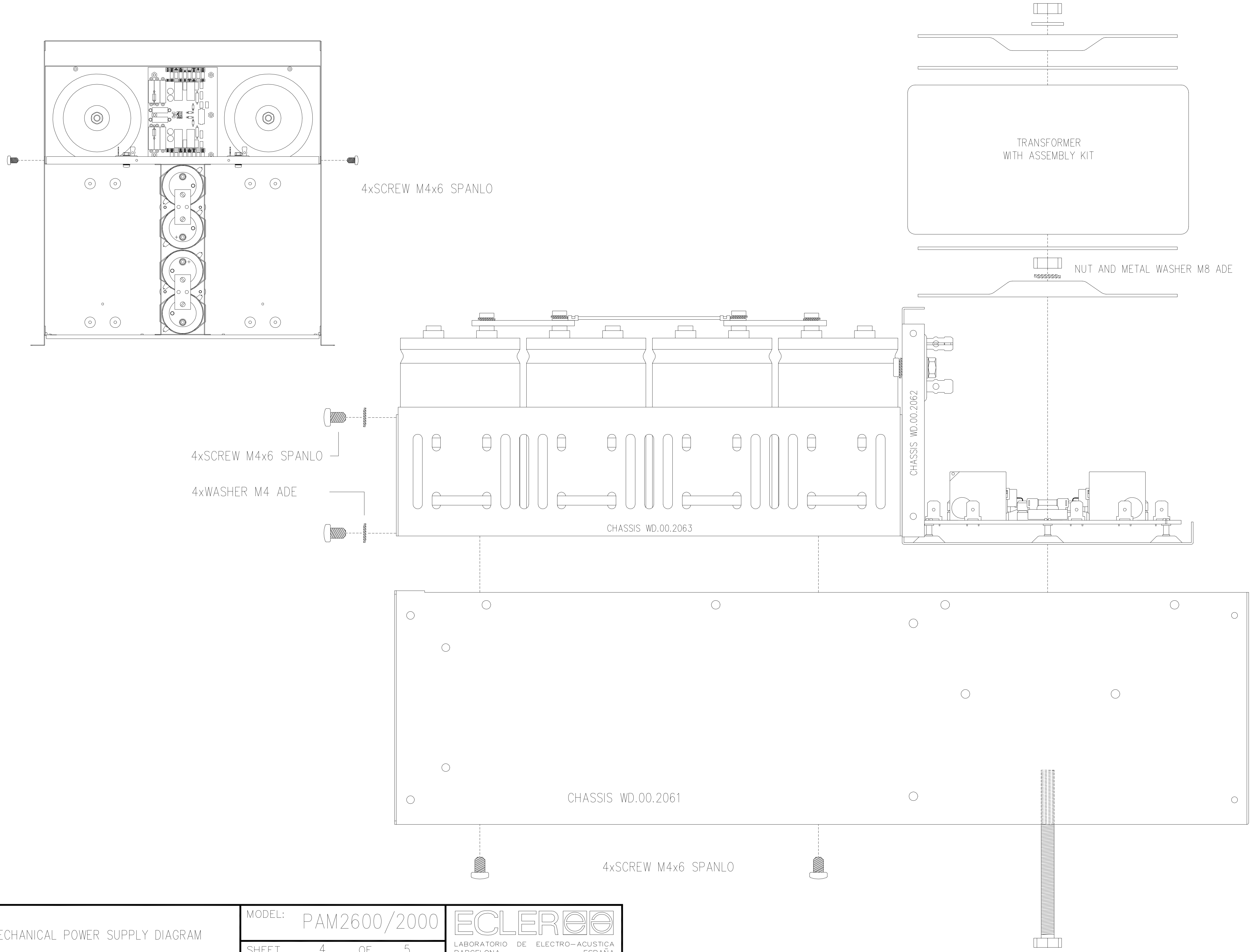
QUANTITY	VALUE
1	CHASSIS WD.00.2063
8	WRAP-IT-TIES T-50-L
2	GROUND WD.00.2098
4	SCREW M5x10 DIN933E
4	METAL WASHER M5 ADE
1	GROUND WIRE7
4	CAPACITORS 22000µ/100V (PAM2600)
4	CAPACITORS 15000µ/80v (PAM2000)



TITLE: ASSEMBLY RECTIFIERS AND SOFT START CIRCUIT		MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 3 OF 5	
DRAWN: J.QUERALT	DATE: 14.07.95	REPLACES:	DRW. NO. 30.0044 / REV.
CHECKED:	DATE:	REPLACED BY:	

PARTS LIST:	ASSEMBLY RECTIFIERS AND SOFT START CIRCUIT	
MODEL : PAM2600/2000	DRW. No 30.0044PL	REV:
DATE: 140795	SHEET 1 OF 1 REPLACES:	REPLACED BY:

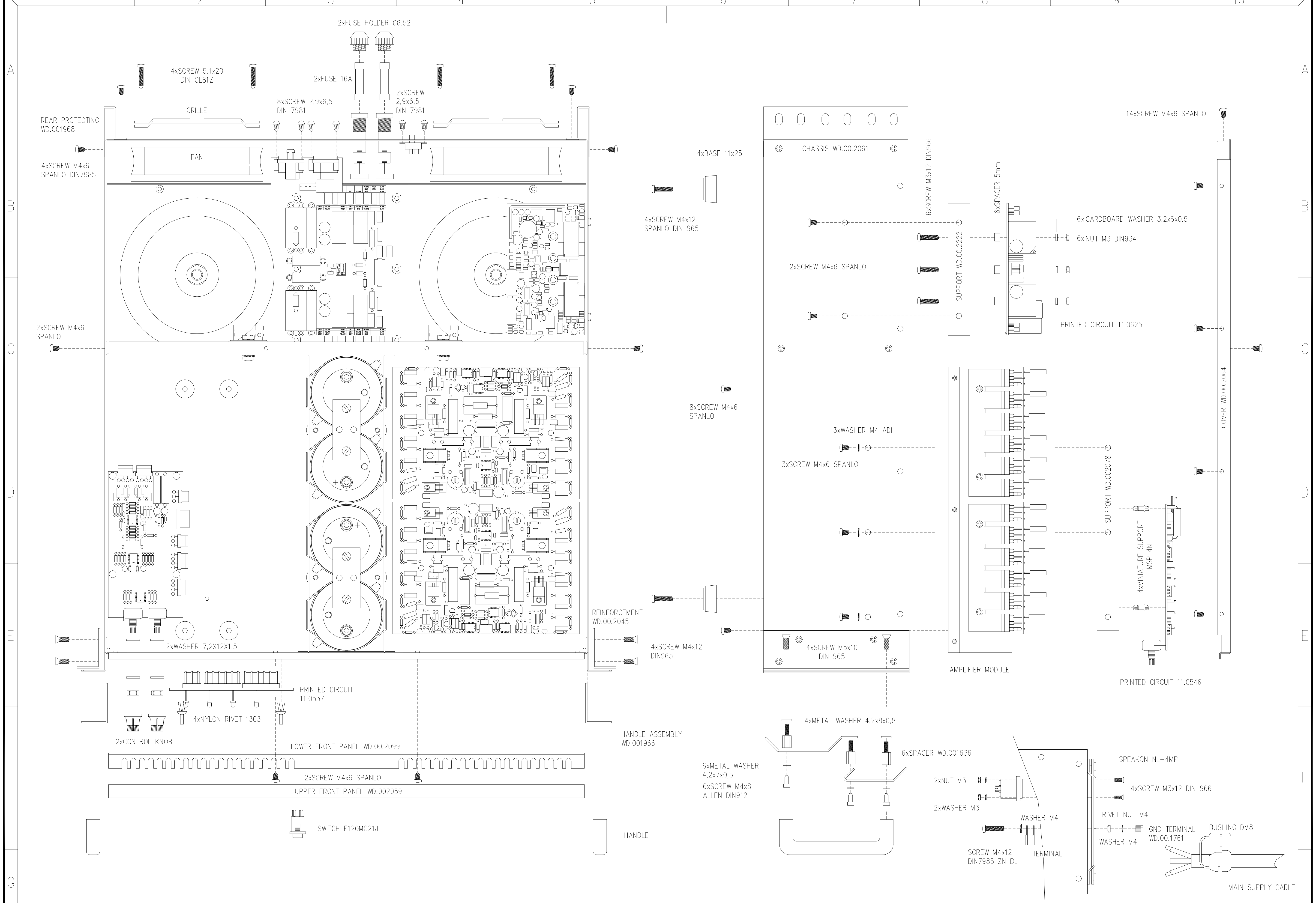
QUANTITY	VALUE
1	ASSEMBLED CHASSIS WD.00.2063
1	CHASSIS WD.00.2062
1	ASSEMBLED SOFT START CIRCUIT 11.0539B
6	MINIATURE SUPPORT MSP-4N
2	SCREW M4x20 DIN7985
2	METAL WASHER M4 SEG.
2	NUT M4 DIN934
4	SCREW M4x6 DIN7985
2	RECTIFIER FB5006 (PAM2600)
2	RECTIFIER FB3506 (PAM2000)



TITLE: MECHANICAL POWER SUPPLY DIAGRAM	MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
	SHEET 4 OF 5	
DRAWN: J. QUERALT — DATE: 18.07.95	REPLACES:	DRW. NO. 30.0045 — REV.
CHECKED: — DATE:	REPLACED BY:	

PARTS LIST:	MECHANICAL POWER SUPPLY DIAGRAM	
MODEL : PAM2600/2000	DRW. No 30.0045PL	REV:
DATE: 180795	SHEET 1 OF 1 REPLACES:	REPLACED BY:

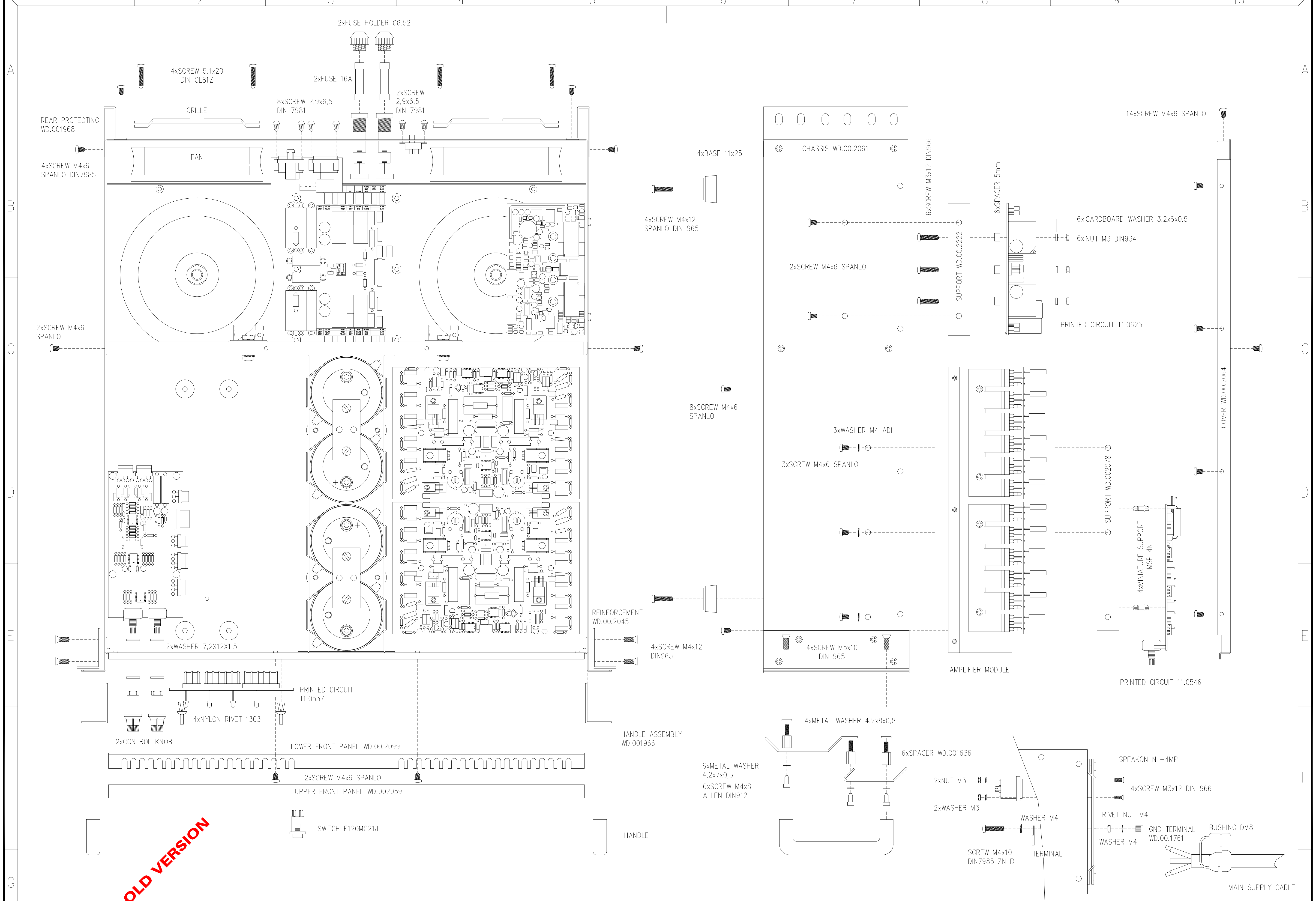
QUANTITY	VALUE
1	ASSEMBLED CHASSIS 2063 AND CHASSIS 2062
12	SCREW M4x6 SPANLO DIN7985
4	METAL WASHER M4 ADE
2	TRANSFORMER 64AD211 (PAM2600)
2	TRANSFORMER 51AD180 (PAM2000)
2	TRANSFORMER ASSEMBLY KIT



TITLE: MECHANICAL DIAGRAM		MODEL: PAM2600/2000		ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA	
		SHEET 5 OF 5			
DRAWN: J.QUERALT	DATE: 18.02.97	REPLACES:		DRW. NO. 30.0046	REV. D
CHECKED:	DATE:	REPLACED BY:			

PARTS LIST:	MECHANICAL DIAGRAM	REV: D
MODEL:PAM2600/2000	DRW.Nº 300046PL	REPLACES:
DATE: 200599	SHEET 1 OF 1	REPLACED BY:

QUANTITY	DESCRIPT
8	SCREW 5.1x20 DIN CL81Z
43	SCREW M4x6 SPANLO DIN7985
8	SCREW M4x12 DIN965
4	SCREW M4x12 SPANLO DIN965
1	SCREW M4x12 DIN7985
10	SCREW M3x12 DIN966
10	SCREW 2.9x6.5 DIN7981
6	SCREW M4x8 ALLEN DIN912
1	WASHER M4 ADE
1	WASHER M4 SEG.
4	WASHER M3 ADE
3	WASHER M4 ADI
1	RIVET NUT M4
1	GND TERMINAL WD.00.1761
10	NUT M3 DIN934
6	SPACER WD.00.1636
4	METAL WASHER 4.2x9x1.5
6	METAL WASHER 4.2x7x0.5
4	NYLON RIVET 1303
6	SPACER 5mm
2	WHITE D15 CONTROL KNOB
2	REINFORCEMENT WD.00.2045
2	HANDLE ASSEMBLY WD.00.1966
1	ASSEMBLY PRINTED CIRCUIT 11.0537
1	LOWER FRONT PANEL WD.00.2099
1	UPPER FRONT PANEL WD.00.2059
1	SWITCH E120MG21J
4	BASE 11x25
2	SUPPORT WD.00.2222
1	SUPPORT WD.00.2078
2	ASSEMBLY AMPLIFIER MODULE
4	MINIATURE SUPPORT MSP 4N
1	ASSEMBLED PRINTED CIRCUIT 11.0546
1	BUSHING DM8
1	MAIN SUPPLY CABLE
1	CHASSIS WD.00.2061
2	REAR PROTECTING WD.00.1968
2	PAPST 4312 FAN
2	FAN GRILLE
2	FUSE HOLDER 06.52
2	FUSE T16A
2	ASSEMBLED PRINTED CIRCUIT 11.0625
1	ASSEMBLED PRINTED CIRCUIT 11.0538
1	SWITCH 17120
2	HANDLE 1578
6	CARDBOARD WASHER 3.2x6x0.5

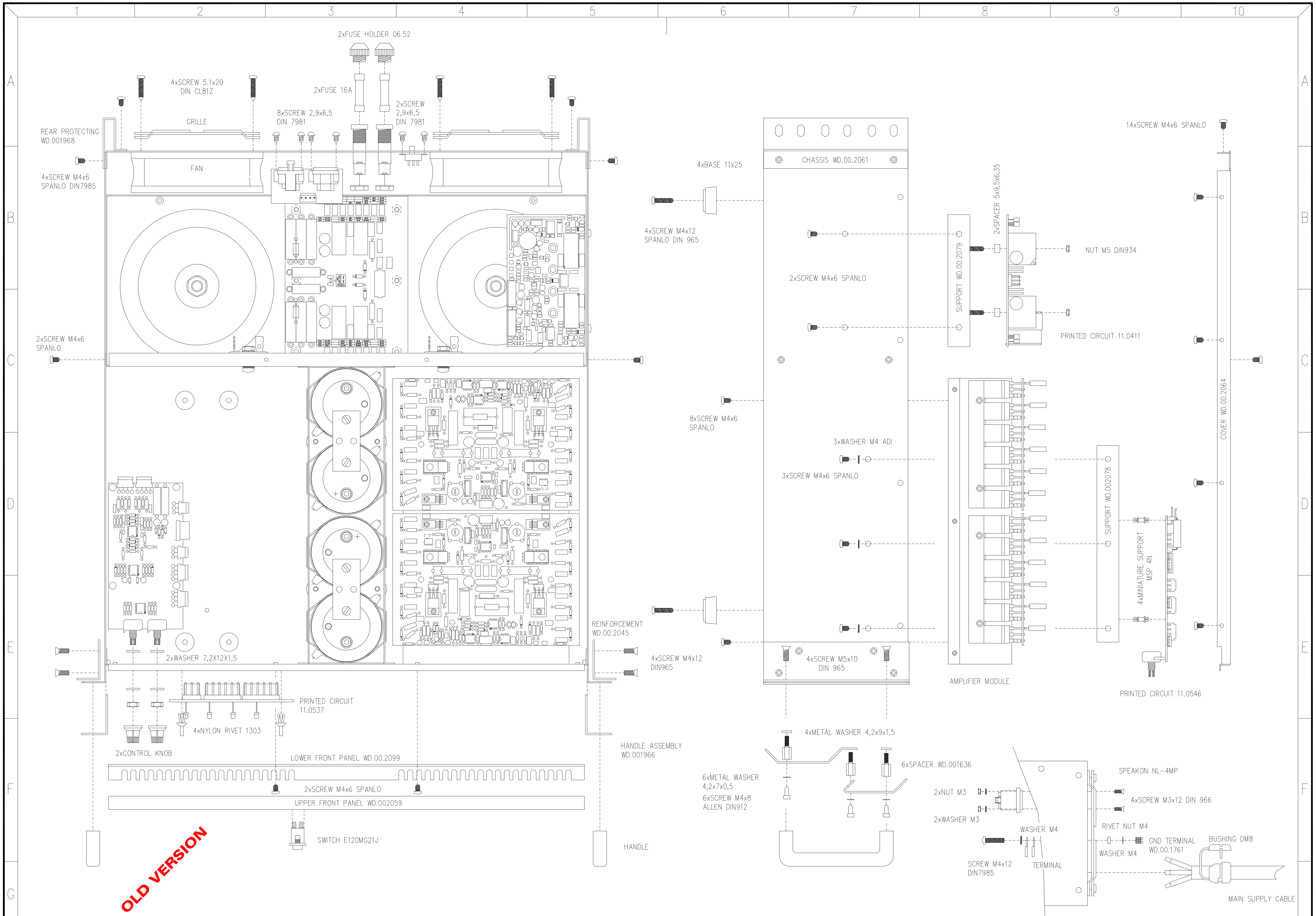


TITLE: MECHANICAL DIAGRAM		MODEL: PAM2600/2000		ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA	
		SHEET 5 OF 5			
DRAWN: J.QUERALT	DATE: 18.02.97	REPLACES:		DRW. NO. 30.0046	REV. C
CHECKED:	DATE:	REPLACED BY:			

PARTS LIST:	MECHANICAL DIAGRAM	REV: C
MODEL:PAM2600/2000	DRW.Nº 300046PL	REPLACES:
DATE: 200599	SHEET 1 OF 1	REPLACED BY:

OLD VERSION

QUANTITY	DESCRIPT
8	SCREW 5.1x20 DIN CL81Z
43	SCREW M4x6 SPANLO DIN7985
8	SCREW M4x12 DIN965
4	SCREW M4x12 SPANLO DIN965
1	SCREW M4x10 DIN7985
10	SCREW M3x12 DIN966
10	SCREW 2.9x6.5 DIN7981
6	SCREW M4x8 ALLEN DIN912
1	WASHER M4 ADE
1	WASHER M4 SEG.
4	WASHER M3 ADE
3	WASHER M4 ADI
1	RIVET NUT M4
1	GND TERMINAL WD.00.1761
10	NUT M3 DIN934
6	SPACER WD.00.1636
4	METAL WASHER 4.2x9x1.5
6	METAL WASHER 4.2x7x0.5
4	NYLON RIVET 1303
6	SPACER 5mm
2	WHITE D15 CONTROL KNOB
2	REINFORCEMENT WD.00.2045
2	HANDLE ASSEMBLY WD.00.1966
1	ASSEMBLY PRINTED CIRCUIT 11.0537
1	LOWER FRONT PANEL WD.00.2099
1	UPPER FRONT PANEL WD.00.2059
1	SWITCH E120MG21J
4	BASE 11x25
2	SUPPORT WD.00.2222
1	SUPPORT WD.00.2078
2	ASSEMBLY AMPLIFIER MODULE
4	MINIATURE SUPPORT MSP 4N
1	ASSEMBLED PRINTED CIRCUIT 11.0546
1	BUSHING DM8
1	MAIN SUPPLY CABLE
1	CHASSIS WD.00.2061
2	REAR PROTECTING WD.00.1968
2	PAPST 4312 FAN
2	FAN GRILLE
2	FUSE HOLDER 06.52
2	FUSE T16A
2	ASSEMBLED PRINTED CIRCUIT 11.0625
1	ASSEMBLED PRINTED CIRCUIT 11.0538
1	SWITCH 17120
2	HANDLE 1578
6	CARDBOARD WASHER 3.2x6x0.5



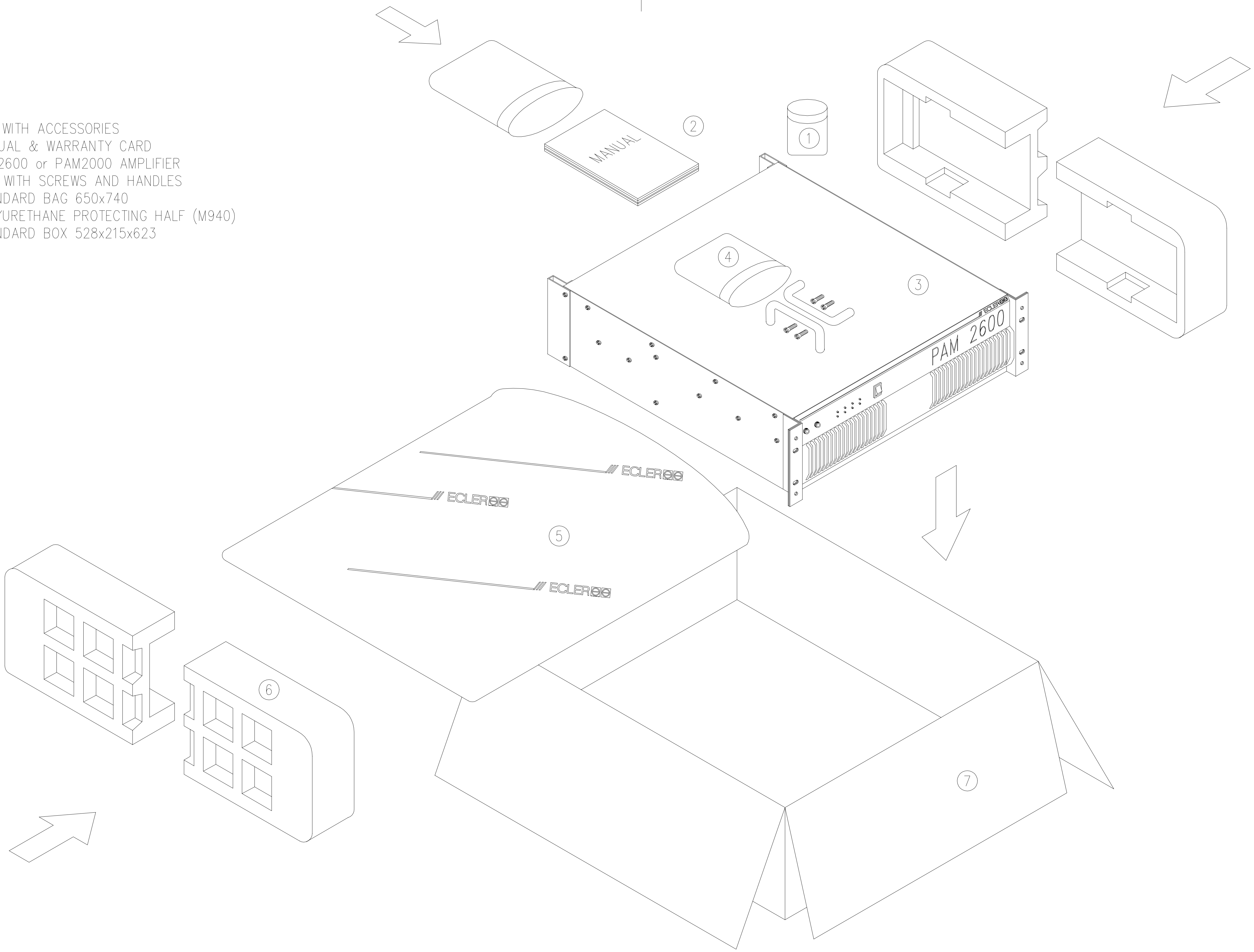
TITLE: MECHANICAL DIAGRAM		MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 5 OF 5	
DRAWN: J.QUERALT	DATE: 05.09.95	REPLACES:	DRW. NO. 30.0046 / REV.
CHECKED:	DATE:	REPLACED BY:	

PARTS LIST:	MECHANICAL DIAGRAM	
MODEL : PAM2600/2000	DRW. No 30.0046PL	REV:
DATE: 050995	SHEET 1 OF 1 REPLACES:	REPLACED BY:

OLD VERSION

QUANTITY	VALUE
8	SCREW 5.1x20 DIN CL81Z
43	SCREW M4x6 SPANLO DIN7985
8	SCREW M4x12 DIN965
4	SCREW M4x12 SPANLO DIN965
1	SCREW M4x12 DIN7985
4	SCREW M3x12 DIN966
10	SCREW 2.9x6.5 DIN7981
4	SCREW M5x10 DIN965
6	SCREW M4x8 ALLEN DIN912
1	WASHER M4 ADE
1	WASHER M4 SEG.
4	WASHER M3 ADE
3	WASHER M4 ADI
1	RIVET NUT M4
1	GND TERMINAL WD.00.1761
4	NUT M3 DIN934
4	NUT M5 DIN934
6	SPACER WD.00.1636
4	METAL WASHER 4.2x9x1.5
6	METAL WASHER 4.2x7x0.5
4	NYLON RIVET 1303
4	SPACER 5x9.5x6.35
2	WHITE D15 CONTROL KNOB
2	REINFORCEMENT WD.00.2045
2	HANDLE ASSEMBLY WD.00.1966
1	ASSEMBLY PRINTED CIRCUIT 11.0537
1	LOWER FRONT PANEL WD.00.2099
1	UPPER FRONT PANEL WD.00.2059
1	SWITCH E120MG21J
4	BASE 11x25
2	SUPPORT WD.00.2079
1	SUPPORT WD.00.2078
2	ASSEMBLY AMPLIFIER MODULE
4	MINIATURE SUPPORT MSP 4N
1	ASSEMBLED PRINTED CIRCUIT 11.0546
1	BUSHING DM8
1	MAIN SUPPLY CABLE
1	CHASSIS WD.00.2061
2	REAR PROTECTING WD.00.1968
2	PAPST 4312 FAN
2	FAN GRILLE
2	FUSE HOLDER 06.52
2	FUSE T16A
2	ASSEMBLED PRINTED CIRCUIT 11.0411
1	ASSEMBLED PRINTED CIRCUIT 11.0538
1	SWITCH 17120
2	HANDLE 1578

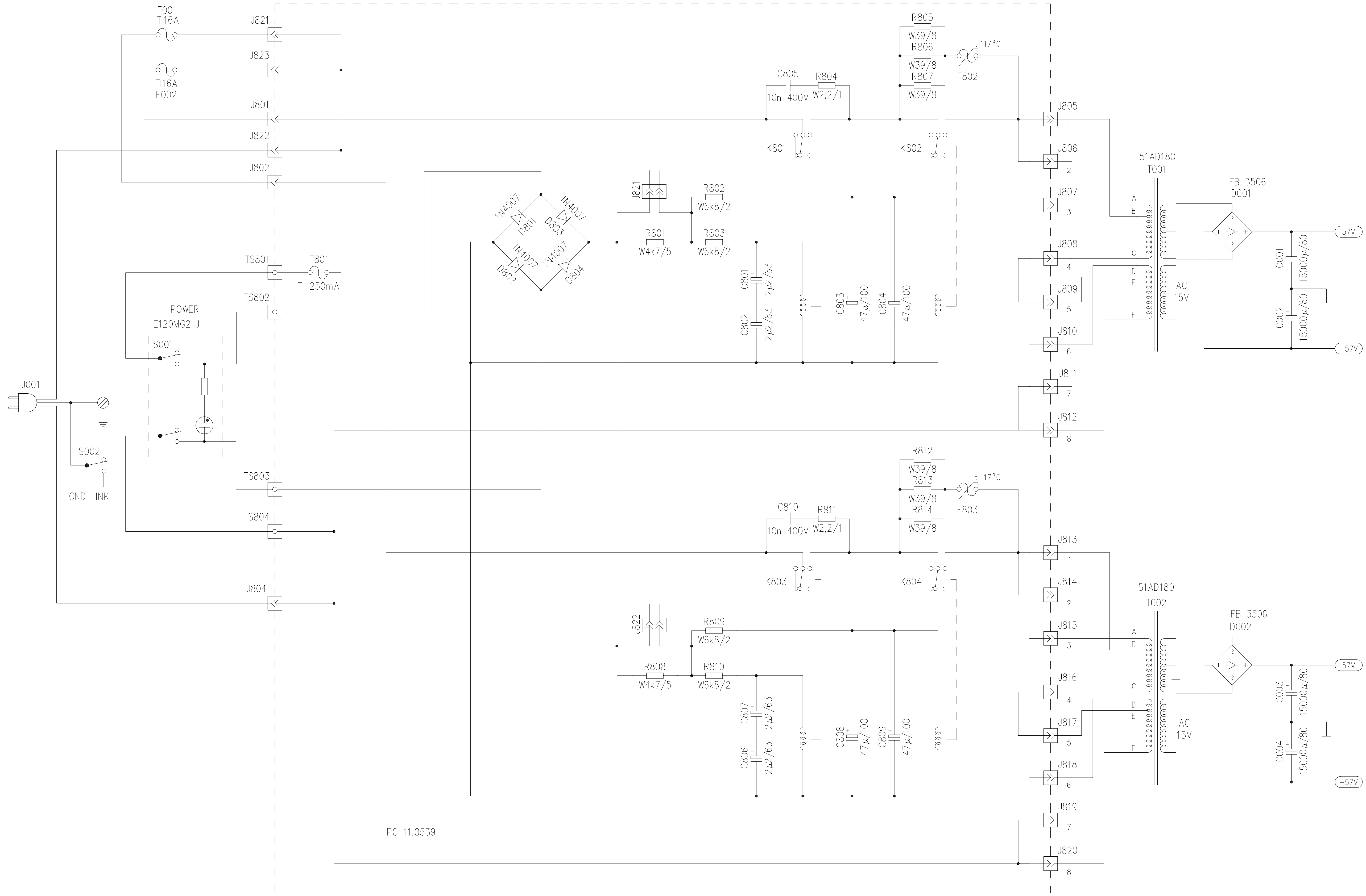
1-BAG WITH ACCESSORIES
2-MANUAL & WARRANTY CARD
3-PAM2600 or PAM2000 AMPLIFIER
4-BAG WITH SCREWS AND HANDLES
5-STANDARD BAG 650x740
6-POLYURETHANE PROTECTING HALF (M940)
7-STANDARD BOX 528x215x623



TITLE: PACKING DIAGRAM		MODEL: PAM2600/2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 1 OF 1	
DRAWN: J.QUERALT	DATE: 26.07.95	REPLACES:	DRW. NO. 32.0014 / REV.
CHECKED:	DATE:	REPLACED BY:	

PARTS LIST:	PACKING DIAGRAM	
MODEL : PAM2600/2000	DRW. No 32.0014PL	REV:
DATE: 260795	SHEET 1 OF 1 REPLACES:	REPLACED BY:

QUANTITY	VALUE
4	METAL WASHER 5x11.5x0.8
4	WASHER AT 5x11.5x3.5 ABS BLACK
2	FUSE T16A
1	STANDARD BOX 528x215x623
4	POLYURETHANE PROTECTING HALF (M940)
1	STANDARD BAG 650x740
1	BAG 60x80
4	SCREW M5x10 DIN965
2	HANDLE 1578
1	MANUAL
1	WARRANTY CARD

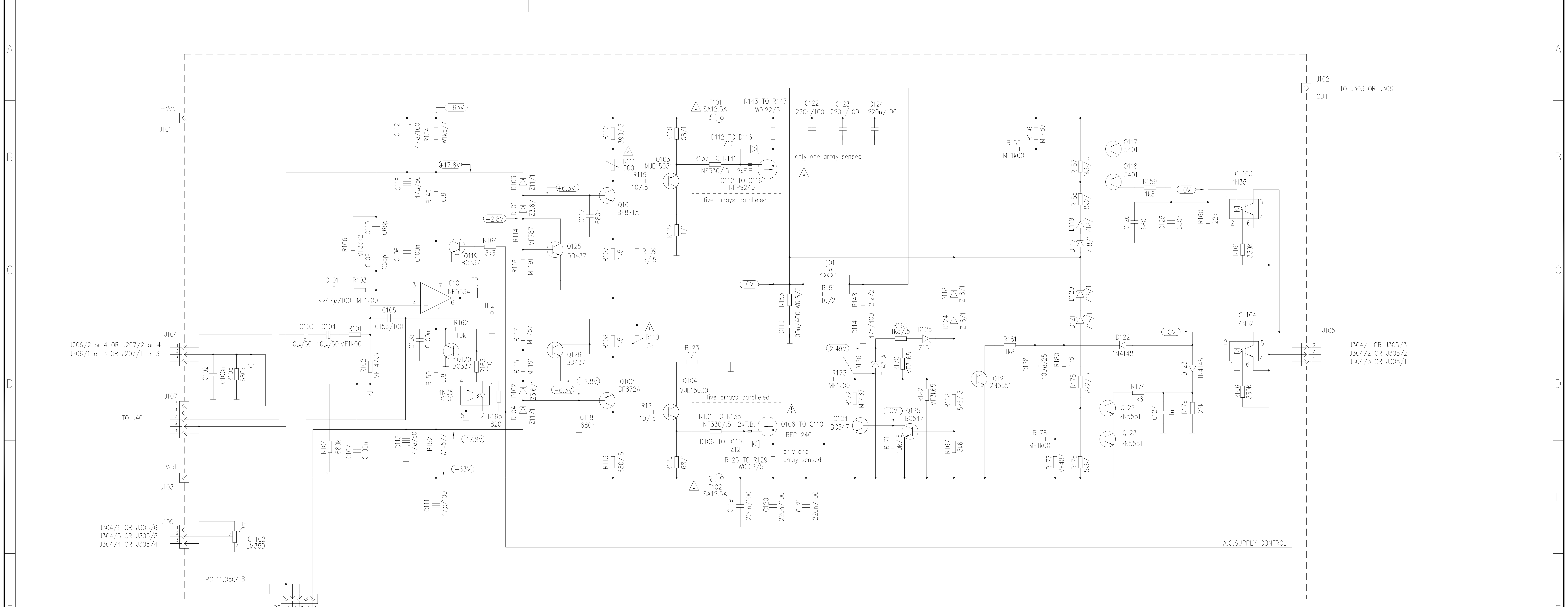


All capacitors 63 V. unless otherwise noted.
Resistors in Ohms. Capacitors in Farads. Inductors in Henries.
All resistors 1/4 W. unless otherwise noted.
See parts list for more information about components.

Special schematic abbreviations:
W wounded wire resistor
C ceramic capacitor

110 V	120 V	220 V	230 V	240 V
1 – B	1 – A	1 – B	1 – A	1 – A
2 – E	2 – D	2 –	2 –	2 –
3 – A	3 – B	3 – A	3 – B	3 – B
4 –	4 –	4 – C	4 – C	4 – C
5 –	5 –	5 – E	5 – E	5 – D
6 – D	6 – E	6 – D	6 – D	6 – E
7 – C	7 – C	7 –	7 –	7 –
8 – F	8 – F	8 – F	8 – F	8 – F
MINI-JUMPER J803 ON		MINI-JUMPER J803 OFF		

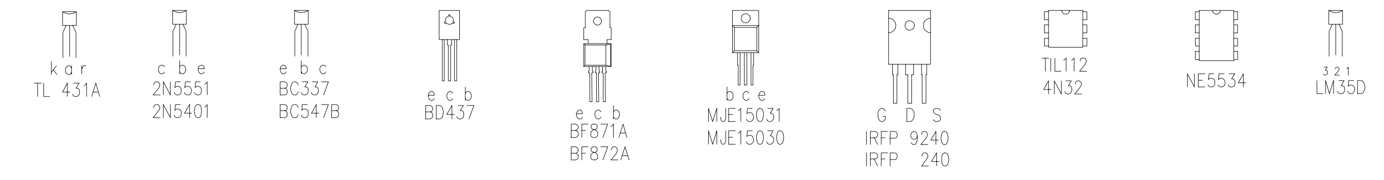
TITLE: SOFT START AND POWER CIRCUIT	MODEL: PAM2000 SHEET 1 OF 5	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA	
DRAWN: J.QUERALT	DATE: 05.04.95	REPLACES:	DRW. NO. 10.0346	REV.
CHECKED:	DATE:	REPLACED BY:	



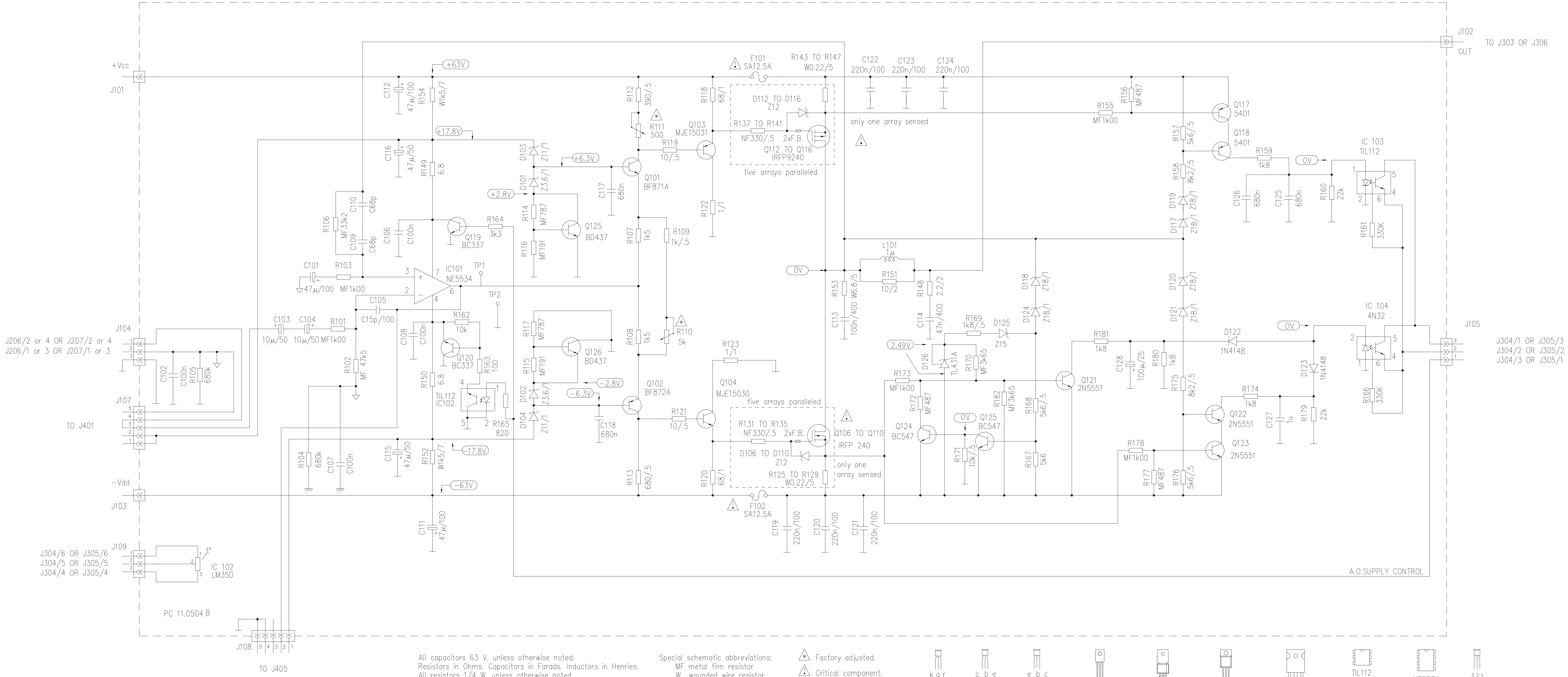
All capacitors 63 V. unless otherwise noted.
Resistors in Ohms. Capacitors in Farads. Inductors in Henries.
All resistors 1/4 W. unless otherwise noted.
See parts list for more information about components.
Part list especifies tolerance and power of the components.

Special schematic abbreviations:
MF metal film resistor
W wounded wire resistor
NF non inflammable resistor
T tantal capacitor
C ceramic capacitor
Z zenner diode

⚠ Factory adjusted.
⚠ Critical component.



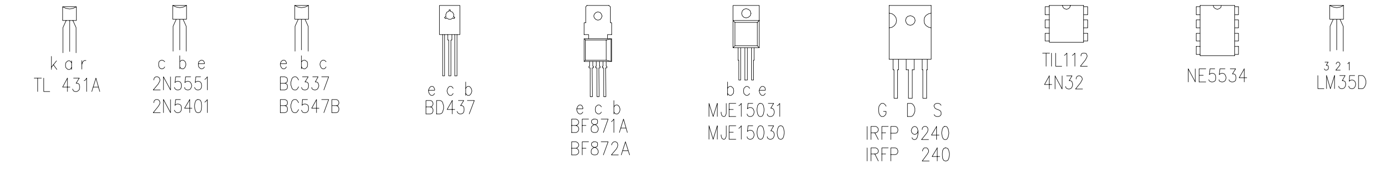
TITLE: POWER CIRCUIT AND SHORT CIRCUIT PROTECTION SCHEMATIC DIAGRAM	MODEL: PAM2000	ECLER — LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA	
	SHEET 3 OF 5		
DRAWN: J.QUERALT — DATE: 05.04.95	REPLACES:	DRW. NO. 10.0347	REV. A
CHECKED: — DATE:	REPLACED BY:		



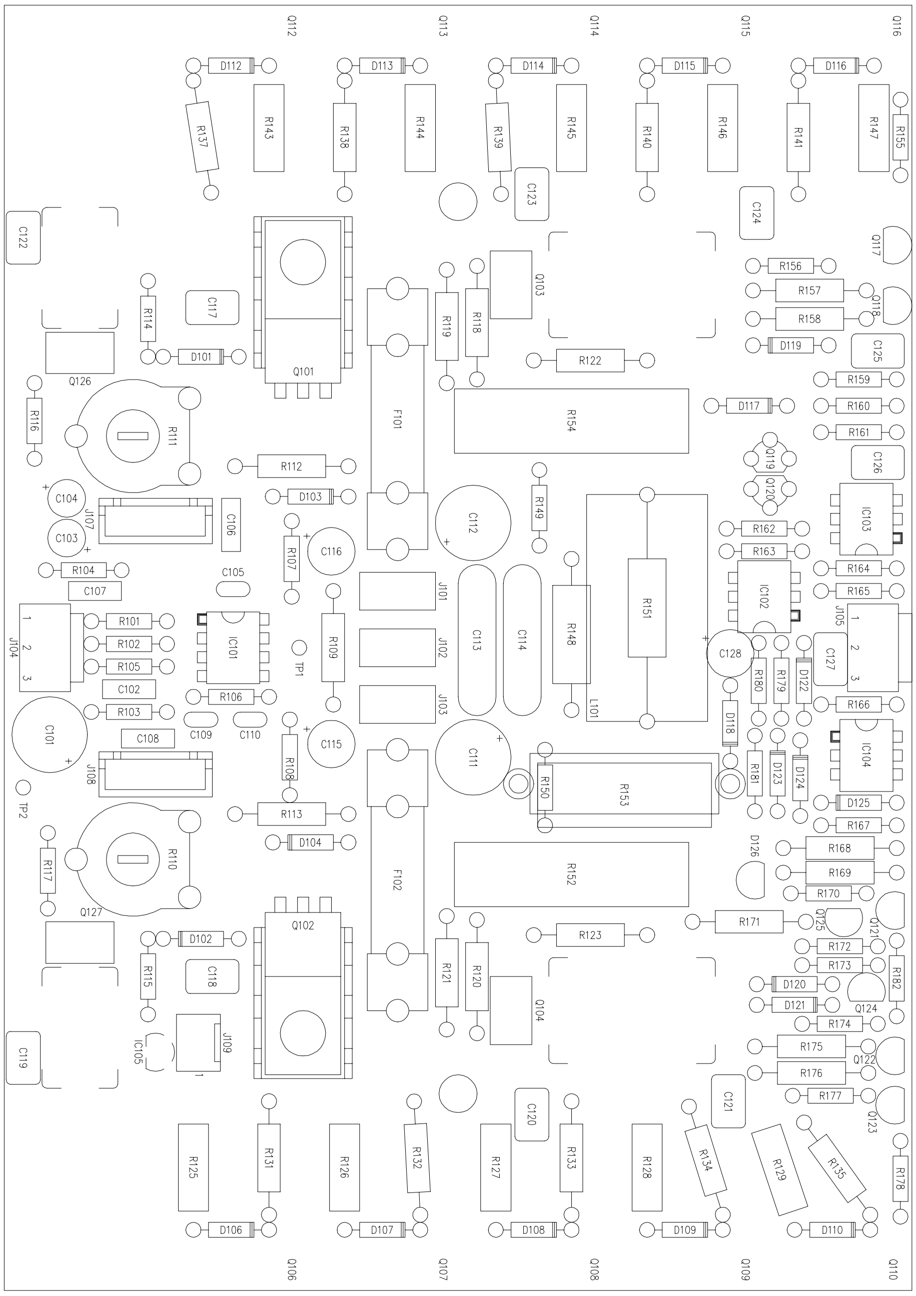
All capacitors 63 V. unless otherwise noted.
Resistors in Ohms. Capacitors in Farads. Inductors in Henries.
All resistors 1/4 W. unless otherwise noted.
See parts list for more information about components.
Part list especifies tolerance and power of the components.

Special schematic abbreviations:
MF metal film resistor
W wounded wire resistor
NF non inflammable resistor
T tantal capacitor
C ceramic capacitor
Z zenner diode

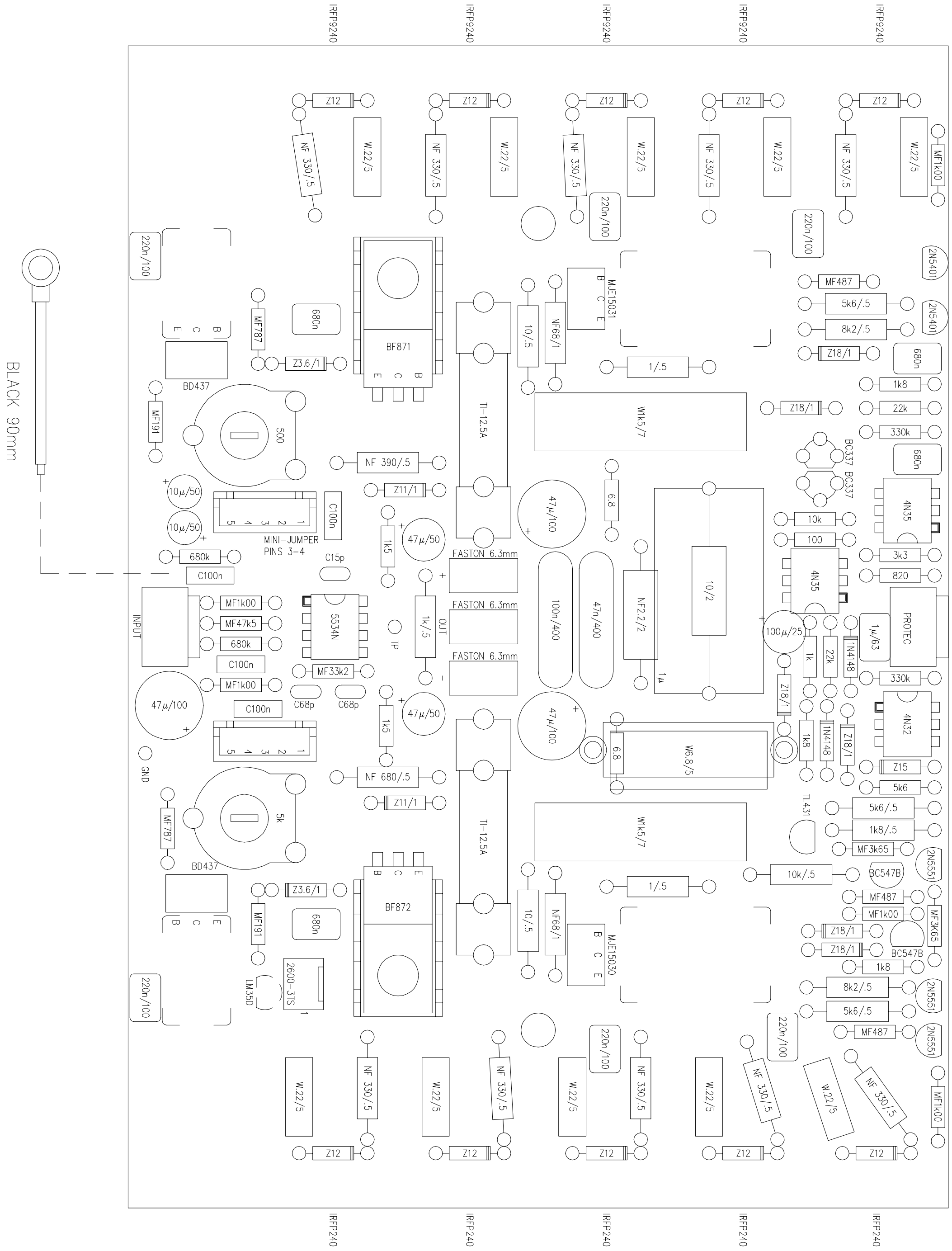
⚠ Factory adjusted.
⚠ Critical component.

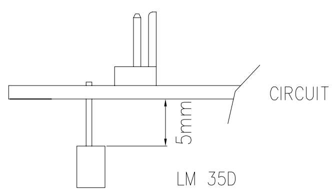


TITLE: POWER CIRCUIT AND SHORT CIRCUIT PROTECTION SCHEMATIC DIAGRAM		MODEL: PAM2000	ECLER — LABORATORIO DE ELECTRO-ACUSTICA, BARCELONA, ESPAÑA
		SHEET 3 OF 5	
DRAWN: J.QUERALT	DATE: 05.04.95	REPLACES:	DRW. NO. 10.0347 / REV.
CHECKED:	DATE:	REPLACED BY:	

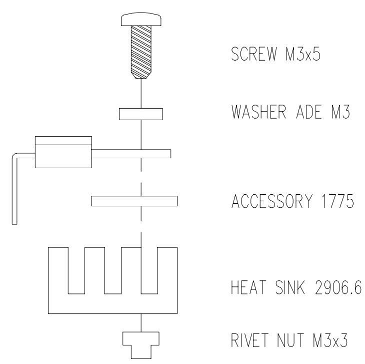


TITLE: POWER CIRCUIT AND SHORT CIRCUIT PROTECTION		MODEL: PAM2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
		SHEET 1 OF 6	
DRAWN: J.QUERALT	DATE: 17.10.95	REPLACES:	DRW. NO. 33.0129R/ — REV. C
CHECKED:	DATE:	REPLACED BY:	

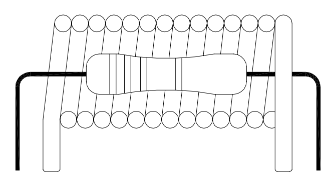




LM 35D ASSEMBLY DETAIL



TRANSISTOR ASSEMBLY DETAIL



RESISTOR AND INDUCTANCE ASSEMBLY DETAIL

TITLE: POWER CIRCUIT AND SHORT CIRCUIT PROTECTION		MODEL: PAM2000 SHEET 1 OF 6	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
DRAWN: J.QUERALT	DATE: 17.10.95	REPLACES:	DRW. NO. 33.0129 V/ — REV. C
CHECKED:	DATE:	REPLACED BY:	

PARTS LIST:	POWER CIRCUIT AND	SHORT CIRCUIT PROTECTION
MODEL:PAM2000	DRW.Nº 33.0129PL	REV : A
DATE: 000621	SHEET 1 OF 3	REPLACED BY:

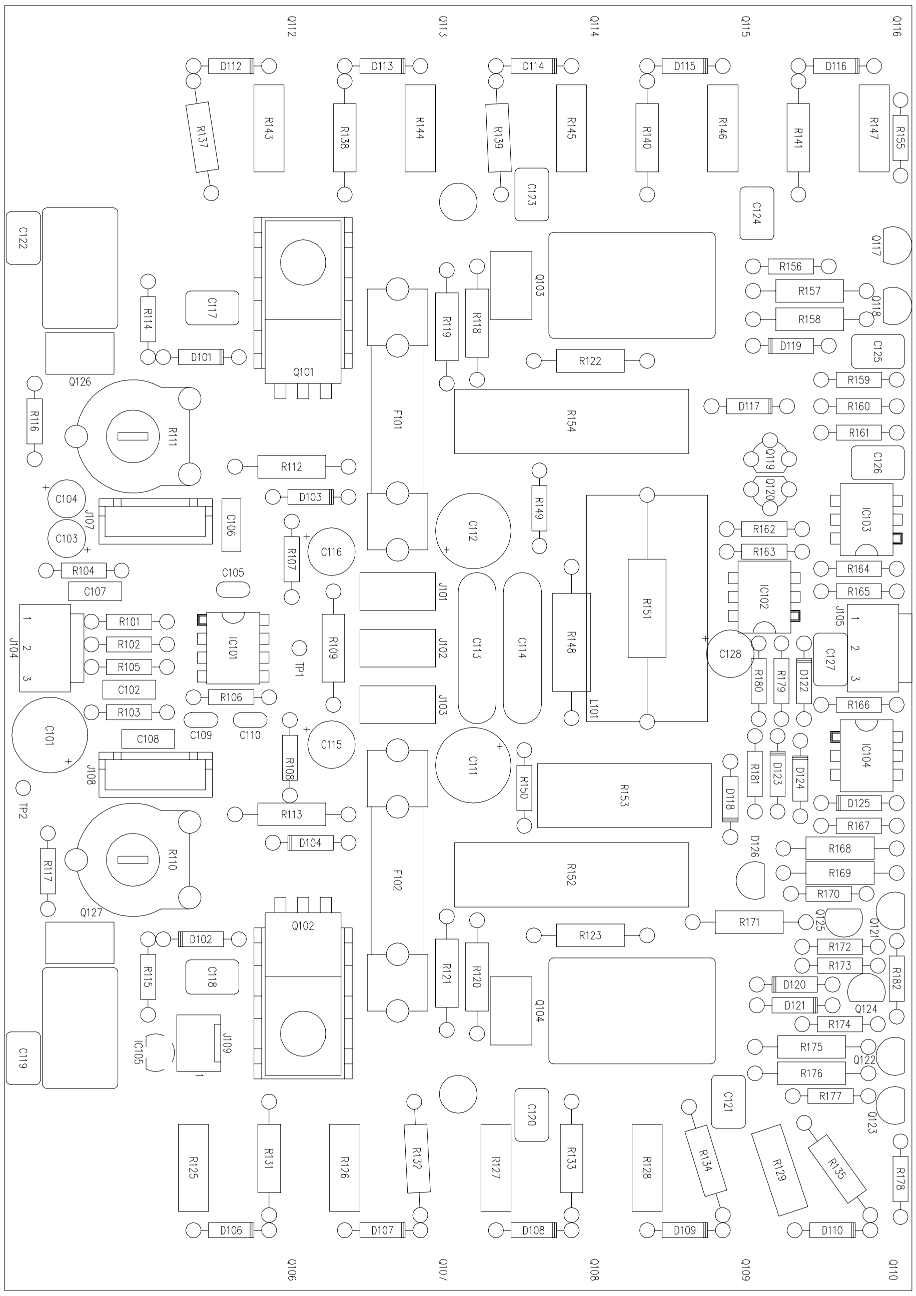
REFERENCE	VALUE
C101	47µ/100
C102	C100n
C103	10µ/50
C104	10µ/50
C105	C15p
C106	C100n
C107	C100n
C108	C100n
C109	C68p
C110	C68p
C111	47µ/100
C112	47µ/100
C113	100n/400
C114	47n/400
C115	47µ/50
C116	47µ/50
C117	680n
C118	680n
C119	220n/100
C120	220n/100
C121	220n/100
C122	220n/100
C123	220n/100
C124	220n/100
C125	680n
C126	680n
C127	1µ/63
C128	100µ/25
D101	Z3.6/1
D102	Z3.6/1
D103	Z11/1
D104	Z11/1
D106	Z12
D107	Z12
D108	Z12
D109	Z12
D110	Z12
D112	Z12
D113	Z12
D114	Z12
D115	Z12
D116	Z12
D117	Z18/1
D118	Z18/1
D119	Z18/1
D120	Z18/1
D121	Z18/1
D122	1N4148
D123	1N4148
D124	Z18/1
D125	Z15
D126	TL431
F101	TI-12.5A
F102	TI-12.5A
IC101	5534N
IC102	4N35
IC103	4N35
IC104	4N32

PARTS LIST:	POWER CIRCUIT AND	SHORT CIRCUIT PROTECTION
MODEL:PAM2000	DRW.Nº 33.0129PL	REV : A
DATE: 000621	SHEET 2 OF 3	REPLACED BY:

REFERENCE	VALUE
IC105	LM35D
J101	FASTON 6.3mm
J102	FASTON 6.3mm
J103	FASTON 6.3mm
J104	B3P-VH
J105	B3P-VH
J107	B5B-XH
J108	B5B-XH
J109	2600-3TS
Q101	BF871
Q102	BF872
Q103	MJE15031
Q104	MJE15030
Q106	IRFP240
Q107	IRFP240
Q108	IRFP240
Q109	IRFP240
Q110	IRFP240
Q112	IRFP9240
Q113	IRFP9240
Q114	IRFP9240
Q115	IRFP9240
Q116	IRFP9240
Q117	2N5401
Q118	2N5401
Q119	BC337
Q120	BC337
Q121	2N5551
Q122	2N5551
Q123	2N5551
Q124	BC547B
Q125	BC547B
Q126	BD437
Q127	BD437
R101	MF1k
R102	MF47k5
R103	MF1k00
R104	680k
R105	680k
R106	MF33k2
R107	1k5
R108	1k5
R109	1k/.5
R110	5k
R111	500 Ω
R112	NF390/.5
R113	NF680 Ω /.5
R114	MF787 Ω
R115	MF191 Ω
R116	MF191 Ω
R117	MF787 Ω
R118	NF68 Ω /1
R119	10 Ω /.5
R120	NF68 Ω /1
R121	10 Ω /.5
R122	1 Ω /.5
R123	1 Ω /.5
R125	W.22 Ω /5

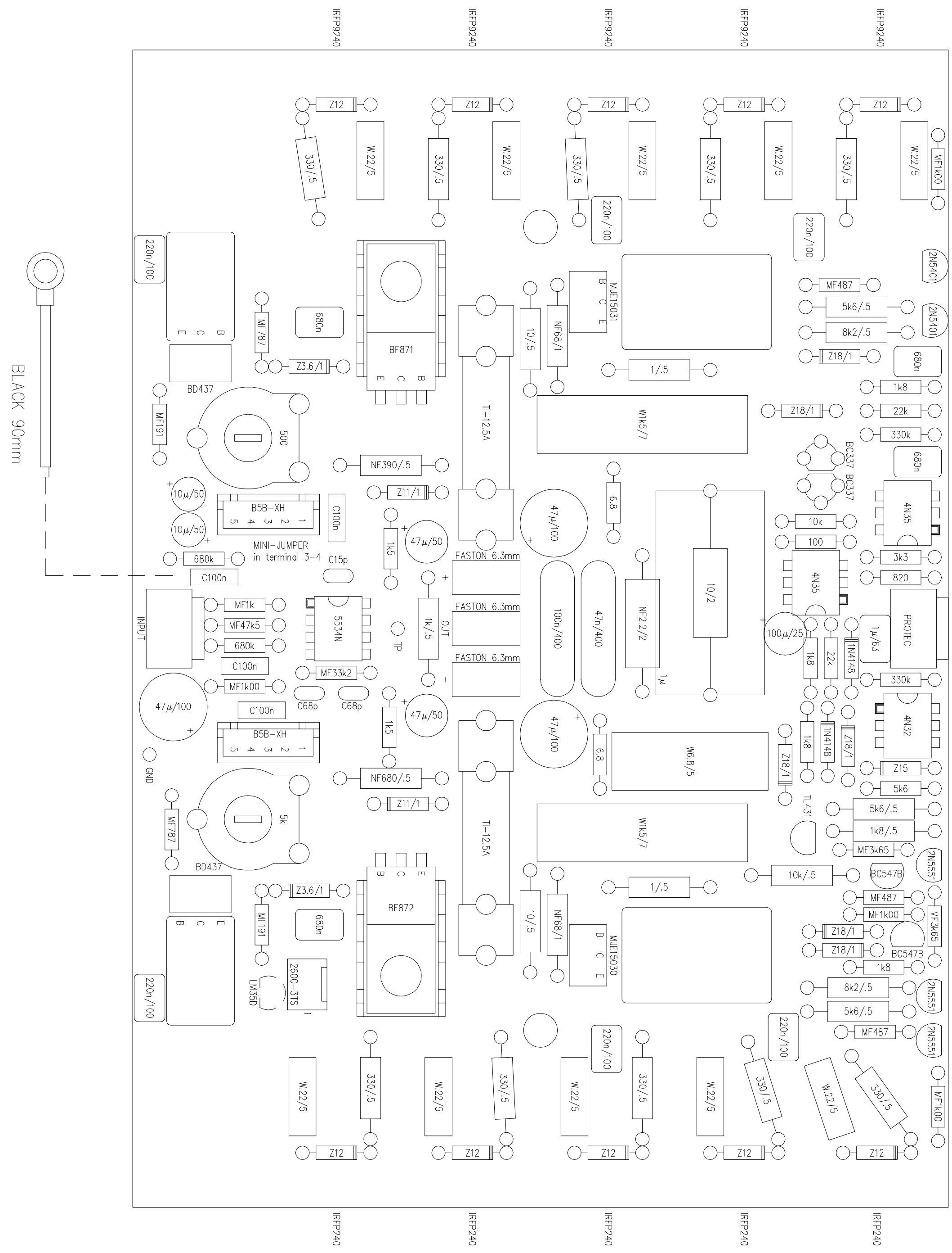
PARTS LIST:	POWER CIRCUIT AND	SHORT CIRCUIT PROTECTION
MODEL:PAM2000	DRW.Nº 33.0129PL	REV : A
DATE: 000621	SHEET 3 OF 3	REPLACED BY:

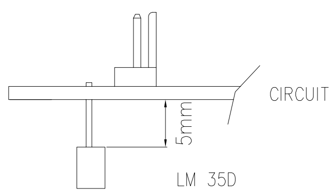
REFERENCE	VALUE
R126	W.22 Ω /5
R127	W.22 Ω /5
R128	W.22 Ω /5
R129	W.22 Ω /5
R131	330 Ω /.5
R132	330 Ω /.5
R133	330 Ω /.5
R134	330 Ω /.5
R135	330 Ω /.5
R137	330 Ω /.5
R138	330 Ω /.5
R139	330 Ω /.5
R140	330 Ω /.5
R141	330 Ω /.5
R143	W.22 Ω /5
R144	W.22 Ω /5
R145	W.22 Ω /5
R146	W.22 Ω /5
R147	W.22 Ω /5
R148	NF2.2 Ω /2
R149	6.8 Ω
R150	6.8 Ω
R151	10 Ω /2
R152	W1k5/7
R153	W6.8 Ω /5
R154	W1k5/7
R155	MF1k00
R156	MF487 Ω
R157	5k6/.5
R158	8k2/.5
R159	1k8
R160	22k
R161	330k
R162	10k
R163	100 Ω
R164	3k3
R165	820 Ω
R166	330k
R167	5k6
R168	5k6/.5
R169	1k8/.5
R170	MF3k65
R171	10k/.5
R172	MF487 Ω
R173	MF1k00
R174	1k8
R175	8k2/.5
R176	5k6/.5
R177	MF487 Ω
R178	MF1k00
R179	22k
R180	1k8
R181	1k8
R182	MF3k65
PC 11.0504B	PRINTED CIRCUIT
WIRE	BLACK 90mm whit TER.



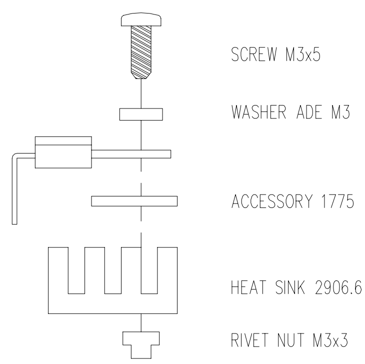
OLD VERSION

TITLE: POWER CIRCUIT AND SHORT CIRCUIT PROTECTION		MODEL: PAM2000 SHEET 1 OF 6	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
DRAWN: J.QUERALT	DATE: 17.10.95	REPLACES:	DRW. NO. 33.0129R/
CHECKED:	DATE:	REPLACED BY:	REV. A

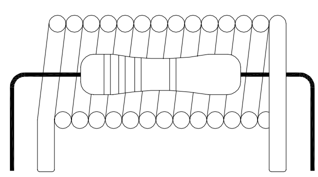




LM 35D ASSEMBLY DETAIL



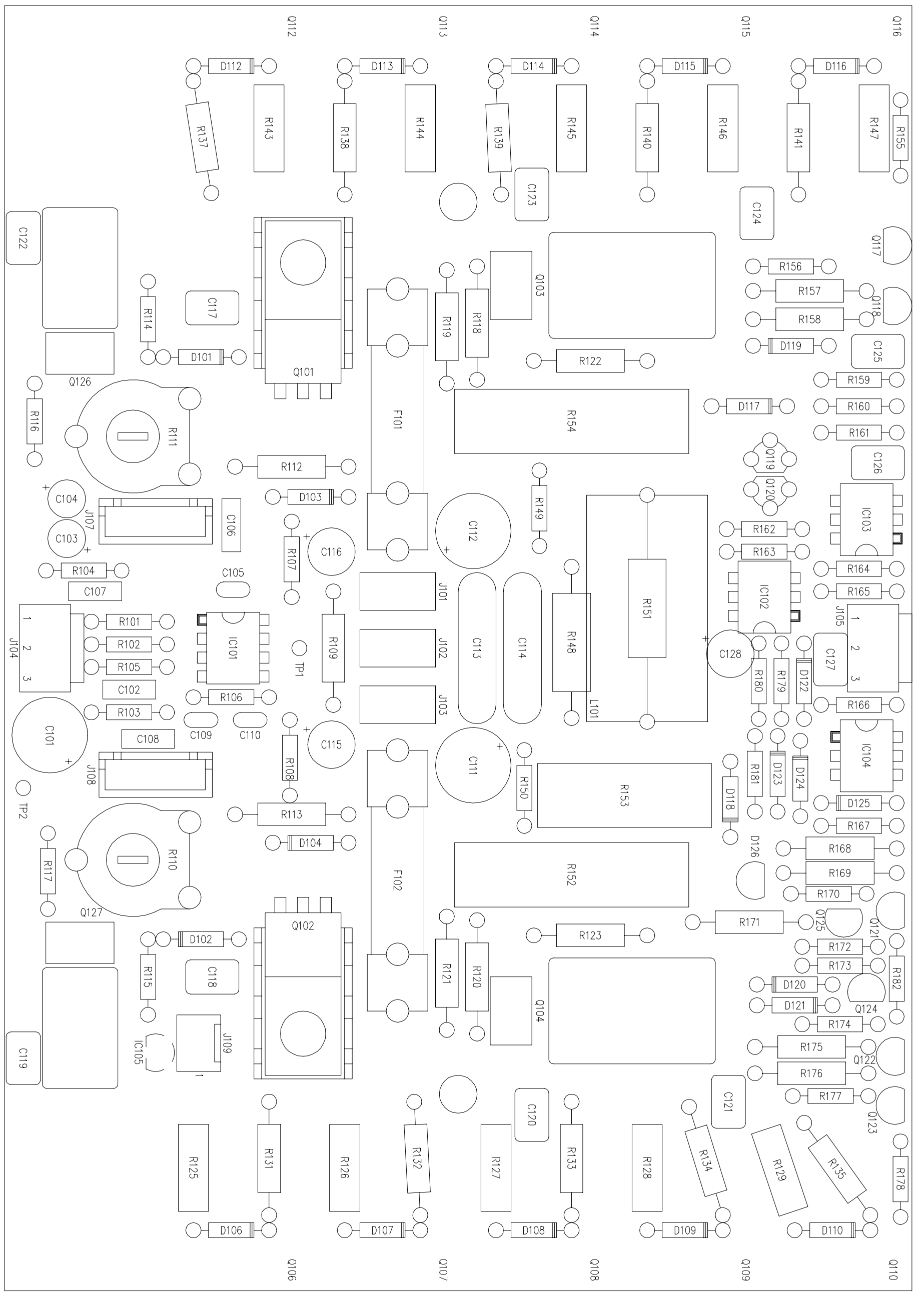
TRANSISTOR ASSEMBLY DETAIL



RESISTOR AND INDUCTANCE ASSEMBLY DETAIL

OLD VERSION

TITLE: POWER CIRCUIT AND SHORT CIRCUIT PROTECTION	MODEL: PAM2000	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
	SHEET 1 OF 6	
DRAWN: J.QUERALT — DATE: 17.10.95	REPLACES:	DRW. NO. 33.0129 V/ — REV. A
CHECKED: — DATE:	REPLACED BY:	



OLD VERSION

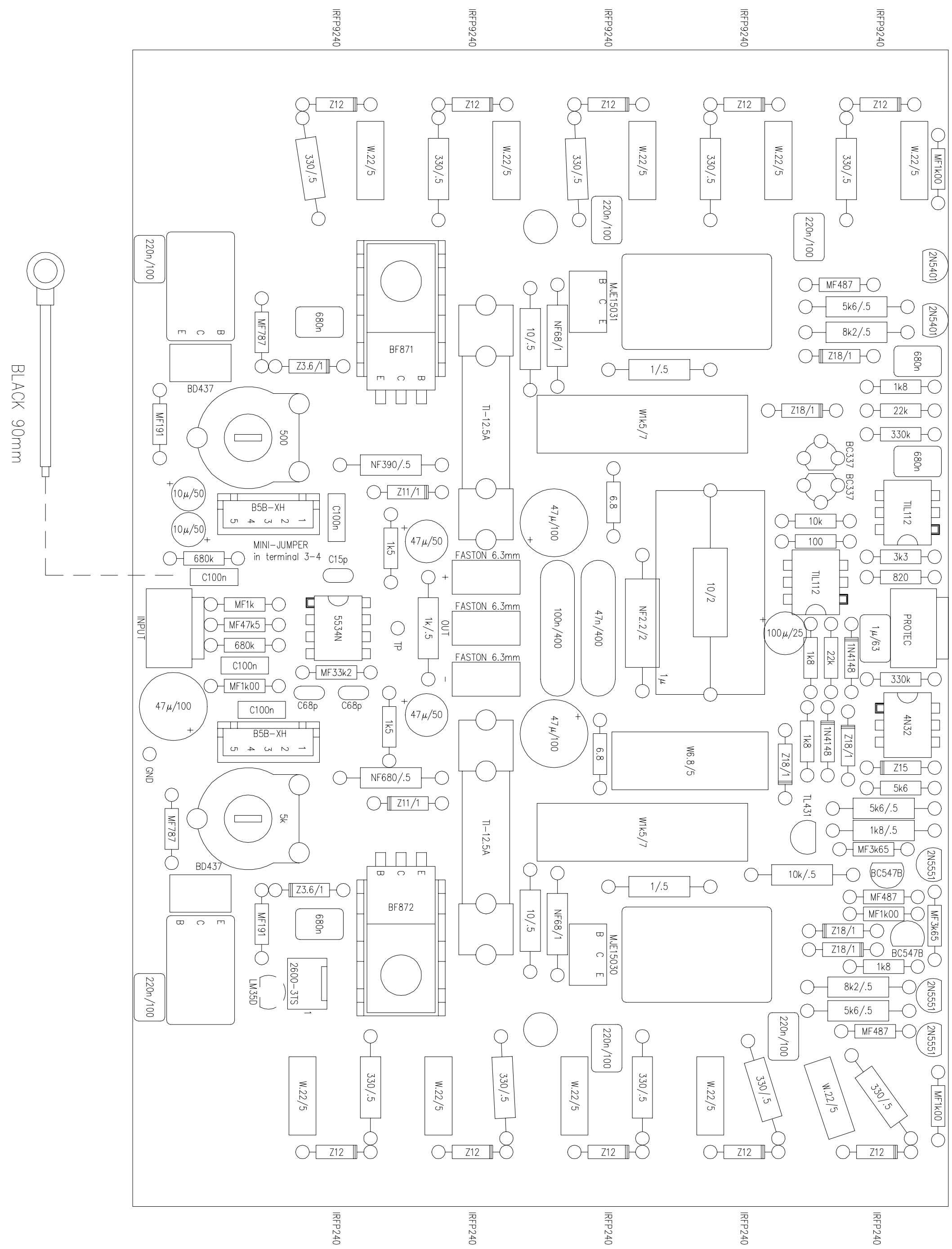
TITLE:
POWER CIRCUIT AND SHORT CIRCUIT PROTECTION

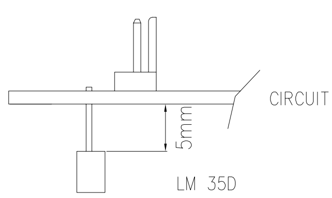
MODEL: PAM2000

SHEET 1 OF 6

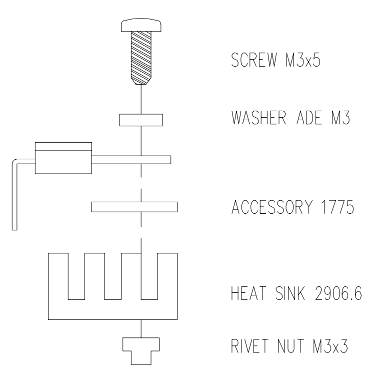
ECLER
LABORATORIO DE ELECTRO–ACUSTICA
BARCELONA ESPAÑA

DRAWN: J.QUERALT	DATE: 17.10.95	REPLACES:	DRW. NO. 33.0129R/
CHECKED:	DATE:	REPLACED BY:	REV.

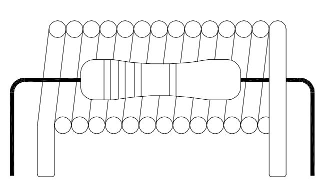




LM 35D ASSEMBLY DETAIL



TRANSISTOR ASSEMBLY DETAIL



RESISTOR AND INDUCTANCE ASSEMBLY DETAIL

OLD VERSION

TITLE: POWER CIRCUIT AND SHORT CIRCUIT PROTECTION		MODEL: PAM2000 / SHEET 1 OF 6	ECLER LABORATORIO DE ELECTRO-ACUSTICA BARCELONA ESPAÑA
DRAWN: J.QUERALT	DATE: 17.10.95	REPLACES:	DRW. NO. 33.0129 V/ — REV.
CHECKED:	DATE:	REPLACED BY:	

PARTS LIST:	POWER CIRCUIT AND	SHORT CIRCUIT PROTECTION
MODEL:PAM2000	DRW.Nº 33.0129PL	REV :
DATE: 000621	SHEET 1 OF 3	REPLACED BY:

OLD VERSION

REFERENCE	VALUE
C101	47µ/100
C102	C100n
C103	10µ/50
C104	10µ/50
C105	C15p
C106	C100n
C107	C100n
C108	C100n
C109	C68p
C110	C68p
C111	47µ/100
C112	47µ/100
C113	100n/400
C114	47n/400
C115	47µ/50
C116	47µ/50
C117	680n
C118	680n
C119	220n/100
C120	220n/100
C121	220n/100
C122	220n/100
C123	220n/100
C124	220n/100
C125	680n
C126	680n
C127	1µ/63
C128	100µ/25
D101	Z3.6/1
D102	Z3.6/1
D103	Z11/1
D104	Z11/1
D106	Z12
D107	Z12
D108	Z12
D109	Z12
D110	Z12
D112	Z12
D113	Z12
D114	Z12
D115	Z12
D116	Z12
D117	Z18/1
D118	Z18/1
D119	Z18/1
D120	Z18/1
D121	Z18/1
D122	1N4148
D123	1N4148
D124	Z18/1
D125	Z15
D126	TL431
F101	TI-12.5A
F102	TI-12.5A
IC101	5534N
IC102	TIL112
IC103	TIL112
IC104	4N32

PARTS LIST:	POWER CIRCUIT AND	SHORT CIRCUIT PROTECTION
MODEL:PAM2000	DRW.Nº 33.0129PL	REV :
DATE: 000621	SHEET 2 OF 3	REPLACED BY:

OLD VERSION

REFERENCE	VALUE
IC105	LM35D
J101	FASTON 6.3mm
J102	FASTON 6.3mm
J103	FASTON 6.3mm
J104	B3P-VH
J105	B3P-VH
J107	B5B-XH
J108	B5B-XH
J109	2600-3TS
Q101	BF871
Q102	BF872
Q103	MJE15031
Q104	MJE15030
Q106	IRFP240
Q107	IRFP240
Q108	IRFP240
Q109	IRFP240
Q110	IRFP240
Q112	IRFP9240
Q113	IRFP9240
Q114	IRFP9240
Q115	IRFP9240
Q116	IRFP9240
Q117	2N5401
Q118	2N5401
Q119	BC337
Q120	BC337
Q121	2N5551
Q122	2N5551
Q123	2N5551
Q124	BC547B
Q125	BC547B
Q126	BD437
Q127	BD437
R101	MF1k
R102	MF47k5
R103	MF1k00
R104	680k
R105	680k
R106	MF33k2
R107	1k5
R108	1k5
R109	1k/.5
R110	5k
R111	500 Ω
R112	NF390/.5
R113	NF680 Ω /.5
R114	MF787 Ω
R115	MF191 Ω
R116	MF191 Ω
R117	MF787 Ω
R118	NF68 Ω /1
R119	10 Ω /.5
R120	NF68 Ω /1
R121	10 Ω /.5
R122	1 Ω /.5
R123	1 Ω /.5
R125	W.22 Ω /5

PARTS LIST: POWER CIRCUIT AND SHORT CIRCUIT PROTECTION
MODEL:PAM2000 DRW.Nº 33.0129PL REV :
DATE: 000621 SHEET 3 OF 3 REPLACED BY:

OLD VERSION

REFERENCE	VALUE
R126	W.22 Ω /5
R127	W.22 Ω /5
R128	W.22 Ω /5
R129	W.22 Ω /5
R131	330 Ω /.5
R132	330 Ω /.5
R133	330 Ω /.5
R134	330 Ω /.5
R135	330 Ω /.5
R137	330 Ω /.5
R138	330 Ω /.5
R139	330 Ω /.5
R140	330 Ω /.5
R141	330 Ω /.5
R143	W.22 Ω /5
R144	W.22 Ω /5
R145	W.22 Ω /5
R146	W.22 Ω /5
R147	W.22 Ω /5
R148	NF2.2 Ω /2
R149	6.8 Ω
R150	6.8 Ω
R151	10 Ω /2
R152	W1k5/7
R153	W6.8 Ω /5
R154	W1k5/7
R155	MF1k00
R156	MF487 Ω
R157	5k6/.5
R158	8k2/.5
R159	1k8
R160	22k
R161	330k
R162	10k
R163	100 Ω
R164	3k3
R165	820 Ω
R166	330k
R167	5k6
R168	5k6/.5
R169	1k8/.5
R170	MF3k65
R171	10k/.5
R172	MF487 Ω
R173	MF1k00
R174	1k8
R175	8k2/.5
R176	5k6/.5
R177	MF487 Ω
R178	MF1k00
R179	22k
R180	1k8
R181	1k8
R182	MF3k65
PC 11.0504B	PRINTED CIRCUIT
WIRE	BLACK 90mm whit TER.