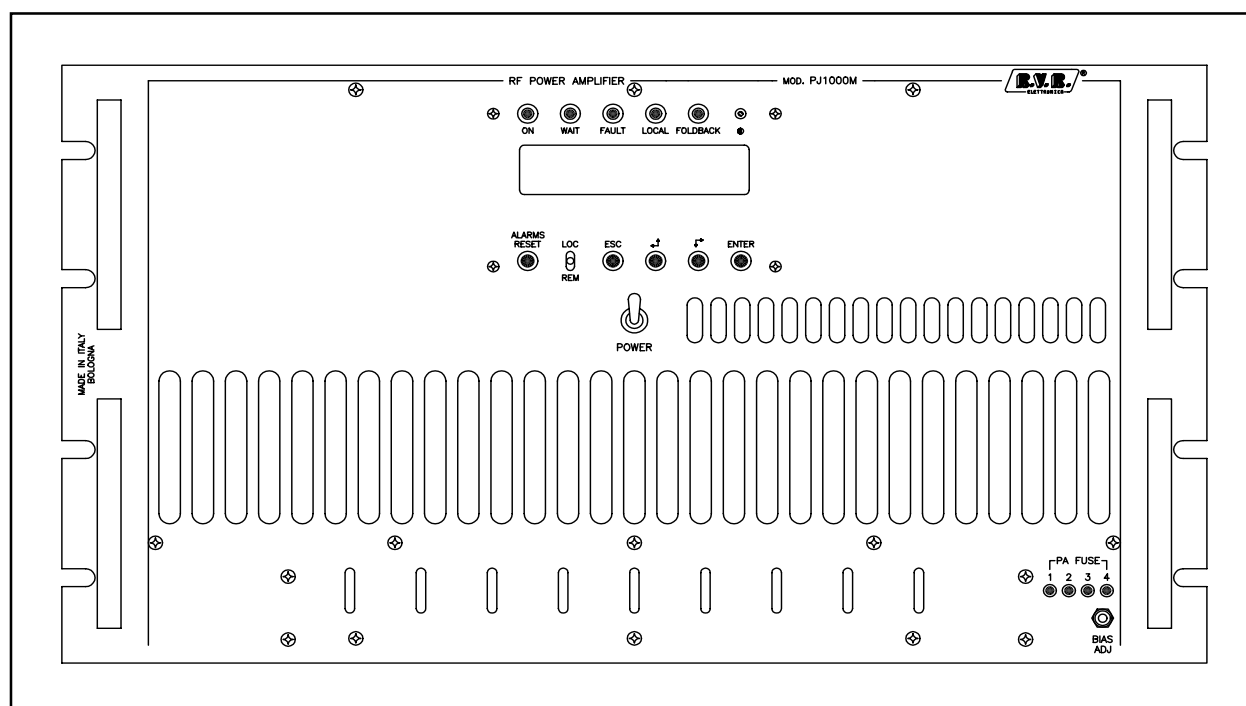

PJ1000M



User Manual

LCD Version

Manufactured by



Italy



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PJ1000M - User Manual
Versione 1.2L

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**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.



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**Avviso riguardante l'uso designato e le limitazioni d'uso del prodotto**

Questo prodotto è un trasmettitore radio indicato per il servizio di radiodiffusione audio in modulazione di frequenza. Utilizza frequenze operative che non sono armonizzate negli stati di utenza designati.

L'utilizzatore di questo prodotto deve ottenere dall'Autorità di gestione dello spettro dello stato di utenza designato apposita autorizzazione all'uso dello spettro radio, prima di mettere in esercizio questo apparato.

La frequenza operativa, la potenza del trasmettitore, nonché altre caratteristiche dell'impianto di trasmissione sono soggette a limitazione e stabilite nell'autorizzazione ottenuta.

Dichiarazione di Conformità

Con la presente R.V.R. Elettronica SpA dichiara che questo trasmettitore è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE



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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.

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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

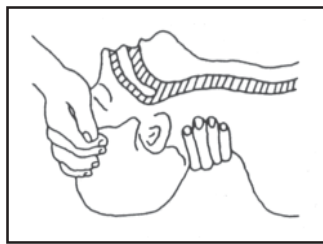


Figure 1



Figure 2

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

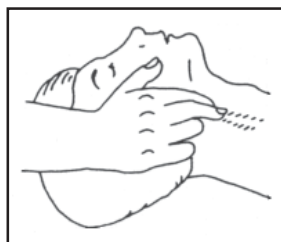


Figura 3

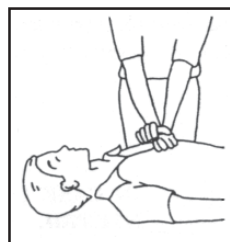


Figura 4

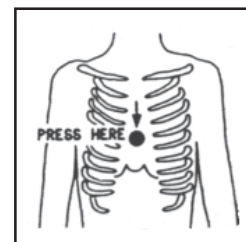


Figura 5

- 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 PJ1000M is controlled by a microprocessor system including a LCD display, implementing the following functions:

- measurement and display of the amplifier's working parameters
- activation and deactivation of the RF power output
- protection of the amplifier against dangerous situations like exceeding output power or SWR, overdrive or overtemperature
- detection of user-settable attention thresholds (e.g. output power being below a certain value), that are made externally available using the "telemetry" connector
- communication with external devices

The amplifier gives the option for an external 24 V dc power supply: this will automatically be used to supply the CPU section in case the mains power goes off, allowing to interact with the device even in such case.

The user can navigate through the menu system using four buttons, ESC, move LEFT/UP, move RIGHT/DOWN and ENTER. Another button is used to reset the alarms that possibly arose.

Five LEDs on the front panel of the amplifier show the current status of the machine: ON/OFF, WAIT, FAULT, LOCAL and FOLDBACK

A switch allows to select the LOCAL or REMOTE mode. LOCAL mode permits to control the machine using the buttons on the front panel, while remote control (that is using the telemetry connector) is disabled. In REMOTE mode, the buttons on the panel can be used only to read the parameters, but they can be changed only remotely.

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.

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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 the amplifier 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 chose between 220 V o 110 V is 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 | 16 A | 10X38 |
| • Service | 10 A | 6,3X32 |
| • Aux | 4 A | 6,3X32 |

Verify that the mains switch is in the OFF positon.

Connect to the RF Input the RF Output of a 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 of the PJ1000M 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 a Rack that contains 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 operaton as well as the correct working of the equipment.

5.2 Operation

Switch ON the amplifier and verify the green “ON” LED being it.

Switch the exciter on (to minimum power level) and wait for it to lock on the working frequency. When the locked condition is reached, progressively increase its output power, while controlling the amplifier's display. Keep increasing the exciter output until the amplifier reaches the desired level, at most 1000W. (Please note that, as result of the digitalization of measurements, it could happen that the displayed value is not exactly 1000W, but a value comprised between 995 and 1005; this is perfectly normal.)

At this point, it is possible for the user to verify all the working parameters of the amplifier using the management software.

Normally, the device doesn't require any human supervision for its normal operation. If any alarm condition arise, these are automatically managed by the embedded protection system, and notified to the user with the LEDs on the panel or via messages on the LCD display.

5.3 Software

This chapter describes the way the microprocessor system controls the amplifier, and how the user can interact with it.

Please note that the user can give commands to the device only when it's set in LOCAL mode using the switch. Otherwise, the user will only be allowed to read the parameters, but not to change any of them.

The flow diagram in figure 3 gives an overall view of the user interface of the software.

At power on, the LCD display will show the following presentation screen, with the name of the device and the indication of the switch-on power limiter device called Soft Start:

A rectangular box representing an LCD screen. Inside the box, the text 'PJ1000M - LCD' is on the top line and 'Soft Start' is on the bottom line, both in a pixelated, monospaced font.

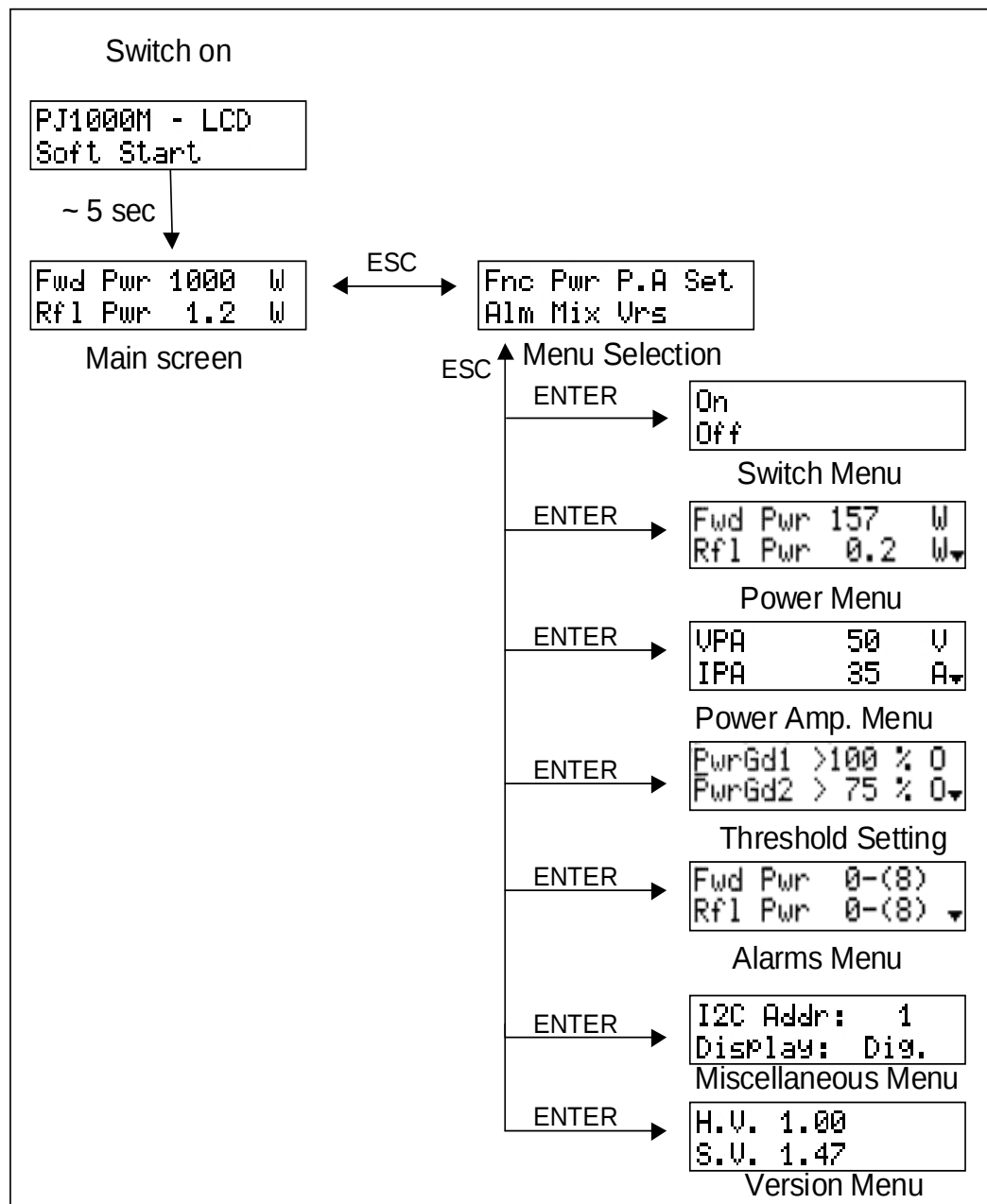


Figure 3 - Flow diagram of the software

After a few seconds, the main screen will be displayed, reporting the values of forward power and reflected power:

Fwd Pwr	1000	W
Rfl Pwr	1.2	W

Pushing the ESC button, the user will be presented with the menu selection screen, from which the other screens can be accessed:

Fnc	Pwr	P.A	Set
Alm	Mix	Urs	

To enter into another menu, just select the corresponding name (that will be indicated by a blinking underscore) with the LEFT and RIGHT buttons, and then push ENTER.

Note that some of the parameters that are measured and can be read may be, in some circumstances, not available. This situation arises when, for physical reasons, the measured values are not significant to be used in the control software.

When the value for a parameter is not available for such reasons, it's substituted with the symbol "==".

5.3.1 RF Power switch menu (Fnc)

On
Off

From this screen the user can switch on and off the power amplifier.

When the amplifier is set in the OFF state, the inner conductor of the INTERLOCK connector will be grounded to force the exciter in stand-by mode(if it is fitted with such an option, as RVR exciters are, and if the devices are correctly linked). At the same time, the auxiliary AC power output circuit is opened to shut off the exciter if it is connected to this plug.

A few seconds after the amplifier is set in OFF mode, the software sends a signal to the relays of the blowers to turn them off too (the delay allows for the proper cooling of the amplifier).

5.3.2 Power menu (Pwr)

In this multi-line scrollable screen it is possible to read all the measurements related to the status of the power section of the amplifier:

- Forward Power (Fwd Pwr)
- Reflected Power (Rfl Pwr)
- Standing Wave Ratio (SWR)
- Input Power (Inp Pwr)
- Internal SWR (Int SWR)

Depending on the configuration, some of the measurements can be disabled.

The complete aspect of the screen is the following (please note that only two lines at a time are visible, use the UP and DOWN buttons to scroll):

Fwd Pwr	1000	W
Rf1 Pwr	1.2	W
SWR	Off	
InP Pwr	17	W
Int SWR	Off	W

5.3.3 Power Amplifier menu (P.A.)

In this multi-line scrollable screen it is possible to read the values of the parameters related to the RF amplifier section of the device:

- voltage (VPA)
- current (IPA)
- efficiency
- temperature
- mains voltage (Percentage variation referred to nominal voltage)

The complete aspect of the screen is the following (only two lines at a time are visible, use the UP and DOWN buttons to scroll):

VPA	50	V
IPA	35	A
Eff.	58	%
Temp.	22.8	°C
Mains	5	%

5.3.4 Threshold setting menu

As it has been said in the introduction, the amplifier offers a maximum of three user settable alarms. For each of them, one of the working parameters is compared against a threshold value that can be modified by the user. The results of the comparisons are available as an open collector states on an telemetry connector or as dry contacts on the optional external telemetry board, and can be read on the display as "O" (open, i.e. the result is false) or "C" (closed, i.e. the result is true).

Two settable thresholds (**Power Good**) regard the emitted power level, the third is used to verify the level of reflected power (**Reflected Warning**).

The thresholds are shown as percentage of full-scale value.

The full-scale value for PJ1000M are:

- Forward Power 1000W
- Reflect Power 100W

It is also possible to change those values executing the following procedure:

- Select the line to modify (UP and DOWN buttons)
- Push the ENTER button
- Modify the value of the threshold (UP and DOWN buttons)
- Push the ENTER button to confirm

The following figure shows an example of configuration for this menu

PwrGd1	>	80	%	0
PwrGd2	>	50	%	0
Rf1War	>	50	%	0

In this example, the thresholds of the warnings are:

- PwrGd 1 800W (80% X 1000W)
- PwrGd2 500W (50% X 1000W)
- Rf1War 50W (50% X 100W)

5.3.5 Alarms menu

This screen gives to the user information regarding the status of the protection system included in the amplifier.

It consists in a number of lines, each of wich holds the name of the quantity that is checked by the protection system and the kind of intervention that is undertaken.

The latter can have the values **X - (Y)**, **Wait**, or **Disabled** (see 5.3.8).

The aspect of this multi-line screen is the following (only two lines at a time are visible, use the UP and DOWN buttons to scroll):

Fwd Pwr	0-(8)
Rfl Pwr	0-(8)
Inp Pwr	0-(8)
U.P.A.	Dis.
I.P.A.	0-(8)
Temp.	Wait
Int SWR	Dis.
Mains	Wait
SWR	Dis.
Eff.	Dis.

This menu mainly represents a diagnostic support for the technician to detect the cause of possible problems in the power amplifier.

5.3.6 Various menu

This menu permits to effect two operation:

- Setup the address of the I²C serial bus type connection.
- Setup the kind of visualitation in the default menu.

I2C Addr:	1
Display:	Di9.

The address of I²C communication is fundamental when the amplifier is connected with other RVR devices that use this protocol. It's recommended to not change this parameter if not necessary.

The visualitation mode can be digital (the default mode described in chapter 5.3) or analogic:

Rfl Pwr	6	▼
■■		

In analogic mode, a little triangle indicates the reflected power level setting in threshold setting menu (RflWar), and the bar below it shows the reflected power in real time.

This kind of visualitation is best used when the amplifier output is connected to a device that needs to be tuned, because the analog representation gives an immediate feedback of the effect of the tuning action.

5.3.7 Version menu

This screen shows the release version of hardware (H.V.) and software (S.V.) of the unit.

H.V.	1.00
S.V.	1.47

5.3.8 Protection system

The protection system implemented by the software is based on two kinds of reaction.

The first reaction is called "Foldback", and consists in lowering the RF power stage voltage in case the forward or reflected power surpass a certain value. In this way, the gain of the amplifier gets smaller, and the overall effect is an opposition to the increase of both the forward and the reflected power. A yellow LED on the front panel signals the intervention of the foldback circuit.

The second kind of reaction consists in shutting off the power stages of the amplifier when a certain quantity exceeds the configured value.

Depending on the kind of problem that caused the failure, after the amplifier has been shut off, it will either be reactivated after a fixed time interval, or only when the impeding condition has been solved. In the Alarm menu, the first kind of configuration is noted by **X - (Y)**, while the second is indicated with **Wait**. The third possibility is that the configuration of the sistem does not implement any protection based on a certain parameter: this would be noted with **Dis.** (Disabled).

While the amplifier is temporarily shut off for an alarm, the yellow WAIT LED is lit, and the cause of the intervention of the protection system is written on the display.

When the protection intervenes for a parameter of "cyclic" kind, a counter is incremented (the value **X** in the alarm screen). If the value of the counter reaches the maximum admitted value (**Y**), the amplifier is definitively switched off, and the red LED "fault" on the front panel is lit.

The button ALARMS RESET gives the user the opportunity to interact with the protection system. Its effect is different depending on the status the amplifier is when the button is pushed:

- If the system is off, waiting for the cycle time to be reached, or if it is definitively off in FAULT state, pushing the ALARMS RESET button will immediately turn the

amplifier on and reset the alarm counters

- If the system is transmitting, but some alarm occurred before, so that the alarm counters are not all at "0", pushing the ALARMS RESET button will have no effect unless the button is pushed while the user is reading the Alarm menu. In this way it is assured that the user doesn't reset the possible alarms without being conscious of them

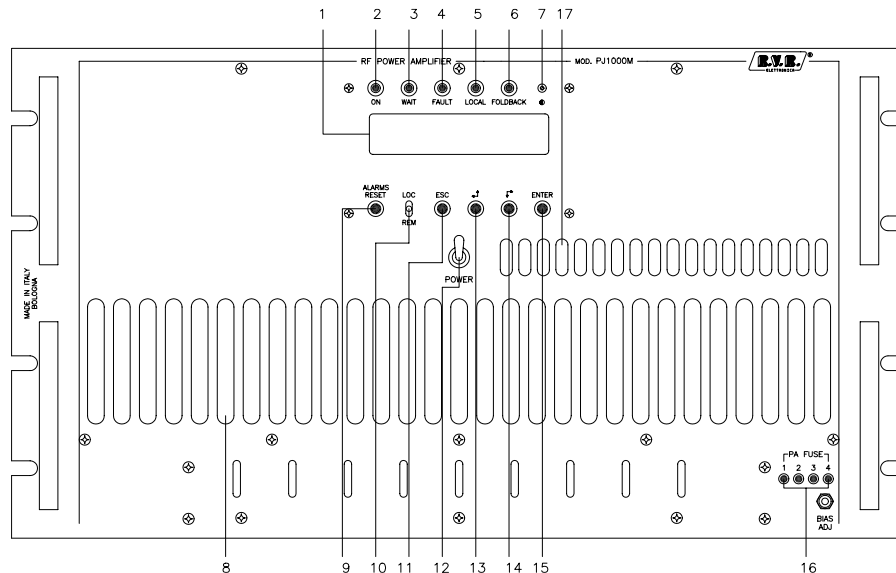
The alarm counters are reset by the system itself without the need for an external intervention after half an hour of undisturbed (i.e. without alarms) working of the amplifier

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6. Controls, Indicators and Connectors

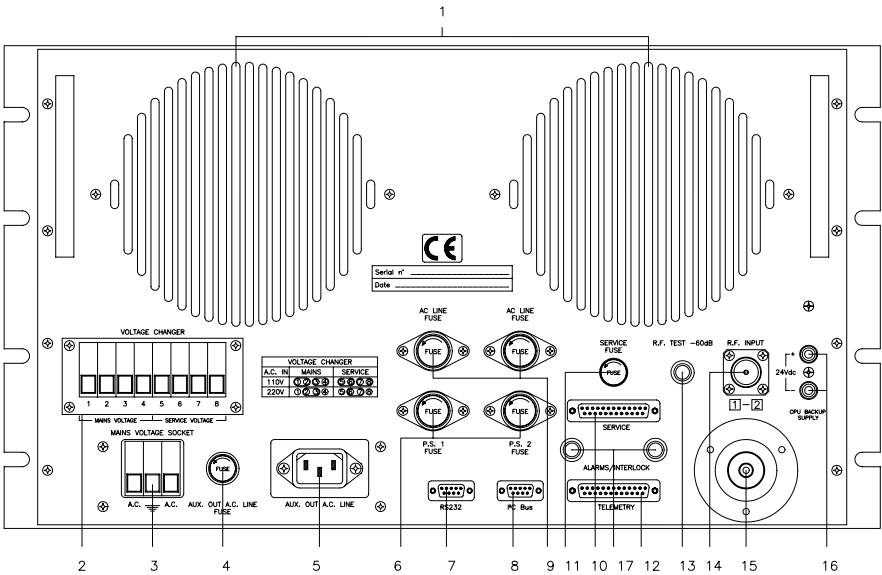
This chapter describes the front and rear panels of the PJ1000M, with a brief indication of all the different components.

6.1 Front Panel



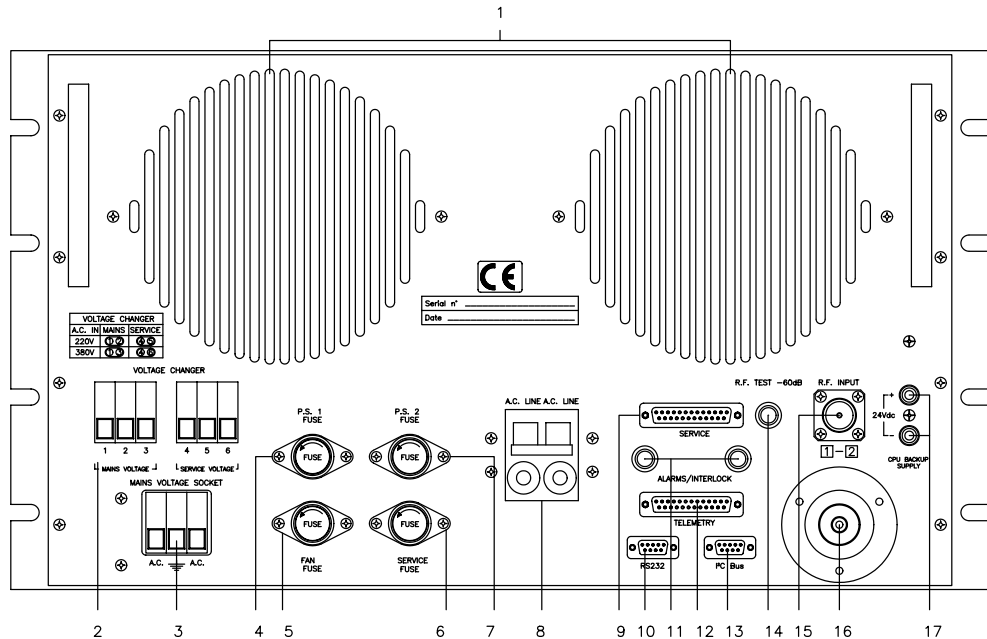
- | | |
|----------------------|---|
| [1] DISPLAY | LCD display |
| [2] ON | Green LED, lit when the amplifier is switched on. |
| [3] WAIT | Yellow LED indicating that the amplifier is waiting for a condition that is blocking the power output to be removed |
| [4] FAULT | Red LED indicating that a fault that cannot be automatically reverted |
| [5] LOCAL | Yellow LED indicating that the amplifier is in local control mode |
| [6] FOLDBACK | Yellow LED indicating the intervention of the foldback function (automatic reduction of the output power) |
| [7] BRIGHTNESS | Trimmer to regulate the brightness of the LCD display |
| [8] HEAT-SINK | Heat sink |
| [9] ALARM RESET | Button used to manually reset the protection system |
| [10] LOC/REM | Switch to select the local or remote control modes |
| [11] ESC | Button used to exit from a menu |
| [12] ON/OFF | Mains Switch |
| [13] LEFT/UP | Button used to navigate in the menu system and to modify the changeable parameters |
| [14] RIGHT/DOWN | Button used to navigate in the menu system and to modify the changeable parameters |
| [15] ENTER | Button used to accept a parameter's value or to enter into a menu |
| [16] P.A. PROTECTION | This four LEDs shown the fuse status of each protection modules of the RF power amplifier |
| [17] HEAT-SINK | Power amplifier's heat sink |

6.2 Rear Panel



- [1] FAN Fan with forced ventilation
- [2] VOLTAGE CHANGER
Voltage changer:
Voltage Mains Service
110 Vac 1-2 / 3-4 5-6 / 7-8
220 Vac 2-3 6-7
- [3] MAINS VOLTAGE SOCKET Mains voltage socket
- [4] AUX FUSE Fuse protecting the auxiliary power output
- [5] AC OUTPUT VDE plug to supply external devices (normally an exciter)
- [6] P.S. 1-2 FUSE Protection fuse of power supply 1 and 2
- [7] RS232 DB9 connector to link the amplifier with external devices
- [8] I²C BUS DB9 connector for I²C bus networking
- [9] A.C. LINE FUSE A.C. line protection fuse
- [10] SERVICE CONNECTOR Connector for research all processed parameters of the RF section
- [11] SERVICE FUSE Service protection fuse
- [12] TELEMETRY CONNECTOR DB25 telemetry connector
- [13] R.F. TEST -60dB -60dB referred to output level
- [14] R.F. INPUT RF input connector ("N" type)
- [15] R.F. OUTPUT RF output connector (7/8" EIA flange)
- [16] 24 V External 24V dc power supply input for CPU backup power supply
- [17]ALARMS/INTERLOCK BNC connectors to inhibit an external device, as an exciter. In case of fault, the inner connector is shorted to ground

6.3 Rear Panel (220-380 TRF version)

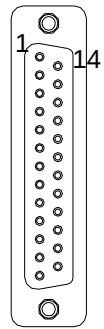


- [1] FAN Fan with forced ventilation
- [2] VOLTAGE CHANGER
 Voltage changer:
 Voltage Mains Service
 220 Vac 1-2 4-5
 380 Vac 1-3 4-6
- [3] MAINS VOLTAGE SOCKET Mains voltage socket
- [4] P.S. 1 FUSE Protection fuse of power supply 1
- [5] FAN FUSE Fuse protecting the Fan
- [6] SERVICE FUSE Service protection fuse
- [7] P.S. 2 FUSE Protection fuse of power supply 2
- [8] A.C. LINE Mains switch
- [9] SERVICE CONNECTOR Connector for research all processed parameters of the RF section
- [10] RS232 DB9 connector to link the amplifier with external devices
- [11] ALARMS/INTERLOCK BNC connectors to inhibit an external device, as an exciter. In case of fault, the inner connector is shorted to ground
- [12] TELEMETRY CONNECTOR DB25 telemetry connector
- [13] I²C BUS DB9 connector for I²C bus networking
- [14] R.F. TEST -60dB -60dB referred to output level
- [15] R.F. INPUT RF input connector ("N" type)
- [16] R.F. OUTPUT RF output connector (7/8" EIA flange)
- [17] 24 V External 24V dc power supply input for CPU backup power supply

6.4 Connectors description

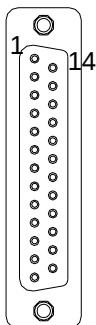
6.4.1 Telemetry Connector

Tipo: DB25 Female

	1	Internal SWR	3.9V x 1/2W
	2	RF power amplifier voltage	3.9V x 50V
	3	GND	GND
	4	Reflected power	4.3V x 100W
	5	Interlock	
	6	Set 4	
	7	GND	GND
	8	“On” command	
	9	Set 1	
	10	WAIT	
	11	Alarms reset	
	12	OFF	
	13	Interlock	
	14	Temperature	3.9V x 100°
	15	RF power amplifier current	3.9V x 50A
	16	Forward power	4.3V x 1000W
	17	FAULT	
	18	Set 3	
	19	Input power	3.9V x 20W
	20	“OFF” command	
	21	GND	GND
	22	Set 2	
	23	LOC	
	24	+Vcc	
	25	ON	

6.4.2 Service Connector

Tipo: 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	

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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

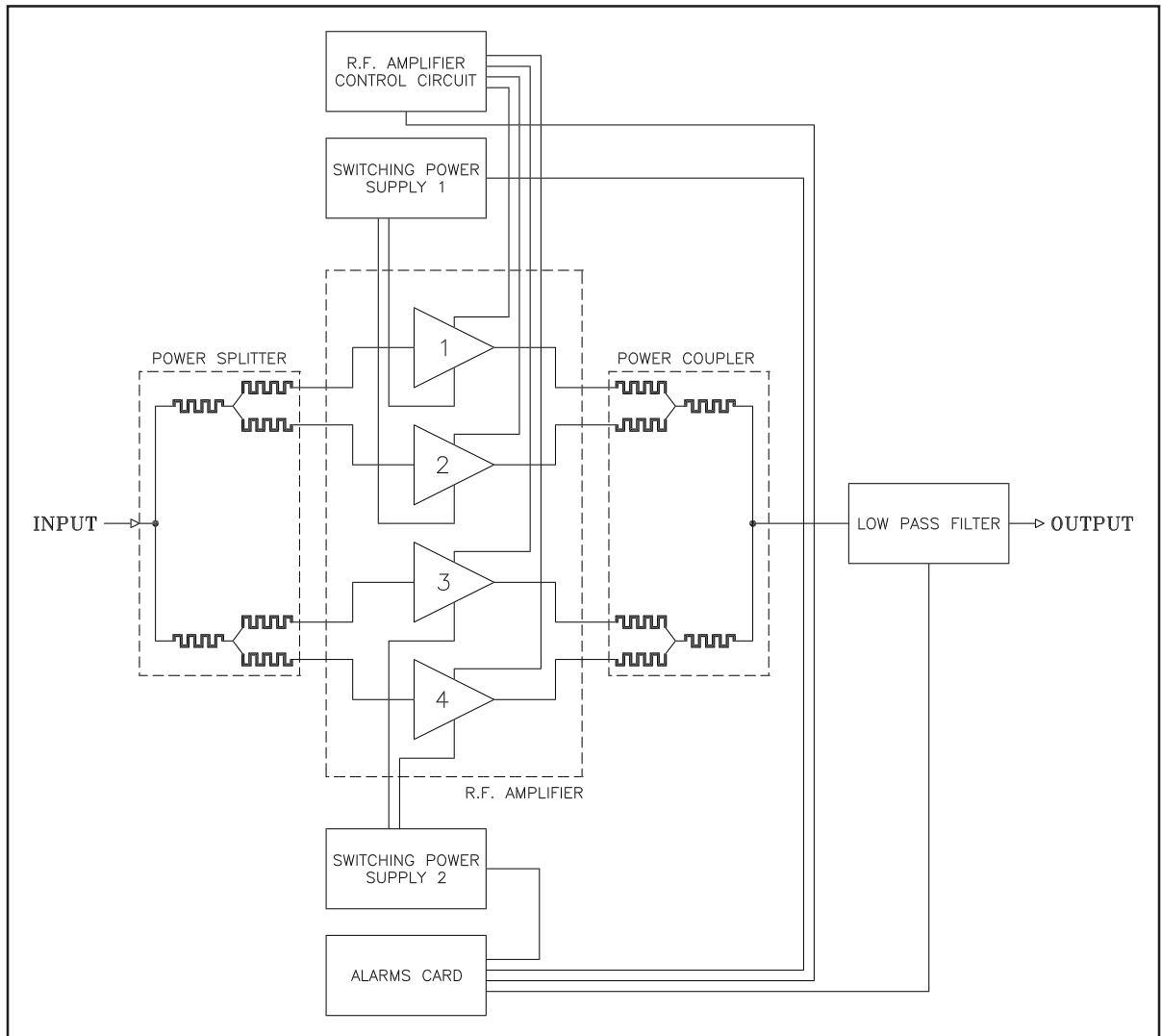
A.C. power supply	100-130 V, 50-60 Hz 198-250 V, 50-60 Hz
Cooling system	Forced ventilation, posticipated auto-OFF system in stand-by mode
Frequency range	87.5 MHz ÷ 108 MHz
Output power	1000 W
Drive power	< 20 W for Pout = 1000 W, typical 12 W
Input connector	"N" type standard connector
Input impedance	50 Ohm
Output connector	Standard 7/8" EIA Flange
Output impedance	50 Ohm
Harmonic and spurious soppression	Respect all requirments FCC and CCIR

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8. Theory of Operation

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



8.1 Power supply

The power supply are housed in the left side of the amplifier. The Switching Power Supply is mounted on a heat sink that allows its cooling through forced ventilation.

Housed inside to the PJ1000M there are two transformers, both having a selectable input for voltages of 110 and 220 Volt.

The first has one output 61-0-61V and is used for the switching power supply.

The second has four outputs: A) 18-0-18V, B) 0-11,5V, C) 0-26V, D) 15-0-15V that supply the other cards of the PJ1000M.

Inside the Alarms Card a rectifying and stabilization circuit provides the +15 and -15 V needed by the electronics.

8.2 Soft Start

The soft-start card is a board placed on the left side of the amplifier.

This circuit imposes a resistive load when the amplifier is activated and excludes it after a certain delay. In this way, the current spikes due to the transformer at power-on are reduced.

8.3 RF Power Amplifier

The R.F. power amplifier section is composed of the four power modules coupled with a Wilkinson splitter and combiner realized with "Strip Line Technology".

The four R.F. modules, splitter card and combiner card are housed in the top side of the equipment.

All R.F. section is mounted on a heat-sink that allows its cooling through forced ventilation.

Each module delivers 300W with 4-6W of drive and is supplied by an switching power supply.

The quiescent parameters of each module are:

VDC=50V Vgs=3.5V Idq=200mA

The active device employed is a Mosfet (BLF278).

8.4 Wilkinson Splitter and Combiner

Both the splitter and the combiner are realized in "Strip-Line technology".

The splitter card is used to split the RF power of the exciter and provide a quarter of it to each of the R.F. Power Amplifier modules.

The combiner card is then used to combine the output power of the R.F. power amplifier modules to obtain the total rated power.

These two circuits guarantee equal phases of the power of each R.F. power amplifier module. A power resistor placed on each circuit is used to dissipate any power due to unbalancement of the power paths in case of fault of one of the modules.

The splitter also hosts the temperature sensor, that is monitored by the software too.

8.5 Bias Card

This card has the function to control and if necessary to correct the polarization current of each Mosfet of the R.F. section.

It is also able to supply measurements as: currents, voltages for each R.F. amplifier module, total current and average voltage.

8.6 Low-pass Filter

This filter is housed in the right side of the equipment. Its role is to suppress the harmonic components generated by the amplifier below the levels required by regulations.

8.7 Directional Coupler

The function of this circuit is to provide the measurement of the forward and reflected output power.

8.8 CPU

This subsystem is composed by three cards: the CPU card, the display card and the analog section card.

This subsystem implements all the software functions (measurements, protection, control, data display, communications) described in the previous chapters.

8.9 Telemetry connector

The telemetry connector is a DB25 type one placed on the rear panel. This connector provides seven analog outputs, eight open-collector digital outputs and four digital inputs.

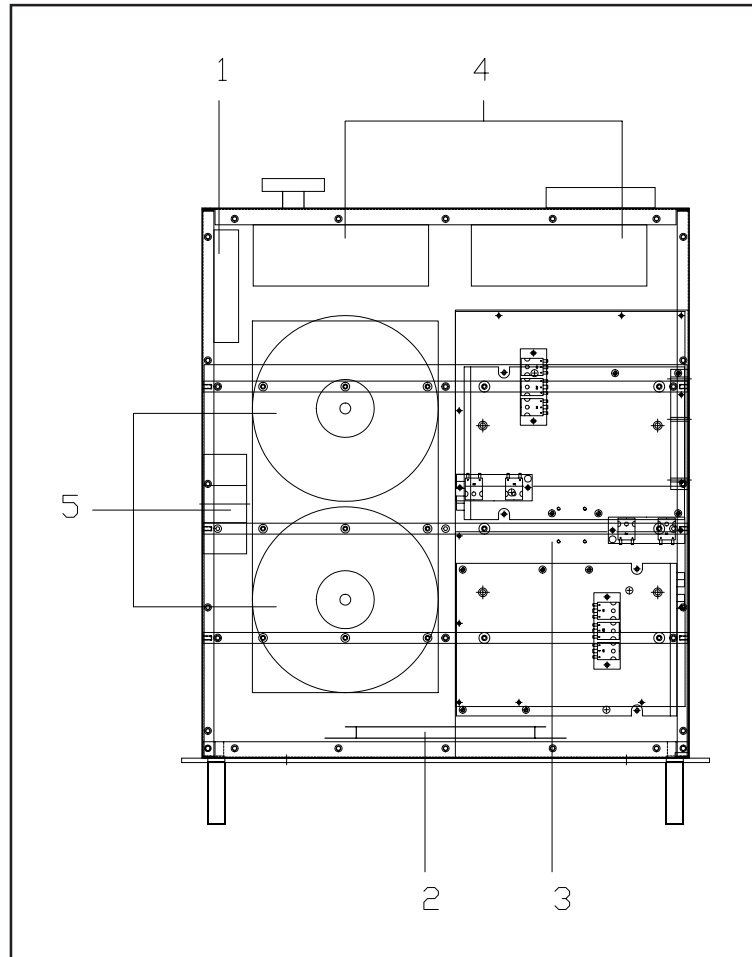
8.10 External telemetry card (optional)

This optional device is designed to interface to the telemetry connector of the PJ1000M, and its main role is to give to the user a number of dry contacts related to the status of the amplifier. The contacts can be configured as normally open or closed, and are triggered by the four user settable thresholds plus LOC/REM, WAIT, FAULT, ON, OFF, INHIBIT.

The analog signals produced by the amplifier are replicated on a DB9 connector.

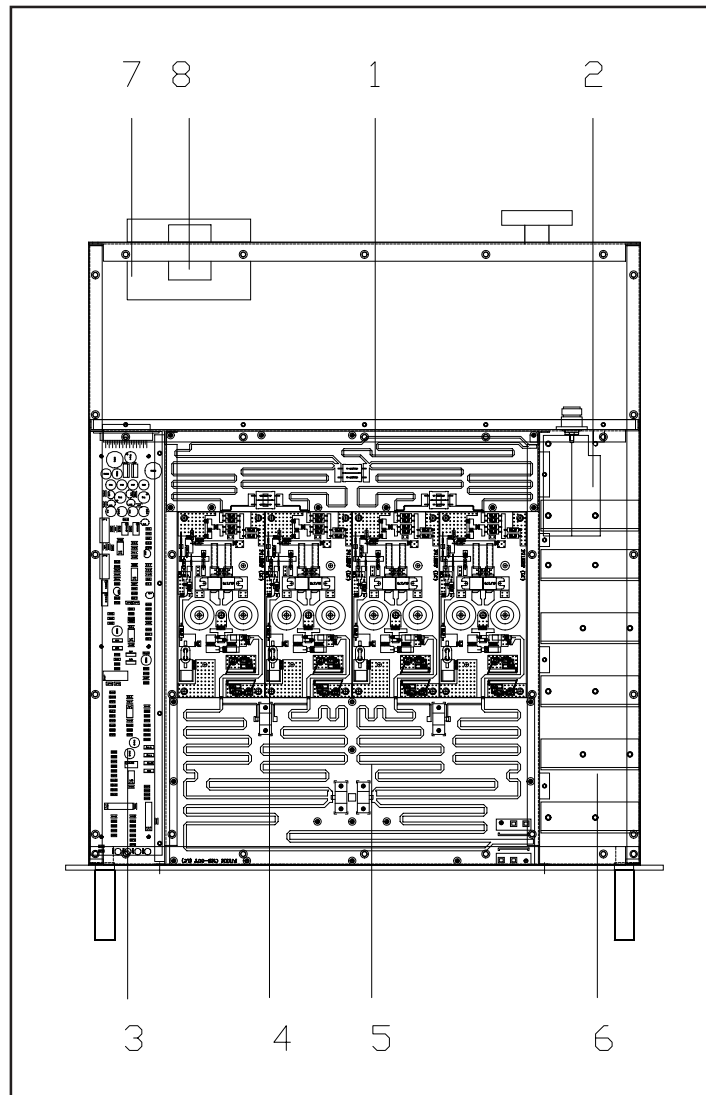
9 Identification and Access to Modules

9.1 Modules Identification (top view)



- [1] Soft Start Card
- [2] Alarms Card
- [3] Power Supply (PSSW5040)
- [4] Fans
- [5] Transformers

9.2 Modules Identification (bottom view)



- [1] Wilkinson Splitter Card
- [2] Directional Coupler Card
- [3] Bias Card
- [4] RF modules of power amplifier
- [5] Wilkinson Combiner Card
- [6] Low Pass Filter
- [7] Voltage changer
- [8] Mains voltage box

9.3 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 a module, it is enough to execute the indicated operations in opposite sequence.

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

9.3.1 Power Supply Replacement

- With the help of the wiring diagram included in the Appendix, take note of the cable position inside the terminal boards JP1, JP2, JP3, JP4, JP5, JP7 e JP14.
- 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 the heat sink.
- Carefully remove the power supply.

9.3.2 R.F. Power Amplifier Module Replacement

- With the help of the wiring diagram included in the 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 the heat sink.
- Carefully remove the RF power amplifier.

9.3.3 Wilkinson Splitter Card Replacement

- Unsolder the wire that connect the input of the splitter to RF input connector of RF section
- Unsolder the wires that connect the input and output of the splitter to the other devices.
- 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.

9.3.4 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.

9.3.5 Directional Coupler Replacement

- With the help of the wiring diagram shown in Appendix, 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.

9.3.6 Soft Start Card Replacement

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

9.3.7 CPU Group Replacement

- Disconnect J1 and J2 alarms card's connectors.
- Disconnect JP1 alarms card's connector.
- Remove the screws securing the board to the front panel.
- Carefully extract the card.

9.3.8 Bias Card Replacement

- Remove the screws that fix the two voltage regulators (U9, U10) to the 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

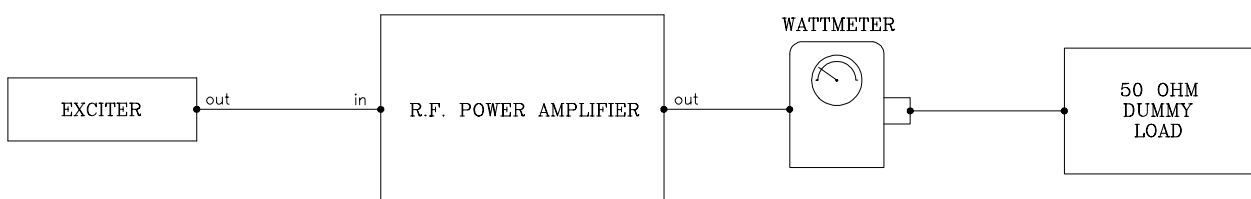
This chapter describe the adjustment to do after the substitution of a module.

10.1 Power Supply Adjustment (PSSW5040)

No adjustments are required on this module.

10.2 R.F. PA Module Adjustment

After a PA module has been substituted and all the connections have been reestablished, follow these steps:



- Set up the system as described in the figure: a wattmeter is inserted in series with the amplifier to verify the RF power generated by it.
- Connect to the RF input connector a suitable exciter able to deliver a variable power of 20 W max.
- Connect the Alarms/Interlock connector to the appropriate connector on the exciter.
- Set the output power of the exciter to its minimum value.
- Switch the PJ1000M on, keeping off the exciter (switched OFF or in stand-by mode) and measure the quiescent current of the module. At working temperature, a RF module has to drain 200 mA. If the current is different from this value, use the trimmer R15 on the module to compensate the difference.

At this point, it is possible to verify how the module works at nominal power:

- Enable the power output from the exciter (switching it on and waiting for the PLL to lock, or exiting from the stand-by mode).
- Gradually rise the power of the exciter and monitor the power output of the amplifier, until it reaches its nominal value of 1000W.

A correctly adjusted amplifier has:

$P_{out} = 1000W$ we have $15W < P_{in} < 18W$ and $32A < I_{pa} < 40A$

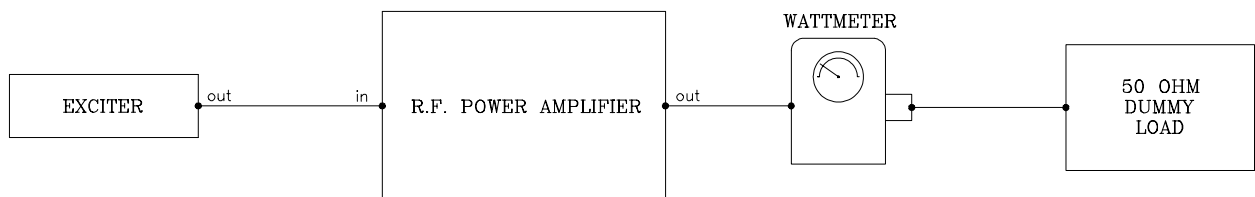
Verify that the current drawn by the modules have about the same value. Little differences are due to the different gain of the MOSFET. Differences not exceeding 800 mA have to be seen as normal.

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 CPU Assembly Adjustment

NOTE: Make sure that this replacement is really necessary.

- After changing the assembly, connect the amplifier as shown in the figure below.
- Switch ON the PJ1000M LCD.

Temperature lecture adjustment

- Measure the temperature with a thermometer.
- Enter on the P.A. menu.
- Adjust the trimmer TR6 to read on the display the same temperature measured with the thermometer.

Mains lecture adjustment

- Measure the main voltage with a multimeter.
- Enter on the P.A. menu.
- Adjust the trimmer TR8 to read on the display the value of 100% (the main voltage is visualized as percentage variation and the value 100% represents 220V).

Trimmer TR7 adjustment

- The trimmer TR7 must be turned completely counter-clockwise, to protect the input channel to the CPU.

VPA lecture adjustment

- Verify, with a multimeter, that the power amplifier voltage is of 50V.
- Enter on the P.A. menu.
- Adjust the trimmer TR4 to read on the display the same voltage measured with the multimeter.

IPA measurement adjustment

- With the amplifier switched OFF, detach from the RF PA modules the faston connectors that give them the 50 V voltage from the switching power supply.
- Connect between one of the Faston connectors and ground a resistive load able to drain 8 A at 50 V (and to dissipate the relative power). An amperometer with suitable full-scale value has to be inserted, in series with the load, an amperometer with suitable full-scale has to be inserted.
- Switch the amplifier ON.
- Go into the PA menu.
- Adjust trimmer TR5, so that the reading of IPA on the display is the same as the one on the amperometer.
- Switch the amplifier OFF.
- Reestablish the connections of the PA modules.

FOLBACK intervention adjustment

- Be sure that the exciter is not operative.
- Measure the voltage on the PIN1 of JP7 on the power supply card with a multimeter, than rotate the trimmer TR9 to obtain a voltage of 0V.

Forward power lecture adjustment

- Increase the PJ1000M to 1000W at 98MHz, using as a reference the reading on the wattmeter that possibly has been connected at the end of the attenuation chain at the RF output.
- Rotate TR1 to read on the display the same value measured with the wattmeter.

Reflected power adjustment

- Apply an unbalanced load in series with a 50 Ohm load and apply in series a by-pass wattmeter BIRD.
- Increase slowly the exciter power to obtain a reflected power of 100W at 98MHz.
- Adjust TR2 to read on the display the same value measured with the wattmeter.

Input power lecture adjustment

- Connect to the PJ1000M' s RF input a by-pass wattmeter BIRD with a full-scale of 10 W.
- Connect a 50Ohm load to the exit and increase slowly the exciter power to obtain 5W on the instrument in series to the input.
- Rotate TR3 on the CPU assembly to read on the display the correct value measured with the wattmeter.

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:

- Verify the "AGC control".
- Verify the Antenna S.W.R. calibration.
- Verify FWD PWR lecture.
- 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.

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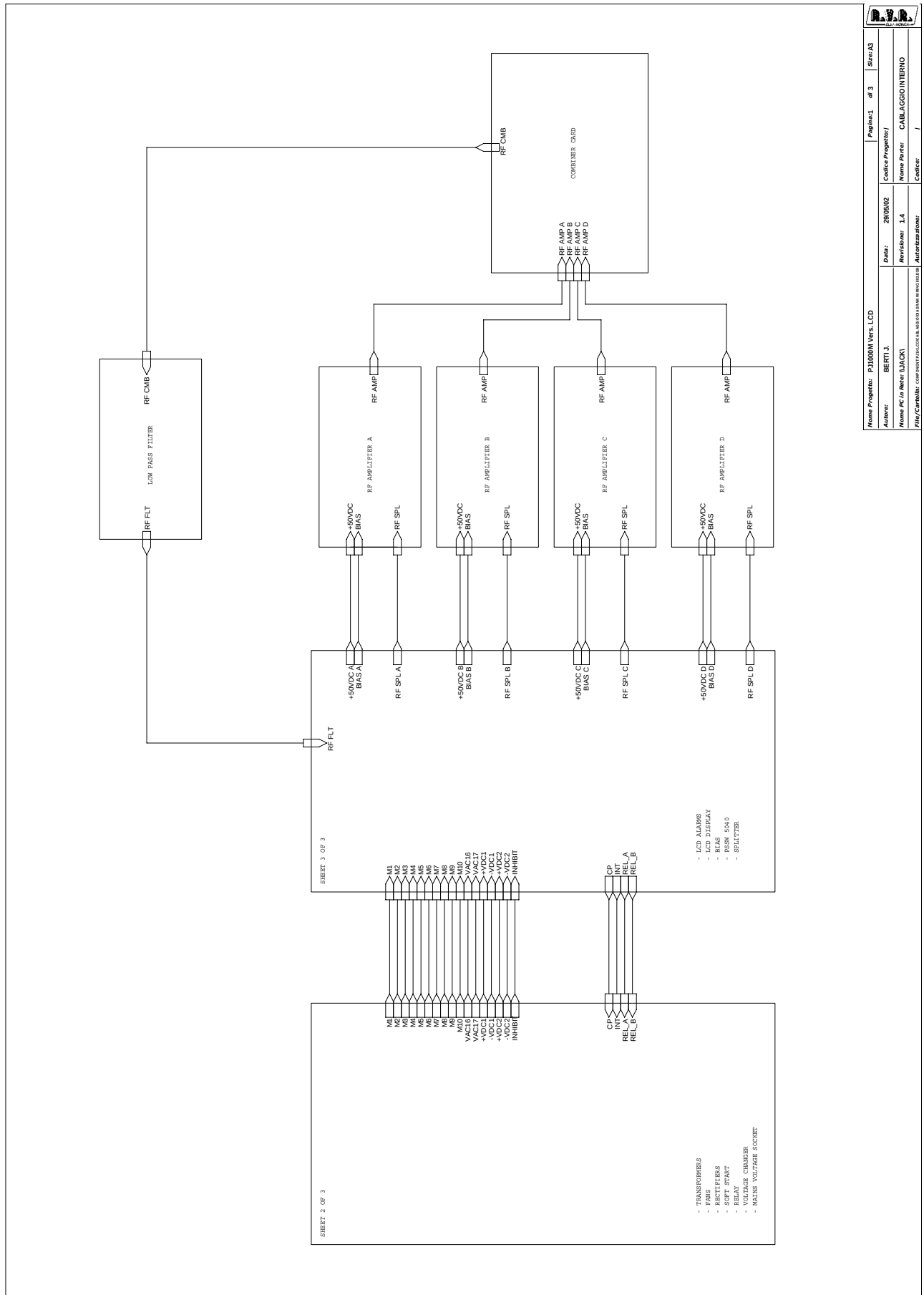
Appendix A Piani di montaggio, schemi elettrici, liste componenti / *Component layouts, schematics, bills of material*

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

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

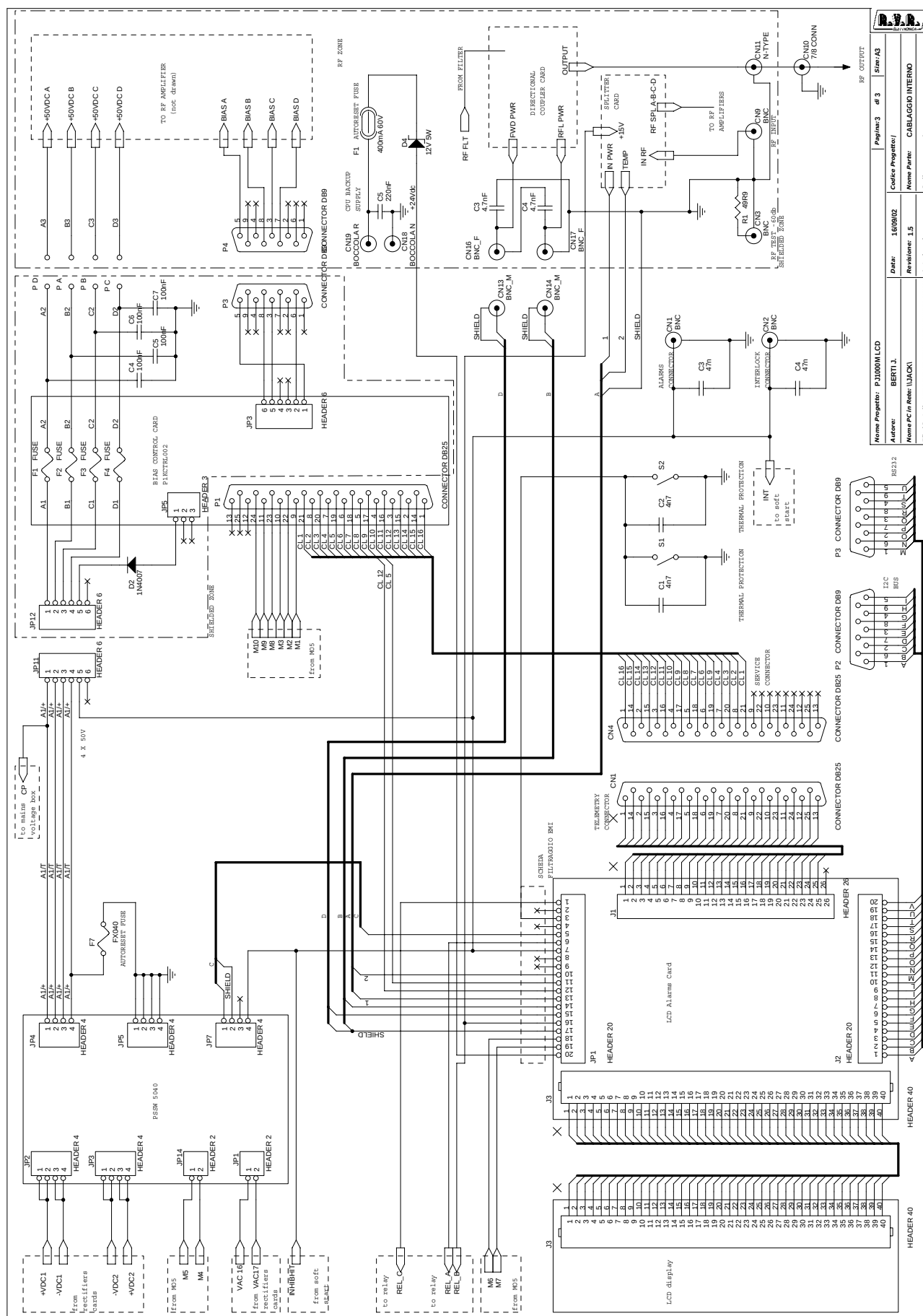
Description	RVR Code Pages	Vers.	
Wiring diagrams	Wiring diagrams	1.5	6
R.F. Power Amplifier Module	PJ1KRF	1.3	4
Wilkinson "4-Way" Splitter Card	CSSPPJ1KMLCD	1.2	4
Wilkinson "4-Way" Combiner Card	PJ1KM CMB-OUT	1.0	4
Scheda Protezioni e CPU	CSPROTF	1.3	10
LPF+MEAS		1.1	4
	CSB1		
	CSBLFPJ1KM		
	CSLPFPJ1KM		
	CSDCLPFPJ1KM		
Low Pass Filter	PJ1KLPF (Before January 2002)	1.0	4
Directional Coupler Card	CSMPOPJ5MCL (Before January 2002)	1.2	4
Switching Power Supply	PSSW5040	1.1	10
Soft Start Card	CSSOFTS	1.0	4
Soft Start Card (vers. 220-380)	CSSOFTSTR	1.0	4
Bias Control Card	PJ1KCTRL002	1.1	6
Scheda filtraggio EMI	CSADPCNPRTPJ	1.0	4
Power Good	CSPWRGDPSS01	1.1	4

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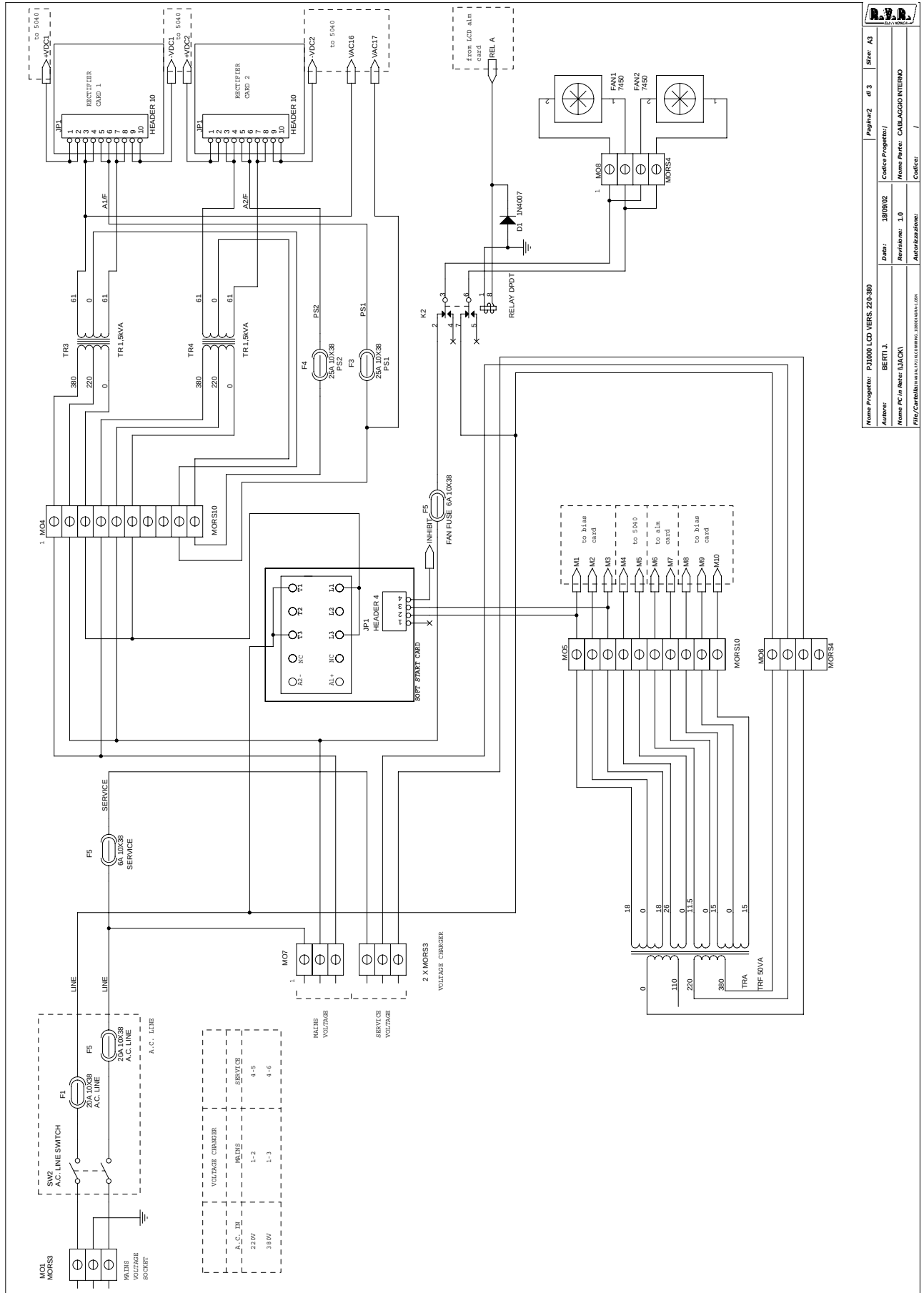


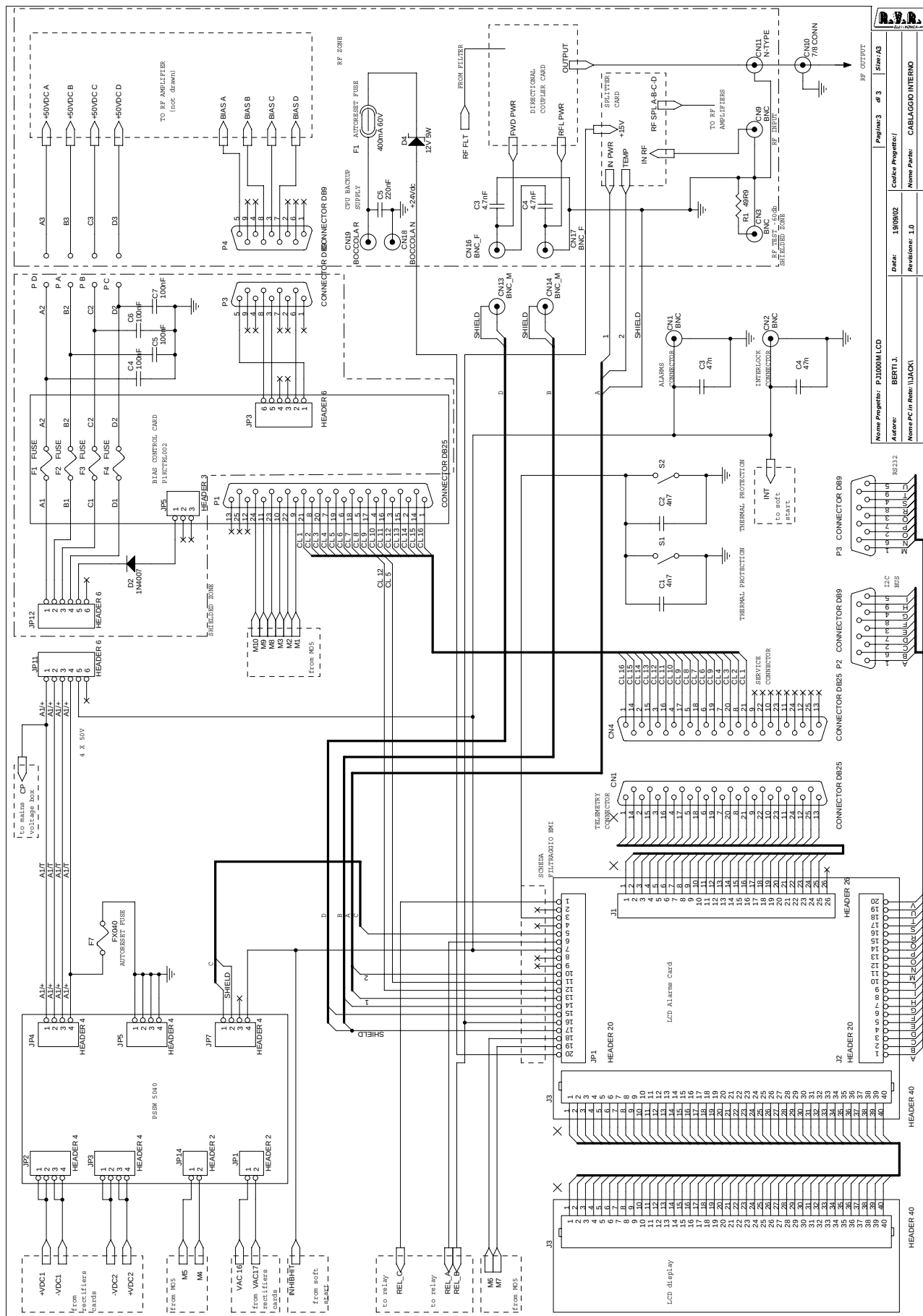
Nome Progetto: PJ1000M Vers. LCD		Page: 1	di 3	Rev: A3
Autore: BERTI J.		Codice Progetto: /		
Data: 28/05/02		Revisioni: 1.4		
Nome PC in Rete: UJACK		Nome Periferico: CABLEGGIO INTERNO		
File/Caratteristiche: COMPONENTI ELETTRICI, MODULO ALIMENTAZIONE, MODULO DISPLAY		Autore: /		



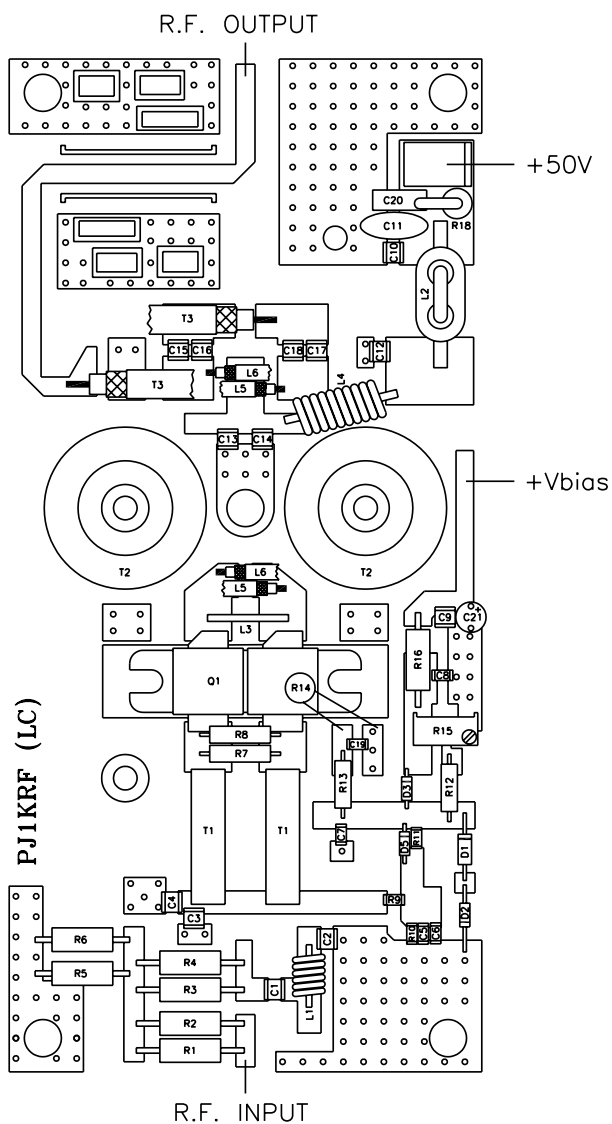




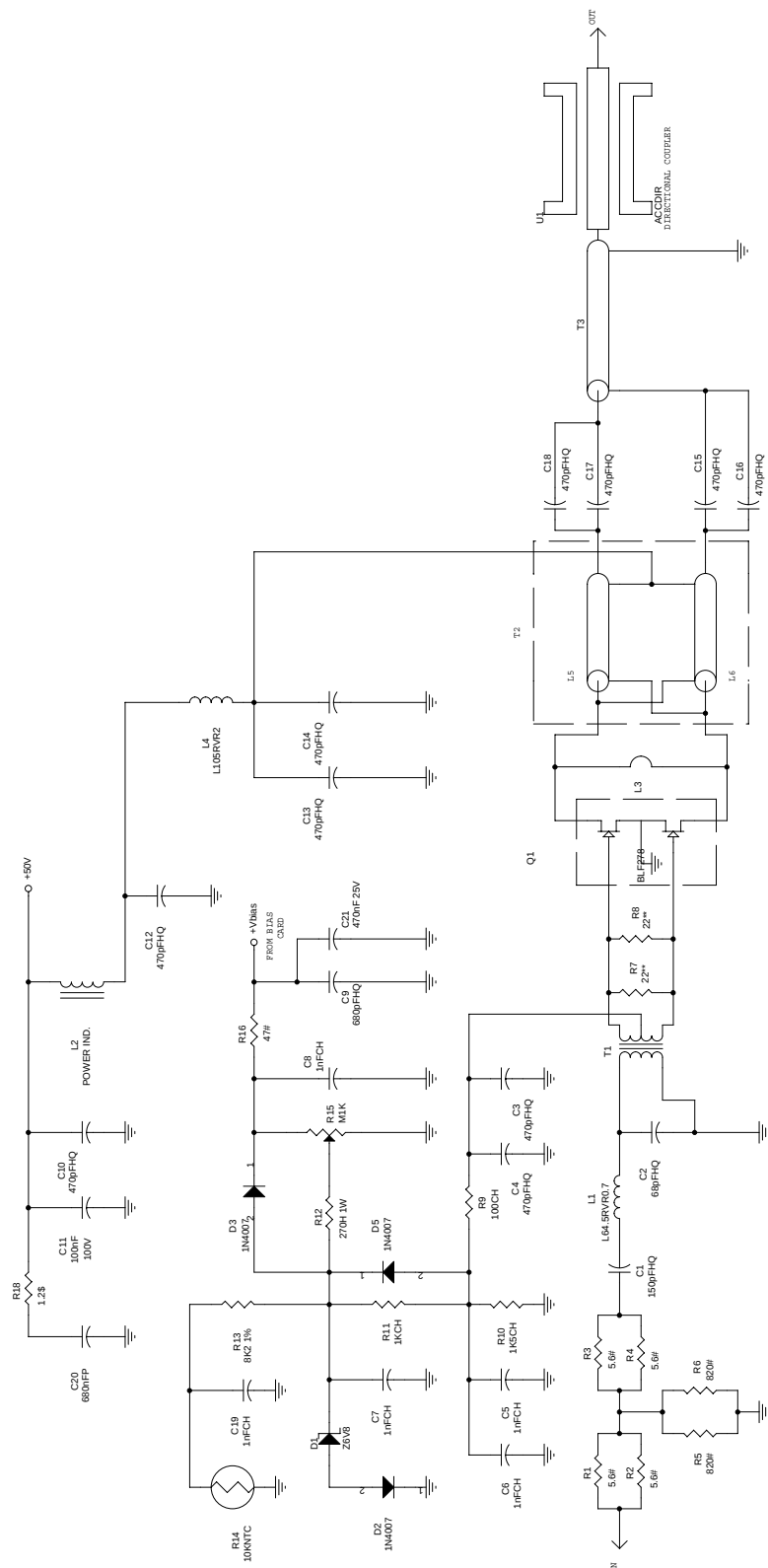




Nome Progetto: PJ1000M/LCD			Page/na:3	di 3	Size: A3
Autore: BERTI J.			Codice Progetto: /		
Nome PC in Rete: \LACKI			Data: 19/09/02	Nome Progetto: CABLAGGIO INTERNO	
			Revisione: 1.0		



Nome Progetto: PJ1000M LCD		Pagina: 1	di 1	Size: A4
Autore: D'ALESSIO D. - REV.: BERTI J.	Codice Progetto: /			
Nome PC in Rete: \\JACK\	Data: 16/09/02			
File/Cartella: MANUALE PJ1KRF MODULE_2 LAYERS DWG	Revisione: 1.2			
Scala: 1:1	Autore: PJ1KRF			
	Trattamento: /			
	Profilo: /			



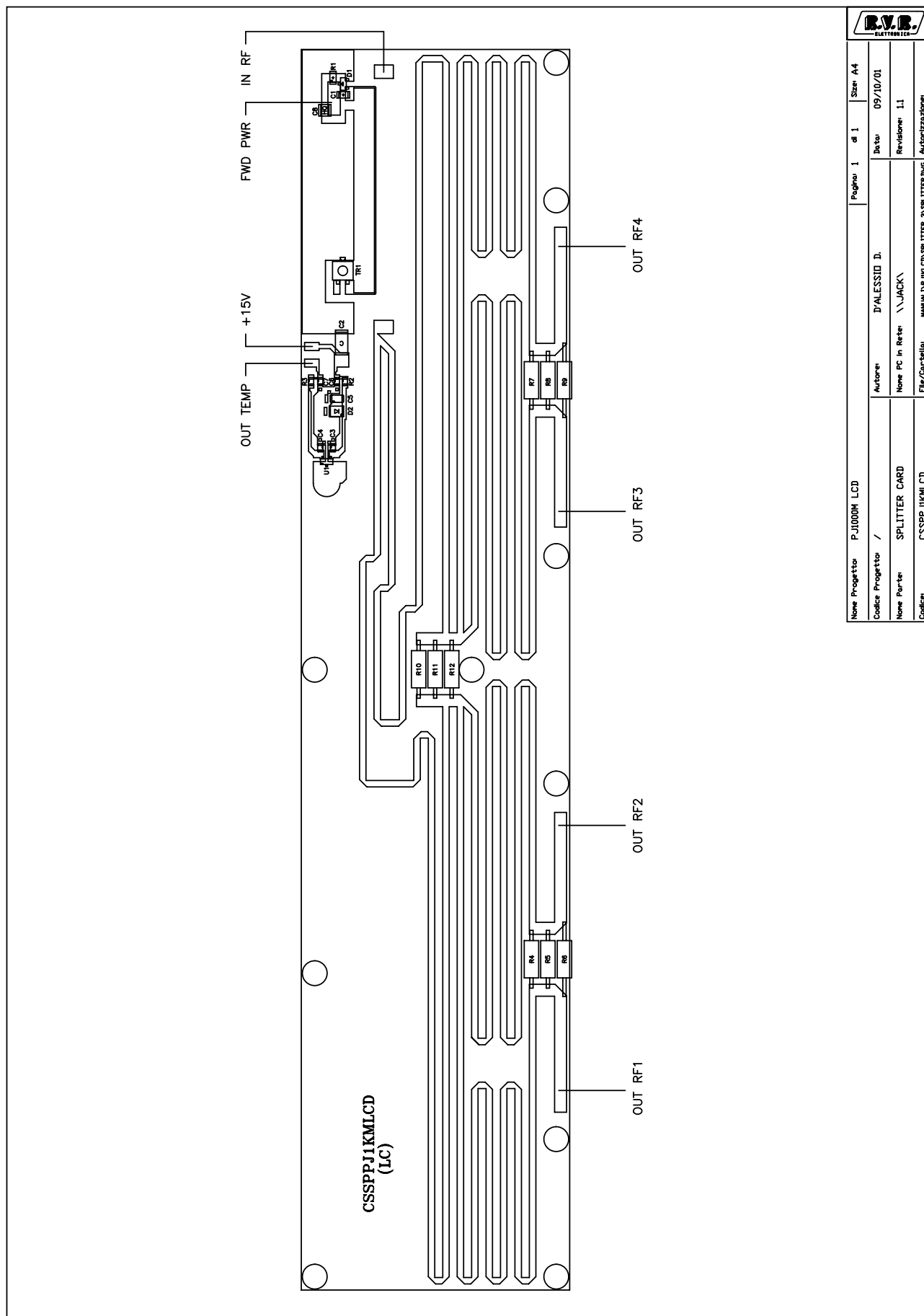
T1 -> AM2 20 St and 19/12 CABLE L=140mm
T2 -> 2 X 25 Ohm CABLE L=240mm 5 TURNS
T3 -> M33.03 CABLE L=120mm

Nome Progetto: PJ1000M VERS. LCD		Figura: 1	di 1	Size: A3
Autore: RW, BERTI J.		Codice Progetto: /		
Nome PC e Rete: UACN		Data: 10/09/02	Nome Perc: RF POWER AMPLIFIER MODULE	
File/Carrello: MANUALE PJ1000M CORREZIONE 20/09/02		Revisione: 1.3	Autore: PJ1000M	

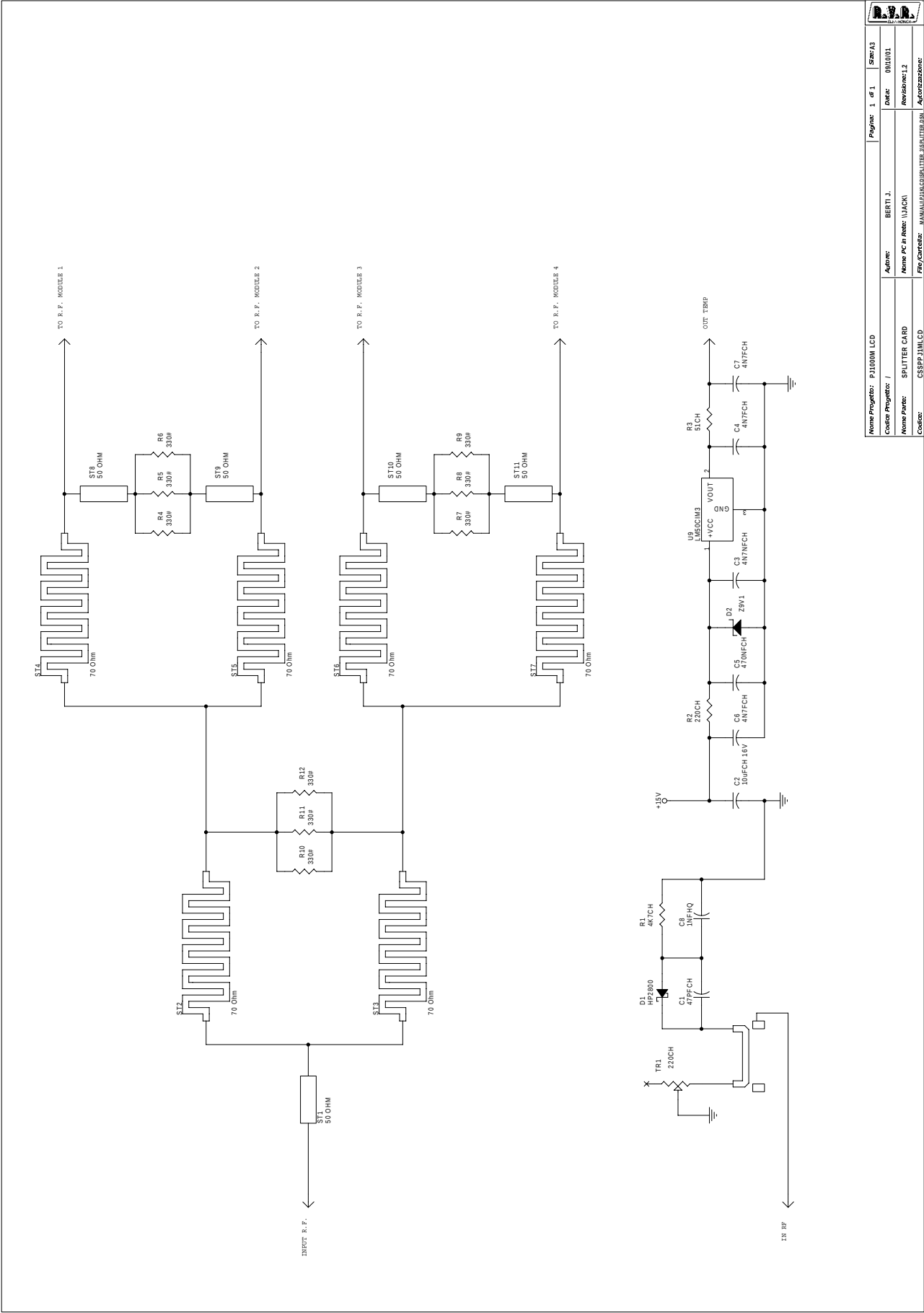
Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CODE
1	1	R18	1.2\$	RESISTOR 5W	
2	4	R1,R2,R3,R4	5.6#	RESISTOR 2W	
3	2	R7,R8	22**	RESISTOR 1W 5%	
4	1	R16	47#	RESISTOR 2W	
5	1	R9	100CH	CHIP RESISTOR 1206 1%	
6	1	R12	270	RESISTOR 1W	
7	2	R5,R6	820#	RESISTOR 2W	
8	1	R11	1KCH	CHIP RESISTOR 1206 1%	
9	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	2	C2, C9	68PFHQ	HIGHT Q CAPACITOR	
14	1	C1	150PFHQ	HIGHT Q CAPACITOR	
15	10	C3,C4,C10,C12,C13,C14,470PFHQ C15,C16,C17,C18		HIGHT Q CAPACITOR	
16	5	C5,C6,C7,C8,C19	1NFCH	CERAMIC CHIP CAPACITOR	
17	1	C11	100NF	CERAMIC CAPACITOR	
18	1	C20	680NFP	POLIESTER CAPACITOR	
19	1	L2	POWER IND.	RF BINOC. CHOCKE	
20	1	L1	L64.5RVR0.76SP	DIA4.5 RAME SMAL 0.7mmI	
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	
29	1	C21	470nF 25V	ELECTROLITIC CAPACITOR	

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Nome Progetto		PJ1000M LCD	Pagina	1	di	1	Size	A4
Codice Progetto	/	D'ALESSIO D.	Autore	Data				09/10/01
Nome Parte	SPLITTER CARD	None PC in Rete	Revisione	1.1				
Codice	CSSPPJ1KMLCD	File/Carrello	Autore	MAMMOTO-JULIO-SPLITTER_3-SPLITTING				Autore



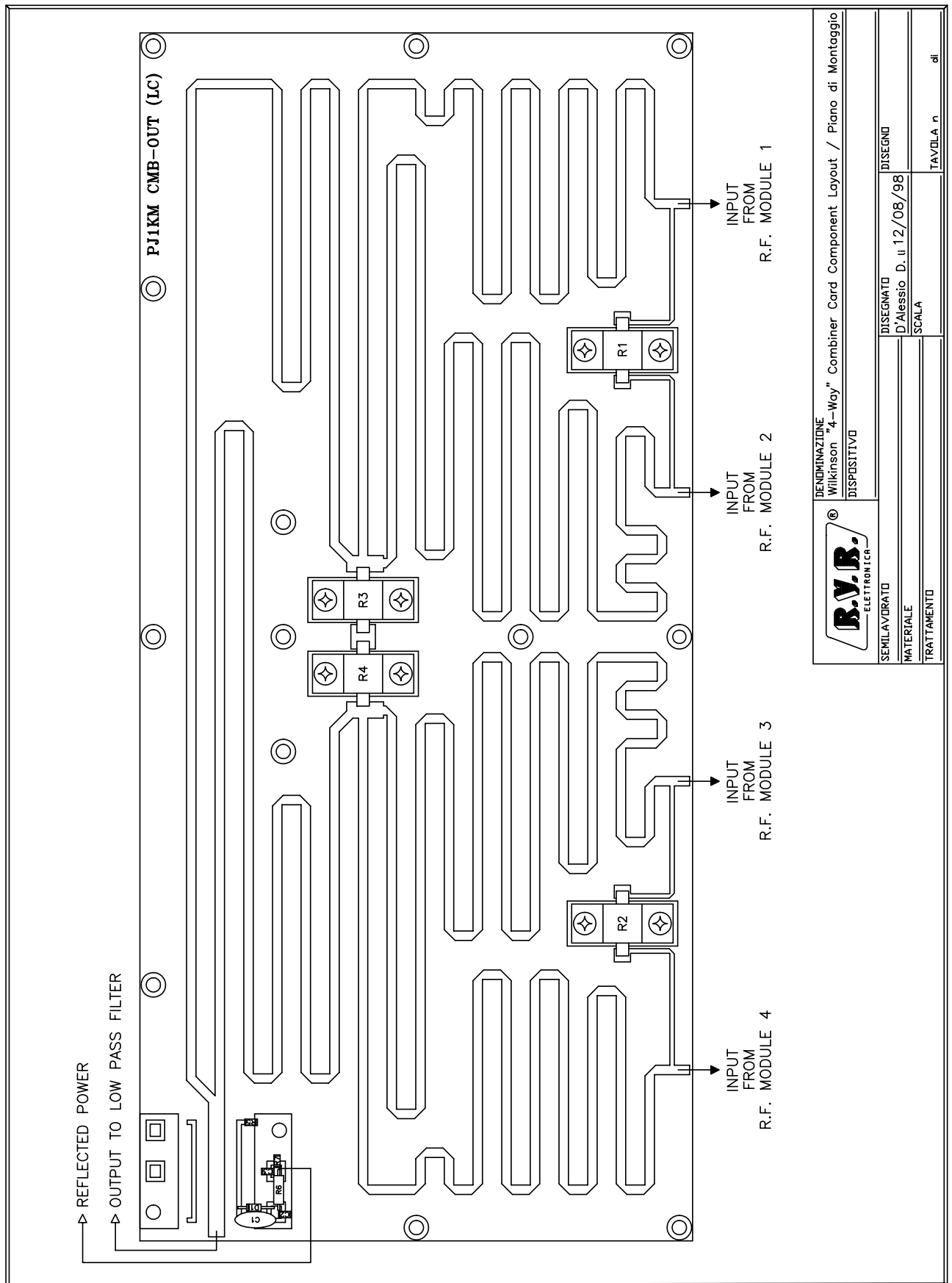
Splitter Ingresso PJ1000M Vers. LCD Cod. CSSPPJ1MLCD
Bill Of Materials JUNE 05, 2001

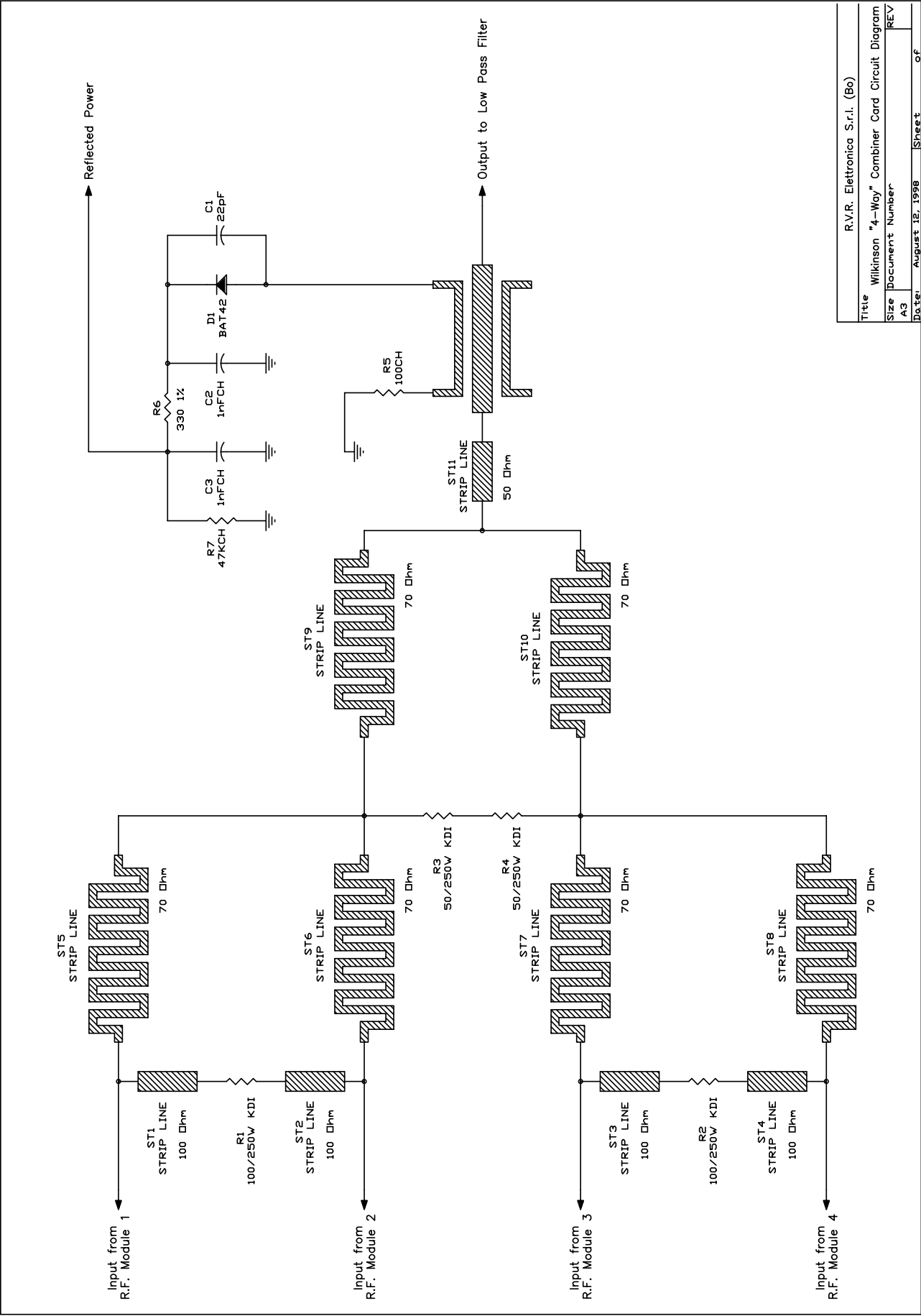
Page 1

Item	Q.ty	Reference	Part	DESCRIPTION	PART ORDER CODE
1	1	R1	4K7CH	CHIP RESISTOR 0805	
2	1	R2	220CH	CHIP RESISTOR 0805	
3	1	R3	51CH	CHIP RESISTOR 0805	
4	9	R4,R5,R5,R7,R8, R9,R10,R11,R12	330 2W	RESISTOR 2W	
5	2	TR1	220CH	TRIMMER SMD G4BT TOKO'S	
6	1	C1	47PFCH	CHIP CAPACITOR 0805	
7	1	C2	10uFCH 16V	TANTALIUM CHIP CAPACITOR	
8	1	C5	470NFCH	CHIP CAPACITOR 1206	
9	4	C3,C4,C6,C7	4N7FCH	CHIP CAPACITOR 0805	
10	1	D1	HP2800	DIODE SMD SOT23	
11	1	D2	Z9V1	ZENER DIODE	
12	1	U1	LM50CIM3	TEMPERATURE SENSOR	
13	1	C8	1NFBQ	CHIP CAPACITOR HQ	

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Combiner Card Circuit Diagram

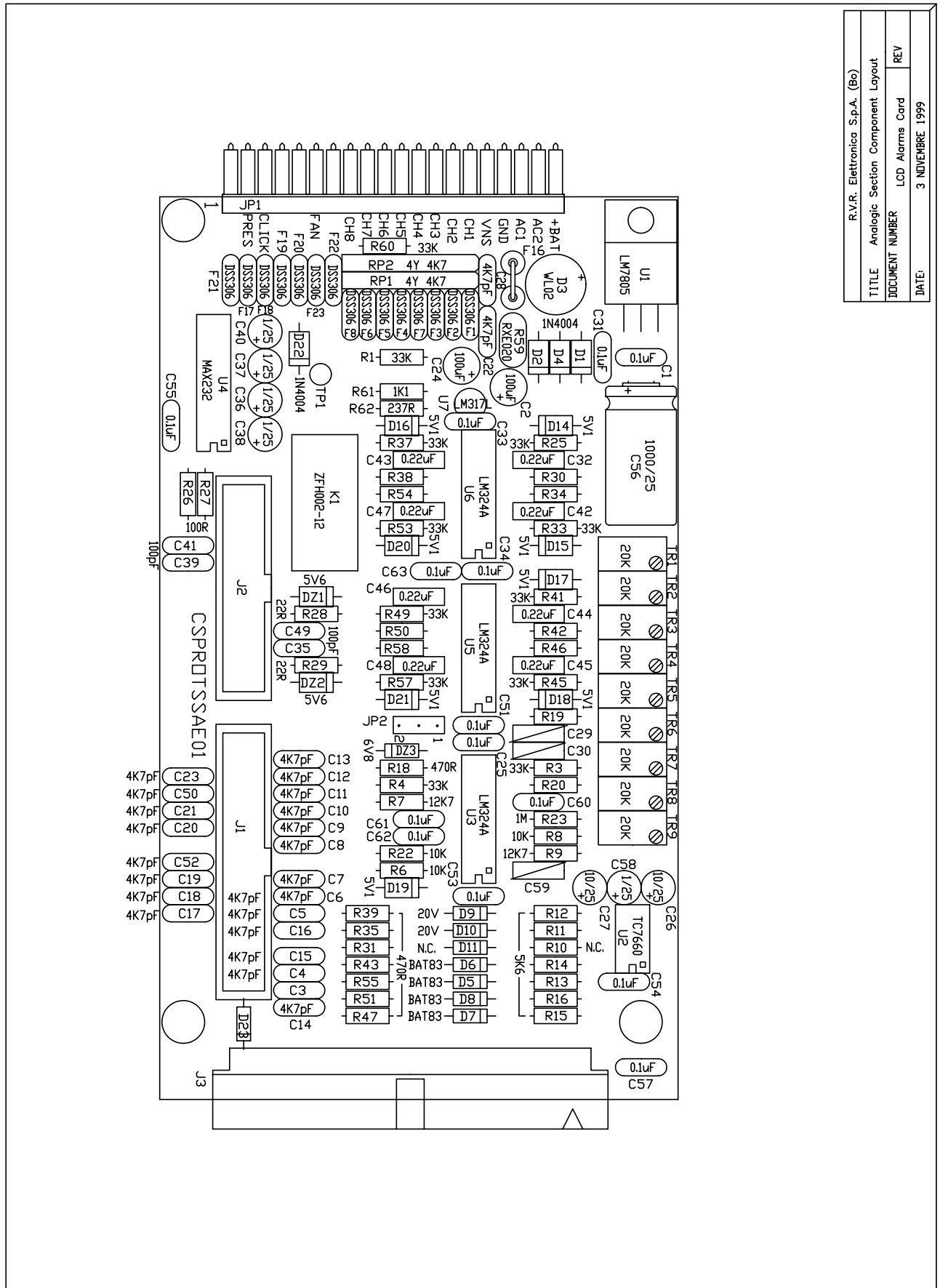
Bill Of Materials

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	

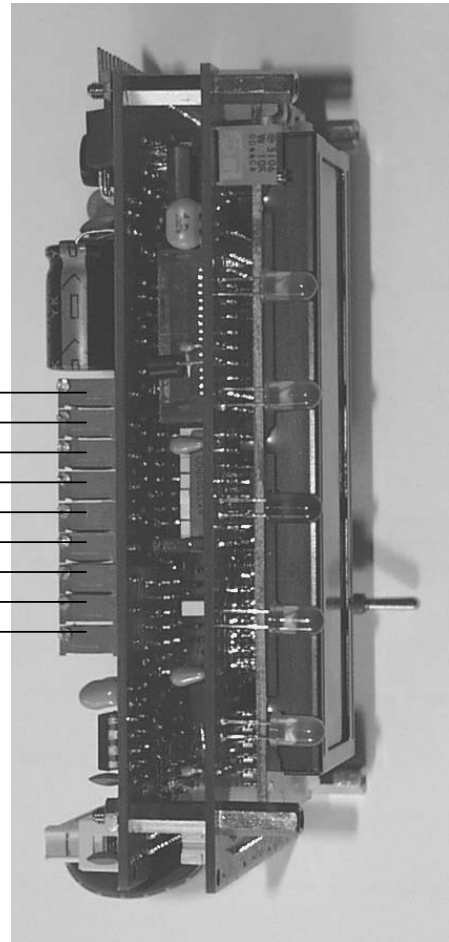
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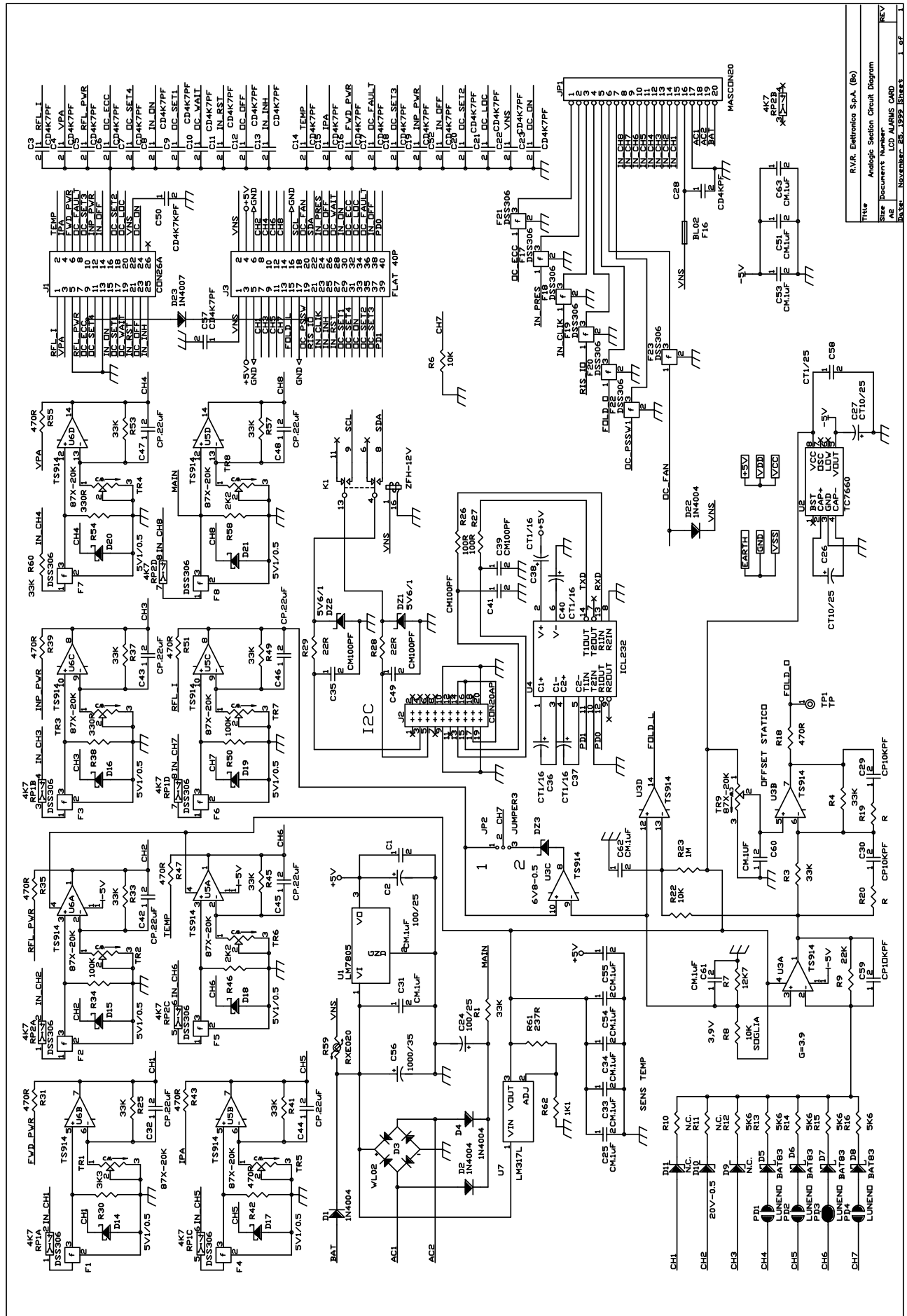
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R.V.R. Elettronica S.p.A. (Bo)
TITLE Analogic Section Component Layout
DOCUMENT NUMBER LCD Alarms Card
REV
DATE: 3 NOVEMBRE 1999

- TR1 - (Ch.1) Forward power measurement adjust
- TR2 - (Ch.2) Reflected power measurement adjust
- TR3 - (Ch.3) Input power measurement adjust
- TR4 - (Ch.4) VPA measurement adjust
- TR5 - (Ch.5) IPA measurement adjust
- TR6 - (Ch.6) Temperature measurement adjust
- TR7 - (Ch.7) Internal SWR measurement adjust
- TR8 - (Ch.8) Mains voltage measurement adjust
- TR9 - Foldback voltage offset adjust



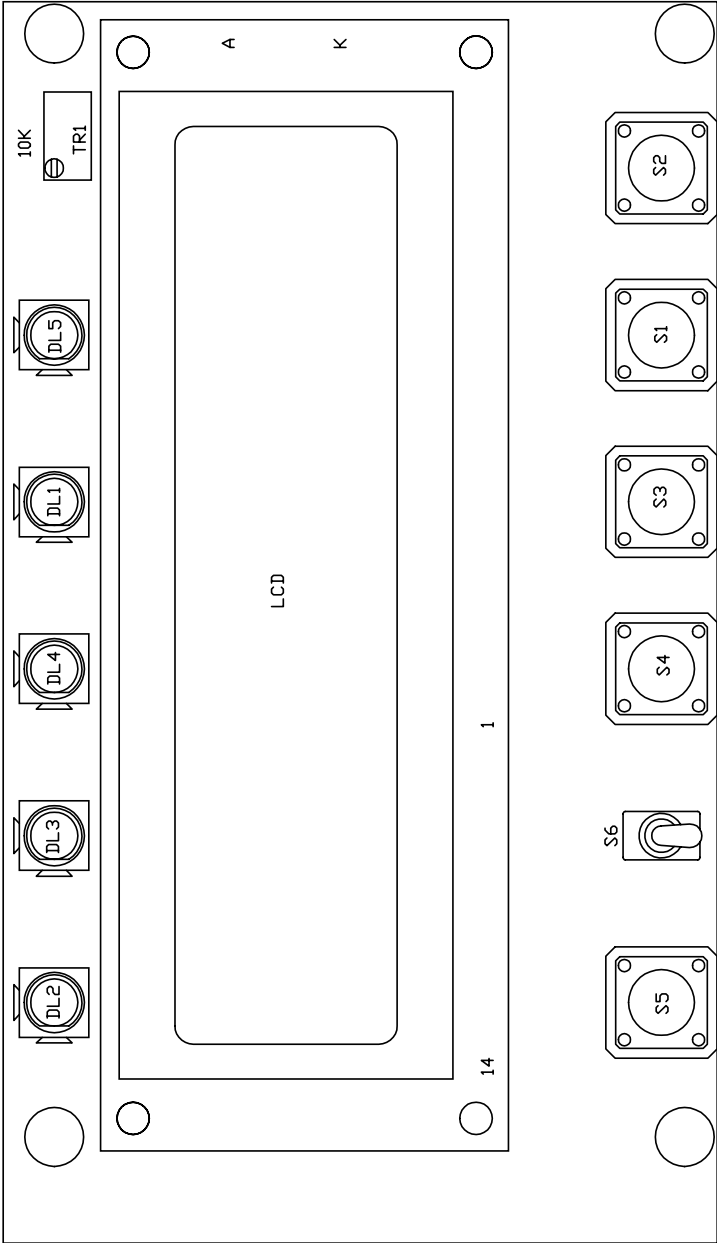


CPU Analog Section Bill Of Materials

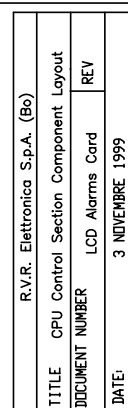
Item	Q.ty	Reference	Part
1	13	C1,C25,C31, CM.1UF C33,C34,C51, C53,C54,C55, C60,C61,C62,C63	
2	2	C2,C24	100/25
3	22	C3,C4,C5,C6, CD4K7PF C7,C8,C10, C11,C12,C13, C14,C15,C16, C17,C18,C19, C20,C21,C22, C23,C52,C57	
4	2	C26,C27	CT10/25
5	1	C28	CD4KPF
6	2	C29,C30	CP10KPF
7	8	C32,C42,C43, CP.22UF C44,C45,C46, C47,C48	
8	4	C35,C39,C41, CM100PF C49	
9	4	C36,C37,C38, CT1/16 C40	
10	1	C50	CD4K7KPF
11	1	C56	1000/35
12	1	C58	CT1/25
13	1	C59	CP10KPF
14	2	DZ1,DZ2	5V6/1
15	1	DZ3	6V8-0.5
16	4	D1,D2,D4,D221N4004	
17	1	D3	WL02
18	4	D5,D6,D7,D8	BAT83
19	2	D9,D10	20V-0.5
20	8	D14,D15,D16, 5V1/0.5 D17,D18,D19, D20,D21	
21	15	F1,F2,F3,F4, DSS306 F5,F6,F7,F8, F17,F18,F19, F20,F21,F22, F23	
22	1	F16	BL02
23	1	JP1	MASCON20
24	1	JP2	JUMPER3
25	1	J1	CON26A

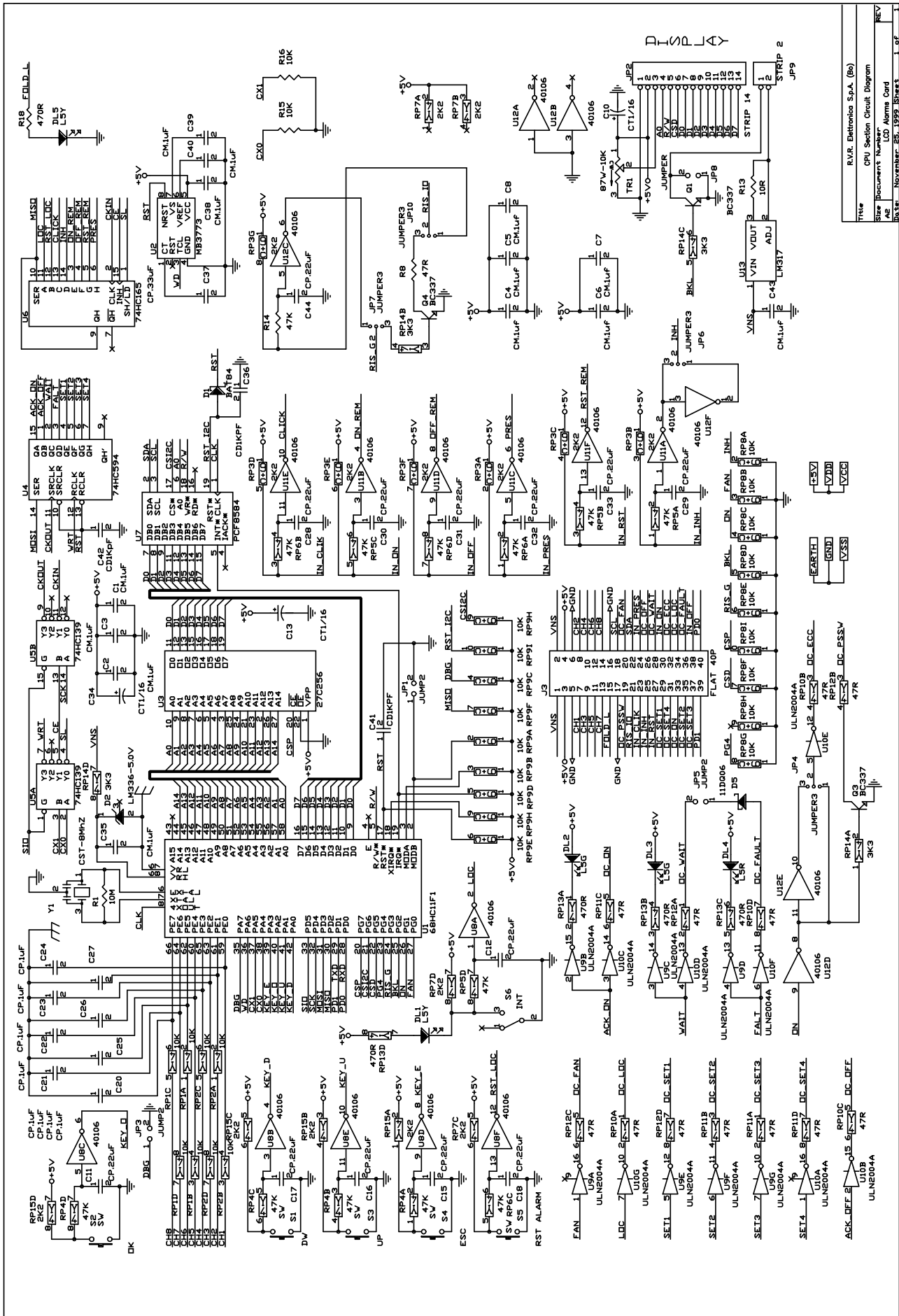
CPU Analog Section Bill Of Materials

Item	Q.ty	Reference	Part
26	1	J2	CON20AP
27	1	J3	FLAT 40P
28	1	K1	ZFH-12V
29	4	PD1, PD2, PD3, PD4	LUNENO
30	2	RP1, RP2	4K7
31	12	R1, R3, R4, R25, R33, R37, R41, R45, R49, R53, R57, R60	33K
32	3	R6, R8, R22	10K
33	1	R7	12K7
34	1	R9	22K
35	5	R11, R16, R13, R14, R15, R16	5K6
36	9	R18, R31, R35, R39, R42, R43, R47, R51, R55	470R
37	2	R19, R20	R
38	1	R23	1M
39	2	R26, R27	100R
40	2	R28, R29	22R
41	1	R30	3K3
42	2	R34, R50	100K
43	2	R38, R54	330R
44	2	R46, R58	2K2
45	1	R59	RXE020
46	1	R61	237R
47	1	R62	1K1
48	1	TP1	TP
49	9	TR1, TR2, TR3, TR4, TR5, TR6, TR7, TR8, TR9	87X-20K
50	1	U1	LM7805
51	1	U2	TC7660
52	3	U3, U5, U6	TS914
53	1	U4	ICL232
54	1	U7	LM317L
55	4	R12, D9, D11, R10	N.C.
56	1	D23	1N4007



R.V.R. Elettronica S.p.A. (Bo)			
TITLE	CPU Display Section	Component Layout	
DOCUMENT NUMBER	LCD Alarms Card	REV	
DATE:	3 NOVEMBRE 1999		





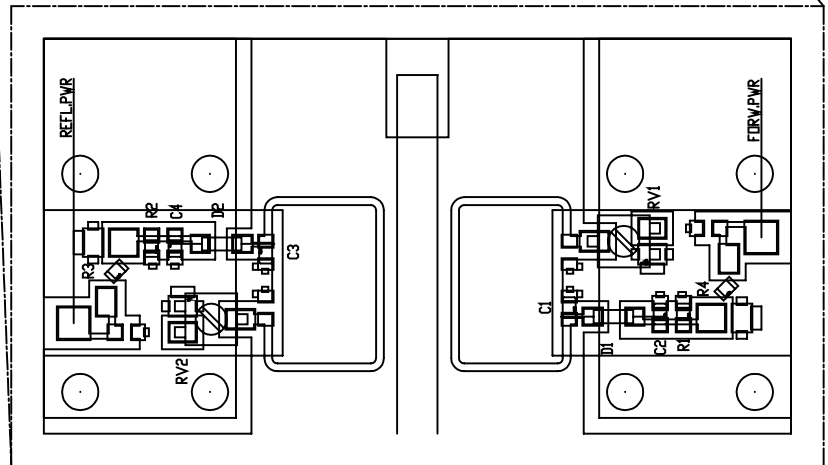
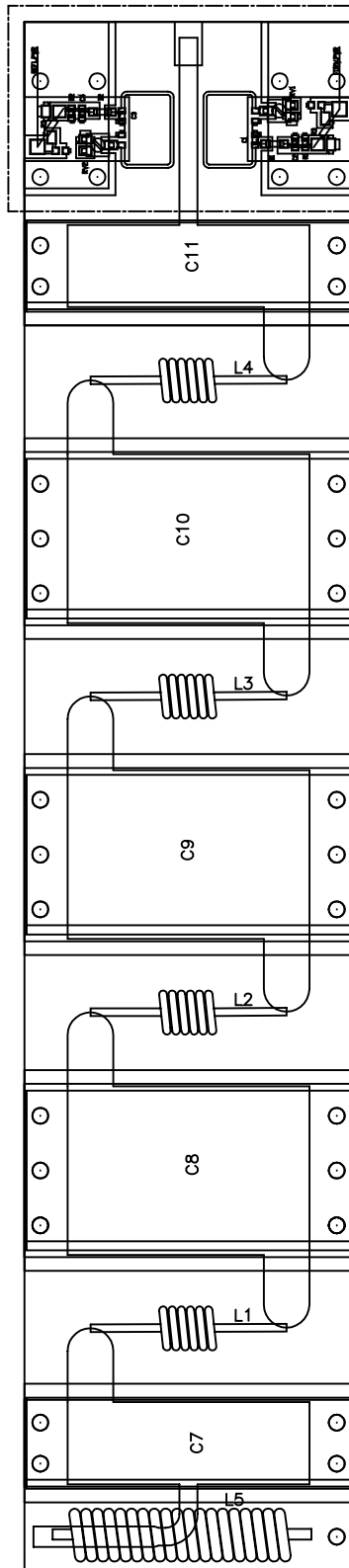
Scheda CPU Bill Of Materials
1999

November 25,

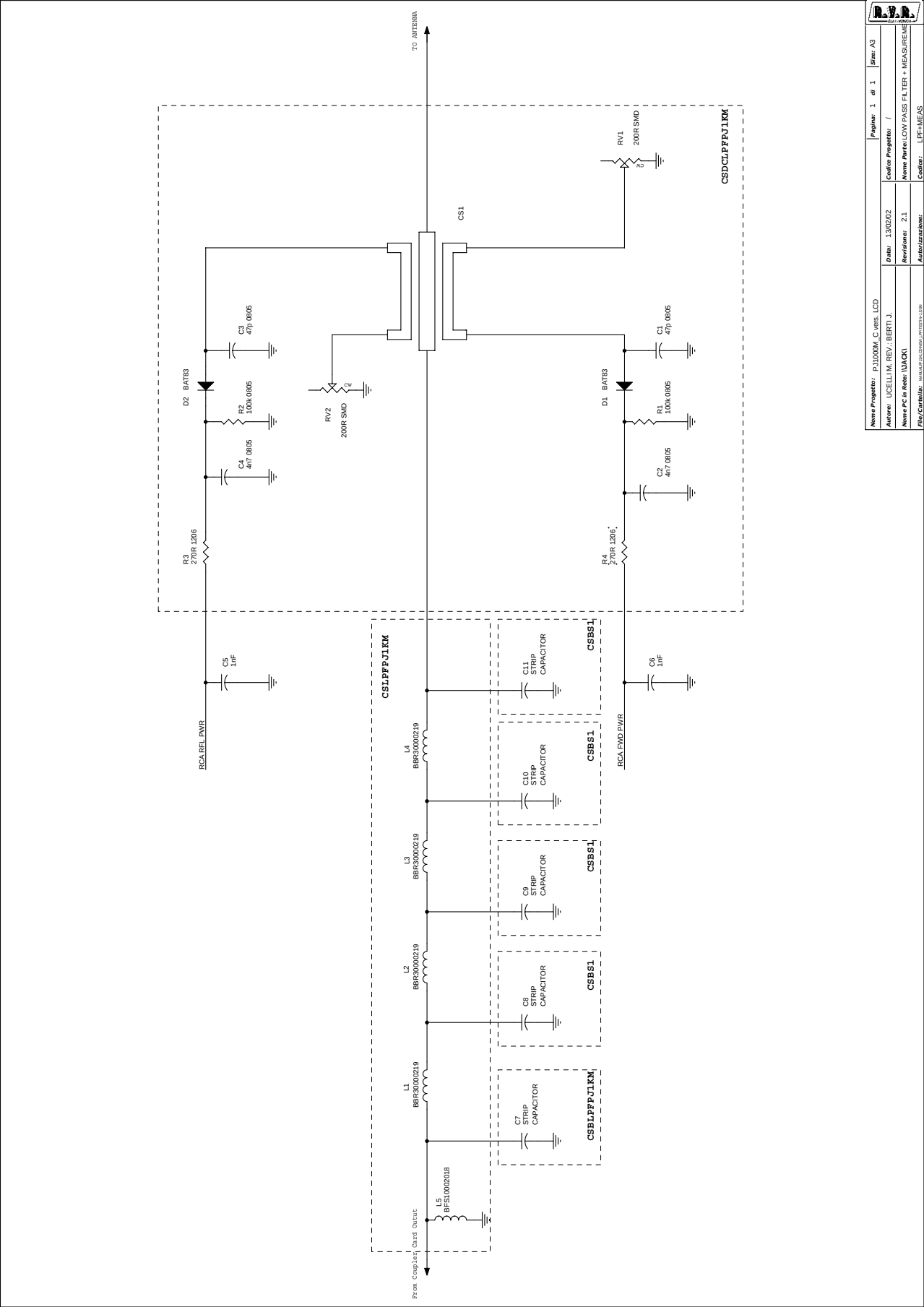
Item Q.tyReference Part

1	13	C1,C2,C3, CM.1UF C4,C5,C6, C7,C8,C35, C38,C39,C40,C43	
2	3	C10,C13,C34 CT1/16	
3	13	C11,C12,C15, CP.22UF C16,C17,C18, C28,C29,C30, C31,C32,C33,C44	
4	8	C20,C21,C22, CP.1UF C23,C24,C25, C26,C27	
5	3	C36,C41,C42 CD1KPF	
6	1	C37 CP.33UF	
7	2	DL1,DL5 L5Y	
8	2	DL2,DL3 L5G	
9	1	DL4 L5R	
10	1	D1 BAT84	
11	1	D2 LM336-5.0V	
12	1	D5 11DQ06	
13	3	JP1,JP3,JP5 JUMP2	
14	1	JP2 STRIP 14	
15	4	JP4,JP6,JP7, JUMPER3 JP10	
16	1	JP8 JUMPER	
17	1	JP9 STRIP 2	
18	1	J3 FLAT 40P	
19	3	Q1,Q3,Q4 BC337	
20	6	RP1,RP2,RP8, 10K RP9,R15,R16	
21	3	RP3,RP7,RP15 2K2	
22	4	RP4,RP5,RP6, 47K R14	
23	4	R8,RP10,RP11, 47R RP12	
24	2	RP13,R18 470R	
25	1	RP14 3K3	
26	1	R1 10M	
27	1	R13 10R	
28	5	S1,S2,S3,S4, SW S5	
29	1	S6 INT	
30	1	TR1 87W-10K	

31	1	U1	68HC11F1
32	1	U2	MB3773
33	1	U3	27C256
34	1	U4	74HC594
35	1	U5	74HC139
36	1	U6	74HC165
37	1	U7	PCF8584
38	3	U8,U11,U12	40106
39	2	U9,U10	ULN2004A
40	1	U13	LM317
41	1	Y1	CST-8MHZ



Nome Progetto: PJ1000M_C ver's. LCD		Foglio 1 di 1		Size: A3
Autore: MAURO U. - REV: BERTI J.	17/04/03	Codice Progetto: /		
Nome PC in Rete: \\\JACK\	Revisione: 2.2	Nome Parte: LDF PMS FILTER + Measurment		
File/Cartella:MANUAL\PJ1000M\NEW_LPF\LPF1000MHz_2.DWG	Autore/Revisione: LPF+MEAS	Codice: /		
Scala: /	Materiali: /	Trattamento: /	Profilo: /	



Nome Progetto: PJ1000M C vers. LCD		Pagina: 1 di 1	See: A3
Autore: UCELLI M. REV: BERTI J.		Codice Progetto: /	
Data: 13/02/02		Nome Parte: LOW PASS FILTER + MEASUREME	
Revisione: 2.1		Autore: UCELLI M.	
File/Caratteristiche: LPT+MEAS		Codice: LPT+MEAS	

PJ1000M_C vers. LCD

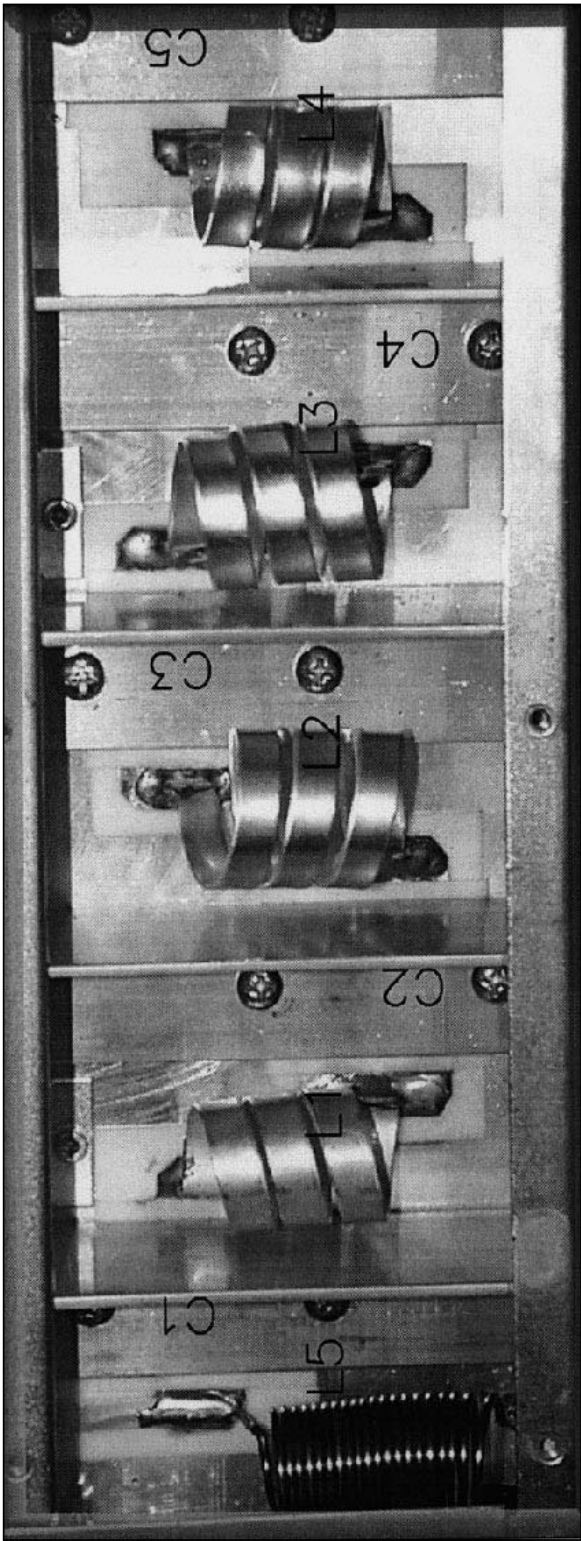
Bill Of Materials

Page1

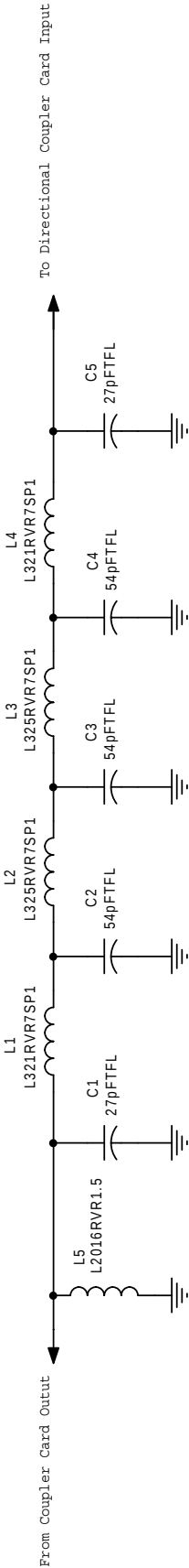
Item	Q.ty	Reference	Part
1	1	L5	BFS10002018
2	1	CS1	CSDRCPPJ1KM
3	2	C3,C1	47p 0805
4	2	C4,C2	4n7 0805
5	2	C5,C6	1nF
6	2	C7,C11	27pFTFL
7	3	C8,C9,C10	54pFTFL
8	2	D2,D1	BAT83
9	4	L1,L2,L3,L4	BBR30000219
10	2	RV2,RV1	200R SMD
11	2	R2,R1	100k 0805
12	2	R3,R4	270R 1206

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



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

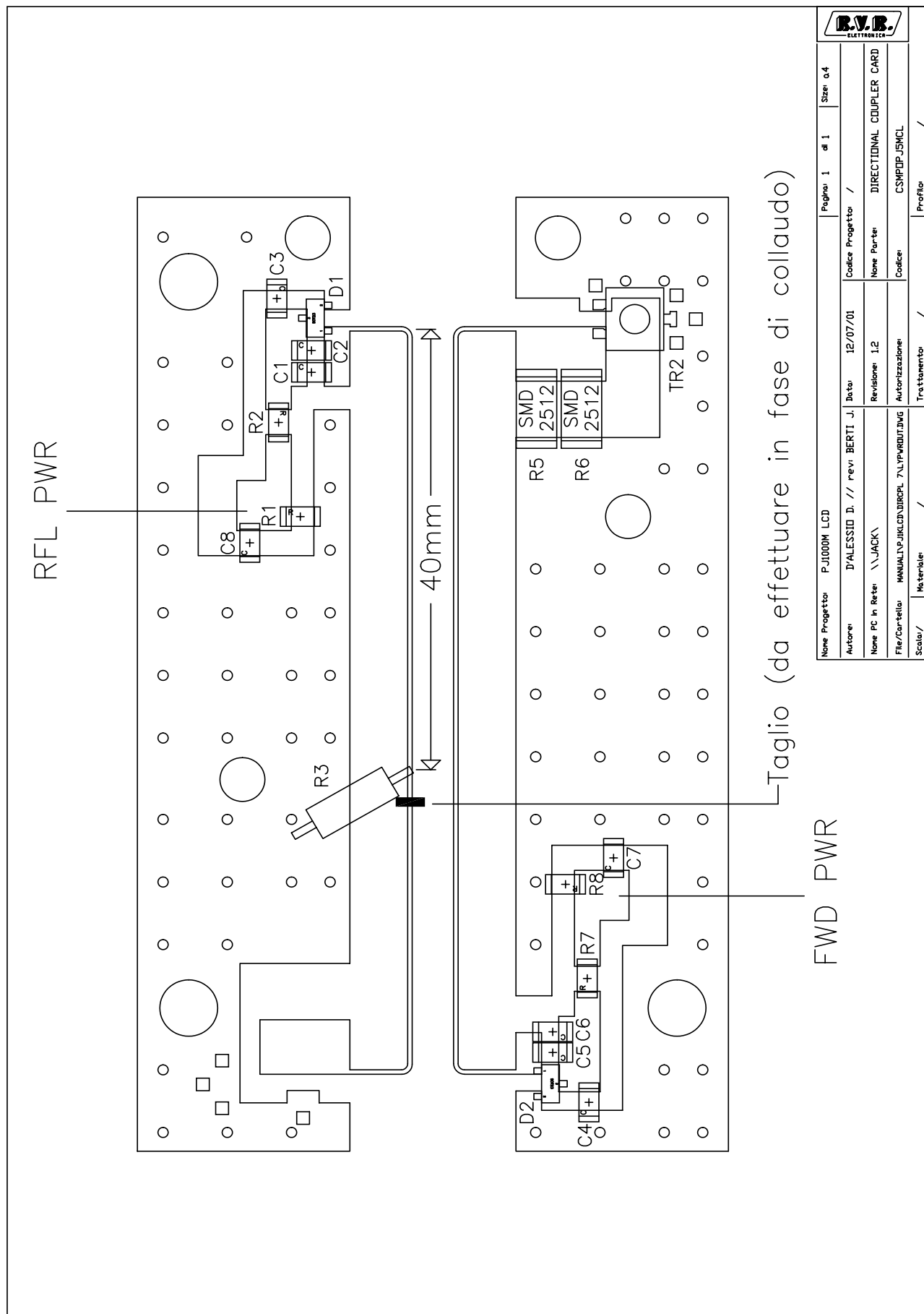
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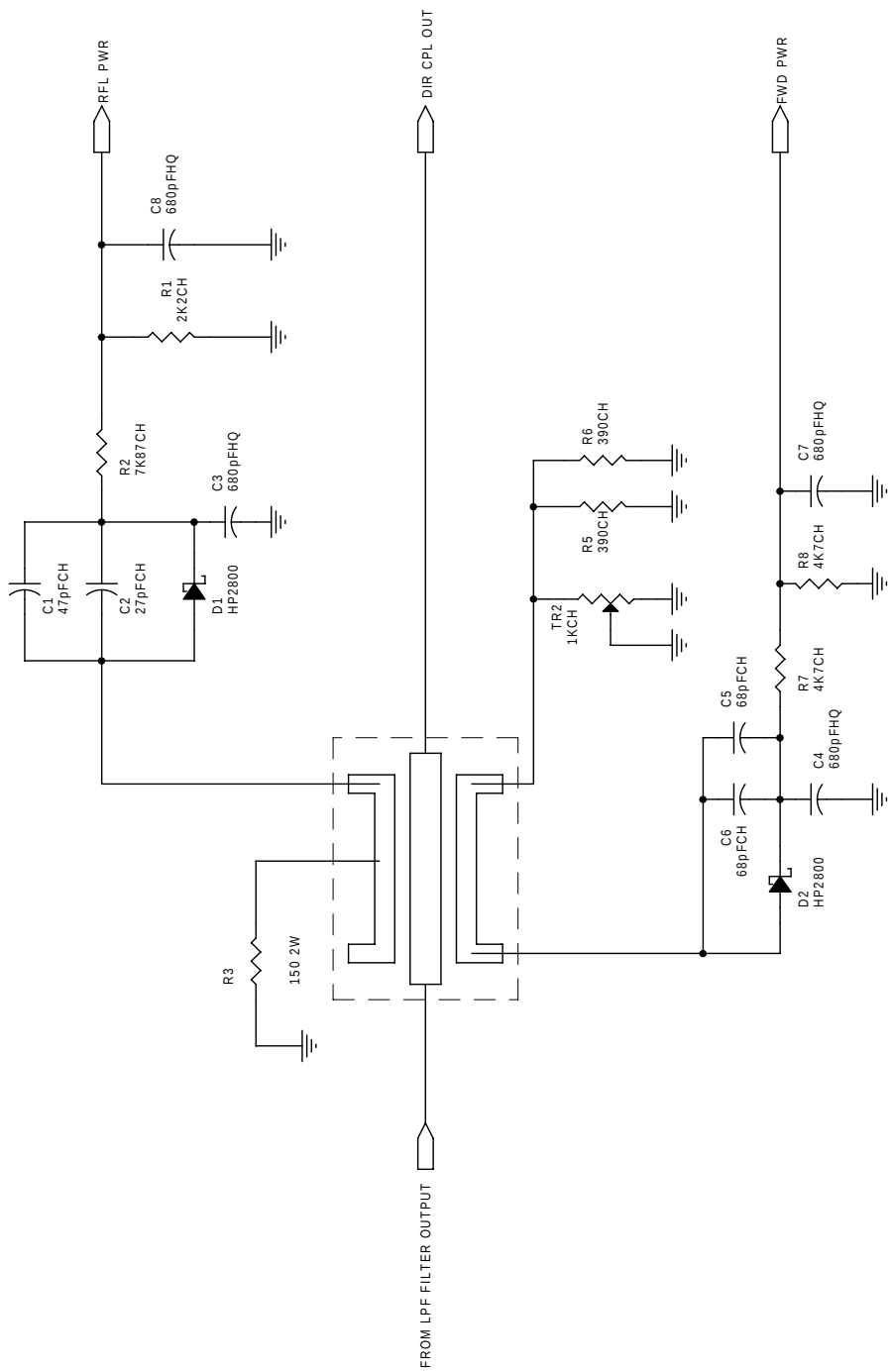
Page 1

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	

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R.V.R. ELETTRONICA		Pagina:1	di 1	Size:A4
Nome Progetto: PJ1000M LCD		Autore: BERTI J.		Data: 12/07/01
Codice Progetto: /		Nome PC In Rete: \\JACK1		Revisione:1,2
Nome Parte: DIRECTIONAL COUPLER CARD		File /Cartella: MANUALI\PIKLCODIR\CP1_TDIR_CPL.DSN		Autorizzazione:
Codice: CSMPOPPJ5MCL				

CSMPOPJ5MCL

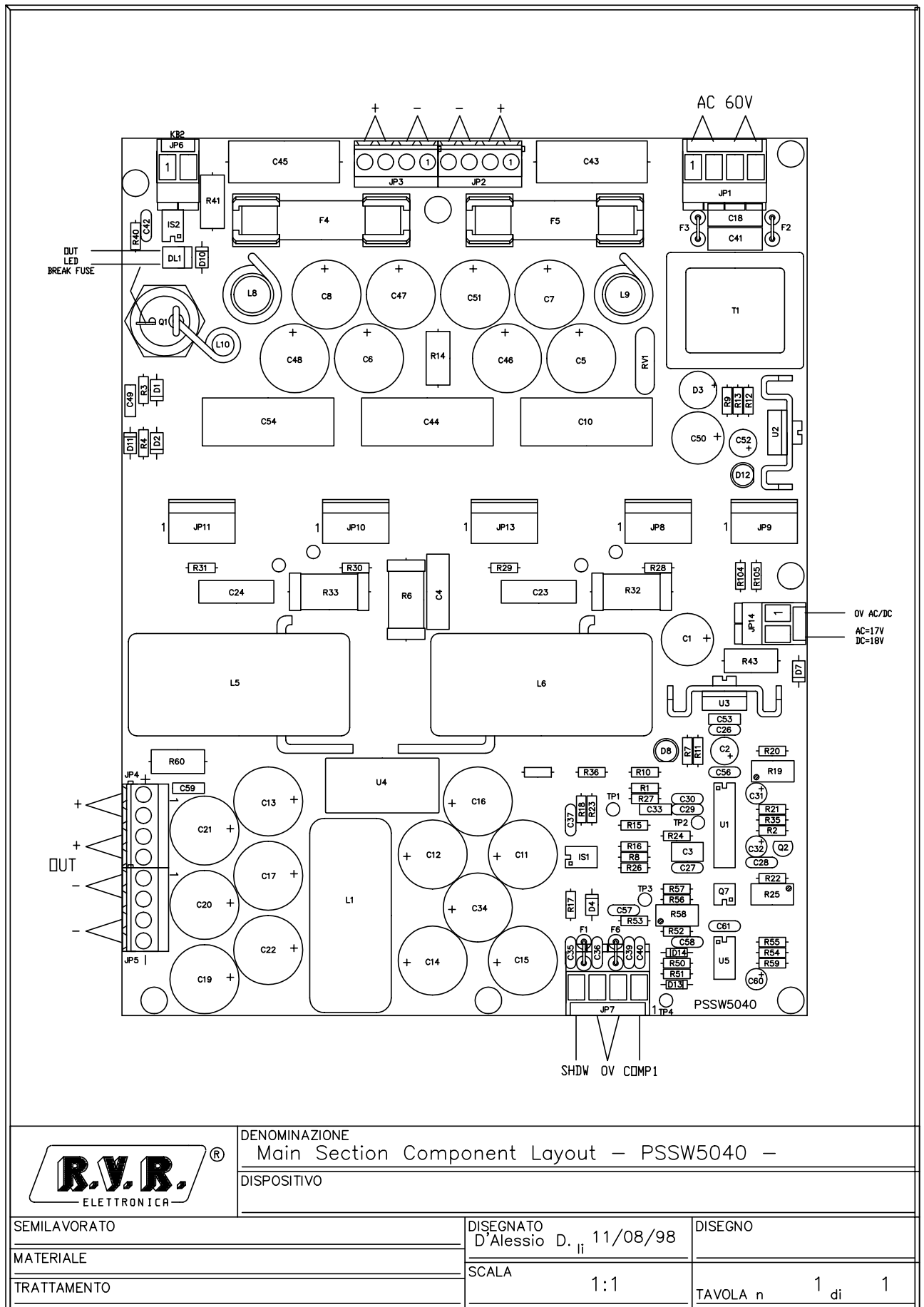
Bill Of Materials

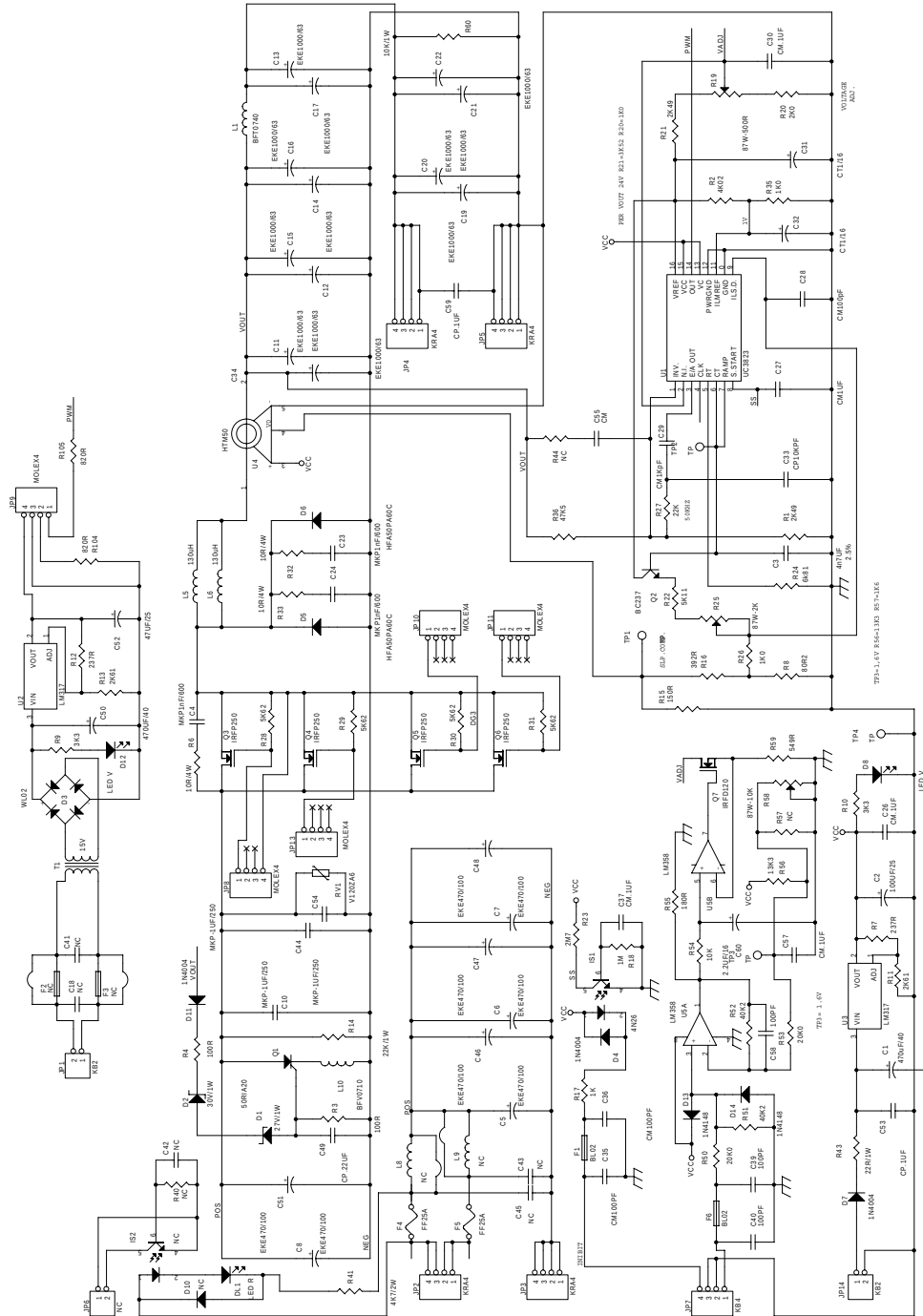
Page 1

Item	Q.ty	Reference	Part	DESCRIPTION
11		R1	2K2CH	CHIP RESISTOR 0805
21		R2	7K87CH	CHIP RESISTOR 0805
32		R5, R6	390CH	CHIP RESISTOR 2512
42		R7, R8	4K7CH	CHIP RESISTOR 0805
51		R3	150 2W	2W RESISTOR (PHILIPS)
61		TR2	1KCH	TRIMMER SMD G4BT TOKO'S
71		C1	47PFCH	CHIP CAPACITOR 0805
81		C2	27PFCH	CHIP CAPACITOR 0805
91		C3, C4, C7, C8	680PFCH	CHIP CAPACITOR 0805
10	1	C5, C6	68PFCH	CHIP CAPACITOR 0805
11	1	D1, D2	HP2800	DIODE SMD SOT23

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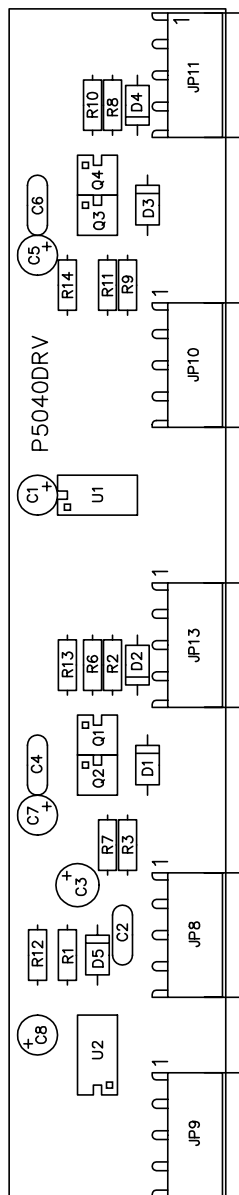
N° V. ELETTRONICA S.T. (B0)			
Power Supply Circuit Diagram			
Drawing Number			
Circuito Alimentazione			
REV.	PRODOTTORE	DATA	REVISIONE
1			1

PS5040 Bill Of Materials

Page1

Item	Quantity	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

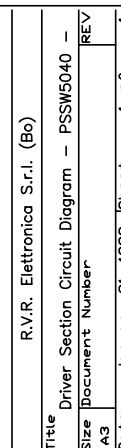
MATERIALE

TRATTAMENTO

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

SCALA
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DISEGNO
TAVOLA n 1 di 1

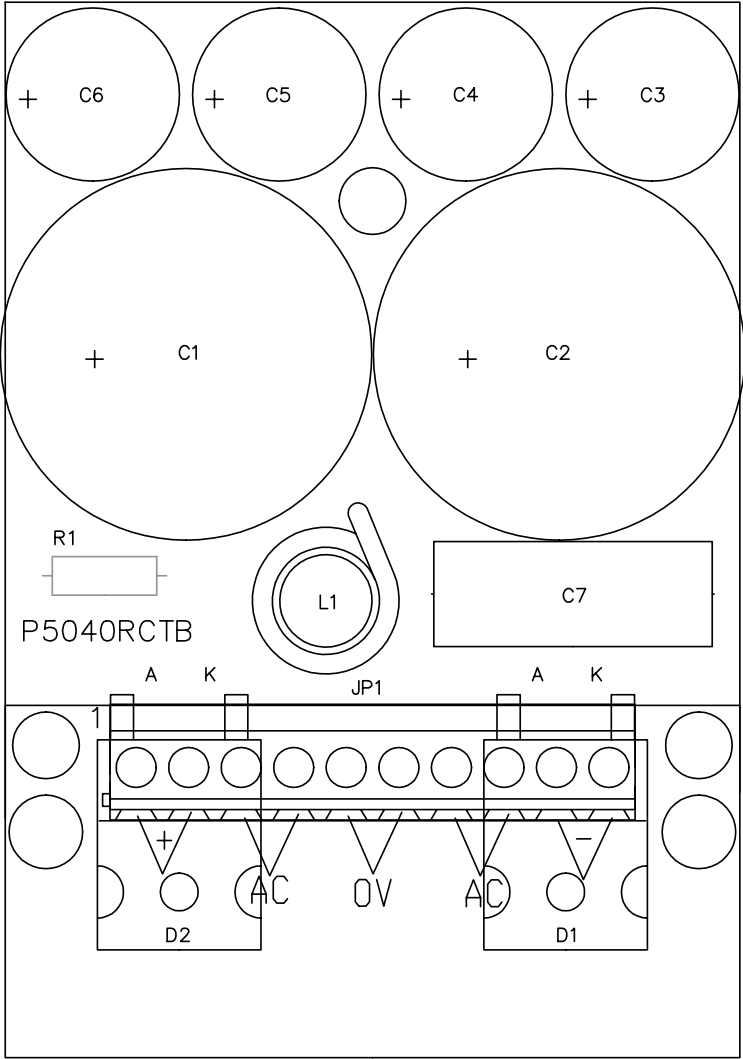


DRIVER PS5040

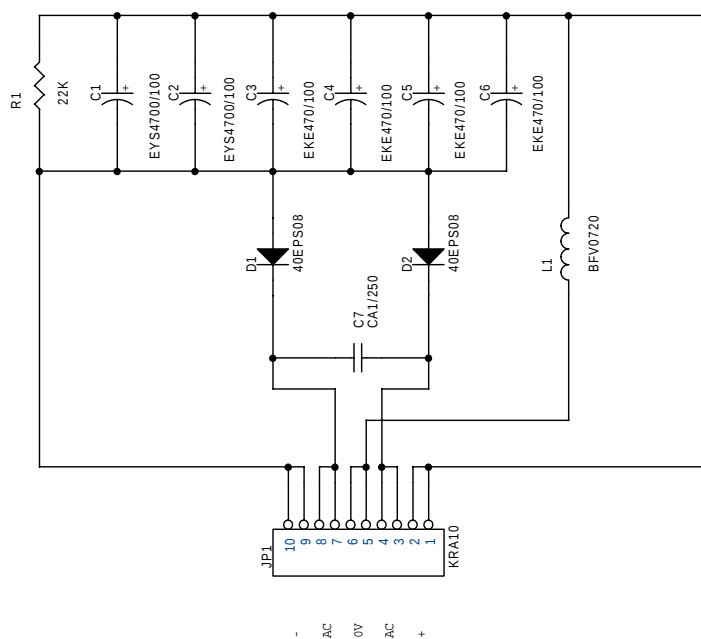
Bill Of Materials

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			



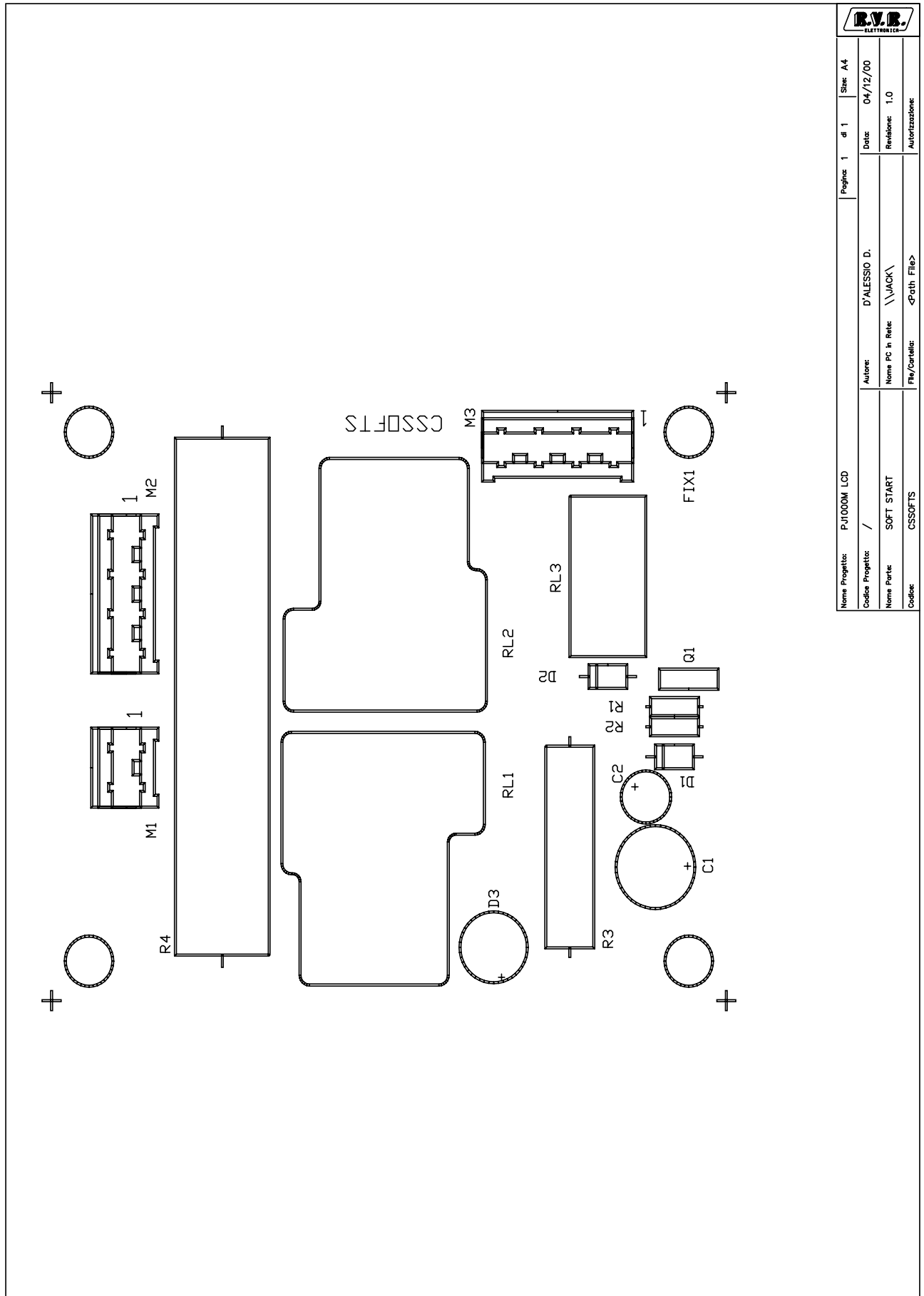
R.V.R. Elettronica s.r.l. (BO)

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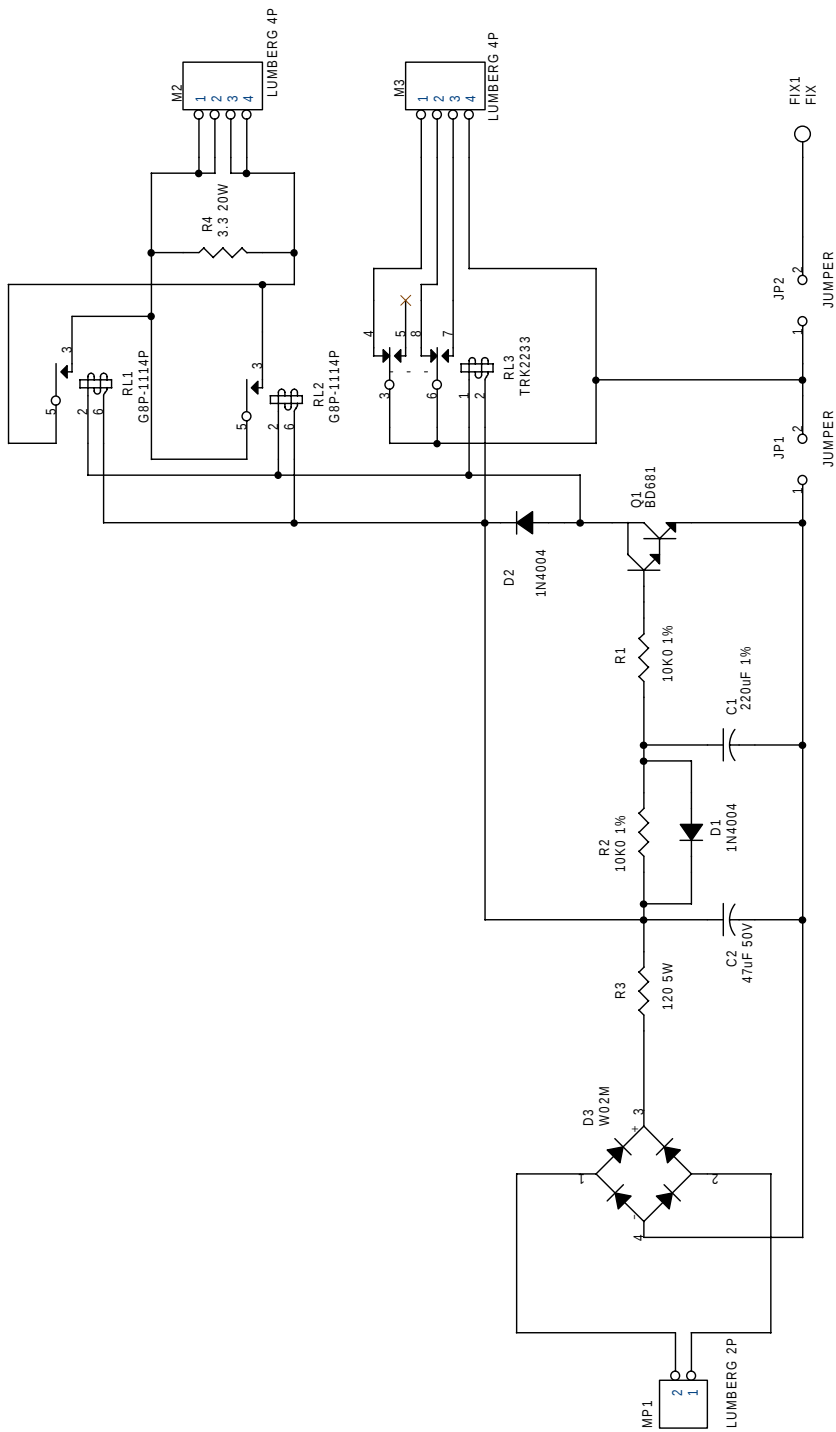
Size A4 Document Number P5040RCT1.SCH Rev

Date: Monday, December 04, 2000 Sheet 1 of 1

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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



Nome Progetto: PJ1000M LCD		Pagina: 1	di 1	Stato: A4
Codice Progetto: /	Autore: D'ALESSIO D.	Data: 04/12/00		
Nome Parte: SOFT START	Nome PC in Rete: \\JACK\	Revisione: 1.0		
Codice: CSSOFTS	File/Caricatore: <Path File>	Autorizzazione:		



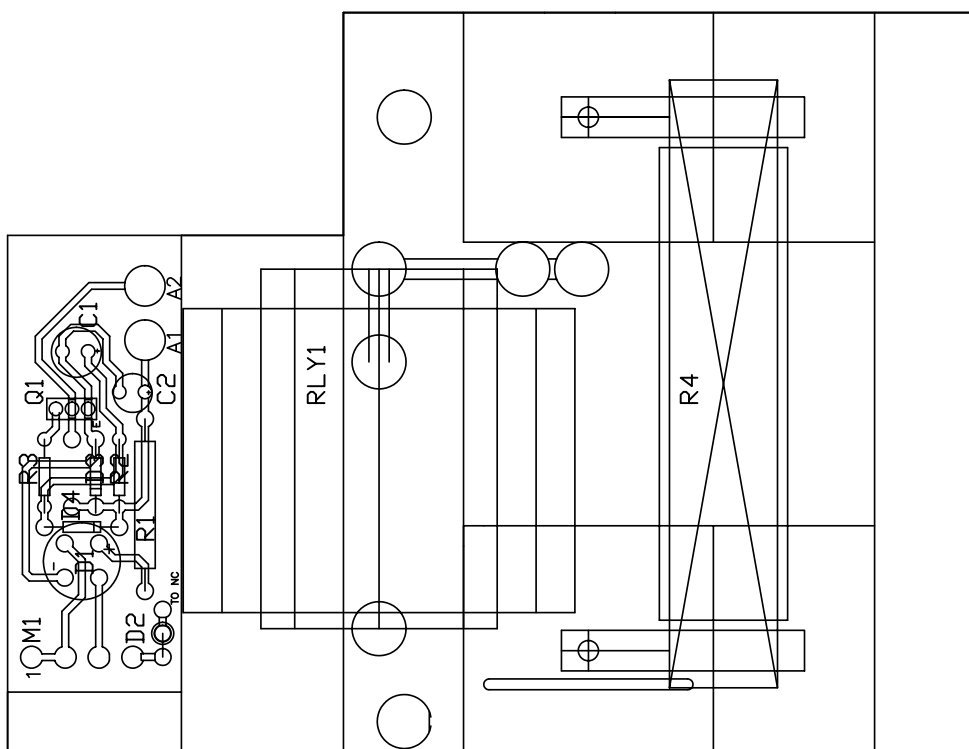
JP1, JP2: JUMPERS SMD CORTOCIRCUITATI

Nome Progetto: PJ1000M LCD		Pagina: 1	di 1	Size: A4
Codice Progetto: /	Autore: REV. BERTI J.	Data: 13/04/01		
Nome Parte: SOFT START	Nome PC in Rete: \\JACK	Revisione: 1.1		
Codice: CSSOFTS	File/Catella: MANUAL PJ1000M START BERTI BERTI	Autore: BERTI J.		

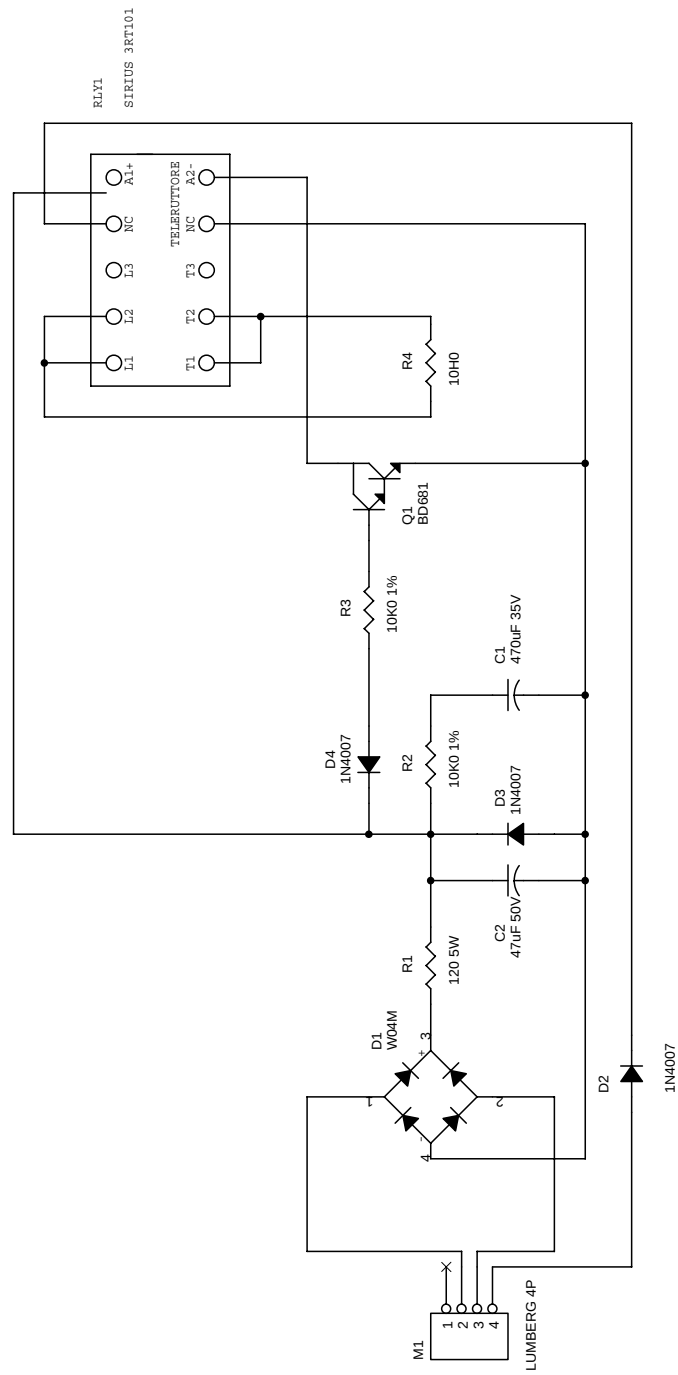
Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CODE
1	1	C1	220UF 50V	COND. ELETTR.	
2	1	C2	47UF 50V	COND. ELETTR.	
3	2	D1,D2	1N4004	DIODO AL SILICIO	
4	1	D3	W02M	PONTE DI DIODI	
5	1	FIX1	FIX		
6	2	JP1,JP2	JUMPER 2P		
7	1	M1	LUMBERG 2P	MORS. 2 PIN	
8	2	M2,M3	LUMBERG 4P	MORS. 4 PIN	
9	1	Q1	BD681	TRANSISTOR	
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	3.3 20W	RES. A FILO	

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Nome Progetto		P.J1000 LCD VERS. 250-380		Pagina: 1	di 1	Size: A4
Autore:	GUERZONI P. - REV.: BERTI J.			Code: Progetto	/	
Nome PC in Rete:	\\JACK\			Revisione: 1.0	SDF START CARD	
File/Cartella MANUALE	J1KCD\SDFSTART 3\STF5380.DWG			Autore:	Nome Parte	
Scala:	/			Autore:	Code:	
Materiale	/			Trattamento:	/	
					CSSDIFSTR	



Nome Progetto: PJ1000 LCD		Pagina: 1	di 1	Size: A4
Autore: GUERZONI P. - REV.: BERTI J.		Codice Progetto: I		
Data: 17/09/02		Nome Parte: SOFT START (220-380)		
Nome PC in Rete: \I\JACKI		Revisione: 1.0		
File/ Cartella MANUALE PJ1000M\SOFT\START\220\STR80.DSN		Autorizzazione:		CSSOFTSTR

CSSOFTSTR

Bill Of Materials

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Item Q.ty

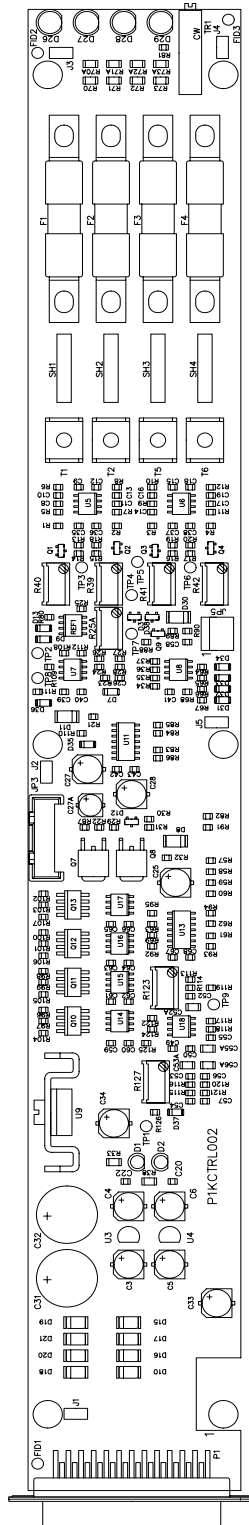
Reference

Part

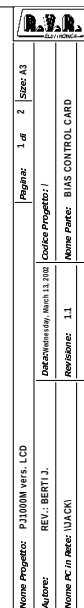
1	3	D2, D3, D4	1N4007
2	2	R2, R3	10K0 1%
3	1	R4	10H0
4	1	C1	470uF 35V
5	1	C2	47uF 50V
6	1	D1	W04M
7	1	M1	LUMBERG 4P
8	1	Q1	BD681
9	1	R1	120 5W
10	1	RLY1	SIRIUS 3RT101

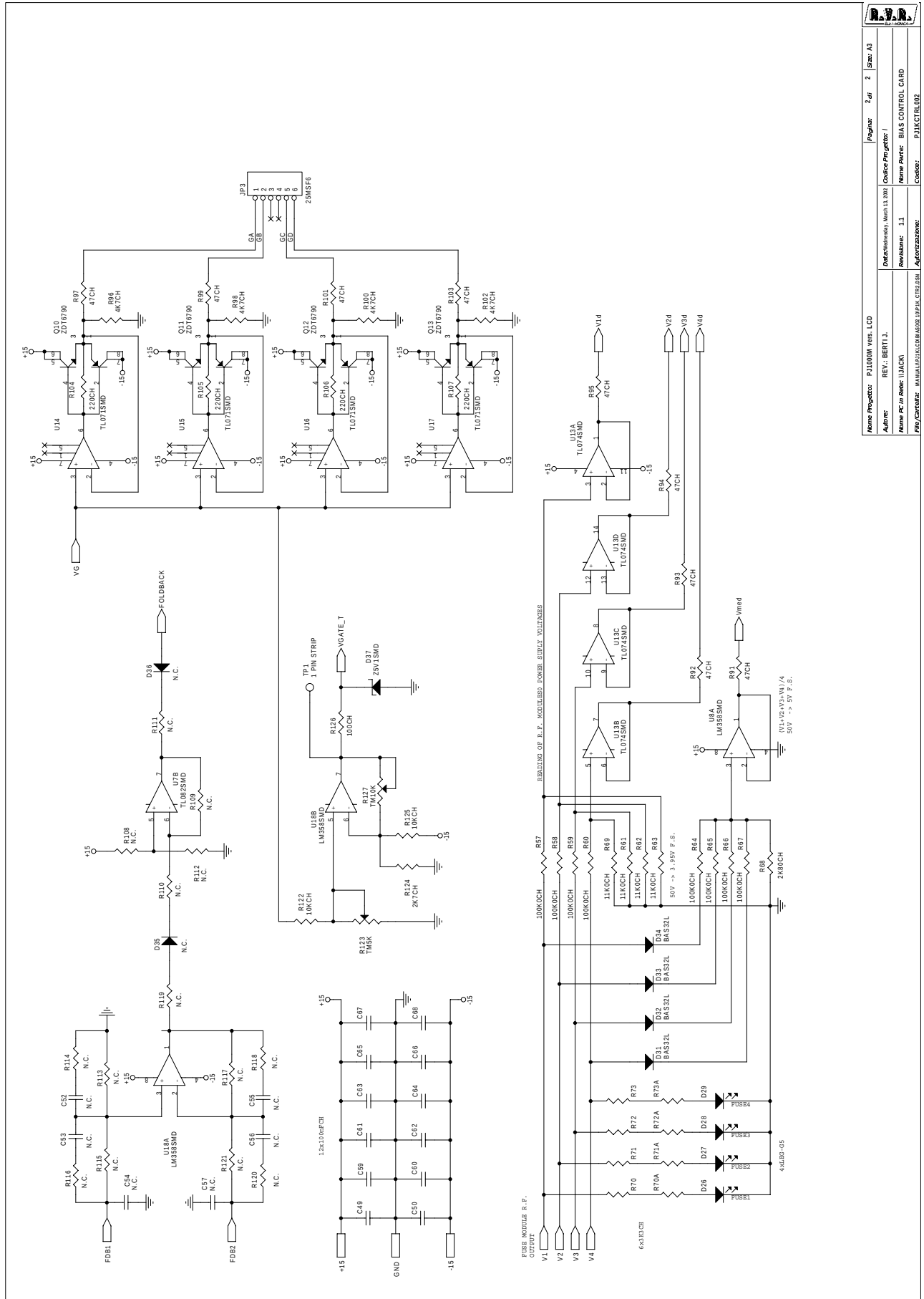
Pagina lasciata intenzionalmente in bianco

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Nome Progetto: PJ 1000 vers. LCD		Pagina: 1	di 1	Size: A3
Autore: REV.: BERTI J.	Codice Progetto: /	Data: 13/03/02		
Nome PC in Rete: \\JACK\	Revisione: 1.1	Nome Parte: BIAS CONTROL CARD		
File/Caricella: MANUALE\PIKCTRL002\PIKCTRL002	Codice: /	Codice: PIKCTRL002		
Schema: /	Materiale: /	Trattamento: /		
Profilo: /		Profilo: /		





Scheda di controllo moduli RF

Revised:

August 27, 1998

PlK-CTRL ver. 1.1

Revision: 2

Bill Of Materials

October 20, 1999

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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
PiK-CTRL ver. 1.1
Bill Of Materials

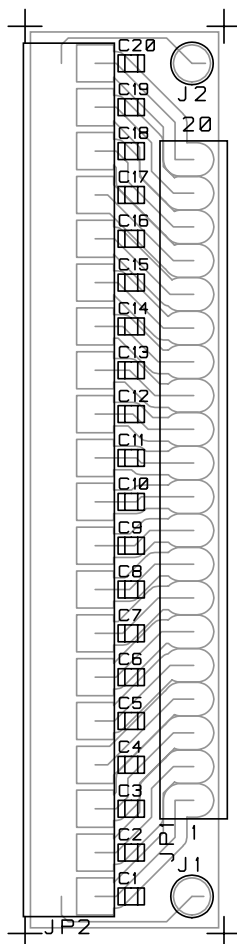
Revised: August 27, 1998
Revision: 2
October 20, 1999 8:43:19 Page 2

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,D34	BAS32L	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
P1K-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	



					
Nome Progetto		P.J500MC LCD		Size: A4	
Autore		GRIPTECH - REV. J. BERTI		Pagina: 1 di 1	
Nome PC in Rete		\\JACK\		Codice Progetto /	
File/Cartella		MANUALI\PJ500MC\FILTR EN\DWG		Nome Parte CONNETTIB. INTERFACCIA PROTEZIONI	
Scala /		Materiale /		Codice CSADPCNPRTPJ	
				Trattamento /	
				Profilo /	



Nome Progetto: P31000 LCD		Pagina: 1 di 1		Size: A4
Autore:	REV.: BERTI J.	Data:	09/10/01	Codice Progetto: I
Nome PC in Rete: \\JACK\		Revisione:	1.0	Nome Parte: CONNETTORE INTERFACCIA PROTEZIONI

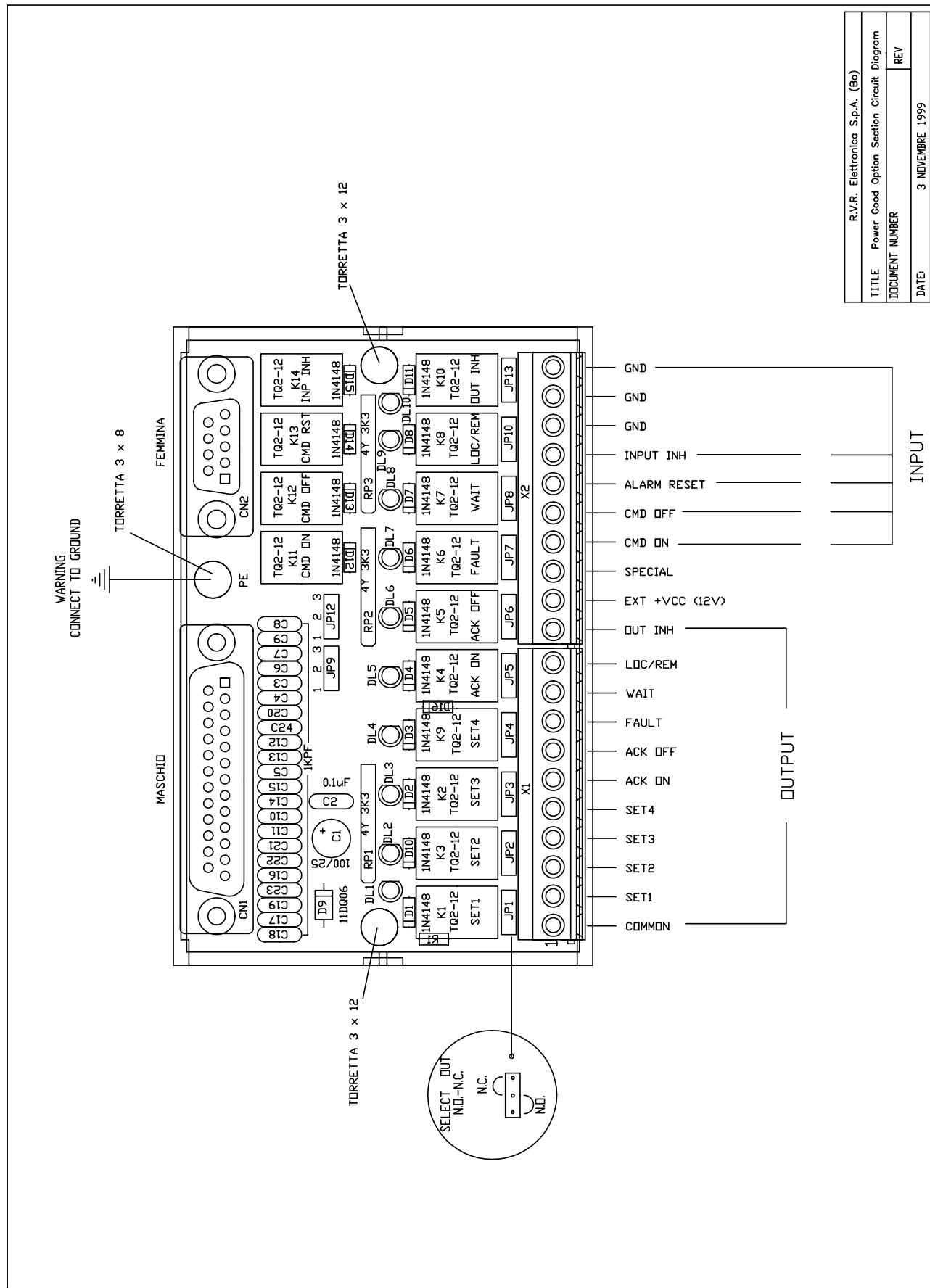
CONNETTORE INTERFACCIA PROTEZIONI

Page 1

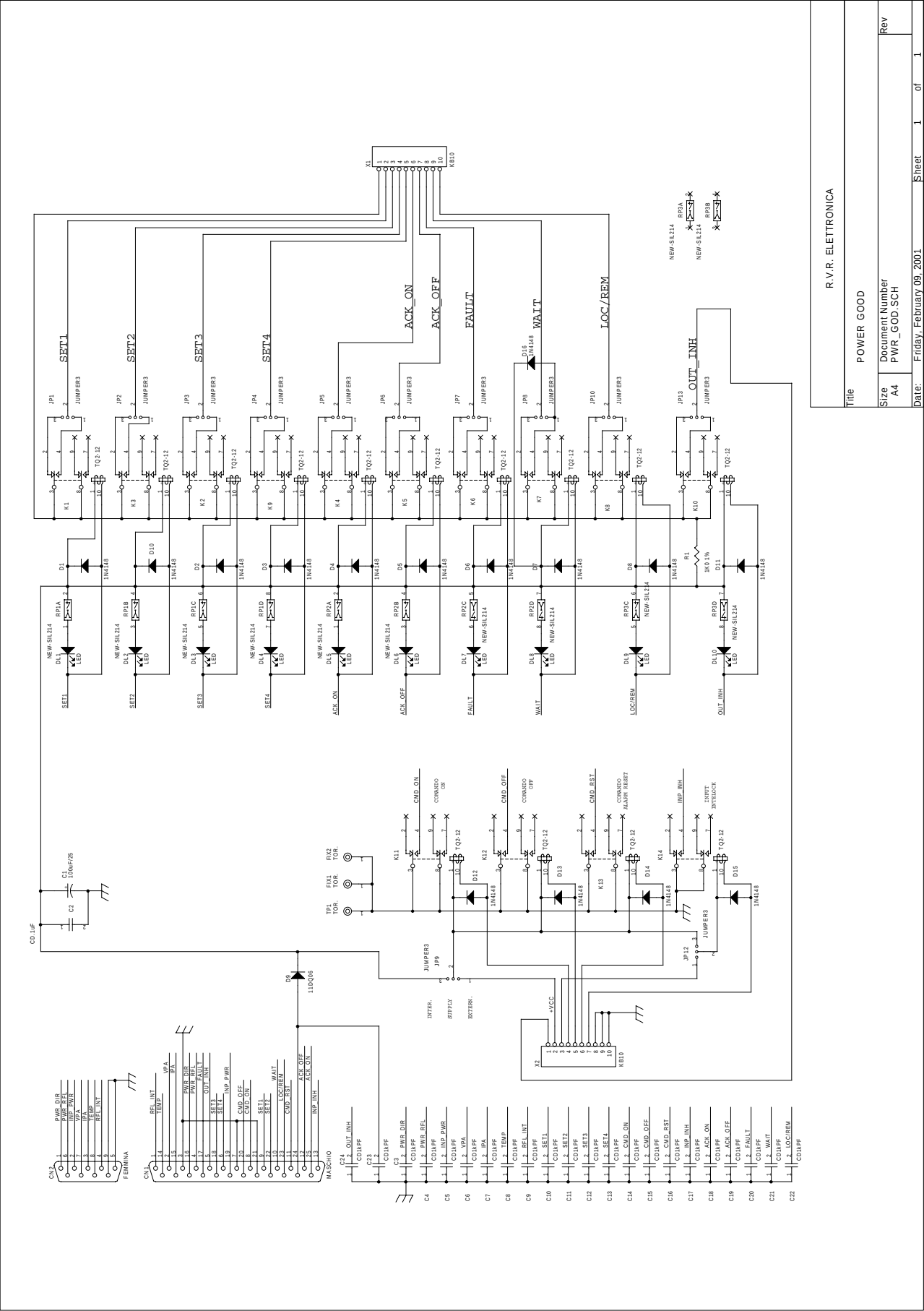
Item	Quantity	Reference	Part
1	20	C1	CD1KPF
		C2	CD1KPF
		C3	CD1KPF
		C4	CD1KPF
		C5	CD1KPF
		C6	CD1KPF
		C7	CD1KPF
		C8	CD1KPF
		C9	CD1KPF
		C10	CD1KPF
		C11	CD1KPF
		C12	CD1KPF
		C13	CD1KPF
		C14	CD1KPF
		C15	CD1KPF
		C16	CD1KPF
		C17	CD1KPF
		C18	CD1KPF
		C19	CD1KPF
		C20	CD1KPF
2	1	JP1	CON90
3	1	JP2	PAD-SALD
4	1	J1	CON1
5	20	PD1	
		PD2	
		PD3	
		PD4	
		PD5	
		PD6	
		PD7	
		PD8	
		PD9	
		PD10	
		PD11	
		PD12	
		PD13	
		PD14	
		PD15	
		PD16	
		PD17	
		PD18	
		PD19	
		PD20	

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R.V.R. Elettronica S.p.A. (Bo)		
TITLE	Power Good Option Section Circuit Diagram	
DOCUMENT NUMBER	REV	
DATE:	3 NOVEMBRE 1999	



POWER GOOD Bill Of Materials Revised: November 25, 1999
Item Q.ty Reference Part

1	1	CN1	MASCHIO
2	1	CN2	FEMMINA
3	1	C1	100UF/25
4	1	C2	CD.1UF
5	22	C3,C4,C5, C6,C7,C8, C9,C10,C11, C12,C13,C14, C15,C16,C17, C18,C19,C20, C21,C22,C23,C24	CD1KPF
6	10	DL1,DL2,DL3, DL4,DL5,DL6, DL7,DL8,DL9, DL10	LED
7	15	D1,D2,D3,D4, D5,D6,D7,D8, D10,D11,D12, D13,D14,D15, D16	1N4148
8	1	D9	11DQ06
9	3	TP1, FIX1, FIX2	TOR.
10	12	JP1,JP2,JP3, JP4,JP5,JP6, JP7,JP8,JP9, JP10,JP12,JP13	JUMPER3
11	14	K1,K2,K3,K4,K5, K6,K7,K8,K9,K10, K11,K12,K13,K14	TQ2-12
12	3	RP1,RP2,RP3	NEW-SIL214
13	2	X1,X2	KB10
14	1	R1	1K0 1%

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