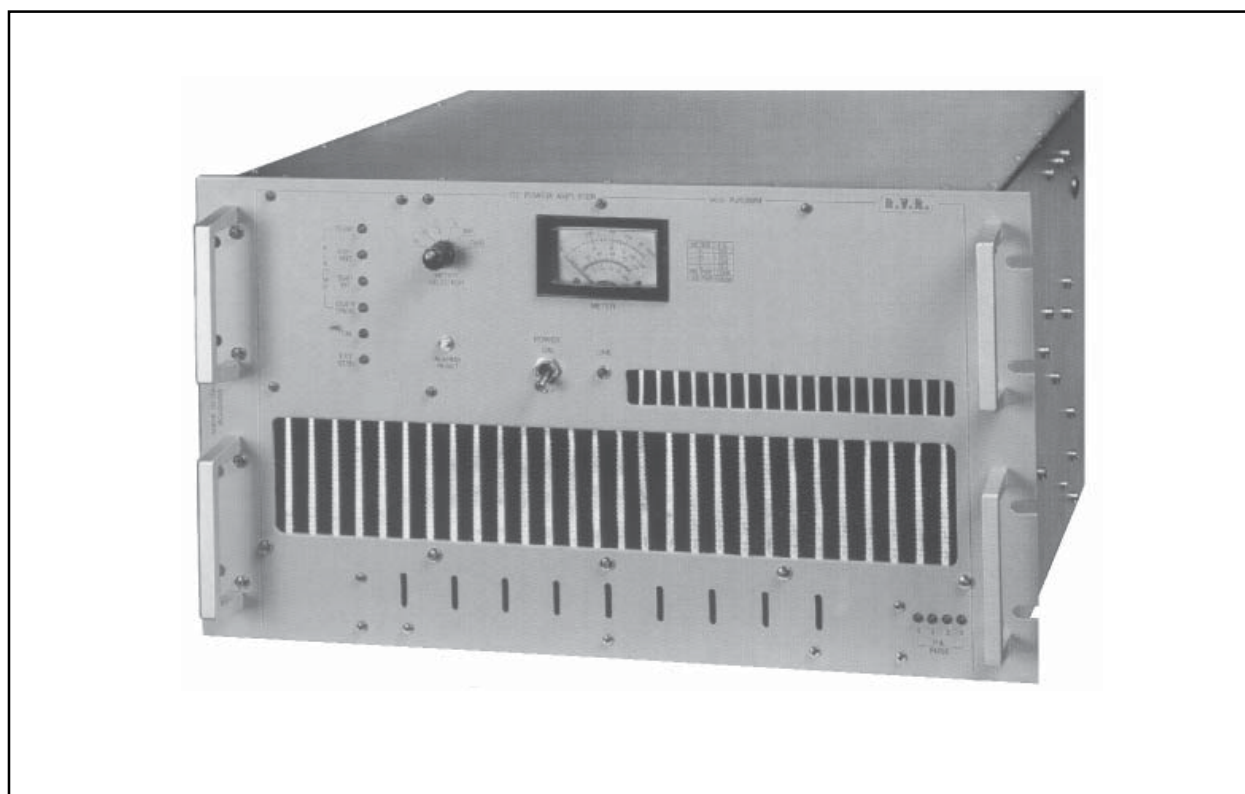

PJ1000M



User Manual

Manufactured by  Italy



PJ1000M - User Manual
Versione 5.2

© Copyright 1993-2001
R.V.R. Elettronica SpA
Via del Fonditore 2/2c - 40138 - Bologna (Italia)
Telefono: +39 051 6010506
Fax: +39 051 6011104
Email: info@rvr.it
Web: www.rvr.it

All rights reserved

Printed and bound in Italy. No part of this manual may be reproduced, memorized or transmitted in any form or by any means, electronic or mechanic, including photocopying, recording or by any information storage and retrieval system, without the permission of the copyright owner.

**Notification of intended purpose and limitations of product use**

This product is a FM transmitter intended for FM audio broadcasting. It utilises operating frequencies not harmonised in the intended countries of use.

The user must obtain a license before using the product in intended country of use. Ensure respective country licensing requirements are complied with. Limitations of use can apply in respect of operating frequency, transmitter power and/or channel spacing.

Declaration of Conformity

Hereby, R.V.R. Elettronica SpA, declares that this FM transmitter is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.



This page intentionally left blank

Table of Content

1. Preliminary instructions	1
2. Warranty	3
3. First Aid	5
3.1 Treatment of electrical shocks	5
3.1.1 If victim is not responsive	5
3.1.2 If victim is responsive	6
3.2 Treatment of electrical Burns	6
3.2.1 Extensive burned and broken skin	6
3.2.2 Less severe burns (1st and 2nd degree)	6
4. General Description	7
5 Installation and Use	9
5.1 Preparation	9
5.2 Operation	10
5.3 Protection System	10
6 External Description	13
6.1 Front Panel	13
6.2 Rear Panel	14
6.3 Rear Panel (380/220V TRF version)	15
6.4 Connectors Description	16
6.4.1 Telemetry Connector	16
6.4.2 Service Connectors	16
7. Technical Specifications	19
7.1 Dimensional and Environmental Specifications	19
7.2 Electrical Specifications	19
8. Theory of Operation	21
8.1 Power Supply	21
8.2 Soft Start	21
8.3 R.F. Power Amplifier	22
8.4 Low Pass Filter	22
8.5 Bias Card	22
8.6 Alarms Card	22
9 Identification and Access to Modules	23
9.1 Modules Identification (top view)	23
9.2 Modules Identification (bottom view)	24
9.4 Removal of the Modules	24
9.4.1 Power Supply Replacement	25
9.4.2 R.F. Power Amplifier Module Replacement	25
9.4.3 Wilkinson Splitter Card Replacement	25
9.4.4 Wilkinson Combiner Card Replacement	25
9.4.5 Directional Coupler Replacement	25

9.4.6	Soft Start Card Replacement	26
9.4.7	Alarms Card Replacement	26
9.4.8	Bias Card Replacement	26
10.	Internal Adjustment	27
10.1	Power Supply Adjustment (PSSW5040)	27
10.2	R.F. Power Amplifier Adjustment	27
10.3	Wilkinson Spiltter Card Adjustment	27
10.4	Wilkinson Combiner Card Adjustment	28
10.5	Alarms Card Adjustment	28
10.6	Directional Coupler Card Adjustment	30
10.7	Soft-start Card Adjusment	30
10.8	Bias Card Adjustment	30

Appendix:

Component layouts, schematics, bills of material

1. Preliminary instructions

This manual is written as a general guide for those having previous knowledge and experience with this kind of equipment.

It is not intended to contain a complete statement of all safety rules which should be observed by personnel in using this or other electronic equipment.

The installation, use and maintenance of this piece of equipment involve risks both for the personnel performing them and for the device itself, that shall be used only by trained personnel.

R.V.R. doesn't assume responsibility for injury or damage resulting from improper procedures or practices by untrained/unqualified personnel in the handling of this unit.

Please observe all local codes and fire protection standards in the operations of this unit.



WARNING: always disconnect power before opening covers or removing any part of this unit.

Use appropriate grounding procedures to short out capacitors and high voltage points before servicing.



WARNING: This is a "CLASS A" equipment. In a residential place this equipment can cause hash. In this case can be requested to user to take the necessary measures.

R.V.R. Elettronica SpA reserves the right to modify the design and/or the technical specifications of the product and this manual without notice.

Pagina lasciata intenzionalmente in bianco

This page was intentionally left blank

2. Warranty

Any product of **R.V.R. Elettronica** is covered by a 12 (twelve) month warranty.

For components like tubes for power amplifiers, the original manufacturer's warranty applies.

R.V.R. extends to the original end-user purchaser all original manufacturers warranties which are transferable and all claims are to be made directly to R.V.R. per indicated procedures.

R.V.R.'s warranty shall not include:

- 1) Re-shipment of the unit to R.V.R. for repair purposes
- 2) Any unauthorized repair/modification
- 3) Incidental/consequential damages as a result of any defect
- 4) Nominal non-incidental defects
- 5) Re-shipment costs or insurance of the unit or replacement units/parts

Warranty shall come into force from invoice date and for the period of the manufactures warranty.

Any damage to the goods must be reported to the carrier in writing on the shipment receipt.

Any discrepancy or damage discovered subsequent to delivery, shall be reported to R.V.R. within five (5) days from its receipt.

To claim your rights under this warranty:

- a. Contact the dealer or distributor where you purchased the unit. Describe the problem and ask if he has an easy solution. Dealers and Distributors are supplied with all the information about problems that may occur and usually they can repair the unit quicker than what the manufacturer could do. Very often installing errors are discovered by dealers.
- b. If your dealer cannot help you, contact R.V.R. in Bologna and explain the problem. If it is decided to return the unit to the factory, R.V.R. will mail you a regular authorization with all the necessary instructions to send back the goods.
- c. When you receive the authorization, you can return the unit. Pack it carefully for the shipment, preferably using the original packing and seal the package perfectly. The customer always assumes the risks of loss (i.e., R.V.R. is never responsible for damage or loss), until the package reaches R.V.R. premises. For this reason, we suggest you to insure the goods for the whole value. Shipment must be effected C.I.F. (PREPAID) to the address specified by R.V.R.'s service manager on the authorization.



DO NOT RETURN UNITS WITHOUT OUR AUTHORIZATION AS THEY WILL BE REFUSED.

- a Be sure to enclose a written technical report where mention all the problems found and a copy of your original invoice establishing the starting date of the warranty.

Replacement and warranty parts may be order from the following address. Be sure to include the equipment model and serial number as well as part description and part number.

R.V.R. Elettronica SpA
Via del Fonditore, 2/2c
40138 BOLOGNA
ITALY
Tel. +39 051 6010506

3. First Aid

The personnel employed in the installation, use and maintenance of the device, shall be familiar with theory and practice of first aid.

3.1 Treatment of electrical shocks

3.1.1 If victim is not responsive

follow the A-B-C's of basic life support

- Place victim flat on his back on a hard surface.
- Open airway: lift up neck, push forehead back
- clear out mouth if necessary and observe for breathing
- if not breathing, begin artificial breathing (Figure 2): tilt head, pinch nostrils, make airtight seal, four quick full breaths. Remember mouth to mouth resuscitation must be commenced as soon as possible

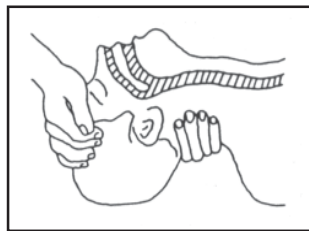


Figure 1



Figure 2

- Check carotid pulse (**Figura 3**); if pulse is absent, begin artificial circulation (**Figura 4**) depressing sternum 1 1/2" TO 2" (**Figura 5**).

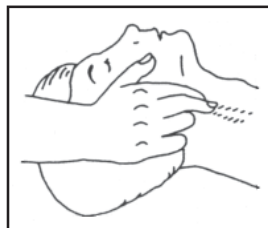


Figura 3

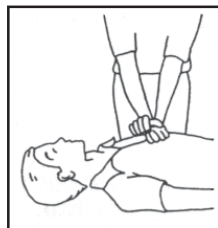


Figura 4

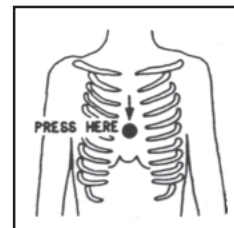


Figura 5

- APPROX. 80 SEC. : ONE RESCUER, 15 COMPRESSIONS
- APPROX. 60 SEC.: TWO RESCUERS, 5 COMPRESSIONS, 1 BREATH
- DO NOT INTERRUPT RHYTHM OF COMPRESSIONS WHEN SECOND PERSON IS GIVING BREATH
- Call for medical assistance as soon as possible.

3.1.2 If victim is responsive

- Keep them warm
- Keep them as quiet as possible
- Loosen their clothing (a reclining position is recommended)
- Call for medical help as soon as possible

3.2 Treatment of electrical Burns

3.2.1 Extensive burned and broken skin

- Cover area with clean sheet or cloth (Cleansed available cloth article).
- Do not break blisters, remove tissue, remove adhered particles of clothing, or apply any salve or ointment.
- Treat victim for shock as required.
- Arrange transportation to a hospital as quickly as possible.
- If arms or legs are affected keep them elevated

If medical help will not be available within an hour and the victim is conscious and not vomiting, give him a weak solution of salt and soda: 1 level teaspoonful of salt and 1/2 level teaspoonful of baking soda to each quart of water (neither hot or cold). Allow victim to sip slowly about 4 ounces (half a glass) over a period of 15 minutes. Discontinue fluid if vomiting occurs



Do not give alcohol

3.2.2 Less severe burns (1st and 2nd degree)

- Apply cool (not ice cold) compresses using the cleansed available cloth article.
- Do not break blisters, remove tissue, remove adhered particles of clothing, or apply salve or ointment.
- Apply clean dry dressing if necessary.
- Treat victim for shock as required.
- Arrange transportation to a hospital as quickly as possible
- If arms or legs are affected keep them elevated.

4. General Description

RVR Elettronica's PJ1000M is a 19" Rack-mountable broadband MOSFET RF power amplifier. It works without adjustment on the whole 87.5-108MHz FM band and its power output is 1000W with a drive level of about 16W.

The RF power section makes use of four modules, able to deliver more than 300W each.

The power supply is a switching mode one and a soft-start circuit is included to minimize the transformer's current spikes when the device is switched on.

The amplifier is implemented with a protection system against dangerous situations like exceeding output power or SWR, overdrive or overtemperature. When the warning conditions are been erased, the machine shall be returned in initial status.

The default working parameters can be selected through a rotate selector and shown onto an analogic display.

On the front panel are located two LEDs group. The first group includes four red alarms LEDs (temperature, external SWR, internal SWR, overdrive), a green LED that indicates the ON status of the amplifier and a yellow LED that indicates if an external standby forces the machine.

The second group is composed by four green LEDs that indicates the fuses status of RF Amplifier Modules.

Different working parameters are made available for the user on the telemetry connector, as voltage levels that are proportional to the value of the parameter under consideration.

A built-in low pass filter keeps the harmonic emission level below the CCIR and FCC permitted levels.

Pagina lasciata intenzionalmente in bianco

This page was intentionally left blank

5 Installation and Use

This chapter is intended to summarize the necessary points for the installation of the device. In case any of the arguments is unclear, for example when you use it for the first time, please read carefully the whole manual.

5.1 Preparation

Unpack the amplifier and before any other operation check that all the controls and connectors on the front and rear panel are in good conditions.

Check the mains voltage selector on the rear panel: the position of the jumpers to choose between 220 V or 110 V, or 380V are indicated on the panel.

Check also the presence and integrity of the fuses. The required value for the 220/110 V version fuses are:

- PS 1, PS 2 2 x 25 A 10X38
- AC Line 2 x 16 A 10X38
- Service 10 A 6,3X32
- Aux 4 A 6,3X32

For 380/220 V version, the fuses required are:

- PS 1, PS 2 2 x 25 A 10X38
- Fan 6 A 10X38
- Service 6 A 10X38
- Line selector fuse:
 2 x 20 A 10X38

Verify that the mains switch is in the OFF position.

Connect to the RF Input the RF Output of suitable exciter (for example the RVR Elettronica's PTX30) using a N-connectors terminated cable; the exciter shall be set for minimum power and OFF.

Link one of the Alarms/Interlock connectors to the Interlock connector of the exciter, if available (it is in RVR Elettronica's exciters).

Connect the RF output to the antenna cable or to a suitable dummy load.



Finally, connect a proper cable to the amplifier's mains input.

ATTENTION: the cable has to be disconnected from the mains outlet!

After the cable has been safely connected to the amplifier's mains plug, it is possible to plug it into the mains outlet.

It is essential that the unit is properly installed in one Rack that contain a anti-strap device to ensure that mains conductors are not exposed accidentally.



ATTENTION: It is essential that the unit is properly earthed to ensure both the safety of operation as well as the correct working of the equipment.

5.2 Operation

Switch ON the amplifier and verify the green "ON" LED being it.

Check through the rotate selector on analogic device that the internal voltages (V1, V2, Vpa) are 50V. Check that the Standby current (Ipa) is approx 800 mA.

Switch ON the exciter (to minimum power) and wait for it to lock on the working frequency. When the locked condition will be reached, progressively increase its power, while controlling the amplifier's display. In which case the delivered power increases, verify the increase of the issued current (Ipa). Keep increasing the exciter output until the amplifier reaches the desired level at most 1000 W. At this point it is possible, for the user, to verify all the working parameters, the normal working nominal values are:

- $V1 = V2 = Vpa \cong 50 \text{ V}$
- $Ipa = 32 \div 40 \text{ A}$

It is possible to verify the precision of the device with an external wattmeter (a difference of approx 10% is tolerated).

With the power amplifier, push and maintain pushed the Alarms Reset button, and verify that V1, V2, Vpa and Ipa goes to 0. If connection to Interlock it has been carried out correctly, the amplifier power, and the exciter power, output goes to 0 too. Releasing the button, all the parameters return to precedent value.

To test the amplifier protection system you can increase the drive level until that the red Overdrive LED will light. At this point the protection system is enabled and disabled the amplifier and the exciter for approx 10 seconds. Until this time they are been rehabilitated. If in the meantime it has not been provided to reduce the exciter issued power, it will verify a new block condition, otherwise the transmitter will be function correctly.

The device doesn't require any human supervision for its normal operation. If any alarm condition arise, these are automatically managed by embedded protection system; if this doesn't succeed is necessary the participation of user to reset the system.

5.3 Protection System

The protection system forced the Standby status of the amplifier in the case one is taken place breakdown situation.

After approx 10 seconds, the amplifier will be rehabilitated. If in the meantime it has not been provided to remove the block condition, the amplifier will be disabled. After four attempts the device will be disabled for approx 90 seconds.

Passed this interval it comes repeated a new cycle of 4 disabilitations, analogous to

the previous one, after that, if the breakdown condition persists, the amplifiers comes disabled until that it does not come carried out a manual reset of the machine.

If, during the cycles of the protection, the amplifier works regularly for 90 seconds, the counters of the protection system come reset.

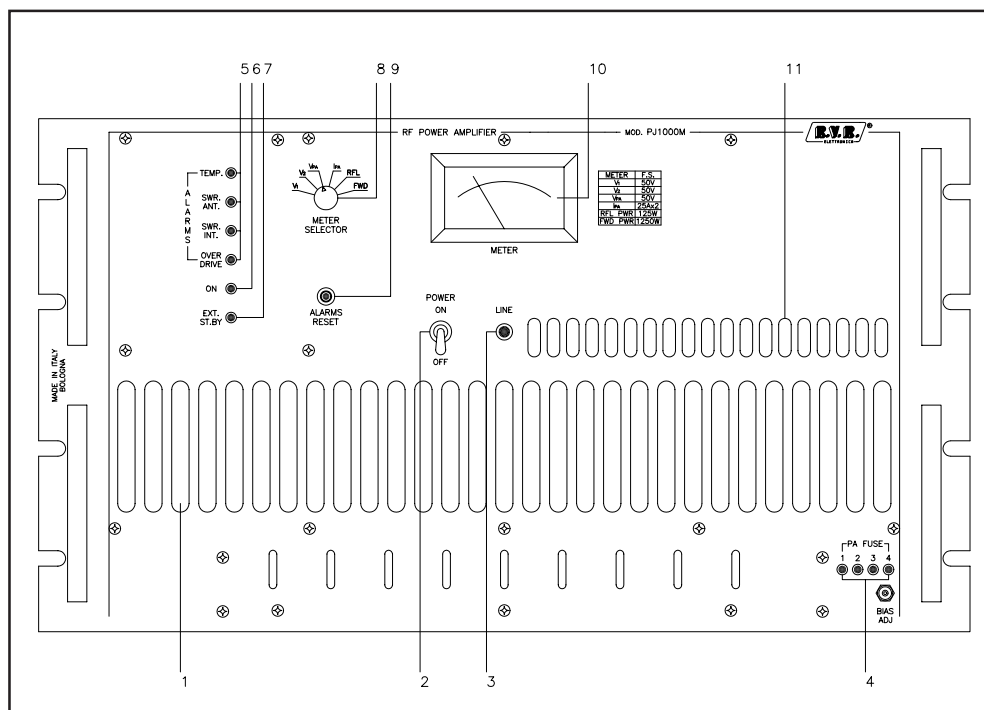
Pagina lasciata intenzionalmente in bianco

This page was intentionally left blank

6 External Description

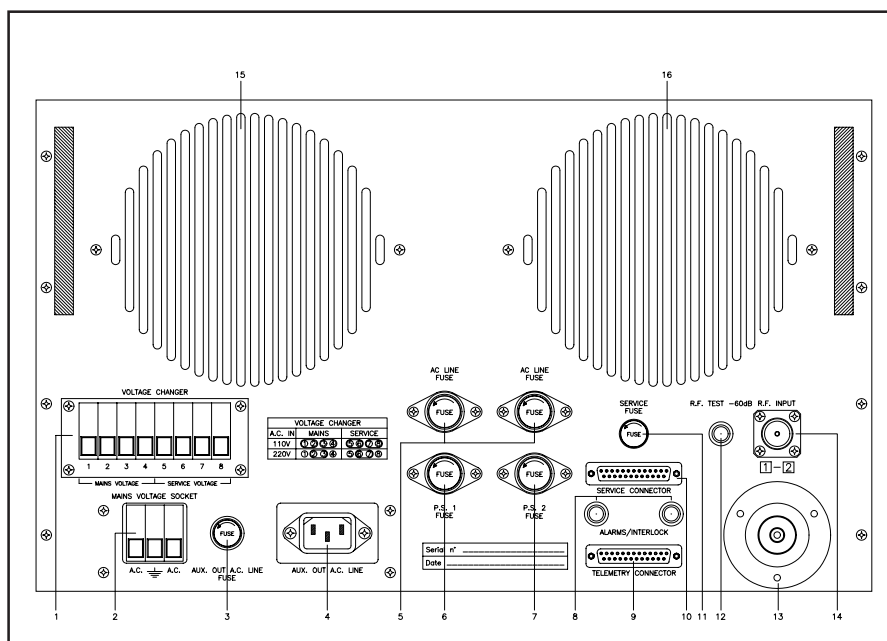
This chapter described the front and rear panel of PJ1000M, with a brief indication of all the different components.

6.1 Front Panel

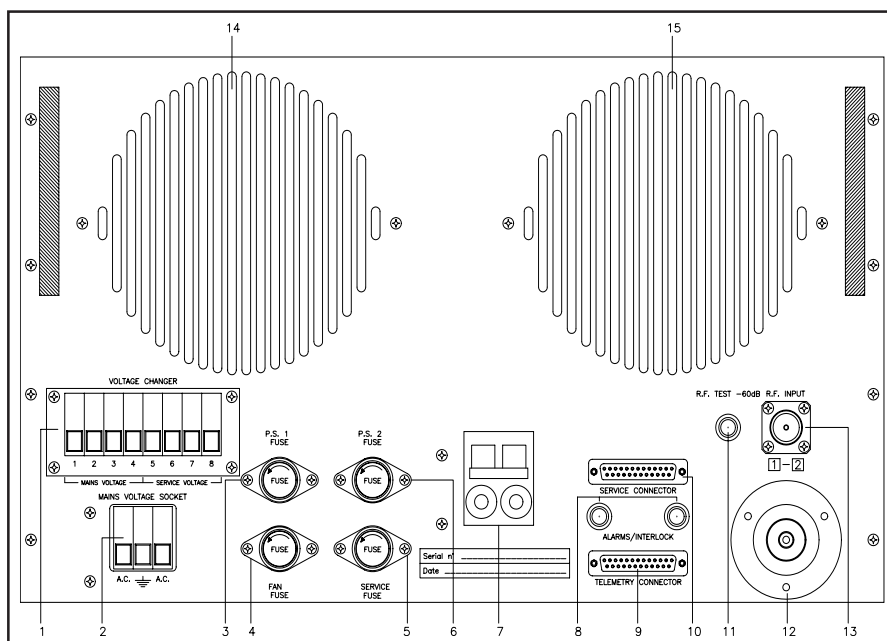


- | | |
|---------------------|--|
| [1] Heat-Sink | Heat sink |
| [2] On / Off | Mains switch (not in TRF version) |
| [3] Line | Line indicator C.A. |
| [4] P.A. Protection | this four green LEDs shown the fuse status of each protection modules of the RF power amplifiers |
| [5] Alarms | PJ1000M conditions alarms LEDs |
| [6] On | Indicates when the aplifier is switched ON |
| [7] Ext. St. By | External Standby LED indicator |
| [8] Meter Selector | Working parameters switch: |
| | V1 voltage of the 1° RF module |
| | V2 voltage of the 2° RF module |
| | Vpa voltage of the Pj1000M |
| | Ipa current of thePJ1000M |
| | RFL Reflected power |
| | FWD Forward power |
| [9] Alarms Reset | Push the button to reset the alarm status (not in TRF version) |
| [10] Meter | Analogic display to show the working parameters |
| [11] Heat-Sink | Power amplifier's heat sink |

6.2 Rear Panel



- | | | | | | | | | | | |
|----------------------------|---|-----------|-------|---------|---------|-----------|-----------|---------|-----|-----|
| [1] Voltage Charger | Voltage changer: | | | | | | | | | |
| | <table border="0"> <tr> <td>Voltage</td> <td>Mains</td> <td>Service</td> </tr> <tr> <td>110 Vac</td> <td>1-2 / 3-4</td> <td>5-6 / 7-8</td> </tr> <tr> <td>220 Vac</td> <td>2-3</td> <td>6-7</td> </tr> </table> | Voltage | Mains | Service | 110 Vac | 1-2 / 3-4 | 5-6 / 7-8 | 220 Vac | 2-3 | 6-7 |
| Voltage | Mains | Service | | | | | | | | |
| 110 Vac | 1-2 / 3-4 | 5-6 / 7-8 | | | | | | | | |
| 220 Vac | 2-3 | 6-7 | | | | | | | | |
| [2] Mains Voltage Socket | Mains voltage socket | | | | | | | | | |
| [3] Aux. Ot A.C. Line Fuse | Auxiliary output A.C. line protection fuse | | | | | | | | | |
| [4] Aux. Out A.C. Line | Auxiliary output A.C. line | | | | | | | | | |
| [5] A.C. Line Fuse | A.C. line protection fuse | | | | | | | | | |
| [6] P.S. 1 Fuse | Protection fuse of power supply1 | | | | | | | | | |
| [7] P.S. 2 Fuse | Protection fuse of power supply 2 | | | | | | | | | |
| [8] Alarms/Interlock | BNC connector that permit to exciter to comes Standby itself, putting to ground the central conductor, in case wich the aplifier is overloaded | | | | | | | | | |
| [9] Telemetry Conector | Connector for remote measurement of working parameters | | | | | | | | | |
| [10] Service Connector | Connector for research all processed parameters of the RF section | | | | | | | | | |
| [11] Service Fuse | Service protection fuse | | | | | | | | | |
| [12] R.F. Test -60 dB | -60 dB riferred to output level | | | | | | | | | |
| [13] R.F. Output | RF output connector (7/8" EIA flange) | | | | | | | | | |
| [14] R.F. Input | RF input connector ("N" type) | | | | | | | | | |
| [15] Fan | Fan with forced ventilation | | | | | | | | | |
| [16] Fan | Fan with forced ventilation | | | | | | | | | |



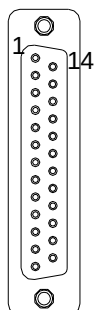
6.3 Rear Panel (380/220V TRF version)

- | | | | |
|--------------------------|--|-------|---------|
| [1] Voltage changer | Voltage changer: | | |
| | Voltage | Mains | Service |
| | 220Vac | 1-2 | 4-5 |
| | 380Vac | 1-3 | 4-6 |
| [2] Mains Voltage Socket | Mains voltage socket | | |
| [3] P.S. 1 Fuse | Protection fuse of power supply 1 | | |
| [4] Fan Fuse | Fan protection fuse | | |
| [5] P.S. 2 Fuse | Protection fuse of power supply 2 | | |
| [6] Service Fuse | Service protection fuse | | |
| [7] A.C. Line | Mains switch | | |
| [8] Alarms/Interlock | BNC connector that permit to exciter to comes Standby itself, putting to ground the central conductor, in case wich the aplifier is overloaded | | |
| [9] Telemetry Connector | Connector for remote measurement of working parameters | | |
| [10] Service Connector | Connector for research all processed parameters of the RF section | | |
| [11] R.f. Test -60 dB | -60 dB riferred to output level | | |
| [12] R.F. Output | RF output connector (7/8" EIA flange) | | |
| [13] R.F. Input | RF input connector (di tipo "N") | | |
| [14] Fan | Fan with forced ventilation | | |
| [15] Fan | Fan with forced ventilation | | |

6.4 Connectors Description

6.4.1 Telemetry Connector

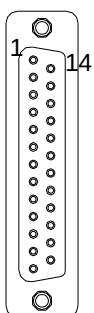
Type: DB25 Female



1	1° RF module voltage	2.0V X 50V
2	RF power amplifier voltage	2.0V X 50V
3	GND	0V
4	Reflected power	1.4V X 100W
5	Inhibitor TX	12V
6	Internal SWR	15V -> fault
7	GND	0V
8	Operativo	15V
9	Not used	
10	Not used	
11	Not used	
12	Not used	
13	Not used	
14	2° RF module amplifier voltage	2.0V X 50V
15	RF power amplifier current	2.0V X 40A
16	Forward power	1.6V X 1000W
17	Temperature	15V -> fault
18	SWR antenna	15V -> fault
19	Over drive	15V -> fault
20	Stand-by	15V
21	GND	0V
22	Not used	
23	Not used	
24	Not used	
25	Not used	

6.4.2 Service Connectors

Type: DB25 female



1	1° RF module voltage	5.0V X 50V
2	3° RF module voltage	5.0V X 50V
3	RF modules wais voltage	5.0V X 50V
4	GND	GND
5	1° RF module current	5.0V X 10A
6	2° RF module current	5.0V X 10A
7	3° RF module current	5.0V X 10A
8	4° RF module current	5.0V X 10A
9	Not used	
10	Not used	
11	Not used	
12	Not used	

13	Not used	
14	2° RF module voltage	5.0V X 50V
15	4° RF module voltage	5.0V X 50V
16	Not used	
17	V gate voltage of the RF module	5.0V X 10V
18	Not Used	
19	RF modules total current	5.0V X 40A
20	GND	GND
21	GND	GND
22	GND	GND
23	Not used	
24	Not used	
25	Not used	

Pagina lasciata intenzionalmente in bianco

This page was intentionally left blank

7. Technical Specifications

7.1 Dimensional and Environmental Specifications

Cabinet Dimensions	454.0 mm (17,87") x 265.0 mm (10,43") x 507.0 mm (19,98")
Panel dimensions	483 mm (19") x 266 mm (10,47")
Depth	344 mm (26 1/2")
Weight	PJ1000M 54 Kg
Operating temperature range	-10 °C ÷ 50 °C
Umidity	95% Maximum, without condensation

7.2 Electrical Specifications

A.C. power supply	100-130 V, 50-60 Hz 198-250 V, 50-60 Hz 380V, 50-60 Hz (versione TRF) 220V, 50-60 Hz (versione TRF)
Cooling system	forced ventilation
Frequency range	87.5 MHz ÷ 108 MHz
Output power	1000 W
Drive power	< 20 W for Pout = 1000 W, typical 12 W
Input connector	"N" type standard connector
Input impedance	50 Ohm
Output connector	Standard 7/8" EIA Flange
Output impedance	50 Ohm
Harmonic and spurious soppression	Respect all requirments FCC and CCIR

Pagina lasciata intenzionalmente in bianco

This page was intentionally left blank

8. Theory of Operation

The figure 9.1 shows the block diagrams of PJ1000M. The blocks are described in the following chapter:

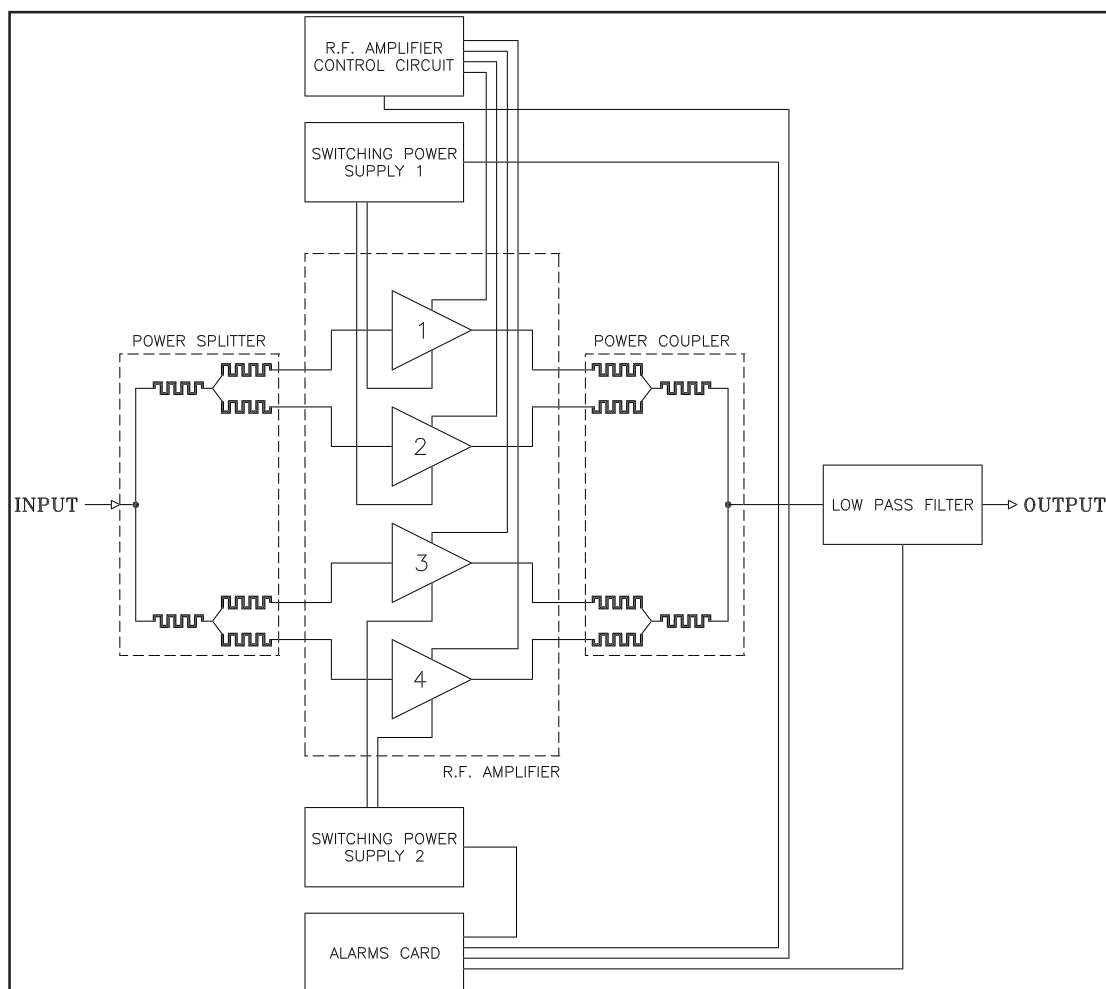


Figura 9.1

8.1 Power Supply

The PJ1000M contains four mains transformers. Depending of the version, the jumpers on rear panel can select the mains voltage of 380 o 220 Vac or 220 o 110 Vac.

Two transformers have one output 61-0-61 V for switching power supply. The switching power supply is located on a fin of cooling.

The third and fourth transformer give the supply for the other devices of the machine.

8.2 Soft Start

The soft-start is mounted on a board placed on the right side of the amplifier. This circuit eliminates the current spikes generated by the transformer when it is powered.

8.3 R.F. Power Amplifier

The RF Power Amplifier section is composed of the four power modules coupled through with a Wilkinson Splitter and Combiner realized with *strip line technology*. The section components are housed in the lower side of the equipment and mounted on a heat sink that allows its cooling through forced ventilation.

The Wilkison Splitter Card is used to split the input exciter's driving powers so that to each amplifier module arrives the same quantity.

Each module is supplied separately, and delivers 300 W di potenza RF with 4 e 6 W of drive.

The quiescent parameters of each module are:

$V_{dc} = 50V$, $V_{gs} = 3.5 V$, $I_{dq} = 200 \text{ mA}$

The active device employed is a MOSFET (BLF278).

The Wilkison Combiner is used to combine the output powers of each RF Power Amplifiers modules. Altogether, the Wilkinson Splitter and Combiner Card are planned so that the contributions of the single modules are added in phase between of they.

A power resistor placed on each circuits is used to absorb any unbalanced powers in case of faulty.

8.4 Low Pass Filter

The low pass filter is mounted on the same fin of cooling of the section of power amplification. The filter pulls down the level of the spurious emissions under the levels allowed from the international norms, so that the amplifier can be connected directly to the transmission antenna.

8.5 Bias Card

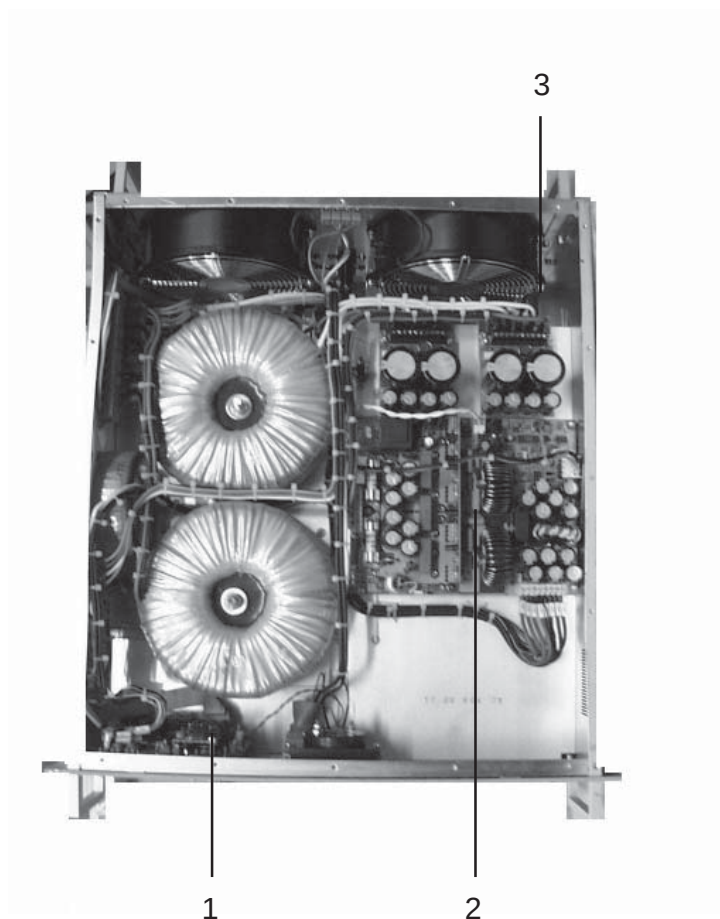
This card is housed in the lower side of the equipment. The default function is to control and if necessary to correct the polarization current of each single MOSFET of the RF section. Then it is able to supply external measures as: currents, voltages for each RF amplifier module, total current and average voltage.

8.6 Alarms Card

This card detect any system anomaly such as excessive SWR, internal or antenna, overtemperature, etc... . This module will also, whenever possible, reset the system to its original condition, after a fault has accused.

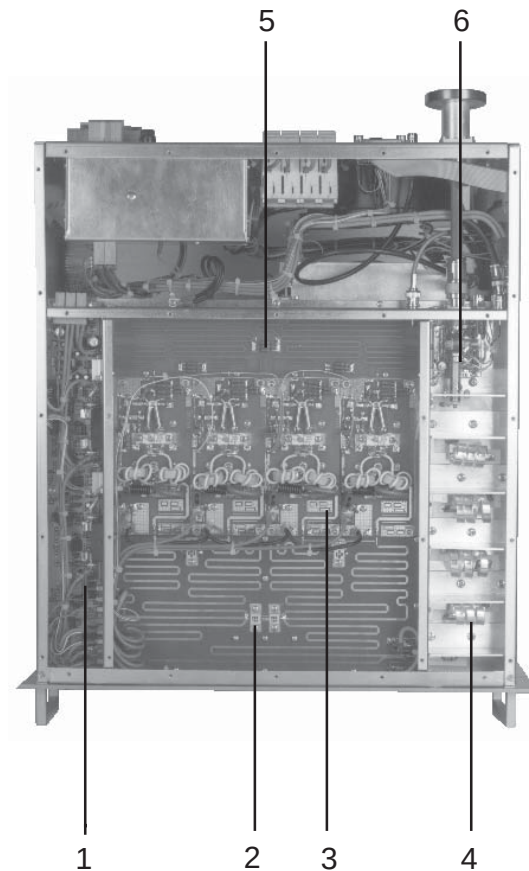
9 Identification and Access to Modules

9.1 Modules Identification (top view)



- [1] Alarms card
- [2] Power supply (PSSW5040)
- [3] Soft start card

9.2 Modules Identification (bottom view)



- [1] Bias card
- [2] Wilkinson combiner card
- [3] RF modules of power amplifier
- [4] Low pass filter
- [5] Wilkinson splitter card
- [6] Directional coupler

9.4 Removal of the Modules



ATTENTION: When the amplifier is operated with the cover removed, hazardous voltages and heavy current are accessible. Ensure all primary power is disconnected from the amplifier before attempting equipment maintenance.

To reinstall the card is enough to execute operations sequence in the opposite way.

Remove all the screws that are located on the top and bottom covers of the machine. After that the covers have been removed, extract, with the help of the chapters 9.1 and 9.2, all amplifier modules.

9.4.1 Power Supply Replacement

- With the help of the Wiring Diagram shown in Appendix, take the note of the cable position inside the terminal boards J1, J2, J3, J4, J5, J6.
- Disconnect the external terminal boards loosening just the screws of the connectors mounted on the board.
- Remove the nine screws that fix the Power Supply to heat sink.
- Carefully remove the Power Supply.

9.4.2 R.F. Power Amplifier Module Replacement

- With the help of the Wiring Diagram shown in Appendix, take note of the wiring.
- Disconnect all wires (Supply, Gain Control, Input RF and output RF).
- Remove the five screws that fix the RF Power Amplifier Module to heat sink.
- Carefully remove the RF Power Amplifier.

9.4.3 Wilkinson Splitter Card Replacement

- Unsolder the wire that connect the input of the Splitter to RF input connector of RF section
- Unsolder the four wires that connect the four outputs of the Splitter to the inputs of RF Power Amplifier Modules.
- Remove the ten screws that fix the card to the heat sink.
- Carefully extract the card.

9.4.4 Wilkinson Combiner Card Replacement

- Unsolder the wire that connect the output of the Combiner to the Low Pass Filter.
- Unsolder the four wires that connect the four inputs of the Combiner to the Outputs of RF Power Amplifier Module.
- Take note of the wiring of the Directional Coupler, after unsolder the three wires.
- Remove the screws that fix the four Power Resistor to the heat sink.
- Remove the screws that fix the Combiner Card to heat sink.
- Carefully extract the card.

9.4.5 Directional Coupler Replacement

- Take note of the wirings.
- Unsolder the wires of the Directional Coupler.
- Unsolder the wire connecting the Directional Coupler Card to RF output connector.
- Unsolder the wire connecting the Directional Coupler Card to Low Pass Filter.
- Remove the four screws that fix the Directional Coupler card to the hex standoffs and remove the board.

9.4.6 Soft Start Card Replacement

- Disconnect M1 and M2 Soft Start 's connectors.
- Disconnect M3.
- Dismount the four securing screws and remove the board.

9.4.7 Alarms Card Replacement

- Remove the knob of the meter selector loosening the screw inside the knob.
- Dismount the screws of the meter selector switch and alarms reset push-button.
- Disconnect CN1 and CN3 Alarms Card's connectors.
- Disconnect CN2 Telemetry Card's Connector.
- Remove the screws securing the board to the front panel.
- Carefully extract the card.

9.4.8 Bias Card Replacement

- Remove the screws that fix the two voltage regulators (U9, U10) internal separator.
- Dismount the screw that fix P1 and P2 Bias Card's connectors to the internal separator.
- Disconnect JP1 and JP2 Bias Card's connectors.
- Carefully extract the card.

10. Internal Adjustment

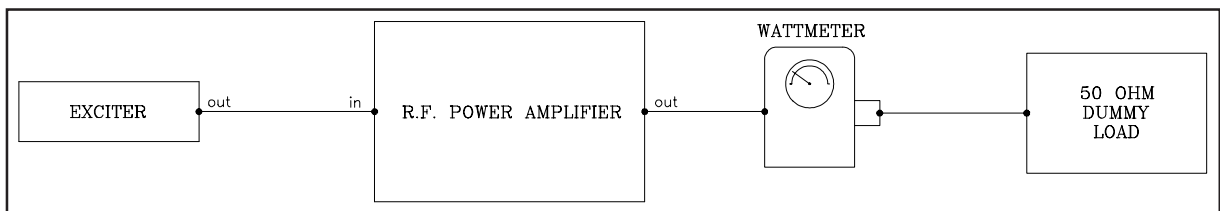
10.1 Power Supply Adjustment (PSSW5040)

No adjustments are required on this module.

10.2 R.F. Power Amplifier Adjustment

After you have changed the module and you have connected again all cables, perform the following:

- 1) See the figure below, connect a dummy load to the RF output connector with through a wattmeter in series.



- 2) Connect to the RF input connector a suitable exciter able to deliver a power between 10 and 30 W.
- 3) Connect the Alarms/Interlock connector to the appropriate connector on the exciter.
- 4) Set the output power of the exciter to its minimum value.
- 5) Switch on the PJ1000M and the exciter and wait for the PLL to lock, now slowly increase the drive checking that the output power rises progressively, with an increase of Ipa current.

NOTE: with Pot= 1000W we have $15W < P_{in} < 18W$ and $32A < I_{pa} < 40A$

Some differences in the currents drawn are related to the different gains of the MOSFET devices (BLF278) and must be compensated with the trimmers R15 placed on each RF Power Amplifier Board. The trimmer to be adjusted will be the one related to the Rf module that has a higher current consumption. This one must be adjusted turning it counter clockwise to obtain the same current consumption in each RF module. Differences of less than 800mA between the four modules are acceptable.

10.3 Wilkinson Splitter Card Adjustment

No adjustment are required on this module. (Be very carefully to correctly reconnect the Splitter Card, since incorrect connections will destroy the RF Power Modules).

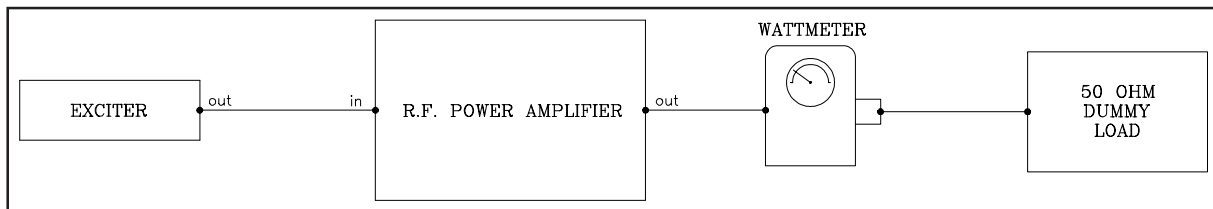
10.4 Wilkinson Combiner Card Adjustment

No adjustment are required on this module. (Be very carefully to correctly reconnect the Splitter Card, since incorrect connections will destroy the RF Power Modules).

10.5 Alarms Card Adjustment

NOTE: Make sure that this replacement is really necessary.

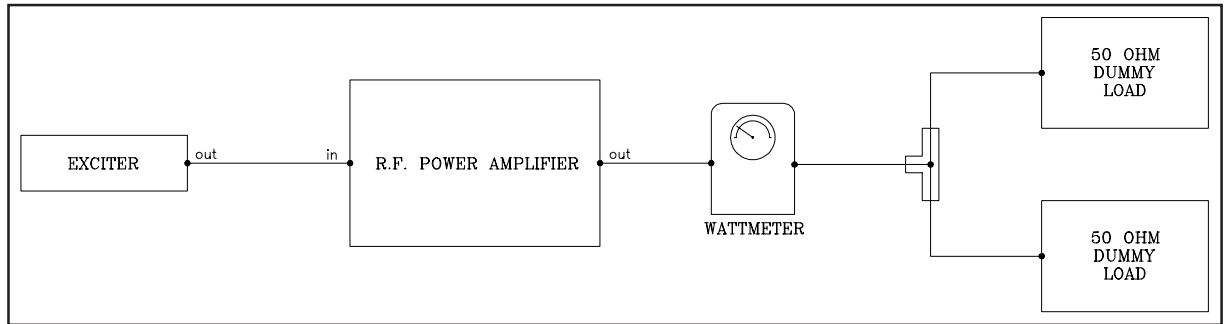
- 1) After changing the board, connect the amplifier as shown in the figure below.
- 2) Switch ON the PJ1000M.



- 3) Place the meter selector on V1 or V2.
- 4) Adjust the trimpot R14 to obtain a .s.d. reading of 50V (check that the output voltage of the power supply is really 50V).
- 5) Switch On the exciter and wait for PLL lock.
- 6) Increase the output power to a level of 1000W.
- 7) Adjust the Fwd reading with trimpot R11.
- 8) Now increase again the drive until V1 and V2 decrease and you obtain a lock condition of the amplifier due to the overdrive protection; this protection is adjustable by means of trimpot R26 on the Alarm Card. This protection must come on when V1 and V2 voltages are about 48Vdc.

NOTE: If the Low Pass Filter and Directional Coupler Card has not been changed, don't move "AGC control" trimmer TR1.

- 9) Internal S.W.R. Calibration (S.W.R. int.)
 - 9A) Reduce the drive power to the minimum value, switch OFF the amplifier and the exciter.
 - 9B) Connect two paralleled dummy loads to the RF Output connector of the amplifier as in schematic below.
 - 9C) Switch ON the amplifier and the exciter and wait for the PLL to lock.
 - 9D) Select RFL with the meter selector, and set the external wattmeter for reflected power reading.



9E) Increase the output power to obtain a reading of 100W RFL on the external wattmeter. Now adjust trimpot R40 on the Alarms Card until the SWR-INT protection acts.

NOTE: This setting may vary with the working frequency, it's preferable to make this adjustment at the operating frequency.

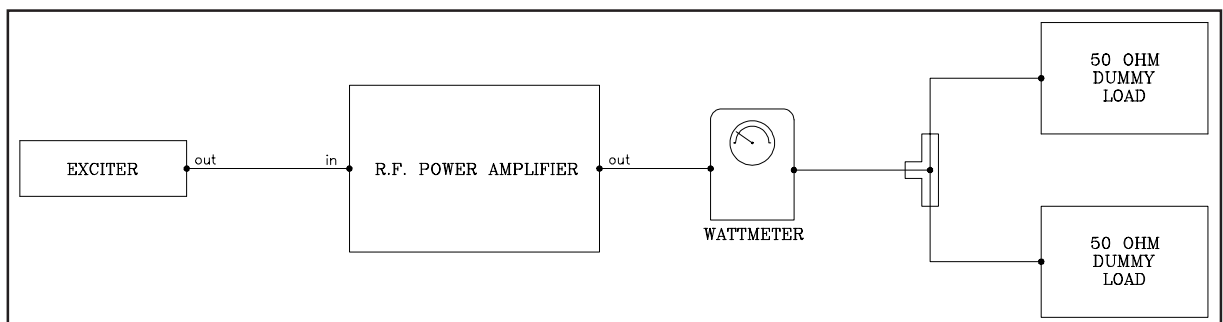
10) Antenna S.W.R. Calibration (S.W.R. ANT.)

10A) Reduce the drive power to the minimum value, switch OFF the amplifier and the exciter.

10B) Connect two paralleled dummy loads to the RF output connector of the amplifier as in the lower schematic.

10C) Switch ON the amplifier and the exciter and wait for the PLL to lock.

10D) Select RFL with the meter selector and set the external wattmeter for reflected power reading.



10E) Increase the output power to obtain a reading of 100W RFL on the external wattmeter. Now adjust trimpot R13 on the Alarms Card to obtain the same reading on the PJ1000M meter.

10F) Increase again the power, until you read 100W or reflected power adjust R56 on the Alarms Cards (remove the metallic shield that covers the Alarms Card) until S.W.R. Antenna protection acts.

NOTE: This setting may vary with the working frequency, it is preferable to make this adjustment at the operating frequency.

11) Overtemperature alarm check (temp.)

11A) Check the overtemperature protection by short circuiting the terminals of the temperature sensor placed on the RF Section heat sink (or on Power Supply heat sink); the appropriate LED will light, and the amplifier will stop.

12) External Standby check (EXT. ST. BY)

12A) Check the EXT.ST.BY protection by short circuiting the pin20 of Telemetry connector, and verify that the EX.ST.BY LED lights and the amplifier will stop.

12B) Short circuiting the pin8 of Telemetry connector will regularly restart.

10.6 Directional Coupler Card Adjustment

The Directional Coupler Card doesn't need any adjustment, perhaps it is necessary to execute the following checkings after the replacing of the card:

- 1) Verify the "AGC control".
- 2) Verify the Antenna S.W.R. calibration.
- 3) Verify FWD PWR lecture.
- 4) Verify RFL PWR lecture.

10.7 Soft-start Card Adjustment

No adjustment are needed after this board has been changed.

NOTE: Pay attention to the correct insertion of the connectors.

10.8 Bias Card Adjustment

No adjustment are required inside the Bias Card because it's a factory adjusted device.

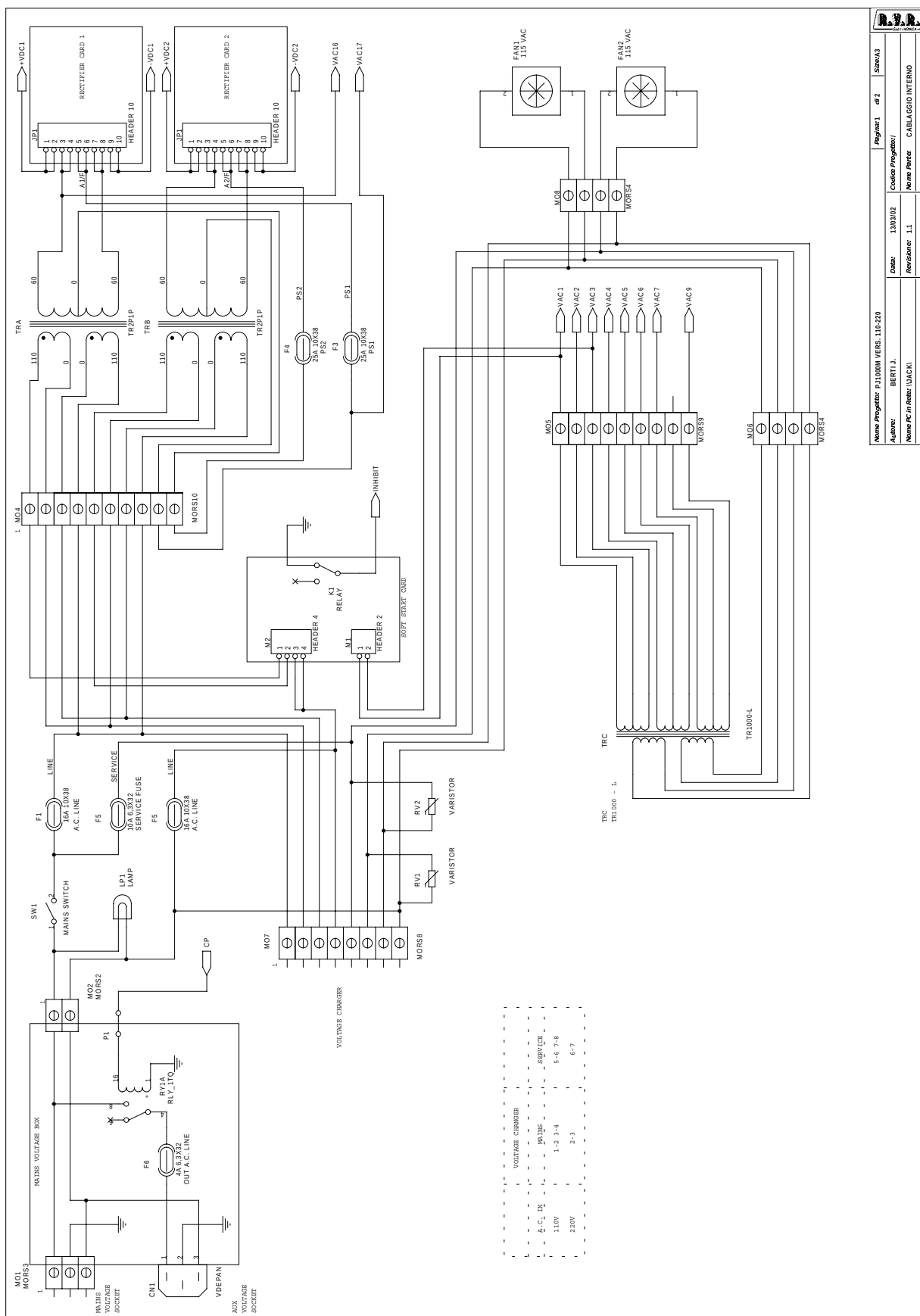
Appendix A Piani di montaggio, schemi elettrici, liste componenti / *Component layouts, schematics, bills of material*

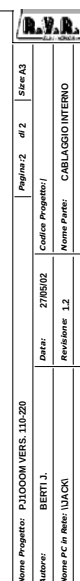
Questa parte del manuale contiene i dettagli tecnici riguardanti la costruzione delle singole schede componenti il PJ1000M. L'appendice è composta dalle seguenti sezioni:

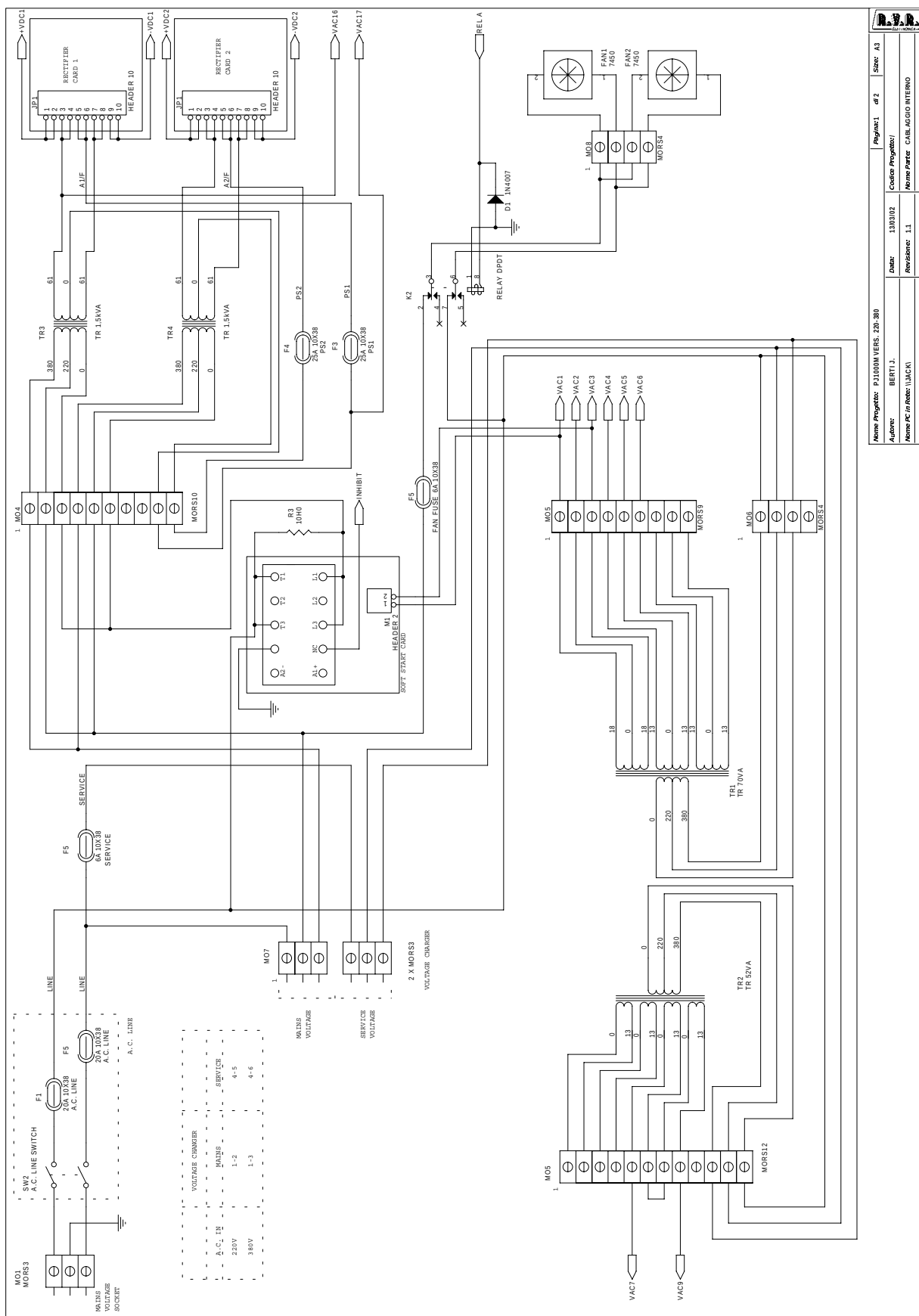
This part of the manual contains the technical details about the different boards of the PJ1000M. This appendix is composed of the following sections:

Description	RVR Code Pages	Vers.	
Wiring diagrams	Wiring diagrams	1.5	8
R.F. Power Amplifier Module	PJ1KRF	1.2	4
Wilkinson "4-Way" Splitter Card	PJ1KM SPL-IN	1.1	4
Wilkinson "4-Way" Combiner Card	PJ1KM CMB-OUT	1.1	4
Alarms Card	PRT501	1.1	4
Telemetry Card	PROT-A2	1.1	4
LPF+MEAS		1.0	4
	CSB1		
	CSBLFPJ1KM		
	CSLPFPJ1KM		
	CSDCLPFPJ1KM		
Low Pass Filter	PJ1KLPF (Before January 2002)	1.1	4
Directional Coupler Card	DRCP-PJ1KM (Before January 2002)	1.1	4
Switching Power Supply	PSSW5040	1.2	10
	PSSW5020B	1.1	4
	PSSW5020	1.1	4
	PSW1000	1.1	6
Soft Start Card	SOFTSTART2	1.1	4
	SOFTSTART1	1.2	4
Bias Control Card	PJ1KCTRL002	1.2	6
	PJ1KCTRL001	1.1	6

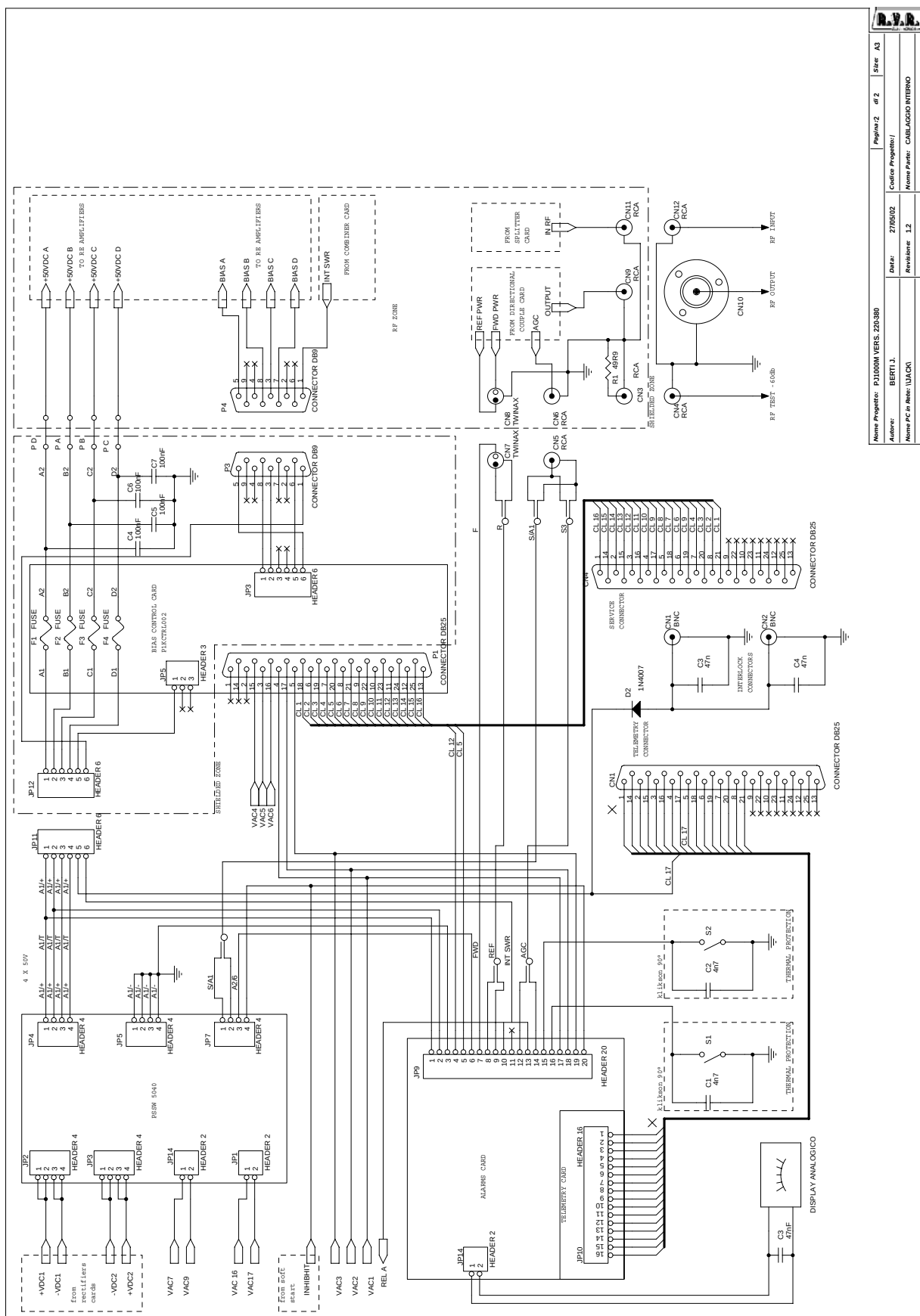
Pagina lasciata intenzionalmente in bianco
This page intentionally left blank



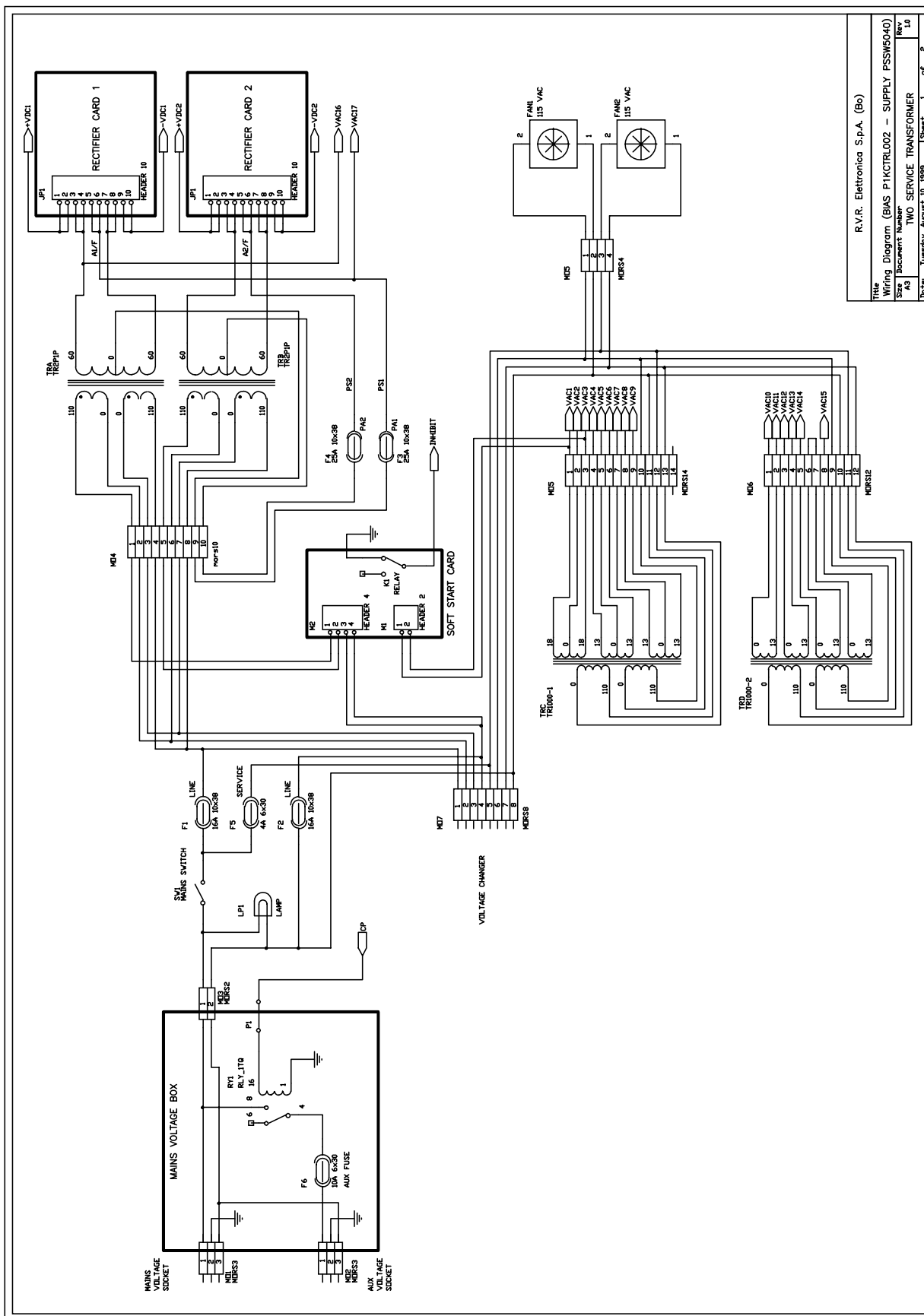




Nome Progetto:	PJ1000M VERS. 220-380	Page:	1 of 2	Size:	A3
Autore:	BERTI J.	Data:	13/03/02	Coefice Progetto:	
Nome PC in Rete:	UACV	Revisione:	1.1	Nome Parere:	CAB. AGGIO INTERNO
Pro/Contrasto:	UACV	Autore:		Coefice:	



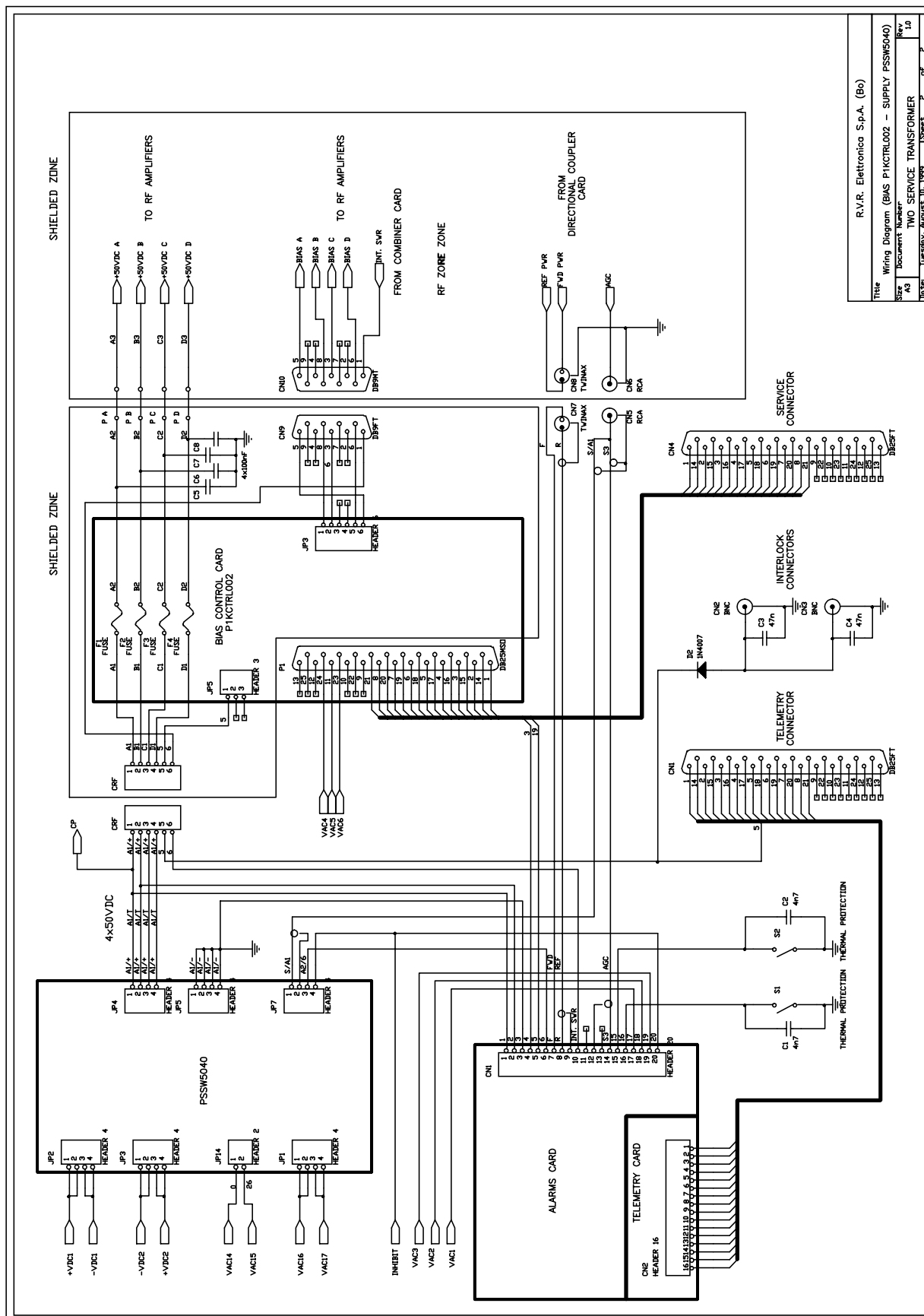
Nome Progetto:	PJ1000M VERS. 220-380	Page: 12	di 2	Size:	A3
Autore:	BERTI L.	Data:	27/05/02	Codice Progetto:	
Nome PC in Rete:	UACK	Revisione:	1.2	Nome Parte:	CABLAGGIO INTERNO
File/Carrello:	DATA: 27/05/02 10:00:00	Autore:		Codice:	



Time	R.V.R. Elettronica S.p.A. (Bo)
Wiring Diagram (BAS P1KTR002 - SUPPLY PSSW5040)	
Size	Document Number
A3	TWO SERVICE TRANSFORMER
Rev.	1.0
Date	Tuesday, August 10, 1999
Sheet	1 of 2

Versione precedente, solo per riferimento

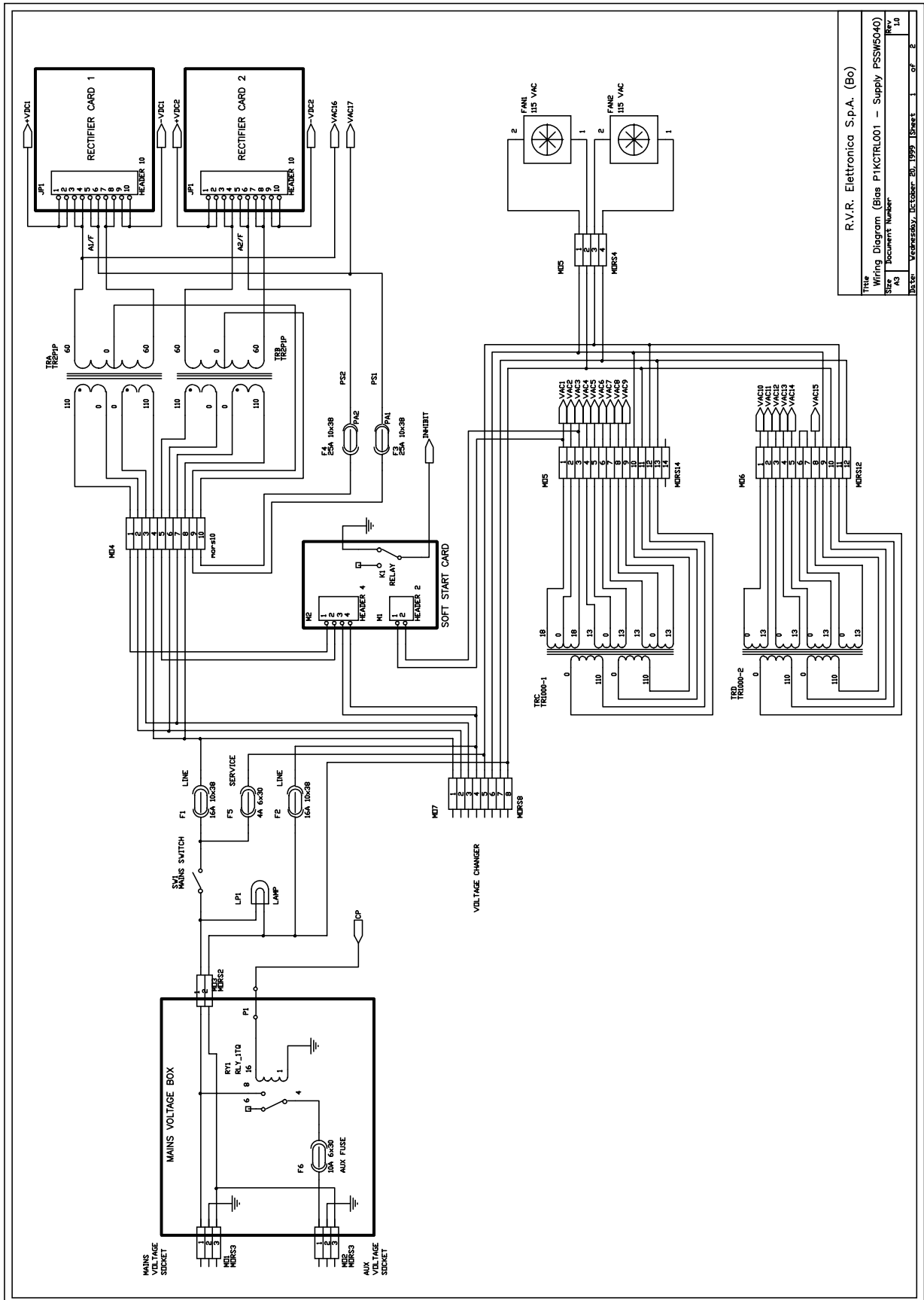
Former version, for reference only



R.V.R. Elettronica S.p.A. (Bo)			
Title	Wiring Diagram (BIAS P1KCTRL002 - SUPPLY PSSW5040)	Size	AS
Document Number	TWO SERVICE TRANSFORMER	Rev	1.0
Date	Tuesday, August 10, 1999	Sheet	2 of 2

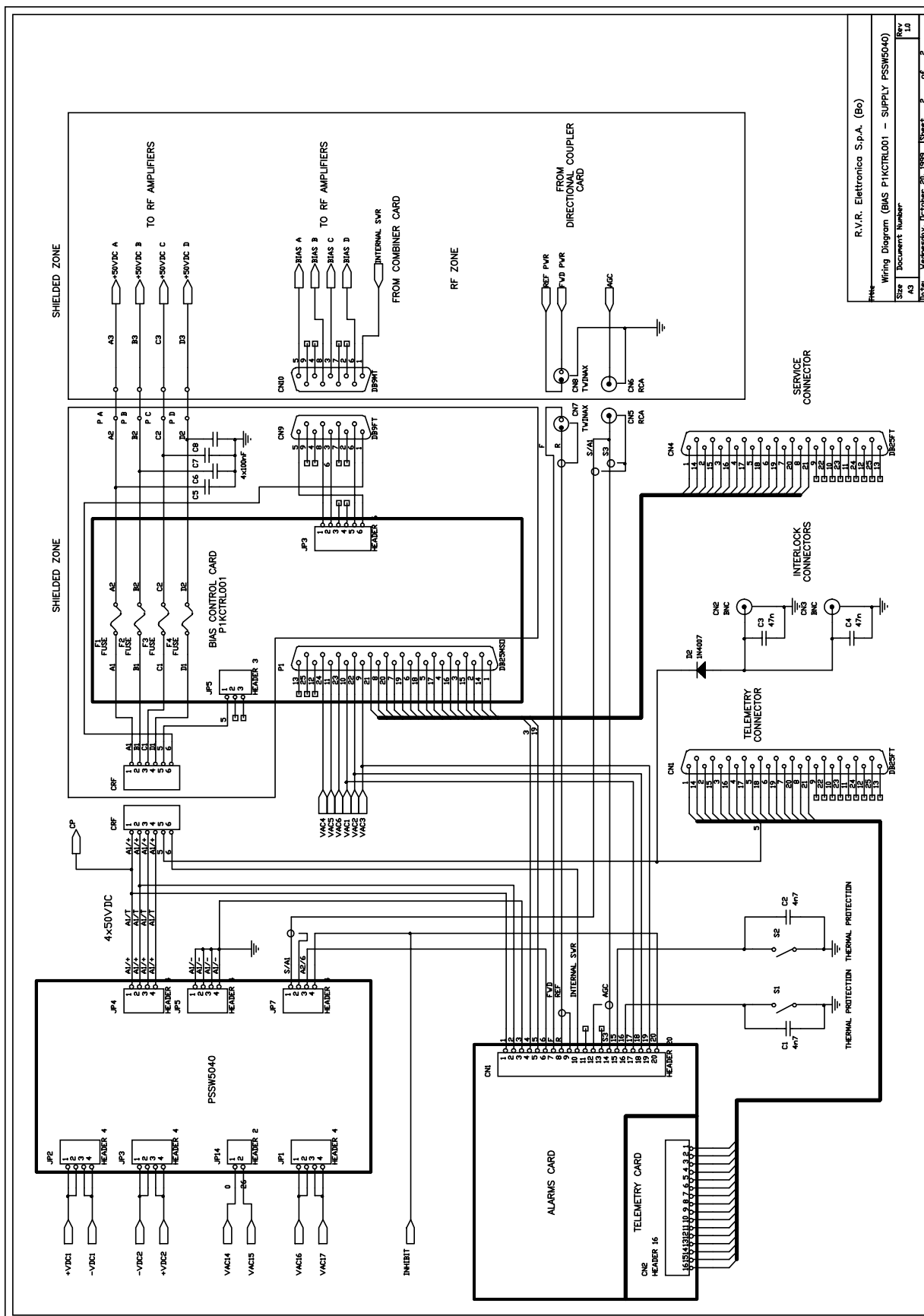
Versione precedente, solo per riferimento

Former version, for reference only



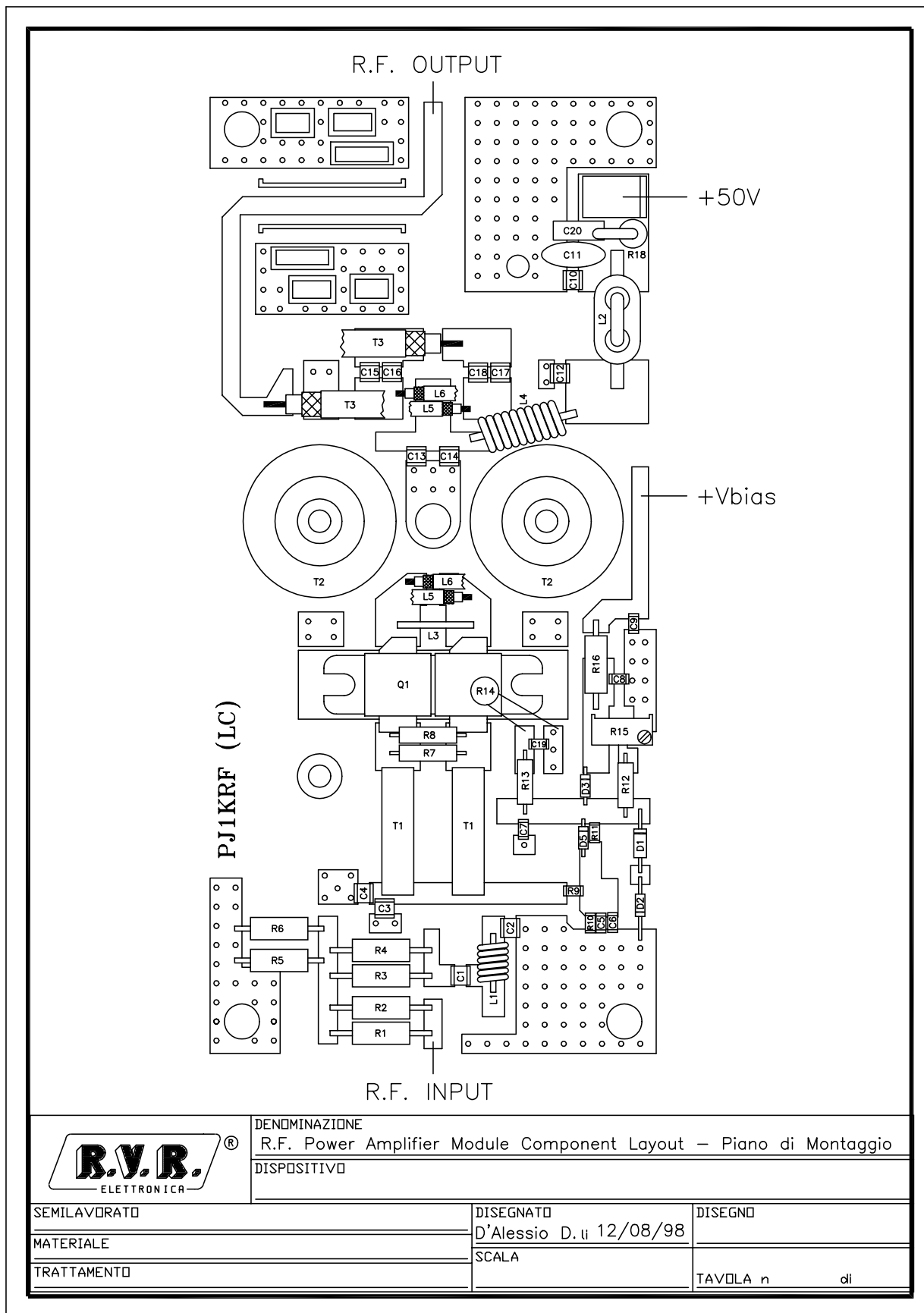
Rev	1.0
Size	A3
Document Number	1000
Version	1
Rev	2

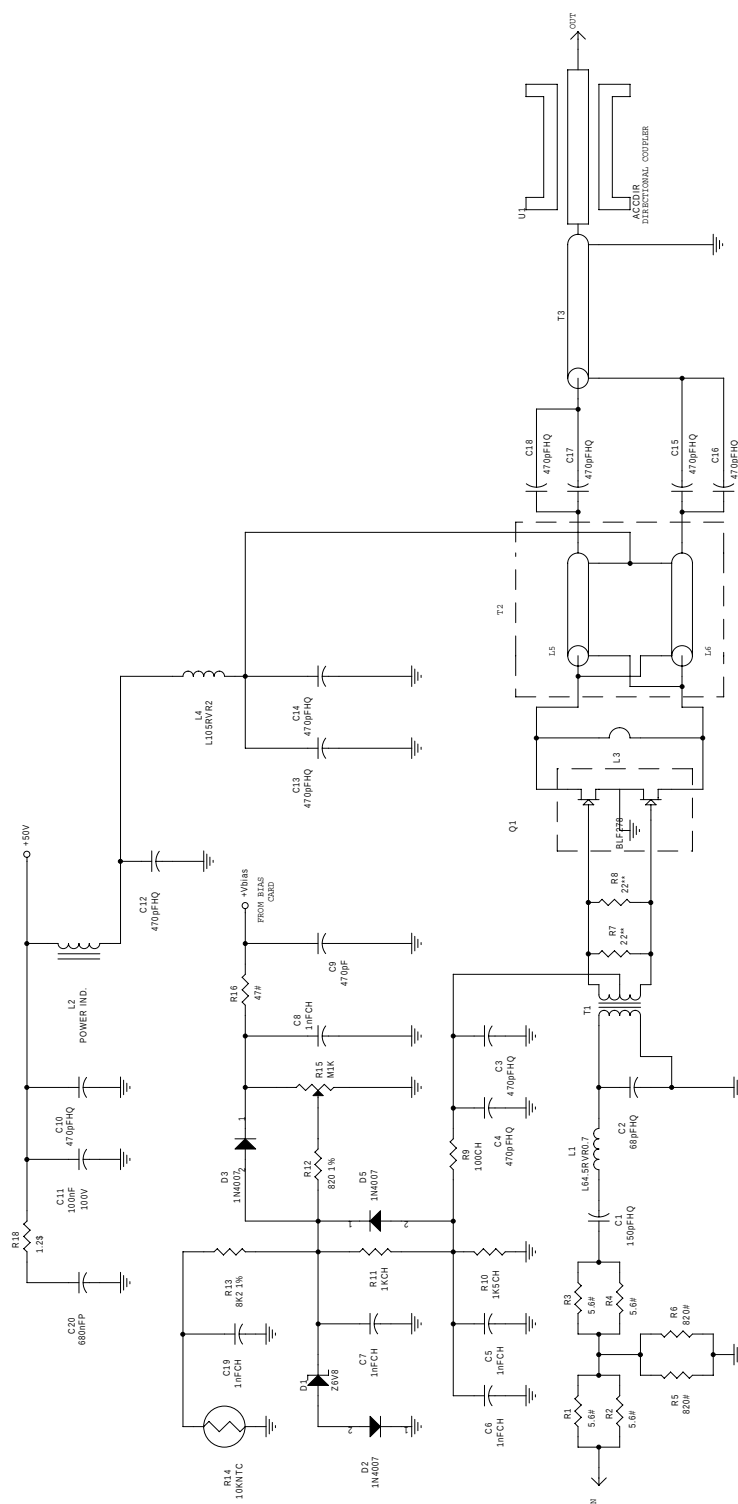
Versione precedente, solo per riferimento
Former version, for reference only



Rev	1.0
Size	A3
Document Number	Wiring Diagram (BIAS P1KICRL001 - SUPPLY PSSW5040)
Date	Wednesday, October 20, 1999
Sheet	2 of 2

Versione precedente, solo per riferimento
Former version, for reference only





T1 -> AWG 20 Stand 19/32 CABLE L=140mm

T2 -> 2 X 25 Ohm CABLE L=240mm 5 TURNS

T3 -> RG303 CABLE L=120mm

Nome Projeto: P.1000M		Paginas: 1 de 1		Folha: A3	
Autor(es): rev.: BERTI J.		Codex Projeto: /			
Nome PC / Rede: \\ACK\		Data: 03/07/01			
		Revisões: 1.1			
		Nome Projeto: RF POWER AMPLIFIER MODULE			

R.F. POWER AMPLIFIER

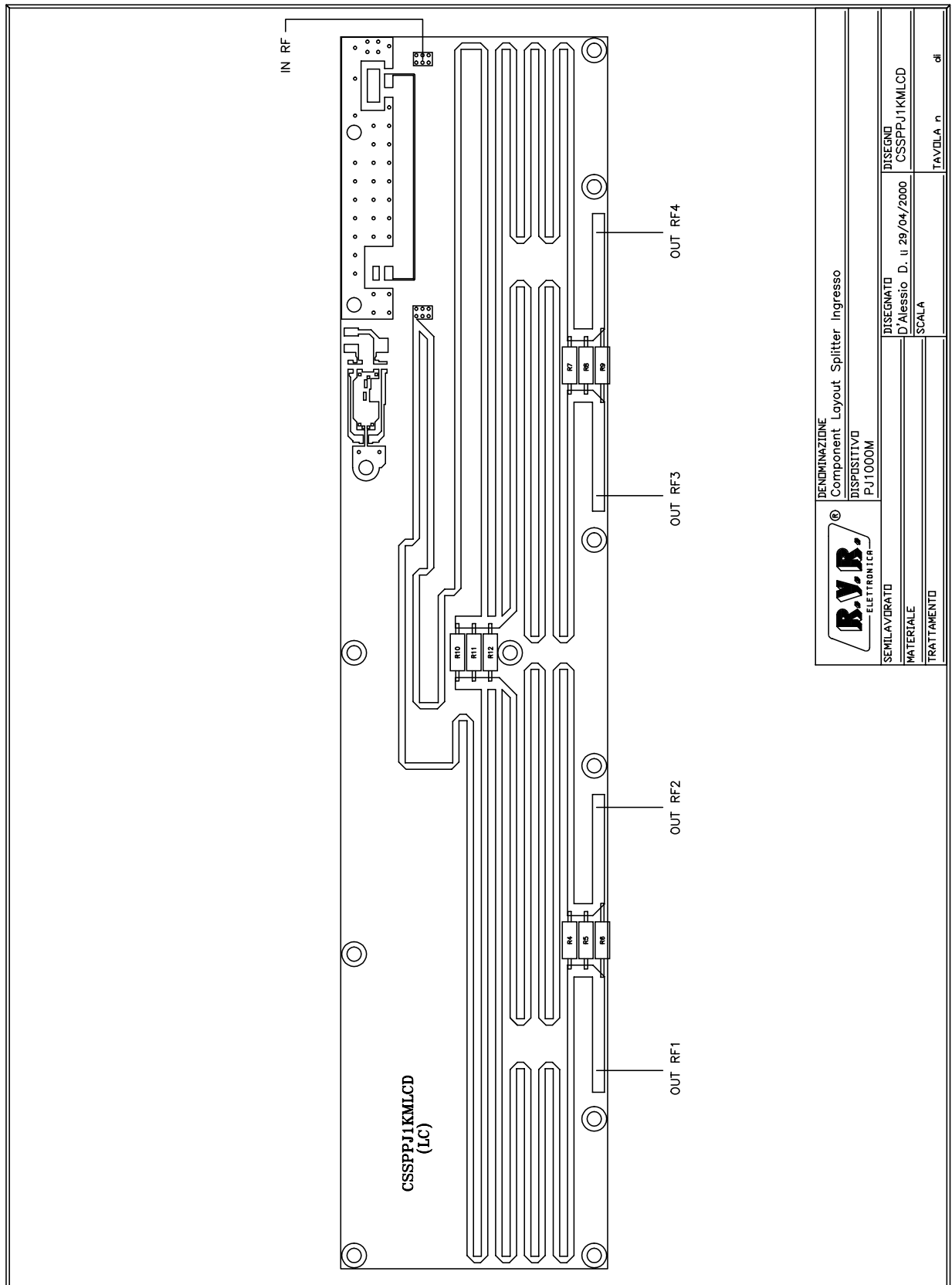
Bill Of Materials

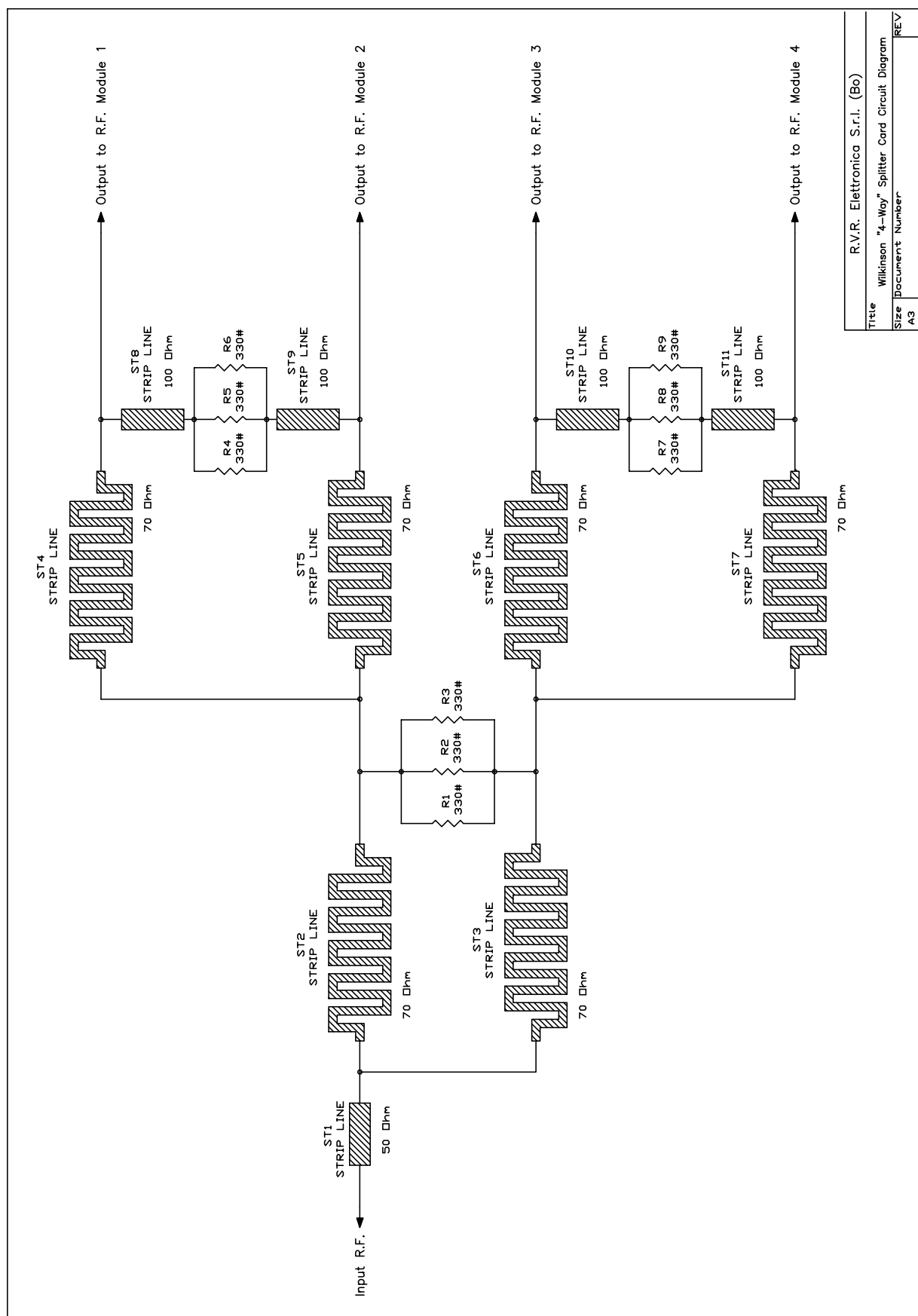
Page 1

Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CODE
1	1	R18	1.2\$	RESISTOR 5W	
2	4	R1,R2,R3,R4	5.6#	RESISTOR 2W	
3	2	R7,R8	22**	RESISTOR 1W 5%	
4	1	R16	47#	RESISTOR 2W	
5	1	R9	100CH	CHIP RESISTOR 1206 1%	
6	1	R12	820 1%	RESISTOR 1/4W 1%	
7	2	R5,R6	820#	RESISTOR 2W	
8	1	R11	1KCH	CHIP RESISTOR 1206 1%	
9	1	R10	1K5CH	CHIP RESISTOR 1206 1%	
10	1	R13	8K2 1%	RESISTOR 1/4W 1%	
11	1	R14	10KNTC	NTC	
12	1	R15	M1K	TRIMMER MULTIGIRI 3296	
13	1	C2	68PFHQ	HIGHT Q CAPACITOR	
14	1	C1	150PFHQ	HIGHT Q CAPACITOR	
15	11	C3,C4,C10,C12,C13,C14,C15,C16,C17,C18,C9	470PFHQ	HIGHT Q CAPACITOR	
16	5	C5,C6,C7,C8,C19	1NFCH	CERAMIC CHIP CAPACITOR	
17	1	C11	100NF	CERAMIC CAPACITOR	
18	1	C20	680NFP	POLIELSTER CAPACITOR	
19	1	L2	POWER IND.	RF BINOC. CHOCKE	
20	1	L1	L64.5RVR0.76SP	DIA4.5 RAME SMAL 0.7mm	
21	1	L4	L105RVR2	10 SP DIA 5 F 2mm	
22	1	L3	BU6012RVR2	BOB L60MM D12 FILO ARG2MM	
23	1	T1	4:1	TRASF. RF. CAVO 25 OHM	
24	1	T3	RG303	COAX CABLE RG303	
25	2	L5,L6	RG316-25	CAOX CABLE RG316 25 Ohm	
26	3	D2,D3,D5	1N4007	SILICON DIODE 400V	
27	1	D1	Z6V8	ZENER DIODE	
28	1	Q1	BLF278	VHF PUSH-PULL POWER MOS	

Pagina lasciata intenzionalmente in bianco

This page was intentionally left blank





Splitter Card Circuit Diagram

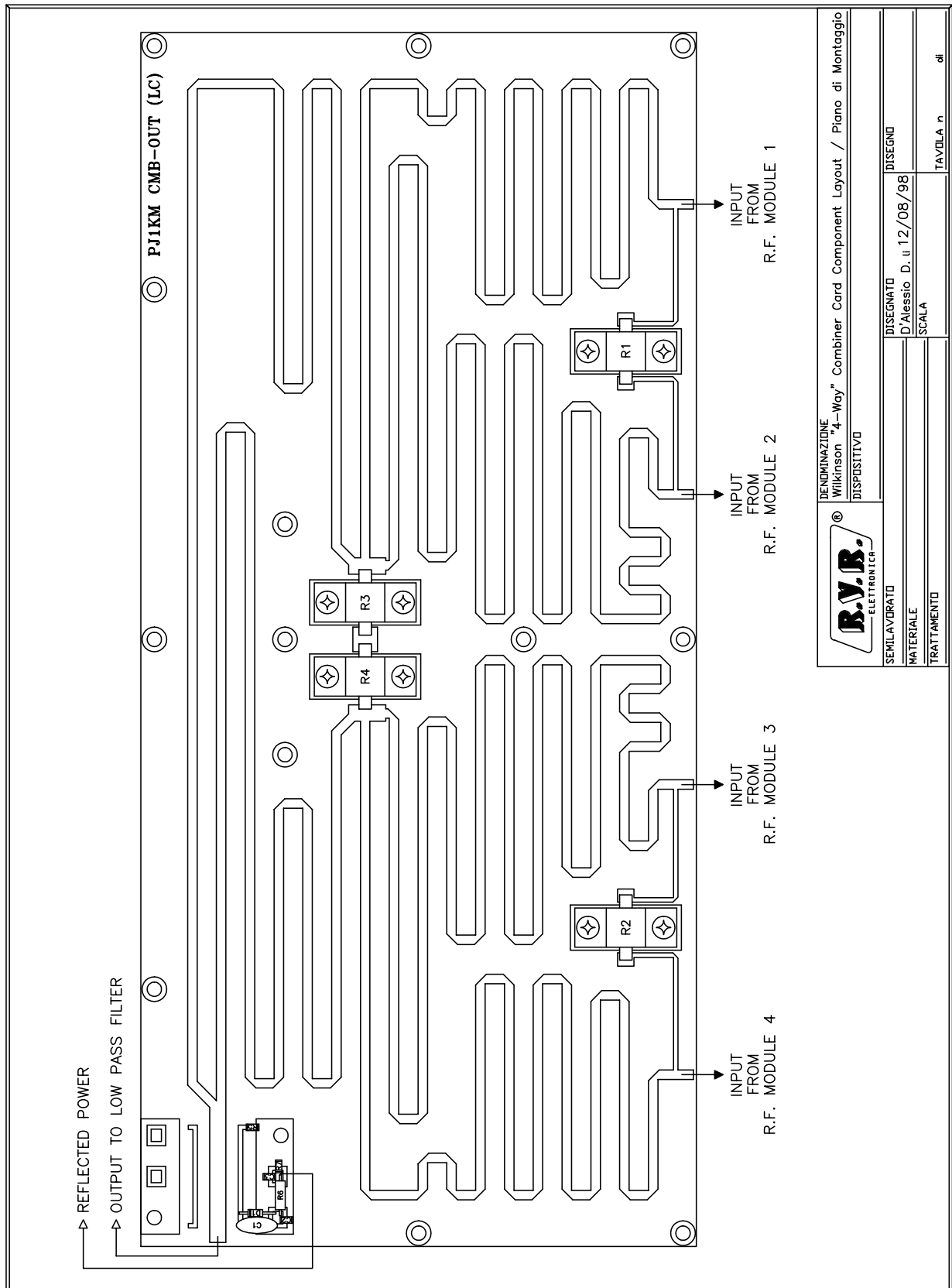
Bill Of Materials

Page 1

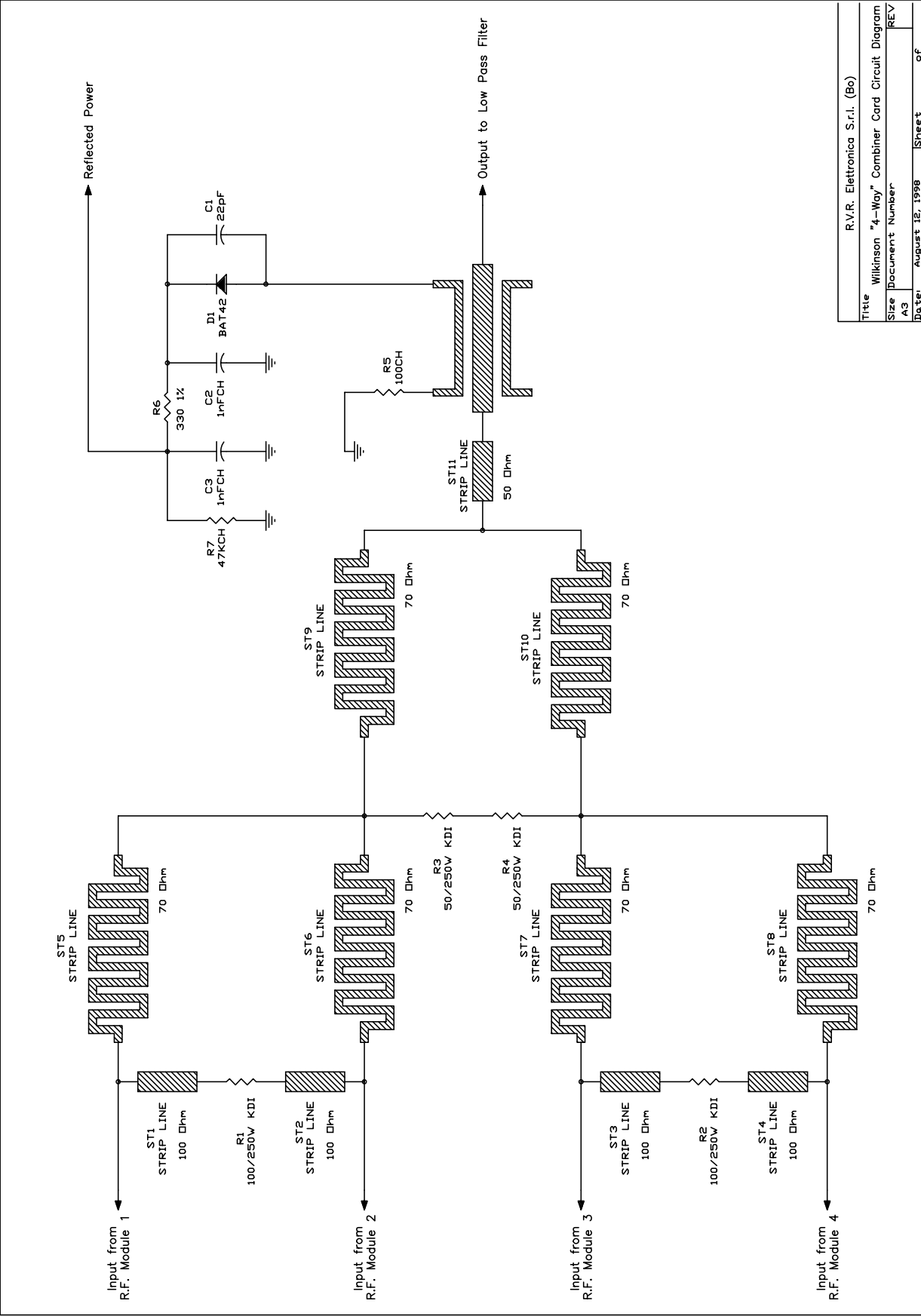
Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CODE
1	9	R1,R2,R3,R4,R5,R6,R7,R8, R9	330#	RESISTOR 2W	
2	11	ST1,ST2,ST3,ST4,ST5,ST6, ST7,ST8,ST9,ST10,ST11	STRIP LINE	STRIP LINE	

Pagina lasciata intenzionalmente in bianco

This page was intentionally left blank



R.V.R. ELETTRONICA		DENOMINAZIONE Wilkinson "4-Way" Combiner Card Component Layout / Piano di Montaggio	
SEMILAVORATO	DISSEGNO	D'Allesio D. il 12/08/98	
MATERIALE	SCALA		
TRATTAMENTO	TAVOLA n	di	



Title		R.V.R. Elettronica S.r.l. (Bo)	
Size		Wilkinson "4-Way" Combiner Card Circuit Diagram	
Document Number		REV	
Date		August 12, 1998	
Sheet		of	

Combiner Card Circuit Diagram

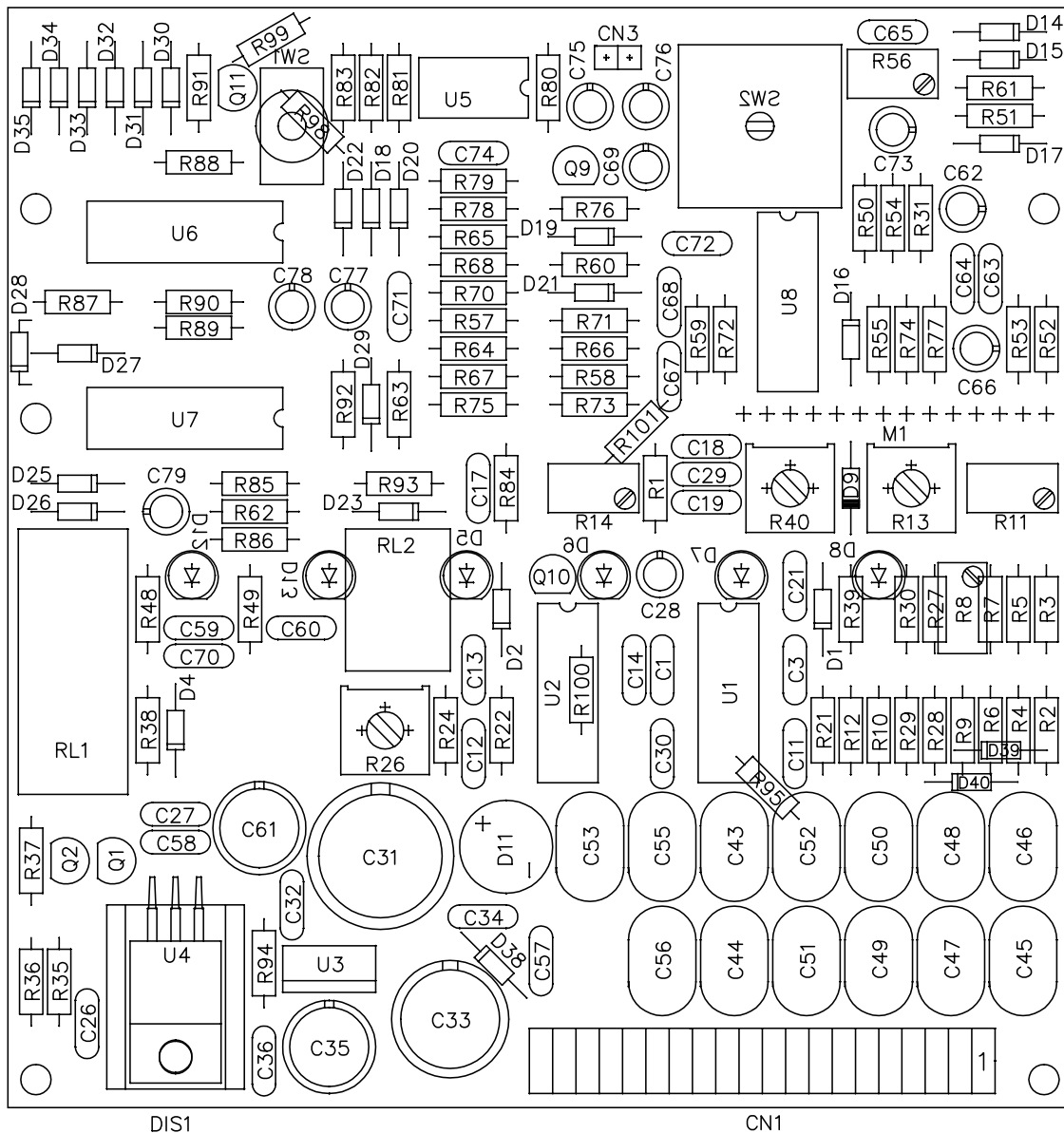
Bill Of Materials

Page 1

Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CODE
1	2	R3,R4	50/250W KDI	RESISTENZA KDI 250W	
2	1	R5	100CH	CHIP RESISTOR 1206 5%	
3	2	R1,R2	100/250W KDI	RESISTENZA KDI 250W	
4	1	R6	330 1%	RESISTOR 1/4W 5%	
5	1	R7	47KCH	RESISTOR 1/4W 5%	
6	1	C1	22PF	CERAMIC CAPACITOR NP0	
7	2	C2,C3	1NFCH	CERAMIC HIGH Q	
8	1	D1	BAT42	HOT CARRIER DIODE	
9	12	ST1,ST2,ST3,ST4,ST5, ST6,ST7,ST8,ST9,ST10, ST11,ST12	STRIP LINE	STRIP LINE	

Pagina lasciata intenzionalmente in bianco

This page was intentionally left blank



DENOMINAZIONE
Alarms Card Component Layout / Piano di Montaggio

DISPOSITIVO

SEMILAVORATO

MATERIALE

TRATTAMENTO

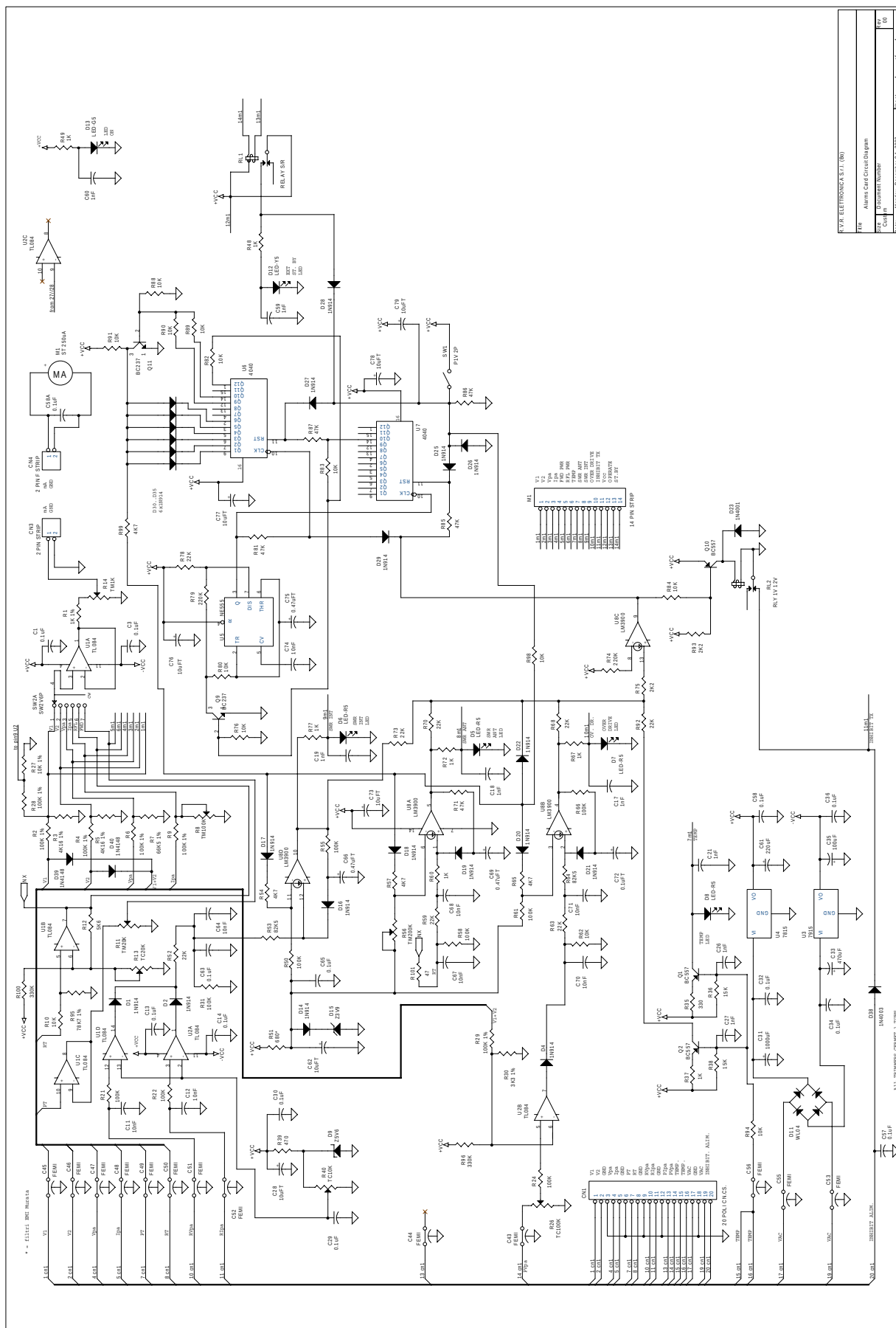
DISEGNATO

li 12/08/98

DISEGNO

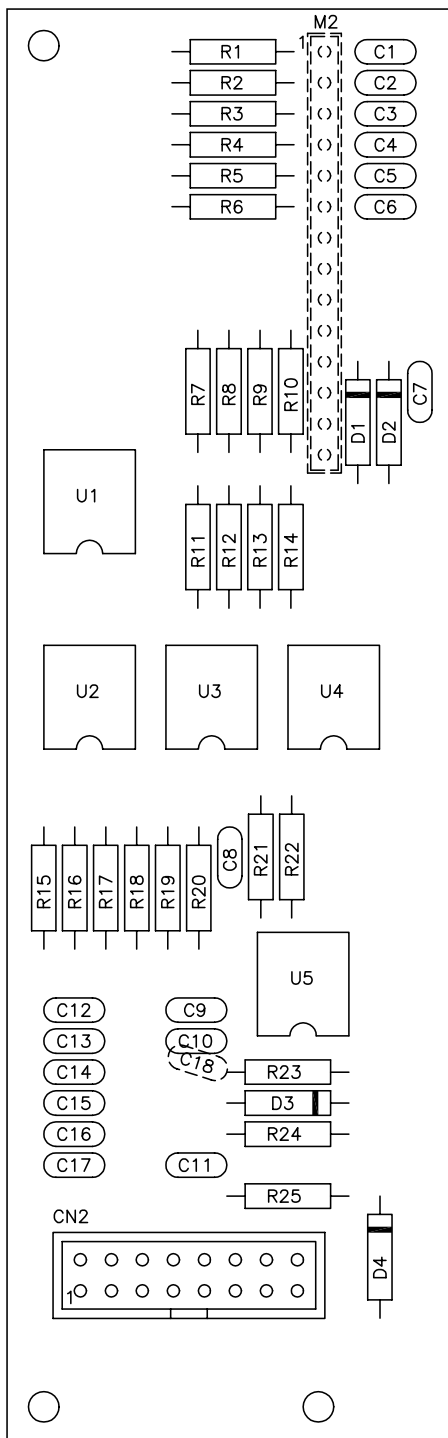
SCALA

TAVOLA n 1 di 2



Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CODE
1	1	R101	47	RESISTOR 1/4W 5%	
2	1	R35	330	RESISTOR 1/4W 5%	
3	1	R39	470	RESISTOR 1/4W 5%	
4	1	R51	680*	RESISTOR 1/2W 5%	
5	1	R1	1K 1%	RESISTOR 1/4W 1%	
6	7	R37, R48, R49, R60, R67, R72, R77	1K	RESISTOR 1/4W 5%	
7	2	R75, R93	2K2	RESISTOR 1/4W 5%	
8	1	R30	3K3 1%	RESISTOR 1/4W 1%	
9	2	R3, R5	4K16 1%	RESISTOR 1/4W 1%	
10	4	R54, R57, R65, R99	4K7	RESISTOR 1/4W 5%	
11	1	R12	5K6	RESISTOR 1/4W 5%	
12	13	R10, R62, R76, R80, R82, R83, R84, R88, R89, R90, R91, R94, R98	10K	RESISTOR 1/4W 5%	
13	2	R36, R38	15K	RESISTOR 1/4W 5%	
14	8	R52, R59, R63, R68, R70, R73, R78, R92	22K	RESISTOR 1/4W 5%	
15	1	R8	TM100K	TRIM.MULTIGIRI REG.VERT	
16	5	R71, R81, R85, R86, R87	47K	RESISTOR 1/4W 5%	
17	1	R7	66K5 1%	RESISTOR 1/4W 1%	
18	1	R95	78K7 1%	RESISTOR 1/4W 1%	
19	2	R53, R64	82K5	RESISTOR 1/4W 5%	
20	5	R2, R4, R6, R9, R29	100K 1%	RESISTOR 1/4W 1%	
21	9	R21, R22, R24, R31, R50, R55, R58, R61, R66	100K	RESISTOR 1/4W 5%	
22	2	R74, R79	220K	RESISTOR 1/4W 5%	
23	2	R96, R100	330K	RESISTOR 1/4W 5%	
24	1	R14	TC1K	TRIM.MULTIGIRI REG.VERT	
25	1	R40	TC10K	TRIM.MULTIGIRI REG.ORIZ	
26	1	R13	TC20K	TRIM.MULTIGIRI REG.ORIZ	
27	1	R26	TC100K	TRIM.MULTIGIRI REG.ORIZ	
28	1	R56	TM220K	TRIM.MULTIGIRI REG.VERT	
29	8	C17, C18, C19, C21, C26, C27, C59, C60	1NF	CERAMIC CAPACITOR	
30	8	C11, C12, C64, C67, C68, C70, C71, C74	10NF	CERAMIC CAPACITOR	
31	14	C1, C3, C13, C14, C29, C30, C32, C34, C36, C57, C58A, C58, C63, C65	0.1UF	CERAMIC CAPACITOR	
32	1	C72	0.1UFT	TANTALIUM CAPACITOR	

33	3	C66,C69,C75	0.47UFT	TANTALIUM CAPACITOR
34	7	C28,C62,C73,C76, C77,C78,C79	10UFT	TANTALIUM CAPACITOR
35	1	C35	100UF	ELECTROLYTIC CAPACITOR
36	1	C61	220UF	ELECTROLYTIC CAPACITOR
37	1	C33	470UF	ELECTROLYTIC CAPACITOR
38	1	C31	1000UF	ELECTROLYTIC CAPACITOR
39	1	M1	ST 250UA	STRUMENTO 250uA
40	1	CN3	2 PIN STRIP	STRIP M P 2.54 2 PIN
41	1	M1	14 PIN STRIP	STRIP M P 2.54 14 PIN
42	1	CN4	2 PIN F STRIP	STRIP F P 2.54 2 PIN
43	1	CN1	20 POLI CN.CS.	CONN.STRIP 20P MASC. CS POL.
44	12	C43,C45,C46,C47, C48,C49,C50,C51, C52,C53,C55,C56	FEMI	FILTRO EMI MURATA
45	1	RL2	RLY 1V 12V	RELAY 1 VIA 12V
46	1	RL1	RELAY S/R	RELAY SET / RESET 12V
47	1	SW1	P1V 2P	PULSANTE 1 VIA 2 POS
48	1	SW2	SW2V6P	COMMUTATORE 2 VIE 6 POS FEME
49	2	D39,D40	1N4148	SILICON DIODE
50	22	D1,D2,D4,D14,D16,1N4148 D17,D18,D19,D20,D21,D22, D25,D26,D27,D28,D29,D30, D31,D32,D33,D34,D35		SILICON DIODE
51	1	D23	1N4148	SILICON DIODE
52	1	D38	1N4004	SILICON DIODE
53	1	D11	WL04	DIODE BRIDGE 1.5A
54	5	D5,D6,D7,D8,D12	LED-R5	RED LED DIODE
55	1	D13	LED-G5	GREEN LED DIODE
56	1	D15	Z3V9	ZENER DIODE 3.9V 1/4W
57	1	D9	Z5V6	ZENER DIODE 5.6V 1/4W
58	1	U4	7815	POS. STABILIZER 1A
59	1	U3	7915	NEG. STABILIZER 1A
60	2	Q9,Q11	BC237	NPN TRANSISTOR
61	3	Q1,Q2,Q10	BC557	PNP TRANSISTOR
62	2	U1,U2	TL084	QUAD OP. AMP.
63	1	U5	NE555	TIMER
64	2	U6,U7	4040	CMOS DIVIDER
65	1	U8	LM3900	NORTON QUAD AMP.
66	1	R11	TM20K	TRIM.MULTIGIRI REG.VERT
67	1	R27	10K 1%	RESISTOR 1/4W 1%
68	1	R28	100K 1%	RESISTOR 1/4W 1%



DENOMINAZIONE
Telemetry Card (Mod. PROT-A2) Component Layout / Piano di Montaggio

DISPOSITIVO

SEMILAVORATO

DISEGNATO
D'Alessio D. U.

DISEGNO

MATERIALE

SCALA

TRATTAMENTO

TAVOLA n di



Telemetry Card Mod. 2

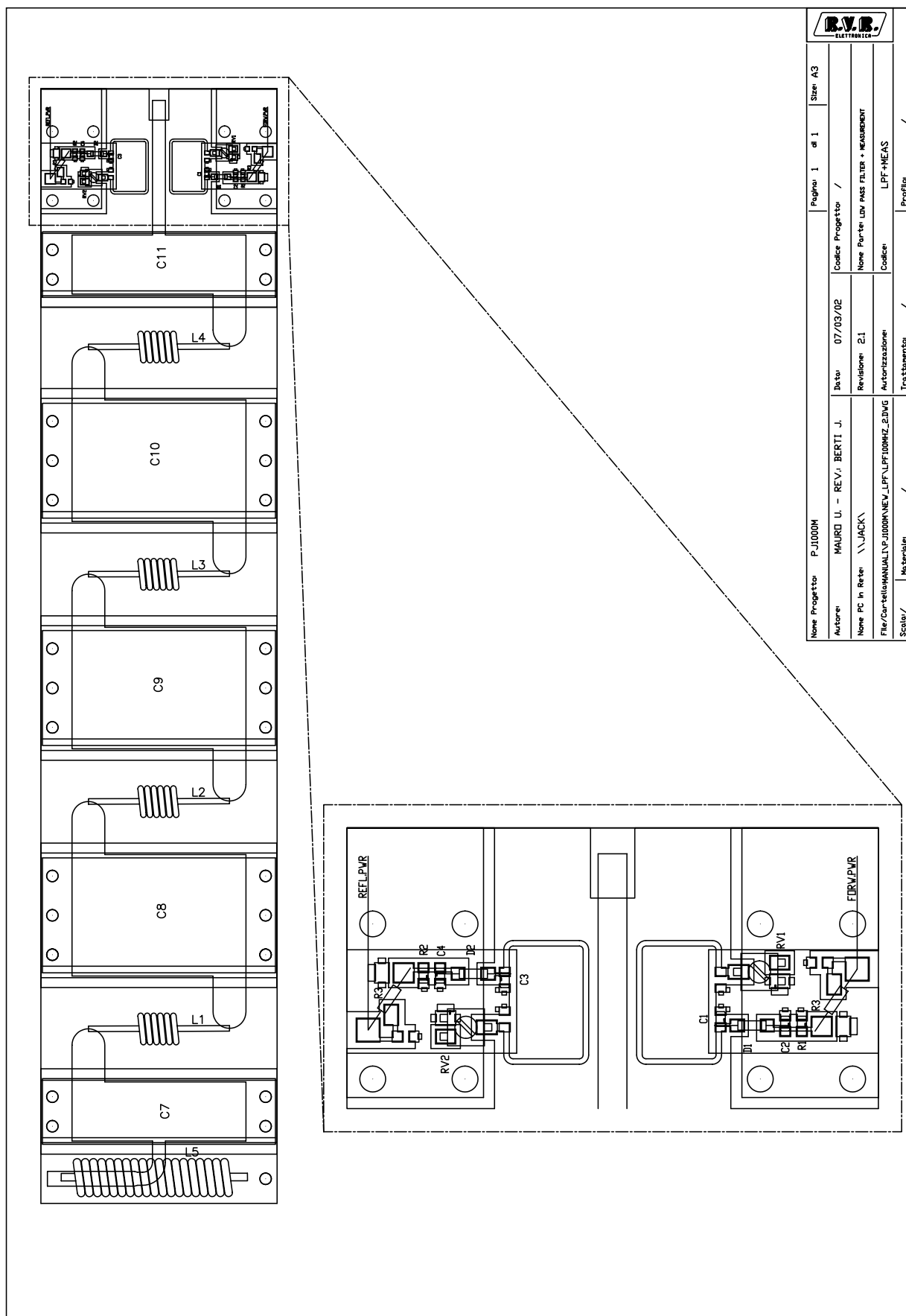
Bill Of Materials

Page 1

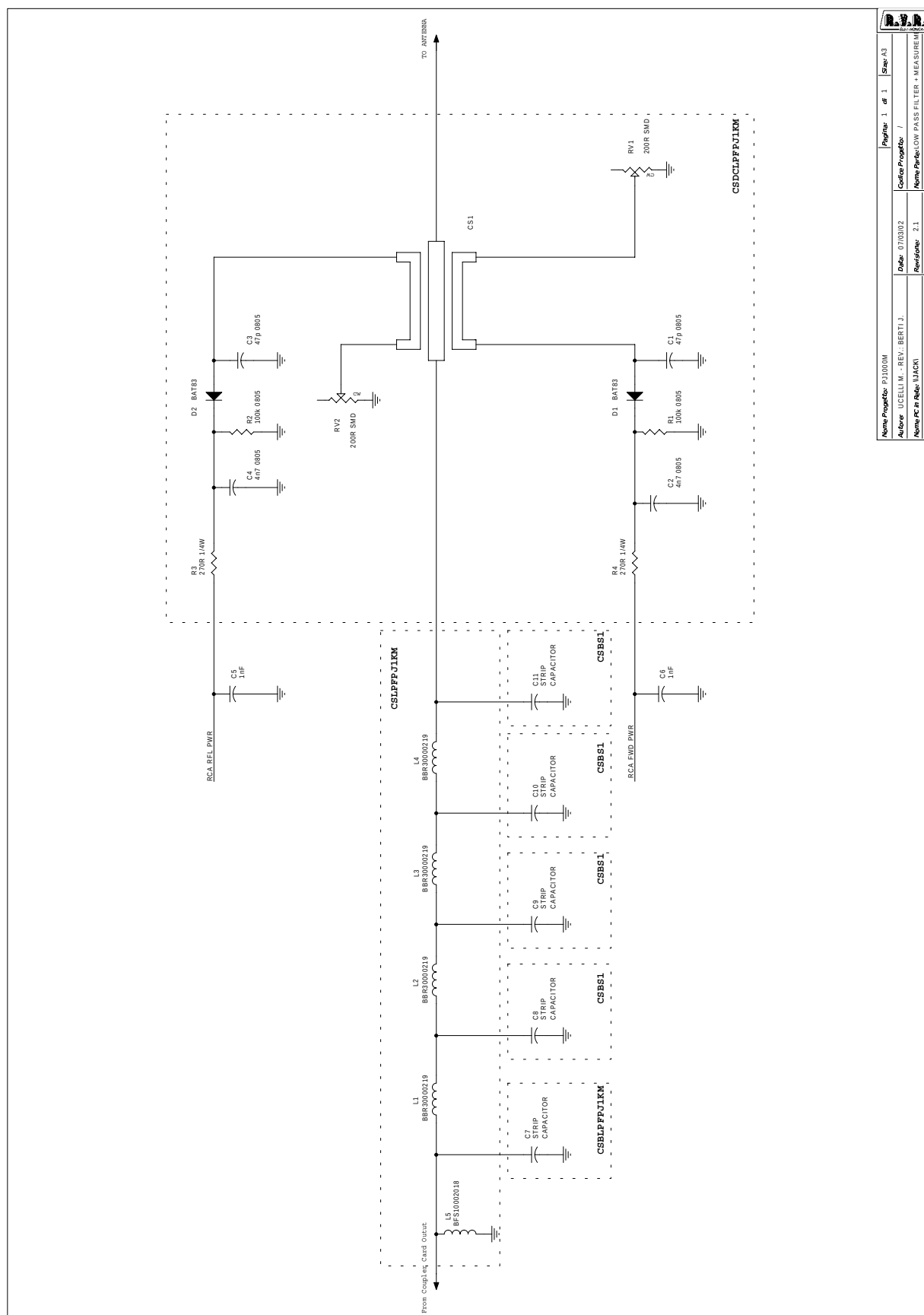
Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CODE
1	9	R15,R16,R17,R19,R20, R22,R23,R24,R25	1K 1%	RESISTOR 1/4W 1%	
2	1	R18	1K	RESISTOR 1/4W 5%	
3	1	R21	2K2 1%	RESISTOR 1/4W 1%	
4	14	R1,R2,R3,R4,R5,R6,R7, R8,R9,R10,R11,R12,R13, R14	100K 1%	RESISTOR 1/4W 1%	
5	18	C1,C2,C3,C4,C5,C6,C7, C8,C9,C10,C11,C12,C13, C14,C15,C16,C17,C18	100NF	CERAMIC CAPACITOR	
6	1	M2	14 PIN F STRIP	STRIP F P 2.54 14 PIN	
7	1	CN2	16 PIN CONN.	CONN. M 2*8 P 2.54	
8	2	D3,D4	1N4148	SILICON DIODE	
9	2	D2,D3	1N4007	SILICON DIODE 1000V	
10	5	U1,U2,U3,U4,U5	LM358N	DOUBLE OP. AMP.	

Pagina lasciata intenzionalmente in bianco

This page was intentionally left blank



R.V.R. ELETTRONICA		Pagina 1	di 1	Size A3
Nome Progetto	PJ1000M	Codice Progetto	/	
Autore	MAURO U. - REV. BERTI J.	Data	07/03/02	
Nome PC in Rete	\\JACK\	Revisione	2.1	
Filer/Caratteristiche	MANUALITYPJ1000MNEW_LPF+MEAS_2.DWG	Autore	LPF+MEAS	
Scala	/	Trattamento	/	Profilo



PJ1000M

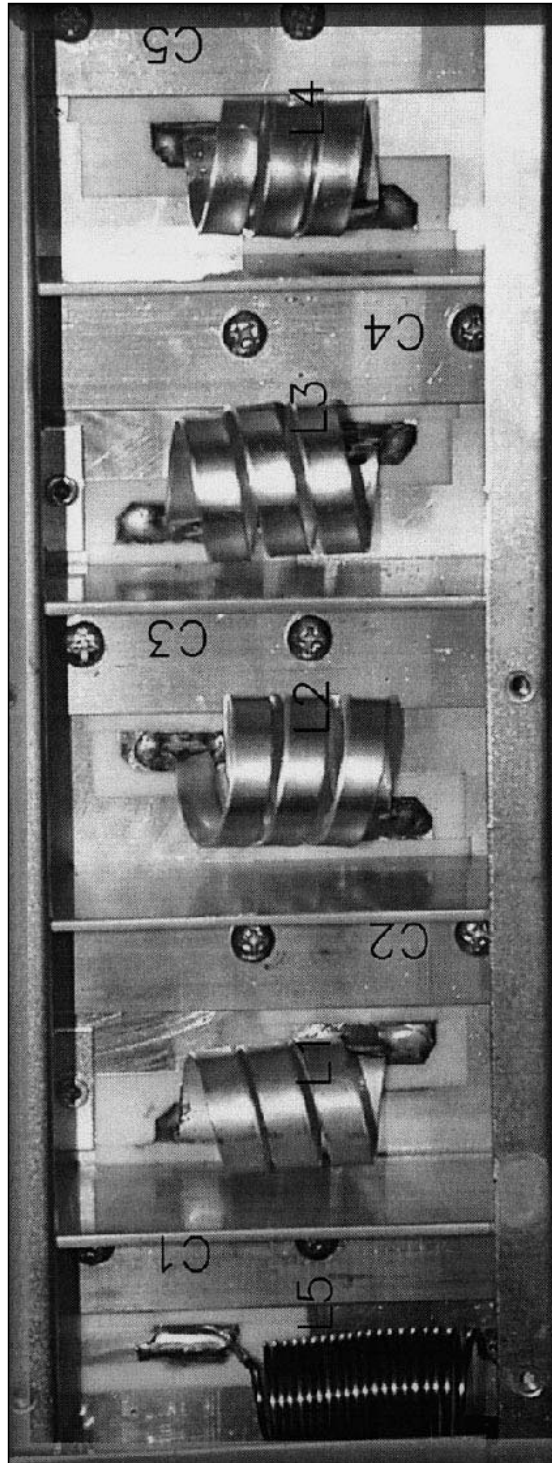
Bill Of Materials

Page1

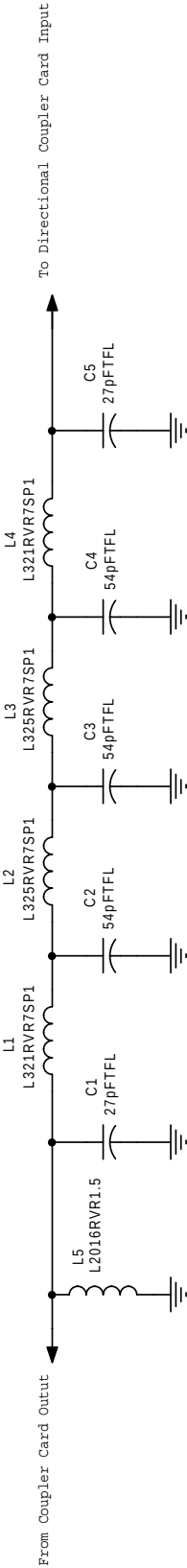
Item	Q.ty	Reference	Part
1	1	L5	BFS10002018
2	1	CS1	CSDRCPPJ1KM
3	2	C3 , C1	47p 0805
4	2	C4 , C2	4n7 0805
5	2	C5 , C6	1nF
6	2	C7 , C11	27pFTFL
7	3	C8 , C9 , C10	54pFTFL
8	2	D2 , D1	BAT83
9	4	L1 , L2 , L3 , L4	BBR30000219
10	2	RV2 , RV1	200R SMD
11	2	R2 , R1	100k 0805
12	2	R3 , R4	270R 1/4W

Pagina lasciata intenzionalmente in bianco

This page was intentionally left blank



DENOMINAZIONE		Low Pass Filter		Photo	
DISPOSITIVO		DISSEGNO		TAVOLA n	
SEMILAVORATO		Berti J.		di	
MATERIALE		18/01/01			
TRATTAMENTO		SCALA			



R.V.R. ELETTRONICA S.r.l. (Bo)			
Title			
Low Pass Filter Circuit Diagram			
Size	Document Number		Rev
			00
Date:		Thursday, January 11, 2001	Sheet 1 of 1

Low Pass Filter Circuit Diagram

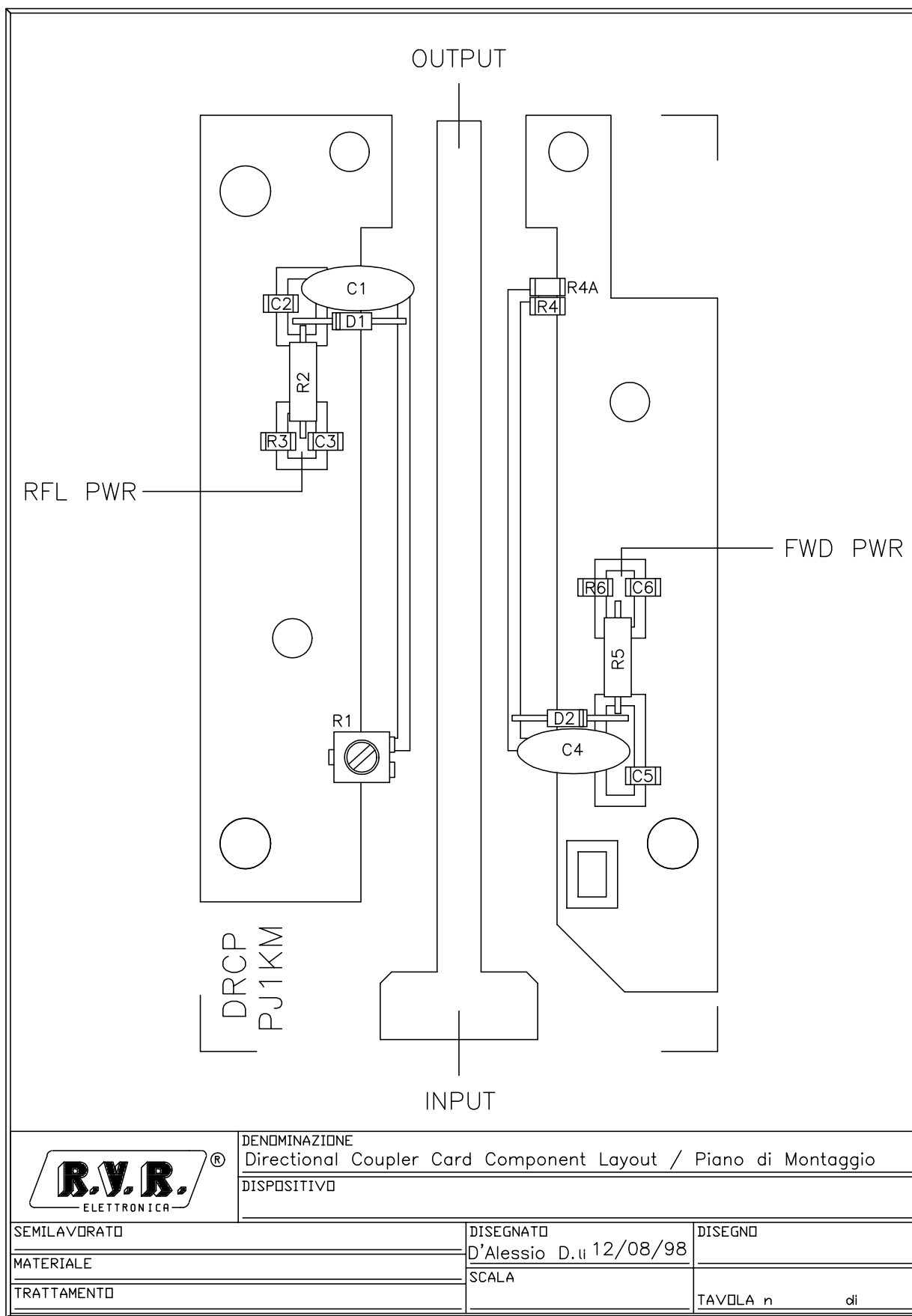
Bill Of Materials

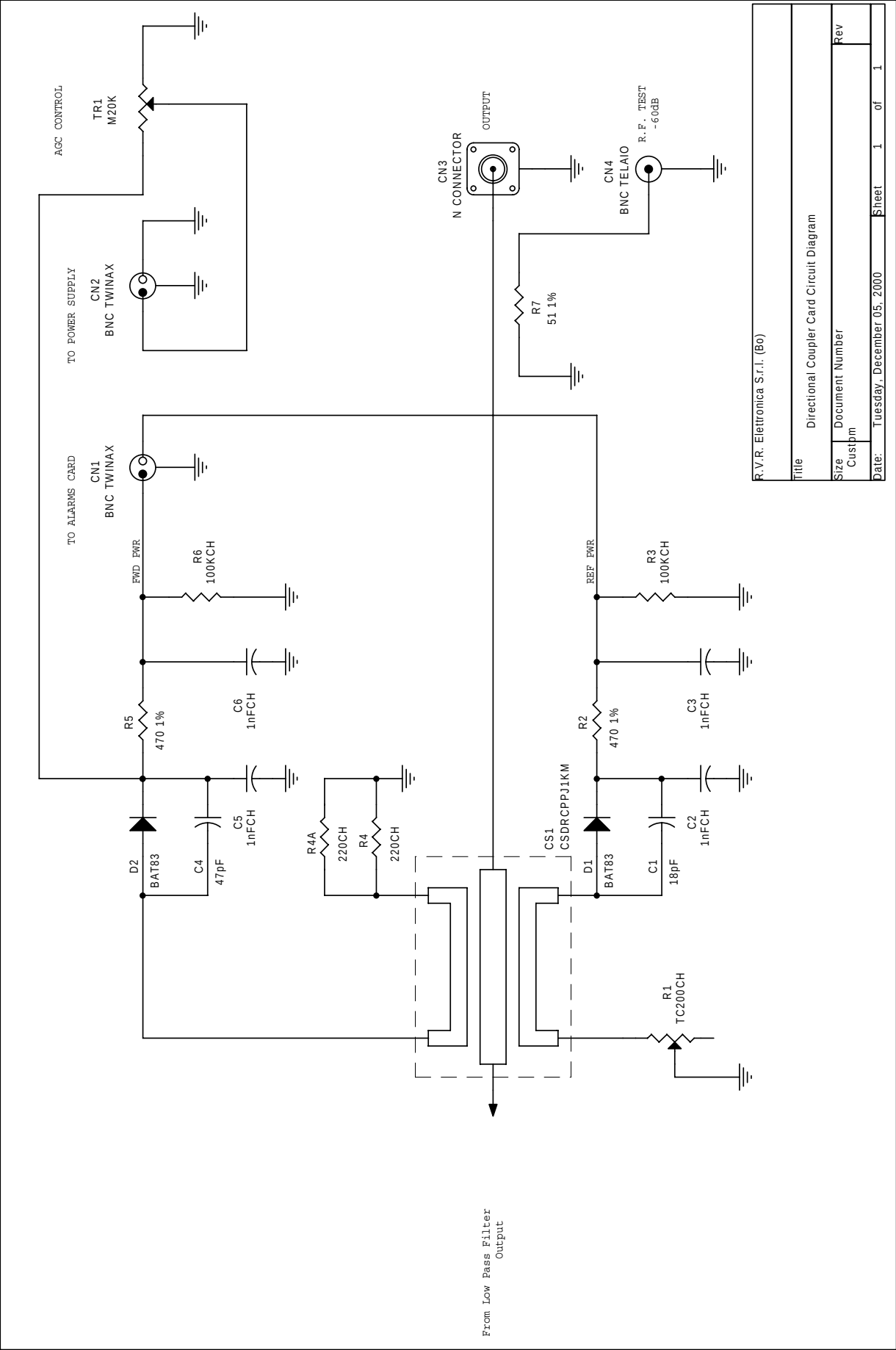
Page 1

Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CODE
1	2	C1,C5	27PFTFL	CONDBANDELLA RAME TEFLON	
2	3	C2,C3,C4	54PFTFL	COND.BANDELLA RAME TEFLON	
3	2	L1,L4	L321RVR7SP1	RAME ARG.3SP DIA21 7MM SP1	
4	2	L2,L3	L325RVR7SP1	RAME ARG.3SP DIA25 7MM SP1	
5	1	L5	L2016RVR1.5	RAME ARG.1.5MM 20SP DIA16MM	

Pagina lasciata intenzionalmente in bianco

This page was intentionally left blank

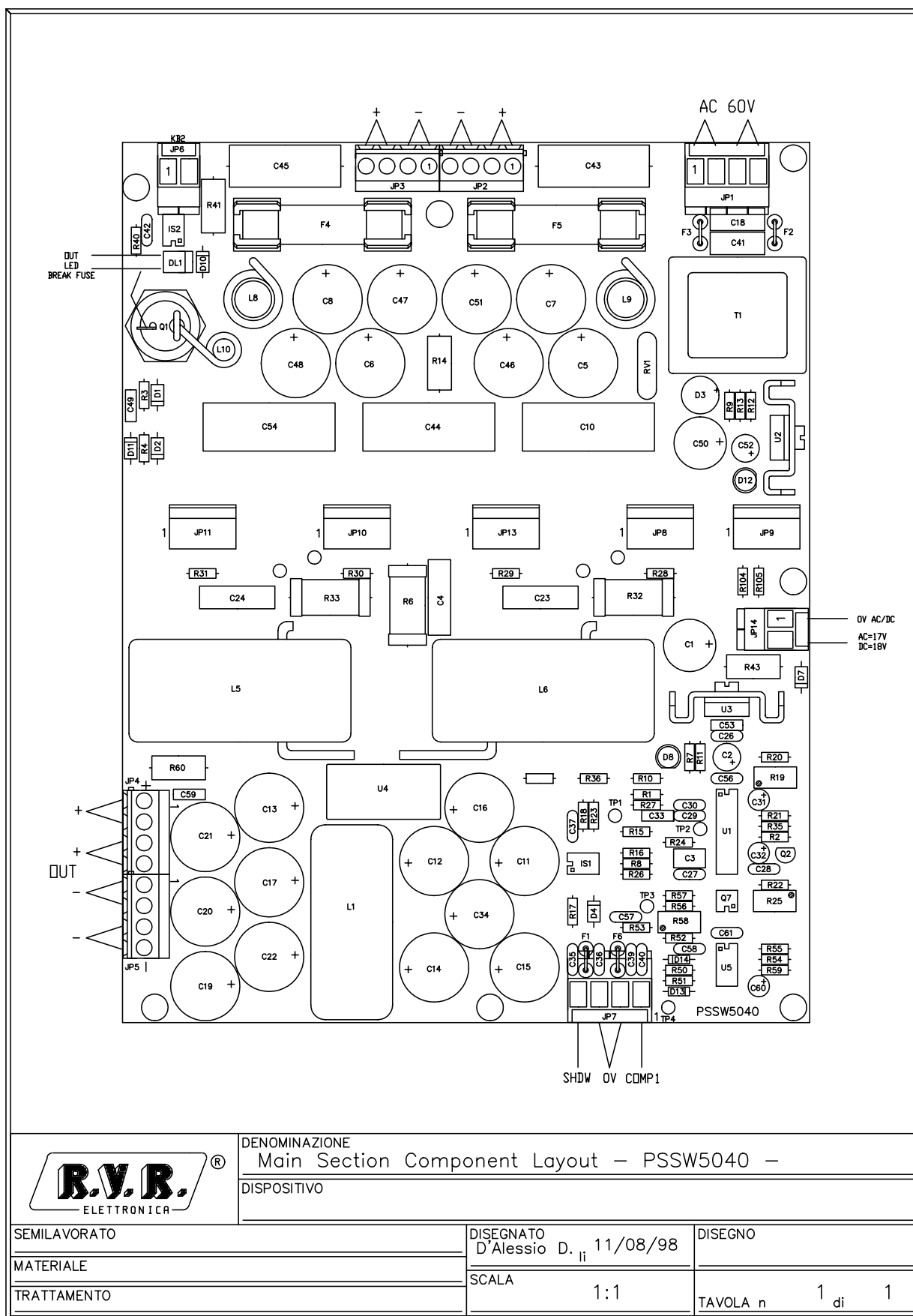


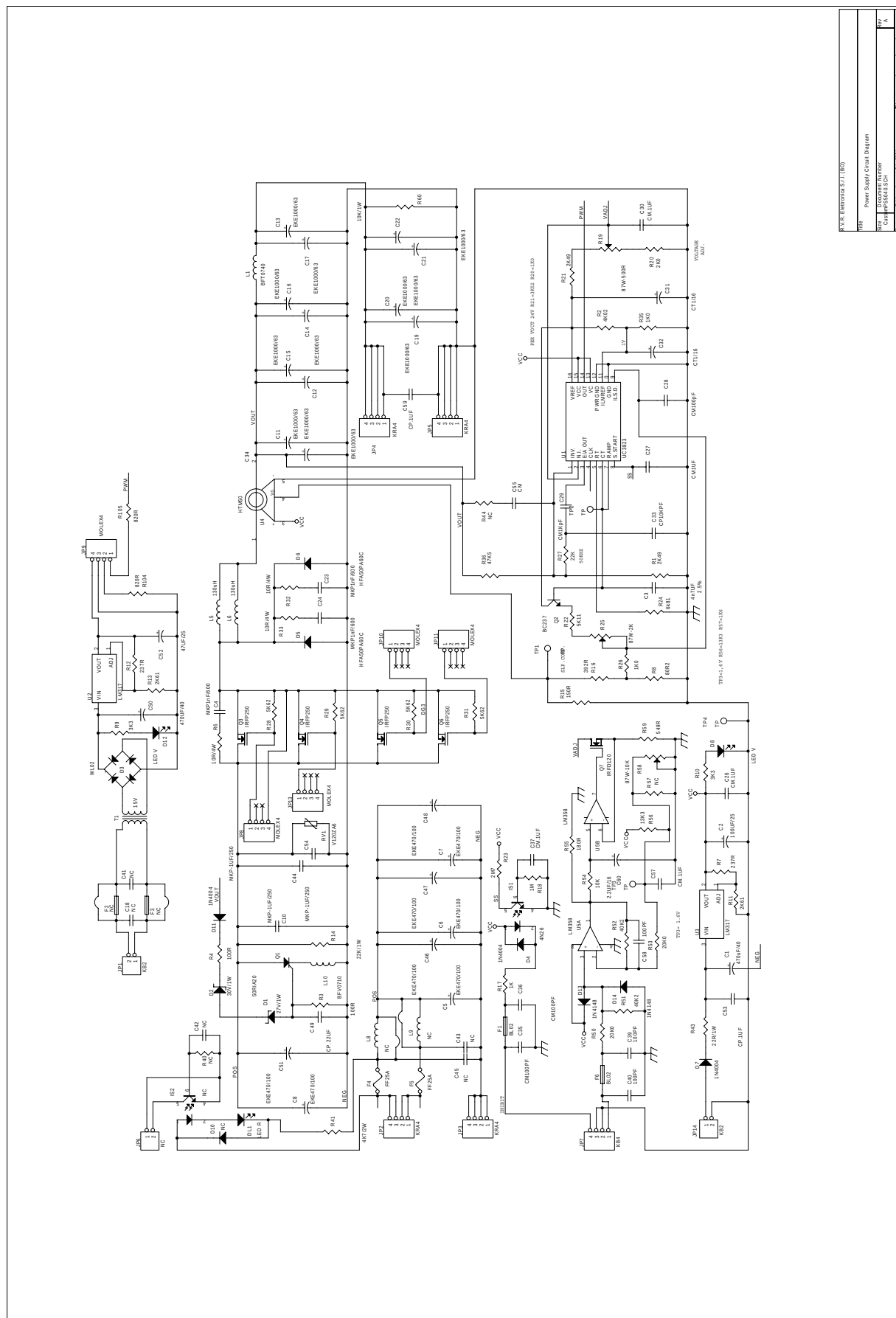


Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CODE
1	1	R7	51 1%	RESISTOR 1/4W 1%	
2	2	R4A,R4	220CH	CHIP RESISTOR 1206 1%	
3	2	R2,R5	470 1%	RESISTOR 1/4W 1%	
4	2	R3,R6	100KCH	CHIP RESISTOR 1206 1%	
5	1	R1	TC200CH	TRIM.REG.VER.CERMET SMD	
6	1	TR1	M20K	TRIMMER MULTIGIRI	
7	1	C1	18PF	CERAMIC CAPACITOR NP0	
8	1	C4	47PF	CERAMIC CAPACITOR NP0	
9	4	C2,C3,C5,C6	1NFCH	CAPACITOR HIGH Q	
10	1	CN4	BNC TELAIO	CONN. BNC A TELAIO	
11	2	CN1,CN2	BNC TWINAX	CONN.BNC X CAVO TWINAX	
12	1	CN3	N CONNECTOR	CONN. N A TELAIO	
13	2	D1,D2	BAT83	HOT CARRIER DIODE	
14	1	CS1	CSDRCPPJ1KM	CS DIR.COUPLER PJ1KM	

Pagina lasciata intenzionalmente in bianco

This page was intentionally left blank





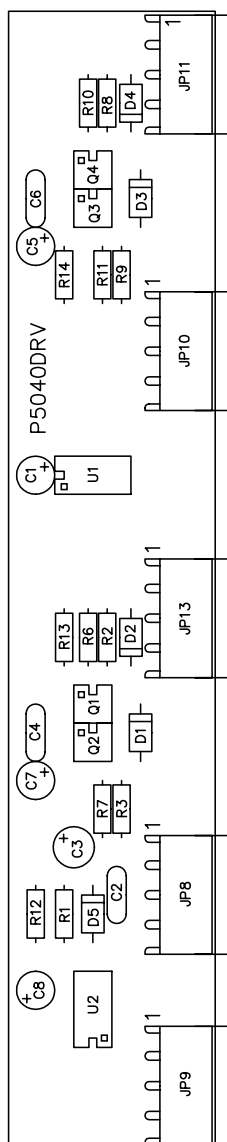
PS5040

Bill Of Materials

Page1

Item	Q.ty	Reference	Part
1	4	Q3, Q4, Q5, Q6	IRFP250
2	2	C1, C50	470UF/40
3	1	C2	100UF/25
4	1	C3	4n7UF
5	3	C4, C23, C24	MKP1nF/600
6	8	C5, C6, C7, C8, C46, C47, C48, C51	EKE470/100
7	3	C10, C44, C54	MKP-1UF/250
8	12	C11, C12, C13, C14, C15, C16, C17, C19, C20, C21, C22, C34	EKE1000/63
9	12	IS2, F2, F3, L8, L9, D10, C18, R40, C42, R44, C45, R57	NC
10	4	C26, C30, C37, C57	CM.1UF
11	1	C27	CM1UF
12	3	C28, C35, C36	CM100PF
13	1	C29	CM1KpF
14	2	C31, C32	CT1/16
15	1	C33	CP10KPF
16	3	C39, C40, C58	100PF
17	3	JP6, C41, C43	NC
18	1	C49	CP.22UF
19	1	C52	47UF/25
20	2	C53, C59	CP.1UF
21	1	C55	CM
22	1	C60	2.2UF/16
23	1	DL1	LED R
24	1	D1	27V/1W
25	1	D2	30V/1W
26	1	D3	WL02
27	3	D4, D7, D11	1N4004
28	2	D6, D5	HFA50PA60C
29	2	D12, D8	LED V
30	2	D13, D14	1N4148
31	2	F6, F1	BL02
32	2	F4, F5	FF25A
33	1	IS1	4N26
34	2	JP1, JP14	KB2
35	4	JP2, JP3, JP4, JP5	KRA4
36	1	JP7	KB4
37	5	JP8, JP9, JP10, JP11, JP13	MOLEX4
38	1	JP12	JUMPER2
39	1	L1	BFT0740
40	2	L5, L6	130uH
41	1	L10	BFV0710
42	1	Q1	50RIA20
43	1	Q2	BC237
44	1	Q7	IRFD120
45	1	RV1	V120ZA6
46	2	R21, R1	2K49
47	1	R2	4K02
48	2	R3, R4	100R
49	3	R6, R32, R33	10R/4W
50	2	R7, R12	237R
51	1	R8	80R2
52	2	R9, R10	3K3

53	2	R11, R13	2K61
54	1	R14	22K/1W
55	1	R15	150R
56	1	R16	392R
57	1	R17	1K
58	1	R18	1M
59	1	R19	87W-500R
60	1	R20	2K0
61	1	R22	5K11
62	1	R23	2M7
63	1	R24	6k81
64	1	R25	87W-2K
65	2	R35, R26	1K0
66	1	R27	22K
67	4	R28, R29, R30, R31	5K62
68	1	R36	47K5
69	1	R41	4K7/2W
70	1	R43	22R/1W
71	2	R50, R53	20K0
72	2	R51, R52	40K2
73	1	R54	10K
74	1	R55	180R
75	1	R56	13K3
76	1	R58	87W-10K
77	1	R59	549R
78	1	R60	10K/1W
79	2	R105, R104	820R
80	4	TP1, TP2, TP3, TP4	TP
81	1	T1	15V
82	1	U1	UC3823
83	2	U3, U2	LM317
84	1	U4	HTM50
85	1	U5	LM358



DENOMINAZIONE
Driver Section Component Layout – PSSW5040 –
DISPOSITIVO

SEMILAVORATO

MATERIALE

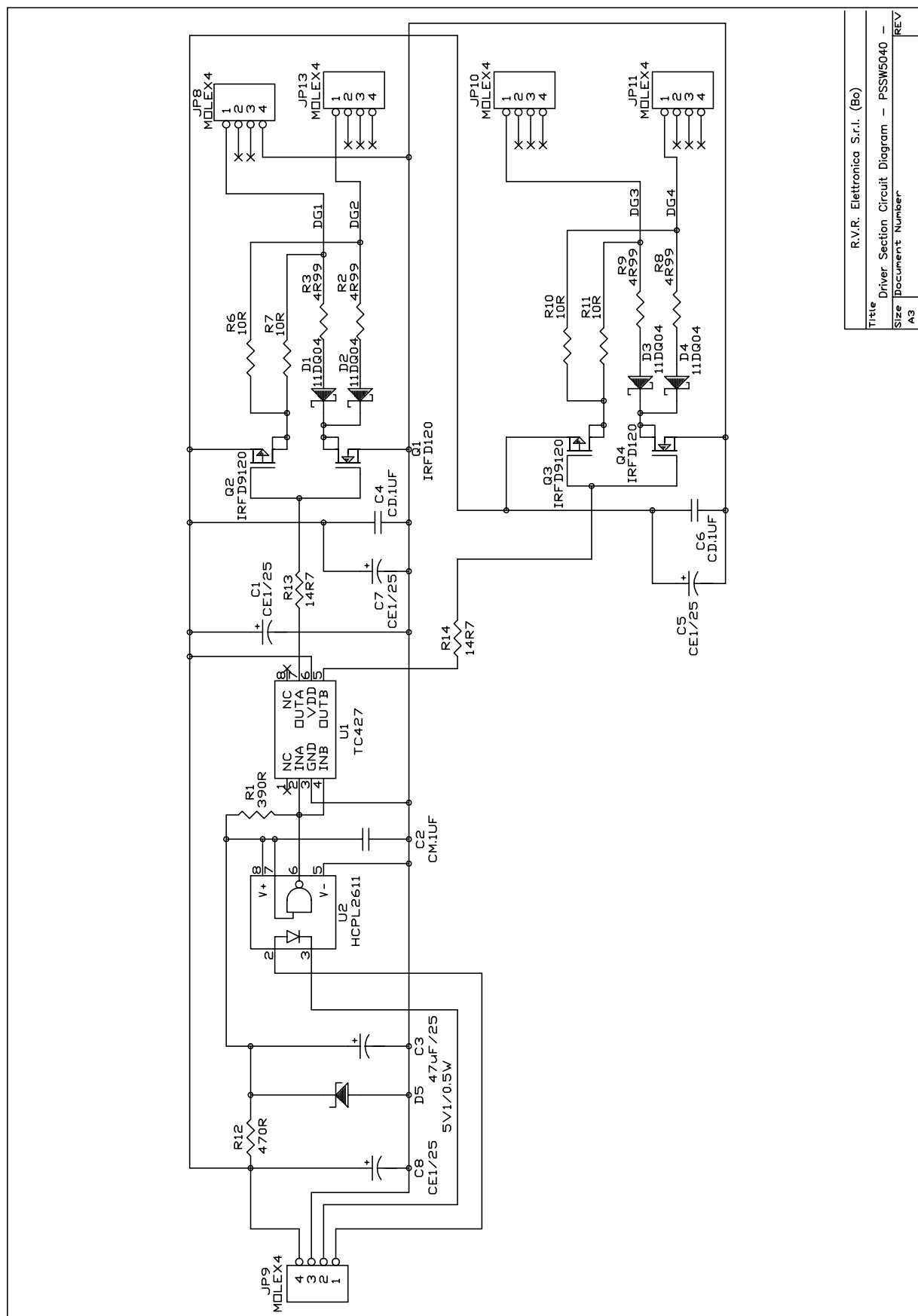
TRATTAMENTO

DISEGNATO
D'Alessio D. li 11/08/98

SCALA
1:1

DISEGNO

TAVOLA n 1 di 1

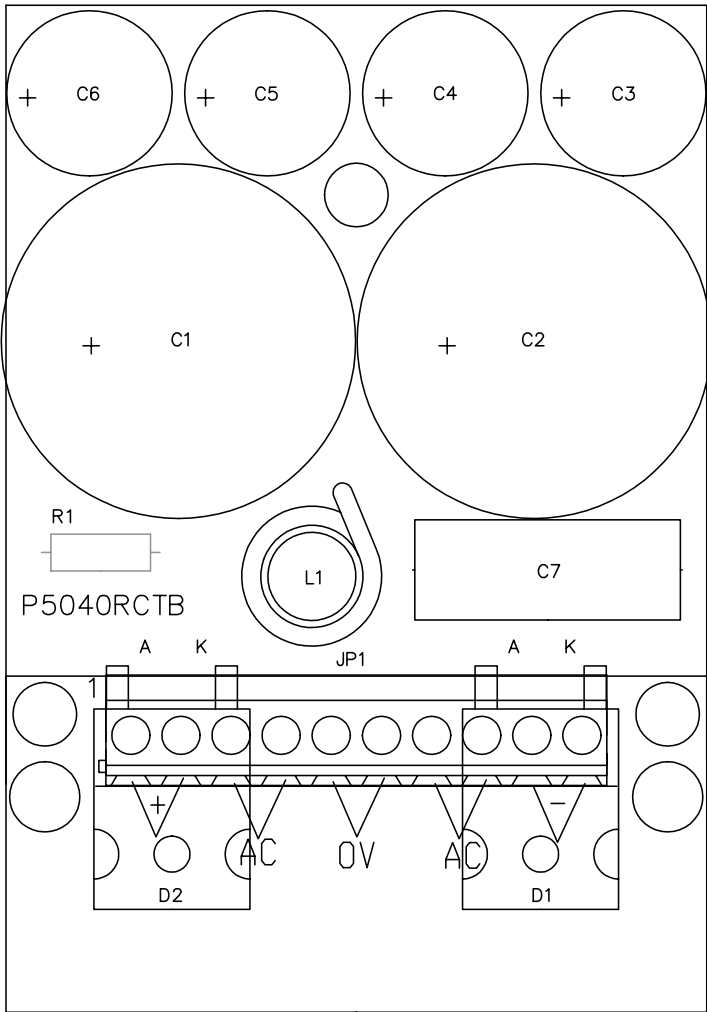


DRIVER PS5040

Bill Of Materials

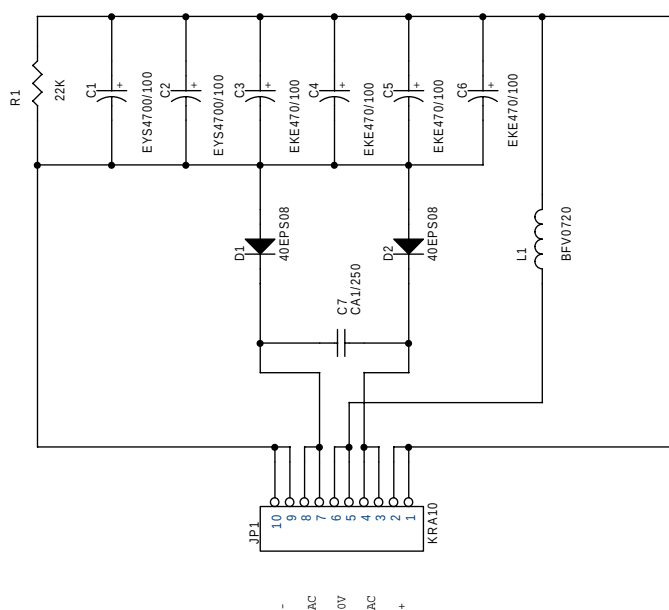
Page 1

Item	Quantity	Reference	Part
1	4	C1,C5,C7,C8	CE1/25
2	1	C2	CM.1UF
3	1	C3	47UF/25
4	2	C4,C6	CD.1UF
5	4	D1,D2,D3,D4	11DQ04
6	1	D5	5V1/0.5W
7	5	JP8,JP9,JP10,JP11,JP13	MOLEX4
8	2	Q1,Q4	IRFD120
9	2	Q2,Q3	IRFD9120
10	1	R1	390R
11	4	R2,R3,R8,R9	4R99
12	4	R6,R7,R10,R11	10R
13	1	R12	470R
14	2	R13,R14	14R7
15	1	U1	TC427
16	1	U2	HCPL2611



DENOMINAZIONE
Rectifier Section Component Layout – PSSW5040 –
DISPOSITIVO

SEMILAVORATO	DISEGNATO D'Alessio D.li 11/08/98	DISEGNO
MATERIALE	SCALA 1:1	TAVOLA n 1 di 1
TRATTAMENTO		

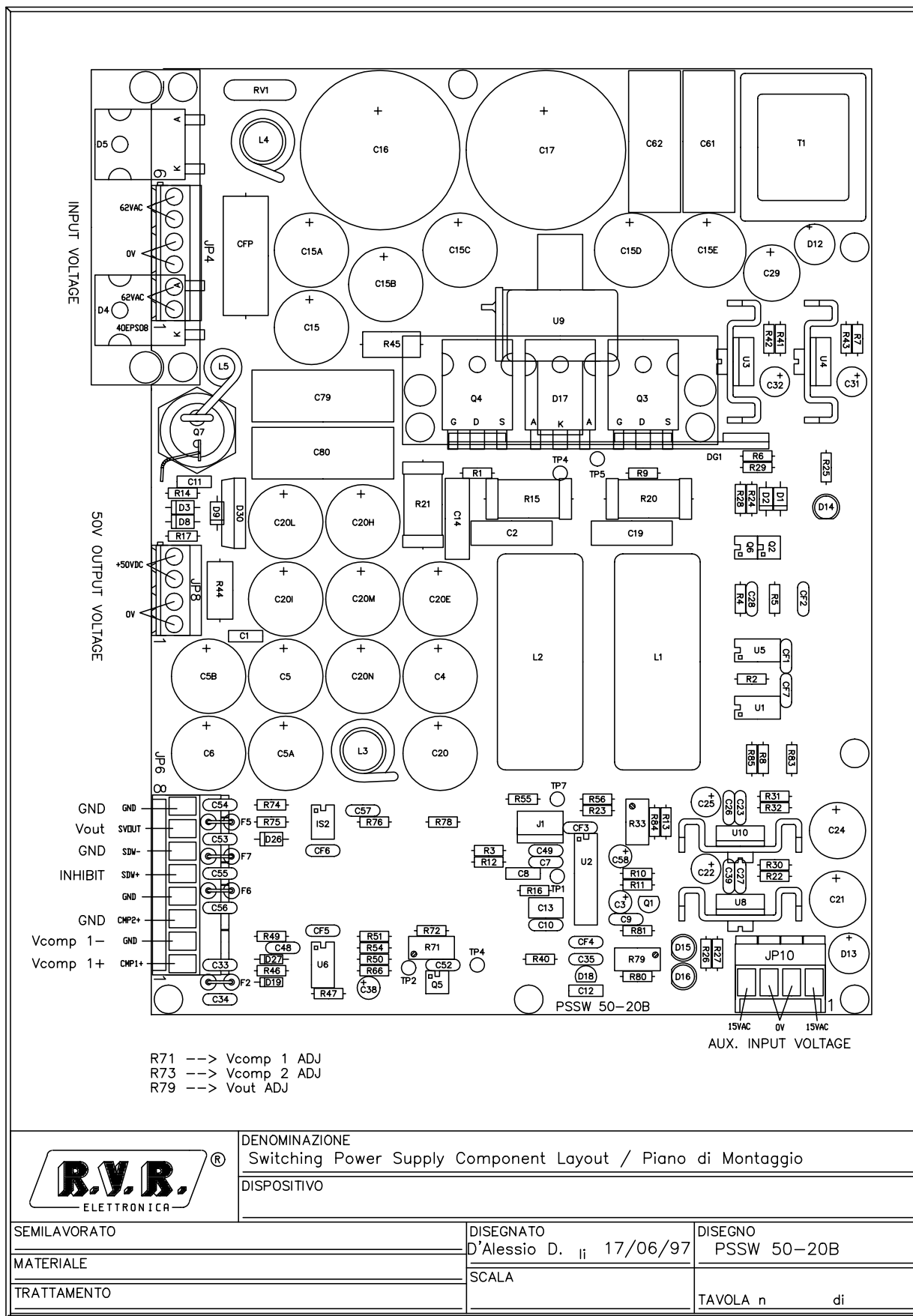


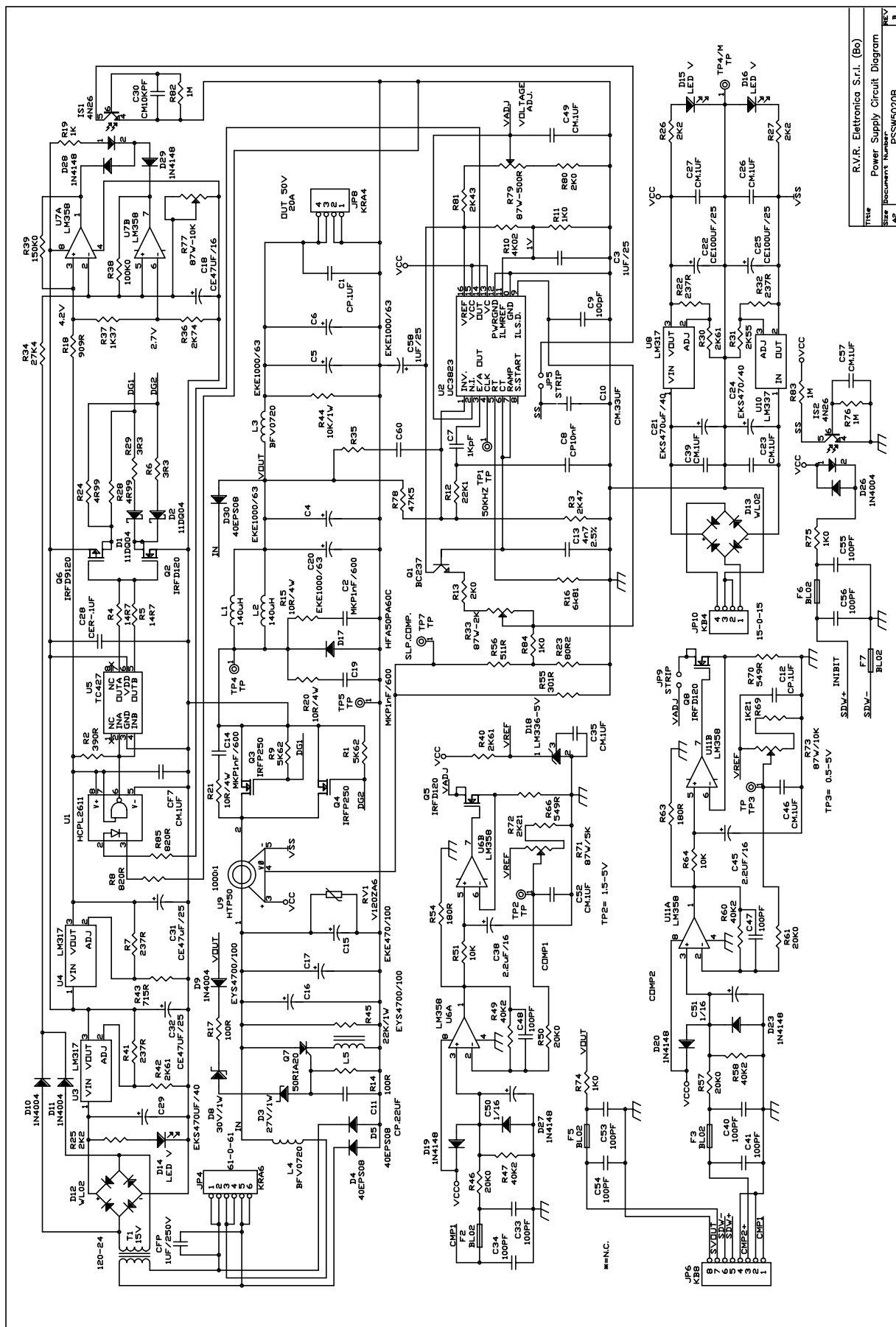
R.V.R. Elettronica s.r.l. (BO)

Title
RETIFICATORE LIVELLATORE PSSW5040

Size A4	Document Number P5040RCT.SCH	Rev
Date:	Monday, December 04, 2000	Sheet 1 of 1

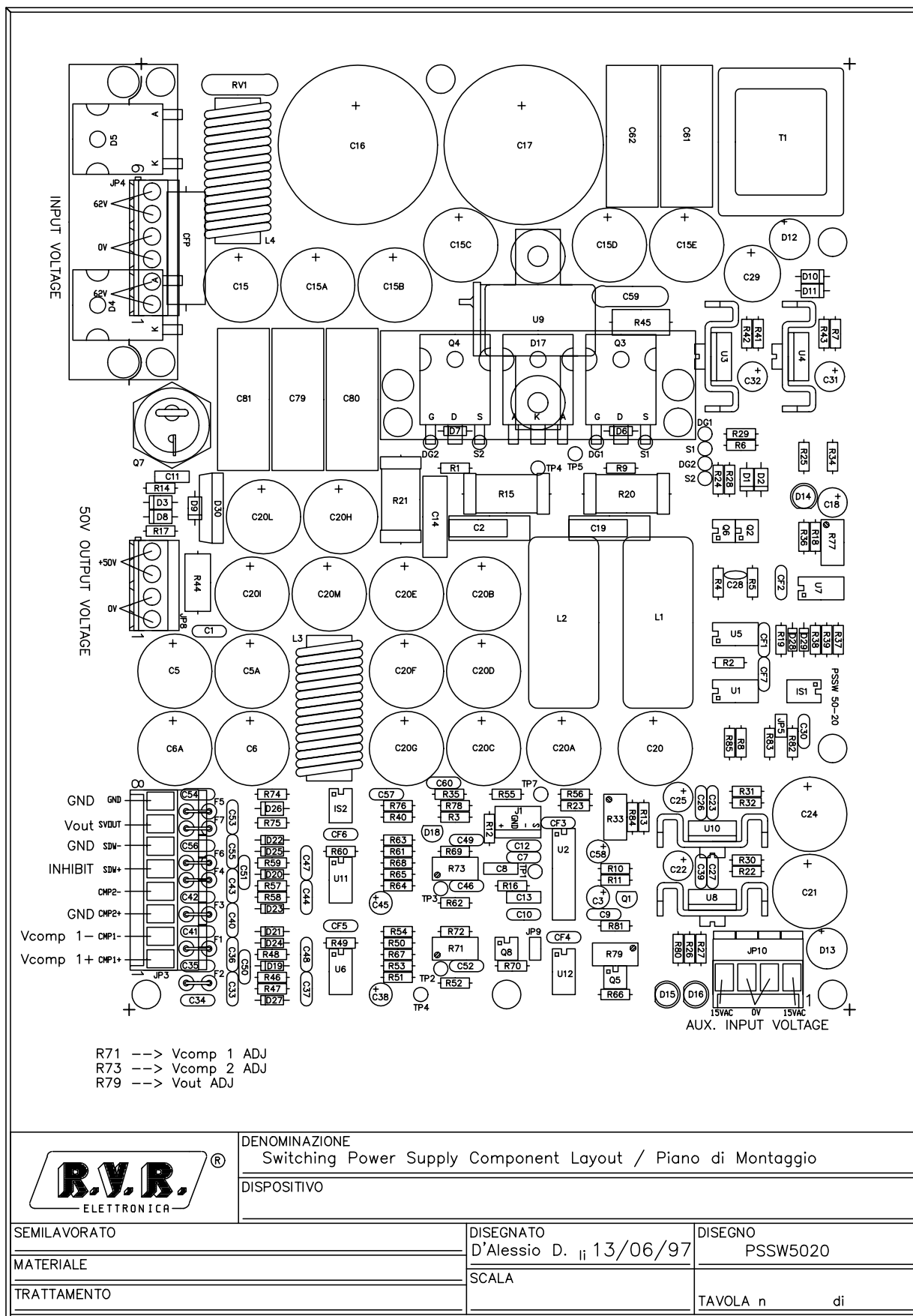
Item	Quantity	Reference	Part
1	2	C1, C2	EYS4700/100
2	4	C3, C4, C5, C6	EKE470/100
3	1	C7	CA1/250
4	2	D1, D2	40EPS08
5	1	JP1	KRA10
6	1	L1	BFV0720
7	1	R1	22K

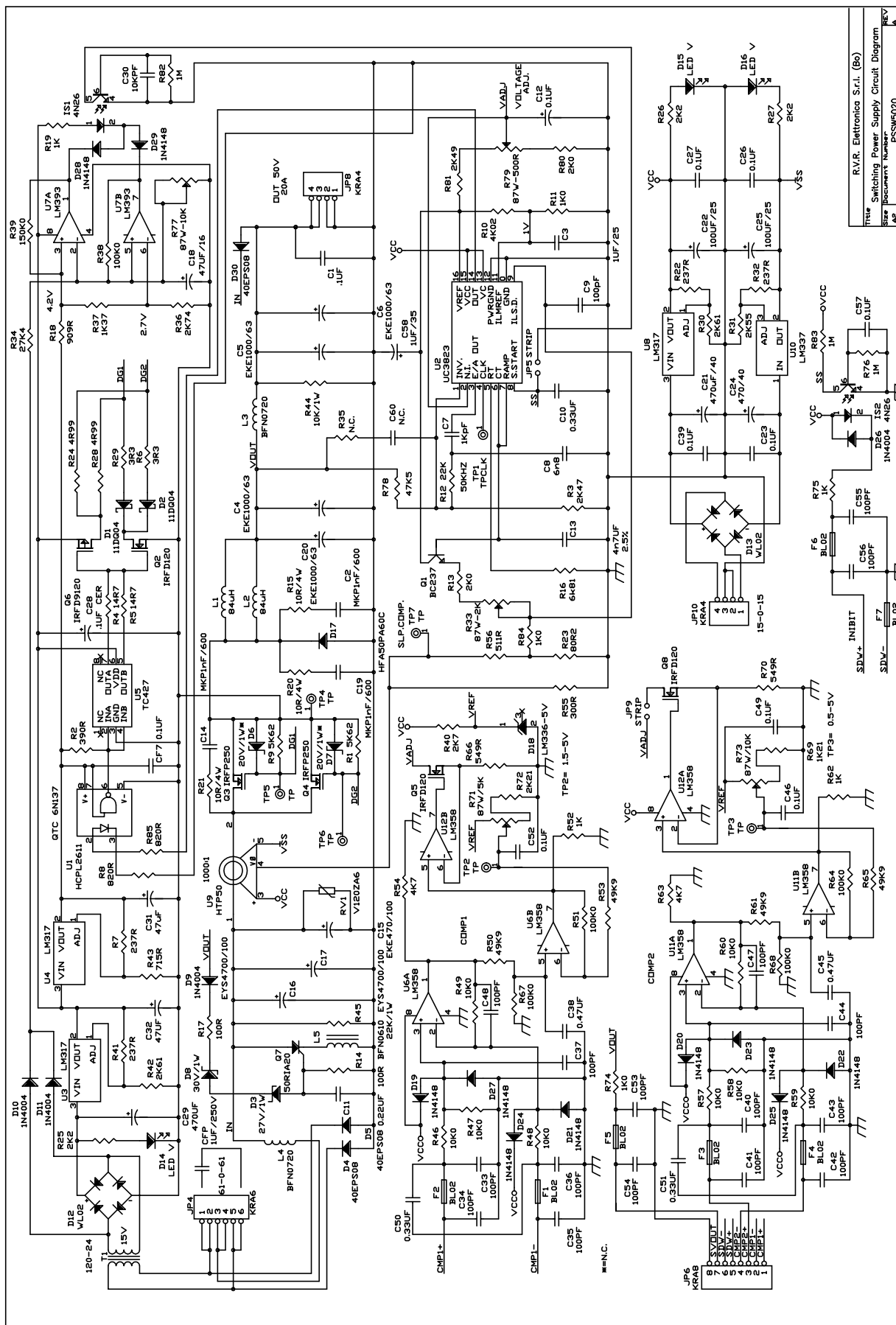




Item	Quantity	Reference	Part
1	1	CFP	1UF/250V
2	10	CF7, C23, C26, C27, C35, C39, C46, C49, C52, C57	CM.1UF
3	2	C1, C12	CP.1UF
4	3	C2, C14, C19	MKP1NF/600
5	2	C3, C58	1UF/25
6	4	C4, C5, C6, C20	EKE1000/63
7	1	C7	1KPF
8	1	C8	CP10NF
9	11	C9, C33, C34, C40, C41, C47, C48, C53, C54, C55, C56	100PF
10	1	C10	CM.33UF
11	1	C11	CP.22UF
12	1	C13	4N7
13	1	C15	EKE470/100
14	2	C16, C17	EYS4700/100
15	1	C18	CE47UF/16
16	2	C21, C29	EKS470UF/40
17	2	C22, C25	CE100UF/25
18	1	C24	EKS470/40
19	1	C28	CER-.1UF
20	1	C30	CM10KPF
21	2	C31, C32	CE47UF/25
22	2	C38, C45	2.2UF/16
23	2	C50, C51	1/16
24	2	R35, C60	N.C.
25	2	D1, D2	11DQ04
26	1	D3	27V/1W
27	3	D4, D5, D30	40EPS08
28	1	D8	30V/1W
29	4	D9, D10, D11, D26	1N4004
30	2	D12, D13	WL02
31	3	D14, D15, D16	LED V
32	1	D17	HFA50PA60C
33	1	D18	LM336-5V
34	6	D19, D20, D23, D27, D28, D29	1N4148
35	5	F2, F3, F5, F6, F7	BL02
36	2	IS1, IS2	4N26
37	1	JP4	KRA6
38	2	JP5, JP9	STRIP
39	1	JP6	KB8
40	1	JP8	KRA4
41	1	JP10	KB4
42	2	L1, L2	140UH
43	2	L3, L4	BFV0720
44	1	L5	BFV0710

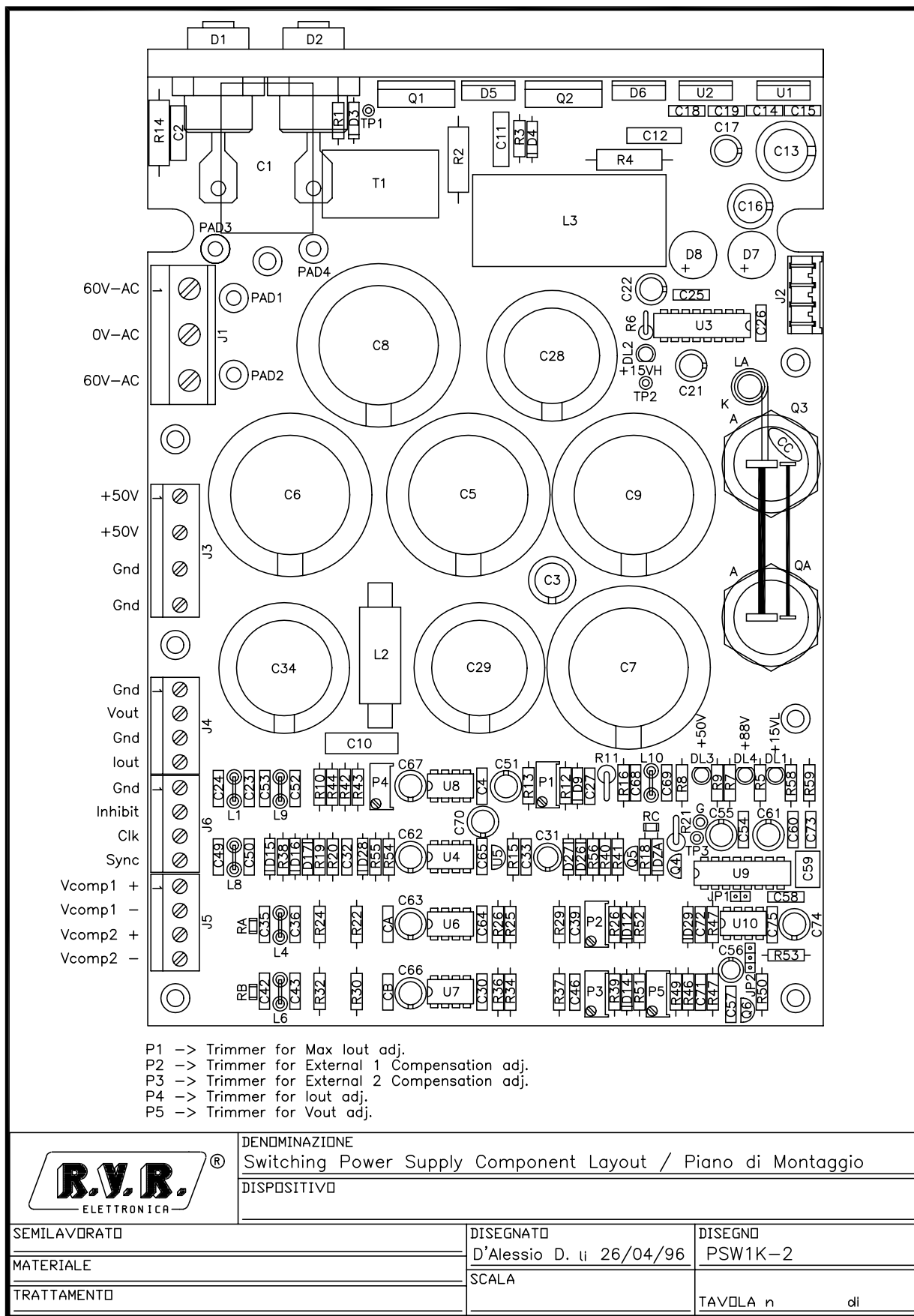
45	1	Q1	BC237
46	3	Q2, Q5, Q8	IRFD120
47	2	Q3, Q4	IRFP250
48	1	Q6	IRFD9120
49	1	Q7	50RIA20
50	1	RV1	V120ZA6
51	2	R1, R9	5K62
52	1	R2	390R
53	1	R3	2K47
54	2	R4, R5	14R7
55	2	R6, R29	3R3
56	4	R7, R22, R32, R41	237R
57	2	R8, R85	820R
58	1	R10	4K02
59	4	R11, R74, R75, R84	1K0
60	1	R12	22K1
61	2	R13, R80	2K0
62	2	R14, R17	100R
63	3	R15, R20, R21	10R/4W
64	1	R16	6K81
65	1	R18	909R
66	1	R19	1K
67	1	R23	80R2
68	2	R24, R28	4R99
69	3	R25, R26, R27	2K2
70	3	R30, R40, R42	2K61
71	1	R31	2K55
72	1	R33	87W-2K
73	1	R34	27K4
74	1	R36	2K74
75	1	R37	1K37
76	1	R38	100K0
77	1	R39	150K0
78	1	R43	715R
79	1	R44	10K/1W
80	1	R45	22K/1W
81	4	R46, R50, R57, R61	20K0
82	4	R47, R49, R58, R60	40K2
83	2	R51, R64	10K
84	2	R54, R63	180R
85	1	R55	301R
86	1	R56	511R
87	2	R66, R70	549R
88	1	R69	1K21
89	1	R71	87W/5K
90	1	R72	2K21
91	1	R73	87W/10K

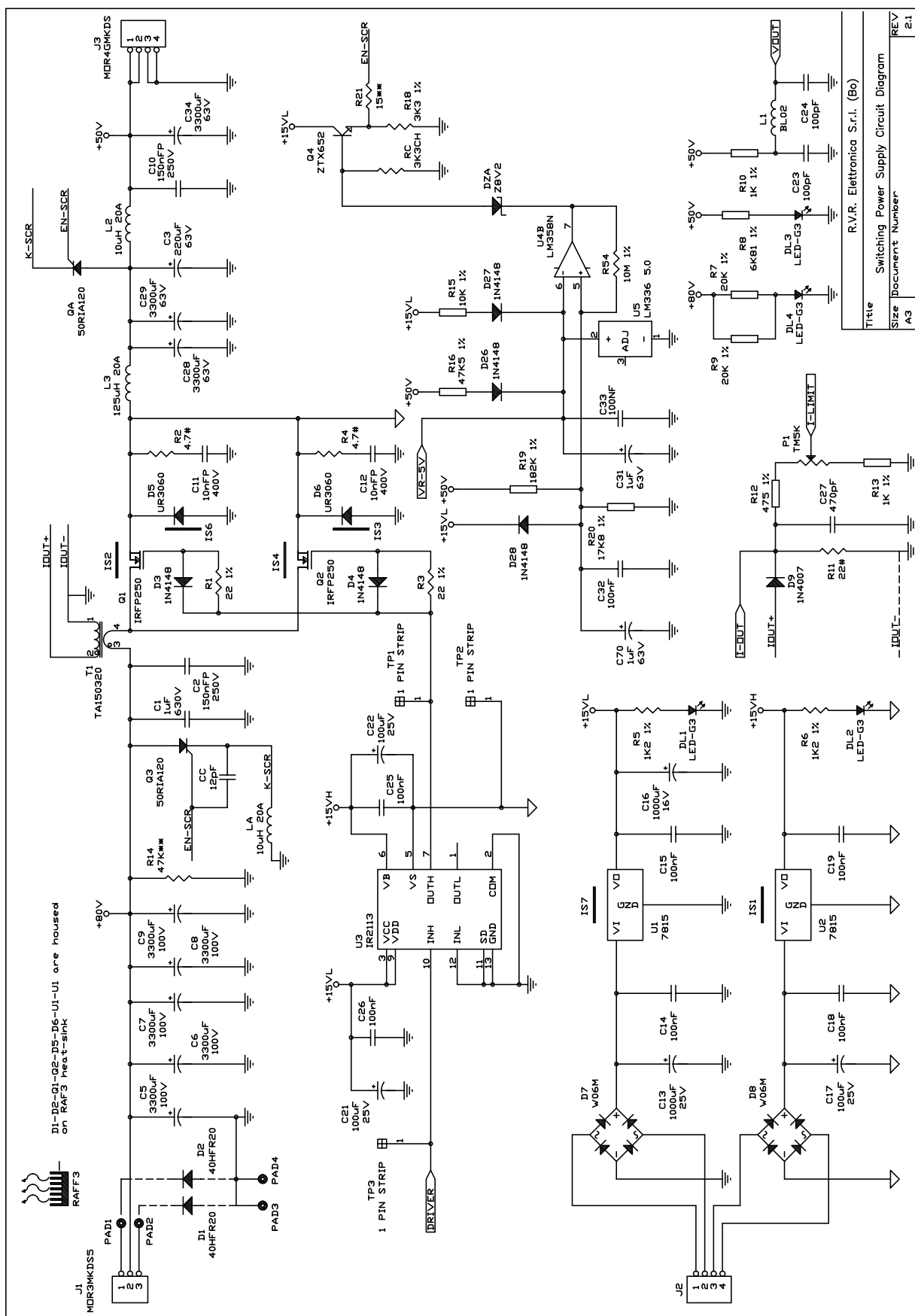




Item	Quantity	Reference	Part
1	1	CFP	1UF/250V
2	10	CF7, C12, C23, C26, C27, C39, C46, C49, C52, C57	0.1UF
3	1	C1	0.1UF
4	3	C2, C14, C19	MKP1NF/600
5	1	C3	1UF/25
6	4	C4, C5, C6, C20	EKE1000/63
7	1	C7	1KPF
8	1	C8	6N8
9	17	C9, C33, C34, C35, C36, CC37, 40, C41, C42, C43, C44, C47, C48, C53, C54, C55, C56	100PF
10	3	C10, C50, C51	0.33UF
11	1	C11	0.22UF
12	1	C13	4N7UF
13	1	C15	EKE470/100
14	2	C16, C17	EYS4700/100
15	1	C18	47UF/16
16	1	C21	470UF/40
17	2	C22, C25	100UF/25
18	1	C24	470/40
19	1	C28	0.1UF CER
20	1	C29	470UF
21	1	C30	10KPF
22	2	C31, C32	47UF
23	2	C38, C45	0.47UF
24	1	C58	1UF/35
25	2	R35, C60	N.C.
26	2	D1, D2	11DQ04
27	1	D3	27V/1W
28	3	D4, D5, D30	40EPS08
29	2	D6, D7	20V/1W*
30	1	D8	30V/1W
31	4	D9, D10, D11, D26	1N4004
32	2	D12, D13	WL02
33	3	D14, D15, D16	LED V
34	1	D17	HFA50PA60C
35	1	D18	LM336-5V
36	10	D19, D20, D21, D22, D23, D24, D25, D27, D28, D29	1N4148
37	7	F1, F2, F3, F4, F5, F6, F7	BL02
38	2	IS1, IS2	4N26

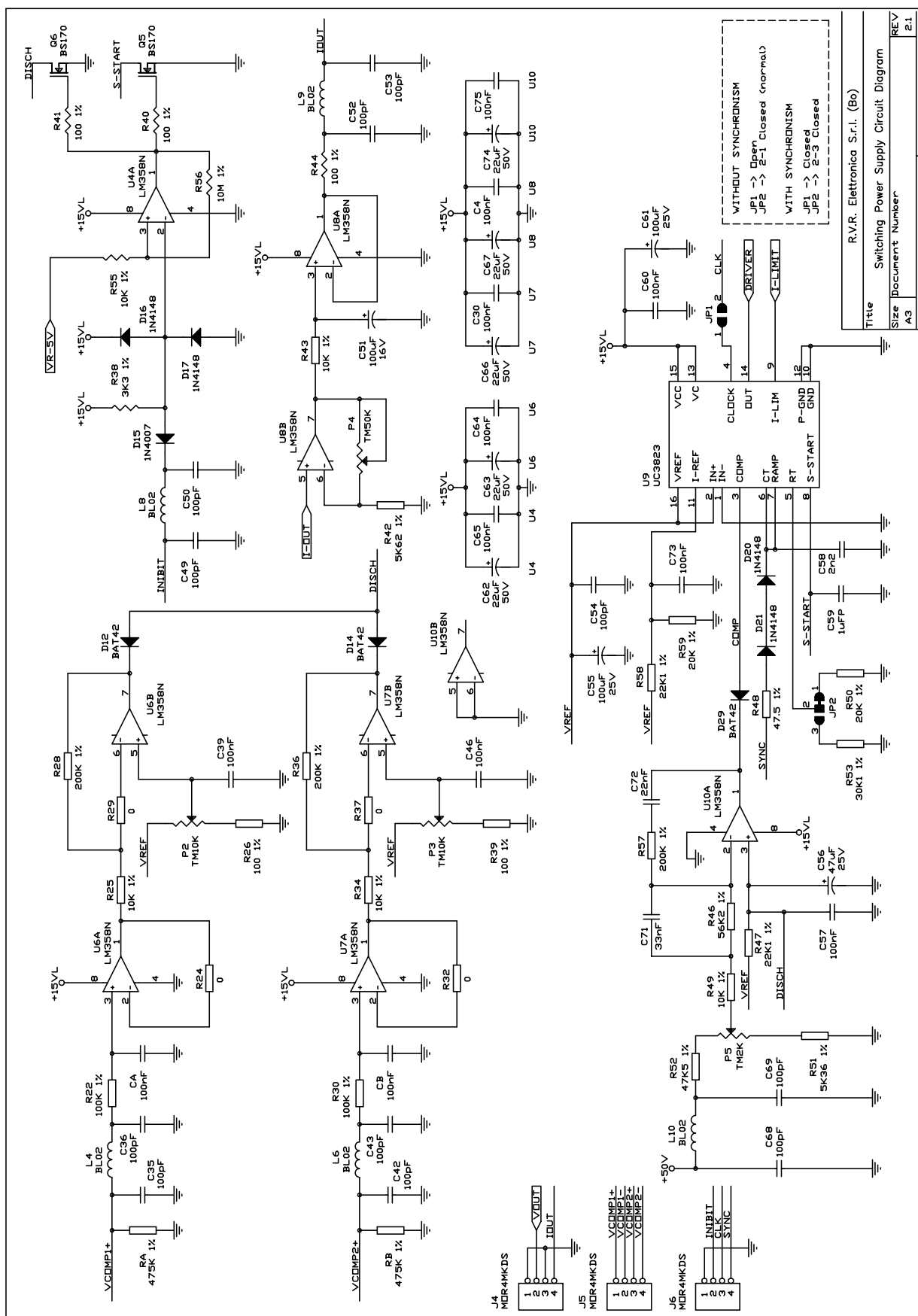
39	1	JP4	KRA6
40	2	JP5, JP9	STRIP
41	1	JP6	KRA8
42	2	JP8, JP10	KRA4
43	2	L1, L2	84UH
44	2	L3, L4	BFN0720
45	1	L5	BFN0610
46	1	Q1	BC237
47	3	Q2, Q5, Q8	IRFD120
48	2	Q3, Q4	IRFP250
49	1	Q6	IRFD9120
50	1	Q7	50RIA20
51	1	RV1	V120ZA6
52	2	R1, R9	5K62
53	1	R2	390R
54	1	R3	2K47
55	2	R4, R5	14R7
56	2	R6, R29	3R3
57	4	R7, R22, R32, R41	237R
58	2	R8, R85	820R
59	1	R10	4K02
60	3	R11, R74, R84	1K0
61	1	R12	22K
62	2	R13, R80	2K0
63	2	R14, R17	100R
64	3	R15, R20, R21	10R/4W
65	1	R16	6K81
66	1	R18	909R
67	4	R19, R52, R62, R75	1K
68	1	R23	80R2
69	2	R24, R28	4R99
70	3	R25, R26, R27	2K2
71	2	R30, R42	2K61
72	1	R31	2K55
73	1	R33	87W-2K
74	1	R34	27K4
75	1	R36	2K74
76	1	R37	1K37
77	5	R38, R51, R64, R67, R68	100K0
78	1	R39	150K0
79	1	R40	2K7
80	1	R43	715R



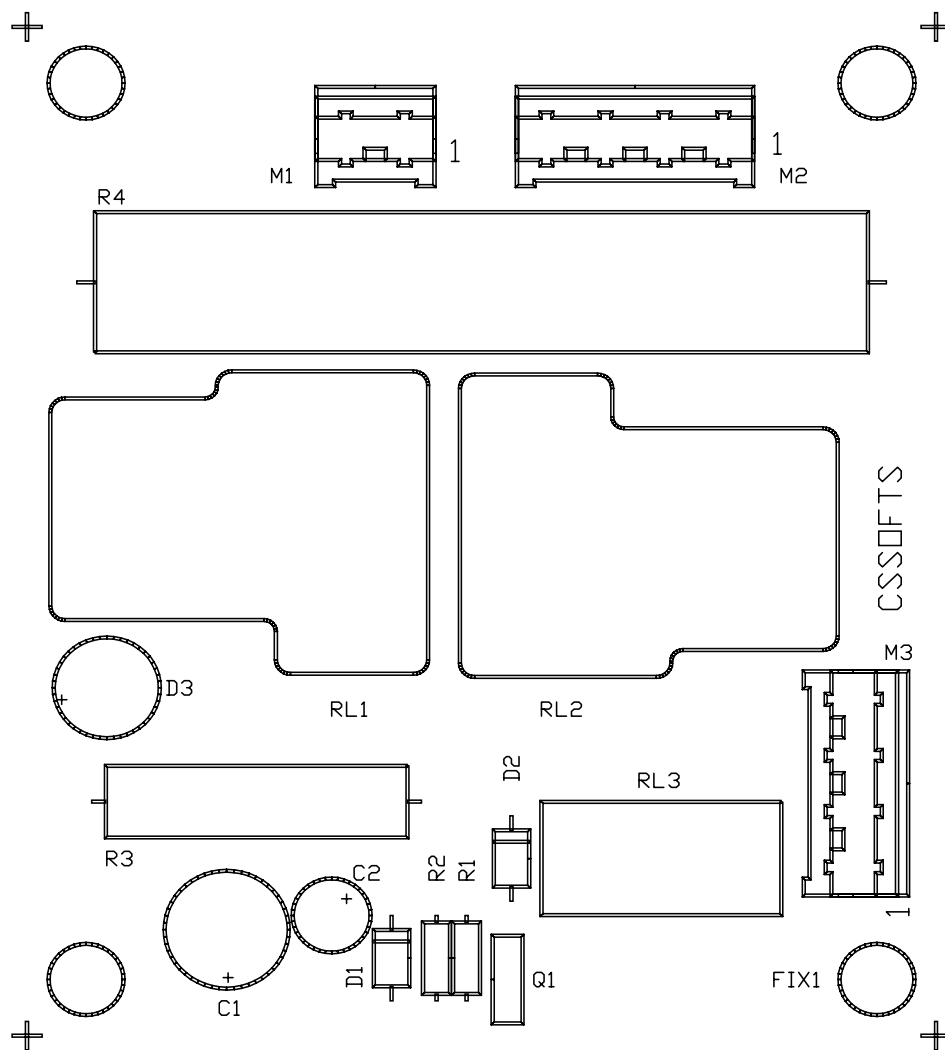


Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CODE
1	2	R2,R4	4.7#	RESISTOR 2W	
2	1	R21	15**	RESISTOR 1W	
3	1	R11	22#	RESISTOR 2W	
4	2	R1,R3	22 1%	RESISTOR 1/4W 1%	
5	1	R12	475 1%	RESISTOR 1/4W 1%	
6	2	R10,R13	1K 1%	RESISTOR 1/4W 1%	
7	2	R5,R6	1K2 1%	RESISTOR 1/4W 1%	
8	1	RC	3K3CH	CHIP RESISTOR	
9	1	R18	3K3 1%	RESISTOR 1/4W 1%	
10	1	R8	6K81 1%	RESISTOR 1/4W 1%	
11	1	R15	10K 1%	RESISTOR 1/4W 1%	
12	1	R20	17K8 1%	RESISTOR 1/4W 1%	
13	2	R7,R9	20K 1%	RESISTOR 1/4W 1%	
14	1	R16	47K5 1%	RESISTOR 1/4W 1%	
15	1	R14	47K**	RESISTOR 1W 5%	
16	1	R19	182K 1%	RESISTOR 1/4W 1%	
17	1	R54	10M 1%	RESISTOR 1/4W 1%	
18	1	P1	TM5K	TRIM.MULTIGIRI REG.VERT	
19	1	CC	12PF	CERAMIC CAPACITOR NP0	
20	2	C23,C24	100PF	CERAMIC CAPACITOR NP0	
21	1	C27	470PF	CERAMIC CAPACITOR	
22	2	C11,C12	10NFP	POLIELSTER CAPACITOR	
23	8	C14,C15,C18,C19,C25,C26,C32,C33	100NF	CERAMIC CAPACITOR	
24	2	C2,C10	150NFP	POLIELSTER CAPACITOR	
25	3	C1,C31,C70	1UF	ELECTROLYTIC CAPACITOR	
26	3	C17,C21,C22	100UF	ELECTROLYTIC CAPACITOR	
27	1	C3	220UF	ELECTROLYTIC CAPACITOR	
28	2	C13,C16	1000UF	ELECTROLYTIC CAPACITOR	
29	8	C5,C6,C7,C8,C9,C28,C29,C34	3300UF	ELECTROLYTIC CAPACITOR	
30	2	L2,LA	10UH 20A	RF CHOICE 10uH 20A	
31	1	L3	125UH 20A	TOR.RF CHOKE 125uH 20A	
32	1	L1	BL02	BL02 IND.POW.SUP.PJ1KM	
33	3	TP1,TP2,TP3	1 PIN STRIP	STRIP M 1 PIN	
34	1	J1	MOR3MKDS5	MORS. 3MKDS5 PHOENIX	

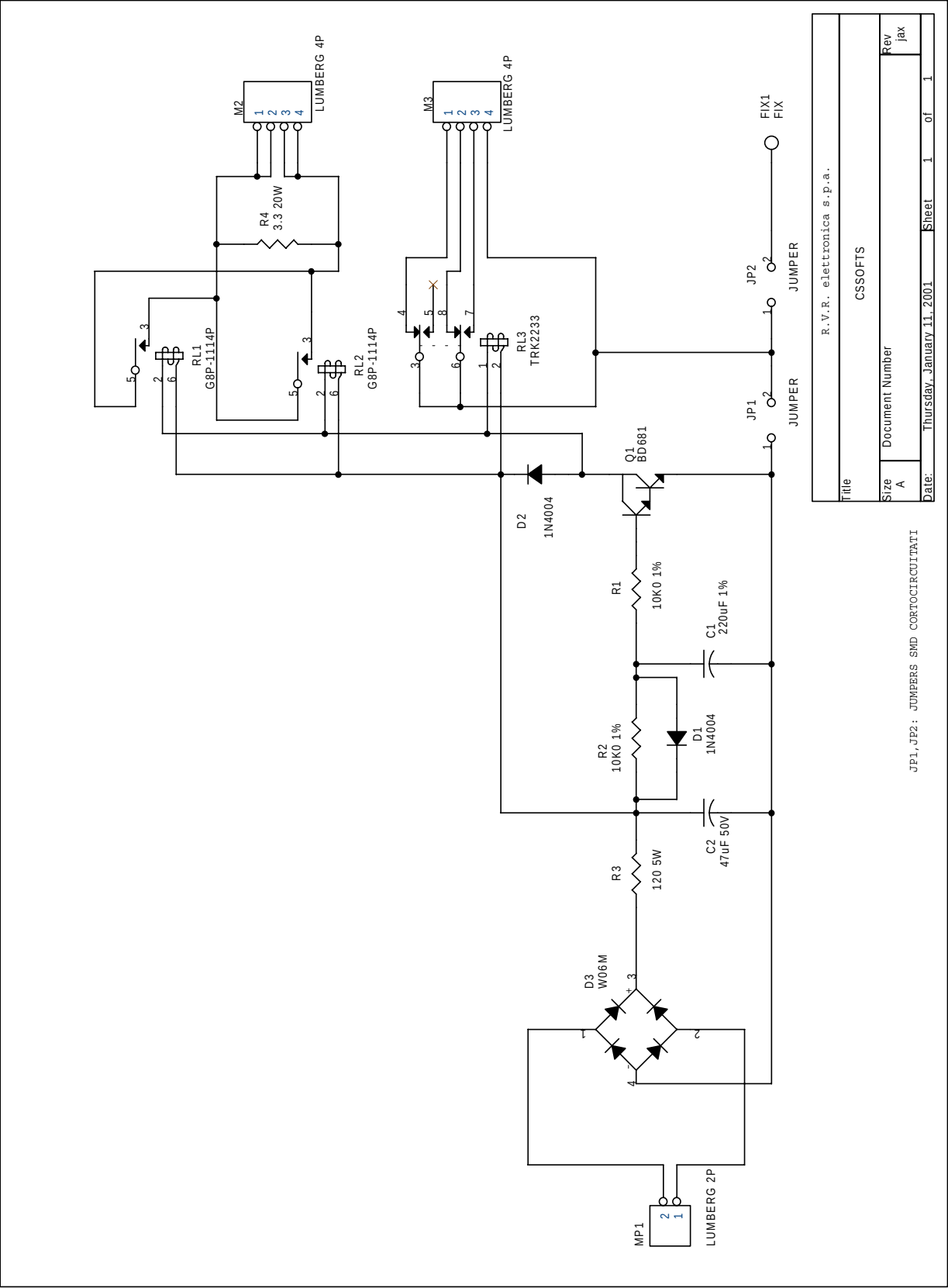
35	1	J3	MOR4GMKDS	MORS. 4GMKDS PHOENIX
36	1	J2	MOR280610	MORS. CTRL PWR SUPPLY PJ1KM
37	2	D1,D2	40HFR20	DIODE IOR 200V 40A
38	5	D3,D4,D26,D27,D28	1N4148	SILICON DIODE
39	1	D9	1N4007	SILICON DIODE 1000V
40	2	D5,D6	UR3060	HARRIS DIODE UR3060
41	2	D7,D8	W06M	DIODE BRIDGE 1.5A 600V
42	2	Q3,QA	50RIA120	PHASE CTRL SCR 1200V 80A
43	4	DL1,DL2,DL3,DL4	LED-G3	GREEN LED DIODE 3mm
44	1	DZA	Z8V2	ZENER DIODE 8.2V 0.4W
45	2	U1,U2	7815	POS. STABILIZER 1A
46	1	U5	LM336 5.0	REFERENCE DIODE
47	2	Q1,Q2	IRFP250	HEXFET N-CHANNEL TO-247AC
48	1	U3	IR2113	HV PWR MOSFET/IGBT GATE DRIV
49	1	Q4	ZTX652	NPN MEDIUM POWER TRANSISTOR
50	1	U4	LM358N	DOUBLE OP. AMP.
51	1	T1	TA150320	CURRENT TRANSF. P.S. PJ1KM
52	1	RAFF3	DISPSPJ1KM	HEAT SINK PWR SUPPLY PJ1KM
53	4	IS1,IS3,IS6,IS7	MICA-TO220	MICA ISOLANTE TO220
54	2	IS2,IS4	MICA-TO247	MICA ISOLANTE TO247
55	4	PAD1,PAD2,PAD3,PAD4	PAD	PAD C.S.



Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CODE
1	4	R24,R29,R32,R37	0	0 OHM RESISTOR	
2	1	R48	47.5 1%	RESISTOR 1/4W 1%	
3	5	R26,R39,R40,R41,R44	100 1%	RESISTOR 1/4W 1%	
4	1	R38	3K3 1%	RESISTOR 1/4W 1%	
5	1	R51	5K36 1%	RESISTOR 1/4W 1%	
6	1	R42	5K62 1%	RESISTOR 1/4W 1%	
7	5	R25,R34,R43,R49,R55	10K 1%	RESISTOR 1/4W 1%	
8	2	R50,R59	20K 1%	RESISTOR 1/4W 1%	
9	2	R47,R58	22K1 1%	RESISTOR 1/4w 1%	
10	1	R53	30K1 1%	RESISTOR 1/4W 1%	
11	1	R52	47K5 1%	RESISTOR 1/4W 1%	
12	1	R46	56K2 1%	RESISTOR 1/4W 1%	
13	2	R22,R30	100K 1%	RESISTOR 1/4W 1%	
14	3	R28,R36,R57	200K 1%	RESISTOR 1/4W 1%	
15	2	RB,RA	475K 1%	RESISTOR 1/4W 1%	
16	1	R56	10M 1%	RESISTOR 1/4W 1%	
17	1	P5	TM2K	TRIM.MULTIGIRI REG.VERT	
18	2	P2,P3	TM10K	TRIM.MULTIGIRI REG.VERT	
19	1	P4	TM50K	TRIM.MULTIGIRI REG.VERT	
20	11	C35,C36,C42,C43,C49, C50,C52,C53,C54,C68,C69	100PF	CERAMIC CAPACITOR NP0	
21	1	C58	2N2	CERAMIC CAPACITOR	
22	1	C72	22NF	CERAMIC CAPACITOR	
23	1	C71	33NF	CERAMIC CAPACITOR	
24	12	C4,C30,C39,C46,C57,C60, C64,C65,C73,C75,CB,CA	100NF	CERAMIC CAPACITOR	
25	1	C59	1UFP	POLIELSTER CAPACITOR	
26	5	C62,C63,C66,C67,C74	22UF	ELECTROLYTIC CAPACITOR	
27	1	C56	47UF	ELECTROLYTIC CAPACITOR	
28	3	C51,C55,C61	100UF	ELECTROLYTIC CAPACITOR	
29	5	L4,L6,L8,L9,L10	BL02	BL02 IND.POW.SUP.PJ1KM	
30	1	JP1	2 PIN STRIP	STRIP M P 2.54 2 PIN	
31	1	JP2	3 PIN STRIP	STRIP M P 2.54 3 PIN	
32	3	J4,J5,J6	MOR4MKDS	MORS. 4MKDS PHOENIX	
33	4	D16,D17,D20,D21	1N4148	SILICON DIODE	
34	3	D12,D14,D29	BAT42	HOT CARRIER DIODE	
35	1	D15	1N4007	SILICON DIODE 1000V	
36	1	U9	UC3823	HIGH SPEED PWM CONTROLLER	
37	2	Q5,Q6	BS170	TMOS FET SWITCHING	
38	5	U4,U6,U7,U8,U10	LM358N	DOUBLE OP. AMP.	



	DENOMINAZIONE soft start		
	DISPOSITIVO		
SEMILAVORATO	DISEGNATO D'Alessio D. li 4/12/00	DISEGNO	
MATERIALE	SCALA 1:1	TAVOLA n	1 di 1
TRATTAMENTO			



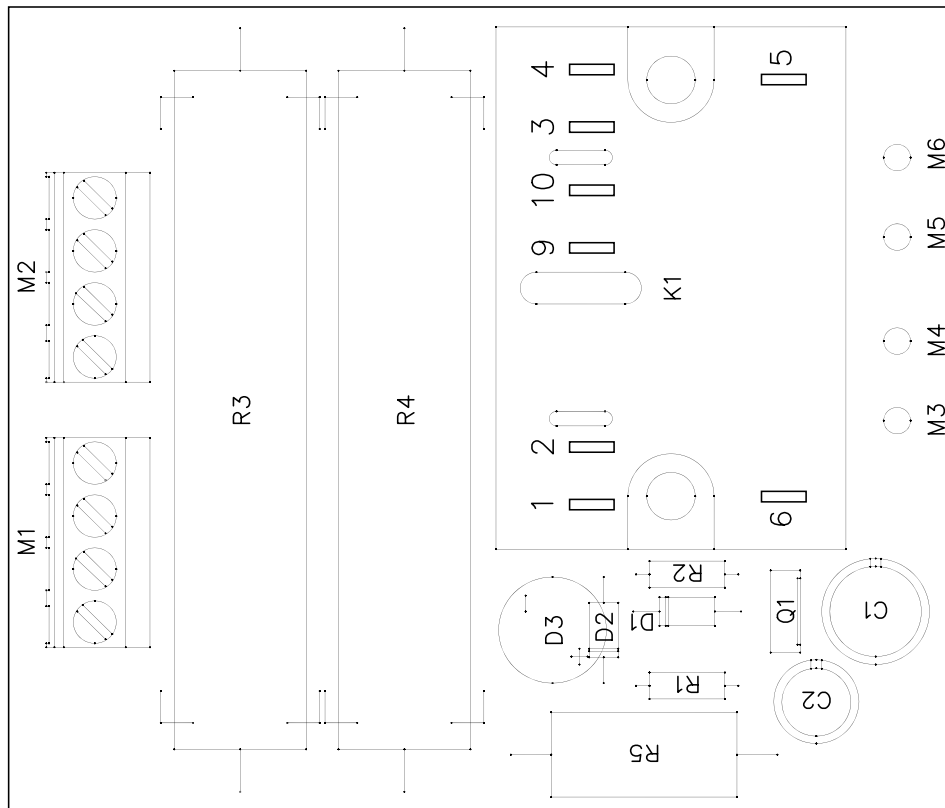
Soft-Start Card Vers.LCD Circuit Diagram Bill Of Materials

Page 1

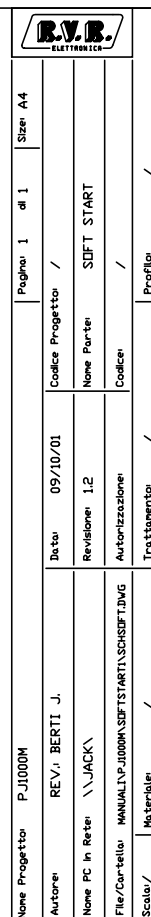
Item	Quantity	Reference	Part	
1	1	C1	220UF 50V	COND. ELETTR.
2	1	C2	47UF 50V	COND. ELETTR.
3	2	D1,D2	1N4004	DIODO AL SILICIO
4	1	D3	W02M	PONTE DI DIODI
5	1	FIX1	FIX	
6	2	JP1,JP2	JUMPER 2P	
7	1	M1	LUMBERG 2P	MORS. 2 PIN
8	2	M2,M3	LUMBERG 4P	MORS. 4 PIN
9	1	Q1	BD681	TRANSISTOR
10	2	RL1,RL2	G8P-1114P	RELè G8-1114P
11	1	RL3	V23042 A 2003	RELè 2SC. 2VIE
12	2	R1,R2	10K	RES. STRATO MET.
13	1	R3	120 5W	RES. A FILO
14	1	R4	4.7 20W	RES. A FILO

Pagina lasciata intenzionalmente in bianco

This page was intentionally left blank



Nome Progetto: PJ1000M		Pagina: 1	di 1	Size: A4
Autore: REV.: BERTI J.	Data: 09/10/01	Codice Progetto: /		
Nome PC in Rete: \\JACK\	Revisione: 1.2	Nome Parte: SOFT START		
File/Cartella: MANUALE\PJ1000M\SOFTSTART\LAISOFT.DWG	Autorizzazione:	Codice: /		
Scala: /	Materiale: /	Trattamento: /		
		Profilo: /		



Soft-Start Card Circuit Diagram

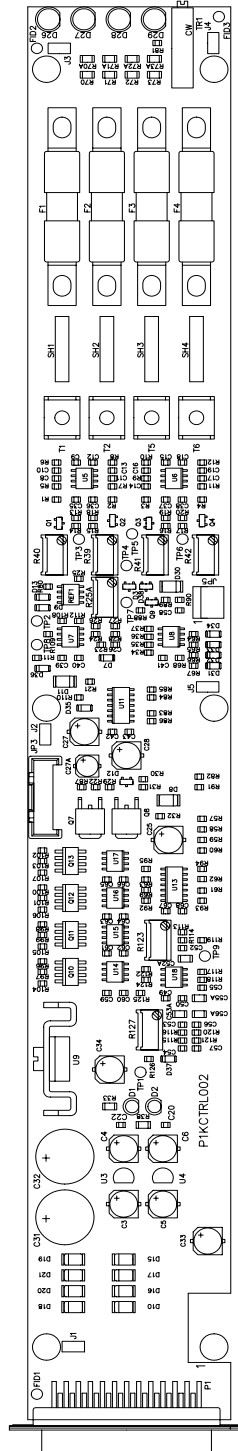
Bill Of Materials

Page 1

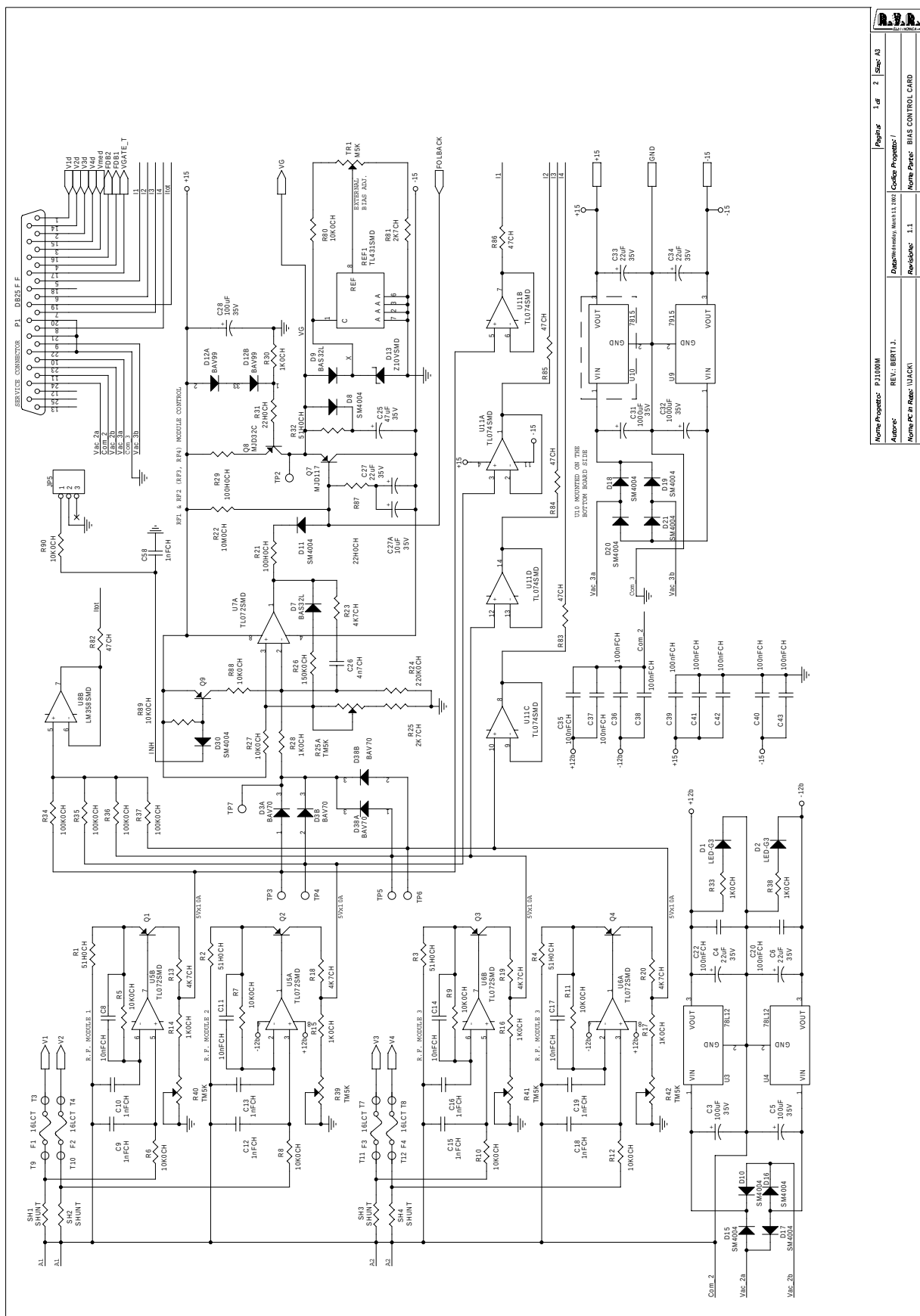
Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CODE
1	2	R3,R4	10/20W	RESISTOR 20W	
2	1	R5	120\$	RESISTOR 5W	
3	2	R1,R2	10K 1%	RESISTOR 1/4W 1%	
4	1	C2	47UF	ELECTROLYTIC CAPACITOR	
5	1	C1	470UF	ELECTROLYTIC CAPACITOR	
6	2	M1,M2	MORS. CS 4	MORSETTIERA C.S.4 CONT.	
7	1	K1	JH2A	RELè MATHSUSHITA 2CA1CC	
8	1	D2	1N4001	SILICON DIODE 50V	
9	1	D1	1N4005	SILICON DIODE 600V	
10	1	D3	WL04	DIODE BRIDGE 1.5A	
11	1	Q1	BD681	NPN DARLINGTON	

Pagina lasciata intenzionalmente in bianco

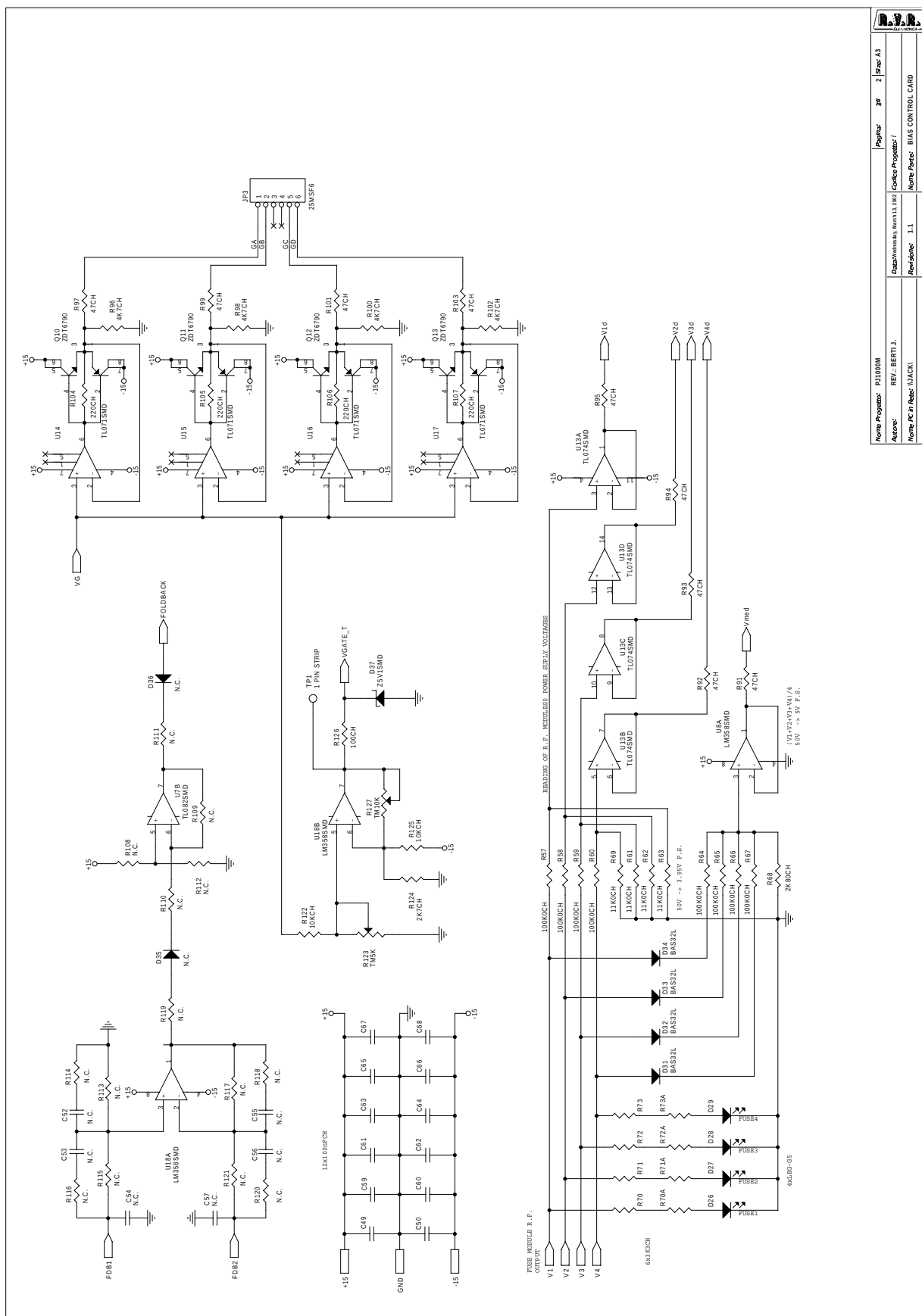
This page was intentionally left blank



Nome Progetto: PJ 1000		Pagina: 1	d 1	Size: A3
Autore: REV.: BERTI J.	Data: 13/03/02		Codice Progetto: /	
Nome PC in Rete: \\JACK\	Revisione: 1.1		Nome Parte: BIAS CONTROL CARD	
File/Caricamento: MANUAL\PJ1000M\BIAS002_1\LAYBIAS2.DWG	Autorizzazione:		Codice: PIKCTRL002	
Socia: /	Trattamento: /		Profilo: /	



Nome Proprietario	PJ1000M	Progetto	1.01	2	Spec. A3
Autore	REV. BERTI J.	Disegnato/Modificato	March 12, 2002		
Nome PC in Rete	UJACK	Nome Progetto	BIAS CONTROL CARD		
File Cartella	MANUALI/BIAS/BIAS01.MP3	Revisione	1.1		
		Autore/Modificatore			
		Code	PJ1KCTRL002		



Scheda di controllo moduli RF
PlK-CTRL ver. 1.1
Bill Of Materials

Revised: August 27, 1998
Revision: 2
October 20, 1999 8:43:19 Page 1

Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CDE
1	2	R31,R87	22H0CH	CHIP RESISTOR 1%	
2	14	R82,R83,R84,R85,R86,R91, R92,R93,R94,R95,R97,R99, R101,R103	47CH	CHIP RESISTOR 1/4W	
3	5	R1,R2,R3,R4,R32	51H0CH	CHIP RESISTOR 1%	
4	2	R21,R29	100H0CH	CHIP RESISTOR 1%	
5	1	R126	100CH	CHIP RESISTOR	
6	4	R104,R105,R106,R107	220CH	CHIP RESISTOR	
7	6	R14,R15,R16,R17,R28,R30,	1K0CH	CHIP RESISTOR 1%	
8	3	R25,R81,R124	2K74CH	CHIP RESISTOR 1%	
9	1	R68	2K80CH	CHIP RESISTOR 1%	
10	8	R70A,R70,R71A,R71,R72A, R72,R73A,R73	3K32CH	CHIP RESISTOR 1%	
11	4	R96,R98,R100,R102	4K7CH	CHIP RESISTOR	
12	5	R13,R18,R19,R20,R23	4K75CH	CHIP RESISTOR 1%	
13	13	R5,R6,R7,R8,R9,R10,R11, R12,R27,R80,R88,R89,R90	10K0CH	CHIP RESISTOR 1%	
14	2	R122,R125	10KCH	CHIP RESISTOR	
15	4	R61,R62,R63,R69	11K0CH	CHIP RESISTOR 1%	
16	12	R34,R35,R36,R37,R57,R58, R59,R60,R64,R65,R66,R67	100K0CH	CHIP RESISTOR 1%	
17	1	R26	150K0CH	CHIP RESISTOR 1%	
18	1	R24	221K0CH	CHIP RESISTOR 1%	
19	1	R22	10M0CH	CHIP RESISTOR 1%	
20	1	TR1	M5K	TRIMMER MULTIGIRI	
21	6	R25A,R39,R40,R41,R42, R123	TM5K	TRIMM. MULTIGIRI	
22	1	R127	TM10K	TRIMM. MULTIGIRI	
23	9	C9,C10,C12,C13,C15,C16, C18,C19,C58	1NFCH	CERAMIC CHIP CAPACITOR	

Scheda di controllo moduli RF

P1K-CTRL ver. 1.1

Bill Of Materials

October 20, 1999

Revised: August 27, 1998

Revision: 2

8:43:19

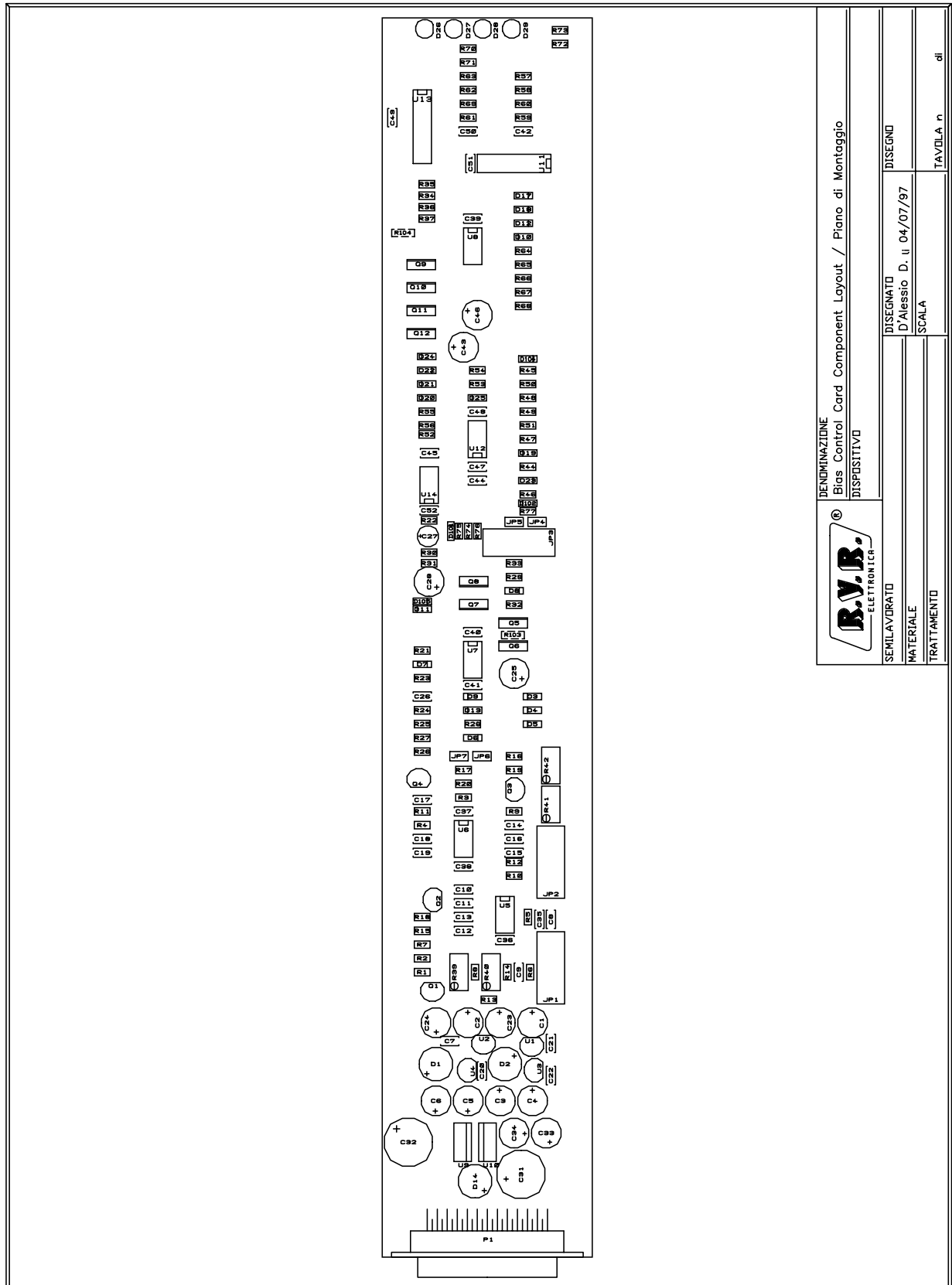
Page 2

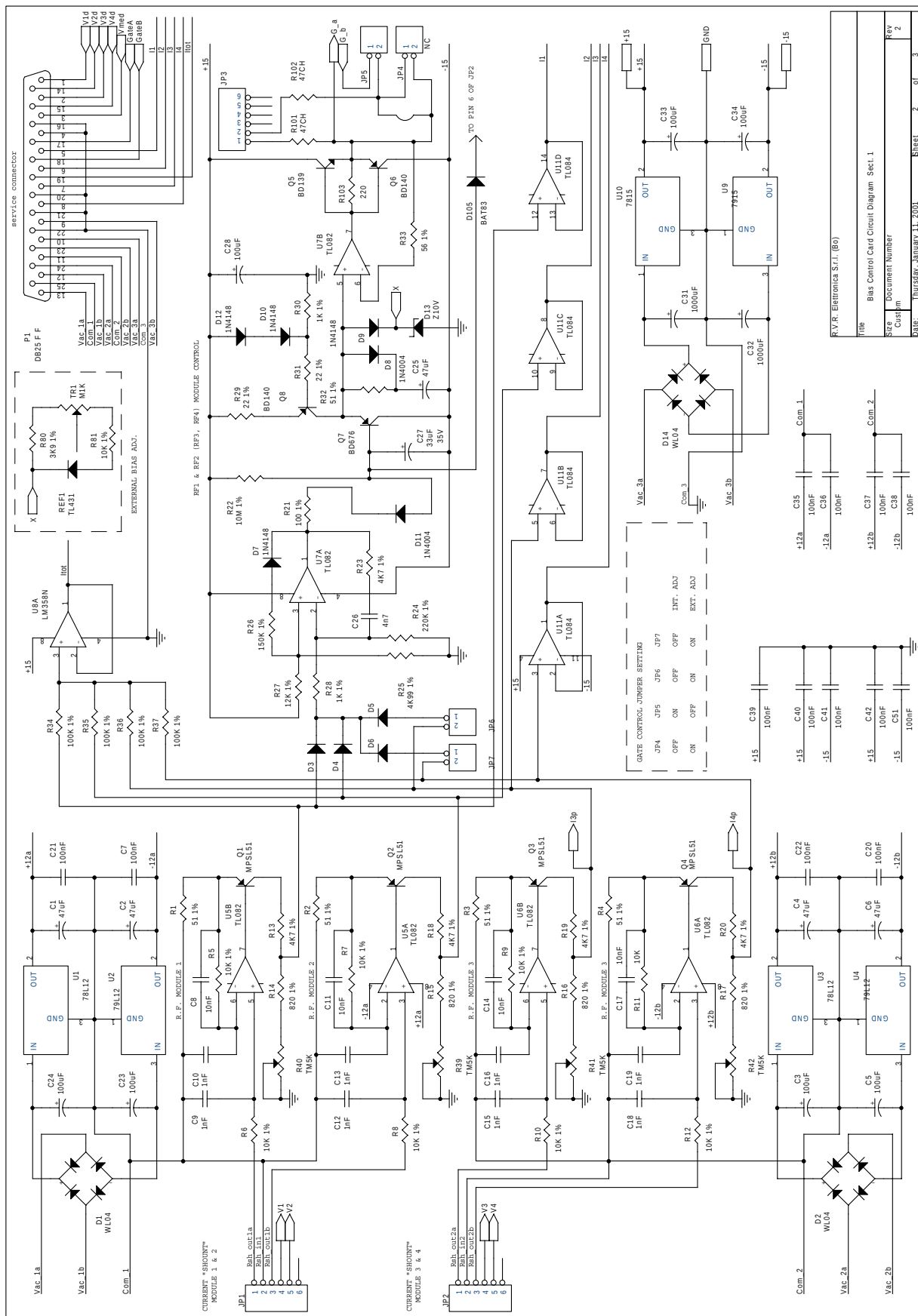
Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CDE
24	1	C26	4N7CH	CERAMIC CHIP CAPACITOR	
25	4	C8,C11,C14,C17	10NFCH	CERAMIC CHIP CAPACITOR	
26	23	C20,C22,C35,C36,C37,C38,100NFCH C39,C40,C41,C42,C43,C49, C50,C59,C60,C61,C62,C63, C64,C65,C66,C67,C68		CERAMIC CHIP CAPACITOR	
27	1	C27A	10UF	ELECTROLYTIC CAPACITOR	
28	5	C4,C6,C27,C33,C34	22UF	ELECTROLYTIC CAPACITOR	
29	1	C25	47UF	ELECTROLYTIC CAPACITOR	
30	3	C3,C5,C28	100UF	ELECTROLYTIC CAPACITOR	
31	2	C31,C32	1000UF	ELECTROLYTIC CAPACITOR	
32	9	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8,TP9	1 PIN STRIP	STRIP M 1 PIN	
33	1	JP5	3 PIN STRIP	STRIP M P 2.54 3 PIN	
34	1	JP3	25MSF6	MINIMODUL CONNECTOR 2.5MM 6P	
35	4	SH1,SH2,SH3,SH4	SHUNT	SHUNT CURRENT	
36	1	P1	DB25 F F	CONN. F 25 FILTRATO MURATA	
37	6	D7,D9,D31,D32,D33,D34BAS32L		CHIP SILICON DIODE	
38	2	D3,D38	BAV70	DUAL COMM. SWITH. CAT. DIODE	
39	1	D12	BAV99	DUAL SERIES. SWITH. DIODE	
40	11	D8,D10,D11,D15,D16,D17,SM4004 D18,D19,D20,D21,D30		SILICON DIODE 400V SMD	
41	2	D1,D2	LED-G3	GREEN LED DIODE 3mm	
42	4	D26,D27,D28,D29	LED-G5	GREEN LED DIODE	
43	1	D37	Z5V1SMD	ZENER DIODE 5.1V 0.4W SMD	
44	1	D13	Z10VSMD	ZENER DIODE 10V 0.4W SMD	
45	1	U3	78L12	POS. STABILIZER 100mA	
46	1	U4	79L12	NEG. STABILIZER 100mA	
47	1	U10	7815	POS. STABILIZER 1A	

Scheda di controllo moduli RF
PlK-CTRL ver. 1.1
Bill Of Materials

Revised: August 27, 1998
Revision: 2
October 20, 1999 8:43:19 Page 3

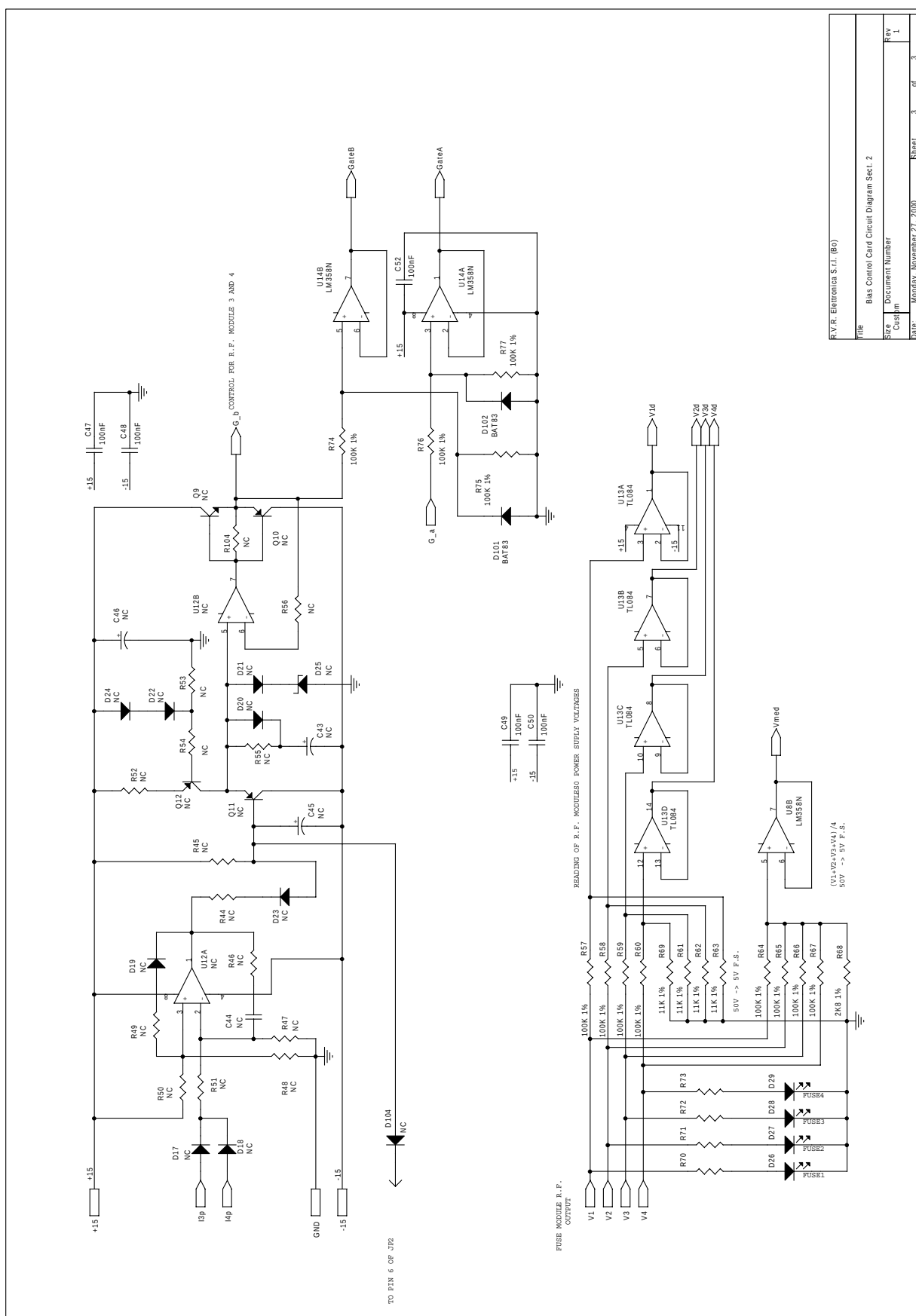
Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CDE
48	1	U9	7915	NEG. STABILIZER 1A	
49	1	REF1	TL431SMD	VOLT. PREC. REFER. SMD	
50	5	Q1,Q2,Q3,Q4,Q9	MMBT5401LT1	PNP HIGH VOLT. TRANSISTOR	
51	1	Q7	MJD117	PNP BIPOLAR POWER TRANS.	
52	1	Q8	MJD32C	PNP BIPOLAR POWER TRANS.	
53	4	Q10,Q11,Q12,Q13	ZDT6790	COMPLEM. MED. PWR HG. TRANS.	
54	2	U8,U18	LM358SMD	DUOBLE OP. AMP. SMD	
55	3	U5,U6,U7	TL082SMD	DOUBLE OP. AMP. SMD	
56	4	U14,U15,U16,U17	TL071SMD	SINGLE OP. AMP.	
57	2	U11,U13	TL084SMD	QUAD OP. AMP. SMD	
58	12	T1,T2,T3,T4,T5,T6,T7,T8,TORRETTA T9,T10,T11,T12		TORRETTA ESAGONALE	
59	22	D35,D36,C52,C53,C54,C55, C56,C57,R108,R109,R110, R111,R112,R113,R114,R115, R116,R117,R118,R119,R120, R121	N.C.	NOT CONNECTED	
60	2	R33,R38	1K0CH	CHIP RESISTOR	
61	4	F1,F2,F3,F4	16LCT	BOLT-IN MOUNTED FUSES 16LCT	





Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CODE
1	2	R29,R31	22 1%	RESISTOR 1/4W 1%	
2	2	R101,R102	47CH	CHIP RESISTOR 1/4W	
3	5	R1,R2,R3,R4,R32	51 1%	RESISTOR 1/4W 1%	
4	1	R33	56 1%	RESISTOR 1/4W 1%	
5	1	R21	100 1%	RESISTOR 1/4W 1%	
6	1	R103	220	RESISTOR 1/4W 5%	
7	4	R14,R15,R16,R17	820 1%	RESISTOR 1/4W 1%	
8	2	R28,R30	1K 1%	RESISTOR 1/4W 1%	
9	1	R80	3K9 1%	RESISTOR 1/4W 1%	
10	5	R13,R18,R19,R20,R23	4K7 1%	RESISTOR 1/4W 1%	
11	1	R25	4K99 1%	RESISTOR 1/4W 1%	
12	8	R5,R6,R7,R8,R9,R10, R12,R81	10K 1%	RESISTOR 1/4W 1%	
13	1	R11	10K	RESISTOR 1/4W 5%	
14	1	R27	12K 1%	RESISTOR 1/4W 1%	
15	4	R34,R35,R36,R37	100K 1%	RESISTOR 1/4W 1%	
16	1	R26	150K 1%	RESISTOR 1/4W 1%	
17	1	R24	220K 1%	RESISTOR 1/4W 1%	
18	1	R22	10M 1%	RESISTOR 1/4W 1%	
19	1	TR1	M1K	TRIMMER MULTIGIRI	
20	4	R39,R40,R41,R42	TM5K	TRIM.MULTIGIRI REG.VERT	
21	8	C9,C10,C12,C13,C15, C16, C18,C19	1NF	CERAMIC CAPACITOR	
22	1	C26	4N7	CERAMIC CAPACITOR	
23	4	C8,C11,C14,C17	10NF	CERAMIC CAPACITOR	
24	13	C7,C20,C21,C22,C35, C36,C37,C38,C39,C40,C41, C42,C51	100NF	CERAMIC CAPACITOR	
25	1	C27	33UF	ELECTROLYTIC CAPACITOR	
26	5	C1,C2,C4,C6,C25	47UF	ELECTROLYTIC CAPACITOR	
27	7	C3,C5,C23,C24,C28,C33, C34	100UF	ELECTROLYTIC CAPACITOR	
28	2	C31,C32	1000UF	ELECTROLYTIC CAPACITOR	
29	3	JP5,JP6,JP7	2 PIN STRIP	STRIP M P 2.54 2 PIN	
30	3	JP1,JP2,JP3	25MSF6	MINIMODUL CONN.2.5MM 6P	
31	1	P1	DB25 F F	CONN.F 25 FILTR.MURATA	
32	8	D3,D4,D5,D6,D7,D9,D10, D12	1N4148	SILICON DIODE	

33	1	D105	BAT83	HOT CARRIER DIODE
34	2	D8,D11	1N4004	SILICON DIODE 400V
35	3	D1,D2,D14	WL04	DIODE BRIDGE 1.5A
36	1	D13	Z10V	ZENER DIODE 10V 0.4W
37	2	U1,U3	78L12	POS. STABILIZER 100mA
38	2	U2,U4	79L12	NEG. STABILIZER 100mA
39	1	U10	7815	POS. STABILIZER 1A
40	1	U9	7915	NEG. STABILIZER 1A
41	1	REF1	TL431	VOLTAGE PRECISION REFERENCE
42	4	Q1,Q2,Q3,Q4	MPSL51	PNP HIGH VOLT. AMP. TRANS.
43	1	Q5	BD139	NPN TRANSISTOR
44	2	Q6,Q8	BD140	PNP TRANSISTOR
45	1	Q7	BD676	PNP DARLINGTON
46	1	U8	LM358N	DOUBLE OP. AMP.
47	3	U5,U6,U7	TL082	DOUBLE OP. AMP.
48	1	U11	TL084	QUAD OP. AMP.
49	1	JP4	N.C.	NON CONNESSO



Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CODE
1	34	Q9,Q10,Q11,U12,Q12,D18, N.C. D20,D21,D22,D24,D25,C43, C44,R45,R47,R48,R52,R53, R54,R55,R56,R104,D104,U12, D17,D19,D23,R44,C45,R46, R49,R50,R51,C46		NON CONNESSO	
2	5	C47,C48,C49,C50,C52	100NF	CERAMIC CAPACITOR	
3	4	D26,D27,D28,D29	LED-G5	GREEN LED DIODE	
4	2	D101,D102	BAT83	HOT CARRIER DIODE	
5	12	R57,R58,R59,R60,R64, R65, R66,R67,R74,R75, R76,R77	100K 1%	RESISTOR 1/4W 1%	
6	4	R61,R62,R63,R69	11K 1%	RESISTOR 1/4W 1%	
7	1	R68	2K8 1%	RESISTOR 1/4W 1%	
8	4	R70,R71,R72,R73	12K*	RESISTOR 1/2W 5%	
9	2	U8,U14	LM358N	DOUBLE OP. AMP.	
10	1	U13	TL084	QUAD OP. AMP.	