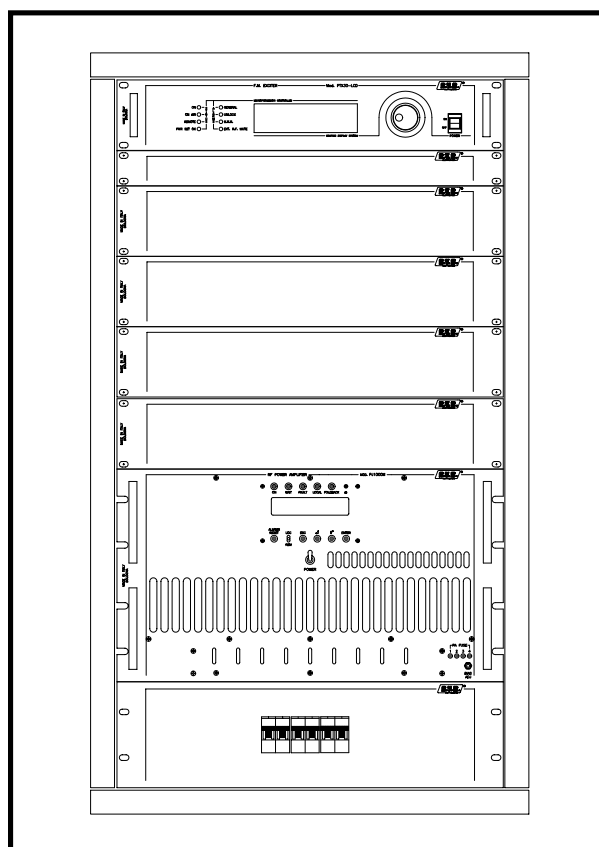

TX1000



User Manual

Manufactured by  Italy



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Date: 02/12/2002

Revision History

Version	Date	Reason	Editor
1.0	02/12/2002	New version	D. Canazza

TX1000 - User Manual

Versione 1.0

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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

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1. Introduction

This manual describes the TX1000SS, an Radio transmitter for frequency modulation audio broadcasting.

The TX1000SS is a modular device, built up of components assembled in a 19" rack, complete with electrical and RF wiring.

This manual shall be read together with the manuals of the different components, that are attached herewith.

Details about warranty, safety, working principles and technical specifications are given in the single manuals.

2. Configurations

2.1 General

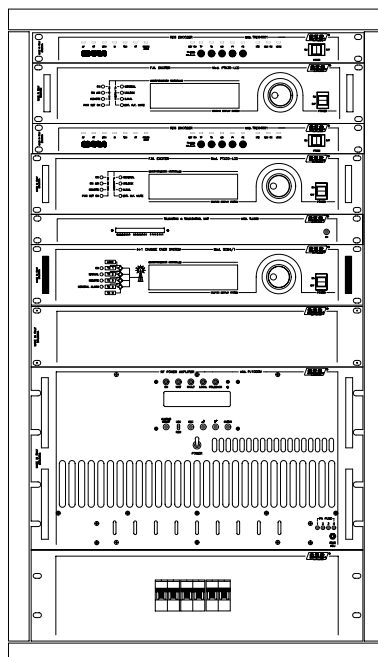
The essential components of the TX1000SS are:

- 1 PTX30LCD/s Exciter;
- 1 PJ1000M LCD Amplifier.

Different configurations of the transmitter are available. The costumer will choose the one that best fits his need in terms, e.g. of redundancy or telecontrol capabilities.

This chapter describes the different configurations the TX1000SS can have. Please note that transmitters layouts given herein are reference ones; the height of the racks and the disposition of the modules may vary and will be specified at the time of placing the order. The names of the different transmitters refer to the components included.

2.2 TX1KSSRD/RDS

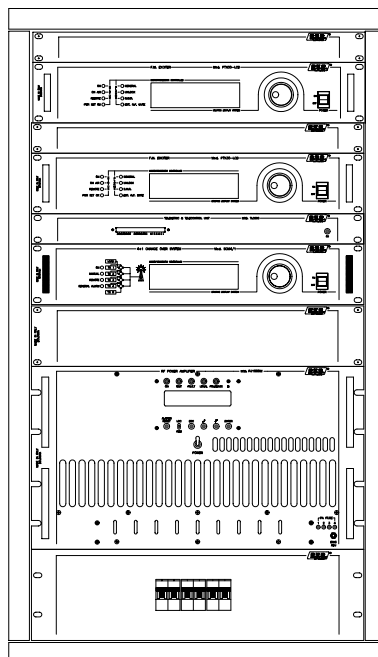


This version is the most complete version of the TX1000SS. With respect to the “essential” components, it features:

- Double excitors (2 PTX30LCD/s);
- Double RDS encoders (2 TRDS4001);
- Automatic change-over (SCM1+1 LCD);
- Telemetry unit (TLC300);

Of course, it also includes the PJ1000M RF amplifier.

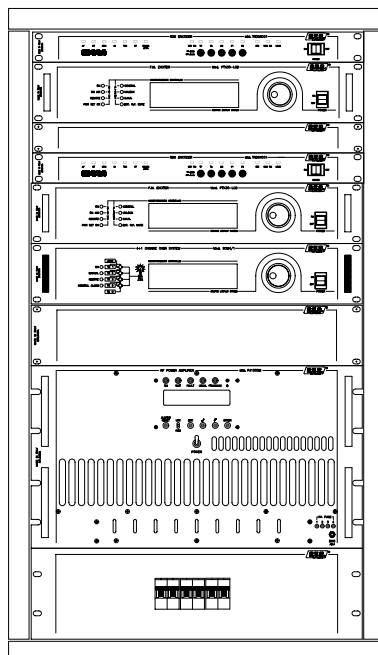
2.3 TX1KSSRD



This version of the transmitter gives to the customer the benefit of redundant exciters and remote control. It is composed of:

- Double exciters (2 PTX30LCD/s);
- Automatic change-over (SCM1+1 LCD);
- Telemetry unit (TLC300);
- Amplifier (PJ1000M LCD).

2.4 TX1KSSD/RDS

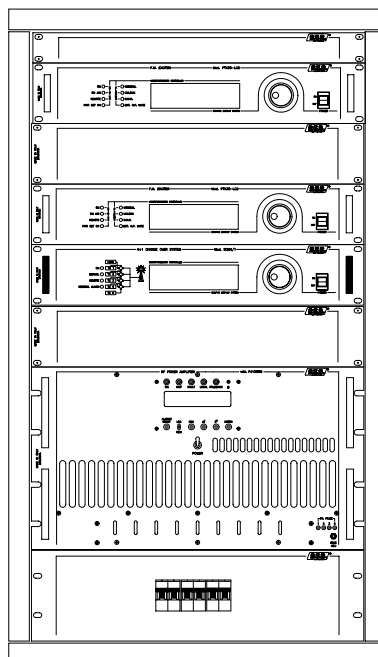


This version of the transmitter gives redundant exciters and RDS coders.

It consists of:

- Double exciters (2 PTX30LCD/s);
- Double RDS encoders (2 TRDS4001);
- Automatic change-over (SCM1+1 LCD);
- Amplifier (PJ1000M LCD).

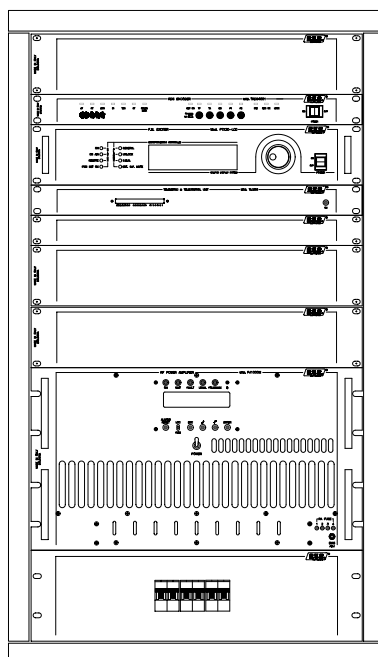
2.5 TX1KSSD



This version is composed of:

- Double exciters (2 PTX30LCD/s);
- Automatic change-over (SCM1+1 LCD);
- Amplifier (PJ1000M LCD).

2.6 TX1KSSR/RDS

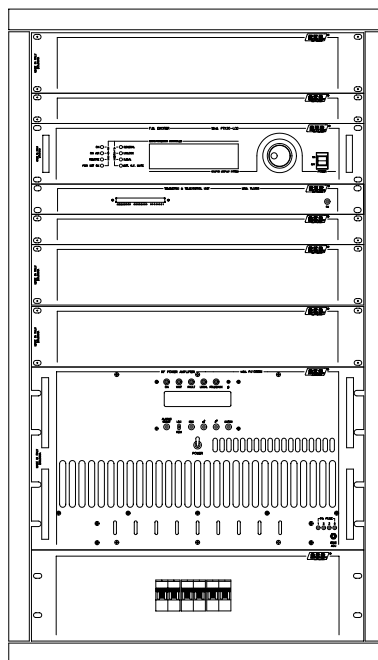


This version of the transmitter is tele-controllable and includes the RDS coder.

It is composed of:

- Exciter (PTX30LCD/s);
- RDS encoder (TRDS4001);
- Telemetry unit (TLC300);
- Amplifier (PJ1000M LCD).

2.7 TX1KSSR

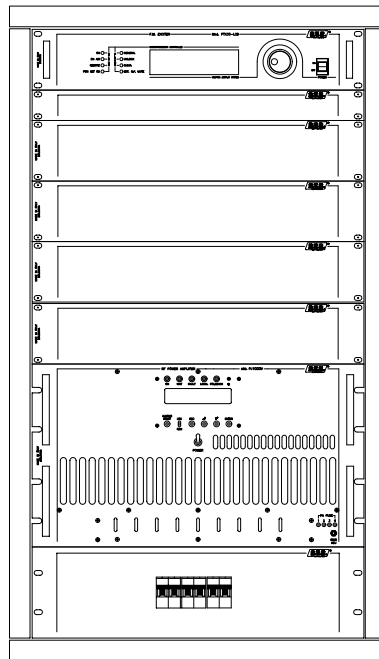


This version of the transmitter is tele-controllable and includes the RDS coder.

It is composed of:

- Exciter (PTX30LCD/s);
- Telemetry unit (TLC300);
- Amplifier (PJ1000M LCD).

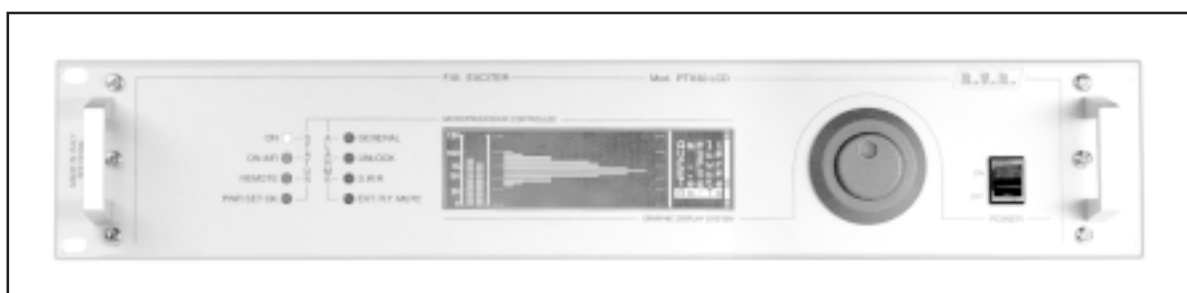
2.8 TX1000SS/V4



This version is composed of:

- Exciter (PTX30LCD/s);
- Amplifier (PJ1000M LCD).

PTX - LCD



User Manual

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2.0	20/03/2001	New version	D. Canazza
2.1	23/11/2001	AUDINP-DIG Upgrade	J. Berti

PTX-LCD - User Manual
Version 2.1

© Copyright 1998-2001
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

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1. Preliminary Instructions

This manual is designed to provide a general guide to skilled and qualified personnel, who are aware of the dangers that may arise when handling electric and electronic circuits.

It does not aim to provide a complete description of all the safety precautions that must be observed by people who use this or similar equipment.

The installation, operation, maintenance and use of this piece of equipment involve risks both for people and the equipment itself, which must be handled only by experienced technicians.

R.V.R. Elettronica SpA does not assume responsibility for injuries to persons or damage to items caused by improper use or incorrect usage procedures, whether the users are experienced or not.

Users should observe local regulations and fire-prevention rules while installing and using this equipment.



WARNING: always disconnect the power before opening covers or removing any part of the equipment.

Take appropriate earthing measures to discharge the condensers and high voltage points before doing any maintenance work.



WARNING: this equipment may radiate radio-frequency energy, and if it is not installed according to the instructions, may cause troublesome interference to radio communications.

Operating this equipment in a residential environment may give rise to radio disturbance; if so, the user may be asked to take appropriate counter measures.

R.V.R. Elettronica SpA reserves the right to make modifications to the design and technical specifications of the equipment, and to update this manual without notice.

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2. Warranty

The guarantee, which is for 12 (twelve) months, is valid for any R.V.R. Elettronica product.

On components such as tubes for final amplifiers, the manufacturer's guarantee applies.

R.V.R. Elettronica extends all transferable original guarantees to its own products. To ensure that servicing is carried out properly and as fast as possible, the work shall be handled by R.V.R. Elettronica; any claims should be sent directly to R.V.R. Elettronica, in accordance with the defined procedures.

The warranty does not include:

- 1 damage while the equipment is being shipped to R.V.R. for repairs;
- 2 any unauthorized modification or repair;
- 3 accidental damage, or damage not due to defects in the equipment;
- 4 nominal damage not accidental;
- 5 shipping the equipment and insuring it, and replacement of parts or units.

Any damage to the equipment caused during shipment must be reported to the transporters and notified in writing on the forwarding receipt.

Any difference or damage discovered after delivery must be reported to R.V.R. Elettronica within 5 (five) days from the delivery date.

To take advantage of the guarantee, adopt the following procedure:

- 1 Contact the retailer or dealer where you bought the equipment; describe the problem or fault to check if there is a simple solution.

Retailers and Distributors can provide full information on the problems that occur most frequently; they can normally repair the equipment much faster than the manufacturer

- 2 If your dealer cannot help you, contact R.V.R. Elettronica and describe the problem to them; if necessary, you will be sent authorization with the necessary instructions;
- 3 When you have received authorisation, return the equipment carriage paid to the address specified.

Pack it carefully, if possible in the original packing, and seal the package.



Do not return the machine without prior authorization, otherwise it may be returned to you

- 4 Quote the machine's type, model and serial number; attach a written technical diagnosis listing all the problems and faults encountered, and enclose a copy of the invoice.

Replacement of parts under guarantee or spare parts can be ordered from the following address:



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

quoting type, model and serial number of the device.

3. First Aid

Personnel involved in the installation, use, and maintenance of the equipment must be familiar with the theory and practice of first aid.

3.1 Treating electric shocks

3.1.1 If the victim is unconscious

Follow the first aid principles described below.

- Lay the victim down on his back on a rigid surface
- Free the respiratory tracts by raising the neck and pushing the forehead back (Figure 1).
- If necessary, check the breathing of the victim opening his mouth.
- If the victim is not breathing, start artificial respiration immediately (Figure 2): incline the head, close the nostrils, apply your mouth to the victim's and make four fast respirations.

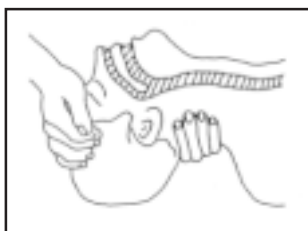


Figure 1



Figure 2

- Check the heart beat (Figure 3); if there is none, start a cardiac massage immediately (Figure 4) pressing the sternum approximately at the centre of the chest (Figure 5).



Figure 3



Figure 4

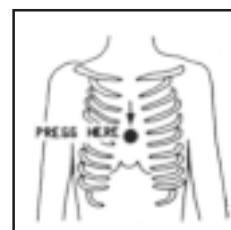


Figure 5

- If there is just one person providing first aid, he must adopt a rhythm of 15 compressions and 2 fast respirations alternately.
- If there are two persons, the rhythm must be 1 respiration and 5 compressions alternately

- Do not interrupt the cardiac massage during the artificial respiration.
- Call a doctor as soon as possible

3.1.2 If the victim is conscious

- Cover the victim with a blanket
- Keep him calm.
- Loosen the victim's clothes and keep him lying down
- Call a doctor as soon as possible

3.2 Treating electric burns

3.2.1 Large-scale burns and serious cuts

- Cover the area concerned with a sheet or a clean cloth.
- Do not break the blisters; remove any fabric and parts of clothing that may be attached to the skin; apply a suitable ointment.
- Treat the victim depending on the type of accident.
- Take the victim to hospital as soon as possible.
- If the arms and legs are injured, keep them raised.

If no medical help is available within an hour and the victim is conscious and has not retched, administer a liquid solution of salt and bicarbonate of soda: 1 teaspoonful of salt to every 250ml of water.

Get the victim to slowly drink half a glass of the solution, four times, over a period of 15 minutes.

Stop the treatment if the victim starts to retch.



Do not administer alcoholics!

3.2.2 Less serious burns

- Apply cold gauze compresses (not iced) using a clean cloth (i.e. as clean as possible).
- Do not break any blisters; remove any fabric and parts of clothing that may be attached to the skin; apply a suitable ointment.
- If necessary, dress the victim in clean dry clothes.
- Treat the victim depending on the type of accident.
- Take the victim to hospital as soon as possible.
- If the arms and legs are injured, keep them raised.

4. General Description

The PTX-LCD is a 19" rack-mountable frequency agile FM exciter. Its frequency range spans from 87.5 to 108 MHz in 10 kHz steps, but other frequencies are available on request.

The PTX-LCD comes in three versions, depending on its maximum output power: 30 W for the PTX30-LCD version, 60 W for the PTX60-LCD version and 100 W for the PTX100-LCD version, on a 50 Ohm load. The output power can be set anywhere between 0 and the nominal power

The PTX-LCD is available either with embedded stereo coder (option code "/S") or in MONO/MPX version. The MONO/MPX model can be used for monophonic broadcasting or stereophonic, in conjunction with an external stereo coder.

The user interface of the exciter is constituted by a LCD display and a knob (encoder). Using this interface, it's possible to read all the working parameters and to adjust the modifiable ones (e.g. power level or working frequency).

This exciter offers a number of connectors that can be used to integrate it in complex systems: it is possible to acquire and control external units such as amplifiers, changeover systems, coaxial relays, etc., and to network it with other modulators.

The PTX-LCD is designed in a modular way: the different functionalities are performed by modules that are then interconnected either directly (the male connector of one module plugs in the the female connector of another one) or by means of connectors-ended cables. This design allows easy servicing and replacement of the single modules.

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5. Quick Start

This chapter gives a concise view of the points that are necessary for the installation of the device. If any item is not completely clear, for example when you use the exciter for the first time, we strongly suggest to read throughly the manual and the description of the operating system.

5.1 Using the encoder

The interaction between the user and the exciter's control software is performed using the encoder (fig. 5.1).

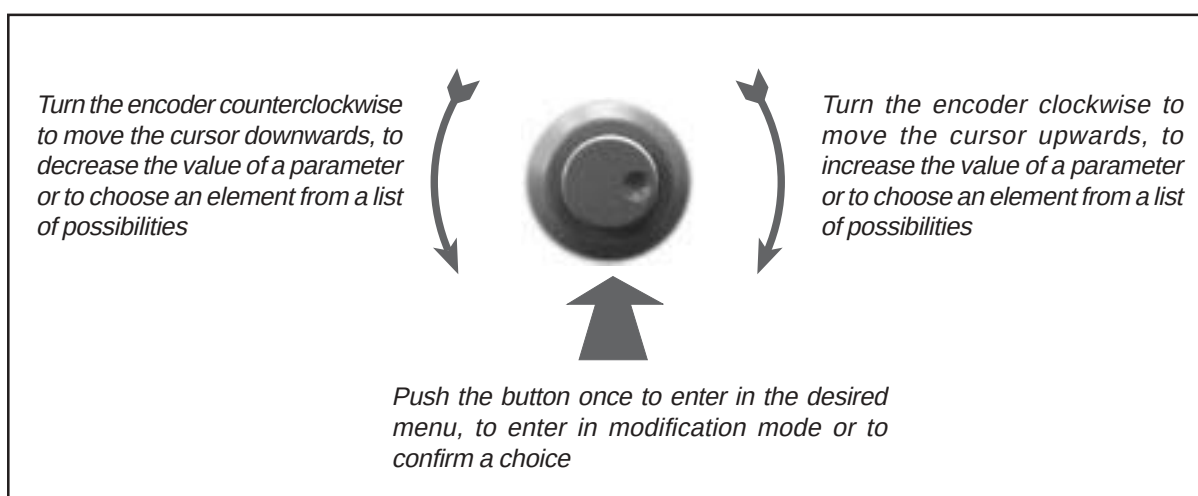


Figure 5-1

The operations supported by the encoder are:

- **rotation:** moves the cursor shown on the display; if you turn the encoder to the left (counterclockwise), the cursor moves downwards, if you turn it right the cursor moves upwards; it also permits to increase or diminish the parameters (turning the encoder left diminishes the parameter, turning it right increases it) or to select an item from a list of options
- **pushing:** push the button once when the cursor is on the name of a menu to enter in that menu, push it when the cursor is on the name of a parameter to enter in modification mode (the cursor starts blinking); after the modification of a parameter, push the button to save the new value.

After having modified the value of a parameter, the cursor goes on blinking for approximately 30 seconds, waiting for confirmation from the user. If the user doesn't confirm the new value (i.e., the button is not pressed), the device emits a sound to indicate that no modification has been saved; the cursor stops blinking and remains on the selected parameter.

5.2 Preparation

Unpack the transmitter and before any other operation check the unit for any shipping damage and check that all the controls and connectors on the front and rear panels are in good conditions.

Check the mains voltage selector on the rear panel: the selected value is indicated by an arrow. If required, extract the selector block levering with a little screwdriver (Fig. 5-2). Rotate the block until the correct printed value corresponds with the arrow, then reinsert it.



Figura 5-2

If it has been necessary to change voltage, check the fuse value. The required values are the following:

PTX30-LCD	220-240 Volt - 3,16 A
	110-120 Volt - 6,30 A
PTX60-LCD	220-240 Volt - 6,30 A
	110-120 Volt - 10,0 A
PTX100-LCD	220-240 Volt - 6,30 A
	110-120 Volt - 10,0 A

It is also possible to check the integrity of the RF amplifier section fuse: Its value is 4A for the PTX30-LCD version and 8A for the PTX60-LCD and PTX100-LCD versions.

Verify that the mains switch on the front panel of the unit is on the OFF position.

Connect to the RF output of the exciter a proper load (a dummy load with suitable dissipation power, an antenna, a final amplifier or a combiner)



NOTE: When you connect the PTX-LCD to other devices, it is necessary to strictly follow the instructions given by the respective manufacturers, to avoid damages or danger situations.

Connect the mains cable to the plug on the rear of the exciter.



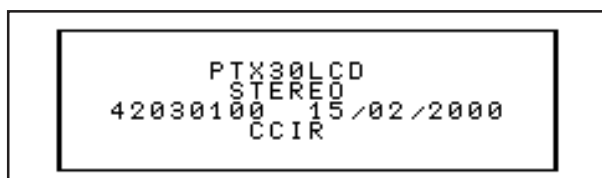
NOTE: This device shall be correctly connected to ground.
Correct grounding is essential both for safety and to reach the rated performances.

Connect your source audio (for example the mixer or STL output) to the suitable input connector. Depending on the version, the PTX-LCD offers a number of input choices, L+R, MPX or even digital; see the connectors description for details.

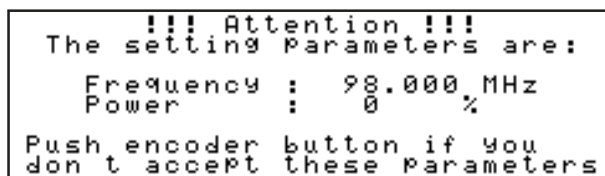
5.3 Operation

Switch on the exciter with the mains switch on the front panel.

All the STATUS and ALARMS leds are lit on to permit the verification of their good working status. The display than shows some information regarding the exciter.



After some seconds, the user is invited by the sound of a buzzer and by a message on the display, to push the encoder if the current settings are not acceptable.



If the user pushes the encoder while the message is displayed, the exciter will start in stand-by mode, that is completely working but with RF power disabled.

If the encoder is not pushed, the start-up sequence goes on undisturbed.

At start-up, the various modifiable parameters will be set as they were before the machine was switched off (i.e., 98.00 % MHz and 0 % are just example values): the current parameters are in fact always stored in non-volatile memory.

When the settings are not correct, for example at the first start up of the machine or if for some reason it is necessary to change some parameters before starting to transmit, it is possible to keep the exciter in stand-by mode, as seen above.

This operation is necessary only if one wants to modify the device's settings before starting transmitting.

Using the menu system provided by the PTX-LCD, described in chapter 7, it is

possible to control all the working parameters of the device. Specifically, before enabling the power output, we suggest to verify and in case to correct according to your needs the fundamental parameters:

- frequency
- power
- audio input level
- audio input impedance
- preemphasys
- kind of audio input (depending on the version, MONO or MPX or MONO, MPX_U, MPX_B, STEREO)
- if in STEREO mode, verify that pilot tone is enabled

If you disabled the power output, it is now possible to activate entering in the main menu, selecting the first item and changing it from OFF to ON.

It is any time possible to disable the power output of the PTX-LCD, from the main menu.

5.4 Adjusting

The PTX-LCD features some trimmers, accessible from the rear panel, that can be adjusted to the user's needs. these are: two EXT AGC trimmers (FWD and RFL) and the LEVEL ADJ (Fig. 6-2 [16]).

The LEVEL ADJ trimmers are used to adjust the modulation level due to the respective input. For audio input, the levels are set via software with 1 dB steps, and the trimmers can be used for fine setting.

For SCA input, the levels are only adjusted with the trimmers.

The EXT AGC trimmers give to the user the possibility to limit the outout power of the transmitter as a function of the levels of two external analog values that are acquired by the Remote connector.

Both trimmers work in the same way: EXT AGC - FWD is connected to pin 10 of the Remote connector, while EXT AGC-RFL is connected to pin 2. If the voltage connected to one of the pins tends to surpass the limit set with the corresponding trimmer, the power emitted by the exciter is reduced until the monitored voltage goes below the fixed limit.

These trimmers are mostly useful when the PTX-LCD is part of a transmission system. For example, if the exciter is connected to a final amplifier it is practical to connect to pin 10 a voltage that is proportional to the RF power emitted by the amplifier, and to pin 2 a voltage proportional to the reflected power. In this way, it

is possible to have constant overall output power even if the amplifier's gain is not constant over the FM range, and to limit the reflected power of the amplifiers so that the its protection system doesn't intervene.

To adjust the EXT AGC trimmers of the PTX-LCD, proceed as described in the following.

Perform the connections described in figure 5-3. The connection cable can be supplied on request by R.V.R. Elettronica or be realized by a technician you trust, depending on the pinout of the amplifier you use.

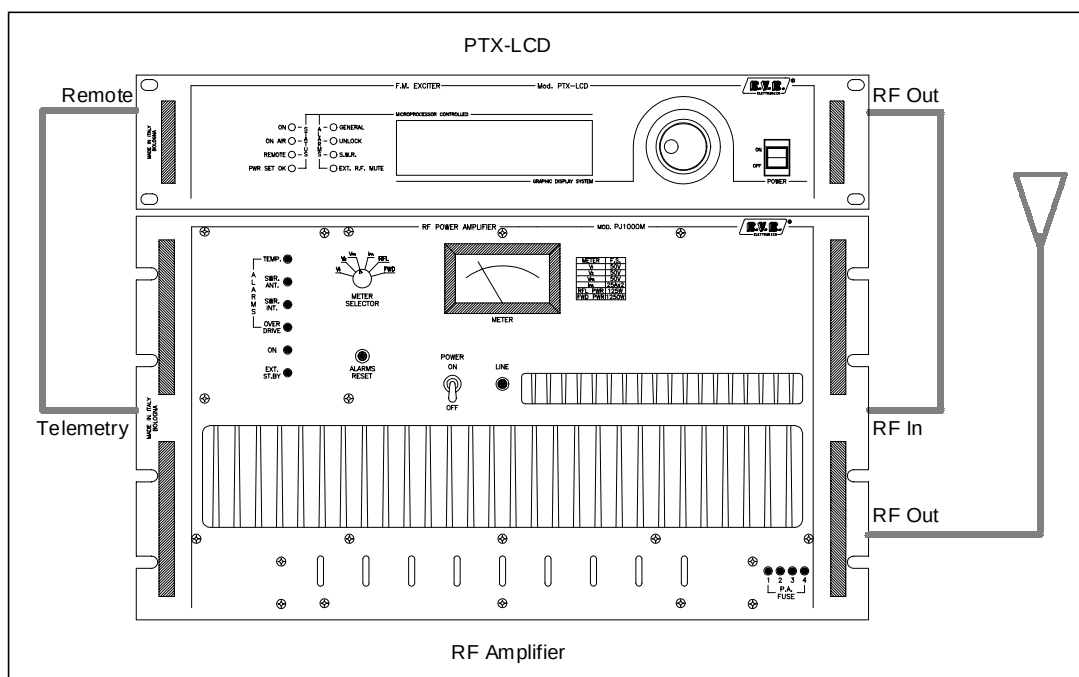


Figure 5-3

Switch on the exciter at minimum power.

Turn both trimmers completely clockwise.

Rise the power emitted by the exciter until on the instrument of the amplifier you read an emitter power level just above the desired threshold.

Turn the EXT AGC - FWD trimmer counter-clockwise until you see the power emitted by the amplifier starting to decrease.

Decrease the power emitted by the exciter to the minimum.

Disconnect the dummy load from the amplifier and substitute it with an unadapted load, so that part of the emitted power is reflected, and set the amplifier's instrument to measure the reflected power.

Rise the power emitted by the exciter until on the instrument of the amplifier you

read a reflected power level just above the desired threshold.

Turn the EXT AGC - RFL trimmer counter-clockwise until you see the power reflected on the amplifier starting to decrease.

At this point, the adjustment of the trimmers is completed. Now you can set on the exciter the output value you desire, without the forward or reflected power of the amplifier surpass the set thresholds.

6 External Description

This chapter describes the elements of the front and rear panels of the PTX-LCD.

6.1 Front Panel

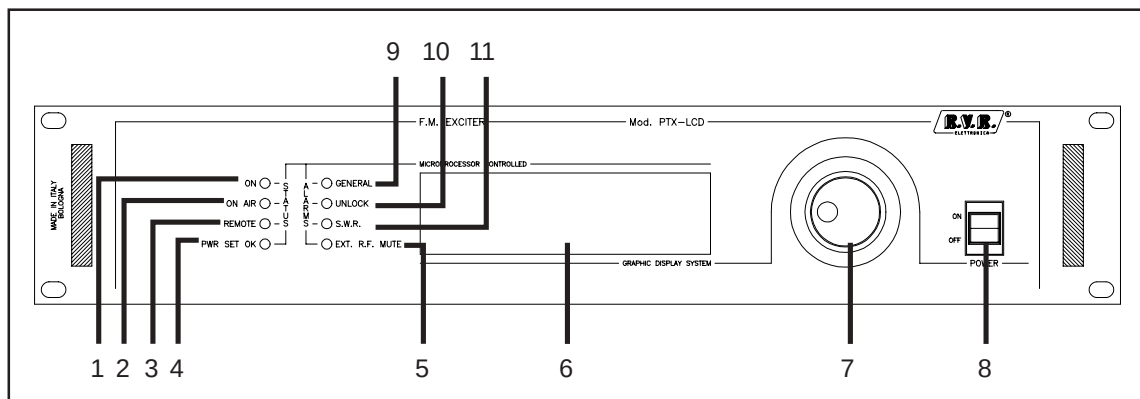


Figura 6-1

- | | |
|-----------------|---|
| [1] ON | Operating indicator |
| [2] ON AIR | indicates that the exciter is transmitting |
| [3] REMOTE | indicates that the exciter is under control of an external system |
| [4] PWR SET OK | lit: the exciter is delivering the set power
blinking: the exciter didn't reach the set power for external reasons |
| [5] EXT RF MUTE | the exciter is not delivering power because of an external interlock |
| [6] DISPLAY | LCD display, both graphic (240x64 pixels) and text (30x8 characters) |
| [7] ENCODER | knob and button to control the management software |
| [8] POWER | main switch |
| [9] GENERAL | indicates generic fault when lit |
| [10] UNLOCK | indicates that the PLL still haven't locked on the set frequency when lit |
| [11] SWR | indicates that the transmitter is disabled for too much SWR |

6.2 Rear panel

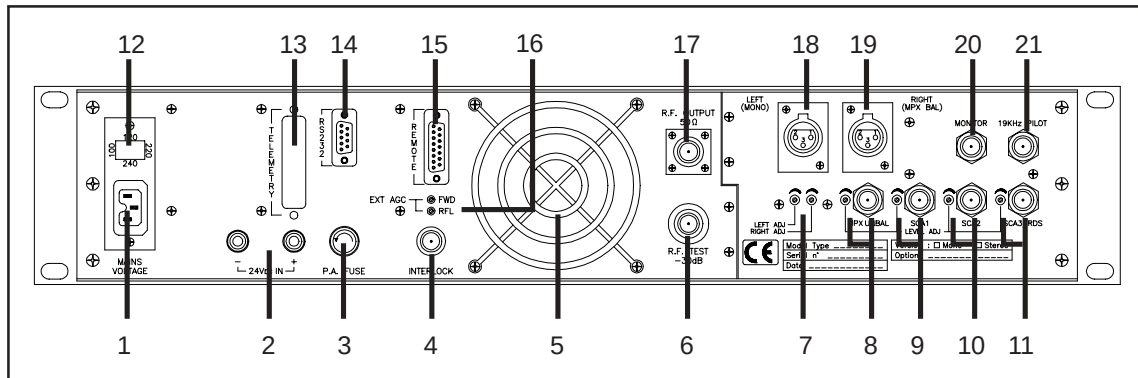
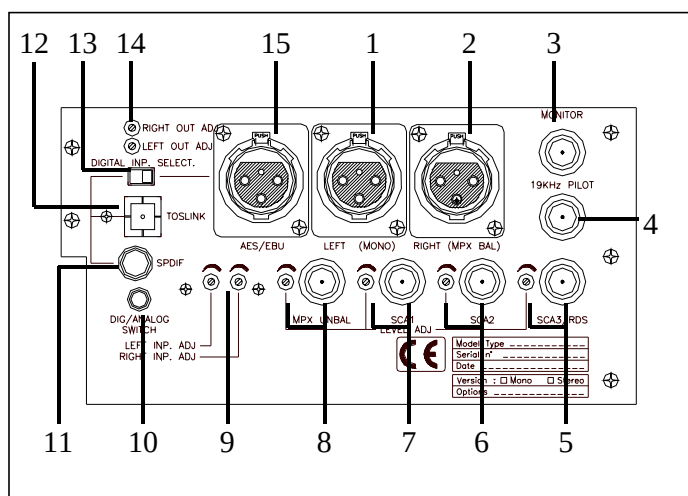


Figura 6-2

- | | |
|-------------------|--|
| [1] PLUG | mains supply plug |
| [2] 24Vdc IN | connectors for external 24 V dc supply (optional). Positive (red) and negative (black) |
| [3] P.A. Fuse | RF power amplifier protection fuse |
| [4] INTERLOCK | interlock BNC connector.: if the central connector is grounded, the exciter is forced in stand-by mode |
| [5] FAN | fan for forced ventilation |
| [6] RF Test | RF test output 30 dB below emitted level |
| [7] LEVEL ADJ | trimmers for adjustment of Left and Right input |
| [8] MPX Unbal | unbalanced MPX BNC connector, with level adjusting trimmer |
| [9] SCA1 | SCA1 BNC connector, with level adjusting trimmer |
| [10] SCA2 | SCA2 BNC connector, with level adjusting trimmer |
| [11] SCA3/RDS | SCA3/RDS BNC connector, with level adjusting trimmer |
| [12] FUSE | mains fuse with voltage changer |
| [13] Telemetry | DB25 connector of optional telemetry board |
| [14] RS232 | DB9 connector for serial communication (direct or via modem) |
| [15] Remote | DB15 connector for interfacing with other devices |
| [16] EXT AGC | trimmers to adjust the automatic gain control depending on external analog signals |
| [17] RF Output | N connector for RF output |
| [18] Left (mono) | XLR connector for Left/mono input |
| [19] Right (MPX) | XLR connector for Right/MPX input |
| [20] Monitor | BNC connector to monitor the composite modulating signal |
| [21] 19 kHz pilot | BNC connector for pilot tone output, suitable to synchronize external devices (e.g. RDS coder) |

6.3 Rear panel - AUDINP-DIG option



Analog section

- | | |
|---------------------|--|
| [1] Left (Mono) | XLR connector for Left/mono input |
| [2] Right (MPX BAL) | XLR connector for Right/MPX input |
| [3] Monitor | BNC connector to monitor the composite modulating signal |
| [4] 19 kHz pilot | BNC connector for pilot tone output, suitable to synchronize external devices (e.g. RDS coder) |
| [5] SCA3/RDS | SCA3/RDS BNC connector, with level adjusting trimmer |
| [6] SCA2 | SCA2 BNC connector, with level adjusting trimmer |
| [7] SCA1 | SCA1 BNC connector, with level adjusting trimmer |
| [8] MPX Unbal | Unbalanced MPX BNC connector, with level adjusting trimmer |
| [9] Level IMP ADJ | Trimmers for adjustment of Left and Right input |

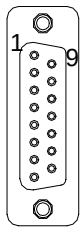
Digital section

- | | |
|--------------------------|--|
| [10] Dig/Analog switch | 3.5 JACK connector for external Digital/Analog switch command |
| [11] SPDIF | PIN/RCA unbalanced connector for S/PDIF format audio input |
| [12] TOSLINK | connector for fiber optic digital audio input |
| [13] Digital Imp. Select | Switch to select the balanced or unbalanced digital audio input |
| [14] Level OUT ADJ | Trimmers for adjustment of Left and Right level of converted digital audio signal. |
| [15] AES/EBU | XLR balanced connector for AES/EBU format digital audio input |

6.4 Connectors description

6.4.1 Remote

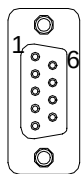
Type: DB15 female



- 1 Ext Rem - Interlock input, if ground the transmitter is disabled
- 2 Ext Rfl Pwr - analog input for reflected power of an external amplifier
- 3 GND
- 4 Analog Input 5
- 5 Analog Input 3
- 6 Analog Input 1
- 7 RLY 2 Out - Digital output. NO relay contact, when the exciter goes from ON to OFF status, the contact has an impulse to ground. If ExPwr is disabled (see 11.7), the meaning of this contact is "Power Good": closed = Power Good, open = Alarm
- 8 GND
- 9 GND
- 10 Ext Fwd Pwr - analog input for forward power of an external amplifier
- 11 Analog Input 6
- 12 Analog Input 4
- 13 Analog Input 2
- 14 GND
- 15 RLY 1 Out - Digital output. NO relay contact, when the exciter goes from OFF to ON status, the contact has an impulse to ground. If ExPwr is disabled (see 11.7), the meaning of this contact is "SWR alarm": closed = OK, open = SWR

6.4.2 RS 232

Tipo: DB9 female

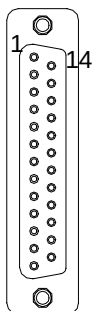


- 1 NC
- 2 TX_D
- 3 RX_D
- 4 NC
- 5 GND
- 6 +12V
- 7 NC
- 8 CTS
- 9 NC

Note: Normally, the PTX-LCD is configured as DCE (Data Communication Equipment) for serial communication.

6.4.3 Telemetry (optional board)

Type: DB25 female



- | | |
|----|---|
| 1 | GND |
| 2 | +12V |
| 3 | NC |
| 4 | relay 1, NC contact |
| 5 | relay 2, common contact |
| 6 | clock I ² C |
| 7 | data I ² C |
| 8 | open collector output ("Out" in Telemetry menu) |
| 9 | telemetry analog input 1 |
| 10 | telemetry analog input 3 |
| 11 | telemetry analog input 5 |
| 12 | telemetry analog input 7 |
| 13 | GND |
| 14 | GND |
| 15 | relay 1, NO contact |
| 16 | relay 1, common contact |
| 17 | relay 2, NO contact |
| 18 | relay 2, NC contact |
| 19 | GND |
| 20 | GND |
| 21 | GND |
| 22 | telemetry analog input 2 |
| 23 | telemetry analog input 4 |
| 24 | telemetry analog input 6 |
| 25 | telemetry analog input 8 |

6.4.4 Left (MONO) / Right (MPX Bal)

Type: XLR female



- | | |
|---|------------|
| 1 | GND |
| 2 | Signal (+) |
| 3 | Signal (-) |

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7. Operating System

The exciter is microprocessor-controlled. The software structure can be divided into a start-up phase and a main cycle.

7.1 Start-up

7.1.1 Operating system loading

When you switch the exciter on, a window appears on the display, showing some information about the device (Fig. 7-1). Note that "CCIR" in the figure, refers to the set of values that would be used in case of EEPROM error and software re-initialization.

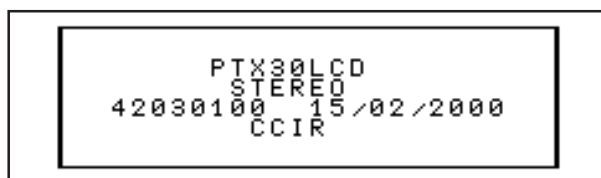


Figure 7-1

After about 10 seconds, a new window will show up, while the buzzer emits an intermittent sound (Fig. 7-2).

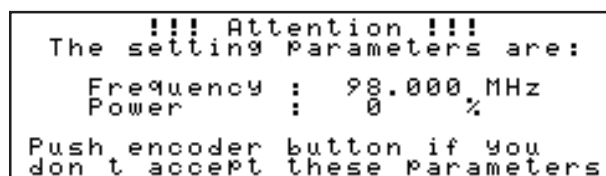


Figure 7-2

While this window is displayed, pushing the encoder will cause RF power to be set "Off": in this way it's possible to change the various parameters before starting transmitting.

After 5 seconds, or when the encoder is pushed, the software jumps into its main cycle.

7.1.2 EEPROM Re-initialization

At start up, the PTX-LCD software check the coherency of the data stored in the non volatile memory (EEPROM) with respect to the software version. A discrepancy will be detected in case software upgrade.

In such case, the software resets the EEPROM to safe values, that are configured in the firmware (EPROM).

This behaviour can also be forced by the user: it is sufficient to keep the encoder pushed while switching on the exciter, until the preliminary checks are performed. In such case, In these situations, the following message will be displayed, inviting the user to keep the button pressed to reset the EEPROM, or to release it to keep the EEPROM as it is.

```

      !!! ATTENTION !!!
    If you Press encoder button
    for some seconds all data
    in EEPROM will be Reset.
      Wait : 5
    Release if you don t accept
  
```

Figure 7-3

If the button is released before the count-down expires, the start-up sequence goes on in the standard way.

If the button is pushed till the end of the wait time, the EEPROM is stored with a set of default values.

```

      !!! Attention !!!
      EEPROM ERROR
      Rel.SW. Modified

    Push Encoder .....
  
```

Figure 7-4

After pushing the button, the message shown in Fig. 7-5 is displayed for some seconds, after which the software goes on running in the standard way.

```

      CCIR
      INIT EPROM
      Please wait..
  
```

Figure 7-5



ATTENTION: We strongly suggest not to force the EEPROM re-initialization except in case of real necessity, since this involve the loss of the user configuration.

7.2 Main cycle

The menu system of the PTX-LCD can be broken up in a default menu and a set of administration menus.

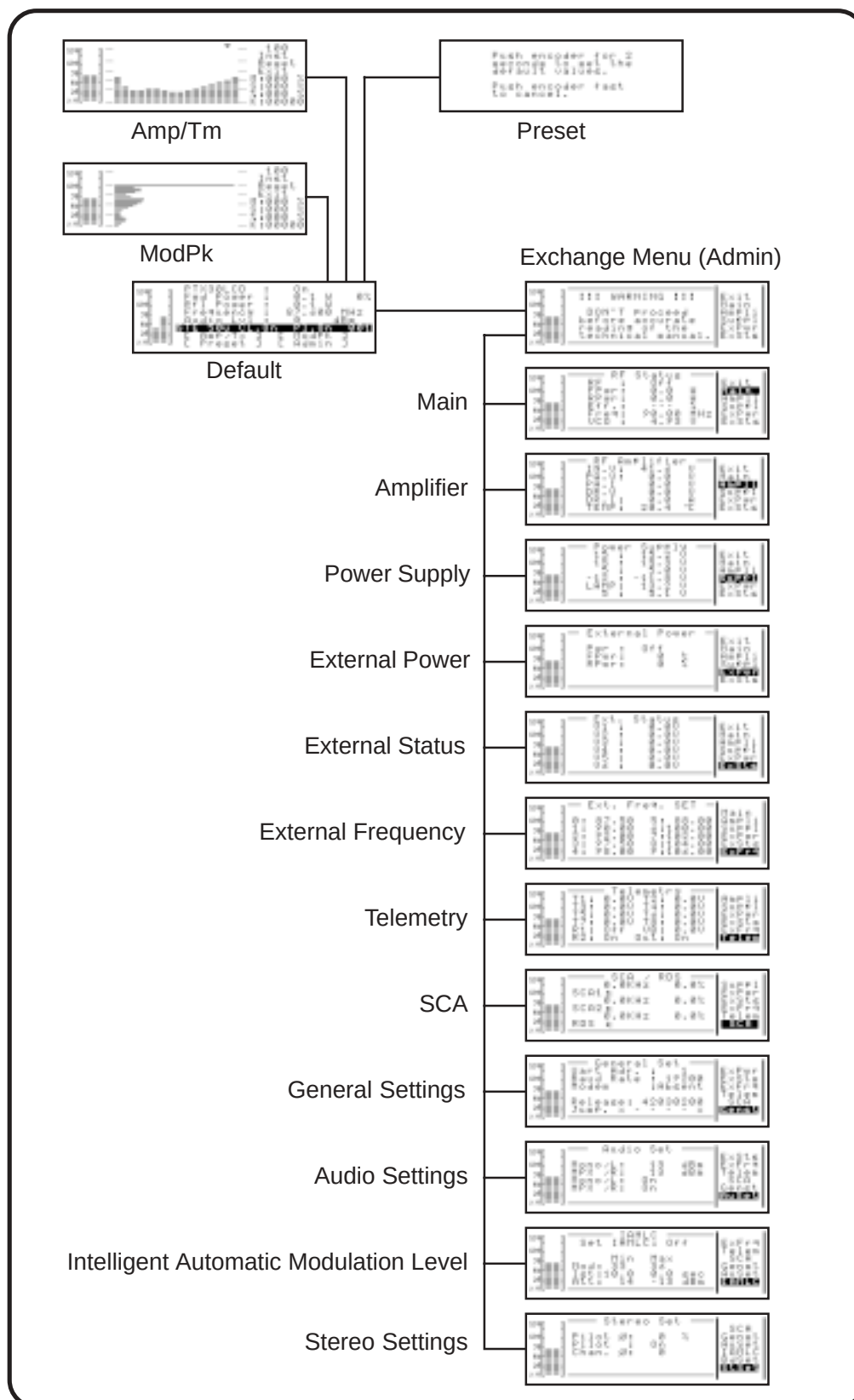


Figure 7-6

Figure 7-6 depicts the overall flow-chart of the menu system.

7.2.1 Default menu

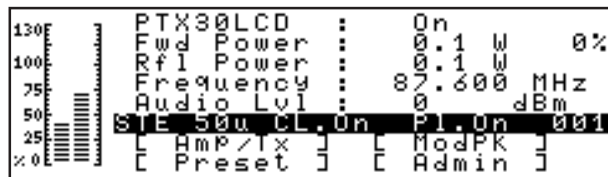


Figure 7-7

To work on a menu item, turn the encoder to select it and then push the encoder. Depending on the item, it could be possible that a new window is opened or that it will be possible to directly modify the parameter.

- **PTX30LCD**

Activation (On) / deactivation (Off) of RF output power.

- **Fwd Power**

Output power reading and setting. The power reading is expressed in Watt, while the setting is expressed as percentage of the maximum output power. Pushing the encoder when the cursor is on this item will put you through the menu that permits to modify the power setting.

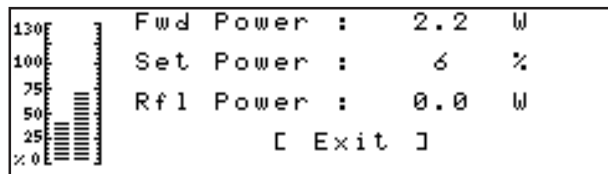


Figure 7-8

- **Rfl Power**

Reflected power reading in watt

- **Frequency**

Reading and setting of the working frequency. Pushing the encoder while the cursor is on this item, will put you through the menu that permits to modify the frequency setting.

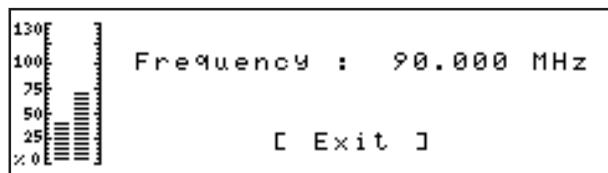


Figure 7-9

After choosing a new frequency value, the management software will ask you to confirm it (Are you shure? Yes/No). After confirmation pushing the encoder on the choice Yes, the exciter unlocks from the current frequency (the unlock LED is lit) and then locks again on the new frequency.

- **Audio Lvl**

Reading and setting of the audio input level. The reported value indicates the audio level that generates 100% modulation. Pushing the encoder while the cursor is on this item, will put you through the menu that permits to modify the audio input level setting.

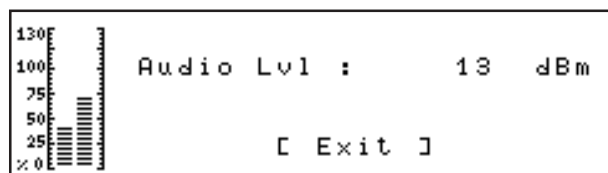


Figure 7-10

The level can be changed between -13 and +14 dBm, at 1 dB steps. On the back of the exciter there are the trimmers to perform fine regulations of the input levels.

- **STE 50u CL.On Pl.On 001**

This “status bar” reports some settings that can be modified in the administration menus and that will be described in the following of this manual.

Ste Audio setting: Stereo/Mono/MPX_U/MPX_B

50u Preemphasys: 0, 25, 50, 75 microsec

CL “Clipper” function, activated (On) or deactivated (Off)

Pl Pilot tone included (On) or excluded (Off)

001 this machine’s address, comprised between 001 and 256, that is meaningful when the exciter is included in a telemetrized transmission system.

- **[Amp/Tm]**

Selecting this menu item you will be presented with the menu of time anlaysis of modulation level.

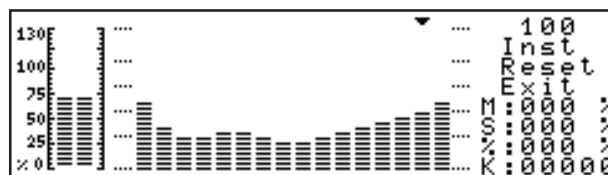


Figure 7-11

100 sampling time of the graphic, selectable out of 100,500 or 1000 millisec; the indicator in the higher part of the display notes the cycle starting point.
Each bar corresponds to the modulation level in an interval long as the sampling time

INST Visualization method: instantaneous (INST) or average on 300 samples. In instantaneous mode, only the graphic visualization is active. In "300" mode, at the end of the analysis (300 x sample time) the values M, S, % and K will be displayed

M Percent value of the mean modulation during the analysis

S Part of the modulation surpassing 100%

% Percentage of modulation peaks on the 300 samples

K S times %

RESET Pushing the encoder on this item will refresh the graphic

EXIT Pushing the encoder on this item will return you to the default menu

• [ModPk]

Selecting this item of the default menu and pushing the encoder will present you the peak modulation analysis menu.

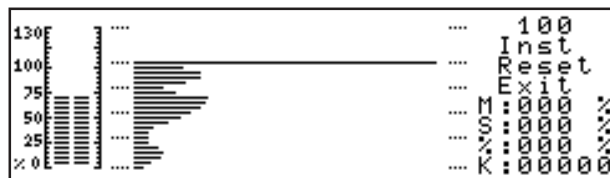


Figure 7-12

This graphic gives a visualization of the distribution of peak modulation levels. With this graphic, you can get a good idea of the modulation level reached during the working time.

Each horizontal bar corresponds to the fraction of the time in which the modulation had that percent value. The percent value can be read on the meter bar on the left of the graph.

100 sampling time of the graphic, selectable out of 100,500 or 1000 millisec.

INST Visualization method: instantaneous (INST) or average on 300 samples. In instantaneous mode, only the graphic visualization is active. In "300" mode, at the end of the analysis (300 x sample time) the values M, S, % and K will be displayed

M Percent value of the mean modulation during the analysis

S Part of the modulation surpassing 100%

% Percentage of modulation peaks on the 300 samples

K S times %

RESET Pushing the encoder on this item will refresh the graphic

EXIT Pushing the encoder on this item will return you to the default menu

- [**Preset**]

Selecting this menu item and pushing the encoder you will access the window that permits to reset the exciter to the factory settings.

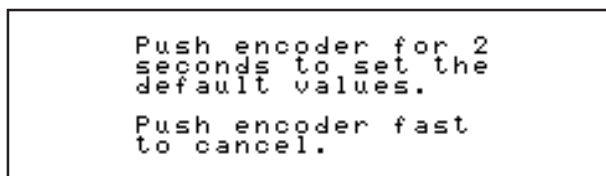


Figure 7-13

As indicated by the window text, keeping the encoder pressed for two seconds will reset the exciter and a start-up procedure analogous to that performed at switch-on will follow. The preset values are the same used for EEPROM re-initialization (see chapter 7.1.2 and chapter 9), except for the working frequency, that remains set as the current one.

If you want to skip the menu, just briefly push the encoder.

- [**Admin**]

Selecting this menu item and pushing the encoder will visualize the window that permits to access all the administration menus.

7.2.2 Administration menu

This menu is divided in 13 submenus (12 for the MONO/MPX version of the PTX-LCD)

The window displayed to the user as soon as he entered in this menu warns to proceed only after reading the technical manual:



Figure 7-14

The windows of the administration menu are subdivided in three parts.

- on the left, the bar indicator shows the instantaneous modulation level
- the central part displays the submenu content, that can be just informative or modifiable depending on the menu
- the right part is a navigation bar permitting the user to go from a submenu to the other

Turning the encoder, the cursor moves over the indicators of the different submenus, while in the central part of the window their contents is displayed in turn.

If you push the encoder while the cursor is on the name of a submenu, and if this one contains modifiable parameters, the cursors enters in the central part of the window, permitting to edit those modifiable parameters.

Each of the menus of this kind contains an "EXIT" item: pushing the encoder while the cursor is on "EXIT" will put you back in navigation mode.

7.2.2.1 Main

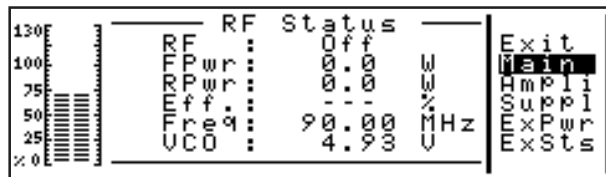


Figure 7-15

- RF Activation (On) / deactivation of RF power output
- FPwr Reading and setting of the output power. The power reading is expressed in Watts, the setting value in % of the maximum power. If one pushes the encoder when the cursor is on this item, the measuring unit changes from "W" to "%", and turning the encoder he will be able to set the desired value. Pushing the encoder again will store the new setting.
- RFPwr Reflected power reading in Watts
- Eff Efficiency of the amplifier in %
- Freq Working frequency. Pushing the encoder when the cursor is on this item will give the possibility to change the working frequency turning the encoder. Please note that when the encoder will be pushed to store the new frequency, the software will ask for its confirmation("Are you sure?"). If you select "Yes" and push the encoder, the new frequency will be set, while pushing the encoder on "No" it will be aborted.
- VCO Control voltage applied to VCO in Volt

7.2.2.2 Ampli

This menu is for information only, no value can be modied, since they show current, voltage and temperature af the amplifier section

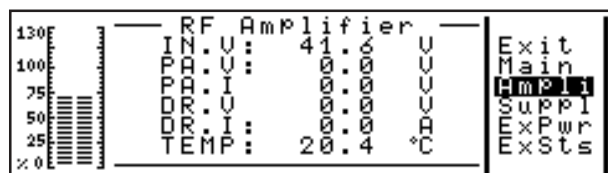


Figure 7-16

- IN . V Input voltage to the power supply
- PA . V Voltage of the final stage of the amplifier
- PA . I Current of the final stage of the amplifier
- DR . V Voltage of the driver stage of the amplifier
- DR . I Current of the driver stage of the amplifier
- TEMP temperature of the amplifier.

7.2.2.3 Suppl

This menu is for information only; it displays to the user the different voltages produced by the power supply:

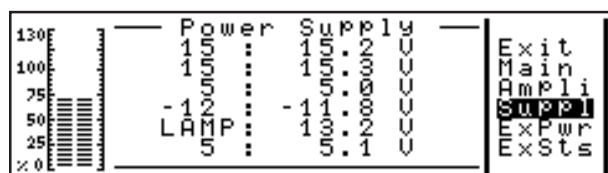


Figure 7-17

- +15 general supply voltage of the circuits audio, pll, coder; it is reduced to 8 V on the main audio board.
- +15 supply voltage of the CPU panel
- +5 power supply's digital circuits voltage
- 12 general negative supply voltage
- LAMP supply voltage of the display lamp, typical 13 V
- +5 CPU supply voltage

7.2.2.4 ExPwr

External amplifier control menu

This menu can be available or not depending on the jumpers configuration (see 11.7.1).

The use of this menu requires the presence of a power amplifier with suitable characteristics (it has to be activable and deactivable opening a contact, and it has to give back the readings of the forward and reflected power as a couple of voltage proportional to those values).

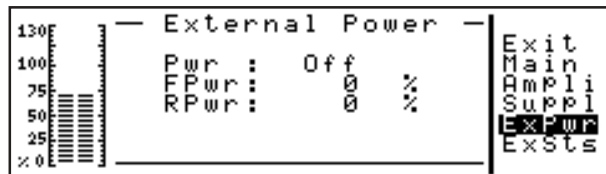


Figure 7-18

PWR status indicator, related to the status of PTX-LCD (MAIN menu)

FPWR forward power of the amplifier, percentage

RPWR reflected power of the amplifier, percentage

7.2.2.5 ExSts

This menu monitors the input voltages on the telemetry connectors.

This menu can be available or not depending on the jumpers configuration (see 11.7.1).

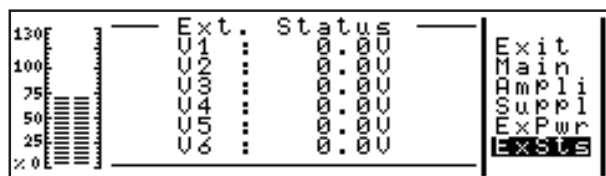


Figure 7-19

V1 Voltage on pin 6 of the Telemetry connector (5 V max.)

V2 Voltage on pin 13 of the Telemetry connector (5 V max.)

V3 Voltage on pin 5 of the Telemetry connector (5 V max.)

V4 Voltage on pin 12 of the Telemetry connector (5 V max.)

V5 Voltage on pin 4 of the Telemetry connector (5 V max.)

V6 Voltage on pin 11 of the Telemetry connector (5 V max.)

7.2.2.6 ExFrq

This menu is used to set the alternative frequencies that shall be used when the exciter is used as backup in a N+1 system.

This menu can be available or not depending on the jumpers configuration (see 11.7.1).

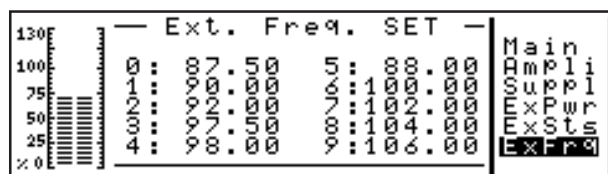


Figure 7-20

- 0 default frequency
- 1 - 6 transmitters 1-6 working frequencies
- 7 - 9 reserved

7.2.2.7 Telem

This menu, that is always activated, shows the status of the optional telemetry board.

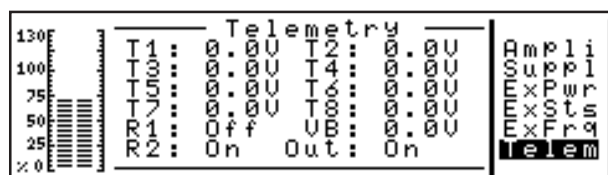


Figure 7-21

If the optional board is not present, the displayed values are not applicable. If the board is there (the DB 25 connector on the rear panel is also present) the meaning of the different fields is the following:

- T1 voltage on pin **9** of the telemetry card connector
- T2 voltage on pin **22** of the telemetry card connector
- T3 voltage on pin **10** of the telemetry card connector
- T4 voltage on pin **23** of the telemetry card connector
- T5 voltage on pin **11** of the telemetry card connector
- T6 voltage on pin **24** of the telemetry card connector
- T7 voltage on pin **12** of the telemetry card connector
- T8 voltage on pin **25** of the telemetry card connector

R1	activation/deactivation of relay 1
R2	activation/deactivation of relay 2
VB	battery supply voltage (only with option 24 volts).
OUT	open collector service output

7.2.2.8 SCA

In this menu one can read the modulation level due to SCA and RDS input

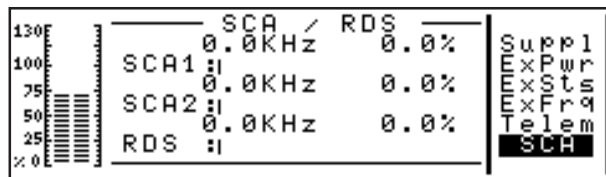


Figure 7-22

In the PTX-LCD there are three input connectors for subcarrier signals, called SCA1, SCA2 and RDS. This menu displays the modulation levels (percentage and kHz) for each of them

7.2.2.9 GenSt

General settings menu

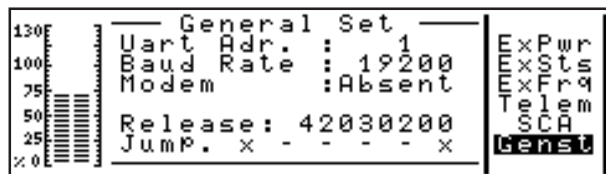


Figure 7-23

Uart Adr

address (serial port and IIC protocol) of this device, selectable between 1 and 200. If the exciter is not networked in a transmission system, this value shall be set to 1

Baud Rate

Baud rate of the serial port

MODEM

Configures the PTX-LCD for the use of a modem (present) or for direct cable connection

JUMP

Shows the jumpers setting. The symbol X means that a jumper is closed, the symbol - indicates it's open. For the meaning of the jumpers setting see chapter 10.7.1.

7.2.2.10 Auset

Audio settings: channels activation and level adjusting.

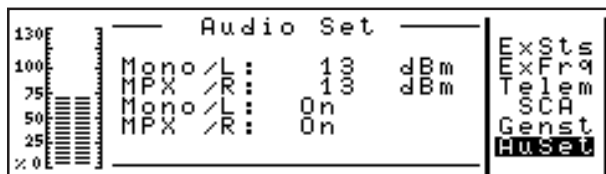


Figure 7-24

MONO/L audio level setting for the MONO input channel (left for the stereo version). It can be set with 1 dB steps between -13 and +14 dBm. If this parameter is set to X dBm, the exciter generates 75 kHz modulation for X dBm input

MPX/R audio level setting for the MONO input channel (left for the stereo version). It can be set with 1 dB steps between -13 and +14 dBm.. The meaning is the same of MONO/L

MONO/L software switch to activate/deactivate the MONO channel (left for the stereo version)

MPX/R software switch to activate/deactivate the MPX channel (right for the stereo version)

When the exciter is in STEREO mode (BdSet menu), the levels on both channels are forced to the same value

7.2.2.11 IAMLC

Intelligent Automatic Modulation Level Control.

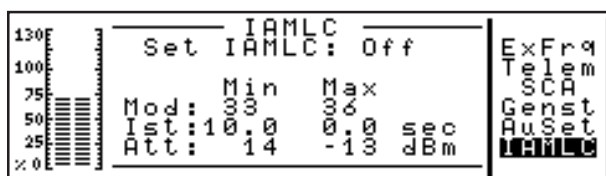


Figure 7-25

The IAMLC functionality provided by PTX-LCD adjusts the modulation level by adaptation of the input level, without the use of limitation or compression.

When the average modulation level surpasses the maximum threshold for a time interval exceeding the maximum hysteresis time that has been set, the input level is attenuated by 1 dB. In the same way, when the average modulation level goes below the minimum threshold for a time interval exceeding the minimum hysteresis time that has been set, the input level is increased by 1 dB.

Both the attenuation and the increase that IAMLC is allowed to introduce, have limits that can be set by the user.

The elements of this menu are the following:

IAMLC	Enable or disable the function
Mod	Minimum and maximum thresholds for the intervention of IAMLC
Ist	Intervention time related to the minimum and maximum thresholds
Att	Maximum attenuation and increase IAMLC is allowed to introduce

The following table suggests the settings of this function for different kinds of radio programs

Radio Program	Mod Min	Mod Max	Ist Min	Ist Max	Att Min	Att Max
Dance	75 %	100 %	10 s	1 s	-3 dBm	+6 dBm
Pop, rock	30 %	100 %	20 s	0,5 s	-3 dBm	+6 dBm
Electronic	50 %	100 %	10 s	1,5 s	-3 dBm	+3 dBm
Jazz	40 %	100 %	5 s	0,5 s	-3 dBm	+6 dBm
Classical	20 %	92 %	30 s	0,5 s	-4 dBm	+10 dBm
Talk show	40 %	85 %	30 s	1 s	-3 dBm	+14 dBm

The best results with this function will be obtained investing some time in experimentation with your own radio programs:

- use the man MODPK to check your average modulation level. Adjust the input level from the main menu so that the average modulation level is the nearest to 100%.
- Set the IAMLC parameters as suggested by the table, and adjust them so that the function is not activated too often. Consider the fact that the intervention of the function stops when the average modulation level goes between the minimum and maximum thresholds.
- The use of the clipper circuit (BdSet menu) helps in the limitation of the modulation peaks above 100%, though introducing a certain amount of distortion. Think about your possible need for this function, depending on your radio program. it aiuta a limitare i picchi superiori al 100 % di modulazione, introducendo però una certa quantità di distorsione. Valutare la necessità di questo limitatore in funzione del proprio programma musicale.

Figure 7.26 shows an example of modulation level evolution when the IAMLC function is activated.

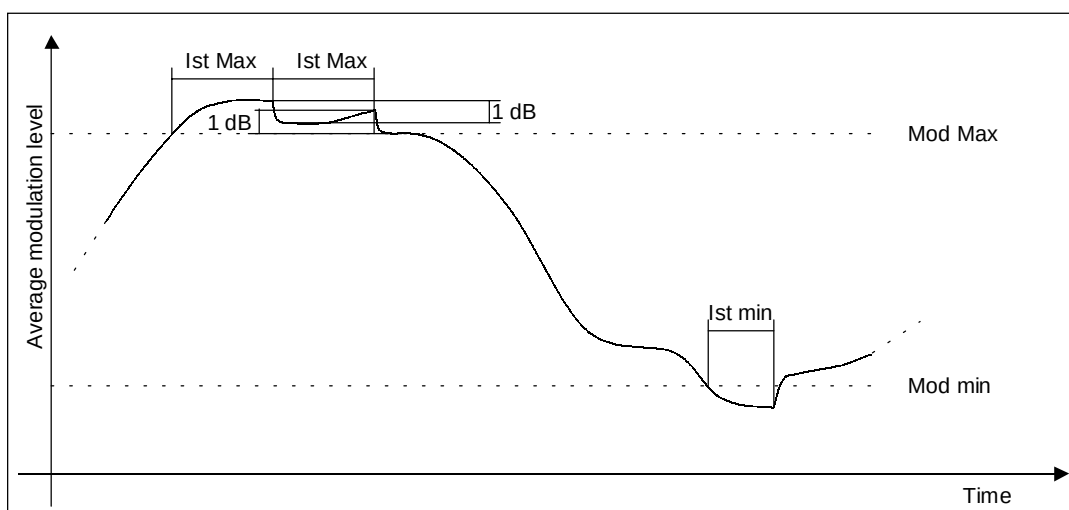


Figure 7-26

7.2.2.12 BdSet

Modulation type configuration

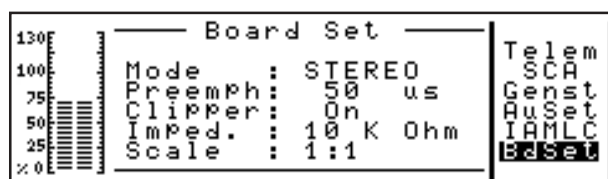


Figure 7-27

- Mode** transmission mode selector: MONO, MPX_U (MPX unbalanced BNC input), MBX_B (MPX balanced XLR input), STEREO. The latter option is active only for stereo machines.
- Preemph** Preemphasys setting, 0, 25, 50 o 75 ms. Preemphasys works on the Right and Left channels in stereo mode and on mono input. MPX input are not touched by this setting.
- Clipper** Activation/deactivation of the modulation limiter. It limits the modulation to 81.5 kHz for input signals 6 dB above the reference input level
- Imped** Balanced audio input impedance, selectable between 600 or 10k Ohm.
- Scale** Graphic scale of the VU meter. It can be set to 1:1 (normal visualization) or 1:10 (multiplied by 10, useful when low modulation levels have to be measured)

7.2.2.13 StSet

Stereo coder board configuratio menu (available if the stereo option is installed)

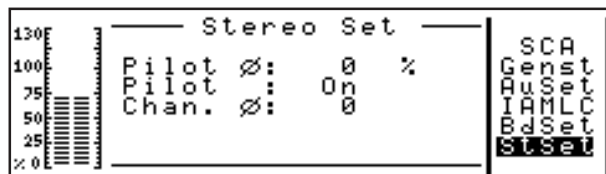


Figure 7-8

Pilot0 Pilot tone phase (not available)

Pilot Activation/deactivation of the pilot tone (can be useful for certain measurements)

Chan0 Phase of the right channel; it can be set to 0 or 180 (signal mirroring, useful for example to measure the “Sub to Main” parameter)

8. Technical Specifications

8.1 Mechanical Specifications

Panel size	483 mm (19") x 88 mm (3 1/2") (2 HE)
Depth	344 mm (26 1/2")
Weight	PTX30 13 Kg
	PTX60 15.5 Kg
	PTX100 15.5 Kg
Temperature range	-10 °C ÷ 50 °C

8.2 Electrical Specifications

General

RF output power	PTX30LCD: 0-30 W adjustable
	PTX60LCD: 0-60 W adjustable
	PTX100LCD: 0-100 W adjustable
RF output connector	type "N"
RF output impedance	50 Ohm
Frequency range	87.5 MHz ÷ 108 MHz
Frequency setting	direct, via software
Frequency stability	±1ppm from -10°C to 50°C
Modulation type	Direct carrier modulation
Soppressione di spurie e armoniche	meets or exceeds FCC e CCIR rules (typical 85 dB)
Modulation capability	meets or exceeds FCC e CCIR rules (typical 240kHz MPX or Mono, 210 KHz Stereo)
Residual async AM	-70 dB or less wrt. 100% AM, no deemphasys
Residual sync AM	-60 dB or less wrt 100% AM, 75 kHz FM at 400Hz, no deemphasys
Intermodulation distortion	Less than 0.1% (typ. 0.05%) measured with a 3.18KHz square wave, 15KHz sinusoidal wave and 100% modulation
Power supply	110÷130 V, 50÷60 Hz 198÷250 V, 50÷60 Hz
Power consumption	PTX30LCD 120 VA ca.
	PTX60LCD 200 VA ca.
	PTX100LCD 300 VA ca.

Input

Left/Mono and Right/MPX	Type XLR female, balanced or unbalanced
MPX	Type BNC, unbalanced
Input impedance	10 KOhm or 600 Ohm, software selectable
Input level	-13 dBm ÷ +14 dBm software adjustable in 1 dB steps, fine adjusting with trimmers
Preemphasys	selectable: 0
	25 us
	50 us (CCIR)
	75 us (FCC)
SCA/RDS input	3 BNC connectors, unbalanced
SCA input impedance	10 KOhm

SCA input level	-20 dBm ÷ +10 dBm, trimmer adjustable
SCA amplitude-frequency response	± 0.2 dB, from 40 KHz to 100 KHz
Crosstalk from subcarrier 67KHz on main or stereo channel	65 dB
Crosstalk from subcarrier 92KHz on main or stereo channels	70 dB

Output

MPX monitor:	0 dBm for FM 75KHz minimum load 600 Ohm
Pilota tone 19 KHz	1 Vpp minimum load 4.7 KOhm
RF Test	-30 dB wrt RF 50 Ohm impedance

MONO operation

FM S/N	> 82dB (90 dB typical) wrt 75KHz measured in 20 Hz ÷ 20 KHz band with 50 us deemphasys, RMS detector
Amplitude/frequency response	± 0.5 dB, 20Hz ÷ 15Khz
Total Harmonic Distortion (THD)	< 0.02%
Intermodulation ditortion	< 0.02% measured with 1 KHz and 1.3 KHz tones, 1:1, 75 kHz modulation

MPX operation

Composite FM S/N	> 82dB (90 dB typical) wrt 75 kHz measured in 20 Hz ÷ 100 kHz band with 50 us deemphasys, RMS detector
MPX frequency/amplitude response	± 0.05 dB, 20 Hz ÷ 53 KHz ± 0.2 dB, 53 KHz ÷ 100 KHz
MPX THD	< 0.02%
Intermodulation distortion	< 0.02% measured with 1 kHz e 1.3 kHz tones, 1:1, 75 kHz FM
Stereo separation	> 50 dB (typical 60dB)

Stereo Operation

Stereo FM S/N	> 82dB (90 dB typical) wrt 75 kHz measured in 20 Hz ÷ 100 kHz band with 50 us deemphasys, RMS detector
Audio amplitude/frequency response	± 0.5 dB, 20 Hz ÷ 15 KHz
Total Harmonic distortion	< 0.03%
Intermodulation distortion	< 0.03%, measured with 1 KHz and 1.3 KHz tones, 1:1, 75 kHz modulation
Stereo separation	> 50 dB (typical 60 dB)

Remote connections

Remote connector	DB15 female; includes: FWD and RFL input for external AGC 6 digital/analog input 2 relay output
Interlock	BNC type, for power output deactivation
I2C interface	

Serial interface	DB9 female RS232, DTE or DCE selectable RS485 (Optional) DTE or DCE selectable
Optional telemetry board	DB25 female 8 analog/digital input 2 digital output 1 I ² C serial interface

Options

/03	External 24V battery
/08	Telemetry interface
/AUDIOINP-DIG	Digital audio input interface

AUDIOINP-DIG

D/A converter	24 bit
Sampling frequency	From 32 to 96 KHz
Data formats	S/PDIF, AES/EBU, IEC958 and EIAJ CP340/1201
Digital inputs	1 Unbalanced for coaxial cable with PIN/RCA connector (S/PDIF) 1 TOSLINK fiber optic 1 XLR balanced female connector (AES/EBU)
Emergency switch	3.5mm JACK; shorted to ground forces the selection of analog input

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9. Factory settings

Each time a working parameter of PTX-LCD is changed by the user, the new value is stored in the working configuration and saved in a non volatile memory. In this way, at switch-on the exciter is configured exactly as it was when it was last switched off.

When shipped, the exciter can be configure at customer's requests (for example if it is part of a transmission system with working frequency and modes specified in the order), or it can have a default configuration.

The default configuration of the PTX-LCD is determined by the setting of a group of internal jumpers. At start-up, the name of the default configuration is shown on the display of the device (see 7.1).

The possible configurations are the following:

CCIR

Parameter	Menu	Value
Power output	Default	On
Minimum frequency	/	87.5 MHz
Maximum frequency	/	108.0 MHz
Frequency steps	/	10 kHz
Preset frequencies	Admin-ExFrq	87.5, 90.0, 92.0, 94.0, 96.0, 98.0, 100.0, 102.0, 104.0, 106.0 MHz
Power	Default	0 %
Input level Mono/L	Admin->AuSet->Mono/L	X dBm 0 dBm
Input level MPX/R	Admin->AuSet->MPX/R	X dBm 0 dBm
Input status Mono/L	Admin->AuSet->Mono/L	On
Input status MPX/R	Admin->AuSet->MPX/R	On
Preemphasys	Admin->BdSet->Preenph	50 μ s
Clipper	Admin->BdSet->Clipper	Off
Audio Mode	Admin->BdSet->Mode	Stereo (If stereocoder present) MPX (If stereocoder not present)
Pilot Tone	Admin->StSet->Pilot	On (If stereocoder present)
Phase shif between channels	Admin->StSet->Chan	0 (If stereocoder present)

FCC

Configuration as CCIR, with:

Parameter	Menu	Value
Preemphasys	Admin->BdSet->Preenph	75 μ s
Audio Mode	Admin->BdSet->Mode	Stereo (If stereo coder present) Mono (If stereo coder not present)

OIRT

Configuration as CCIR, with:

Parameter	Menu	Value
Minimum frequency	/	66.0 MHz
Maximum frequency	/	74.0 MHz
Preset frequencies	Admin-ExFrq	66.0, 67.00, 68.00, 68.00, 69.00, 70.00, 71.00, 72.00, 73.00, 74.00 MHz
Audio mode	Admin->BdSet->Mode	Stereo (If stereo coder present) Mono (If stereo coder present)

JAPAN

Configuration as CCIR, with:

Parameter	Menu	Value
Minimum frequency	/	76.0 MHz
Maximum frequency	/	90.0 MHz
Preset frequencies	Admin-ExFrq	76.0, 78.0, 80.0, 82.0, 83.0, 84.0, 85.0, 86.0, 88.0, 90.0 MHz
Modo di funzionamento	Admin->BdSet->Mode	Stereo (If stereo coder present) Mono (If stereo coder not present)

ITALIA

Configuration as CCIR, with:

Parameter	Menu	Value
Minimum frequency	/	87.6 MHz
Maximum frequency	/	107.9 MHz
Frequency step	/	100 kHz
Preset frequencies	Admin-ExFrq	87.6, 90.0, 92.0, 94.0, 96.0, 98.0, 100.0, 102.0, 104.0, 106.0 MHz
Clipper	Admin->BdSet->Preenph	On
Modo di funzionamento	Admin->BdSet->Mode	Stereo (If stereo coder present) Mono (If stereo coder not present)

C.S.I

Configuration as CCIR, with:

Parameter	Menu	Value
Minimum frequency	/	100.0 MHz
Maximum frequency	/	108.0 MHz
Preset frequencies	Admin-ExFrq	100.0, 100.5, 100.1, 101.5, 102.0, 103.0, 104.0, 105.0, 106.0, 108.0 MHz

10. Identification and access to the modules

10.1 Modules identification

Figure 10-1 shows the upper view of the internal of the exciter. The components are described below.

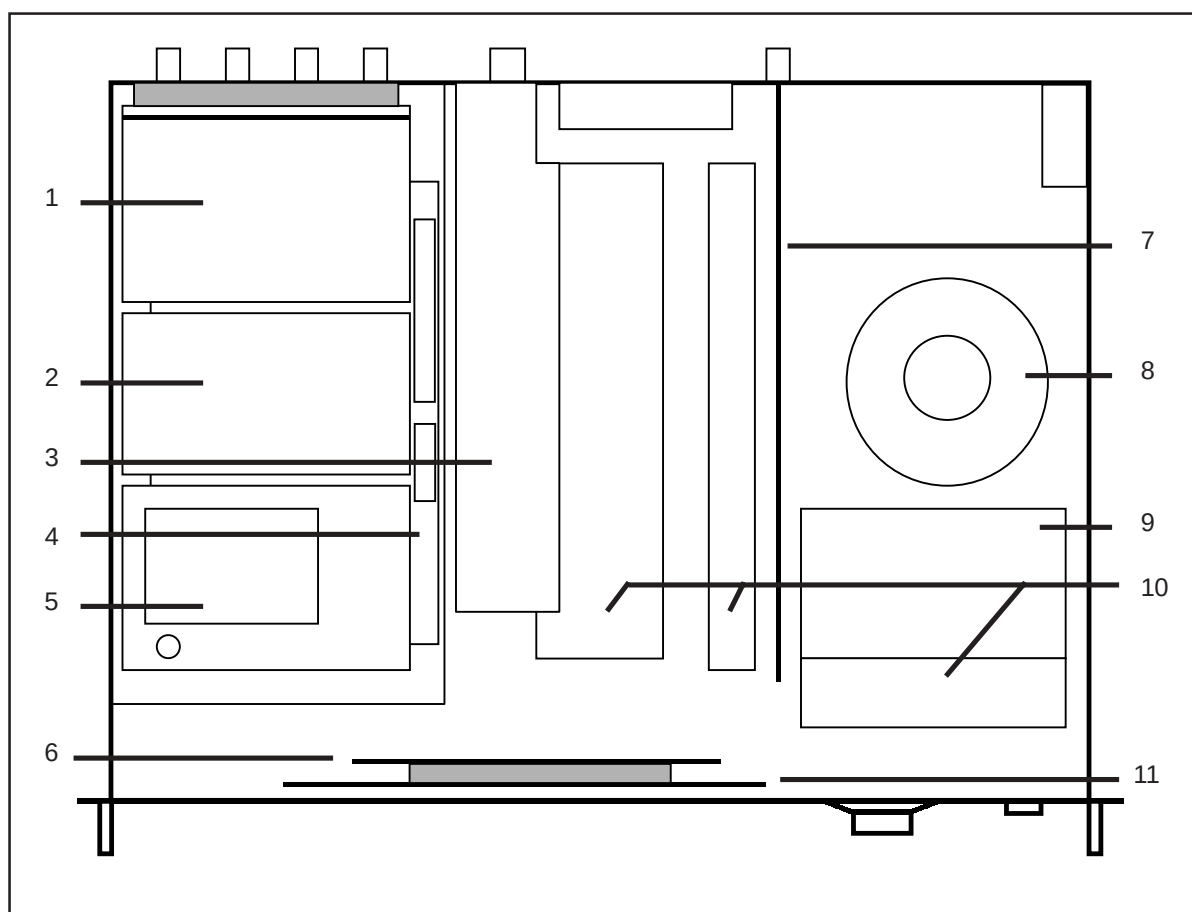


Figure 10-1

- [1] Audio input board
- [2] Stereo coder or mono board
- [3] RF power amplifier
- [4] Audio mother board
- [5] PLL & VCO board
- [6] CPU board
- [7] Power supply
- [8] Transformer
- [9] Switching power supply
- [10] Heatsink
- [11] Panel board - display

10.2 Access to the modules



ATTENTION: opening the device, points with dangerous voltages and currents are exposed. Always disconnect the mains supply before removing the covers or taking away any part of the piece of equipment.

Remove all the screws on the upper cover of the exciter. After taking away the cover, identify with the help of figure 10-1, the components of the exciter.

To remove the coder boards (stereo and mono) and PLL, it is sufficient to remove the nuts that fix them to their hexagonal supports. Note that in the lower parts of both boards there are strip line connectors that are plugged into the audio motherboard.

To remove the input audio board (that is united with the audio connector board and the right part of the rear panel of the exciter), unscrew the four nuts that fix the board to the hex supports on the audio mother board.ore), the five screws on the rear panel (figure 10-2) and the three screws in the bottom part that fix the support of the connectors.

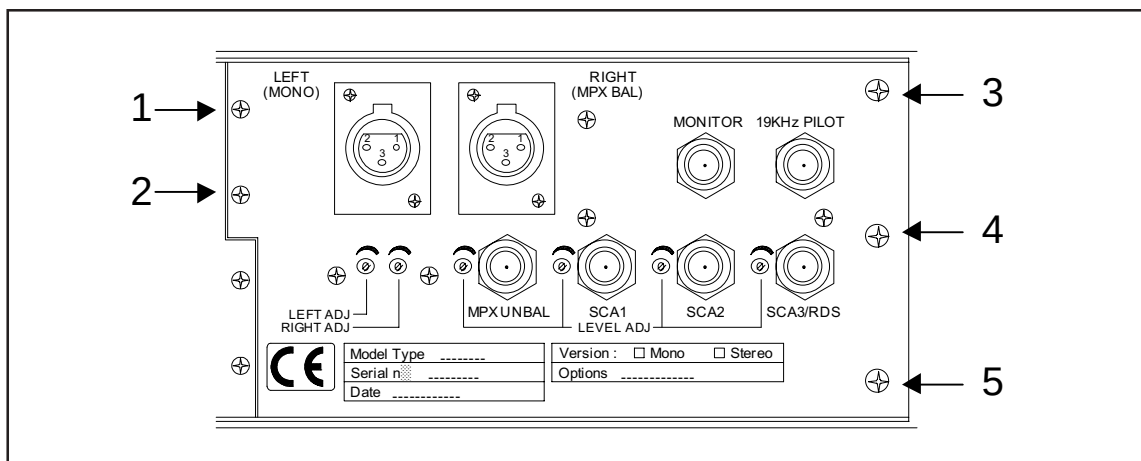


Figure 10-2

The RF power amplifier, joined to its heatsink, is kept in place by three screw on the bottom of the exciter. The screws are fastened in the heatsink, and it's sufficient to remove them to release the amplifier.

To remove the power supply and the switching power supply, the same procedure has to be followed, i.e. the screws that fix the heatsinks to the bottom of the machine have to be removed. Note that the interlock connector, soldered to the power supply, is fixed to the rear panel with a nut that has to be removed to release the power supply.

Finally, the panel board and the CPU board are simply fixed to hex supports on the front panels with nuts. To remove these boards, we suggest to release the front panel of the exciter from the chassis.

11 Working principles

Figure 11-1 gives an overview of modules and connections composing the PTX-LCD.

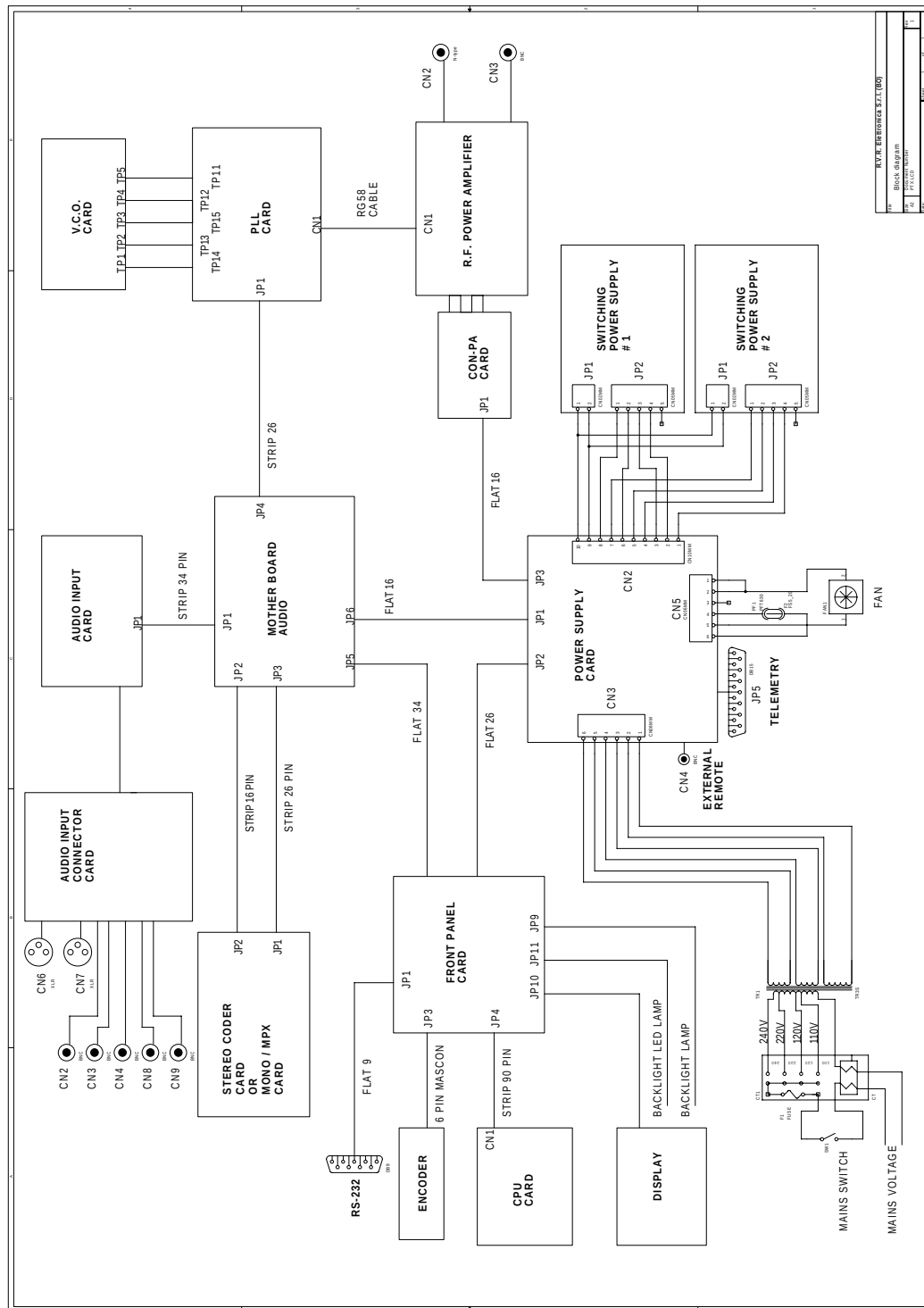


Figure 11-1

In the following you will find a short description of the functionalities of each module.

11.1 Power supply

The power supply is composed of two sections.

The first one is dedicated to the finale amplifier. It is a switch mode power supply fastened to a heat sink (Fig. 10-1 9). In the 30 W version, there is a second switching power supply of the same kind under the first one.

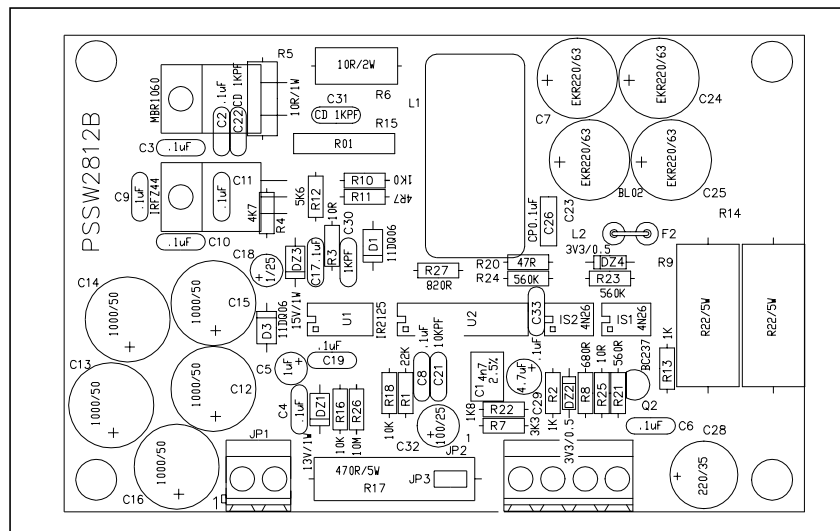


Figure 11-2

The second section (Fig. 11-3) is the board fixed to a heatsink in the central part of the exciter (Fig 10-1 7). This board contains the power supply for the different boards of the exciter (audio, CPU, ...), the section that manages the analog input from the "Remote" connector and the Automatic Gain Control for the output power level management.

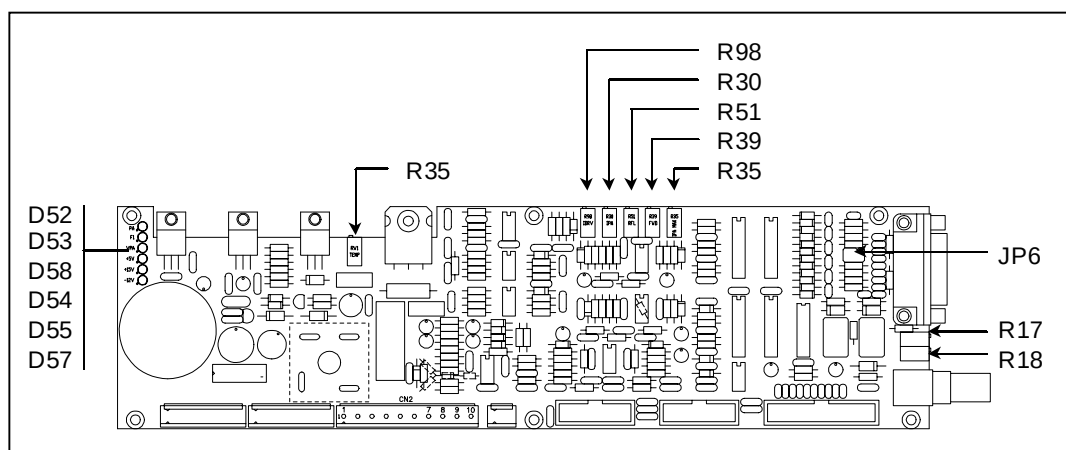


Figure 11-3

11.1.1 Adjustings, settings and indicators

The switching mode power supply doesn't need any adjusting, while the power supply board features a number of indicators and adjustable components.

D52	lit: fault of the power amplifier fuse
D53	lit: fault of PF1 fuse
D54	lit: voltage +5V OK
D55	lit: voltage +15V OK
D57	lit: voltage -12V OK
D58	lit: power amplifier power supply OK
RV1	adjustment of the temperature sensor
R17	adjustment of the level for external AGC
R18	adjustment of the level for external AGC
R30	adjustment of the measurement of PA current
R35	adjustment of the maximum PA current
R39	adjustment of the measurement of forward power
R51	adjustment of the measurement of reflected power
R98	adjustment of the measurement of driver stage current
JP6	1-3, 2-4 the Remote connector pins are used as analog input 3-5, 4-6 the Remote connector pins are used for I ² C communication

11.2 Audio motherboard

This board (Fig 11-4) is the interface between the audio section boards and the PLL with the other modules of the exciter. The audio motherboard is in the lower left part of the exciter (Fig. 10-1 4). It contains the connectors on which the other boards are directly plugged in.

This module also contains the circuit mixing MPX signals and SCA/RDS subcarriers.

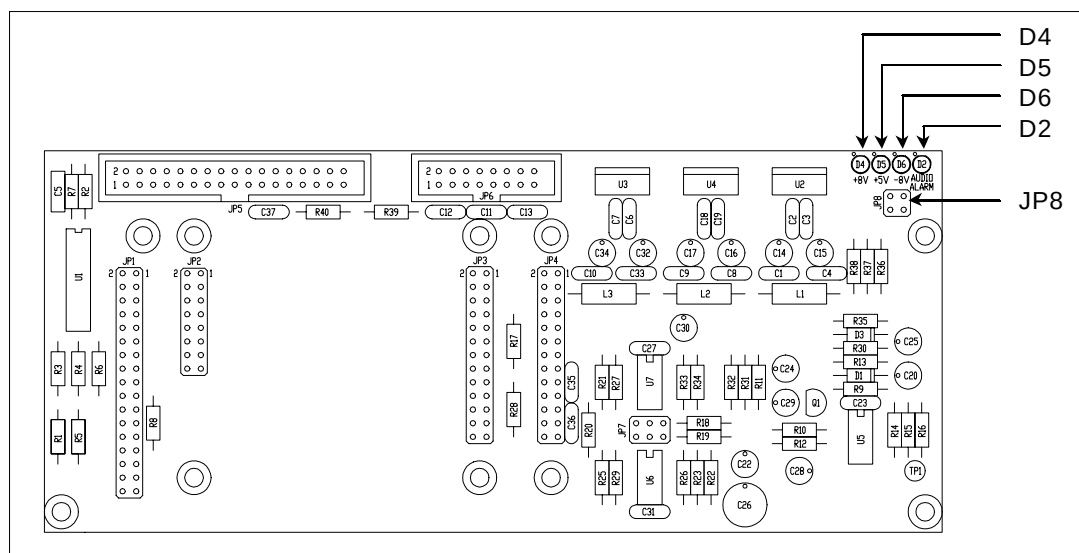


Figure 11-4

11.2.1 Adjustments, settings and indicators

D2	lit: no audio
D4	lit: supply voltage OK
D5	lit: supply voltage OK
D6	lit: supply voltage OK
JP8	factory setting, please don't change

11.3 Audio input

The audio input section is on the rear part of the exciter and is directly connected to the audio motherboard using a strip-line connector. It is composed of two boards coupled in a L shape and fastened to the part of the rear panel that hosts the audio connectors.

The first board (Fig. 11-5) contains the trimmers to adjust the levels and the filters for each input channel. The second board (Fig. 11-6) contains the level regulations and the switches for the software-based audio configuration.

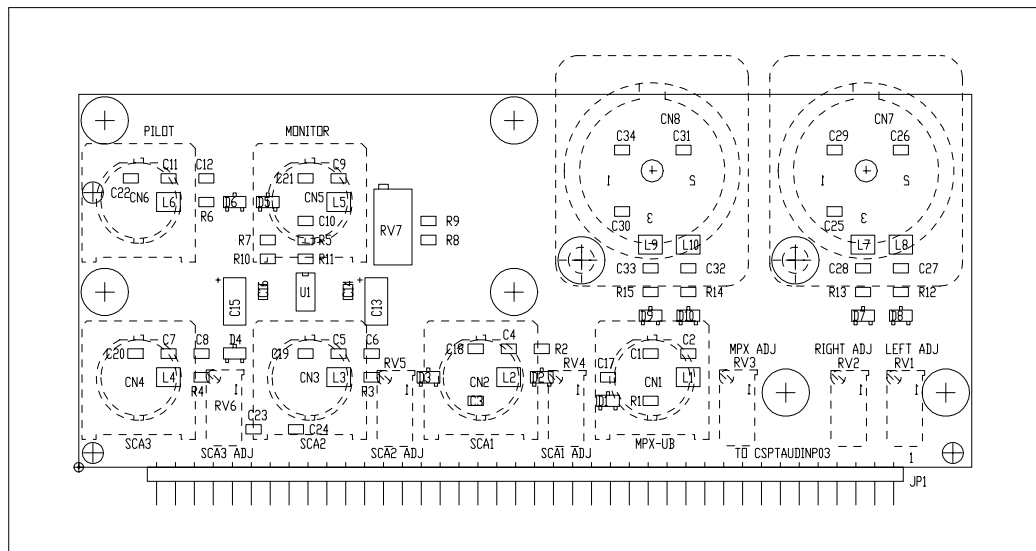


Figure 11-5

After the necessary processing (filtering, level regulation, selection), the audio input section passes the signals to the audio motherboard that route them to the coder card.

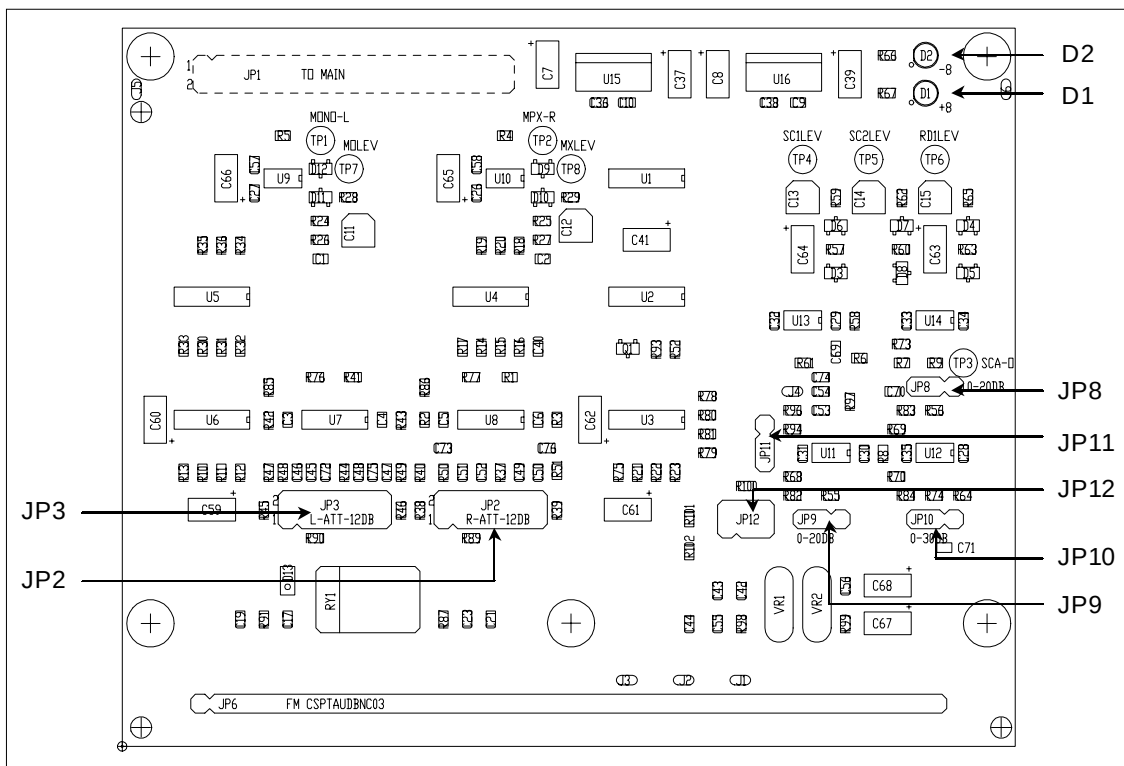


Figura 11-6

11.3.1 Adjustments, settings and indicators

- D2 On: negative power supply voltage present
- D1 On: positive power supply voltage present
- JP3 3-5, 4-6, 9-11, 10-12 no attenuation con channel L
1-3, 2-4, 7-9, 8-10 12 dB attenuation on channel L
- JP2 as JP3, for channel R
- JP8 1-2 no gain on channel SCA2, 2-3 20 dB gain
- JP11 1-2 input impedance for channel MPX_U 50 Ohm, 2-3 10 kOhm
- JP10 1-2 no gain on channel SCA3, 2-3 30 dB gain
- JP9 1-2 no gain on channel SCA1, 2-3 20 dB gain
- JP12 3-5, 4-6 no attenuation on channel MPX
1-3, 2-4 12 dB attenuation on channel MPX
- RV7 Adjustment of the MPX monitor output

11.4 Coder

The coder card is located above the audio motherboard between the audio input section and the PLL/Driver board.

Two versions of this boards are available, the Stereo one (Fig. 11-7) and the Mono/MPX one (Fig. 11-8). The only difference between a Stereo PTX-LCD and a Mono/MPX one resides in the kind of coder module.

On this board, depending on the version, there are the low-pass filters, the preemphasys circuits, the stereo coder and the clipper circuit, that can be included or excluded via software.

The function of the Clipper circuit, that in some countries is mandatory, is to limit the modulation level even for audio input levels above the nominal value.

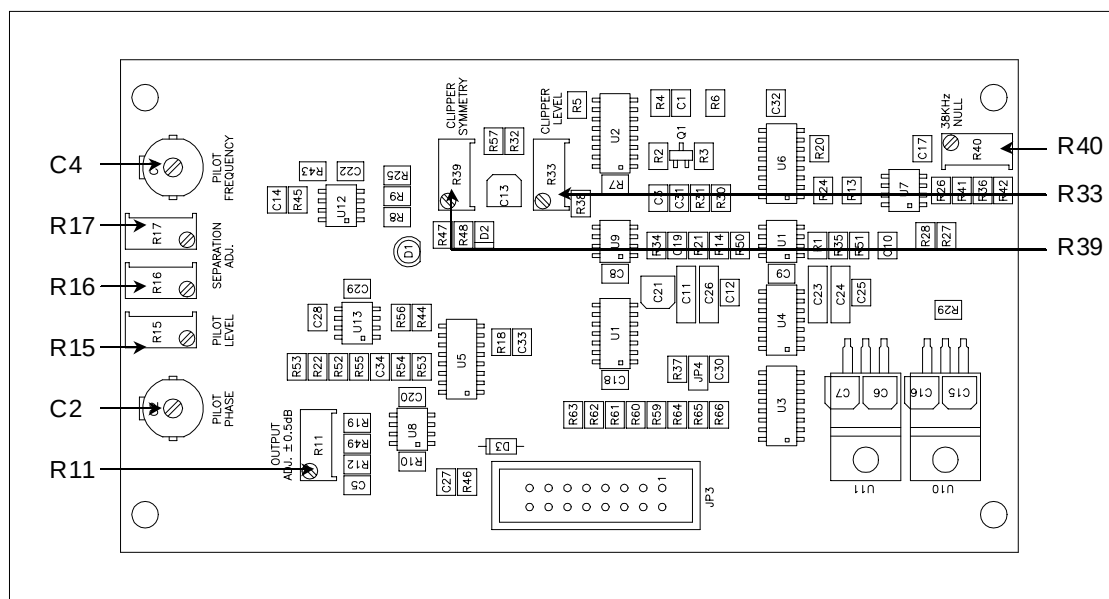


Figure 11-7

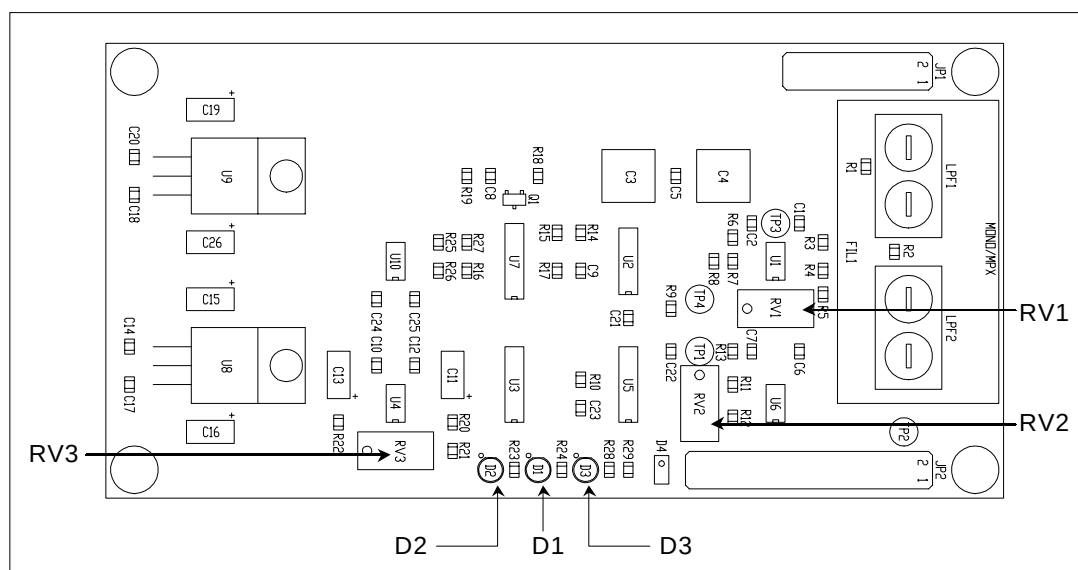


Figure 11.8

11.4.1 Adjustments, settings and indicators

Stereo Coder

- C2 Pilot tone phase
- C4 Pilot tone frequency
- R11 Output level stereocoder card
- R15 Pilot tone level
- R16 stereo separation optimization - left channel
- R17 stereo separation optimization - right channel
- R33 clipper circuit intervention threshold

- R39 clipper symmetry adjustment
- R40 38 kHz subcarrier suppression optimization

Mono/MPX board

- LP1 Low pass filter 1
- LP2 Low pass filter 2
- RV1 Mono level
- RV2 Board output level (modulation)
- RV3 clipper circuit intervention threshold
- D1 positive power supply voltage presence
- D2 negative power supply voltage presence
- D3 clipper intervention signalling

11.5 PLL/Driver card & VCO Card

The PLL/Driver board (Fig. 11-9) is placed on the left part of the PTX-LCD (Fig. 10-1 5) and is directly connected to the audio motherboard.

The digital PLL module is composed by a high stability temperature-controlled oscillator and by the digital circuit doing the division and the comparison of the working frequency. The oscillator generates a 10 MHz frequency divided by a fixed 1 kHz signal.

This signal is routed to the digital comparator/divider circuit that compares it to the signal generated by the VCO divided depending on the exciter's working frequency.

The output of the comparator is the AFC signal that is applied to the varicap diodes on the VCO board and added to the audio signal coming from the coder card.

The Voltage Controlled Oscillator generates the RF signal that is amplified up to around 300mW (25dBm), that is the level required to drive the R.F. Power Amplifier.

Nota: The VCO is contained in a silvered brass box fixed on the PLL & Driver board.

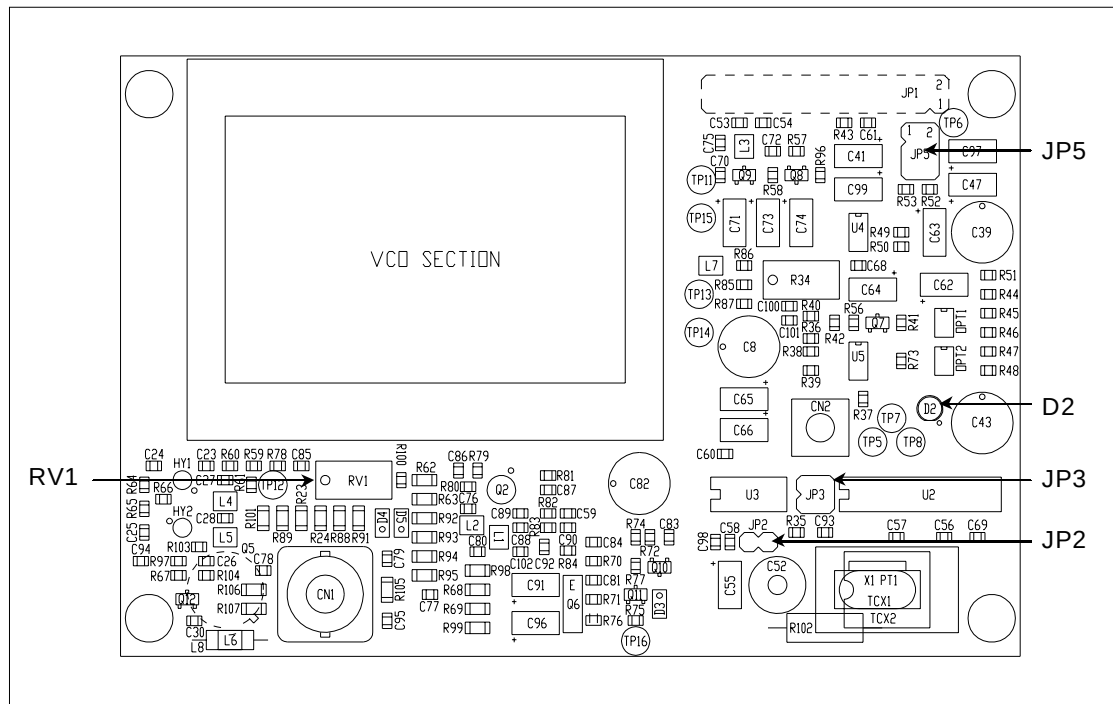


Figure 11-9

11.5.1 Adjustments, settings and indicators

- D2 On: PLL unlocked
- RV1 bias adjustment
- JP2 factory settings - do not change
- JP3 factory settings - do not change
- JP5 factory settings - do not change

11.6 Power Amplifier

The RF power amplifier is available in two versions, 30 and 60/100W.

This section is placed in the central part of the device (Fig. 10-1 3), is fixed to a heatsink and contained in a metal box completely shielding it.

The RF signal coming from the PLL/Driver card is first amplified by the pilot stage (MRF237 working in class C) up to 1.5 W, and then passed to the final stage (BLW86) that amplifies it to 30W.

The amplified signal is filtered by a low-pass filter to reduce the harmonic emissions below the permitted levels.

A directional coupler inside the final amplifier gives the readings of forward and reflected power, that are then sent to the power supply section to be controlled.

A -30 dB test probe is available on a BNC connector on the rear panel of the exciter, just under the RF output connector.

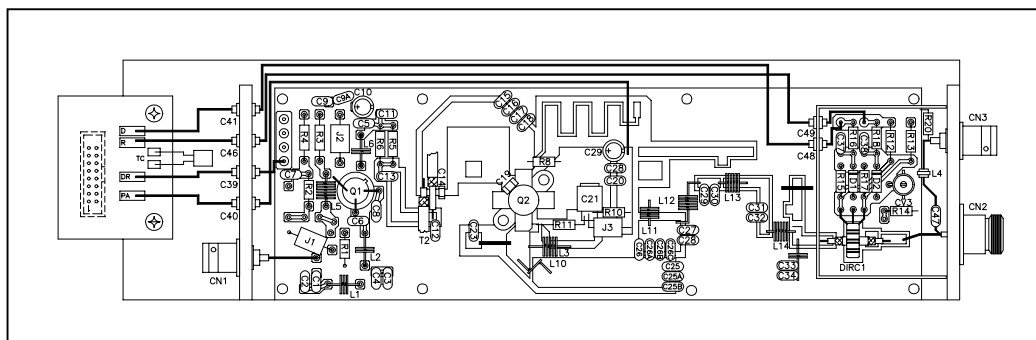


Figure 11-10 - 30W

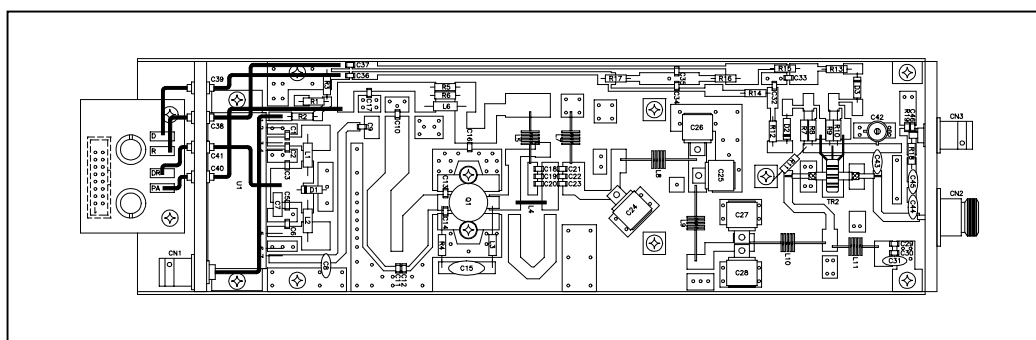
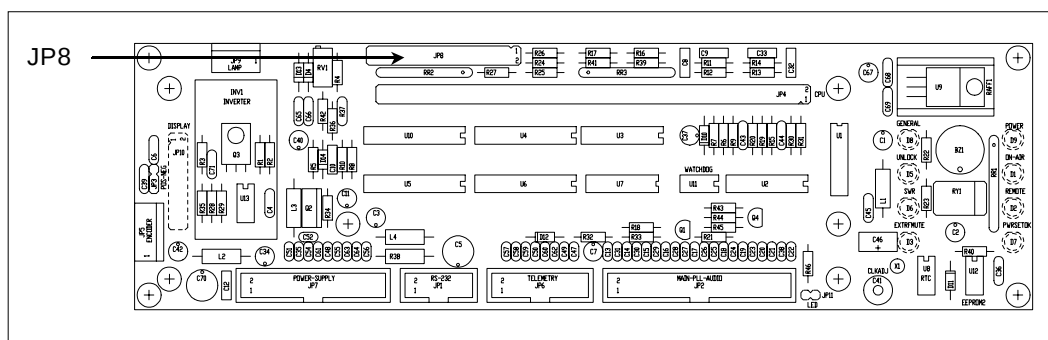


Figure 11-11 - 60/100W

11.7 Panel Board

This board, on the front part of the piece of equipment, is the interface between the CPU board and the other components of the PTX-LCD.

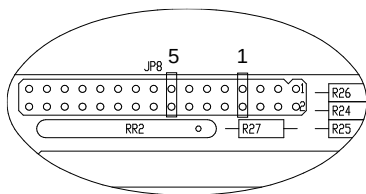
This board conveys all the signals coming from and going to: LCD display, Encoder, Signaling LEDs, power supply board, audio motherboard and the external telemetry card, that is all the signals composing the I/O of the CPU board.



11.7.1 Adjustments, settings and indicators

JP8 setting of the jumpers of the menu GenSt:

7-8 = jumper 1, ... , 15-16 = jumper 5



The meaning that the software assigns to the jumpers position is the following (1 means closed link, 0 stays for open, X for jumper in any position):

Jump 1	Jump 2	Jump 3	Jump 4	Jump 5	Meaning
0	0	X	X	X	ExPwr, ExSts and ExFrq menus disabled
1	0	X	X	X	ExPwr and ExSts enabled, ExFrq disabled
0	1	X	X	X	ExPwr and ExSts disabled, ExFrq enabled
1	1	X	X	X	ExPwr, ExSts and ExFrq menus disabled
X	X	0	0	0	Default parameters set in case of exciter reset: CCIR
X	X	1	0	0	Default parameters set in case of exciter reset: FCC
X	X	0	1	0	Default parameters set in case of exciter reset: OIRT
X	X	1	1	0	Default parameters set in case of exciter reset: Japan
X	X	0	0	1	Default parameters set in case of exciter reset: Italia
X	X	1	0	1	Default parameters set in case of exciter reset: CSI
X	X	0	1	1	Reserved for future applications
X	X	1	1	1	Reserved for future applications

11.8 CPU board

The CPU board is on the front part of the device, fixed to the panel board.

This board is the heart of the transmitter, since it manages and elaborates all the information coming from the other boards and possibly from other devices via the serial interface or the telemetry board.

The main characteristics of the CPU board are:

- Microprocessor: 80C552
- Eprom size: 64KBytes
- Static RAM size: 32KBytes
- Communication interfaces: RS232-RS485 and I2C Bus
- EEPROM size: 256KBytes
- Self-diagnosys Leds: 9, red

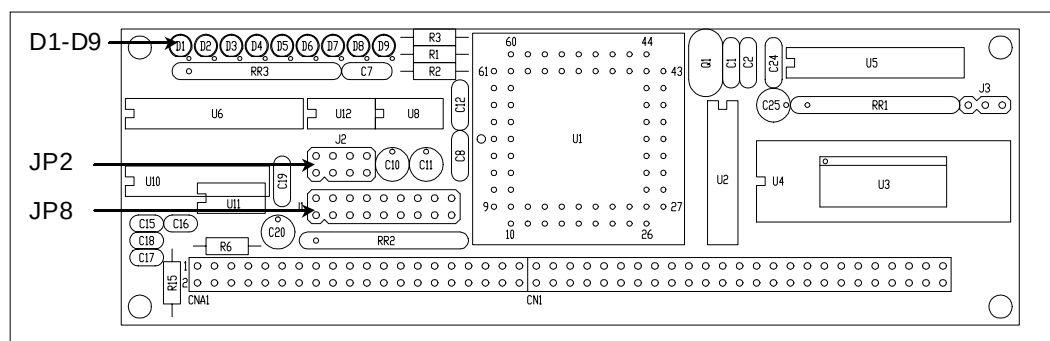


Figure 11-13

11.8.1 Adjustments, settings and indicators

- D1-D9 On: communication activity
- JP1 1-2, 3-4 serial port set as DCE
5-6, 7-8 serial port set as DTE
- JP2 7-8 closed, 17-18 open: no parameter of the exciter is locally controllable
7-8 open, 17-18 closed: only the default menu parameters are modifiable, the user can't access to the admin menus
7-8 closed, 17-18 closed: only the default menu parameters except the frequency are modifiable, the user can't access to the admin menus.
7-8 open, 17-18 open: normal behaviour
Other jumpers: reserved

11.9 Telemetry board (optional)

This board holds a DB25 female connector that is accessible from the rear side of the exciter.

If this board is present, it is possible for the user to utilise the measurements and the controls of the "TELEM" menu. This board can measure 8 analog input channels for voltages between 0 and 5 V, to control two relays and an open-collector digital output.

This board does not include any means for adjustment.

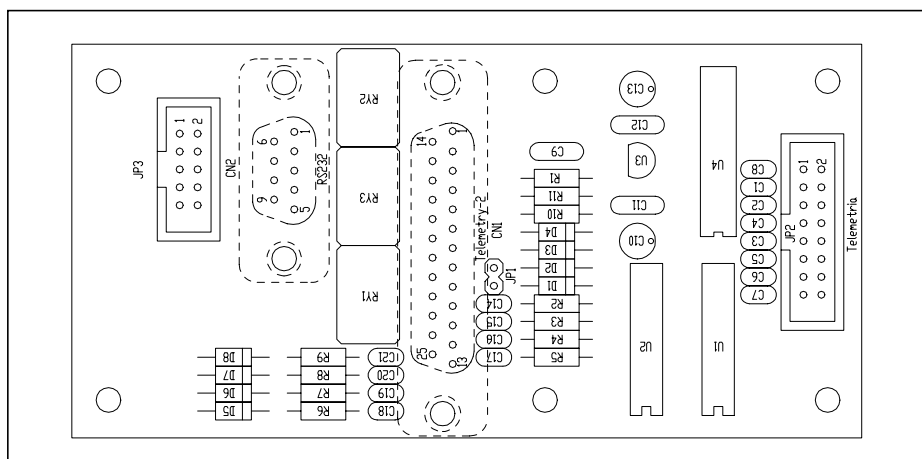


Figure 11-14

11.10 AUDINP-DIG board (optional)

The option "/AUDINP-DIG" allows the PTX-LCD exciter to be inserted in the system that use digital audio distribution.

This option is designed to replace without any special adjustment the standard audio input section, allowing the upgrade doesn't require firmware modification of the exciter (Release 04xxxx).

If digital input is present, it is automatically selected by the embedded logics.

Through an external command, it is possible to force the selection of the analog input instead of the digital one (a jack to be connected to ground).

A manual switch allows to select balanced or unbalanced digital input.

Through two trimmers it is possible to adjust the level of the converted digital input to normalize the R and L signals with respect to the level set for analog input.

The D/A conversion is performed by a 24 bit converter with a sampling frequency automatically selectable from 32 to 96 KHz.

This option supports S/PDIF, AES/EBU, IEC958 and EIAJ CP340/1201 data formats.

11.10.1 Functional description

The option section is placed on the rear part of the PTX-LCD and is directly connected to the audio motherboard using a strip line connector. It is composed of three different boards.

The first board (Fig. 11-15) contains the balanced analog input and the trimmers to adjust the level for each analog input and the relative filters; this board is the same used in the PTX-LCD without AUDINP-DIG. The second board (Fig. 11-16) contains the level regulations and the switches for the software-based audio configuration. The third section (Fig. 11-17) attends to conversion of the digital signal into analog left and right signals with the respective trimmers for the adjustment levels. This section provides also the selection of digital or analog input: the digital input are selected automatically when they are present or, through the jack connector "Dig/Analog switch" connected to ground, selects the analog input. A manual switch is present to select the unbalanced (TOSLINK and S/PDIF) or balanced (AES/EBU) digital input.

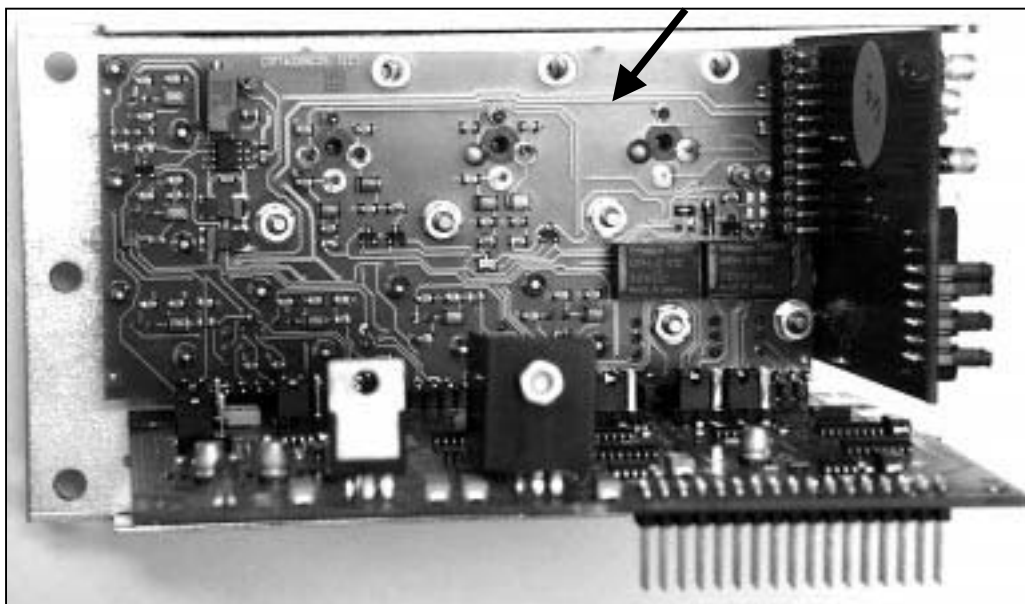


Figure 11-15

After the necessary processing (filtering, level regulation, digital/analog conversion, selection), the audio input section passes the signal to the audio motherboard that routes them to the coder card.

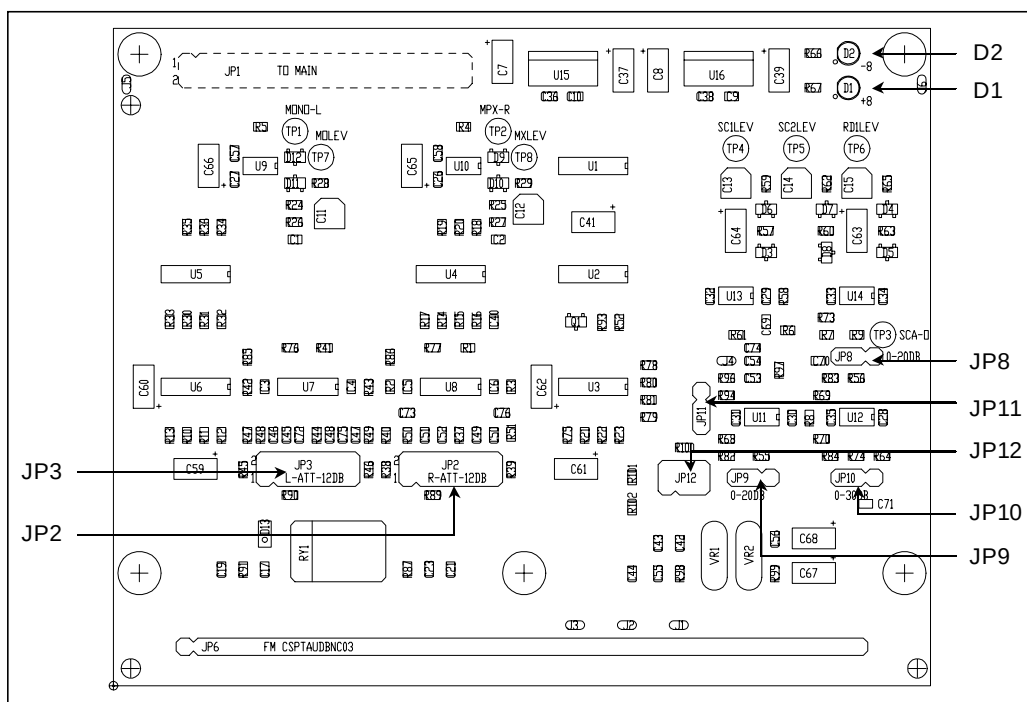


Figure 11-16

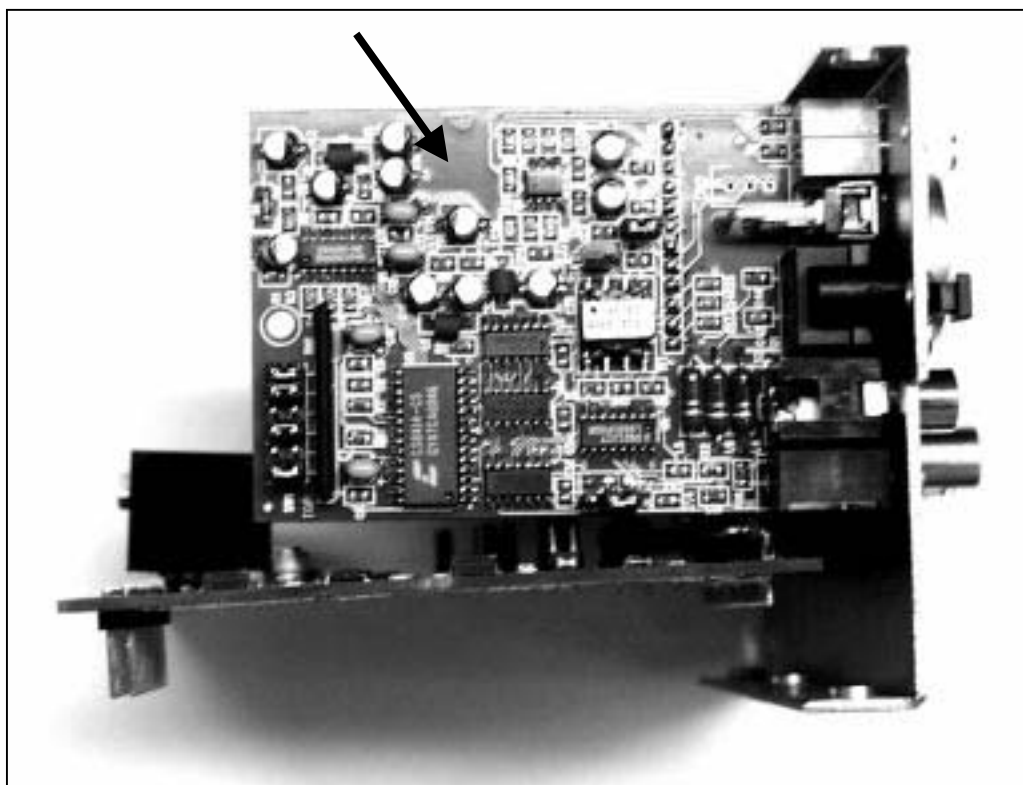


Figure 11-17

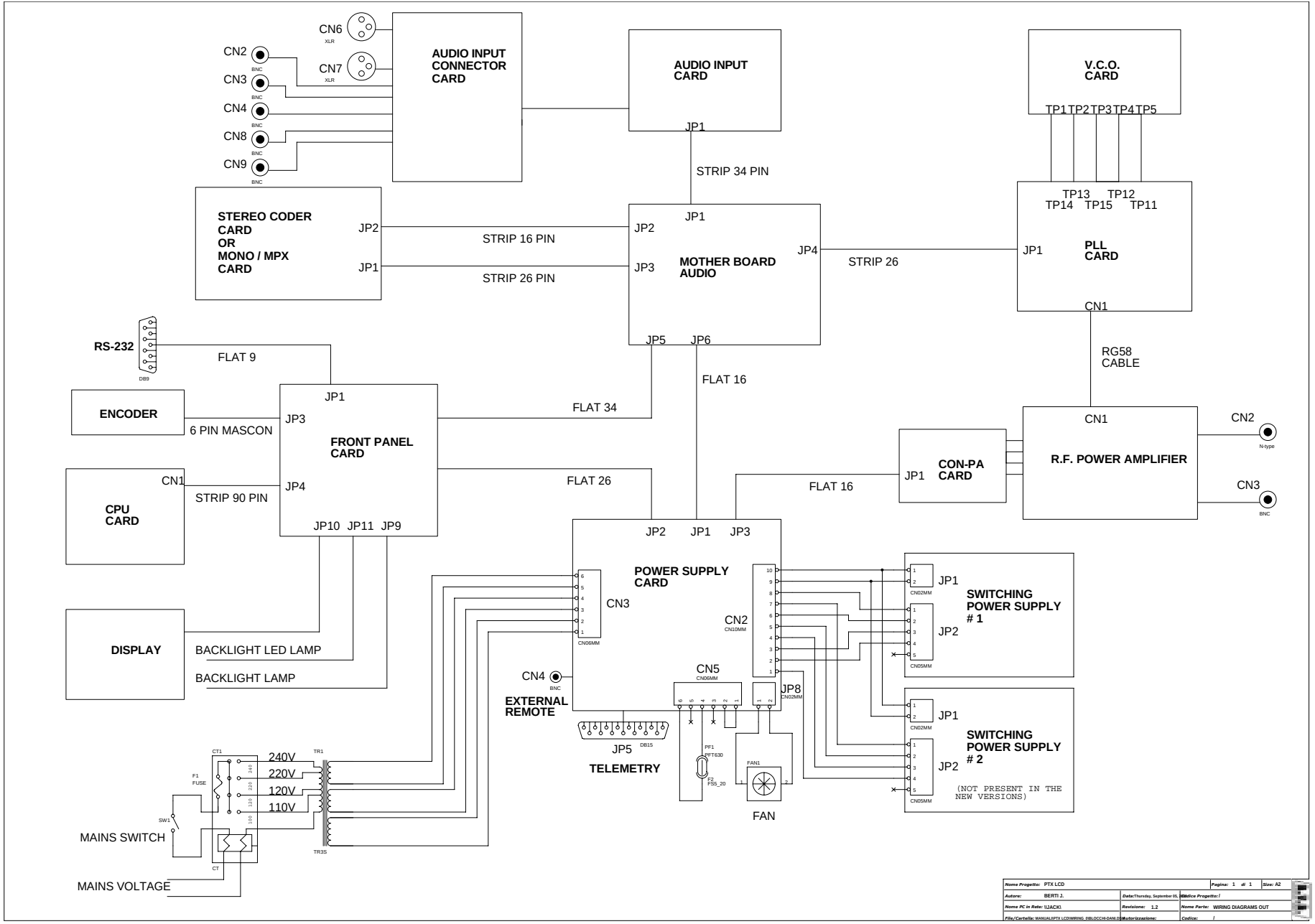
Appendix A Piani di montaggio, schemi elettrici, liste componenti / Component layouts, schematics, bills of material

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

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

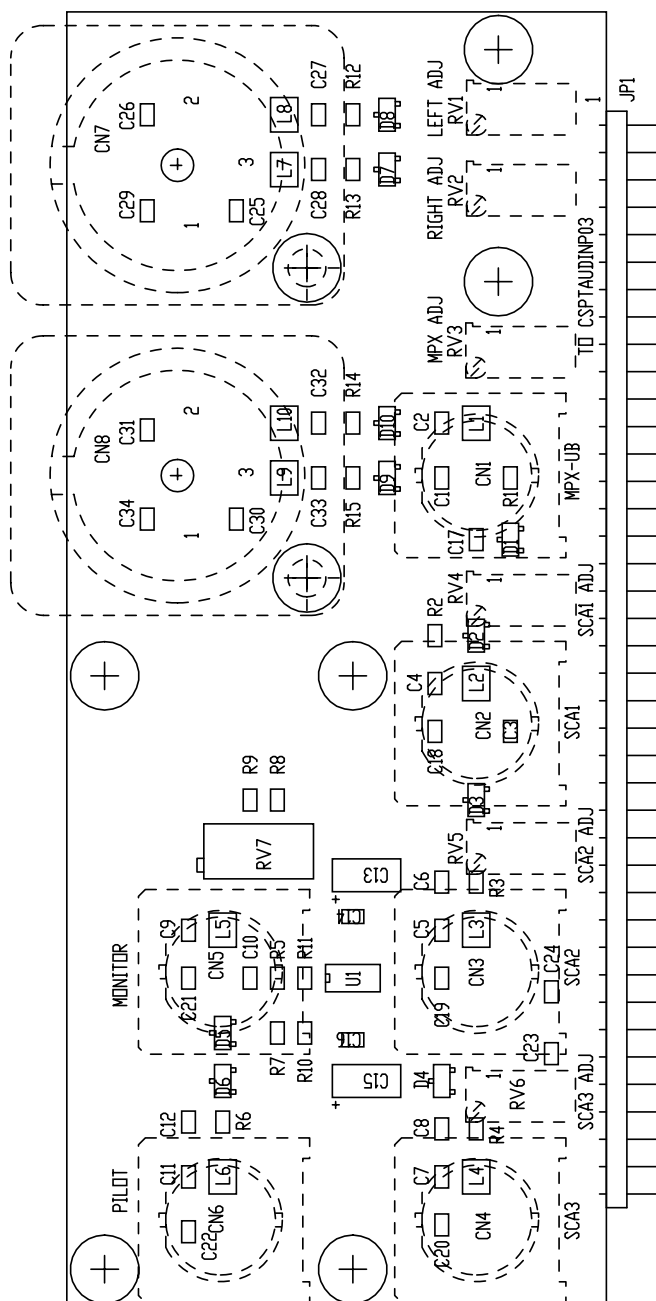
Description	RVR Code	Vers.	Pages
Wiring diagram	/	1.2	2
BNC connectors card	SLPTAUDBNC04	1.0	4
	SLPTAUDBNC03 (before april 2000)	1.0	4
	SLPTAUDBNC02 (before may 1999)	1.0	2
Audio input connectors card	SLPTAUDCON02 (included in SLPTAUDBNC03 after may 1999)	1.1	4
Audio input card	SLPTAUDINP04	1.2	4
	SLPTAUDINP03 (before april 2000)	1.0	4
	SLPTAUDINP02 (before may 1999)	1.1	8
Audio Motherboard	SLPTMDBAUD04	1.1	4
Mono/MPX Coder Card	SLPTMONMPX02	1.2	4
Stereo Coder Card	CSSTCOD03	1.1	6
	SLPTCODSTE02 (before february 2001)	1.1	4
VCO Card	SLPTXVCO0001	1.2	4
PLL & Driver Card	SLPTPLLDREV03	1.5	14
CPU Card	SLPTCPU55202	1.0	4
Motherboard Panel Card	SLPTMDBPAN06	1.1	4
	SLPTMDBPAN03 (before may 1999)	1.0	6
Power supply	SLPTPWRSUP04	1.4	6
Switching power supply card	PSSW2812B	1.2	8
External remote card	SLTELEM00001	1.1	4
Power Amp connector	SLCONPA2	1.1	4
Power Amp connector	SLCONPA3	1.1	4
30W RF Power amplifier	SLPA30	1.2	4
60-100W RF Power amplifier	CSRF100W2U	1.0	4
	SLPA100 (before february 2001)	1.0	4
Digital Audio Input	CSPTAUDBNC05	1.2	4
Audio Input Selector	CSRXAES	1.2	8
Optional 24V supply board	SLBATT24-001	1.1	4

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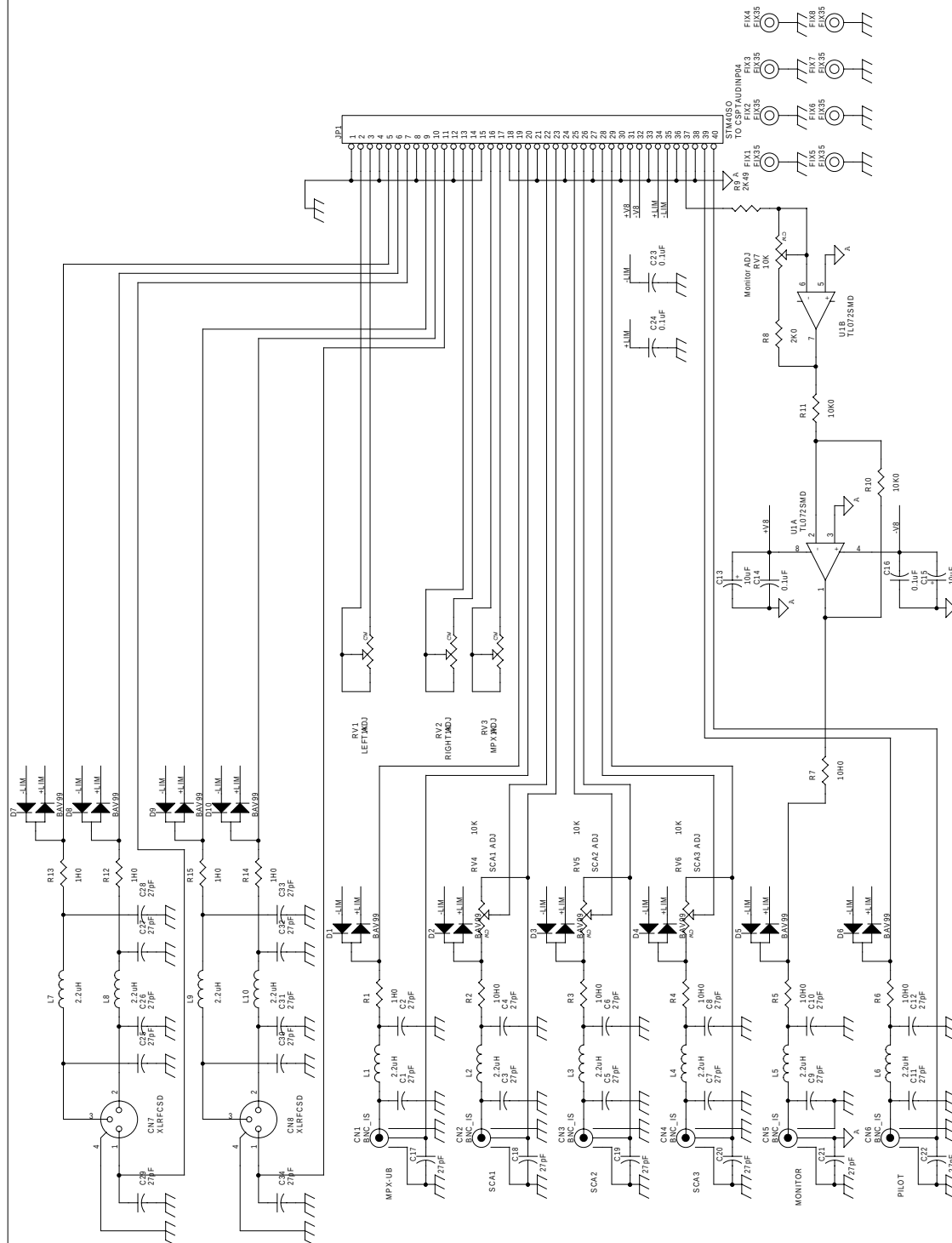


Nome Progetto: PTX-LCD	Progetto: 1	di 1	Stato: A2
Autore: BERTI J.	Data/Thursday, September 01, 2005 10:00 AM	Revisione: 1.2	Nome Parallelo: WIRING DIAGRAMS OUT
Nome PC in Rete: UJACK	Revisione: 1.2	Nome Parallelo: WIRING DIAGRAMS OUT	File/Caratteristiche: MANUALE PTX-LCD
File/Caratteristiche: MANUALE PTX-LCD	Revisione: 1.2	Nome Parallelo: WIRING DIAGRAMS OUT	File/Caratteristiche: MANUALE PTX-LCD

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B.V.B. ELETTRONICA		DENOMINAZIONE SCHEDE CONNETTORI BNC, SCA, MPX E REGOLAZIONI	
SEMILAVORATO		DISPOSITIVO CSPTAUDBNCO4	
MATERIALE		DISEGNATO D'Alessio D. il 19/07/99	
TRATTAMENTO		SCALA	
		TAVOLA n. di	



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

Scheda connettori BNC SCA e MPX e regolazioni

Document Number
A3 SLPTAUDBNC04Rev.
Date: Thursday, February 10, 2000
Fillet: 1 of 1

Scheda connettori BNC SCA e MPX e regolazioni

Revised: Thursday, February 10, 2000

SLPTAUSBNC04

Revision:

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

Bill Of Materials

November 2, 2000

14:39:06

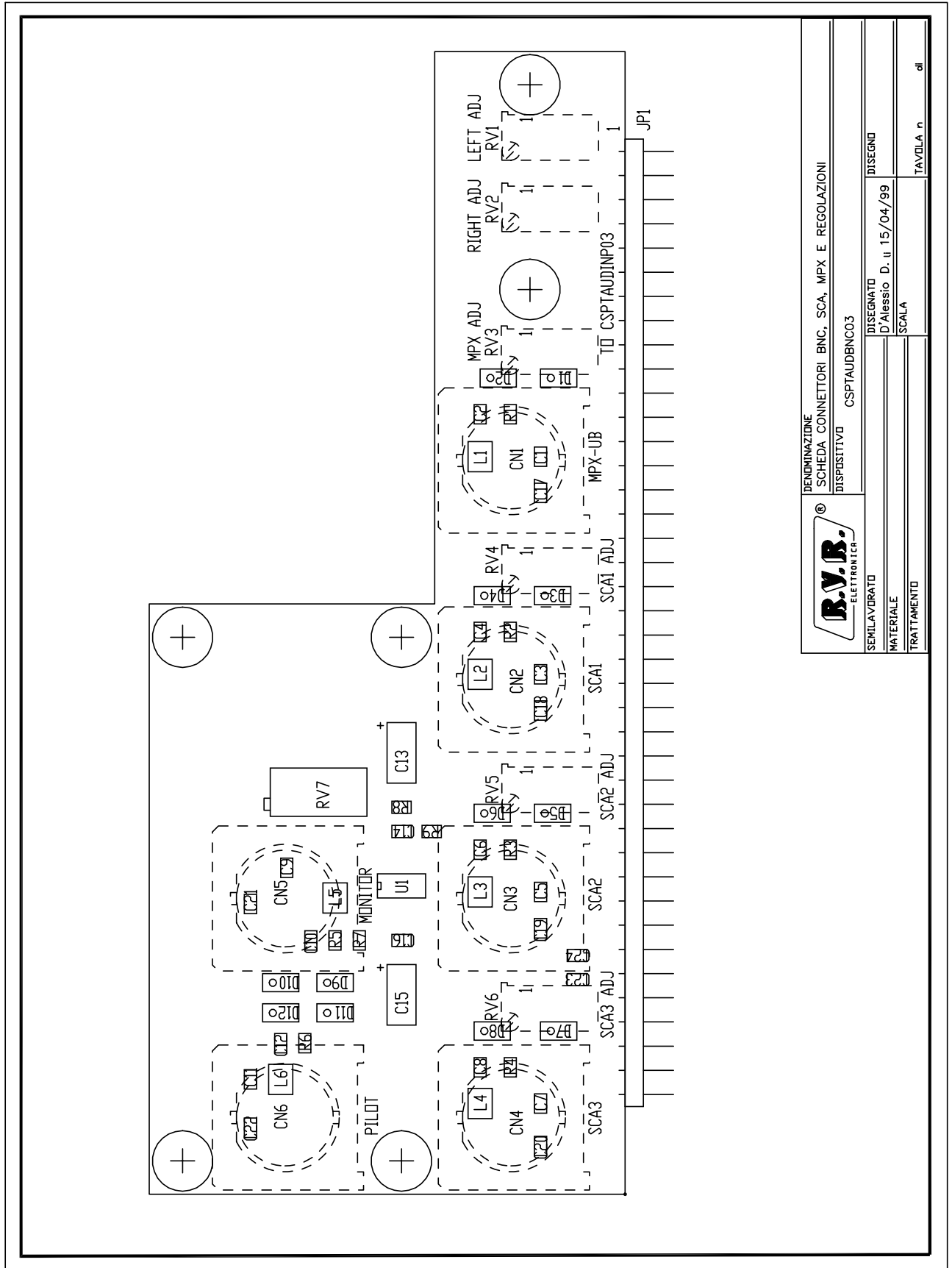
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Item Qty Reference

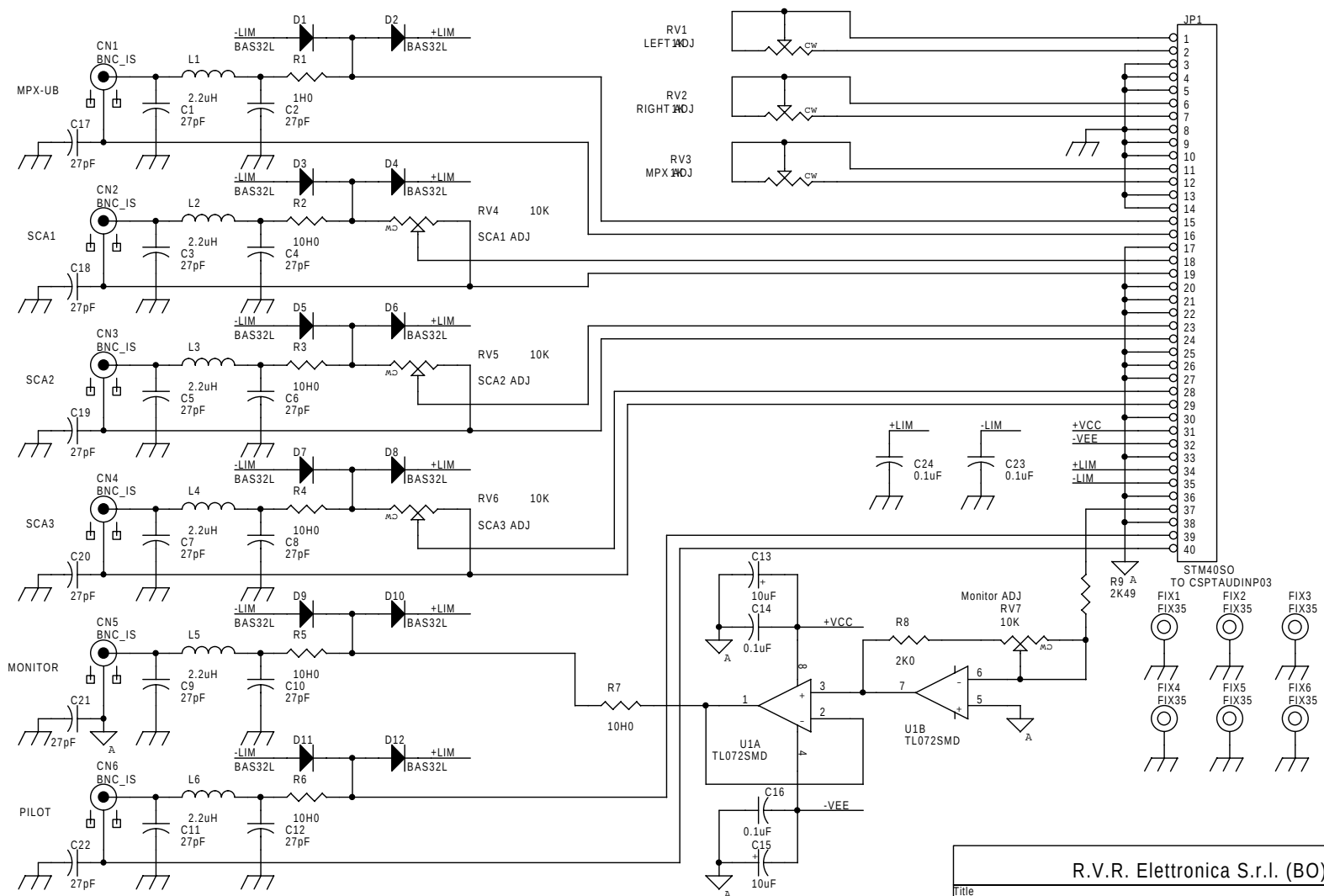
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1	6	CN1, CN2, CN3, CN4, CN5, CN6	BNC_IS
2	2	CN7, CN8	XLRFCSD
3	28	C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C17, C18, C19, C20, C21, C22, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34	27pF
4	2	C15, C13	10uF
5	4	C14, C16, C23, C24	0.1uF
6	10	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10	BAV99
7	8	FIX1, FIX2, FIX3, FIX4, FIX5, FIX6, FIX7, FIX8	FIX35
8	1	JP1	STM40SO
9	10	L1, L2, L3, L4, L5, L6, L7, L8, L9, L10	2.2uH
10	3	RV1, RV2, RV3	1K
11	3	RV4, RV5, RV6	10K
12	5	R1, R12, R13, R14, R15	1H0
13	6	R2, R3, R4, R5, R6, R7	10H0
14	1	R8	2K0
15	1	R9	2K49
16	2	R10, R11	10K0
17	1	U1	TL072SMD
18	1	RV7	10K

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B.V.B. ELETTRONICA		DENOMINAZIONE SCHEDE CONNETTORI BNC, SCA, MPX E REGOLAZIONI	
SEMILAVORATO		DISPOSITIVO	
MATERIALE		DISEGNATO D'Alessio D. li 15/04/99	
TRATTAMENTO		SCALA	
		TAVOLA n. di	



R.V.R. Elettronica S.r.l. (BO)		
Title		
Scheda connettori BNC SCA e MPX e regolazioni		
Size	Document Number	Rev
A4	SLPTAUDBNC03	
Date:	Tuesday, July 27, 1999	Sheet 0 of 0

Scheda connettori BNC SCA e MPX e regolazion

Revised: April 14, 1999

SLPTAUDBNC03

Bill Of Materials

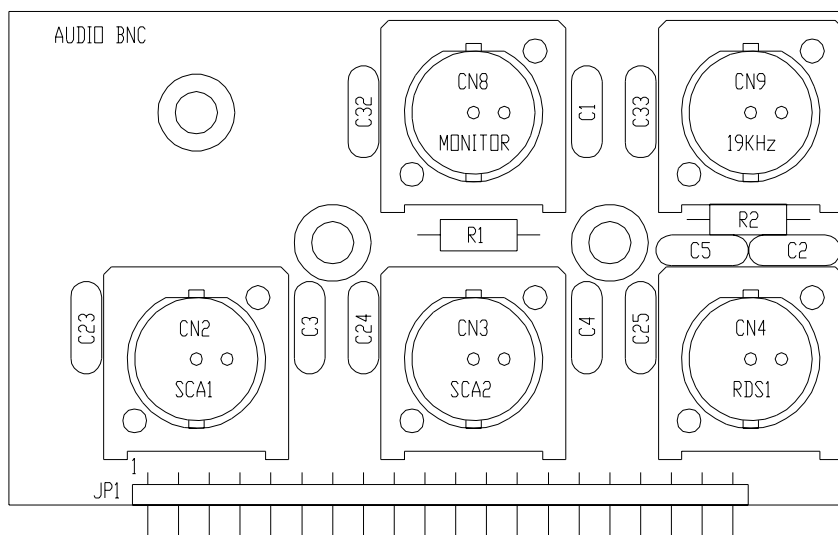
Page 1

Revision:

April 21, 1999 12:58:52

Item	Quantity	Reference	Part
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2	18	C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C17, C18, C19, C20, C21, C22	27pF
3	2	C15, C13	10uF
4	4	C14, C16, C23, C24	0.1uF
5	12	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12	BAS32L
6	6	FIX1, FIX2, FIX3, FIX4, FIX5, FIX6	FIX35
7	1	JP1	STM40SO
8	6	L1, L2, L3, L4, L5, L6	2.2uH
9	3	RV1, RV2, RV3	1K
10	4	RV4, RV5, RV6, RV7	10K
11	1	R1	1H0
12	6	R2, R3, R4, R5, R6, R7	10H0
13	1	R8	2K0
14	1	R9	2K49
15	1	U1	TL072SMD

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DENOMINAZIONE
Audio BNC Connector Card Component Layout / Piano Componenti

DISPOSITIVO

SEMILAVORATO

MATERIALE

TRATTAMENTO

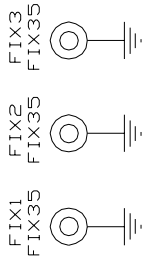
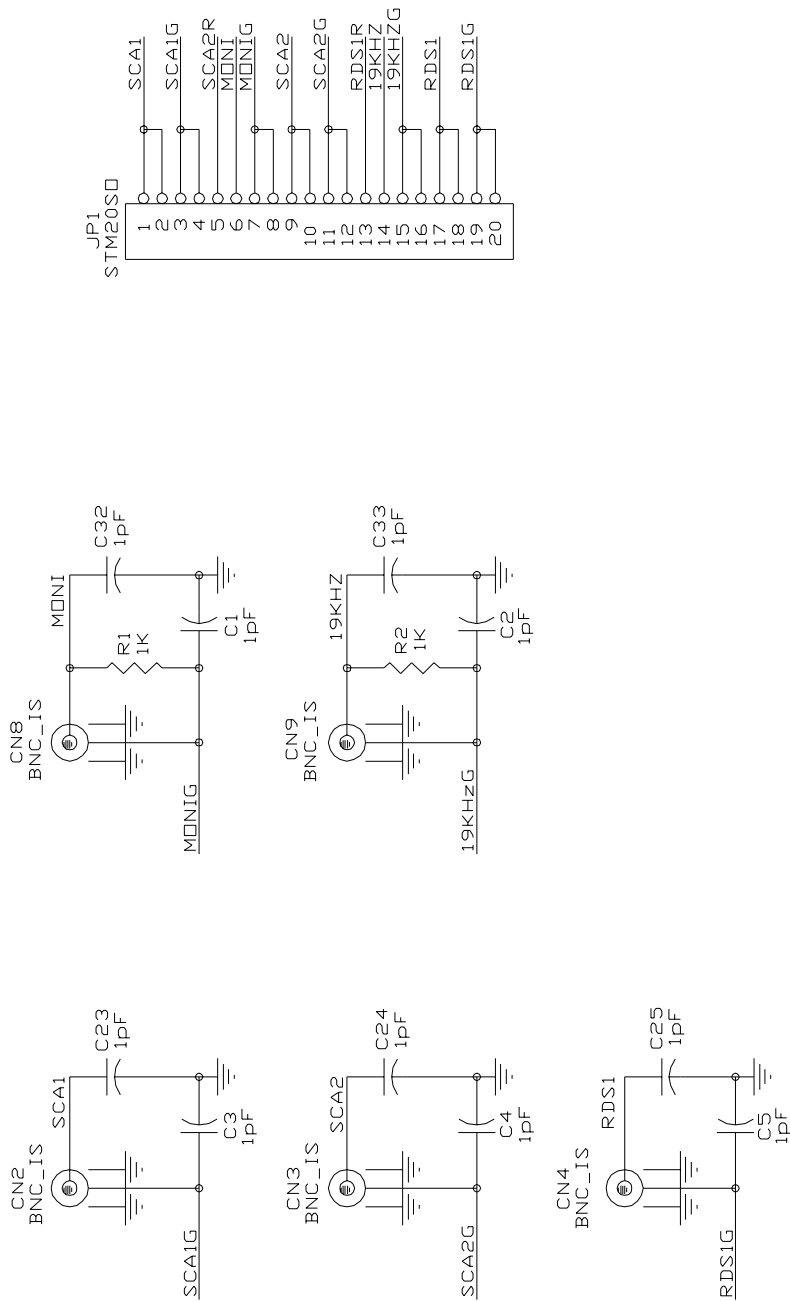
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D'Alessio D.li 05/02/97

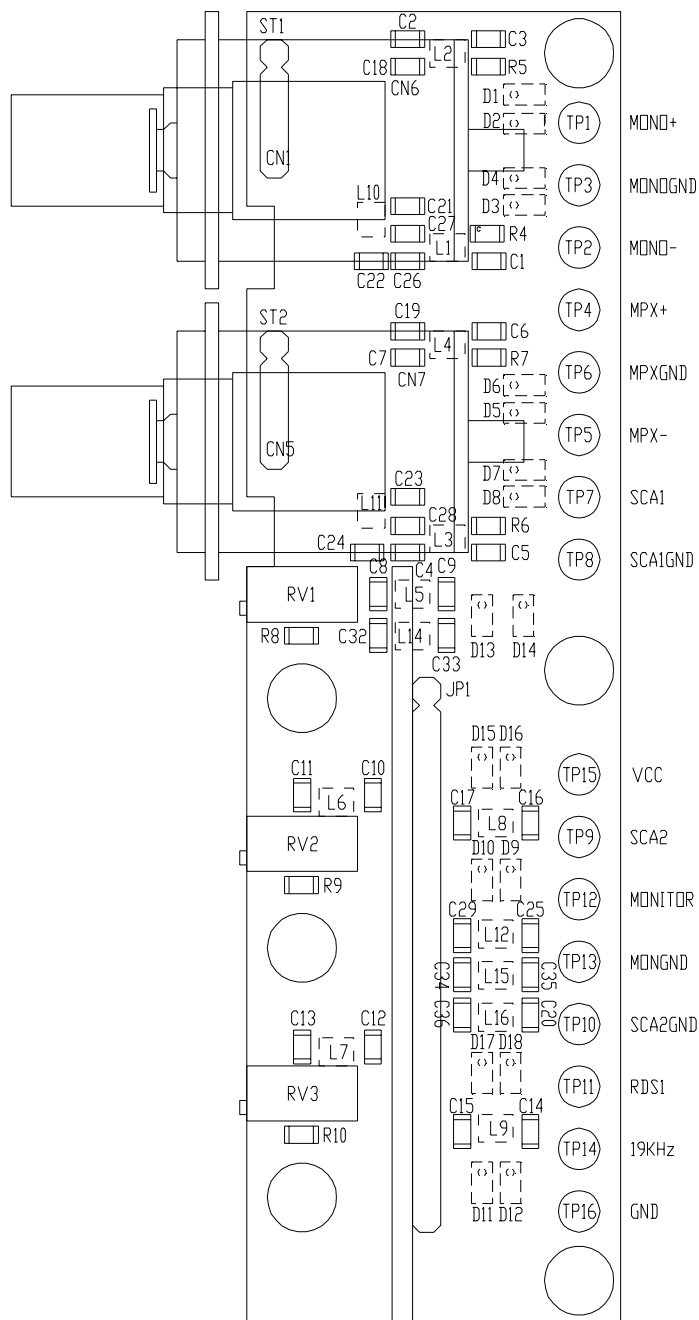
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DISEGNO

TAVOLA n di



Title		R.V.R. Elettronica S.r.l. (Bo)	
Size		SCA & RDS Connector	
Document Number	REV		
A4	SLPTAUBNC02 - Audio BNC Connector Card	1	
Date:	August 30, 1996	Sheet	of



DENOMINAZIONE
Audio Connector Card Component Layout / Piano Componenti
DISPOSITIVO

SEMILAVORATO

MATERIALE

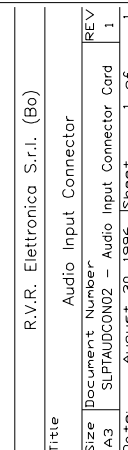
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DISEGNATO
D'Alessio D. li 07/02/97

SCALA

DISEGNO

TAVOLA n di



Audio Input Connector
SLPTAUDCON02
Bill of Materials

Revised : July 15, 1996
Revision: 1

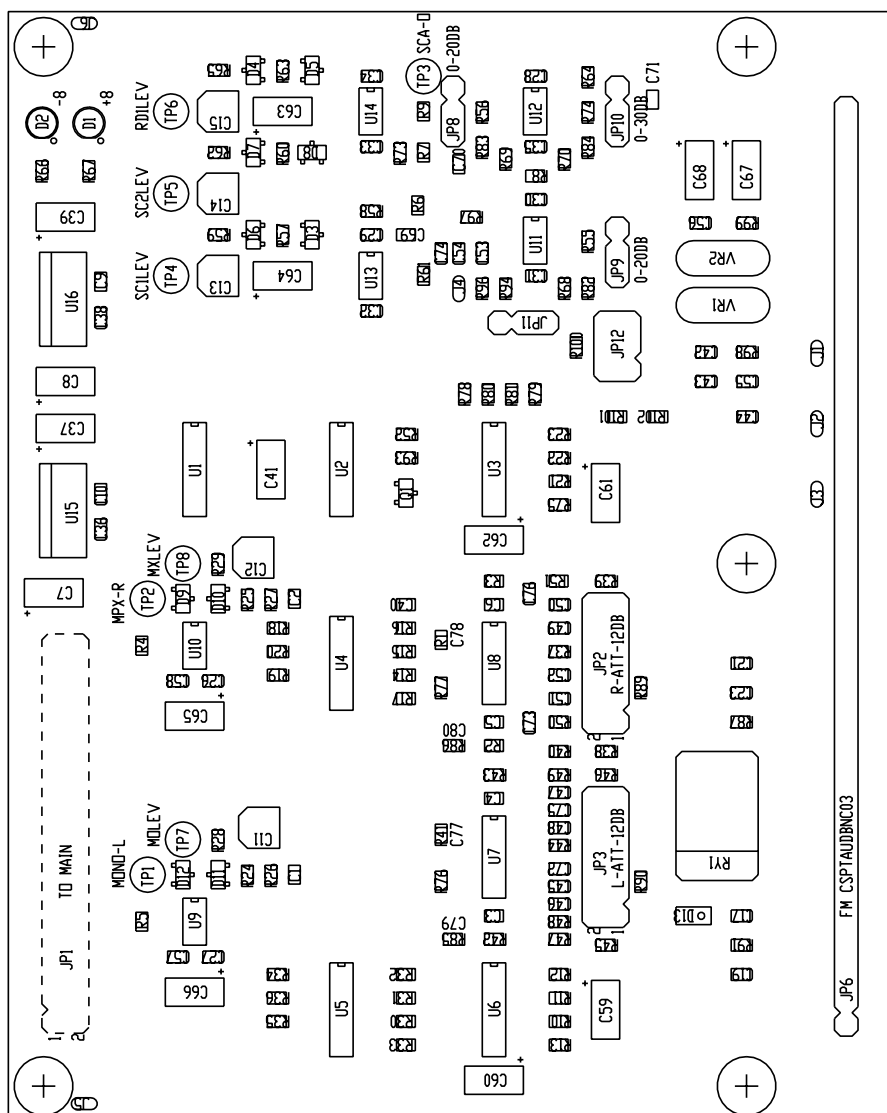
Item	Reference	Part	Description	RVRCode
------	-----------	------	-------------	---------

1	CS1	CS	Circuito stampato	
2	CN6	XLRFC	Conn. XLR F. da CS 90ø	
3	C27	1pF	Cond. chip 0805	
4	C18	1pF	Cond. chip 0805	
5	C2	27pF	Cond. chip 0805	
6	C3	27pF	Cond. chip 0805	
7	C26	27pF	Cond. chip 0805	
8	C1	27pF	Cond. chip 0805	
9	C22	27pF	Cond. chip 0805	
10	C21	27pF	Cond. chip 0805	
11	CN7	XLRFC	Conn. XLR F. da CS 90ø	
12	C19	1pF	Cond. chip 0805	
13	C7	27pF	Cond. chip 0805	
14	C6	27pF	Cond. chip 0805	
15	C5	27pF	Cond. chip 0805	
16	C4	27pF	Cond. chip 0805	
17	C28	1pF	Cond. chip 0805	
18	C23	27pF	Cond. chip 0805	
19	C24	27pF	Cond. chip 0805	
20	C17	27pF	Cond. chip 0805	
21	C16	27pF	Cond. chip 0805	
22	C25	27pF	Cond. chip 0805	
23	C29	27pF	Cond. chip 0805	
24	C15	27pF	Cond. chip 0805	
25	C14	27pF	Cond. chip 0805	
26	RV1	10K	Trim. mult. 3296X rg H	
27	C8	27pF	Cond. chip 0805	
28	C9	27pF	Cond. chip 0805	
29	C33	27pF	Cond. chip 0805	
30	C32	27pF	Cond. chip 0805	
31	C10	27pF	Cond. chip 0805	
32	C34	27pF	Cond. chip 0805	
33	C35	27pF	Cond. chip 0805	
34	C12	27pF	Cond. chip 0805	
35	C13	27pF	Cond. chip 0805	
36	C36	27pF	Cond. chip 0805	
37	C20	27pF	Cond. chip 0805	
38	C11	27pF	Cond. chip 0805	
39	JP1	NC	Non connesso	
40	RV2	10K	Trim. mult. 3296X rg H	
41	RV3	10K	Trim. mult. 3296X rg H	
42	CN1	NC	Non connesso	
43	CN5	NC	Non connesso	
44	ST1	NC	Non connesso	
45	R5	1	Res. SMD 0805 al 5%	
46	R4	1	Res. SMD 0805 al 5%	
47	R7	1	Res. SMD 0805 al 5%	
48	R6	1	Res. SMD 0805 al 5%	
49	R10	100	Res. SMD 0805 al 5%	
50	R9	100	Res. SMD 0805 al 5%	
51	R8	100	Res. SMD 0805 al 5%	
52	D1	1N4148SMD	Diodo silicio Minimelf	
53	D2	1N4148SMD	Diodo silicio Minimelf	
54	D4	1N4148SMD	Diodo silicio Minimelf	
55	D3	1N4148SMD	Diodo silicio Minimelf	

Audio Input Connector
SLPTAUDCON02
Bill of Materials

Revised : July 15, 1996
Revision: 1

Item	Reference	Part	Description	RVRCode
56	D5	1N4148SMD	Diodo silicio Minimelf	
57	D6	1N4148SMD	Diodo silicio Minimelf	
58	D8	1N4148SMD	Diodo silicio Minimelf	
59	D7	1N4148SMD	Diodo silicio Minimelf	
60	D10	1N4148SMD	Diodo silicio Minimelf	
61	D9	1N4148SMD	Diodo silicio Minimelf	
62	D11	1N4148SMD	Diodo silicio Minimelf	
63	D12	1N4148SMD	Diodo silicio Minimelf	
64	D18	1N4148SMD	Diodo silicio Minimelf	
65	D17	1N4148SMD	Diodo silicio Minimelf	
66	D16	1N4148SMD	Diodo silicio Minimelf	
67	D15	1N4148SMD	Diodo silicio Minimelf	
68	D14	1N4148SMD	Diodo silicio Minimelf	
69	D13	1N4148SMD	Diodo silicio Minimelf	
70	ST2	NC	Non connesso	
71	L2	22uH	Impedenza SMD	
72	L1	22uH	Impedenza SMD	
73	L10	22uH	Impedenza SMD	
74	L4	22uH	Impedenza SMD	
75	L3	22uH	Impedenza SMD	
76	L11	22uH	Impedenza SMD	
77	L9	22uH	Impedenza SMD	
78	L12	22uH	Impedenza SMD	
79	L8	22uH	Impedenza SMD	
80	L5	22uH	Impedenza SMD	
81	L14	22uH	Impedenza SMD	
82	L6	22uH	Impedenza SMD	
83	L15	22uH	Impedenza SMD	
84	L7	22uH	Impedenza SMD	
85	L16	22uH	Impedenza SMD	



Nome Progetto		PTX LCD		Pagina: 1 di 1		Size: A3	
Autore:		D'ALESSIO D. - REV.: BERTI J.		Data:		16/09/02	
Nome PC in Rete		\\JACK\		Revisione:		1.1	
File/Cartella/Manual/PTX_LCD/SLP/AUDIMP_3VL/AUDIMP04.DWG				Autorizzazione			
Scala: 1:1		Materiale:		Trattamento:		/	
				Profilo:		/	

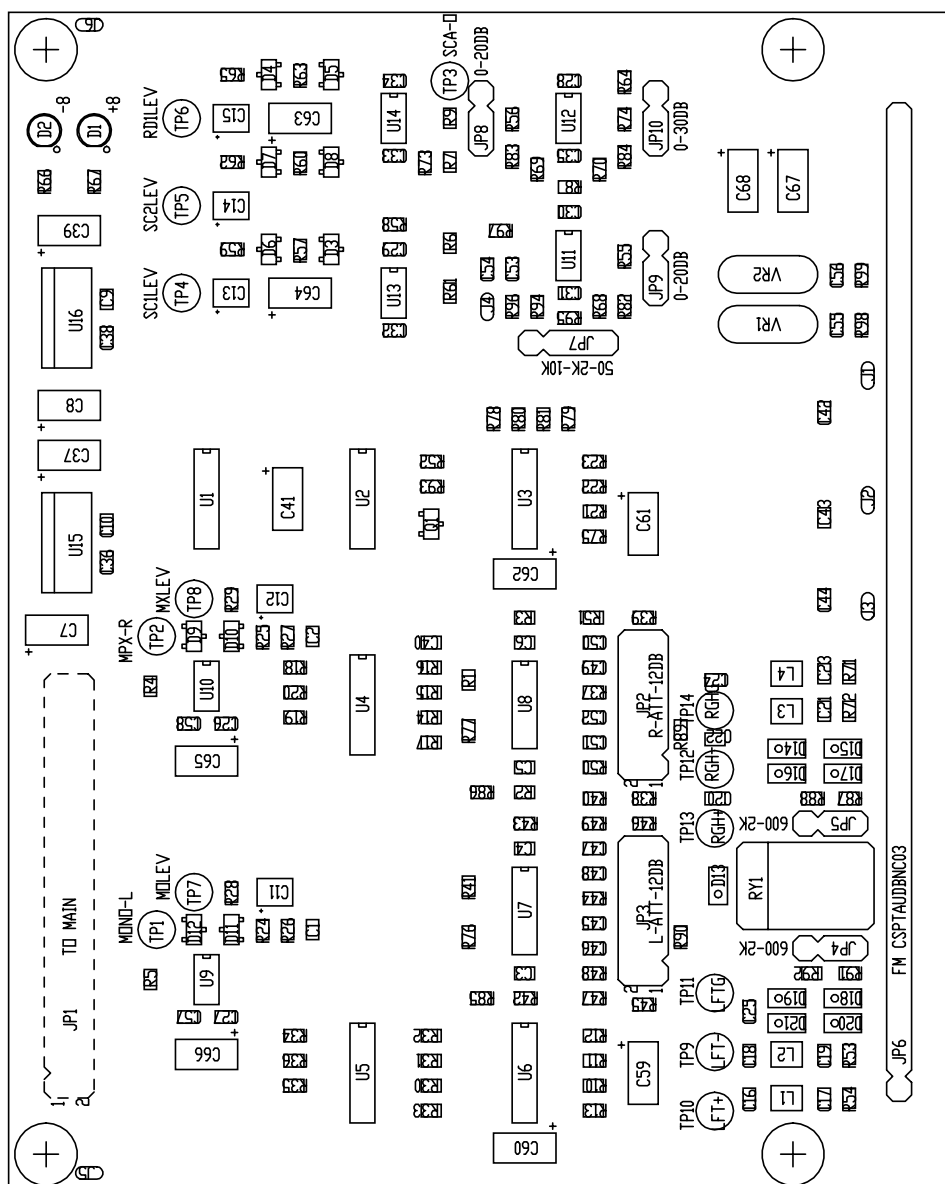


Input gain selector Bill Of Materials

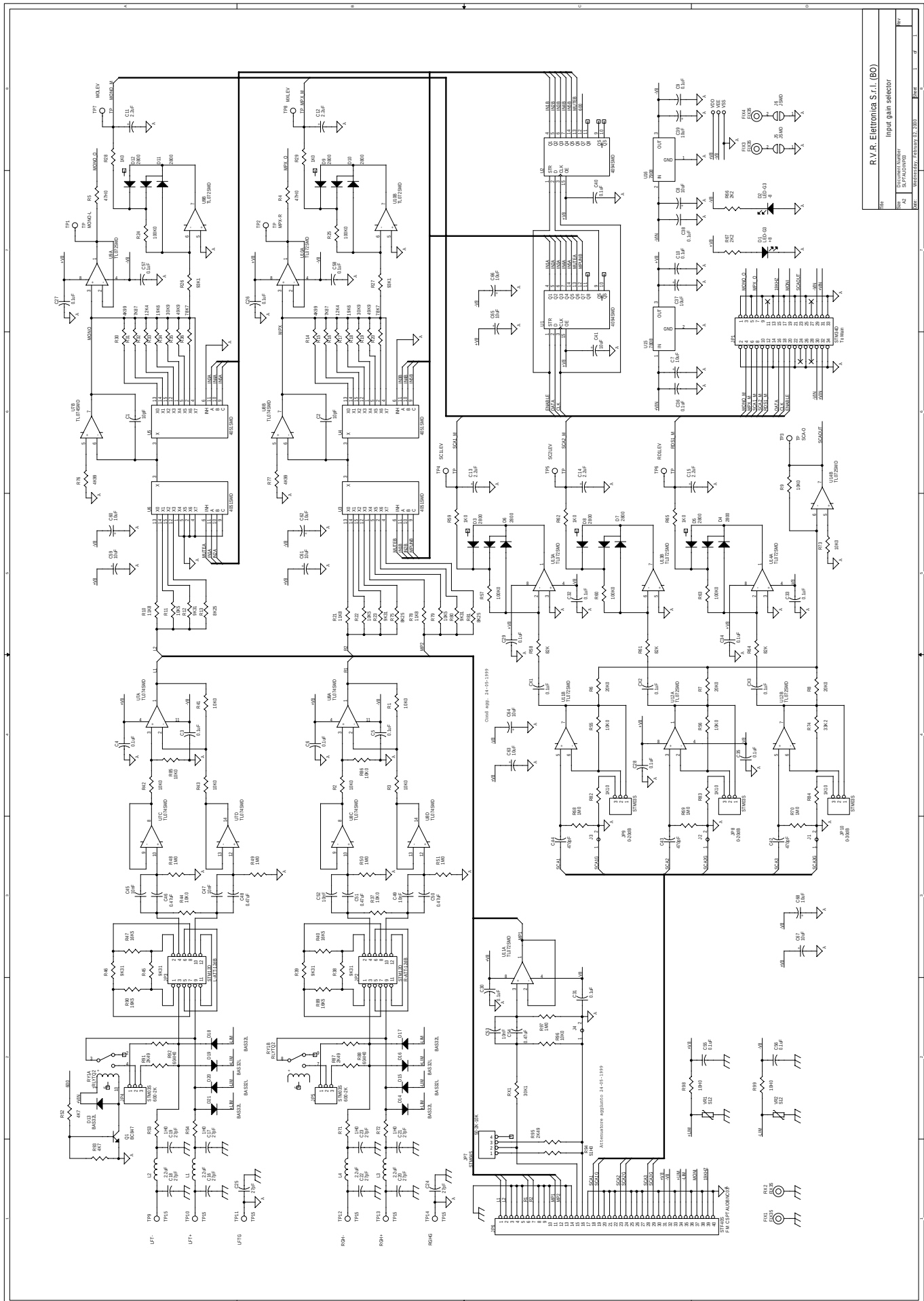
Page1

Item	Qty	Reference	Part
1	6	C1, C2, C17, C19, C21, C23	10pF
2	26	C3, C4, C5, C6, C9, C10, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C38, C40, C55, C56, C57, C58, C69, C70, C71	0.1uF
3	15	C7, C8, C37, C39, C41, C59, C60, C61, C62, C63, C64, C65, C66, C67, C68	10uF
4	5	C11, C12, C13, C14, C15	2.2uF
5	3	C42, C43, C44	470pF
6	5	C45, C47, C49, C52, C53	10nF
7	10	C46, C48, C50, C51, C54, C72, C73, C74, C75, C76	0.47uF
8	2	D1, D2	LED-G3
9	5	D3, D5, D8, D9, D12	NC
10	5	D4, D6, D7, D10, D11	2802
11	1	D13	BAS32L
12	5	FIX1, FIX2, FIX3, FIX4, FIX5	FIX35
13	1	JP1	STM34D
14	2	JP2, JP3	STM12D
15	1	JP6	STF40S
16	4	JP8, JP9, JP10, JP11	STM03S
17	1	JP12	STM06D
18	4	J1, J2, J3, J4	GNDCC
19	2	J5, J6	JSMD
20	1	Q1	BC847
21	1	RY1	RLYTQ2V12
22	15	R1, R2, R3, R9, R37, R41, R42, R43, R44, R55, R56, R73, R85, R86, R96	10K0
23	2	R4, R5	47H0
24	3	R6, R7, R8	20K0
25	3	R10, R21, R78	11K8
26	3	R11, R22, R79	10K5
27	7	R12, R23, R38, R39, R45, R46, R80	9K31
28	3	R13, R75, R81	8K25
29	4	R14, R30, R76, R77	4K99
30	2	R15, R31	7K87
31	2	R16, R32	12K4
32	2	R17, R33	19K6
33	2	R18, R34	30K9
34	2	R19, R35	49K9
35	2	R20, R36	78K7
36	5	R24, R25, R57, R60, R63	100K0
37	5	R26, R27, R58, R61, R64	93K1
38	5	R28, R29, R59, R62, R65	1K0
39	6	R40, R47, R89, R90, R100, R102	16K5
40	5	R48, R49, R50, R51, R97	2M2
41	2	R52, R93	4K7
42	2	R66, R67	2K2
43	3	R68, R69, R70	1M0

44	1	R74	33K2
45	3	R82, R83, R84	1K10
46	2	R91, R87	604H0
47	1	R94	51H0
48	2	R98, R99	10H0
49	1	R101	18K7
50	8	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8	TP
51	2	U1, U2	4094SMD
52	4	U3, U4, U5, U6	4051SMD
53	2	U8, U7	TL074SMD
54	6	U9, U10, U11, U12, U13, U14	TL072SMD
55	1	U15	7808
56	1	U16	7908
57	2	VR1, VR2	S12
58	4	C77, C78, C79, C80	33pF



R.V.B. ELETTRONICA		DENOMINAZIONE	INPUT GAIN SELECTOR
SEMI-LAVORATO		DISPOSITIVO	CSPTAUDINPO3
MATERIALE		DISEGNATO	D'Alessio D. u. 19/04/99
TRATTAMENTO		SCALA	
		TAVOLA n.	01



Input gain selector
SLPTAUDINP03

Revised: April 16, 1999

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Page 1

Item Quantity Reference

Part

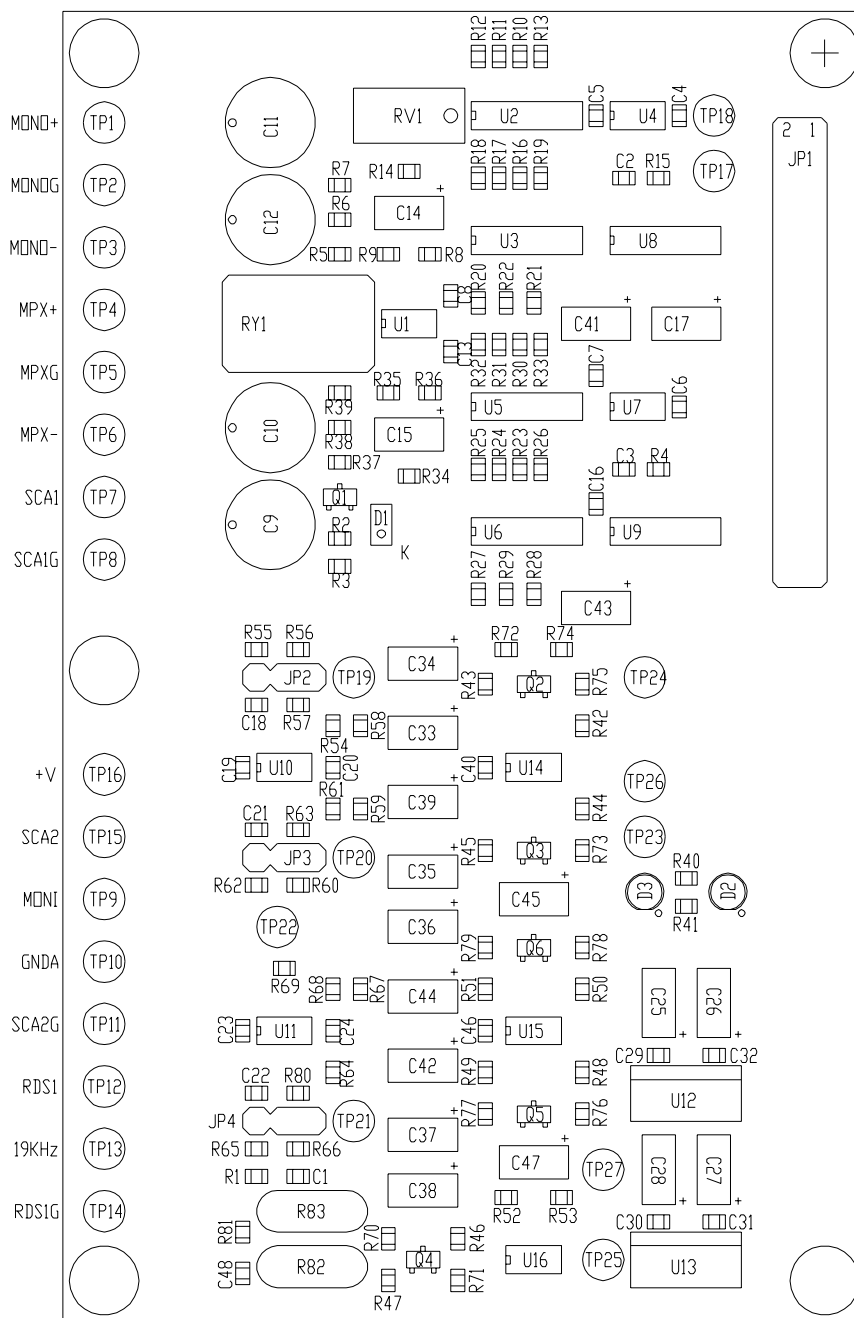
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2	23	C3,C4,C5,C6,C9,C10,C26, C27,C28,C29,C30,C31,C32, C33,C34,C35,C36,C38,C40, C55,C56,C57,C58	0.1uF
3	15	C7,C8,C37,C39,C41,C59, C60,C61,C62,C63,C64,C65, C66,C67,C68	10uF
4	9	L1,L2,L3,L4,C11,C12,C13, C14,C15	2.2uF
5	10	C16,C17,C18,C19,C20,C21, C22,C23,C24,C25	27pF
6	3	C42,C43,C44	470pF
7	5	C45,C47,C49,C52,C53	10nF
8	5	C46,C48,C50,C51,C54	0.47uF
9	2	D1,D2	LED-G3
10	5	D3,D5,D8,D9,D12	2800
11	5	D4,D6,D7,D10,D11	2802
12	9	D13,D14,D15,D16,D17,D18, D19,D20,D21	BAS32L
13	4	FIX1, FIX2, FIX3, FIX4	FIX35
14	1	JP1	STM34D
15	2	JP2, JP3	STM12D
16	5	JP4, JP5, JP8, JP9, JP10	STM03S
17	1	JP6	STF40S
18	1	JP7	STM04S
19	4	J1, J2, J3, J4	GNDCC
20	2	J5, J6	JSMD
21	1	Q1	BC847
22	1	RY1	RLYTQ2
23	15	R1,R2,R3,R9,R37,R41,R42, R43,R44,R55,R56,R73,R85, R86,R96	10K0
24	2	R4,R5	47H0
25	3	R6,R7,R8	20K0
26	3	R10,R21,R78	11K8
27	3	R11,R22,R79	10K5
28	7	R12,R23,R38,R39,R45,R46, R80	9K31
29	3	R13,R75,R81	8K25
30	4	R14,R30,R76,R77	4K99
31	2	R15,R31	7K87
32	2	R16,R32	12K4
33	2	R17,R33	19K6
34	2	R18,R34	30K9
35	2	R19,R35	49K9
36	2	R20,R36	78K7
37	5	R24,R25,R57,R60,R63	100K0
38	5	R26,R27,R58,R61,R64	93K1
39	5	R28,R29,R59,R62,R65	1K0
40	4	R40,R47,R89,R90	16K5
41	8	R48,R49,R50,R51,R68,R69, R70,R97	1M0

Input gain selector
SLPTAUDINP03

Revised: April 16, 1999

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Item	Quantity	Reference	Part
42	2	R52,R93	4K7
43	4	R53,R54,R71,R72	1H0
44	2	R66,R67	2K2
45	1	R74	33K2
46	3	R82,R83,R84	1K10
47	3	R87,R91,R95	2K49
48	2	R88,R92	604H0
49	1	R94	51H0
50	2	R98,R99	10H0
51	8	TP1,TP2,TP3,TP4,TP5,TP6, TP7,TP8	TP
52	6	TP9,TP10,TP11,TP12,TP13, TP14	TP15
53	2	U1,U2	4094SMD
54	4	U3,U4,U5,U6	4051SMD
55	2	U8,U7	TL074SMD
56	6	U9,U10,U11,U12,U13,U14	TL072SMD
57	1	U15	7808
58	1	U16	7908
59	2	VR1,VR2	S12



DENOMINAZIONE
Audio Input Card Component Layout / Piano Componenti

DISPOSITIVO

SEMILAVORATO

MATERIALE

TRATTAMENTO

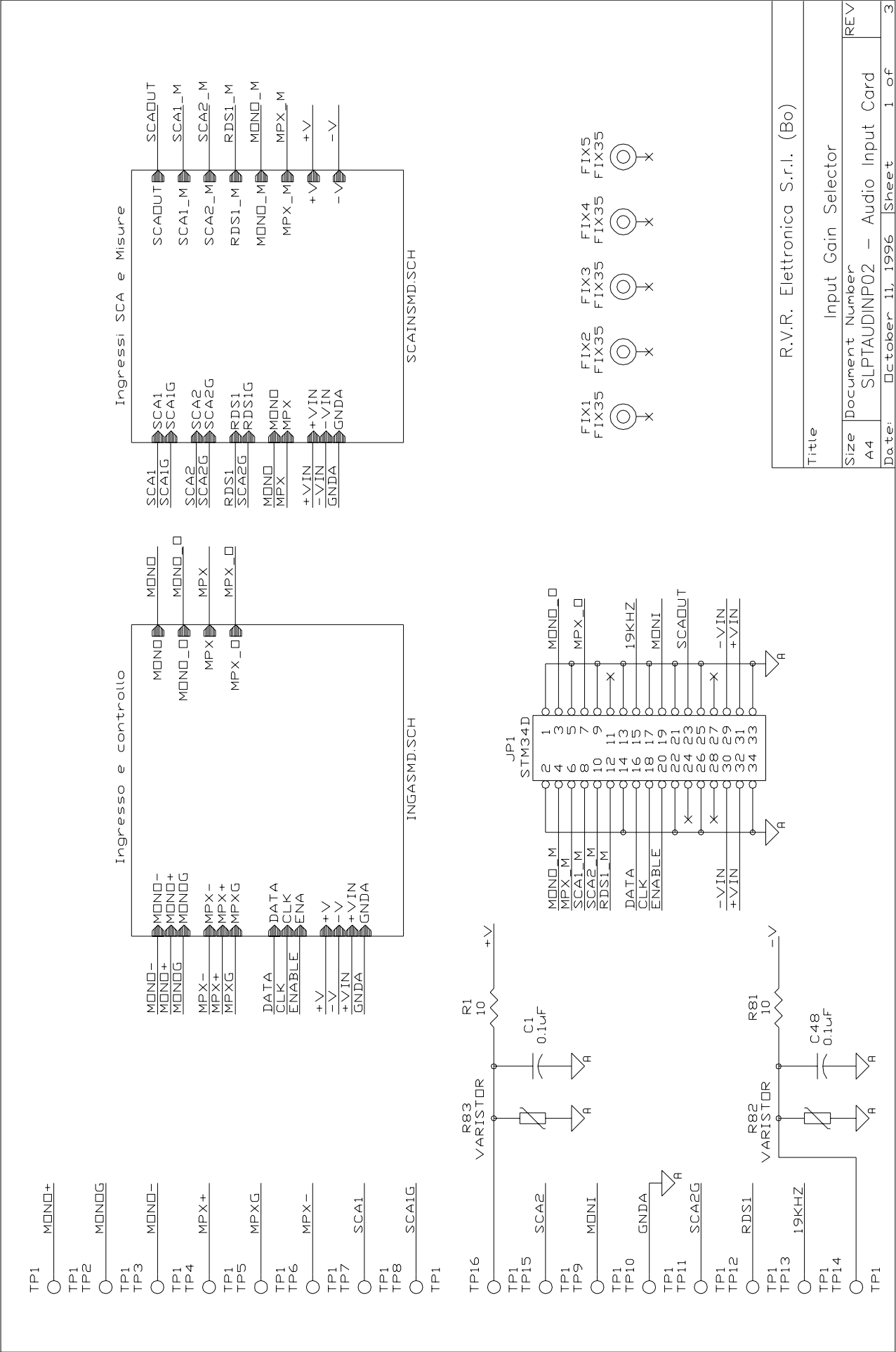
DISEGNATO

D'Alessio D. li 08/02/97

SCALA

DISEGNO

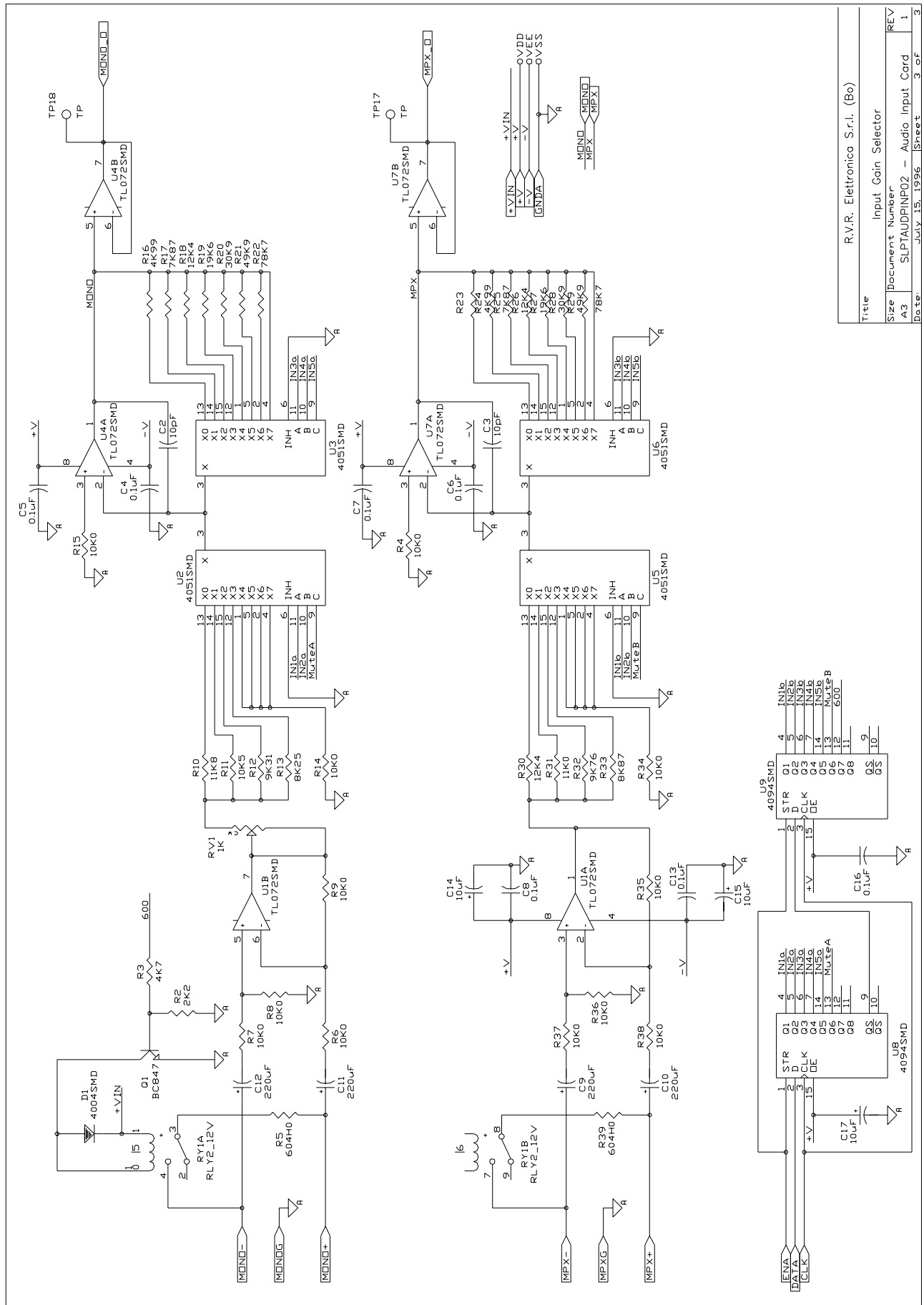
TAVOLA n di



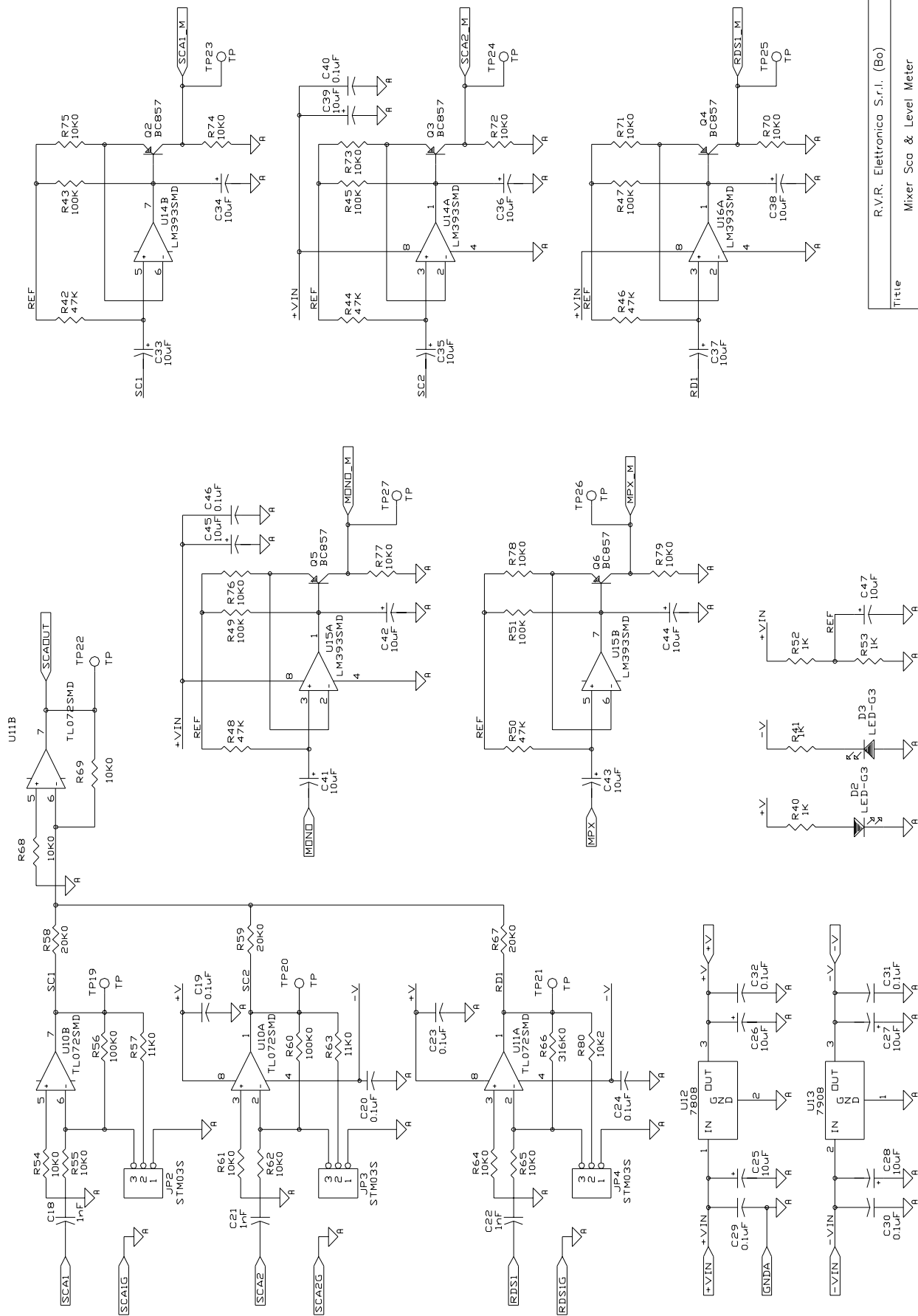
R.V.R. Elettronica S.r.l. (Bo)

Input Gain Selector

Size	Document Number	REV
A4	SLPTAUDINP02 - Audio Input Card	
Date:	October 11, 1996	Sheet 1 of 3



Title		
R.V.R. Elettronica S.r.l. (Bo)		
Size	Document Number	REV
A3	SLPTAUDINP02 - Audio Input Card	1
Date	July 15, 1996	Sheet 3 of 3



R.V.R. Elettronica S.r.l. (Bo)

Mixer Sca & Level Meter

Document Number

SLPTAUDINP02 - Audio Input Card

REV 1

Date: July 18, 1996

Sheet 2 of 3

Input gain selector
SLPTAUDINP02

Revised : July 15, 1996

Bill of Materials

Item	Reference	Part	Description	RVRCode
------	-----------	------	-------------	---------

1	CS1	CS	Circuito stampato	
2	JP1	STM34D	Strip M 2x2.54 34 pin.	
3	R1	10	Res. SMD 0805 al 5%	
4	C1	0.1uF	Cond. chip 0805	
5	R81	10	Res. SMD 0805 al 5%	
6	C48	0.1uF	Cond. chip 0805	
7	R82	VARISTOR	Varistor	
8	R83	VARISTOR	Varistor	
9	C19	0.1uF	Cond. chip 0805	
10	C20	0.1uF	Cond. chip 0805	
11	C23	0.1uF	Cond. chip 0805	
12	C24	0.1uF	Cond. chip 0805	
13	C25	10uF	Cond. el. SMD 16V	
14	C26	10uF	Cond. el. SMD 16V	
15	C27	10uF	Cond. el. SMD 16V	
16	C28	10uF	Cond. el. SMD 16V	
17	R40	1K	Res. SMD 0805 al 5%	
18	R41	1K	Res. SMD 0805 al 5%	
19	D2	LED-G3	Led Verde > 3mm	
20	D3	LED-G3	Led Verde > 3mm	
21	C29	0.1uF	Cond. chip 0805	
22	C30	0.1uF	Cond. chip 0805	
23	C31	0.1uF	Cond. chip 0805	
24	C32	0.1uF	Cond. chip 0805	
25	C33	10uF	Cond. el. SMD 16V	
26	R42	47K	Res. SMD 0805 al 5%	
27	C34	10uF	Cond. el. SMD 16V	
28	R43	100K	Res. SMD 0805 al 5%	
29	Q2	BC857	Tr. SMD in SOT23 BC857	
30	C35	10uF	Cond. el. SMD 16V	
31	R44	47K	Res. SMD 0805 al 5%	
32	C36	10uF	Cond. el. SMD 16V	
33	R45	100K	Res. SMD 0805 al 5%	
34	Q3	BC857	Tr. SMD in SOT23 BC857	
35	C37	10uF	Cond. el. SMD 16V	
36	R46	47K	Res. SMD 0805 al 5%	
37	C38	10uF	Cond. el. SMD 16V	
38	R47	100K	Res. SMD 0805 al 5%	
39	Q4	BC857	Tr. SMD in SOT23 BC857	
40	C39	10uF	Cond. el. SMD 16V	
41	C40	0.1uF	Cond. chip 0805	
42	C41	10uF	Cond. el. SMD 16V	
43	R48	47K	Res. SMD 0805 al 5%	
44	C42	10uF	Cond. el. SMD 16V	
45	R49	100K	Res. SMD 0805 al 5%	
46	Q5	BC857	Tr. SMD in SOT23 BC857	
47	C43	10uF	Cond. el. SMD 16V	
48	R50	47K	Res. SMD 0805 al 5%	
49	C44	10uF	Cond. el. SMD 16V	
50	R51	100K	Res. SMD 0805 al 5%	
51	Q6	BC857	Tr. SMD in SOT23 BC857	
52	C45	10uF	Cond. el. SMD 16V	
53	C46	0.1uF	Cond. chip 0805	
54	R52	1K	Res. SMD 0805 al 5%	
55	R53	1K	Res. SMD 0805 al 5%	

Input gain selector

Revised :

July 15, 1996

SLPTAUDINP02

Bill of Materials

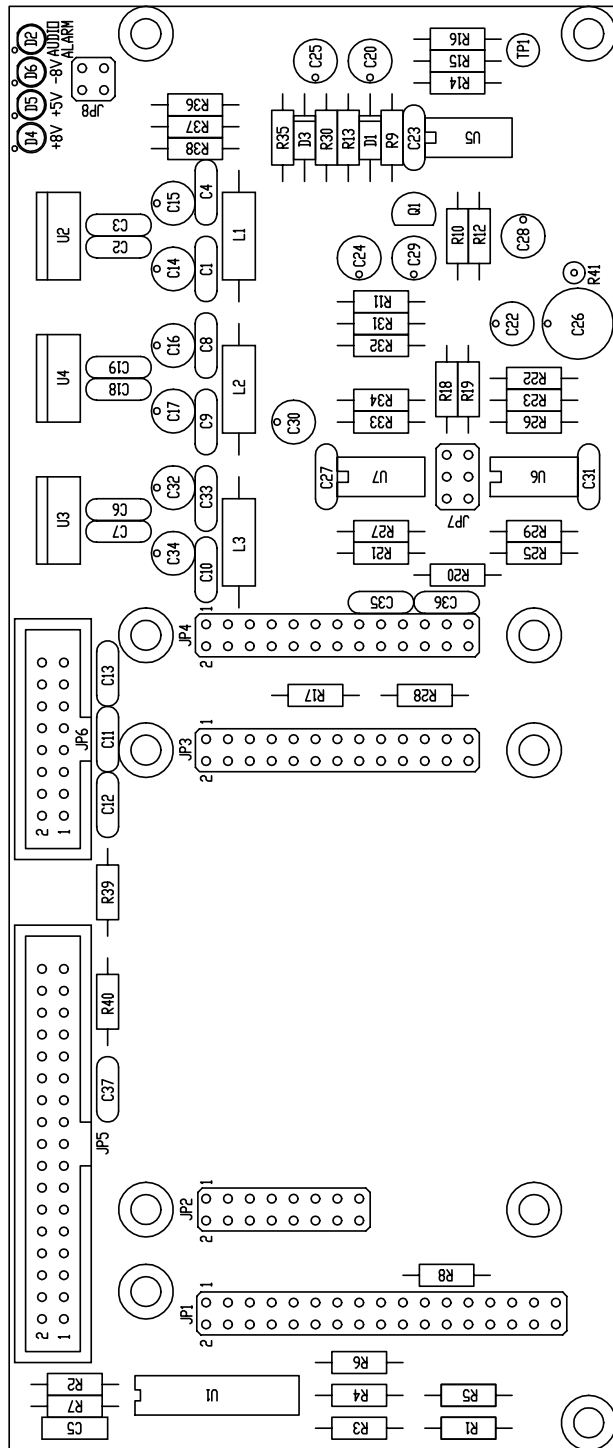
Item	Reference	Part	Description	RVRCode
56	C47	10uF	Cond. el. SMD 16V	
57	R54	10K0	Res. SMD 0805 al 1%	
58	R55	10K0	Res. SMD 0805 al 1%	
59	R56	100K0	Res. SMD 0805 al 1%	
60	R57	11K0	Res. SMD 0805 al 1%	
61	R58	20K0	Res. SMD 0805 al 1%	
62	R59	20K0	Res. SMD 0805 al 1%	
63	R60	100K0	Res. SMD 0805 al 1%	
64	R61	10K0	Res. SMD 0805 al 1%	
65	R62	10K0	Res. SMD 0805 al 1%	
66	R63	11K0	Res. SMD 0805 al 1%	
67	R64	10K0	Res. SMD 0805 al 1%	
68	R65	10K0	Res. SMD 0805 al 1%	
69	R66	316K0	Res. SMD 0805 al 1%	
70	R67	20K0	Res. SMD 0805 al 1%	
71	R68	10K0	Res. SMD 0805 al 1%	
72	R69	10K0	Res. SMD 0805 al 1%	
73	R70	10K0	Res. SMD 0805 al 1%	
74	R71	10K0	Res. SMD 0805 al 1%	
75	R72	10K0	Res. SMD 0805 al 1%	
76	R73	10K0	Res. SMD 0805 al 1%	
77	R74	10K0	Res. SMD 0805 al 1%	
78	R75	10K0	Res. SMD 0805 al 1%	
79	R76	10K0	Res. SMD 0805 al 1%	
80	R77	10K0	Res. SMD 0805 al 1%	
81	R78	10K0	Res. SMD 0805 al 1%	
82	R79	10K0	Res. SMD 0805 al 1%	
83	R80	10K2	Res. SMD 0805 al 1%	
84	U12	7808	CI lin. 7808	
85	U13	7908	CI lin. 7908	
86	JP2	STM03S	Strip M 2.54 3 pin.	
87	JP3	STM03S	Strip M 2.54 3 pin.	
88	JP4	STM03S	Strip M 2.54 3 pin.	
89	U10	TL072SMD	CI lin. TL072SMD SMD	
90	U15	LM393SMD	CI lin. LM393SMD SMD	
91	U14	LM393SMD	CI lin. LM393SMD SMD	
92	U16	LM393SMD	CI lin. LM393SMD SMD	
93	U11	TL072SMD	CI lin. TL072SMD SMD	
94	C18	1nF	Cond. chip 0805	
95	C21	1nF	Cond. chip 0805	
96	C22	1nF	Cond. chip 0805	
97	RV1	1K	Trim. mult. 3296X rg V	
98	C2	10pF	Cond. chip 0805	
99	C3	10pF	Cond. chip 0805	
100	R2	2K2	Res. SMD 0805 al 5%	
101	R3	4K7	Res. SMD 0805 al 5%	
102	Q1	BC847	Tr. SMD in SOT23 BC847	
103	C4	0.1uF	Cond. chip 0805	
104	C5	0.1uF	Cond. chip 0805	
105	C6	0.1uF	Cond. chip 0805	
106	C7	0.1uF	Cond. chip 0805	
107	C8	0.1uF	Cond. chip 0805	
108	C9	220uF	Cond. el. ver. 16V p.2.5mm	
109	C10	220uF	Cond. el. ver. 16V p.2.5mm	
110	C11	220uF	Cond. el. ver. 16V p.2.5mm	

Input gain selector
SLPTAUDINP02
Bill of Materials

Revised : July 15, 1996

Item	Reference	Part	Description	RVRCode
111	C12	220uF	Cond. el. ver. 16V p. 2.5mm	
112	C13	0.1uF	Cond. chip 0805	
113	C14	10uF	Cond. el. SMD 16V	
114	C15	10uF	Cond. el. SMD 16V	
115	C16	0.1uF	Cond. chip 0805	
116	C17	10uF	Cond. el. SMD 16V	
117	R5	604H0	Res. SMD 0805 al 1%	
118	R6	10K0	Res. SMD 0805 al 1%	
119	R7	10K0	Res. SMD 0805 al 1%	
120	R8	10K0	Res. SMD 0805 al 1%	
121	R9	10K0	Res. SMD 0805 al 1%	
122	R10	11K8	Res. SMD 0805 al 1%	
123	R11	10K5	Res. SMD 0805 al 1%	
124	R12	9K31	Res. SMD 0805 al 1%	
125	R13	8K25	Res. SMD 0805 al 1%	
126	R14	10K0	Res. SMD 0805 al 1%	
127	R15	10K0	Res. SMD 0805 al 1%	
128	R16	4K99	Res. SMD 0805 al 1%	
129	R17	7K87	Res. SMD 0805 al 1%	
130	R18	12K4	Res. SMD 0805 al 1%	
131	R19	19K6	Res. SMD 0805 al 1%	
132	R20	30K9	Res. SMD 0805 al 1%	
133	R21	49K9	Res. SMD 0805 al 1%	
134	R22	78K7	Res. SMD 0805 al 1%	
135	R23	4K99	Res. SMD 0805 al 1%	
136	R24	7K87	Res. SMD 0805 al 1%	
137	R25	12K4	Res. SMD 0805 al 1%	
138	R26	19K6	Res. SMD 0805 al 1%	
139	R27	30K9	Res. SMD 0805 al 1%	
140	R28	49K9	Res. SMD 0805 al 1%	
141	R29	78K7	Res. SMD 0805 al 1%	
142	R30	12K4	Res. SMD 0805 al 1%	
143	R31	11K0	Res. SMD 0805 al 1%	
144	R32	9K76	Res. SMD 0805 al 1%	
145	R33	8K87	Res. SMD 0805 al 1%	
146	R34	10K0	Res. SMD 0805 al 1%	
147	R35	10K0	Res. SMD 0805 al 1%	
148	R36	10K0	Res. SMD 0805 al 1%	
149	R37	10K0	Res. SMD 0805 al 1%	
150	R38	10K0	Res. SMD 0805 al 1%	
151	R39	604H0	Res. SMD 0805 al 1%	
152	R4	10K0	Res. SMD 0805 al 1%	
153	D1	4004SMD	Diodo silicio Minimelf	
154	U1	TL072SMD	CI lin. TL072SMD SMD	
155	U8	4094SMD	CI dig. 4094SMD SMD	
156	U9	4094SMD	CI dig. 4094SMD SMD	
157	U5	4051SMD	CI dig. 4051SMD SMD	
158	U6	4051SMD	CI dig. 4051SMD SMD	
159	U7	TL072SMD	CI lin. TL072SMD SMD	
160	U3	4051SMD	CI dig. 4051SMD SMD	
161	U2	4051SMD	CI dig. 4051SMD SMD	
162	U4	TL072SMD	CI lin. TL072SMD SMD	
163	RY1	RLY2_12V	Rele' Y_2TQ a 2V V	

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DENOMINAZIONE
Mother Board Audio Componente Layout / Piano Componenti
DISPOSITIVO

SEMILAVORATO

MATERIALE

TRATTAMENTO

DISEGNATO
D'Alessio D. li 06/02/97

SCALA

DISEGNO

TAVOLA n di

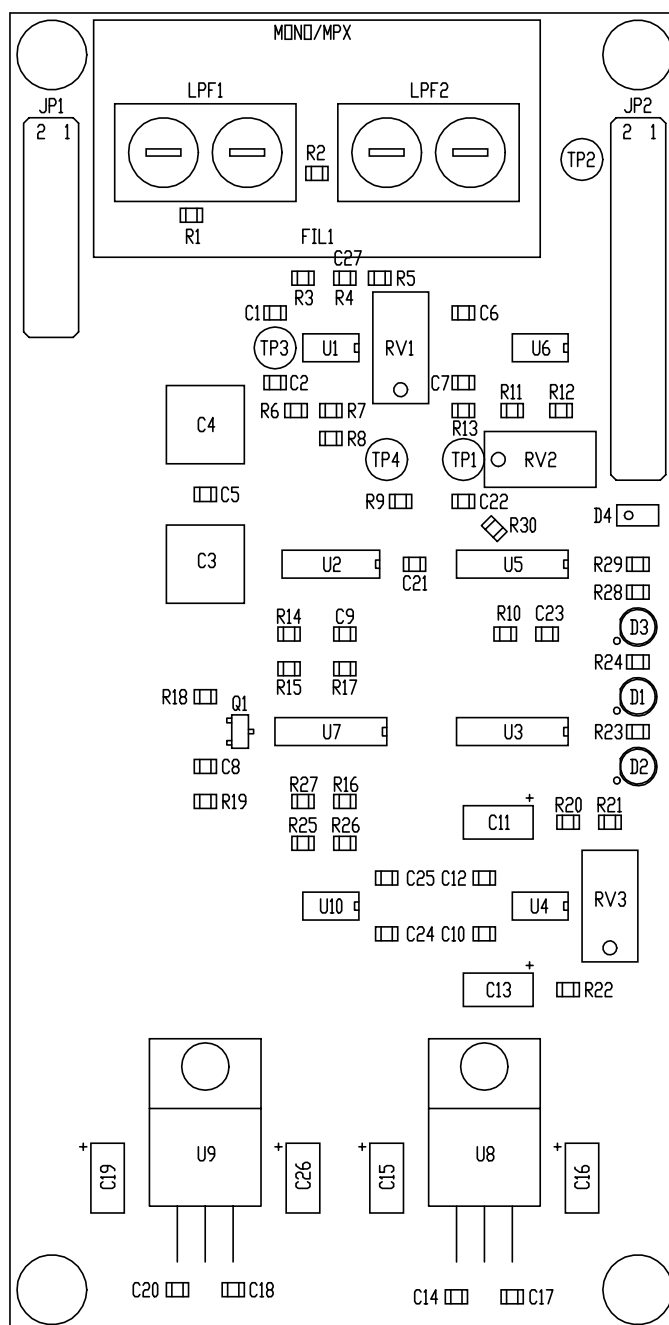


Mother Board Bus con Mixer SCA/MPX Revised: Friday, July 28, 2000
SLPTMDBAUD04 Revision: 4.1

R.V.R. Elettronica S.r.l. (BO)
Bill Of Materials November 2, 2000 18:11:17 Page1

Item	Qty	Reference	Part
1	21	C1, C2, C3, C4, C6, C7, C8, C9, C10, C11, C12, C13, C18, C19, C23, C27, C31, C33, C35, C36, C37	0.1uF
2	1	C5	100nF
3	8	C14, C15, C16, C17, C25, C28, C32, C34	47uF
4	4	C20, C22, C29, C30	10uF
5	1	C24	2.2uF
6	1	C26	100uF
7	2	D1, D3	1N4148
8	1	D2	LED-R3
9	3	D4, D5, D6	LED-G3
10	10	FIX1, FIX2, FIX3, FIX4, FIX5, FIX6, FIX7, FIX8, FIX9, FIX10	FIX35
11	1	JP1	Audio Input
12	1	JP2	STF16D
13	2	JP4, JP3	STF26D
14	1	JP5	CN34PD
15	1	JP6	CN16PD
16	2	JP9, JP7	STM03S
17	1	JP8	STM04D
18	3	L1, L2, L3	2u2
19	1	Q1	BC557
20	6	R1, R2, R3, R4, R5, R6	4K99
21	3	R7, R38, R40	1K0
22	3	R8, R31, R32	2K20
23	11	R9, R10, R17, R20, R21, R22, R25, R26, R27, R29, R34	10K0
24	1	R11	475K0
25	1	R12	47K5
26	1	R13	2M20
27	1	R14	56K0
28	1	R15	3K48
29	3	R16, R18, R19	100K0
30	1	R28	24K9
31	1	R30	1K50
32	1	R33	60K4
33	1	R35	4K70
34	2	R36, R37	1K80
35	1	R39	3K01
36	1	R41	100H0
37	1	R43	NC
38	1	TP1	TP
39	1	U1	7407
40	1	U2	7805
41	1	U3	7808
42	1	U4	7908
43	1	U5	LM393

44	2	U6,U7	TL072
45	1	R42	NC
46	1	R23	57K5



DENOMINAZIONE
Mono/MPX Card Component Layout / Piano Componenti
DISPOSITIVO

SEMILAVORATO

MATERIALE

TRATTAMENTO

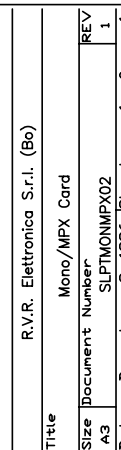
DISEGNATO

D'Alessio D. li 08/02/97

SCALA

DISEGNO

TAVOLA n di



1	CS1	CS	Circuito stampato
2	JP1	STM16D	Strip M 2x2.54 16 pin.
3	LPF1	LPF19K1	---
4	LPF2	LPF19K1	---
5	FIL1	MPXAEV	---
6	U1	TL072SMD	CI lin. TL072SMD SMD
7	U2	4066SMD	CI dig. 4066SMD SMD
8	U3	4094SMD	CI dig. 4094SMD SMD
9	U4	TL072SMD	CI lin. TL072SMD SMD
10	U5	4053SMD	CI dig. 4053SMD SMD
11	R1	4K7	Res. SMD 0805 al 5%
12	R2	33K	Res. SMD 0805 al 5%
13	R3	4K7	Res. SMD 0805 al 5%
14	R4	4K7	Res. SMD 0805 al 5%
15	R5	3K3	Res. SMD 0805 al 5%
16	RV1	5K	Trim. mult. 3296X rg V
17	C1	0.1uF	Cond. chip 0805
18	C2	0.1uF	Cond. chip 0805
19	R6	680	Res. SMD 0805 al 5%
20	R7	150K	Res. SMD 0805 al 5%
21	R8	27K	Res. SMD 0805 al 5%
22	R9	10K0	Res. SMD 0805 al 1%
23	C5	100pF	Cond. chip 0805
24	R10	10K0	Res. SMD 0805 al 1%
25	RV2	1K	Trim. mult. 3296X rg V
26	R11	10K0	Res. SMD 0805 al 1%
27	R12	10K0	Res. SMD 0805 al 1%
28	U6	TL072SMD	CI lin. TL072SMD SMD
29	Q1	BC857	Tr. SMD in SOT23 BC857
30	JP2	STM26D	Strip M 2x2.54 26 pin.
31	R20	10K0	Res. SMD 0805 al 1%
32	RV3	5K	Trim. mult. 3296X rg V
33	R22	10K0	Res. SMD 0805 al 1%
34	D1	LED-G3	Led Verde > 3mm
35	D2	LED-G3	Led Verde > 3mm
36	U10	LM393SMD	CI lin. LM393SMD SMD
37	D3	LED-R3	Led Rosso > 3mm
38	D4	DSMINIM	Diodo silicio Minimelf
39	U7	3096SMD	CI lin. 3096SMD SMD
40	R13	4K7	Res. SMD 0805 al 5%
41	R14	2K2	Res. SMD 0805 al 5%
42	R15	10K	Res. SMD 0805 al 5%
43	R16	47K	Res. SMD 0805 al 5%
44	R17	47K	Res. SMD 0805 al 5%
45	R18	10K	Res. SMD 0805 al 5%
46	R19	2K2	Res. SMD 0805 al 5%
47	R23	1K2	Res. SMD 0805 al 5%
48	R24	1K2	Res. SMD 0805 al 5%
49	R25	270	Res. SMD 0805 al 5%
50	R27	100K	Res. SMD 0805 al 5%
51	R26	10K	Res. SMD 0805 al 5%
52	R29	5K6	Res. SMD 0805 al 5%
53	R28	3K3	Res. SMD 0805 al 5%
54	C23	0.1uF	Cond. chip 0805
55	C22	0.1uF	Cond. chip 0805

SLPTMONMPX02

Item Reference

Part

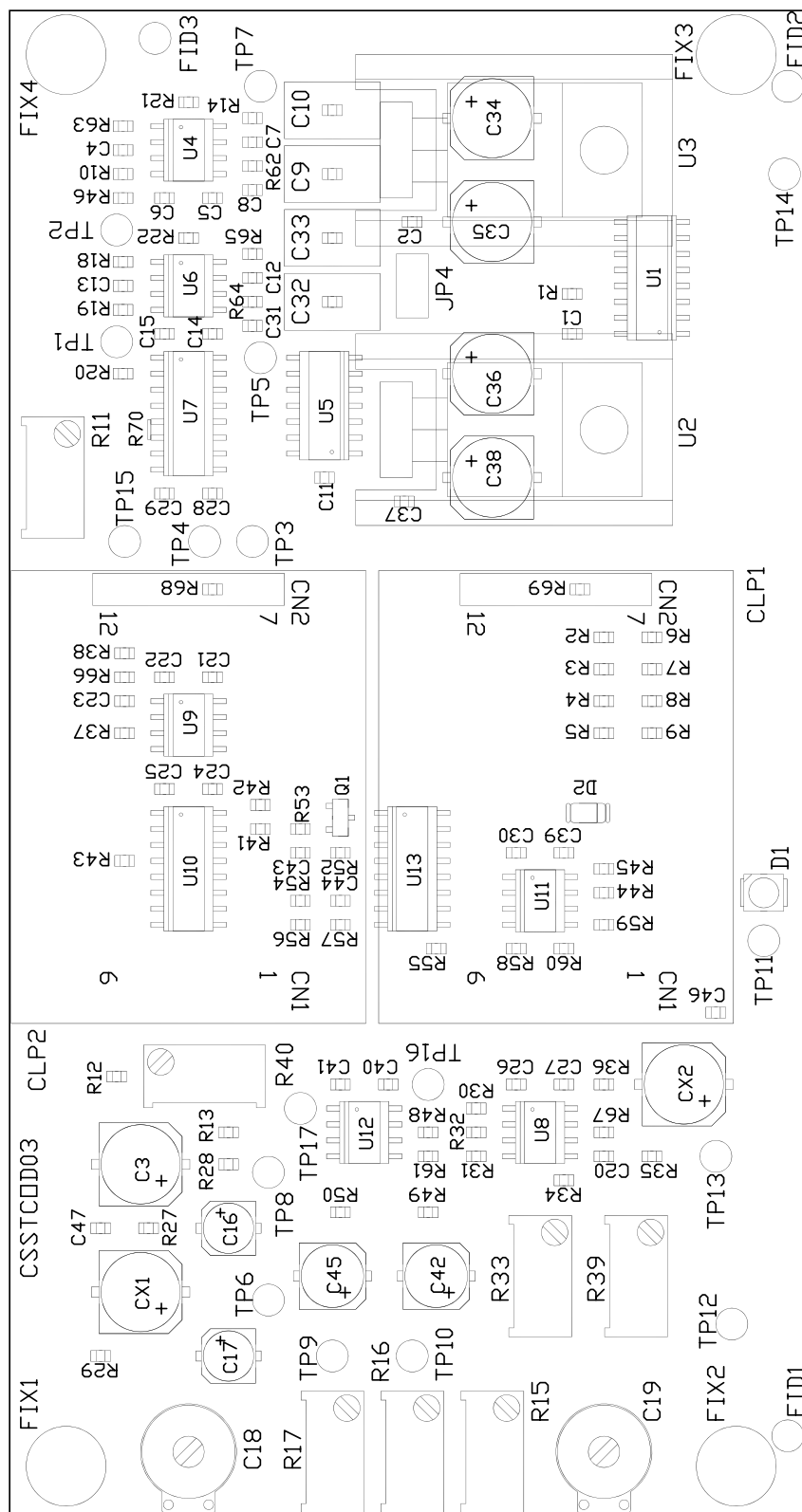
Bill of Materials

Description

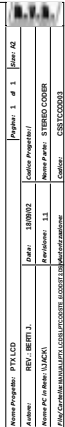
Page 2

RVRCODE

56	C6	0.1uF	Cond. chip 0805
57	C7	0.1uF	Cond. chip 0805
58	C8	47pF	Cond. chip 0805
59	C9	47pF	Cond. chip 0805
60	C24	0.1uF	Cond. chip 0805
61	C25	0.1uF	Cond. chip 0805
62	C10	0.1uF	Cond. chip 0805
63	C12	0.1uF	Cond. chip 0805
64	C14	0.1uF	Cond. chip 0805
65	C17	0.1uF	Cond. chip 0805
66	C20	0.1uF	Cond. chip 0805
67	C18	0.1uF	Cond. chip 0805
68	C15	10uF	Cond. el. SMD 16V
69	C16	10uF	Cond. el. SMD 16V
70	C19	10uF	Cond. el. SMD 16V
71	C26	10uF	Cond. el. SMD 16V
72	C11	10uF	Cond. el. SMD 16V
73	C13	10uF	Cond. el. SMD 16V
74	C21	0.1uF	Cond. chip 0805
75	U9	7908	CI lin. 7908
76	U8	7808	CI lin. 7808
77	C4	1nF	Cond. pol. 1% p. 7mm
78	C3	2.2nF	Cond. pol. 1% p. 7mm
79	R21	6K8	Res. SMD 0805 al 5%
80	R30	1K0	Res. SMD 0805 al 1%
81	C27	1nF	Cond. chip 0805



Nome Progetto		PTX LCD	Pagina: 1	di 1	Size: A4
Autore	REV.: BERTI J.		Data	06/07/01	Codice Progetto /
Nome PC in Rete	\\JACK\		Revisione	1.0	Nome Parte STEREO CODER
File/Cartella/MANUAL/PTX_LCD/SLPTCDSTE_6/CDD03_LY.DWG			Autorizzazione		Codice CSSTCCDD03
Scala/	Materiale /		Trattamento	/	Profilo /



SLPTCODSTE03

Bill Of Materials

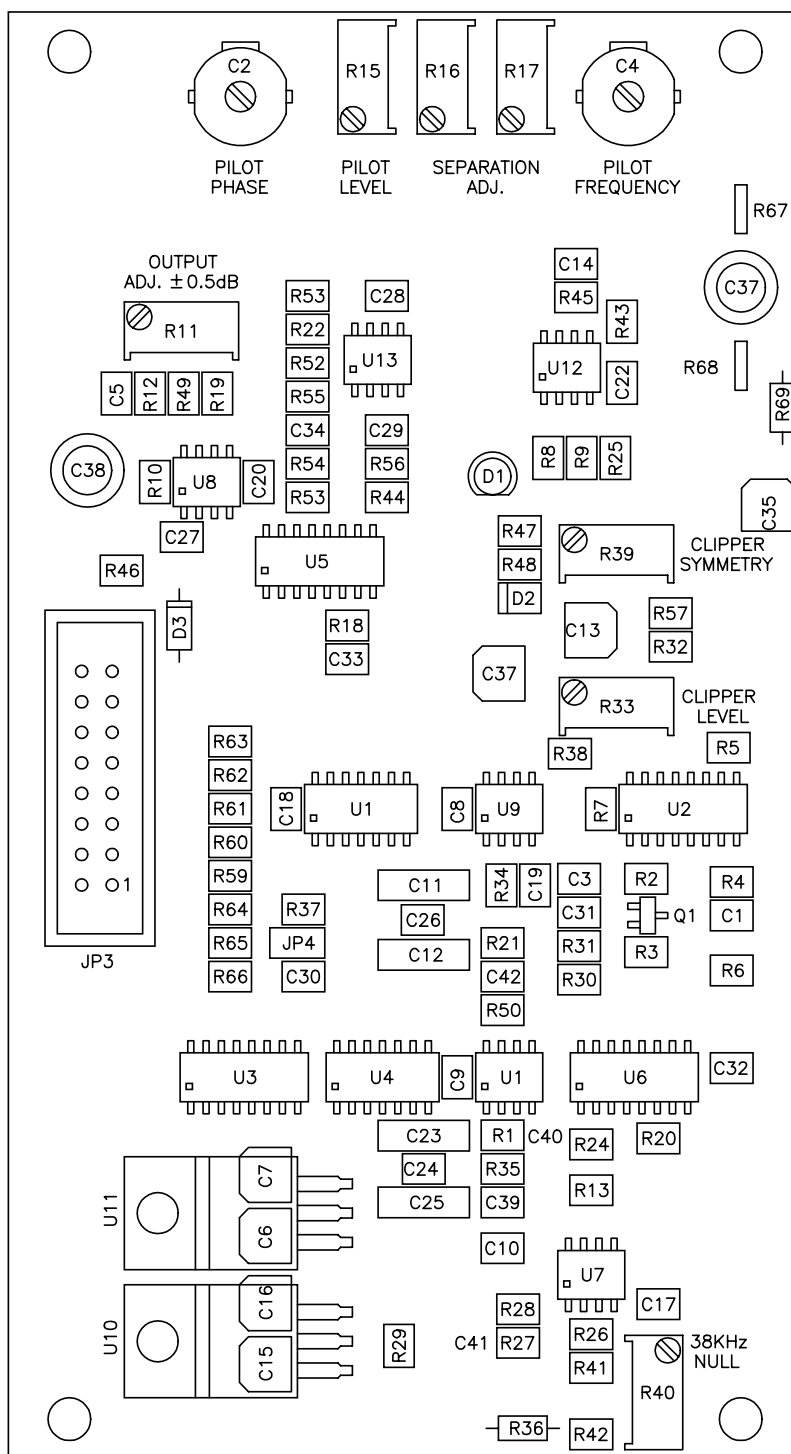
Page1

Item	Q.ty	Reference	Part
1	2	CLP1	CLIPPER
		CLP2	CLIPPER
2	1	COD1	CODER PERRY
3	2	CX1	220uF
		CX2	220uF
4	22	C1	0.1uF
		C2	0.1uF
		C5	0.1uF
		C6	0.1uF
		C11	0.1uF
		C14	0.1uF
		C15	0.1uF
		C21	0.1uF
		C22	0.1uF
		C24	0.1uF
		C25	0.1uF
		C26	0.1uF
		C27	0.1uF
		C28	0.1uF
		C29	0.1uF
		C30	0.1uF
		C37	0.1uF
		C39	0.1uF
		C40	0.1uF
		C41	0.1uF
		C46	0.1uF
		C47	0.1uF
5	1	C3	100 uF
6	4	C7	47pF
		C12	47pF
		C43	47pF
		C44	47pF
7	2	C8	220pF
		C31	220pF
8	2	C9	1nFP
		C32	1nFP
9	2	C10	2n2P
		C33	2n2P
10	4	C16	10uF
		C17	10uF
		C42	10uF
		C45	10uF
11	1	C18	CV20pF
12	1	C19	CV40pF
13	4	C4	NC
		C13	NC
		C20	NC
		C23	NC
14	2	C36	100uF
		C34	100uF
15	2	C38	47uF
		C35	47uF
16	1	D1	LED-R3
17	1	D2	1N4148

18	4	FIX1	FIX35
		FIX2	FIX35
		FIX3	FIX35
		FIX4	FIX35
19	1	FL1	FILPERRY
20	1	JP1	STM26D
21	1	JP2	STM16D
22	1	JP3	CN16PD
23	1	Q1	BC327
24	34	R1	10K
		R2	10K
		R3	10K
		R4	10K
		R5	10K
		R6	10K
		R7	10K
		R8	10K
		R9	10K
		R10	10K
		R12	10K
		R13	10K
		R18	10K
		R19	10K
		R20	10K
		R27	10K
		R29	10K
		R30	10K
		R32	10K
		R34	10K
		R36	10K
		R37	10K
		R41	10K
		R42	10K
		R43	10K
		R46	10K
		R48	10K
		R50	10K
		R53	10K
		R57	10K
		R59	10K
		R63	10K
		R66	10K
		R67	10K
25	3	R11	TMV1K
		R39	TMV1K
		R40	TMV1K
26	2	R14	22K
		R65	22K
27	2	R15	TMV10K
		R33	TMV10K
28	2	R17	TMV50K
		R16	TMV50K
29	4	R21	2K2
		R22	2K2
		R52	2K2
		R56	2K2
		R68	2K2
		R69	2K2
30	1	R28	475K
31	2	R31	100K

		R58	100K
32	1	R35	15K
33	2	R49	4K7
		R38	4K7
		R70	4K7
34	1	R44	3K3
35	1	R45	5K6
36	2	R54	47K
		R55	47K
37	1	R60	270
38	1	R61	180K
39	2	R62	680
		R64	680
40	1	U1	4094
41	1	U2	7808
42	5	U4	TL072
		U6	TL072
		U8	TL072
		U9	TL072
		U12	TL072
43	1	U5	4066
44	2	U7	4053
		U10	4053
45	1	U11	LM393
46	1	U13	CA3096

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DENOMINAZIONE

Stereo Coder Component Layout / Piano di Montaggio

DISPOSITIVO

SEMILAVORATO

MATERIALE

TRATTAMENTO

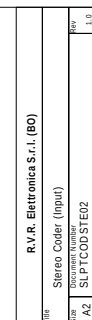
DISEGNATO

D'Alessio D.li 20/03/97

SCALA

DISEGNO

TAVOLA n di



SLPTCODSTE02

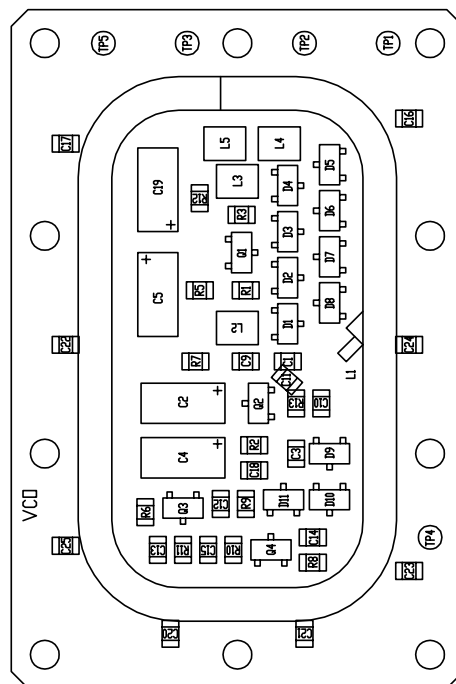
Bill Of Materials

Page1

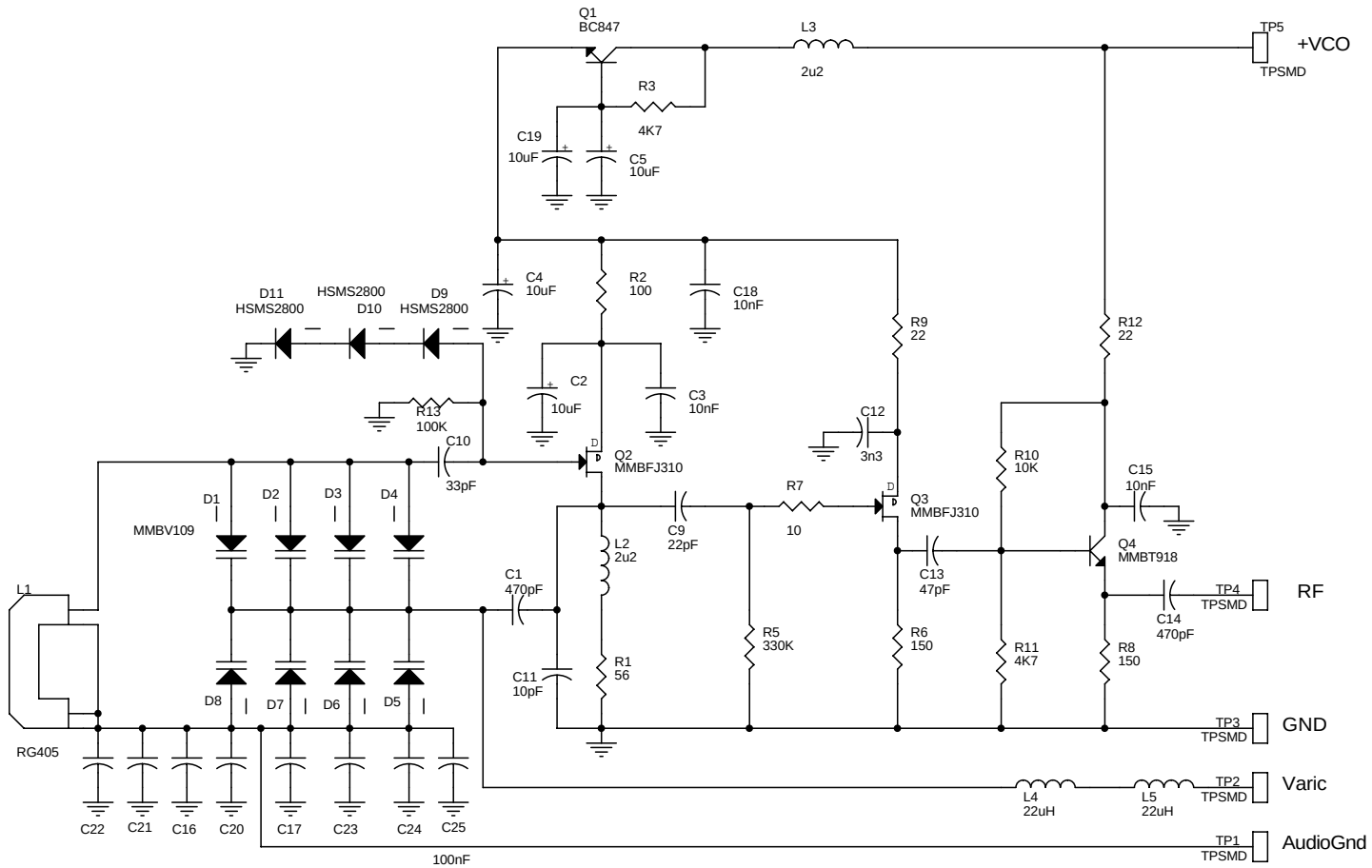
Item	Quantity	Reference	Part
1	1	COD1	CODERPERRY
2	2	CX2, CX1	220uF
3	6	C1, C3, C39, C40, C41, C42	47pF
4	1	C2	CV40pF
5	1	C4	CV20pF
6	18	C5, C8, C9, C10, C14, C17, C18, C19, C20, C22, C28, C29, C30, C31, C32, C33, C34, C35	0.1uF
7	7	C6, C7, C13, C15, C16, C35, C37	10uF
8	2	C11, C23	2n2P
9	2	C12, C25	100pF
10	2	C24, C26	1nFP
11	2	D3, C27	NC
12	2	DX1, DX2	BAT83
13	1	D1	LED-R3
14	1	D2	1N4148
15	4	FIX1, FIX2, FIX3, FIX4	FIX35
16	1	HY1	FILPERRY
17	1	JP1	STM26D
18	1	JP2	STM16D
19	1	JP3	CN16PD
20	1	JP4	JPSMD
21	1	Q1	BC557
22	1	RX1	8K25
23	1	RX2	2K
24	33	R1, R2, R4, R9, R12, R18, R19, R20, R24, R26, R27, R32, R34, R36, R37, R41, R42, R43, R45, R52, R53, R54, R55, R56, R59, R60, R61, R62, R63, R64, R65, R66, R67	10K
25	6	R3, R5, R28, R29, R30, R31	2K2
26	2	R6, R7	47K
27	3	R8, R44, R46	100K
28	2	R10, R38	4K7
29	2	R11, R40	TMV1K
30	1	R13	27K
31	1	R15	TMV10K
32	2	R16, R17	TMV50K
33	2	R21, R35	680
34	1	R22	15K
35	1	R23	82K
36	1	R25	270
37	1	R33	TM10K
38	1	R39	TM1K
39	1	R47	3K3
40	1	R48	5K6
41	2	R49, R57	180K
42	1	R50	22K
43	1	R69	475K
44	5	U1, U7, U8, U9, U13	TL072
45	1	U2	CA3096
46	1	U3	4094
47	1	U4	4066



48	2	U5, U6	4053
49	1	U10	7908
50	1	U11	7808
51	1	U12	LM393
52	1	10K	R68



Nome Progetto		PTX LCD		Pagina 1 di 1		Size A4	
Autore		D'ALESSIO D. - REV. BERTI J.		Data		07/01/03	
Nome PC in Rete		\\JACK\\		Revisione		1.1	
File/Cartella		MANUALI\PTX LCD\SLPTV\LCD_ZASLPTVCD0001.DWG		Autore		VCD CARD COMPONENT	
Scala		1:1		Trattamento		CSPTXVCD001	
Materiale		/		Profilo		/	



L1 = Cavo schermato semirigido 17cm estremita' calza

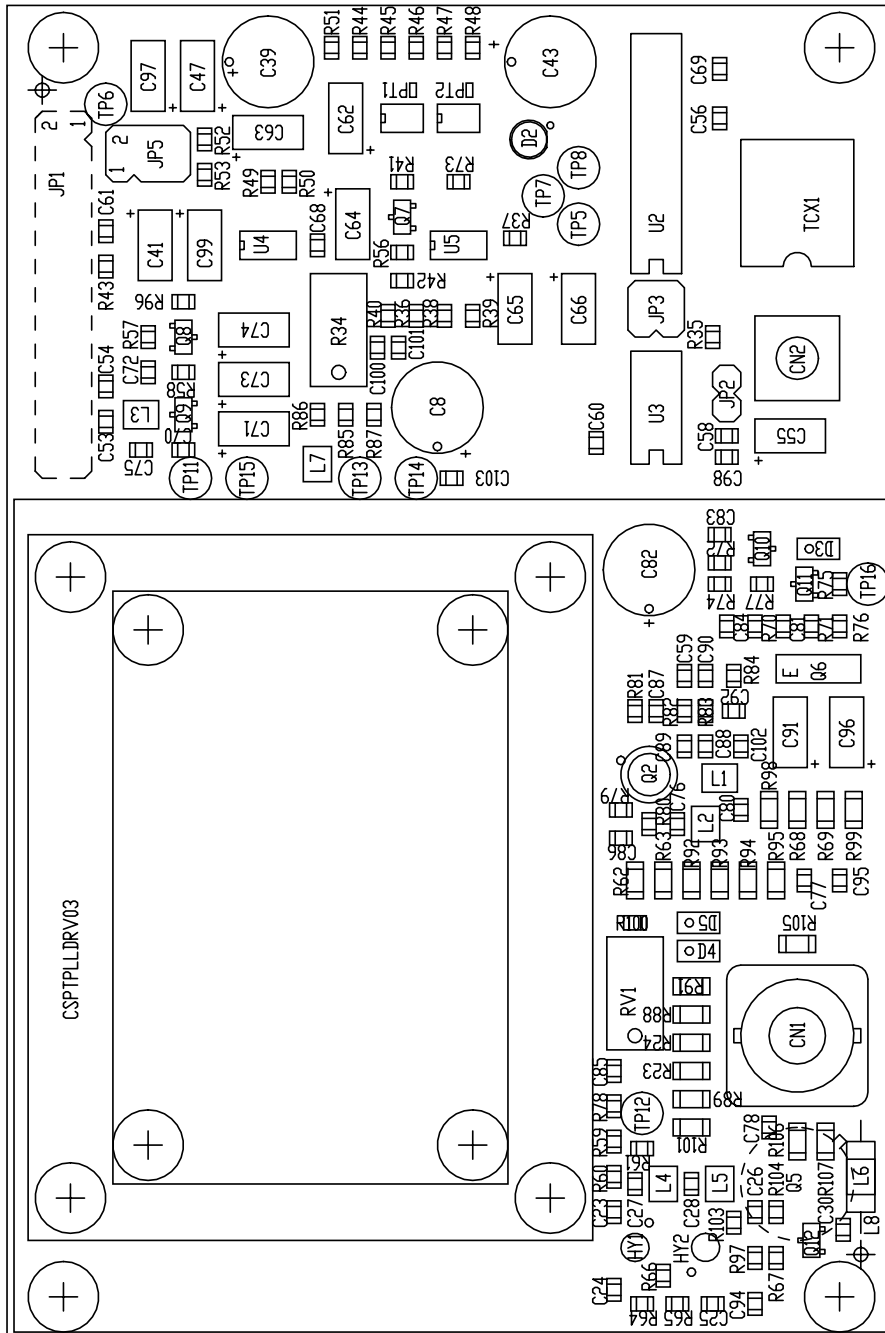
Nome Progetto: PTX LCD			Pagina: 1 di 1	Size: A4
Autore: REV.: BERTI J.	Data: 07/01/03	Codice Progetto: I		
Nome PC in Rete: \\JACKI	Revisione: 1.1	Nome Parte: VCO SMD		
File/Cartella: MANUALIPTX LCD\SLPTVCO_7\SLPTVCO0001.DSN	Autorizzazione:	Codice: SLPTXVCO0001		

VCO SMD
SLPTXVCO0001
Bill of Materials

Revised :September 17, 1996
Revision:

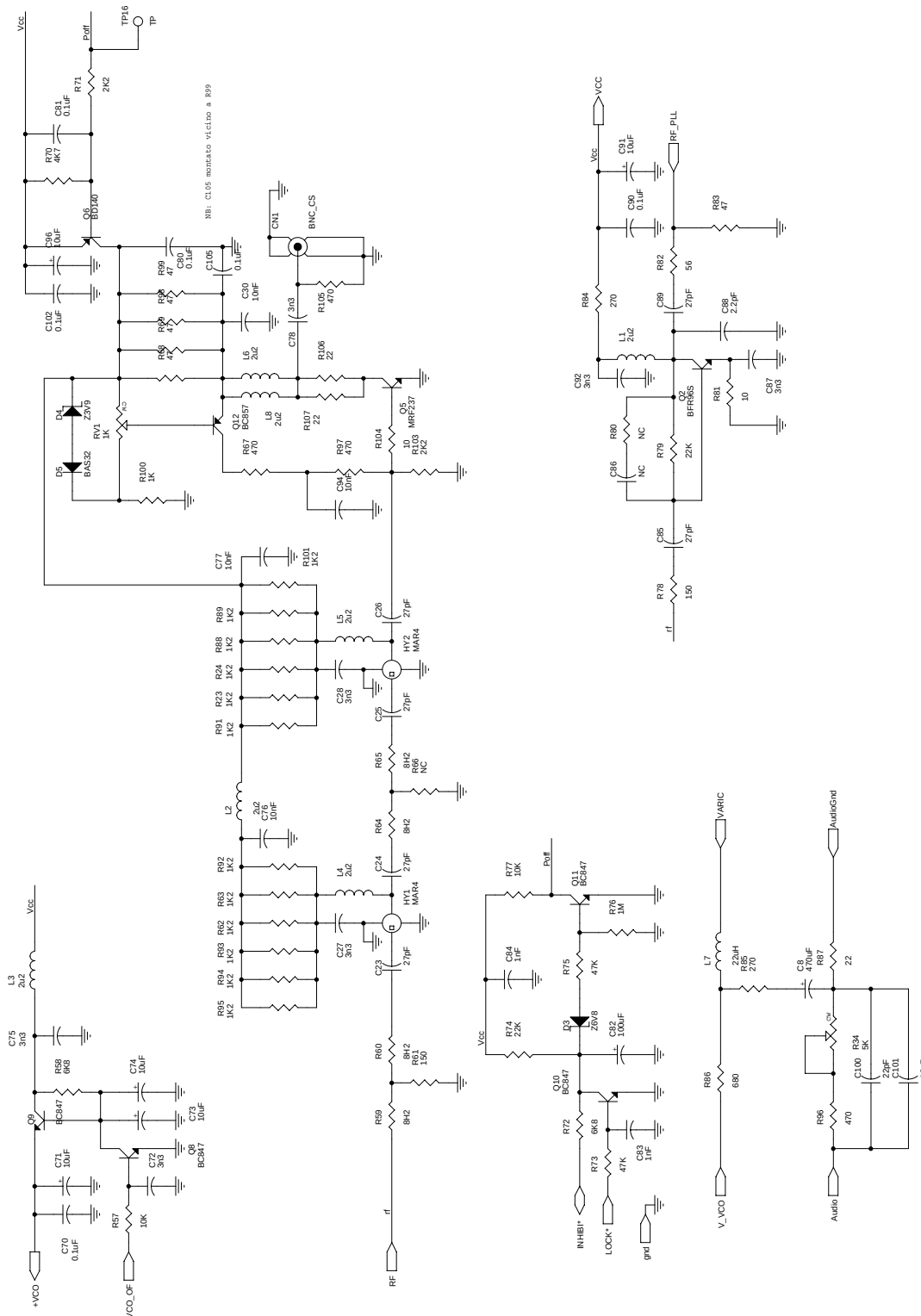
Item	Reference	Part	Description	RVRCode
1	CS1	CS	Circuito stampato	
2	C3	10nF	Cond. chip 0805	
3	R2	100	Res. SMD 0805 al 1%	
4	C4	10µF	Cond. el. SMD 16V	
5	Q1	BC847	Tr. SMD in SOT23 BC847	
6	L3	2.2uH	Impedenza SMD	
7	Q2	MMBFJ310	FET SMD in SOT23 MMBFJ310	
8	Q3	MMBFJ310	FET SMD in SOT23 MMBFJ310	
9	R9	22	Res. SMD 0805 al 5%	
10	C13	47pF	Cond. chip 0805	
11	Q4	MMBT918	Tr. SMD in SOT23 MMBT918	
12	R12	22	Res. SMD 0805 al 5%	
13	R13	100K	Res. SMD 0805 al 5%	
14	R7	10	Res. SMD 0805 al 5%	
15	D11	HSMS2800	Diodo silicio HSMS2800	
16	D10	HSMS2800	Diodo silicio HSMS2800	
17	D9	HSMS2800	Diodo silicio HSMS2800	
18	C9	22pF	Cond. chip 0805	
19	L4	22uH	Impedenza SMD	
20	L5	22uH	Impedenza SMD	
21	C5	10uF	Cond. el. SMD 16V	
22	C10	33pF	Cond. chip 0805	
23	C18	10nF	Cond. chip 0805	
24	C12	3.3nF	Cond. chip 0805	
25	R5	330K	Res. SMD 0805 al 1%	
26	R6	150	Res. SMD 0805 al 1%	
27	R8	150	Res. SMD 0805 al 1%	
28	C14	10nF	Cond. chip 0805	
29	D2	MMBV109	Diodo Varicap SMD in SOT23	
30	D1	MMBV109	Diodo Varicap SMD in SOT23	
31	D3	MMBV109	Diodo Varicap SMD in SOT23	
32	D4	MMBV109	Diodo Varicap SMD in SOT23	
33	D8	MMBV109	Diodo Varicap SMD in SOT23	
34	D7	MMBV109	Diodo Varicap SMD in SOT23	
35	D6	MMBV109	Diodo Varicap SMD in SOT23	
36	D5	MMBV109	Diodo Varicap SMD in SOT23	
37	C2	10uF	Cond. tant. SMD 16V	
38	C19	10uF	Cond. tant. SMD 16V	
39	C15	10nF	Cond. chip 0805	
40	C1	470pF	Cond. chip 0805	
41	R11	4K7	Res. SMD 0805 al 5%	
42	R10	10K	Res. SMD 0805 al 5%	
43	R1	56	Res. SMD 0805 al 5%	
44	R3	4K7	Res. SMD 0805 al 5%	
45	L1	RG405	Induttanza cavo RG405	
46	C22	100nF	Cond. chip 0805	
47	C21	100nF	Cond. chip 0805	
48	C16	100nF	Cond. chip 0805	
49	C20	100nF	Cond. chip 0805	
50	C17	100nF	Cond. chip 0805	
51	C23	100nF	Cond. chip 0805	
52	C24	100nF	Cond. chip 0805	
53	C25	100nF	Cond. chip 0805	
54	L2	2.2uH	Impedenza SMD	
55	C11	10pF	Cond. chip 0805	

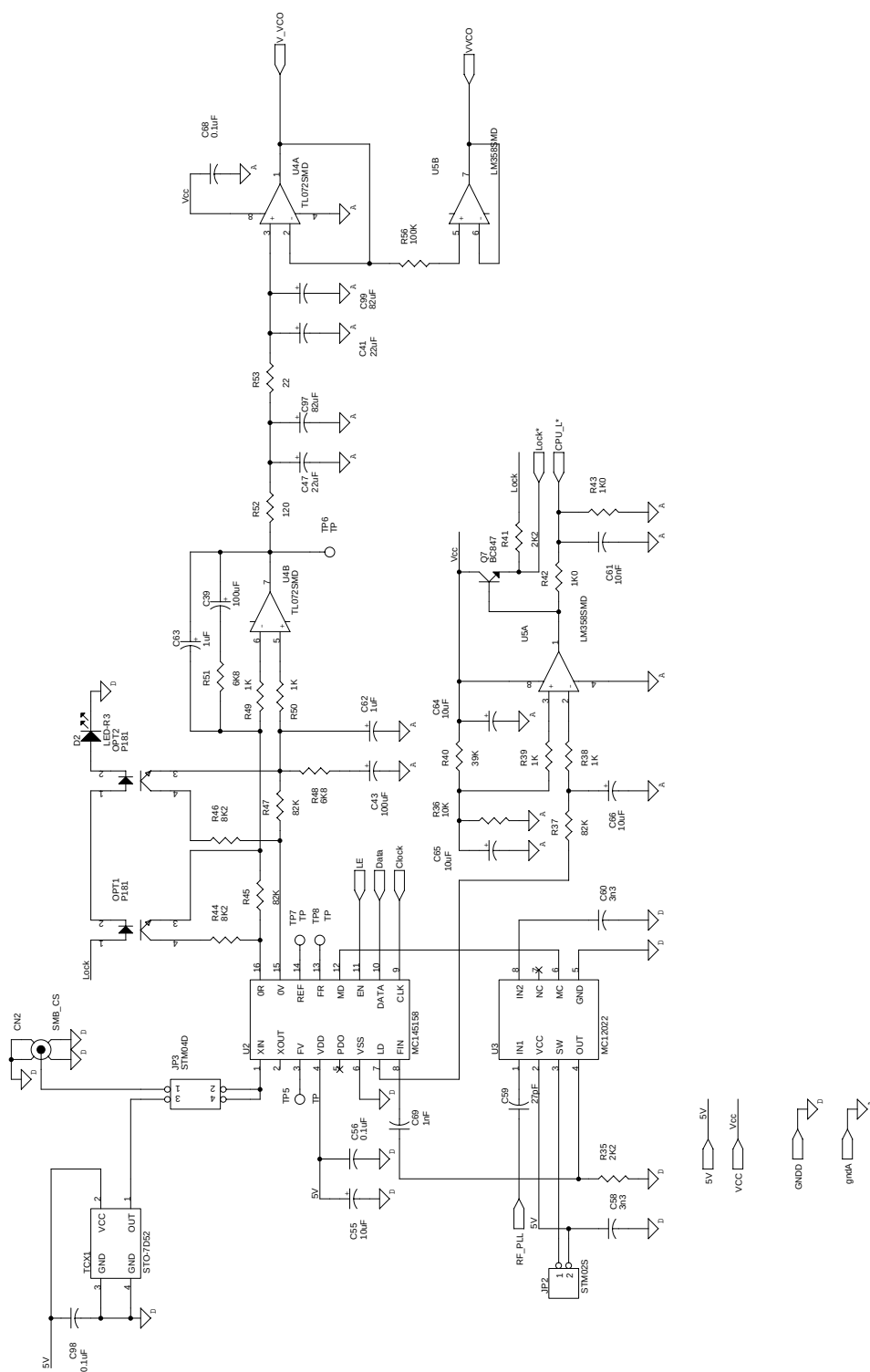
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Nome Progetto		Pagina		di		Size	
PTX LCD		1		1		A3	
Autore		REV. BERTI J.		Codice Progetto		/	
Nome PC in Rete		\\JACK\		Revisione		1.1	
File/Cartella		MANUALITY LCD\SLPTPLLDV03\IN\SLPTPLLDV03.DWG		Autore		PLL & DRIVER	
Scala		/		Trattamento		CSPTPLLDV03	
Materiale		/		Profilo		/	



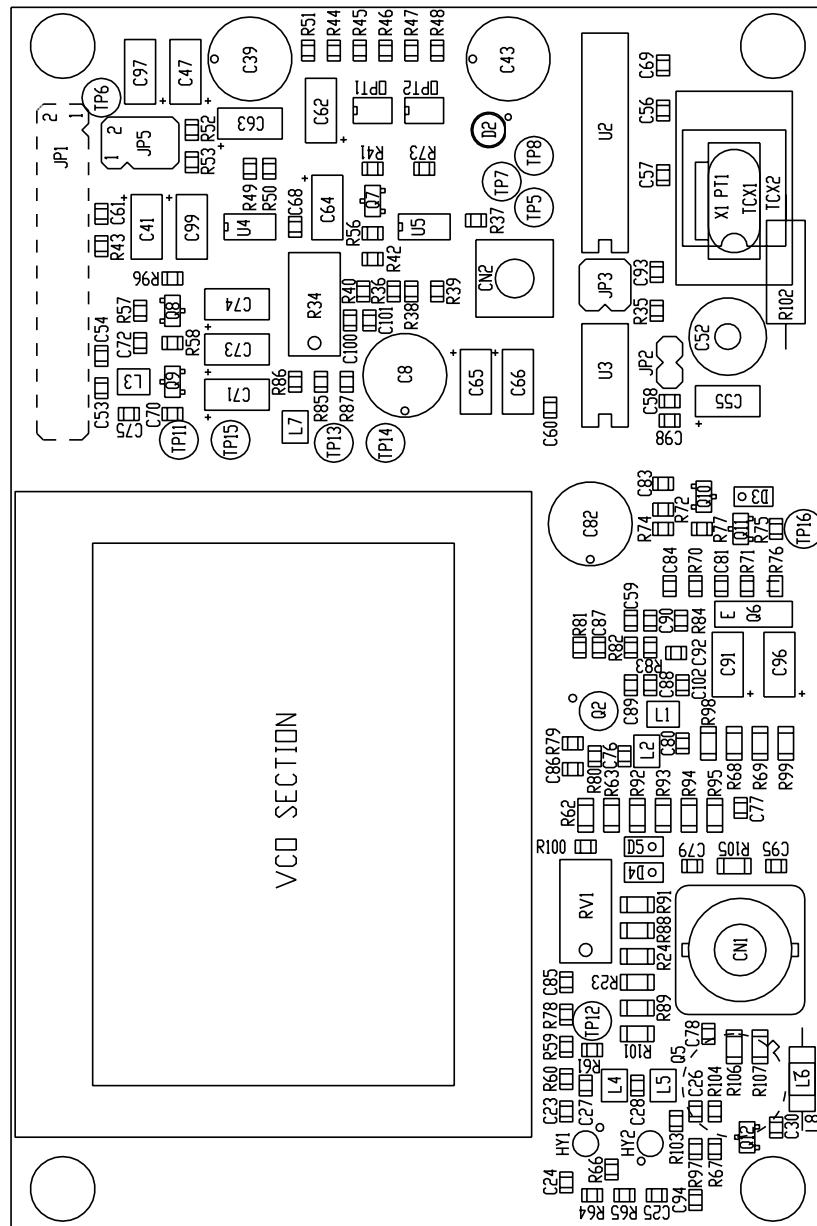




Nome Progetto:	PTX-LCD	Page:	3	di	3	Size:	A3
Autore:	TOMMASI A. - REV: BERTI J.	Data:	07/01/03	Versione:	1.3	Nome Progetto:	PTX-LCD
Nome PC in Rete:	UACCI	Revisione:	1.3	Nome Progetto:	PTX-LCD	Nome Progetto:	PTX-LCD
File Cartella:	MANUALPTX-LCD	Autore:	PTX-LCD	Autore:	PTX-LCD	Autore:	PTX-LCD

SLPTPLLDRV03		Bill Of Materials		Page1
Item	Q.ty	Reference	Part	
1	1	CN1	BNC_CS	
2	1	CN2	SMB_CS	
3	1	C8	470uF	
4	7	C23,C24,C25,C26,C59,C85,C89	27pF	
5	9	C27,C28,C58,C60,C72,C75,C78,C87,C92	3n3	
6	5	C30,C61,C76,C77,C94	10nF	
7	3	C39,C43,C82	100uF	
8	2	C41,C47	22uF	
9	12	C53,C54,C56,C68,C70,C80,C81,C90,C98,C102,C103,C105	0.1uF	
10	9	C55,C64,C65,C66,C71,C73,C74,C91,C96	10uF	
11	2	C62,C63	1uF	
12	3	C69,C83,C84	1nF	
13	3	R66,R80,C86	NC	
14	1	C88	2.2pF	
15	2	C99,C97	82uF	
16	1	C100	22pF	
17	1	C101	10pF	
18	1	D2	LED-R3	
19	1	D3	Z6V8	
20	1	D4	Z3V9	
21	1	D5	BAS32	
22	12	FIX1, FIX2, FIX3, FIX4, FIX5, FIX6, FIX7, FIX8, FIX9, FIX10, FIX11, FIX12	FIX35	
23	2	HY1, HY2	MAR4	
24	1	JP1	STM26D	
25	1	JP2	STM02S	
26	1	JP3	STM04D	
27	1	JP5	STM06D	
28	7	L1, L2, L3, L4, L5, L6, L8	2u2	
29	1	L7	22uH	
30	2	OPT1, OPT2	P181	
31	1	Q2	BFR96S	
32	1	Q5	MRF237	
33	1	Q6	BD140	
34	5	Q7, Q8, Q9, Q10, Q11	BC847	
35	1	Q12	BC857	
36	6	RV1, R38, R39, R49, R50, R100	1K	
37	12	R23, R24, R62, R63, R88, R89, R91, R92, R93, R94, R95, R101	1K2	
38	1	R34	5K	
39	4	R35, R41, R71, R103	2K2	
40	3	R36, R57, R77	10K	
41	3	R37, R45, R47	82K	
42	1	R40	39K	
43	2	R43, R42	1K0	
44	2	R44, R46	8K2	
45	4	R48, R51, R58, R72	6K8	
46	1	R52	120	

47	4	R53, R87, R106, R107	22
48	1	R56	100K
49	4	R59, R60, R64, R65	8H2
50	2	R61, R78	150
51	4	R67, R96, R97, R105	470
52	5	R68, R69, R83, R98, R99	47
53	1	R70	4K7
54	2	R75, R73	47K
55	2	R79, R74	22K
56	1	R76	1M
57	2	R81, R104	10
58	1	R82	56
59	2	R84, R85	270
60	1	R86	680
61	1	TCX1	STO-7D52
62	10	TP5, TP6, TP7, TP8, TP11, TP12, TP13, TP14, TP15, TP16	TP
63	1	U2	MC145158
64	1	U3	MC12022
65	1	U4	TL072SMD
66	1	U5	LM358SMD



DENOMINAZIONE

PLL & Driver Card Component Layout / Piano Componenti

DISPOSITIVO

SEMILAVORATO

DISEGNATO

D'Alessio D. li 08/02/97

DISEGNO

MATERIALE

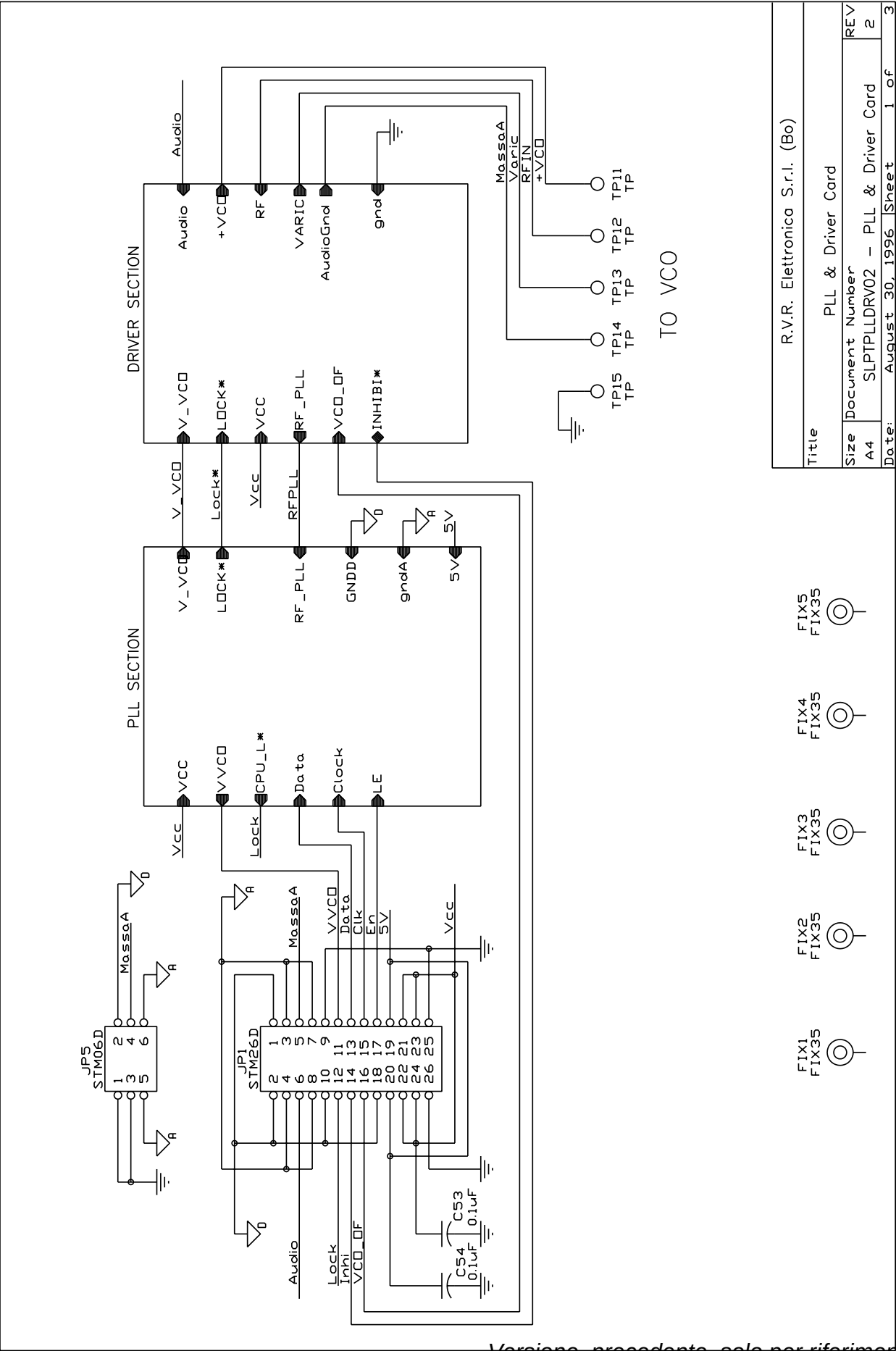
SCALA

TAVOLA n di

TRATTAMENTO

Versione precedente, solo per riferimento

Former version, for reference only



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

Title			R.V.R. Elettronica S.r.l. (Bo)		
Size			PLL & Driver Card		
Document Number			REV		
A4			SLPTPLLDREV02 - PLL & Driver Card		
Date:			August 30, 1996		
Sheet			1 of 3		

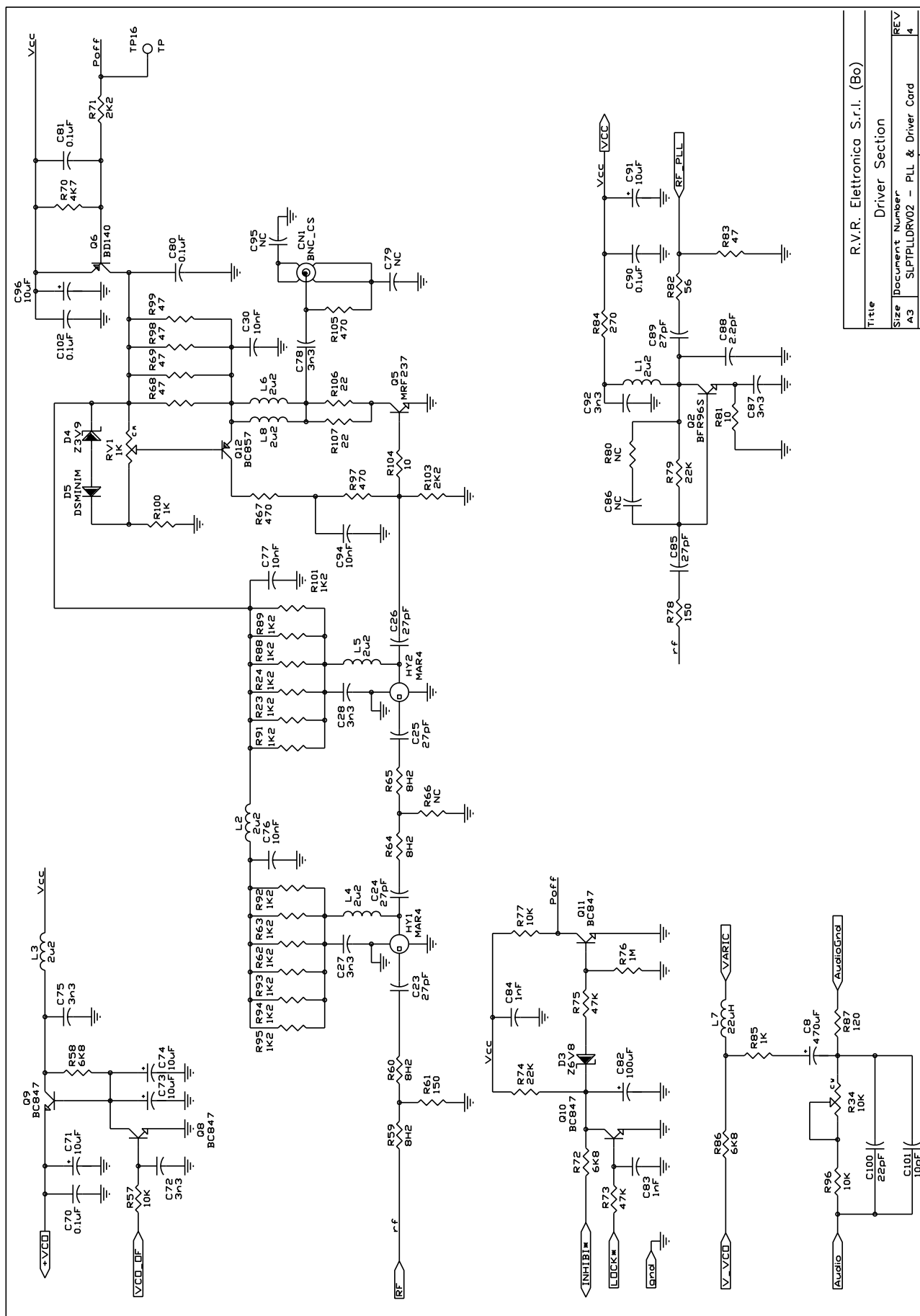
FIX5
FIX35

FIX4
FIX35

FIX3
FIX35

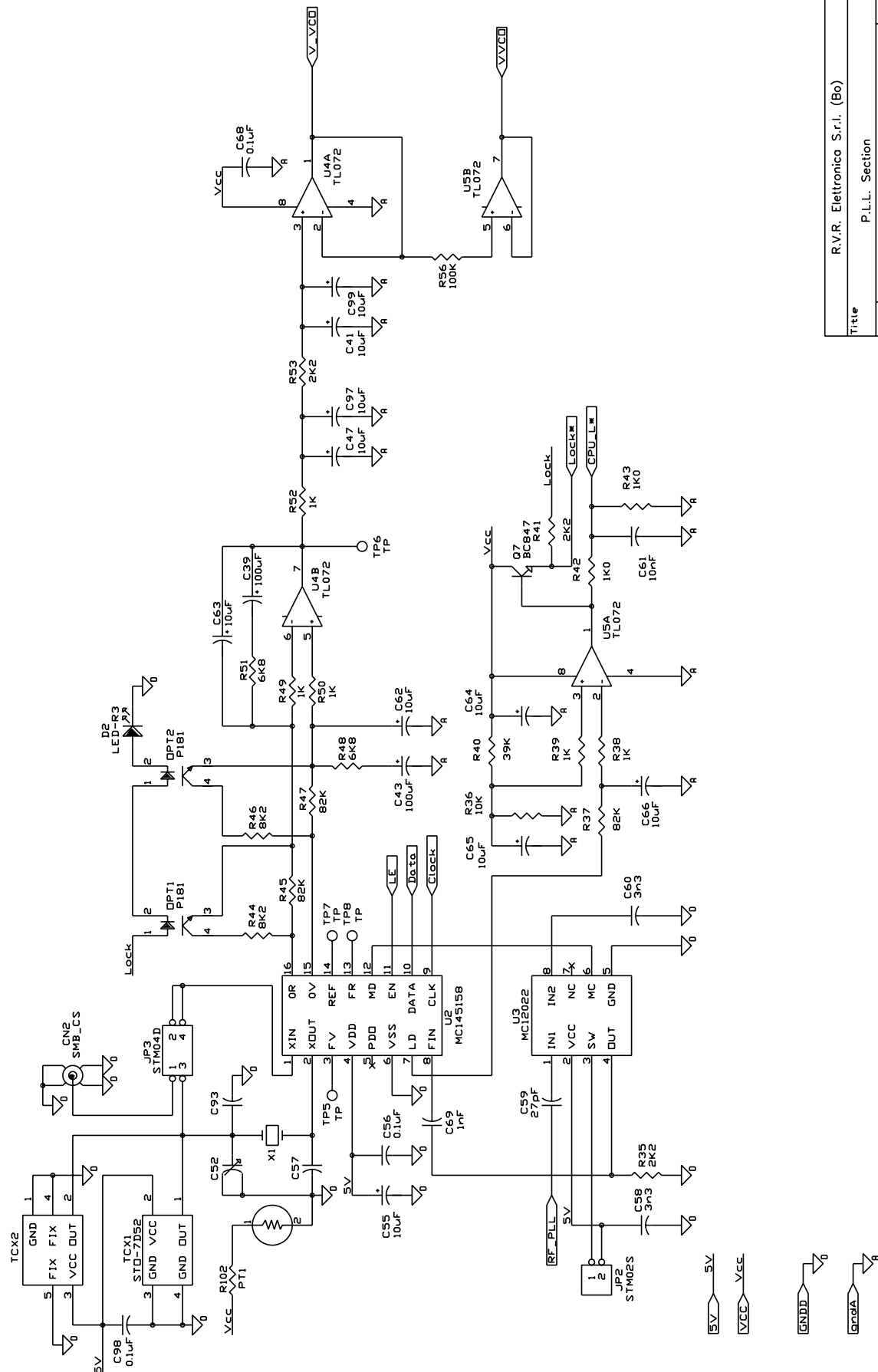
FIX2
FIX35

FIX1
FIX35



Versione precedente, solo per riferimento

Former version, for reference only



Title R.V.R. Elettronica S.r.l. (Bo)

P.L.L. Section

Size Document Number

A3 SLPTPLLDV02 - PLL & Driver Card

REV 6

Date: November 15, 1996 Sheet 3 of 3

Versione precedente, solo per riferimento

Former version, for reference only

Pll e Driver

Bill of Materials

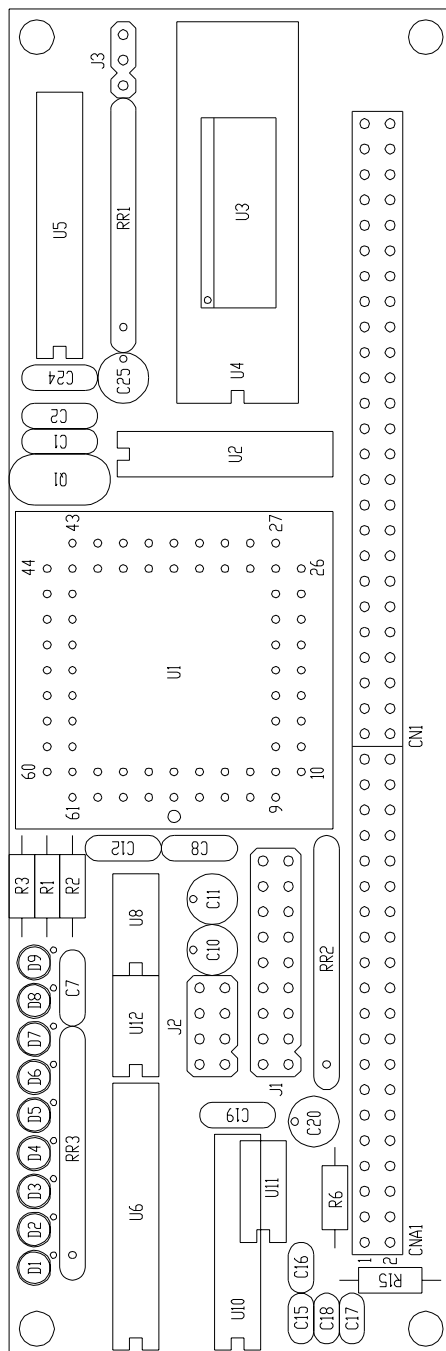
Item	Reference	Part	Description	RVRCode
1	CS1	CS	Circuito stampato	
2	JP1	STM26D	Strip M 2x2.54 26 pin.	
3	JP5	STM06D	Strip M 2x2.54 6 pin.	
4	C54	0.1µF	Cond. chip 0805	
5	C53	0.1µF	Cond. chip 0805	
6	C8	470µF	Cond. el. ver. 16V p. 2.5mm	
7	Q2	BFR96S	Tr. BFR96S	
8	CN1	BNC_CS	Conn. BNC da cs	
9	C71	10µF	Cond. el. SMD 16V	
10	R57	10K	Res. SMD 0805 al 5%	
11	C74	10µF	Cond. el. SMD 16V	
12	Q9	BC847	Tr. SMD in SOT23 BC847	
13	R60	8H2	Res. SMD 0805 al 5%	
14	R61	150	Res. SMD 0805 al 5%	
15	R64	8H2	Res. SMD 0805 al 5%	
16	R65	8H2	Res. SMD 0805 al 5%	
17	R70	4K7	Res. SMD 0805 al 5%	
18	C82	100µF	Cond. el. ver. 25V p. 2.5mm	
19	R73	47K	Res. SMD 0805 al 5%	
20	R74	22K	Res. SMD 0805 al 5%	
21	C84	1nF	Cond. chip 0805	
22	R75	47K	Res. SMD 0805 al 5%	
23	R76	1M	Res. SMD 0805 al 5%	
24	Q11	BC847	Tr. SMD in SOT23 BC847	
25	R77	10K	Res. SMD 0805 al 5%	
26	R79	22K	Res. SMD 0805 al 5%	
27	R80	NC	Non connesso	
28	C86	NC	Non connesso	
29	R81	10	Res. SMD 0805 al 5%	
30	C88	2.2pF	Cond. chip 0805	
31	R82	56	Res. SMD 0805 al 5%	
32	R83	47	Res. SMD 0805 al 5%	
33	C90	0.1µF	Cond. chip 0805	
34	C91	10µF	Cond. el. SMD 16V	
35	D3	6V8	Diodo Zener SMD 6V8	
36	C70	0.1µF	Cond. chip 0805	
37	Q8	BC847	Tr. SMD in SOT23 BC847	
38	C73	10µF	Cond. el. SMD 16V	
39	Q5	MRF237	Tr. MRF237	
40	R85	1K	Res. SMD 0805 al 5%	
41	R87	120	Res. SMD 0805 al 5%	
42	C83	1nF	Cond. chip 0805	
43	Q10	BC847	Tr. SMD in SOT23 BC847	
44	L6	2.2µH	Impedenza SMD	
45	L5	2.2µH	Impedenza SMD	
46	L4	2.2µH	Impedenza SMD	
47	L1	2.2µH	Impedenza SMD	
48	L2	2.2µH	Impedenza SMD	
49	C27	3.3nF	Cond. chip 0805	
50	C28	3.3nF	Cond. chip 0805	
51	C78	3.3nF	Cond. chip 0805	
52	C87	3.3nF	Cond. chip 0805	
53	C92	3.3nF	Cond. chip 0805	
54	C72	3.3nF	Cond. chip 0805	
55	HY1	MAR4	Modulo ibrido MAR4	
56	HY2	MAR4	Modulo ibrido MAR4	

57	R59	8H2	Res. SMD 0805 al 5%
58	R78	150	Res. SMD 0805 al 5%
59	L7	22 μ H	Impedenza SMD
60	R23	1K2	Res. SMD 1206 al 5%
61	R24	1K2	Res. SMD 1206 al 5%
62	R88	1K2	Res. SMD 1206 al 5%
63	R89	1K2	Res. SMD 1206 al 5%
64	R91	1K2	Res. SMD 1206 al 5%
65	R92	1K2	Res. SMD 1206 al 5%
66	R63	1K2	Res. SMD 1206 al 5%
67	R62	1K2	Res. SMD 1206 al 5%
68	R93	1K2	Res. SMD 1206 al 5%
69	R94	1K2	Res. SMD 1206 al 5%
70	R95	1K2	Res. SMD 1206 al 5%
71	L3	2.2 μ H	Impedenza SMD
72	C75	3.3nF	Cond. chip 0805
73	R86	6K8	Res. SMD 0805 al 5%
74	R96	10K	Res. SMD 0805 al 5%
75	R34	10K	Trim. mult. 3296X rg V
76	R58	6K8	Res. SMD 0805 al 5%
77	Q6	BD140	Tr. BD140
78	R68	47	Res. SMD 1206 al 5%
79	R69	47	Res. SMD 1206 al 5%
80	R98	47	Res. SMD 1206 al 5%
81	R99	47	Res. SMD 1206 al 5%
82	C96	10 μ F	Cond. el. SMD 16V
83	Q12	BC857	Tr. SMD in SOT23 BC857
84	C100	22pF	Cond. chip 0805
85	C94	10nF	Cond. chip 0805
86	R97	470	Res. SMD 0805 al 5%
87	D5	DSMINIM	Diodo silicio Minimelf
88	C80	0.1 μ F	Cond. chip 0805
89	C81	0.1 μ F	Cond. chip 0805
90	R103	2K2	Res. SMD 0805 al 5%
91	R104	10	Res. SMD 0805 al 5%
92	R105	470	Res. SMD 1206 al 5%
93	R106	22	Res. SMD 1206 al 5%
94	C77	10nF	Cond. chip 0805
95	C102	0.1 μ F	Cond. chip 0805
96	R71	2K2	Res. SMD 0805 al 5%
97	RV1	1K	Trim. mult. 3296X rg V
98	L8	2.2 μ H	Impedenza
99	C30	10nF	Cond. chip 0805
100	R107	22	Res. SMD 1206 al 5%
101	C101	10pF	Cond. chip 0805
102	C76	10nF	Cond. chip 0805
103	R67	470	Res. SMD 0805 al 5%
104	R101	1K2	Res. SMD 1206 al 5%
105	C23	27pF	Cond. chip 0805
106	C24	27pF	Cond. chip 0805
107	R66	NC	Non connesso
108	C25	27pF	Cond. chip 0805
109	C26	27pF	Cond. chip 0805
110	R72	6K8	Res. SMD 0805 al 5%
111	C85	27pF	Cond. chip 0805
112	C89	27pF	Cond. chip 0805
113	C79	NC	Non connesso
114	C95	NC	Non connesso
115	D4	3V9	Diodo Zener SMD 3V9
116	R100	1K	Res. SMD 0805 al 5%
117	R84	270	Res. SMD 0805 al 5%

118	D2	LED-R3	Led Rosso > 3mm
119	C39	100µF	Cond. el. ver. 25V p. 2.5mm
120	U2	MC145158	CI dig. MC145158
121	U3	MC12022	CI dig. MC12022
122	C56	0.1µF	Cond. chip 0805
123	R35	2K2	Res. SMD 0805 al 5%
124	R37	82K	Res. SMD 0805 al 5%
125	Q7	BC847	Tr. SMD in SOT23 BC847
126	R44	8K2	Res. SMD 0805 al 5%
127	R45	82K	Res. SMD 0805 al 5%
128	R46	8K2	Res. SMD 0805 al 5%
129	R47	82K	Res. SMD 0805 al 5%
130	R51	6K8	Res. SMD 0805 al 5%
131	C62	10µF	Cond. el. SMD 16V
132	C63	10µF	Cond. el. SMD 16V
133	R39	1K	Res. SMD 0805 al 5%
134	R38	1K	Res. SMD 0805 al 5%
135	C66	10µF	Cond. el. SMD 16V
136	C64	10µF	Cond. el. SMD 16V
137	C61	10nF	Cond. chip 0805
138	C68	0.1µF	Cond. chip 0805
139	R49	1K	Res. SMD 0805 al 5%
140	R50	1K	Res. SMD 0805 al 5%
141	R48	6K8	Res. SMD 0805 al 5%
142	C43	100µF	Cond. el. ver. 25V p. 2.5mm
143	C55	10µF	Cond. el. SMD 16V
144	R36	10K	Res. SMD 0805 al 5%
145	R41	2K2	Res. SMD 0805 al 5%
146	C58	3.3nF	Cond. chip 0805
147	C60	3.3nF	Cond. chip 0805
148	R42	1K0	Res. SMD 0805 al 5%
149	R43	1K0	Res. SMD 0805 al 5%
150	JP2	STM02S	Strip M 2.54 2 pin.
151	C69	1nF	Cond. chip 0805
152	R40	39K	Res. SMD 0805 al 5%
153	C65	10µF	Cond. el. SMD 16V
154	U4	TL072	CI lin. TL072 SMD
155	U5	TL072	CI lin. TL072 SMD
156	R52	1K	Res. SMD 0805 al 5%
157	R53	2K2	Res. SMD 0805 al 5%
158	R56	100K	Res. SMD 0805 al 5%
159	C97	10µF	Cond. el. SMD 16V
160	JP3	STM04D	Strip M 2x2.54 4 pin.
161	CN2	SMB_CS	Conn. SMB da cs
162	C98	0.1µF	Cond. chip 0805
163	TCX1	STO-7D52	TCXO SMD STO-7D52
164	C99	10µF	Cond. el. SMD 16V
165	C41	10µF	Cond. el. SMD 16V
166	C47	10µF	Cond. el. SMD 16V
167	C57	NC	Non connesso
168	C52	NC	Non connesso
169	X1	NC	Non connesso
170	C93	NC	Non connesso
171	PT1	NC	Non connesso
172	R102	NC	Non connesso
173	TCX2	NC	Non connesso
174	OPT1	P181	Fotoacc. SMD P181
175	OPT2	P181	Fotoacc. SMD P181
176	C59	27pF	Cond. chip 0805

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DENOMINAZIONE
CPU Card Component Layout / Piano Componenti

DISPOSITIVO

SEMILAVORATO

MATERIALE

TRATTAMENTO

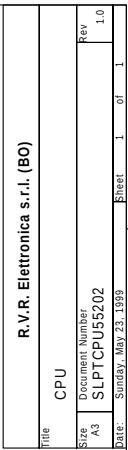
DISEGNATO

D'Alessio D. li 06/02/97

SCALA

DISEGNO

TAVOLA n di



CPU Revised: Sunday, May 23, 1999
SLPTCPU55202 Revision: 1.0

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

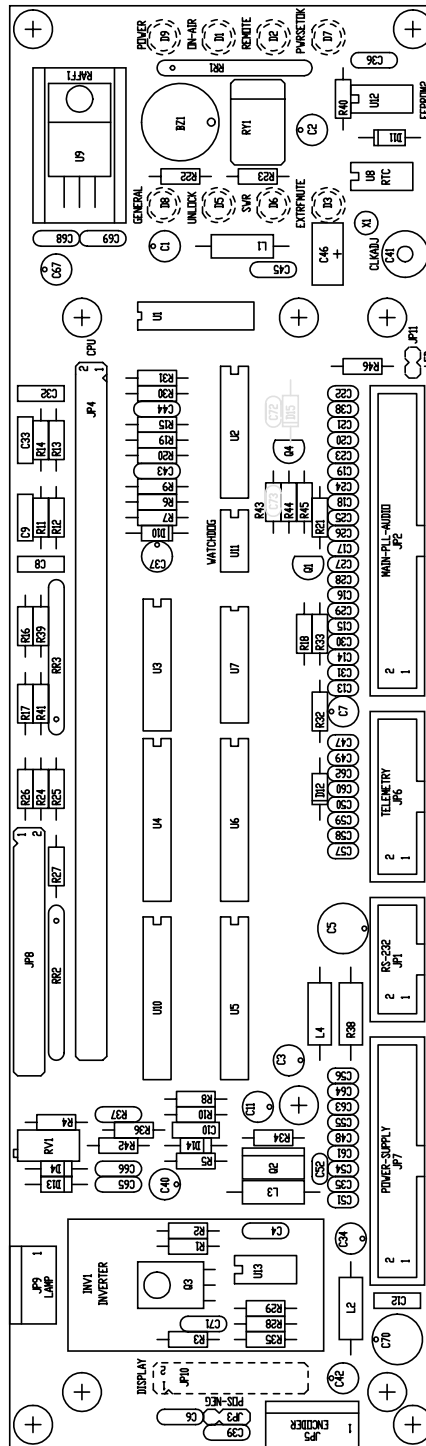
Bill Of Materials

Page 1

Item	Quantity	Part	Reference
------	----------	------	-----------

1	1	CN1	STM90D
2	2	C1,C2	22pF
3	1	C7	2n2
4	7	C8,C15,C16,C17,C18,C19,C24	0.1uF
5	4	C10,C11,C20,C25	10uF
6	1	C12	10nF
7	9	D1,D2,D3,D4,D5,D6,D7,D8,D9	LED-R3
8	4	FIX1, FIX2, FIX3, FIX4	FIX35
9	1	J1	STM18D
10	1	J2	STM08D
11	2	U11,J3	NC
12	1	Q1	Q14M74
13	2	RR2,RR1	10K
14	1	RR3	2K2
15	3	R1,R2,R6	100
16	1	R3	56K
17	1	R15	1
18	1	U1	80C552
19	1	U2	74HC138
20	1	U3	43256SMD
21	1	U4	27C512
22	1	U5	74HC573
23	1	U6	74HC541
24	1	U8	PCF8582
25	1	U10	MAX232
26	1	U12	82B715

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DENOMINAZIONE

Panel Mother Board Component Layout / Piano Componenti

DISPOSITIVO

SEMILAVORATO

MATERIALE

TRATTAMENTO

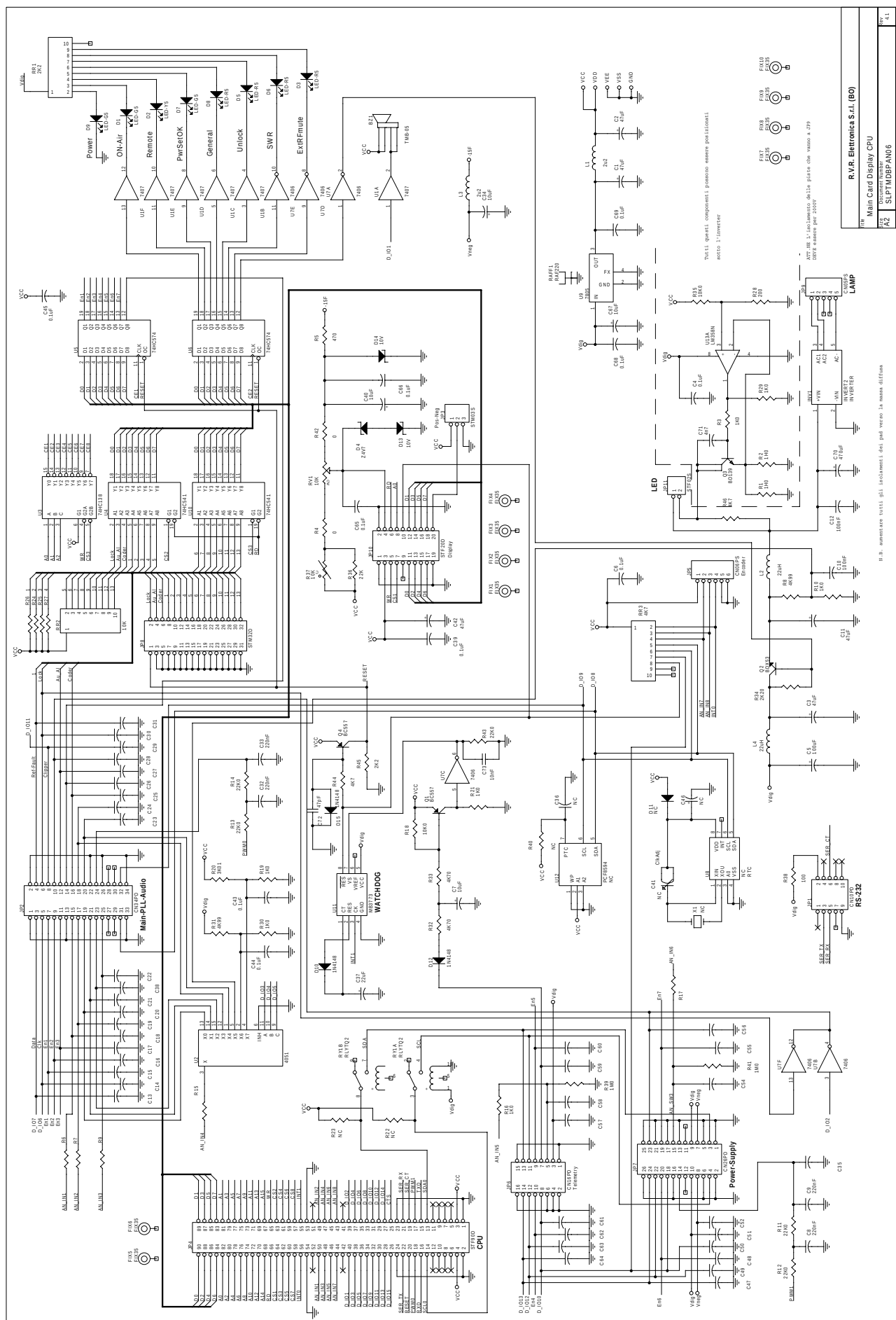
DISEGNATO

D'Alessio D. ti 31/03/98

SCALA

DISEGNO

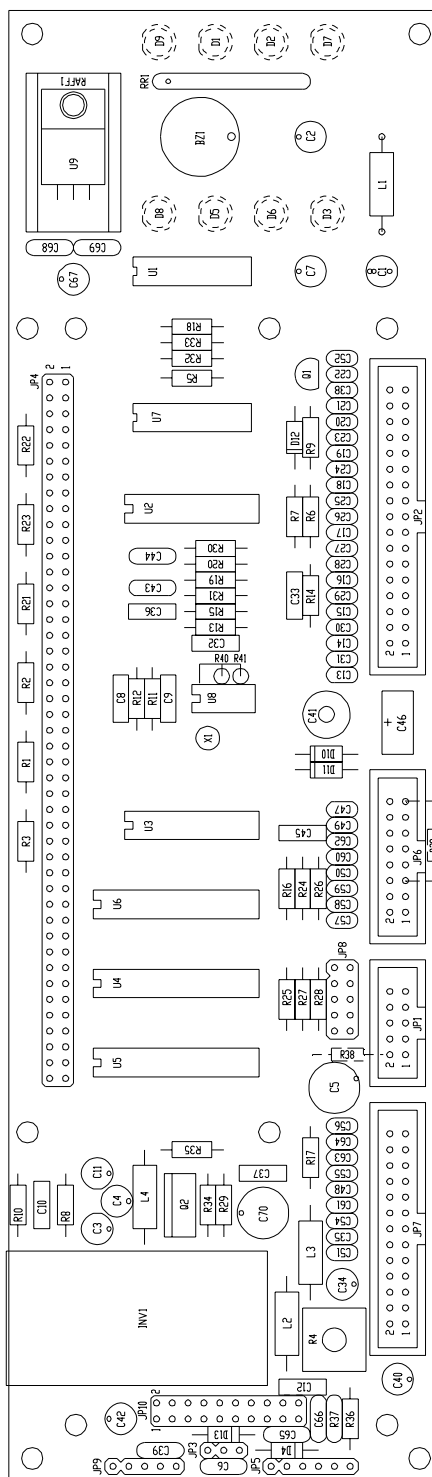
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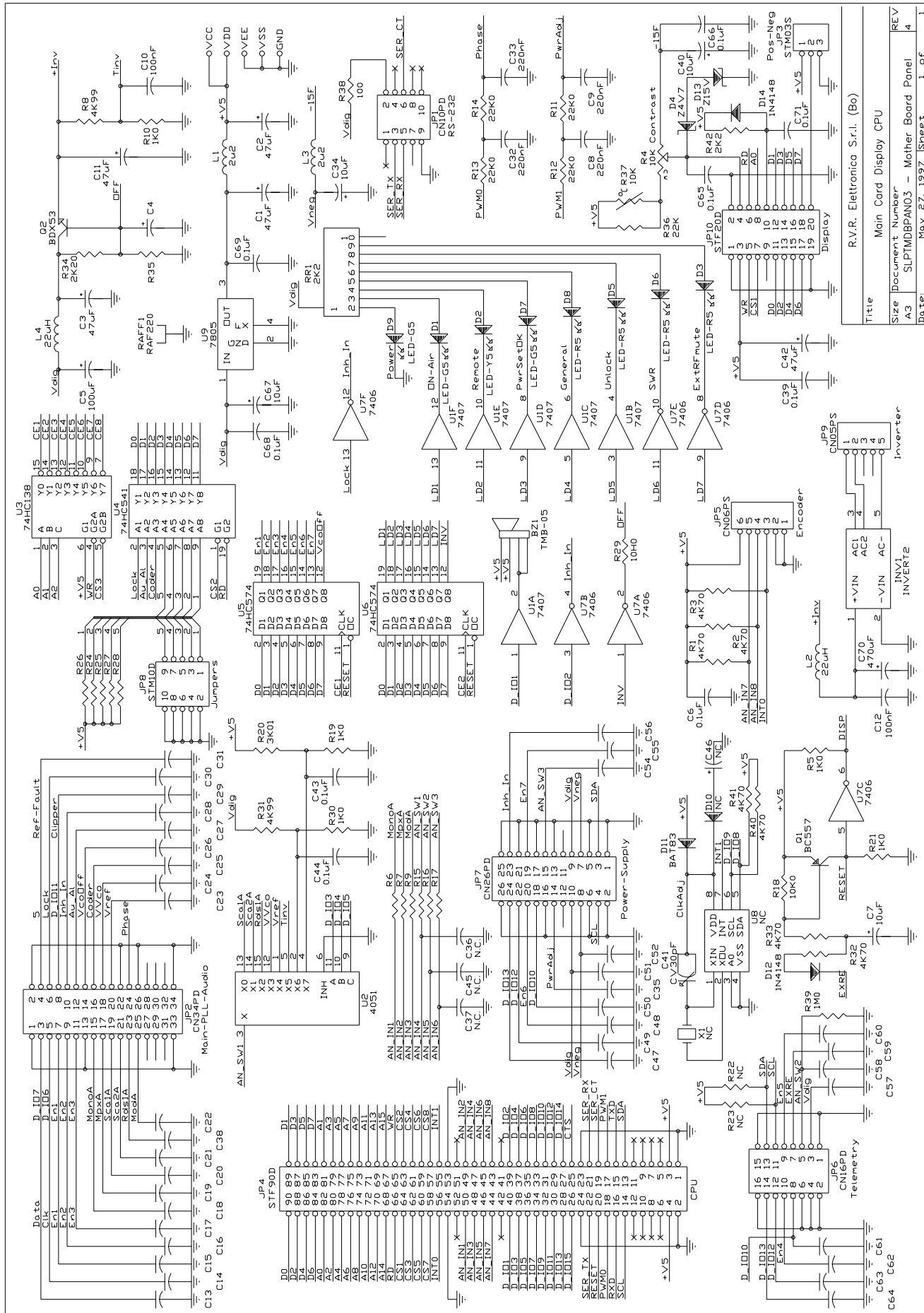
SLPTMDBPAN06 Bill Of Materials Page1

Item	Quantity	Reference	Part
1	1	BZ1	TMB-05
2	5	C1, C2, C3, C11, C42	47uF
3	10	C4, C6, C39, C43, C44, C45, C65, C66, C68, C69	0.1uF
4	1	C5	100uF
5	4	C7, C34, C40, C67	10uF
6	4	C8, C9, C32, C33	220nF
7	2	C10, C12	100nF
8	35	C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C35, C38, C47, C48, C49, C50, C54, C55, C56, C58, C59, C60, C61, C62, C63, C64	100pF
9	9	X1, U8, D11, R22, R23, C36, R40, C41, C46	NC
10	1	C37	22uF
11	4	C51, C52, C57, C73	10nF
12	1	C70	470uF
13	1	C71	4n7
14	1	C72	47pF
15	3	D1, D7, D9	LED-G5
16	1	D2	LED-Y5
17	4	D3, D5, D6, D8	LED-R5
18	1	D4	Z4V7
19	3	D10, D12, D15	1N4148
20	2	D14, D13	10V
21	10	FIX1, FIX2, FIX3, FIX4, FIX5, FIX6, FIX7, FIX8, FIX9, FIX10	FIX35
22	1	INV1	INVERT2
23	1	JP1	CN10PD
24	1	JP2	CN34PD
25	1	JP3	STM03S
26	1	JP4	STF90D
27	1	JP5	CN06PS
28	1	JP6	CN16PD
29	1	JP7	CN26PD
30	1	JP8	STM32D
31	1	JP9	CN05PS
32	1	JP10	STF20D
33	1	JP11	STF02S
34	2	L3, L1	2u2
35	2	L4, L2	22uH
36	2	Q1, Q4	BC557
37	1	Q2	BDX53
38	1	Q3	BD139
39	1	RAFF1	RAF220
40	2	RR1, R45	2K2
41	7	RV1, RR2, R24, R25, R26, R27, R37	10K
42	3	RR3, R44, R46	4K7
43	1	RY1	RLYTQ2
44	2	R1, R2	1H0
45	12	R3, R6, R7, R9, R10, R15, R16	1K0

		R17, R19, R21, R29, R30	
46	2	R4, R42	0
47	1	R5	470
48	2	R8, R31	4K99
49	5	R11, R12, R13, R14, R43	22K0
50	2	R18, R35	10K0
51	1	R20	3K01
52	1	R28	200
53	2	R32, R33	4K70
54	1	R34	2K20
55	1	R36	22K
56	1	R38	100
57	2	R41, R39	1M0
58	1	U1	7407
59	1	U2	4051
60	1	U3	74HC138
61	2	U4, U10	74HC541
62	2	U5, U6	74HC574
63	1	U7	7406
64	1	U9	7805
65	1	U11	MB3773
66	1	U12	PCF8594
67	1	U13	LM358N



	DENOMINAZIONE	
	Panel Mother Board Component Layout / Piano Componenti	
	DISPOSITIVO	
SEMILAVORATO	DISEGNATO	DISEGNO
MATERIALE	D'Alessio D. li 28/05/97	
TRATTAMENTO	SCALA	TAVOLA n di



R.V.R. Elettronica S.r.l. (Bo)

Main Card Display CPU

Size Document Number

A3 SLPTMDBPAN03 - Mother Board Panel

REV 4

Date: May 27, 1997 Sheet 1 of 1

Main Card Display CPU
SLPTMDBPAN03
Bill of Materials

Revised : May 27, 1997
Revision: 4

Item	Reference	Part	Description	RVRCode
1	CS1	CS	Circuito stampato	
2	U1	7407	CI digitale	
3	ZOC1	ZOC14	Zoccolo int. 14 pin	
4	R1	4K70	Res. 1/4 W 1%	
5	R2	4K70	Res. 1/4 W 1%	
6	R3	4K70	Res. 1/4 W 1%	
7	C1	47uF	Cond. el. ver. 16V p. 2.5mm	
8	C2	47uF	Cond. el. ver. 16V p. 2.5mm	
9	C3	47uF	Cond. el. ver. 16V p. 2.5mm	
10	C5	100uF	Cond. el. ver. 25V p. 2.5mm	
11	C6	0.1uF	Cond. ceramico p. 5mm P100	
12	C7	10uF	Cond. el. ver. 35V p. 2.5mm	
13	C8	220nF	Cond. poliestere p. 5mm	
14	C9	220nF	Cond. poliestere p. 5mm	
15	U2	4051	CI digitale	
16	ZOC2	ZOC16	Zoccolo int. 16 pin	
17	R8	4K99	Res. 1/4 W 1%	
18	R10	1K0	Res. 1/4 W 1%	
19	C10	100nF	Cond. poliestere p. 5mm	
20	R11	22K0	Res. 1/4 W 1%	
21	R12	22K0	Res. 1/4 W 1%	
22	C11	47uF	Cond. el. ver. 16V p. 2.5mm	
23	C12	100nF	Cond. poliestere p. 5mm	
24	L2	22uH	Impedenza	
25	C13	100pF	Cond. ceramico p. 2.54mmNP0	
26	C14	100pF	Cond. ceramico p. 2.54mmNP0	
27	C15	100pF	Cond. ceramico p. 2.54mmNP0	
28	C16	100pF	Cond. ceramico p. 2.54mmNP0	
29	C17	100pF	Cond. ceramico p. 2.54mmNP0	
30	C18	100pF	Cond. ceramico p. 2.54mmNP0	
31	C19	100pF	Cond. ceramico p. 2.54mmNP0	
32	C20	100pF	Cond. ceramico p. 2.54mmNP0	
33	C21	100pF	Cond. ceramico p. 2.54mmNP0	
34	C22	100pF	Cond. ceramico p. 2.54mmNP0	
35	C23	100pF	Cond. ceramico p. 2.54mmNP0	
36	C24	100pF	Cond. ceramico p. 2.54mmNP0	
37	C25	100pF	Cond. ceramico p. 2.54mmNP0	
38	C26	100pF	Cond. ceramico p. 2.54mmNP0	
39	C27	100pF	Cond. ceramico p. 2.54mmNP0	
40	C28	100pF	Cond. ceramico p. 2.54mmNP0	
41	C29	100pF	Cond. ceramico p. 2.54mmNP0	
42	C30	100pF	Cond. ceramico p. 2.54mmNP0	
43	C31	100pF	Cond. ceramico p. 2.54mmNP0	
44	INV1	INVERT2	Inverter per lampada LCD	
45	R13	22K0	Res. 1/4 W 1%	
46	R14	22K0	Res. 1/4 W 1%	
47	C32	220nF	Cond. poliestere p. 5mm	
48	C33	220nF	Cond. poliestere p. 5mm	
49	C34	10uF	Cond. el. ver. 35V p. 2.5mm	
50	L3	2.2uH	Impedenza	
51	U3	74HC138	CI digitale	
52	ZOC3	ZOC16	Zoccolo int. 16 pin	
53	U4	74HC541	CI digitale	
54	ZOC4	ZOC20	Zoccolo int. 20 pin	
55	U5	74HC574	CI digitale	

Main Card Display CPU
SLPTMDBPAN03
Bill of Materials

Revised : May 27, 1997
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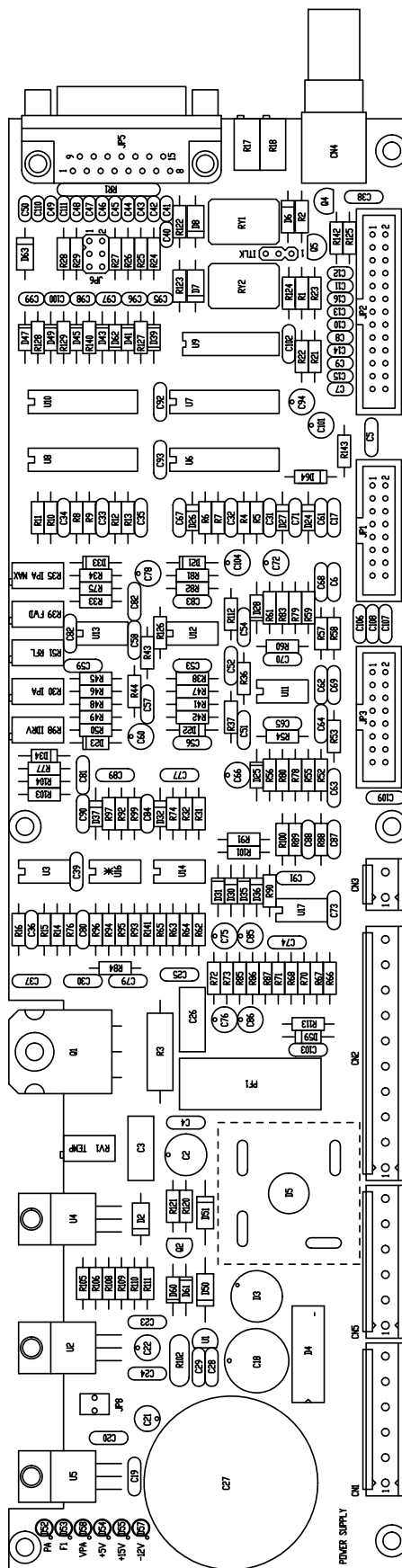
Item	Reference	Part	Description	RVRCode
56	ZOC5	ZOC20	Zoccolo int. 20 pin	
57	U6	74HC574	CI digitale	
58	ZOC6	ZOC20	Zoccolo int. 20 pin	
59	RR1	2K2	Rete res. 9 resistenze	
60	U7	7406	CI digitale	
61	ZOC7	ZOC14	Zoccolo int. 14 pin	
62	R18	10K0	Res. 1/4 W 1%	
63	Q1	BC557	Tr. in TO 92	
64	C38	100pF	Cond. ceramico p. 2.54mmNP0	
65	C39	0.1uF	Cond. ceramico p. 5mm P100	
66	R19	1K0	Res. 1/4 W 1%	
67	R20	3K01	Res. 1/4 W 1%	
68	R24	4K70	Res. 1/4 W 1%	
69	R25	4K70	Res. 1/4 W 1%	
70	R26	4K70	Res. 1/4 W 1%	
71	C40	10uF	Cond. el. ver. 35V p.2.5mm	
72	C42	47uF	Cond. el. ver. 16V p.2.5mm	
73	R29	10H0	Res. 1/4 W 1%	
74	R30	1K0	Res. 1/4 W 1%	
75	R31	4K99	Res. 1/4 W 1%	
76	C43	0.1uF	Cond. ceramico p. 5mm P100	
77	C44	0.1uF	Cond. ceramico p. 5mm P100	
78	C47	100pF	Cond. ceramico p. 2.54mmNP0	
79	C48	100pF	Cond. ceramico p. 2.54mmNP0	
80	C49	100pF	Cond. ceramico p. 2.54mmNP0	
81	C50	100pF	Cond. ceramico p. 2.54mmNP0	
82	C54	100pF	Cond. ceramico p. 2.54mmNP0	
83	C55	100pF	Cond. ceramico p. 2.54mmNP0	
84	C56	100pF	Cond. ceramico p. 2.54mmNP0	
85	D12	1N4148	Diode silicio	
86	R32	4K70	Res. 1/4 W 1%	
87	R33	4K70	Res. 1/4 W 1%	
88	C61	100pF	Cond. ceramico p. 2.54mmNP0	
89	C62	100pF	Cond. ceramico p. 2.54mmNP0	
90	C63	100pF	Cond. ceramico p. 2.54mmNP0	
91	C64	100pF	Cond. ceramico p. 2.54mmNP0	
92	D13	15V	Diode Zener 0.4 W	
93	C65	0.1uF	Cond. ceramico p. 5mm P100	
94	C67	10uF	Cond. el. ver. 35V p.2.5mm	
95	RAFF1	RAF220	Dissipatore per TO220	
96	Q2	BDX53	Tr. in TO 220	
97	C68	0.1uF	Cond. ceramico p. 5mm P100	
98	L4	22uH	Impedenza	
99	U9	7805	CI lineare	
100	C35	100pF	Cond. ceramico p.2.54mmNP0	
101	C69	0.1uF	Cond. ceramico p. 5mm P100	
102	R15	1K0	Res. 1/4 W 1%	
103	R16	1K0	Res. 1/4 W 1%	
104	R17	1K0	Res. 1/4 W 1%	
105	R9	1K0	Res. 1/4 W 1%	
106	R7	1K0	Res. 1/4 W 1%	
107	R6	1K0	Res. 1/4 W 1%	
108	C37	N.C.	Non connesso	
109	C45	N.C.	Non connesso	
110	C36	N.C.	Non connesso	

Main Card Display CPU
SLPTMDBPAN03
Bill of Materials

Revised : May 27, 1997
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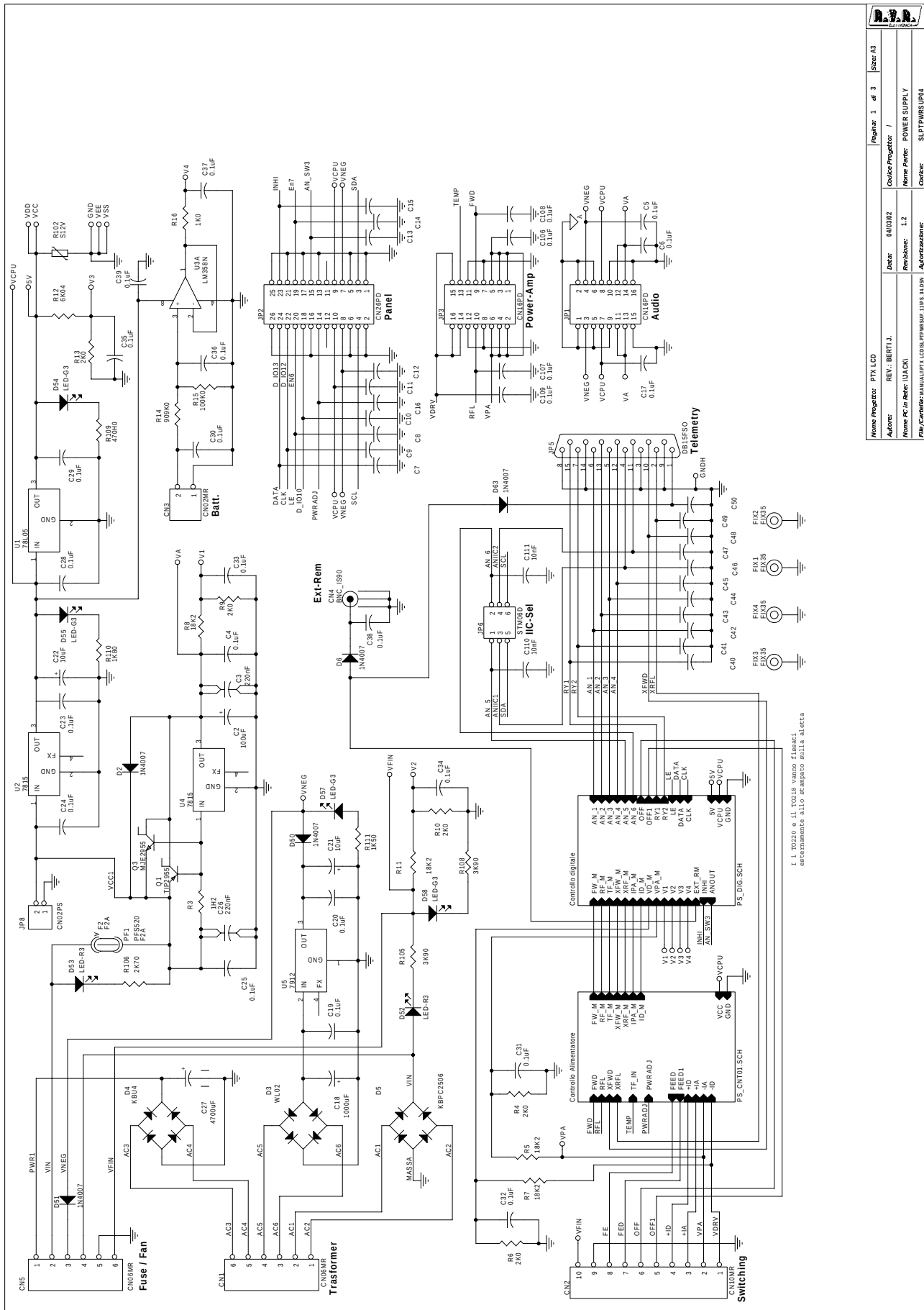
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111	R21	1K0	Res. 1/4 W 1%	
112	C70	470uF	Cond. el. ver. 16V p.2.5mm	
113	R27	4K70	Res. 1/4 W 1%	
114	R28	4K70	Res. 1/4 W 1%	
115	R37	10K	Res. NTC 10K @25°C	
116	L1	2.2uH	Impedenza	
117	R5	1K0	Res. 1/4 W 1%	
118	R35	NC	Non connesso	
119	R36	22K	Res. 1/4 W 5%	
120	U8	NC	Non connesso	
121	ZOC8	ZOC8	Zoccolo int. 8 pin	
122	X1	NC	Non connesso	
123	C46	NC	Non connesso	
124	C51	10nF	Cond. cera p. 2.54mm P100	
125	C52	10nF	Cond. cera p. 2.54mm P100	
126	R23	NC	Non connesso	
127	R22	NC	Non connesso	
128	R34	2K20	Res. 1/4 W 1%	
129	C4	NC	Non connesso	
130	JP4	STF90D	Strip F 2x2.54 90 pin.	
131	JP6	CN16PD	Conn. M cs 2x2.54mm 16 pin	
132	JP2	CN34PD	Conn. M cs 2x2.54mm 34 pin	
133	JP8	STM10D	Strip M 2x2.54 10 pin.	
134	JP5	CN06PS	Conn. M cs p 2.54mm 06 pin	
135	JP9	CN05PS	Conn. M cs p 2.54mm 05 pin	
136	JP10	STF20D	Strip F 2x2.54 20 pin.	
137	JP1	CN10PD	Conn. M cs 2x2.54mm 10 pin	
138	JP7	CN26PD	Conn. M cs 2x2.54mm 26 pin	
139	R38	100	Res. 1/2 W 5%	
140	D11	BAT83	Diode Hot Carrier	
141	R39	1M0	Res. 1/4 W 1%	
142	C60	100pF	Cond. cera p. 2.54mm NP0	
143	C59	100pF	Cond. cera p. 2.54mm NP0	
144	C58	100pF	Cond. cera p. 2.54mm NP0	
145	C57	10nF	Cond. cera p. 2.54mm P100	
146	R40	4K70	Res. 1/4 W 1%	
147	R41	4K70	Res. 1/4 W 1%	
148	D10	NC	Non connesso	
149	C41	30pF	Cond. cer. var. dia. 7mm	
150	JP3	STM03S	Strip M 2.54 3 pin.	
151	C66	0.1uF	Cond. ceramico p. 5mm P100	
152	D4	4V7	Diode Zener 0.4 W	
153	D14	1N4148	Diode silicio	
154	C71	0.1uF	Cond. ceramico p. 5mm P100	
155	R42	2K2	Res. 1/4 W 1%	
156	R4	10K	Trim. mono. cermet 3386H	
157	D9	LED-G5	Led Verde dia. 5mm	
158	D1	LED-G5	Led Verde dia. 5mm	
159	D2	LED-Y5	Led Giallo dia. 5mm	
160	D7	LED-G5	Led Verde dia. 5mm	
161	D8	LED-R5	Led Rosso dia. 5mm	
162	D5	LED-R5	Led Rosso dia. 5mm	
163	D6	LED-R5	Led Rosso dia. 5mm	
164	D3	LED-R5	Led Rosso dia. 5mm	
165	BZ1	TMB-05	Buzzer	

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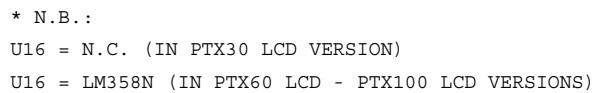


* N.B.:
UI6 = N.C. (IN PTX30 LCD VERSION)
UI6 = LM358N (IN PX60 LCD - PTX100 LCD VERSIONS)

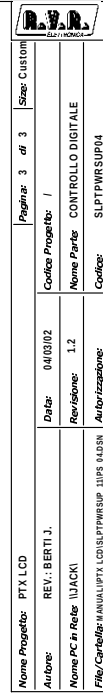
Nome Progetto: PTX-LCD		Pagina 1 di 1		Size: A3
Autore: REV:1 BERTI J.	Data: 04/03/02	Codice Progetto: /		
Nome PC in Rete: \JACK\	Revisione: 1.2	Nome Parte: POWDER SUPPLY COMPONENT LAYOUT		
File/Corsetto: MANUAL\PTX_LCD\SLTPWRSUP_IN\SLTPWRSUP.BUG	Autore: /	Codice: SLTPWRSUP04		
Scala: /	Material: /	Trattamento: /		



Nome Progetto:	PTX LCD	Revisione:	1	di	3	Size:	A3
Autore:	REV.: BERTI J.	Data:	04/03/02	Nome Progetto:	POWER SUPPLY		
Nome PC in Rete:	NAACKI	Revisione:	1.2	Nome Progetto:	POWER SUPPLY		
File/Caratteristiche:	MANUALI PTX LCD, PTX WRSUP, IUPS, ALI, SCL	Autore:	SLPTWRSUP04				



Nome Progetto: PTX LCD		Pagina: 2 di 3		Size: A3
Autore:	REV.: BERTI J.	Data:	04/03/02	
Nome PC in Rete: \JACKI		Revisione:	1.2	
File/Cartella: MANUAL\PTX LCD\SLPTP\WRSUP.11P5.04.DSN		Nome Pare:	CONTROLLO ALIMENTATORE	
AutORIZZAZIONE:		Codici:	SLPTP\WRSUP04	



SLPTPWRSUP04

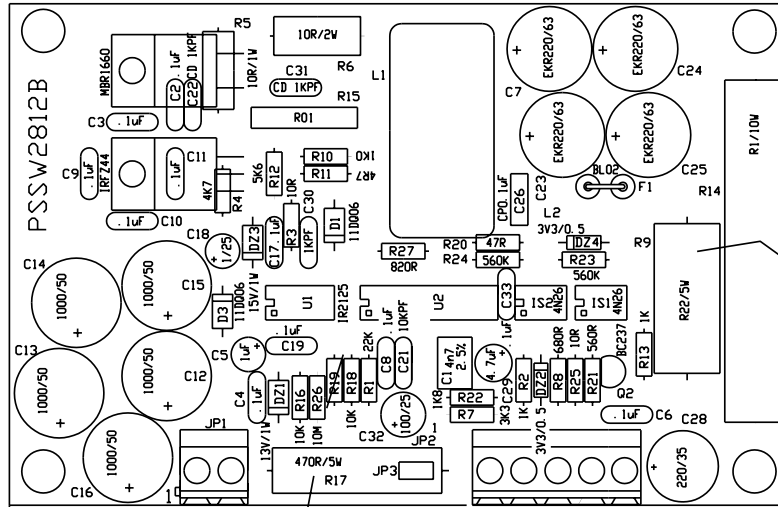
Bill Of Materials

Page1

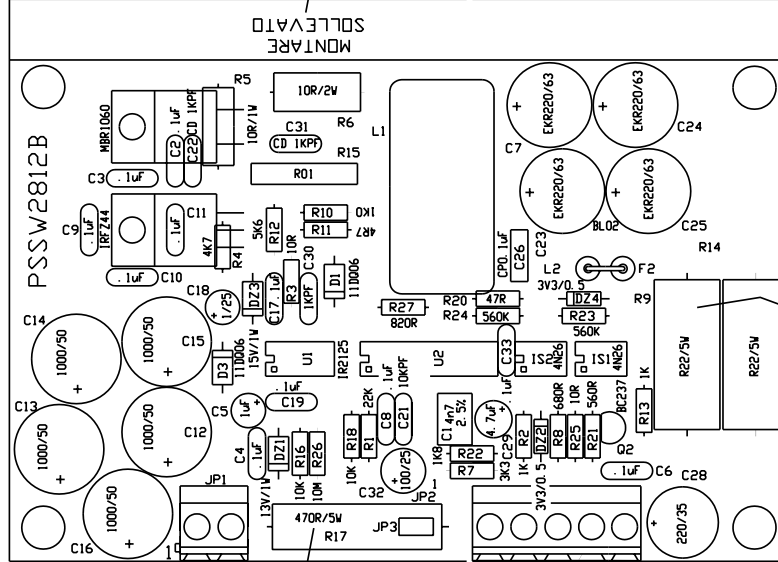
Item	Q.ty	Reference	Part
1	2	CN1, CN5	CN06MR
2	1	CN2	CN10MR
3	1	CN3	CN02MR
4	1	CN4	BNC_IS90
5	1	C2	100uF
6	2	C26, C3	220nF
7	42	C4, C5, C6, C17, C19, C20, C23, C24, C25, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C54, C56, C61, C62, C67, C71, C73, C77, C81, C82, C84, C89, C90, C92, C93, C102, C103, C106, C107, C108, C109	0.1uF
8	10	C7, C8, C9, C10, C13, C14, C15, C16, C46, C47	100pF
9	19	C11, C12, C40, C41, C42, C43, C44, C45, C48, C49, C50, C95, C96, C97, C98, C99, C100, C110, C111	10nF
10	1	C18	1000uF
11	6	C21, C22, C75, C85, C94, C101	10uF
12	1	C27	4700uF
13	10	C51, C52, C57, C58, C63, C64, C68, C69, C79, C80	47nF
14	6	C53, C59, C65, C70, C74, C83	10pF
15	6	C60, C66, C72, C76, C78, C86	1uF
16	9	R84, C87, R88, C88, C91, R104, C104, R134, R135	NC
17	7	D2, D6, D7, D8, D50, D51, D63	1N4007
18	1	D3	WL02
19	1	D4	KBU4
20	1	D5	KBPC2506
21	7	D21, D23, D25, D28, D33, D62, D64	BAT83
22	14	D22, D24, D26, D27, D32, D34, D37, D39, D41, D43, D45, D47, D49, D59	5V1
23	1	D30	20V
24	4	D31, D35, D60, D61	1N4148
25	1	D36	7V5
26	2	D52, D53	LED-R3
27	4	D54, D55, D57, D58	LED-G3
28	4	FIX1, FIX2, FIX3, FIX4	FIX35
29	1	F2	F2A
30	2	JP1, JP3	CN16PD
31	1	JP2	CN26PD
32	1	JP5	DB15FSO
33	1	JP6	STM06D
34	1	JP7	STM03S
35	1	JP8	CN02PS
36	1	PF1	PFS520
37	1	Q1	TIP2955
38	2	Q4, Q2	BC557
39	1	Q3	MJE2955

40	1	Q5	BC547
41	1	RR1	100K
42	1	RV1	500
43	2	RY1, RY2	RLY2_12V
44	1	R1	3K3
45	1	R2	330
46	1	R3	1H2
47	5	R4, R6, R9, R10, R13	2K0
48	4	R5, R7, R8, R11	18K2
49	1	R12	6K04
50	1	R14	909K0
51	16	R15, R37, R44, R53, R58, R62, R63, R64, R65, R67, R93, R94, R95, R96, R126, R127	100K0
52	21	R16, R38, R42, R49, R50, R55, R56, R61, R66, R73, R74, R75, R77, R78, R79, R81, R86, R97, R124, R140, R141	1K0
53	4	R17, R18, R39, R51	10K
54	8	R21, R22, R71, R87, R89, R90, R91, R128	4K70
55	2	R125, R23	2K2
56	16	R24, R25, R26, R27, R28, R29, R36, R43, R46, R47, R52, R54, R57, R60, R76, R143	10K0
57	2	R98, R30	50K
58	4	R31, R34, R99, R111	1K50
59	3	R32, R33, R92	22K1
60	1	R35	5K
61	4	R41, R48, R80, R83	665H0
62	2	R45, R59	332H0
63	4	R68, R70, R101, R112	470K0
64	2	R72, R85	100H0
65	1	R82	560K0
66	1	R100	12K0
67	1	R102	S12V
68	1	R103	0
69	2	R105, R108	3K90
70	1	R106	2K70
71	1	R109	470H0
72	1	R110	1K80
73	1	R113	680H0
74	1	R120	2K20
75	1	R121	680
76	2	R123, R122	270
77	1	R129	1K47
78	1	R142	4K7
79	1	U1	78L05
80	2	U4, U2	7815
81	7	U3, U11, U12, U13, U14, U16, U17	LM358N
82	1	U5	7912
83	1	U6	4094
84	3	U7, U8, U10	4051
85	1	U9	7407

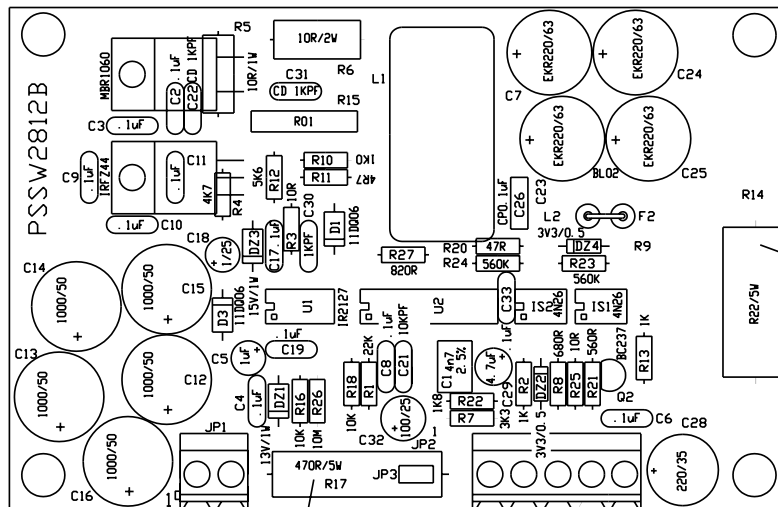
VERSIONE 10A
PTX100 LCD



VERSIONE BASE
VERSIONE 6A
PTX60 LCD



VERSIONE 2.5A
PTX30 LCD



MONTARE SOLLEVATE
COME CAMPIONE

MODIFICHE RISPETTO LA VERSIONE BASE

MONTARE SOLLEVATE
COME CAMPIONE

MONTARE SOLLEVATE
COME CAMPIONE

Nome Progetto		Pagina		Size	
PTX LCD		1 di 1		A4	
Autore:		Data:		Codice Progetto:	
GRIPTECH - REV. BERTI J.		03/09/02		/	
Nome PC in Rete:		Revisione:		Nome Porte: LAYOUT SWITCHING POWER SUPPLY	
\\JACK\		1.2		Codice:	
File/Cartella MANUALE\PTX LCD\PSSW2812B.DWG		Autorizzazione:		PSSW2812B	
Scale:		Trattamento:		Profilo:	
/		/		/	

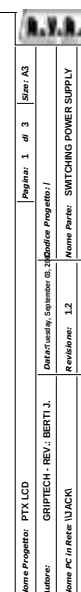
MODIFICHE RISPETTO LA VERSIONE BASE

R3=15R

R11=8R2

U1=IR2127

R9=NON MONTARE

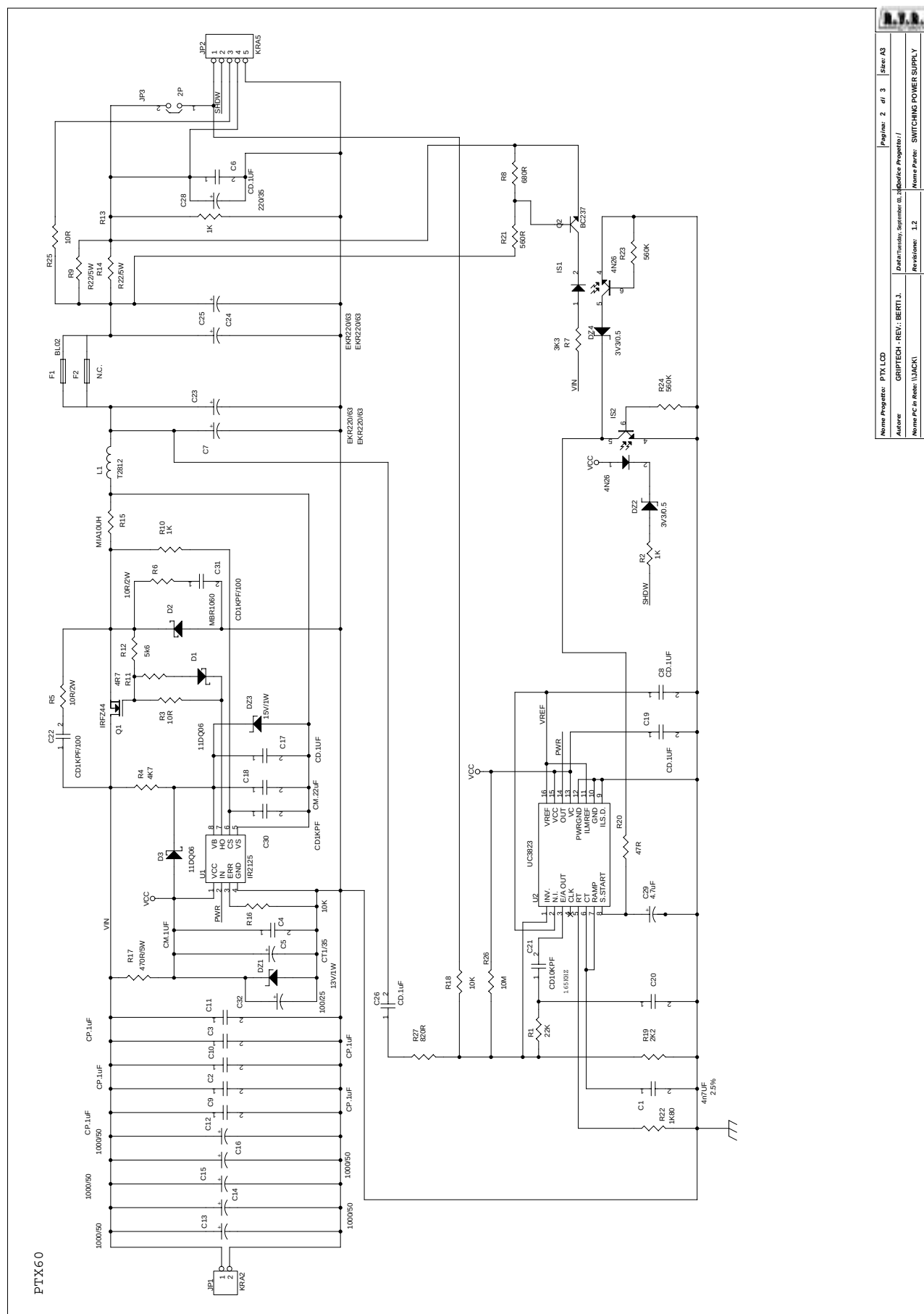


PSSW 2812B

Bill Of Materials

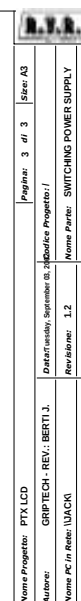
Page1

Item	Q.ty	Reference	Part
1	1	C1	4n7UF
2	5	C2,C3,C9,C10,C11	CP.1uF
3	1	C4	CM.1UF
4	1	C5	CT1/35
5	5	C6,C8,C17,C19,C26	CD.1uF
6	4	C7,C23,C24,C25	EKR220/63
7	5	C12,C13,C14,C15,C16	1000/50
8	1	C18	CM.22uF
9	1	C20	CAP NP
10	1	C21	CD10KPF
11	2	C22,C31	CD1KPF/100
12	1	C28	220/35
13	1	C29	4.7uF
14	1	C30	CD1KPF
15	1	C32	100/25
16	1	DZ1	13V/1W
17	2	DZ2,DZ4	3V3/0.5
18	1	DZ3	15V/1W
19	2	D1,D3	11DQ06
20	1	D2	MBR1060
21	1	F1	BL02
22	3	F2,R9,R19	N.C.
23	2	IS2,IS1	4N26
24	1	JP1	KRA2
25	1	JP2	KRA5
26	1	JP3	2P
27	1	L1	T2812
28	1	Q1	IRFZ44
29	1	Q2	BC237
30	1	R1	22K
31	3	R2,R10,R13	1K
32	2	R25,R3	10R
33	1	R4	4K7
34	2	R5,R6	10R/2W
35	1	R7	3K3
36	1	R8	680R
37	1	R11	4R7
38	1	R12	5k6
39	1	R14	R22/5W
40	1	R15	MIA10UH
41	2	R16,R18	10K
42	1	R17	470R/5W
43	1	R20	47R
44	1	R21	560R
45	1	R22	1K80
46	2	R23,R24	560K
47	1	R26	10M
48	1	R27	820R
49	1	U1	IR2127
50	1	U2	UC3823



PSSW2812B Bill Of Materials Page1

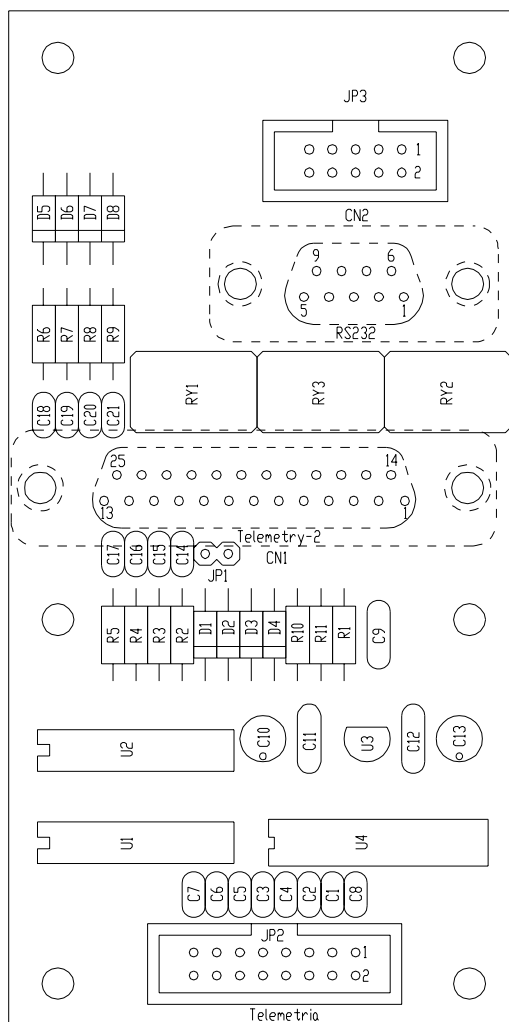
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3	1	C4	CM. 1UF
4	1	C5	CT1/35
5	5	C6, C8, C17, C19, C26	CD. 1uF
6	4	C7, C23, C24, C25	EKR220/63
7	5	C12, C13, C14, C15, C16	1000/50
8	1	C18	CM. 22uF
9	1	C20	CAP NP
10	1	C21	CD10KPF
11	2	C22, C31	CD1KPF/100
12	1	C28	220/35
13	1	C29	4. 7uF
14	1	C30	CD1KPF
15	1	C32	100/25
16	1	DZ1	13V/1W
17	2	DZ2, DZ4	3V3/0.5
18	1	DZ3	15V/1W
19	2	D1, D3	11DQ06
20	1	D2	MBR1060
21	1	F1	BL02
22	1	F2	N. C.
23	2	IS1, IS2	4N26
24	1	JP1	KRA2
25	1	JP2	KRA5
26	1	JP3	2P
27	1	L1	T2812
28	1	Q1	IRFZ44
29	1	Q2	BC237
30	1	R1	22K
31	3	R2, R10, R13	1K
32	2	R3, R25	10R
33	1	R4	4K7
34	2	R5, R6	10R/2W
35	1	R7	3K3
36	1	R8	680R
37	2	R9, R14	R22/5W
38	1	R11	4R7
39	1	R12	5k6
40	1	R15	MIA10UH
41	2	R16, R18	10K
42	1	R17	470R/5W
43	1	R19	2K2
44	1	R20	47R
45	1	R21	560R
46	1	R22	1K80
47	2	R23, R24	560K
48	1	R26	10M
49	1	R27	820R
50	1	U1	IR2125
51	1	U2	UC3823



PSSW2812B Bill Of Materials Page1

Item	Q.ty	Reference	Part
1	1	C1	4n7UF
2	5	C2, C3, C9, C10, C11	CP.1uF
3	1	C4	CM.1UF
4	1	C5	CT1/35
5	5	C6, C8, C17, C19, C26	CD.1uF
6	4	C7, C23, C24, C25	EKR220/63
7	5	C12, C13, C14, C15, C16	1000/50
8	1	C18	CM.22uF
9	1	C20	CAP NP
10	1	C21	CD10KPF
11	2	C22, C31	CD1KPF/100
12	1	C28	220/35
13	1	C29	4.7uF
14	1	C30	CD1KPF
15	1	C32	100/25
16	1	DZ1	13V/1W
17	2	DZ2, DZ4	3V3/0.5
18	1	DZ3	15V/1W
19	2	D3, D1	11DQ06
20	1	D2	MBR1660
21	1	F1	BL02
22	2	R19, F2	N.C.
23	2	IS1, IS2	4N26
24	1	JP1	KRA2
25	1	JP2	KRA5/6
26	1	JP3	2P
27	1	L1	T2812
28	1	Q1	IRFZ44
29	1	Q2	BC237
30	1	R1	22K
31	3	R2, R10, R13	1K
32	2	R3, R25	10R
33	1	R4	4K7
34	2	R5, R6	10R/2W
35	1	R7	3K3
36	1	R8	680R
37	1	R9	R22/5W
38	1	R11	4R7
39	1	R12	5k6
40	1	R14	R1/10W
41	1	R15	MIA10UH
42	2	R16, R18	10K
43	1	R17	470R/5W
44	1	R20	47R
45	1	R21	560R
46	1	R22	1K80
47	2	R23, R24	560K
48	1	R26	10M
49	1	R27	820R
50	1	U1	IR2125
51	1	U2	UC3823

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DENOMINAZIONE
Telemetry Card Opt. Component Layout / Piano di Montaggio

DISPOSITIVO

SEMILAVORATO

MATERIALE

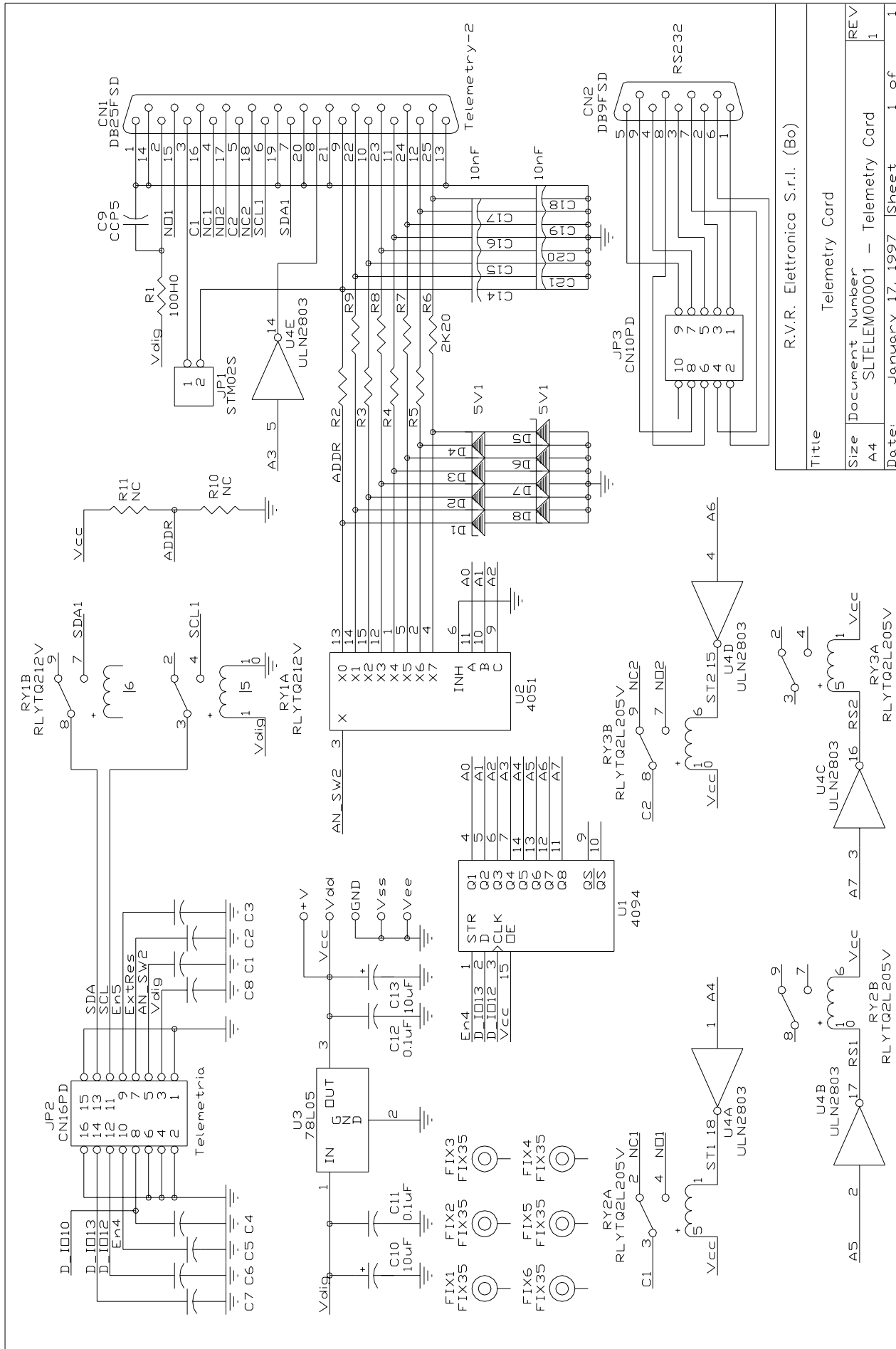
TRATTAMENTO

DISEGNATO
D'Alessio D. li 27/05/97

SCALA

DISEGNO

TAVOLA n di



R.V.R. Elettronica S.r.l. (Bo)

Title

Telemetry Card

Size

Document Number

SLTELEM00001 - Telemetry Card

REV

1

Date:

January 17, 1997

Sheet

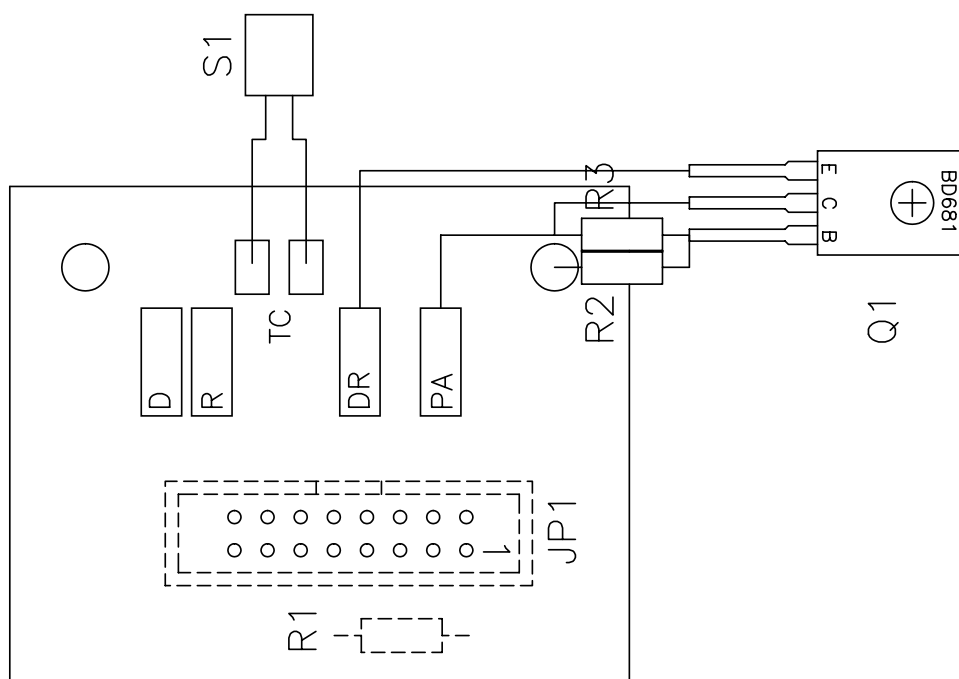
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Telemetry card
SLTELEM00001
Bill of Materials

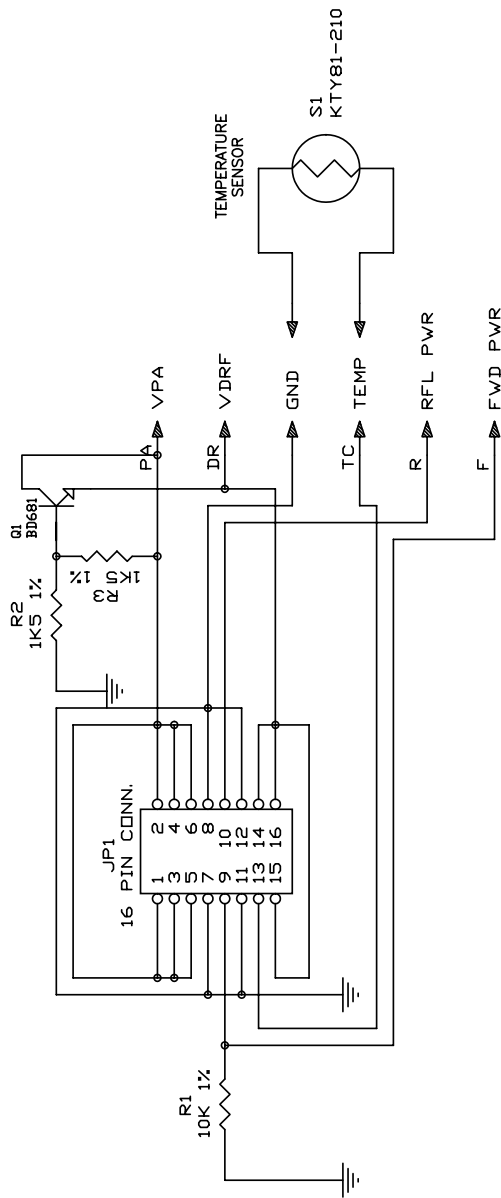
Revised : January 17, 1997
Revision: 1

Item	Reference	Part	Description	RVRCode
1	CS1	CS	Circuito stampato	
2	C1	100pF	Cond. ceramico p. 2.54mm	
3	C2	100pF	Cond. ceramico p. 2.54mm	
4	C3	100pF	Cond. ceramico p. 2.54mm	
5	C4	100pF	Cond. ceramico p. 2.54mm	
6	C5	100pF	Cond. ceramico p. 2.54mm	
7	C6	100pF	Cond. ceramico p. 2.54mm	
8	C7	100pF	Cond. ceramico p. 2.54mm	
9	C8	10nF	Cond. ceramico p. 2.54mm	
10	U1	4094	CI digitale	
11	U2	4051	CI digitale	
12	R1	100H0	Res. 1/4 W 1%	
13	C9	CCP5	Cond. ceramico p. 5mm	
14	JP1	STM02S	Strip M 2.54 2 pin.	
15	JP2	CN16PD	Conn. M cs 2x2.54mm a 16 p.	
16	C10	10uF	Cond. el. ver. 16V p. 2.5mm	
17	C11	0.1uF	Cond. ceramico p. 5mm	
18	C12	0.1uF	Cond. ceramico p. 5mm	
19	C13	10uF	Cond. el. ver. 16V p. 2.5mm	
20	RY1	RLYTQ212V	Rele' con bobina a 2V V	
21	RY2	RLYTQ2L205V	Rele' con bobina a 5V V	
22	RY3	RLYTQ2L205V	Rele' con bobina a 5V V	
23	D1	5V1	Diodo Zener 1/2 W	
24	D2	5V1	Diodo Zener 1/2 W	
25	D3	5V1	Diodo Zener 1/2 W	
26	D4	5V1	Diodo Zener 1/2 W	
27	D5	5V1	Diodo Zener 1/2 W	
28	D6	5V1	Diodo Zener 1/2 W	
29	D7	5V1	Diodo Zener 1/2 W	
30	D8	5V1	Diodo Zener 1/2 W	
31	R2	2K20	Res. 1/4 W 1%	
32	R3	2K20	Res. 1/4 W 1%	
33	R4	2K20	Res. 1/4 W 1%	
34	R5	2K20	Res. 1/4 W 1%	
35	R6	2K20	Res. 1/4 W 1%	
36	R7	2K20	Res. 1/4 W 1%	
37	R8	2K20	Res. 1/4 W 1%	
38	R9	2K20	Res. 1/4 W 1%	
39	C14	10nF	Cond. ceramico p. 2.54mm	
40	C16	10nF	Cond. ceramico p. 2.54mm	
41	C17	10nF	Cond. ceramico p. 2.54mm	
42	C18	10nF	Cond. ceramico p. 2.54mm	
43	C19	10nF	Cond. ceramico p. 2.54mm	
44	C20	10nF	Cond. ceramico p. 2.54mm	
45	C21	10nF	Cond. ceramico p. 2.54mm	
46	R10	NC	Non connesso	
47	R11	NC	Non connesso	
48	JP3	CN10PD	Conn. M cs 2x2.54mm a 10 p.	
49	U4	ULN2803	CI digitale	
50	CN1	DB25FSD	Conn. DB25 F stampato a 90°	
51	CN2	DB9FSD	Conn. DB9F SD	
52	C15	10nF	Cond. ceramico p. 2.54mm	
53	U3	78L05	CI lineare	

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Nome Progetto		PTX LCD		Pagina		di		Size	
Autore		BERTI J.		Codice Progetto		/		A4	
Nome PC in Rete		\\JACK\		Data		04/03/02			
File/Carrello		MANUAL\PTX LCD\SLCDPA2_14\LCDPA2.DWG		Revisione		1.1		CDN-PA2 CARD	
Scala		/		Autorizzazione		Codice		CSCDPA2	
Materiale		/		Trattamento		/		Profilo	



Nome Progetto		PTX LCD	Pagina	1	di	1	Size	A4
Autore	BERTI J.		Codice Progetto	/				
Nome PC in Rete	\\JACK\		Data	04/03/02			Nome Parte	CON-PA2 CARD
File/Cartella MANUALE PTX LCD	SLCINPA2_1A	SLCINPA2.DWG	Revisione	1.1			Codice	SLCINPA2
Scala	/		Trattamento	/			Profilo	/

CONPA2 Card Circuit Diagram

Revised: May 22, 1997

Revision: 0

Bill Of Materials

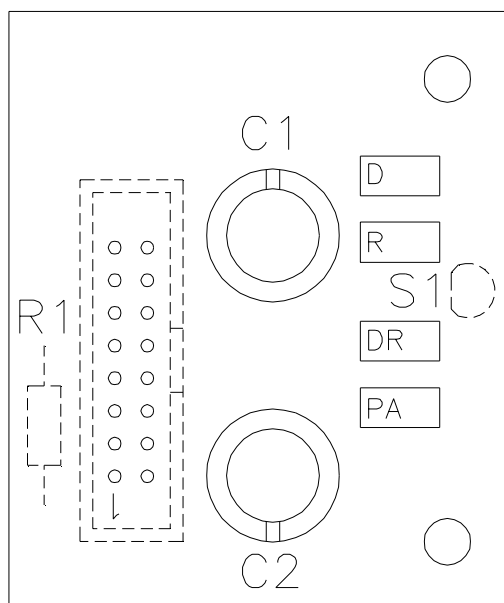
May 22, 1997

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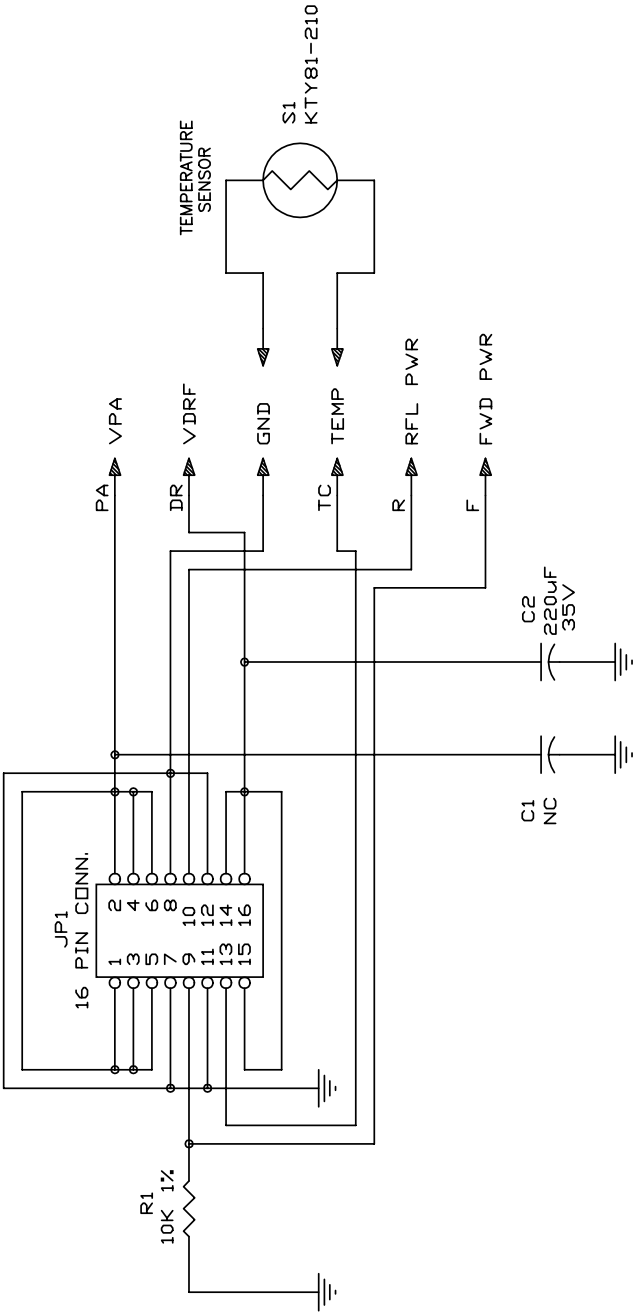
Page 1

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1	1	R1	10K 1%	RESISTOR 1/4W 1%
2	2	R2,R3	1K5 1%	RESISTOR 1/4W 1%
3	1	JP1	16 PIN CONN.	CONN. M 2*8 P 2.54
4	1	S1	KTY81-210	SIL. TEMP. SENSOR
5	1	Q1	BD681	TRANSISTOR DB681

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	DENOMINAZIONE		
	CON-PA3 Card Component Layout / Piano di Montaggio		
DISPOSITIVO			
SEMILAVORATO	DISEGNATO		DISEGNO
MATERIALE	D'Alessio D. li 22/05/97		
TRATTAMENTO	SCALA		TAVOLA n di



R.V.R. Elettronica S.r.l. (Bo)			
Title			
CON-PA3 Card Circuit Diagram			
Size	Document Number	REV	
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Date:	May 22, 1997	Sheet	of

CONPA3 Card Circuit Diagram

Revised: May 22, 1997

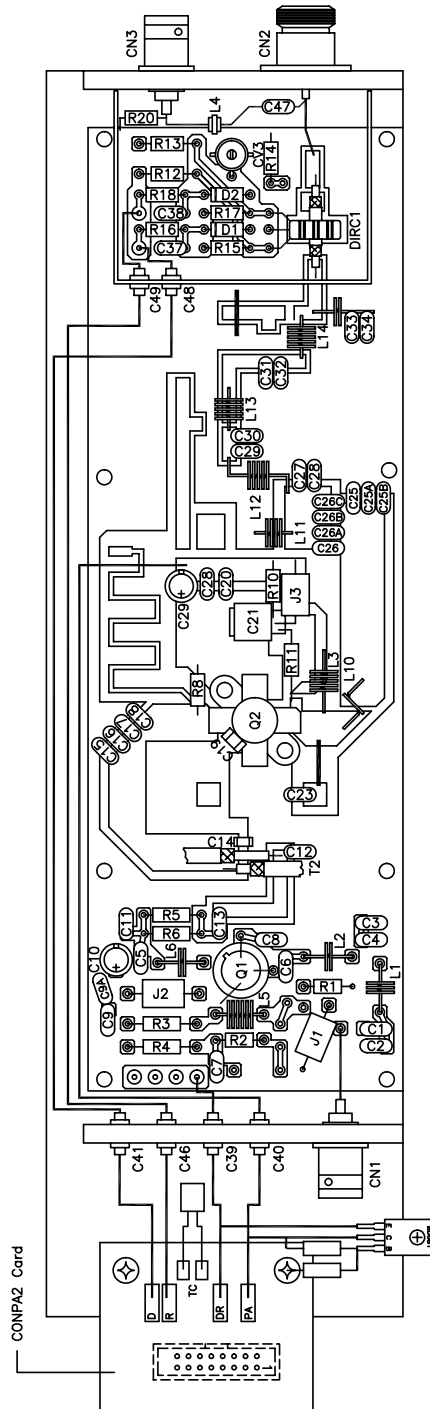
Revision: 0

Bill Of Materials May 22, 1997 11:32:58 Page 1

Item	Qty	Reference	Part	DESCRIPTION	PART ORDER CDE
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1	1	R1	10K 1%	RESISTOR 1/4W 1%	
2	1	C2	220UF	ELECTR. CAPACITOR	
3	1	JP1	16 PIN	CONN. M 2*8 P 2.54	
4	1	S1	KTY81-210	SILICON TEMP. SENSOR	
5	1	C1	NC	NON CONNESSO	

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Autore	REV:	BERTI J.	04/03/02	Codice Progetto		/		
Nome PC in Rete	\\JACK\	Revisione	1.2	Nome Parte		RF. Power Amplifier		
File/Cartella	MANUAL\PTX_LCD\SLPA30_16\LA\FIN\30.DWG	Autore		Codice		SLPA30		
Scala	/	Modulo	/	Trattamento		/		
				Profilo		/		



30W RF POWER AMPLIFIER Revised: Thursday, June 03, 1999

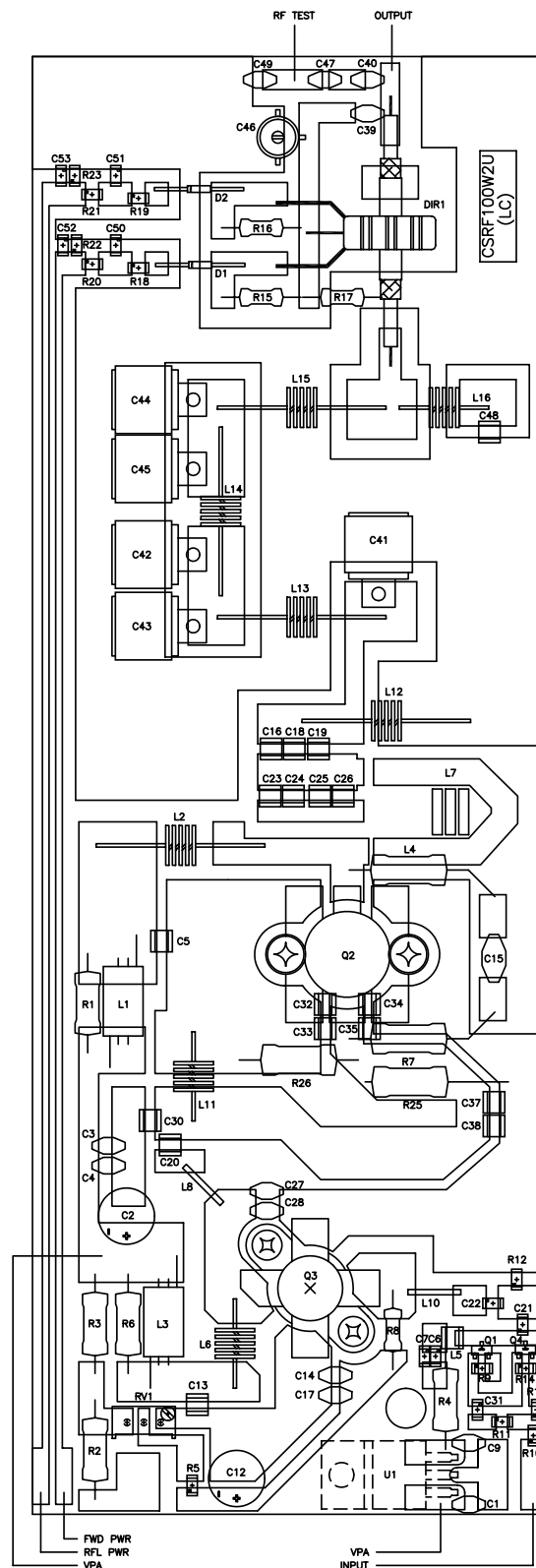
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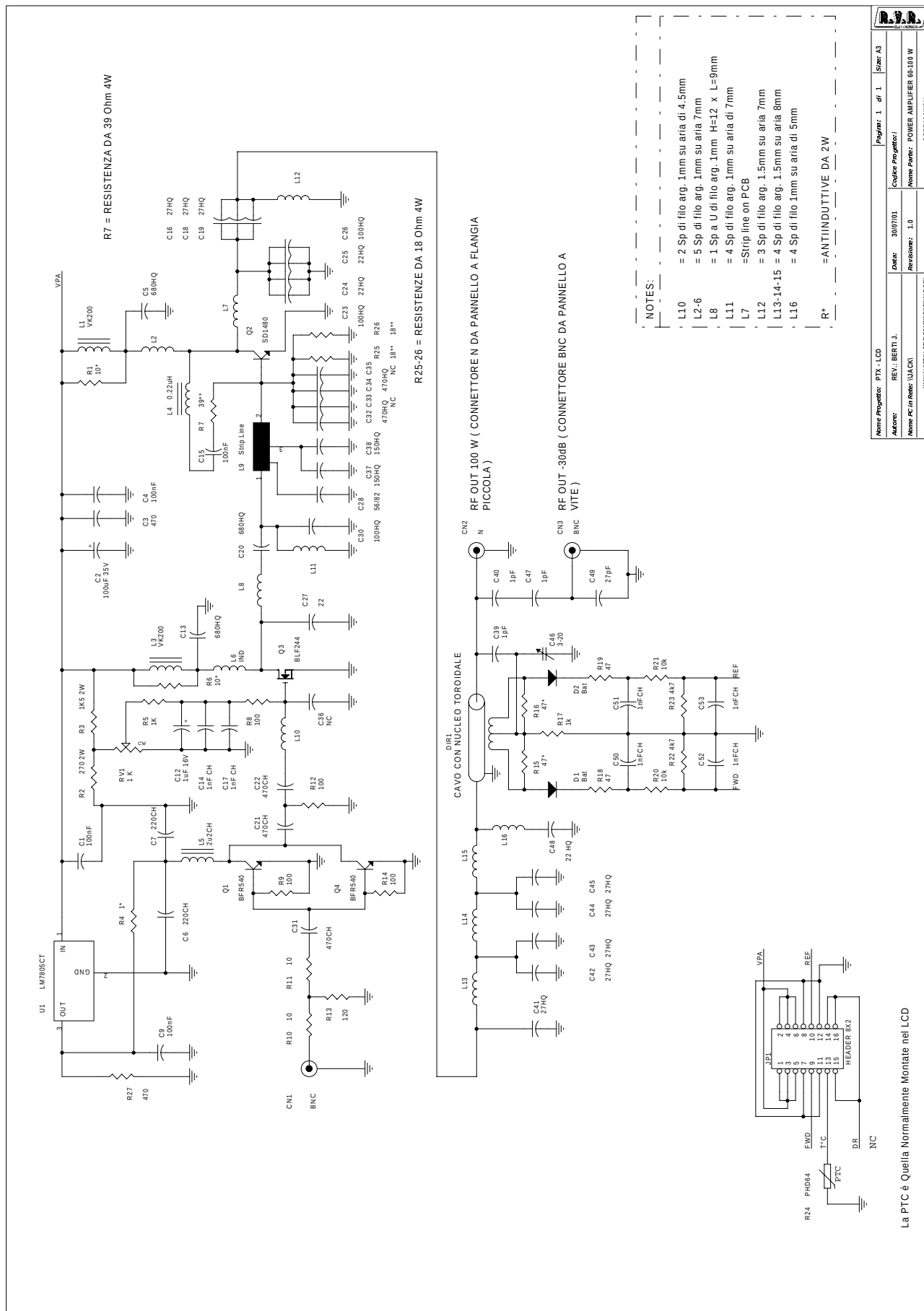
Bill Of Materials Page 1

Item	Qty	Reference	Part
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2	1	CN2	N TELAIO
3	1	CV3	T40pF
4	4	C9,C28,C37,C38	4n7
5	2	C2,C11	39pF
6	1	C3	47pF
7	1	C4	100pF
8	7	C5,C6,C7,C23,C27,C28,C33	12pF
9	2	C8,C34	6p8
10	2	C20,C9A	0.1uF
11	1	C10	10uF
12	1	C12	15pF
13	1	C14	150pFHQ
14	4	C15,C16,C17,C18	82pF
15	1	C21	1nFUNELCO
16	1	C22	680pFHQ
17	3	C25B,C25A,C25	33pF
18	4	C26C,C26B,C26A,C26	18pF
19	1	C29	100uF
20	4	C29,C30,C31,C32	27pF
21	2	C36,C47	2p2
22	6	C39,C40,C41,C46,C48,C49	1nFPAS
23	1	DIRC1	TOROIDE
24	2	D1,D2	1N4148
25	3	J1,J2,J3	VK200
26	1	L1	L35.5RVR0.8
27	1	L2	L24RVR0.8
28	4	L3,L12,L13,L14	L56RVR1
29	1	L4	LINK
30	1	L5	L65.5RVR0.8
31	1	L6	L27RVR0.8
32	1	L10	L16RVR1
33	1	L11	L46RVR1
34	1	L15	L26RVR1
35	1	Q1	MRF237
36	1	Q2	BLW86
37	2	R1,R10	18#
38	2	R2,R11	270#
39	2	R4,R3	3.9**
40	2	R6,R5	18**
41	2	R13,R12	47*
42	1	R14	1K 1%
43	3	R15,R17,R20	47 1%
44	2	R16,R18	3K3
45	4	STR1,STR2,STR3,STR5	S.L.
46	1	T2	4:1
47	2	C1,C13	470p
48	1	R8	10#

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Nome Progetto: PTX - LCD		Pagina: 1	di 1	Size: A4
Autore: REV. J. BERTI J.	Detto: 30/07/01	Codice Progetto: /		
Nome PC in Rete: \JACK\	Revisione: 1.0	Nome Parte: POWER AMPLIFIER 60-100 W		
File/Caricella: MANUAL\PTX_LCD\SLR100W2U\LAYOUT.DWG	Autorizzazione:	Codice: CSRF100W2U		
Scala: /	Materiale: /	Trattamento: /		



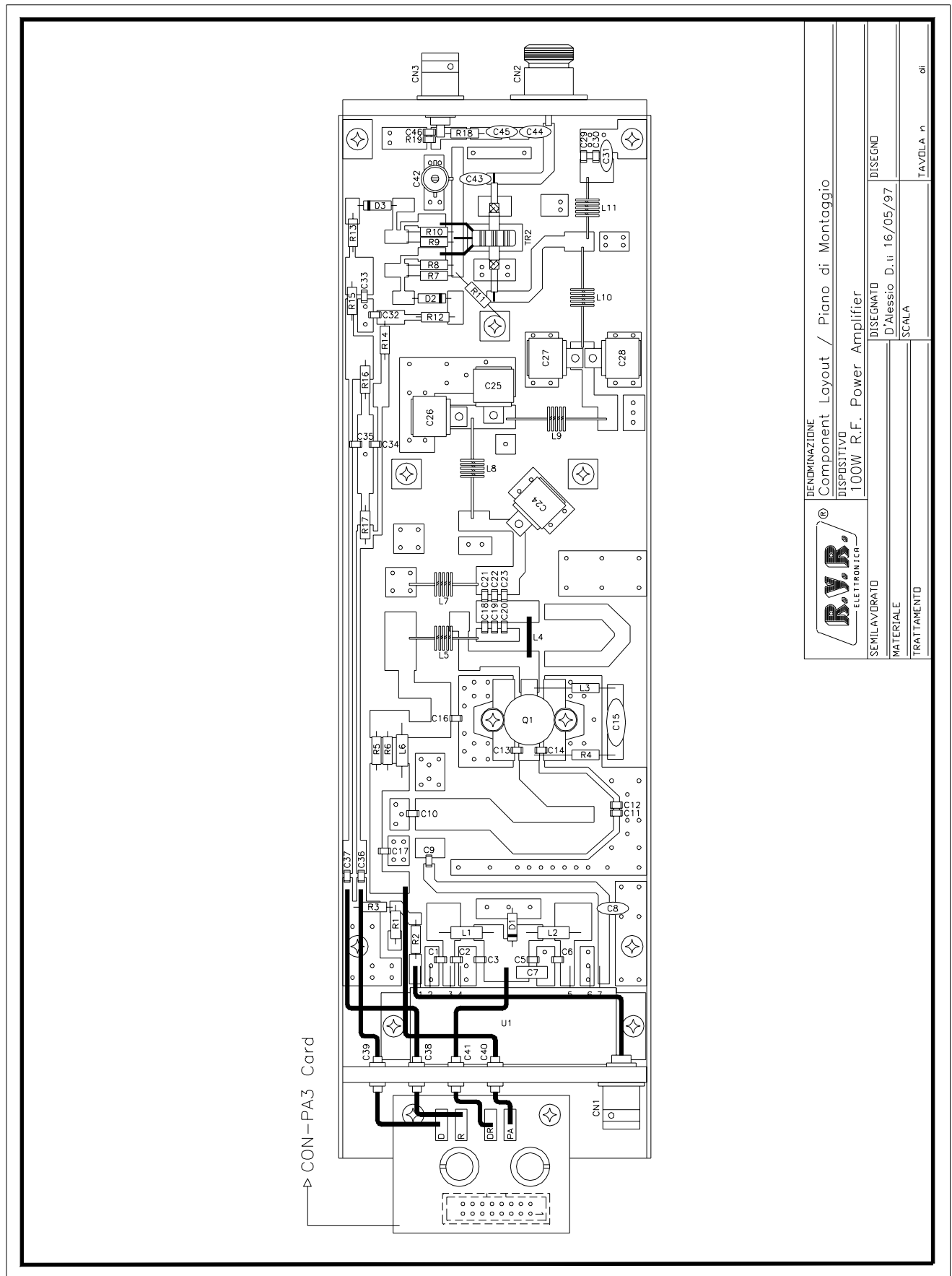
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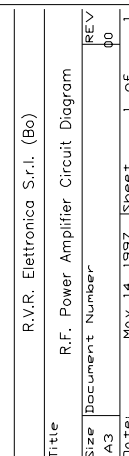
Bill Of Materials

Page1

Item	Quantity	Reference	Part
1	2	CN1,CN3	BNC F A VITE BA
2	1	CN2	N F A FLANGIA PICCOLA
3	4	C1,C4,C9,C15	100nF
4	1	C2	100uF 35V
5	2	R27,C3	470
6	3	C5,C13,C20	680HQ
7	2	C6,C7	220CH
8	1	C12	1uF 16V
9	2	C17,C14	1nFCH
10	8	C16,C18,C19,C41,C42,C43, C44,C45	27HQ
11	3	C21,C22,C31	470CH
12	3	C23,C26,C30	100HQ
13	2	C25,C24	22HQ
14	1	C27	22
15	1	C28	56/82
16	2	C34,C32	470HQ
17	3	C33,C35,C36	NC
18	2	C37,C38	150HQ
19	3	C39,C40,C47	1pF
20	1	C46	3-20pFVAR
21	1	C48	22pFHQ
22	1	C49	27pF
23	4	C50,C51,C52,C53	1nFCH
24	1	DIR1	DIREZIONALE RVR
25	2	D1,D2	BAT 83
26	1	JP1	HEADER 8X2
27	2	L3,L1	VK200
28	11	L2,L6,L7,L8,L10,L11,L12, L13,L14,L15,L16	VEDI SCHEMA
29	1	L4	0.22uH
30	1	L5	2u2CH
31	1	L9	STRIP LINE SU STAMPATO
32	2	Q1,Q4	BFR540
33	1	Q2	SD1480
34	1	Q3	BLF244
35	1	RV1	1K
36	2	R1,R6	10*
37	1	R2	270 2W
38	1	R3	1K5 2W
39	1	R4	1*
40	2	R17,R5	1K
41	1	R7	39 4W
42	4	R8,R9,R12,R14	100
43	2	R11,R10	10
44	1	R13	120
45	2	R15,R16	47*
46	2	R18,R19	47
47	2	R20,R21	10k
48	2	R22,R23	4k7
49	1	R24	PHD64
50	2	R26,R25	18 4W
51	1	U1	LM7805CT

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FINALE 100W-LCD
15, 1997

Revised: May

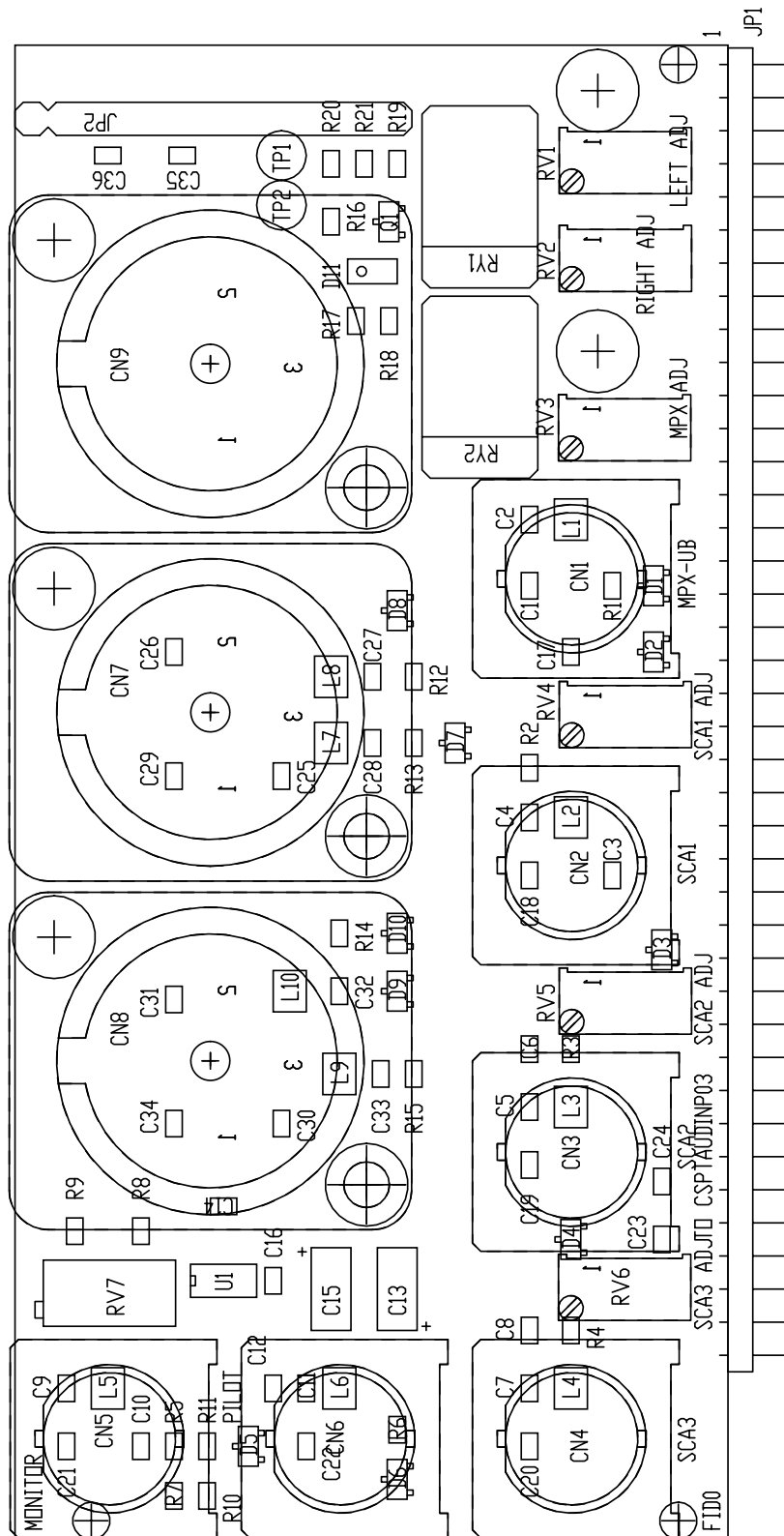
Revision: 00

Bill Of Materials
Page 1

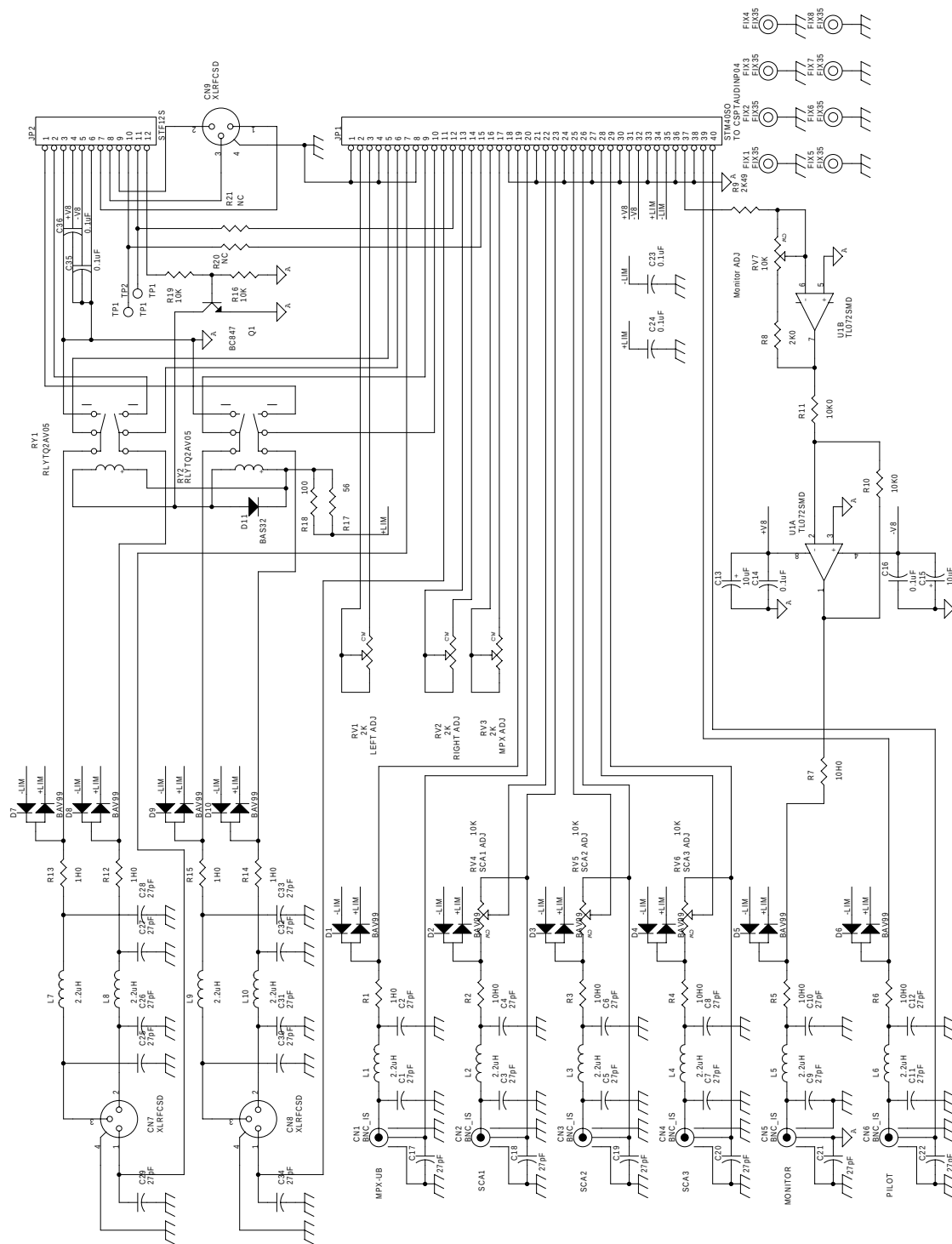
May 15, 1997 9:42:40

Item	Quantity	Reference	Part
DESCRIPTION		PART ORDER CDE	
1	2	R5,R6 18#	RESISTOR 2W
2	1	R4 39#	RESISTOR 2W
3	2	R12,R13 47	RESISTOR 1/4W 5%
4	1	R19 51CH	CHIP RESISTOR
5	1	R3 68 1%	RESISTOR 1/4W 1%
6	1	R18 100	RESISTOR 1/4W 5%
7	4	R7,R8,R9,R10 100#	RESISTOR 2W
8	2	R1,R2 150 1%	RESISTOR 1/4W 1%
9	1	R11 1K*	RESISTOR 1/2W 5%
10	2	R16,R17 4K7 1%	RESISTOR 1/4W 1%
11	2	R14,R15 10K 1%	RESISTOR 1/4W 1%
12	1	C31 1PF	CERAMIC CAPAC NP0
13	2	C44,C45 1P5	CERAMIC CAPAC NP0
14	1	C42 T2P22F	TRIMMER CAPAC
15	1	C43 2P7	CERAMIC CAPAC NP0
16	1	C8 10PF	CERAMIC CAPAC NP0
17	2	C29,C30 10PFHQ	HIGHT Q CAPACITOR
18	1	C18 22PFHQ	HIGHT Q CAPACITOR
19	4	C21,C22,C23,C46 27PFHQ	HIGHT Q CAPACITOR
20	5	C24,C25,C26,C27,C28 27PFUNELCO	SILVER MICA CAPACITOR
21	2	C19,C20 100PFHQ	HIGHT Q CAPACITOR
22	3	C10,C11,C12 150PFHQ	HIGHT Q CAPACITOR
23	1	C9 470PFHQ	HIGHT Q CAPACITOR
24	3	C13,C14,C16 680PFHQ	HIGHT Q CAPACITOR
25	13	C1,C2,C3,C4,C5,C6,C17,C32,C33,C34,C35,C36,C37	1NFCH CERAMIC CHIP CAPACITOR
26	4	C38,C39,C40,C41 1NFPAS	CERAM. THROUGH CAP
27	1	C15 100NF	CERAMIC CAPACITOR
28	1	C7 0.1UFP	POLIESTER CAPACITOR
29	1	L3 0U22	RF CHOKE
30	3	L1,L2,L6 VK	RF CHOKE
31	1	L11 L35RVR1.5 3 SP DIA 5	RAME ARG.
32	1	L7 L37RVR1.5 3 SP DIA 7	RAME ARG.
33	3	L8,L9,L10 L57RVR1.55 SP DIA 7	RAME ARG.
34	1	L5 L78RVR1.5 7 SP DIA 8	RAME ARG.
35	1	L4 LINK	LINK FILO ARG. 1mm
36	1	TR1 RG188	COAX CABLE RG188
37	2	CN1,CN3 BNC TELAIO	CONN. BNC A TELAIO
38	1	CN2 N CONNECTOR	CONN. N A TELAIO
39	2	D2,D3 BAT83	HOT CARRIER DIODE
40	1	D1 Z13V	ZENER DIODE 13V 0.4W
41	1	Q1 SD1480	RF POWER TRANSISTOR
42	1	U1 BGY33	VHF POW AMP MODULE BGY33
43	1	TR2 WIDE-BAND TRF	WIDE-BAND TRANSF
44	4	ST1,ST2,ST3,ST4	STRIP LINE

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Nome Progetto		PTX LCD		Pagina 1 di 1		Size A4	
Autore:	REV: BERTI J.	Data		23/11/01		Codice Progetto	
Nome PC in Rete:	\\JACK\	Revisione:		1.0		Nome Part: SCHEMA CONNETTORI BNC-SCAMPX e REGOLAZIONI	
File/Correlato MANUALE PTX LCD OPTIC AUDIOME-DIGIVIEWBNC.DWG		Autorizzazione:				Codice: CSPTAUDBNC05	
Scala(2:1)	Materiale	Trattamento		/		Profilo	



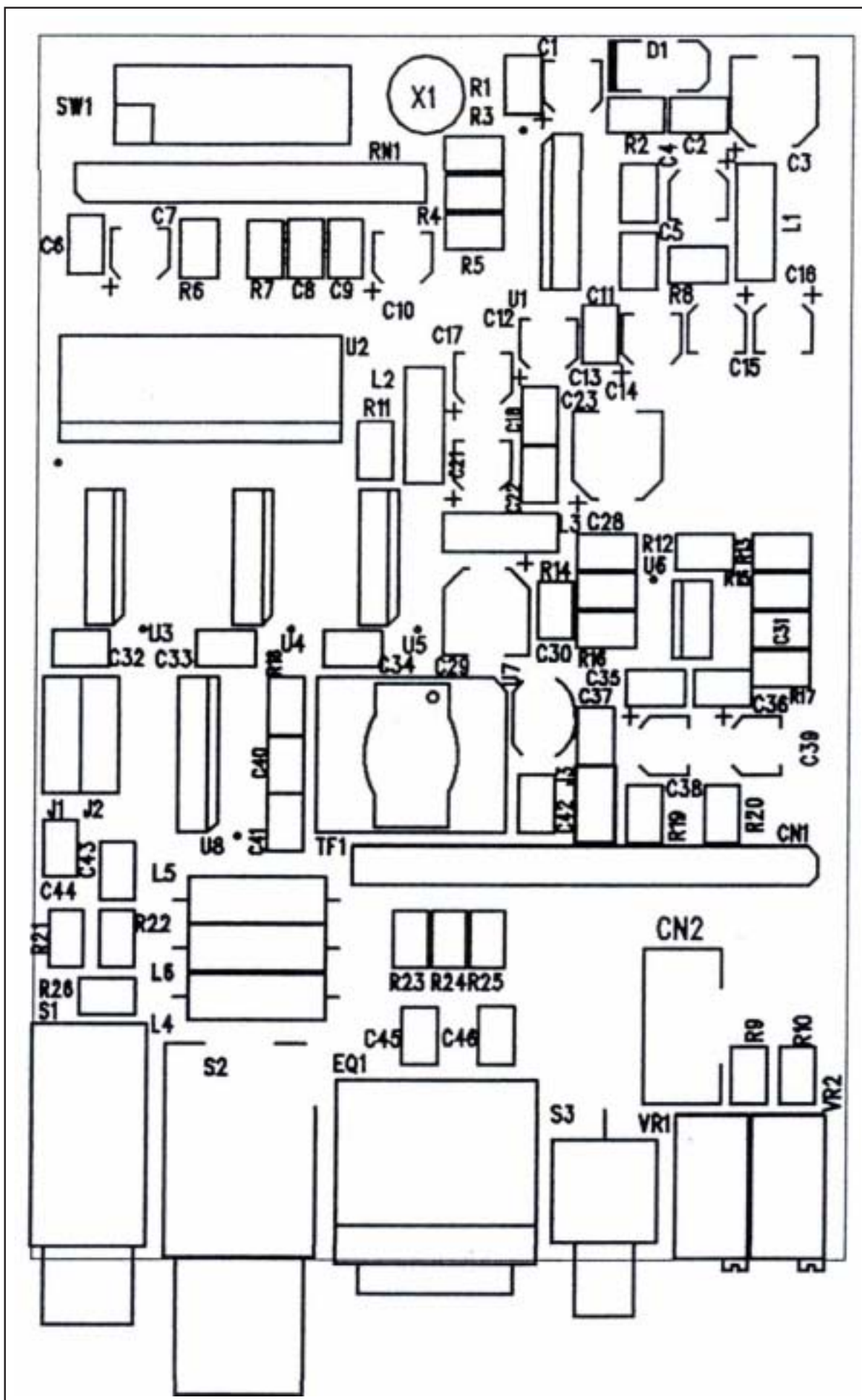
Nome Progetto: PTX LCD		Pagina: 1	di: 1	Size: A3
Autore: REV. BERTI J.		Data: 24/01/02		
Nome PC in Rete: WACKI		Codice Progetto: I		
File/Caratteristiche: MANUALE PTX CONVERSIONE AUDIO IN VIDEO E L'IDR		Nome Punto: 1.1		
		Revisione: 1.1		
		Autore/Revisione: CSPTAUDBNC05		

SLPTAUDBNC05 Bill Of Materials Page1

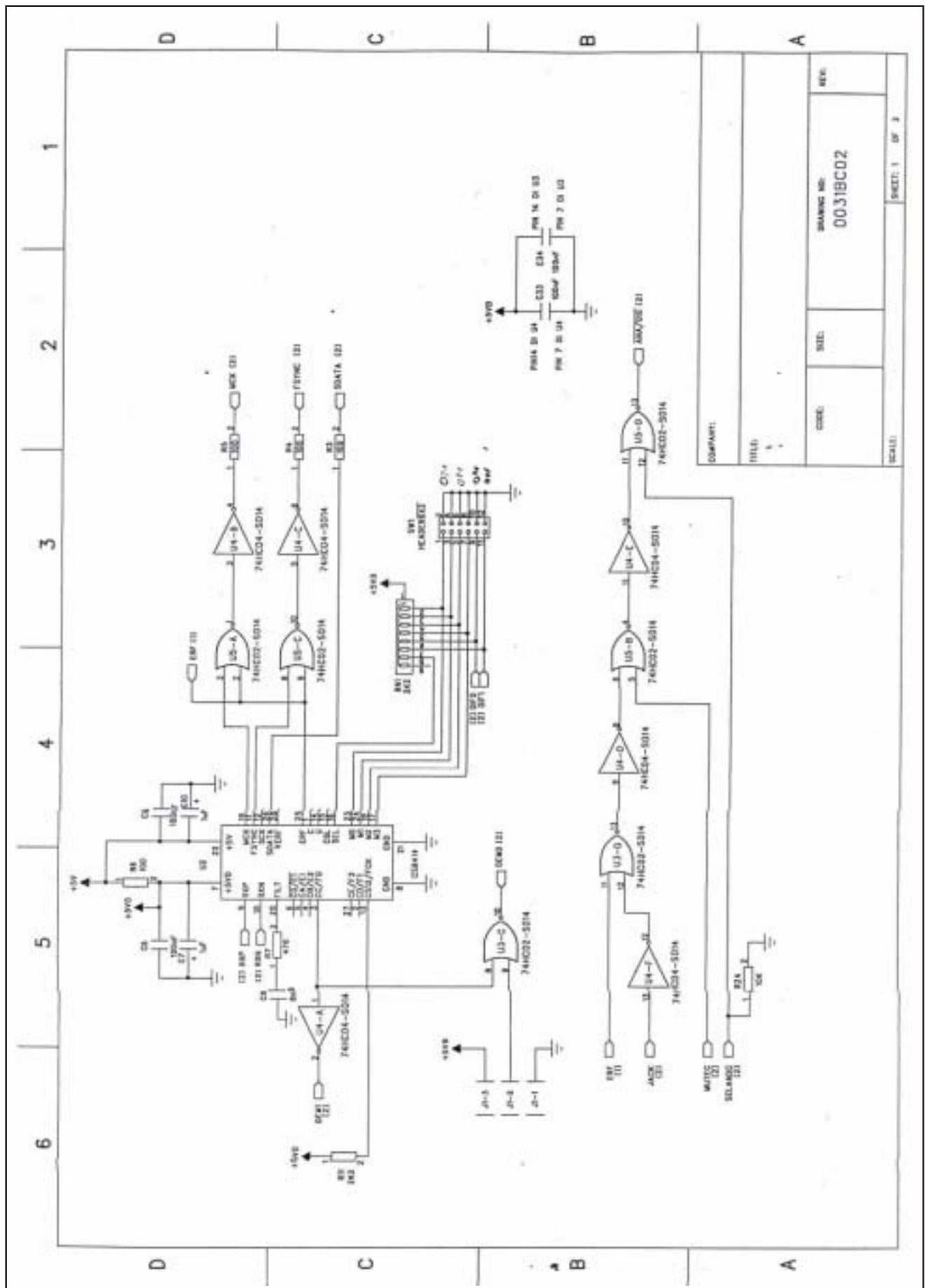
Item Q.ty Reference Part

1	6	CN1, CN2, CN3, CN4, CN5, CN6	BNC_IS
2	3	CN7, CN8, CN9	XLRFCSD
3	28	C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C17, C18, C19, C20, C21, C22, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34	27pF
4	2	C15, C13	10uF
5	6	C14, C16, C23, C24, C35, C36	0.1uF
6	10	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10	BAV99
7	1	D11	BAS32
8	8	FIX1, FIX2, FIX3, FIX4, FIX5, FIX6, FIX7, FIX8	FIX35
9	1	JP1	STM40SO
10	1	JP2	STF12S
11	10	L1, L2, L3, L4, L5, L6, L7, L8, L9, L10	2.2uH
12	1	Q1	BC847
13	3	RV1, RV2, RV3	2K
14	6	RV4, RV5, RV6, RV7, R16, R19	10K
15	2	RY1, RY2	RLYTQ2AV05
16	5	R1, R12, R13, R14, R15	1H0
17	6	R2, R3, R4, R5, R6, R7	10H0
18	1	R8	2K0
19	1	R9	2K49
20	2	R11, R10	10K0
21	1	R18	100
22	2	R21, R20	NC
23	2	TP2, TP1	TP1
24	1	U1	TL072SMD
21	1	R17	56

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Sheet by Sheet'Part Report for 003lbc02.sch

Sheet: Sheet 1

Name	Logic	Gates	VALUE	Part Type	VALUE
C6	CAP	1	100nF	C0805	100nF
C7	CAP	1	1uF	AECAP	1uF
C8	CAP	1	6n8	C0805	6n8
C9	CAP	1	100nF	C0805	100nF 1
C10	CAP	1	1uF	AECAP	1uF
C33	CAP	1	100nF	C0805	100nF
C34	CAP	1	100nF	C0805	100nF
J1	CON	3		HEADER03	
R3	RES	1	-100	R0805	100
R4	RES	1	100	R0805	100
RS	RES	1	100	R0805	100
R6	RFS	1	100	R0805	100
R7	RES	1	470	R0805	470
R11	RES	1	2K2	R0805	2K2
R24	RES	1	10K	R0805	10K
RN1	RES	1	2K2	RN9A	2K2
SW1	UND	1		HEADER\6X2	
U2	UND	1		CS8414	
U3	TTL	4		74HC02-S01	
U4	TTL	6		74HC04-S0I	
U5	TTL	4		74HC02-S0I	

Part count on the sheet: 21

Sheet: Sheet 2

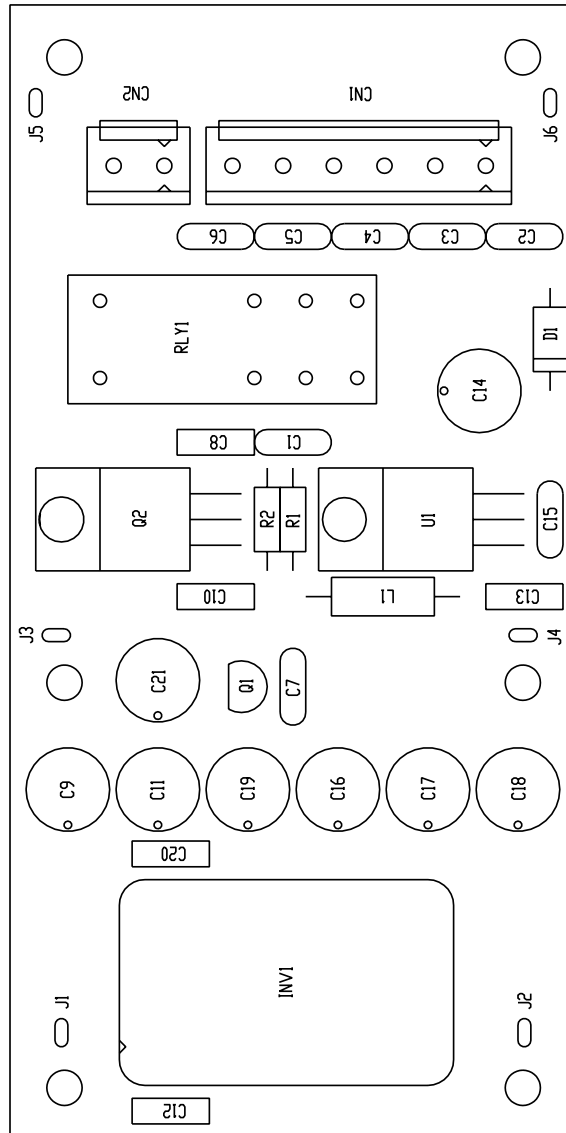
Name	Logic	Gates	VALUE	Part Type	V ALUE
------	-------	-------	-------	-----------	--------

REF.	DESCRIPTION	QTY	VALUE	REF.	DESCRIPTION
C1	CAP	1	4.7uF	AECAP	4.7UF
C2	CAP	1	100nF	C0805	100nF
C3	CAP	1	47uF	AECAP	47uF
C4	CAP	1	100nF	C0805	100nF
C5	CAP	1	10uF	AECAP	10uF
C11	CAP	1	100nF	C0805	100nF
C12	CAP	1	1uF	AECAP	1uF
C13	CAP	1	100nF	C0805	100nF
C14	CAP	1	1uF	AECAP	1uF
C15	CAP	1	10uF	AECAP	10uF
C16	CAP	1	10uF	AECAP	10uF
C17	CAP	1	10uF	AECAP	10uF
C18	CAP	1	100nF	C0805	100nF
C19	CAP	1	220p	C0805	220p
C20	CAP	1	220p	C0805	220p
C21	CAP	1	47uF	AECAP	47uF
C22	CAP	1	100nF	C0805	100nF
C23	CAP	1	47UF	AECAP	47uF
C24	CAP	1	220P	C0805	220p
C25	CAP	1	220p	C0805	220p
C26	CAP	1	220p	C0805	220p
C27	CAP	1	220p	C0805	220p
C28	CAP	1	220p	C0805	220p
C29	CAP	1	47uF	AECAP	47uF
C39	CAP	1	100nF	C0805	100nF
C31	CAP	1	220p	C0805	220p
C32	CAP	1	100nF	C0805	100nF

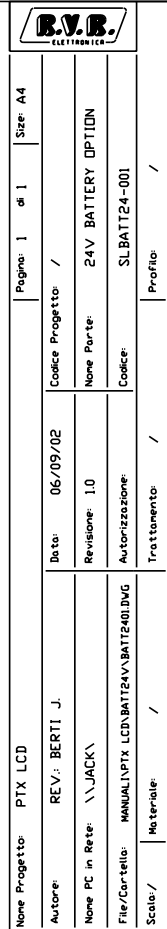
C35	CAP	1	100nF	C0805	100nF
C36	CAP	1	100nF	C0805	100nF
C37	CAP	1	100nF	C0805	100nF
C38	CAP	1	47uF	AECAP	47uF
C39	CAP	1	47uF	AECAP	47uF
C40	CAP	1	100nF	C0805	100nF
C41	CAP	1	100nF	C0805	100nF
C42	CAP	1	100nF	C0805	100nF
C43	CAP	1	10nF	C0805	10nF
C44	CALD	1	100nF	C0805	100nF
C45	CAP	1	10nF	C0805	10nF
C46	CAP	1	10nF	C0805	10nF
CN1	CON	12		SIP12	
D1	DIO	1	1N4148	MLL345	1N4148
EQ1	UND	1		TORX176	
J2	CON	3		HEADER03	
J3	JUM	1		JUMPER	
L1	IND	1	FLSR	RM77	F LSR
L2	IND	1	FL5R	RM77	F LSR
L3	IND	1	FLSR	RM77	F L5R
L4	IND	1		BLO1	
L5	IND	1		BLO1	
L6	IND	1		BLO1	
R1	RES	1	100	R0805	100
R2	RES	1	220K	R0805	220K
R8	RES	1	10	R0805	1
R9	RES	1	3K32	R0805	3K32
R10	RES	1	3K32	R0805	3K32
R12	RES	1	1K58	R0805	1K58
R13	RES	1	1K58	R0805	1K58

R14	RES	1	3K32	R0805	3K32
R15	RES	1	3K32	R0805	3K32
R16	RES	1	10K	R0805	i o K
R17	RES	1	10K	R0805	i 0 K
R18	RES	1	75	R0805	7 5
R19	RES	1	10	R0805	i o
R20	RES	1	10	R0805	i o
R21	RES	1	2K2	R0805	2 K2
R22	RES	1	150	R0805	i 50
R23	RES	1	2K2	R0805	2 K2
R25	RES	1	2K2	R0805	2 K2
R26	RES	1	2K2	R0805	2 K2
S1	UND	1		JACK-APJ20	
S2	UND	1		ARC5500	
TF1	UND	1		TRASF-DIG_	
TF2	UND	1		NEUTRIK1	
U1	UND	1		C54340	
U3	TTL	4		74HCO2-S01	
U6	ANA	2		TL072-S08	
U7	ANA	1		LM78L08ACZ	
U8	CMO	4		ADG211AVR	

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Nome Progetto: PTX LCD		Pagina: 1	di 1	Size: A4
Autore:	D'ALESSIO D. - REV.: BERTI J.	Data:	06/09/02	Codice Progetto: /
Nome PC in Rete:	\\JACK\	Revisione:	1.0	Nome Parte: 24V BATTERY DPT. LAYOUT
File/Cartella:	MANUAL\PTX LCD\BATT24V\LAYOUT\BATT.DWG	Autorizzazione:		Codice: CSBATT24-001
Scala:	/	Materiale:	/	Trattamento: /



Opzione 24 V

Bill of Materials

Item	Reference	Part	Description	RVRCode
1	CS1	CS	Circuito stampato	
2	INV1	INV2415	_ _ _ _ _	
3	CN1	CN06MR	Conn. morsetto 06 pin F c.s.	
4	RLY1	RLYRKS11	Rele' con bobina a V	
5	C1	0.1µF	Cond. ceramico p. 5mm	
6	C2	0.1µF	Cond. ceramico p. 5mm	
7	C3	0.1µF	Cond. ceramico p. 5mm	
8	C4	0.1µF	Cond. ceramico p. 5mm	
9	C5	0.1µF	Cond. ceramico p. 5mm	
10	C6	0.1µF	Cond. ceramico p. 5mm	
11	R1	4K70	Res. 1/4 W 1%	
12	C7	0.1µF	Cond. ceramico p. 5mm	
13	Q1	BC547	Tr. in TO 92	
14	C8	100nF	Cond. poliestere p. 5mm	
15	C9	220µF	Cond. el. ver. 16V p. 2.5mm	
16	R2	4K70	Res. 1/4 W 1%	
17	C10	100nF	Cond. poliestere p. 5mm	
18	C11	220µF	Cond. el. ver. 16V p. 2.5mm	
19	C12	100nF	Cond. poliestere p. 5mm	
20	L1	100µH	Impedenza	
21	C13	100nF	Cond. poliestere p. 5mm	
22	D1	1N4005	Diodo silicio	
23	C14	100µF	Cond. el. ver. 25V p. 2.5mm	
24	C15	0.1µF	Cond. ceramico p. 5mm	
25	CN2	CN02MR	Conn. morsetto 02 pin F c.s.	
26	U1	VFN220H	CI lineare	
27	C16	220µF	Cond. el. ver. 16V p. 2.5mm	
28	C17	220µF	Cond. el. ver. 16V p. 2.5mm	
29	C18	220µF	Cond. el. ver. 16V p. 2.5mm	
30	C19	220µF	Cond. el. ver. 16V p. 2.5mm	
31	C20	100nF	Cond. poliestere p. 5mm	
32	C21	220µF	Cond. el. ver. 16V p. 2.5mm	
33	Q2	TIP120	Tr.	

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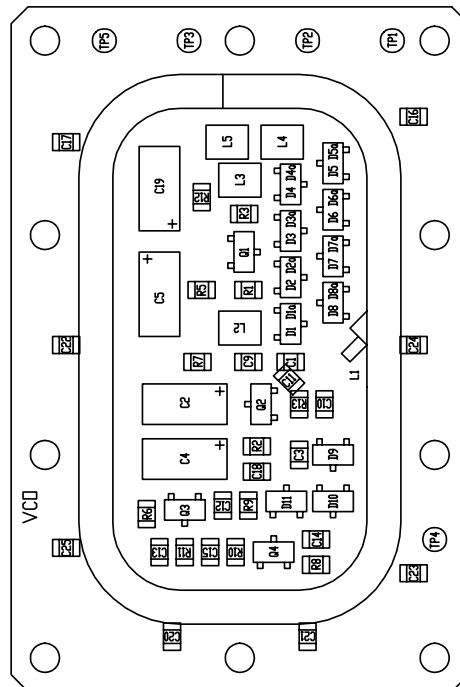
Appendix B **Piani di montaggio, schemi elettrici, liste componenti modificati per la versione 76-90MHz / *Component layouts, schematics, bills of material modified for 76-90MHz version***

Questa parte del manuale contiene i dettagli tecnici riguardanti la costruzione delle singole schede componenti il PTX-LCD modificate per il funzionamento nella frequenze 76-90MHz. L'appendice è composta dalle seguenti sezioni:

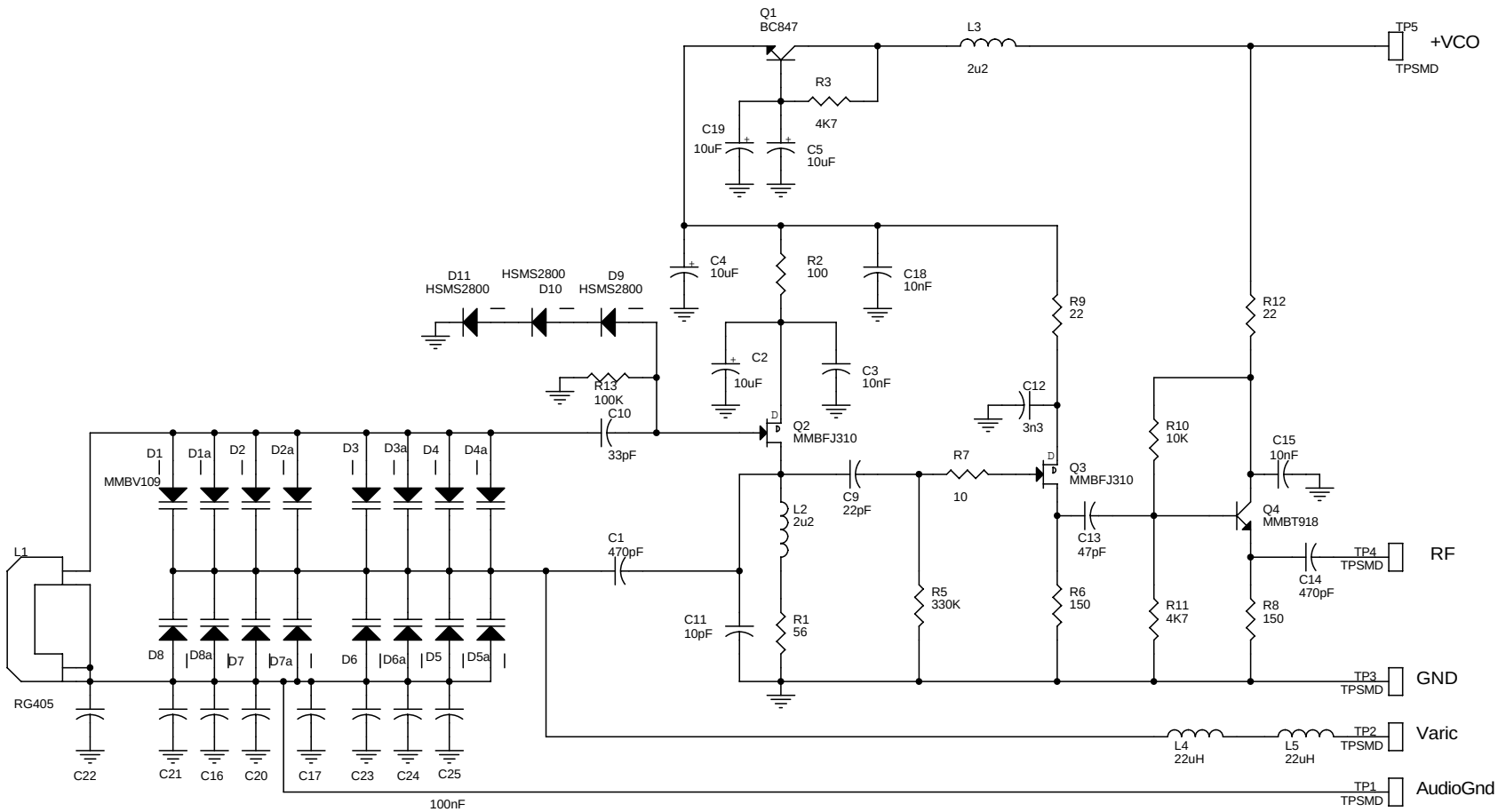
This part of the manual contains the technical details about the different boards of the PTX-LCD modified for the operation in 76-90MHz frequencies. This appendix is composed of the following sections:

Description	RVR Code	Vers.	Pages
VCO Card	SLPTXVCO0001	1.1	4
60-100W RF Power amplifier	CSRF100W2U	1.0	4

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Nome Progetto		PTX LCD		Pagina	1	di	1	Size	A4		
Autore:	REV. BERTI J.			Data:	05/11/02				Codice Progetto	/	
Nome PC in Rete:	\\JACK\			Revisione:	1.0						
File/Cartella	MANUALE PTX LCD SLPTVCDL7\SLPTVCD000.DWG			Autorizzazione:						Nome Parte:	VCD CARD (76-90MHz)
Scala:1:1	Materiali			/	Trattamento:	/				Codice:	CSPTXVCD0001
										Profilo:	/



L1 = Cavo schermato semirigido 17cm estremita' calza

Nome Progetto: PTX LCD		Pagina: 1 di 1	Size: A4
Autore: REV.: BERTI J.	Data: 06/11/02	Codice Progetto: I	
Nome PC in Rete: I\JACK\	Revisione: 1.0	Nome Parte: VCO SMD (76-90MHz)	
File/ Cartella: \MANUALIPTX LCD\SLPTTVCO_7\SLPTVCO0001.DSN	Autorizzazione:	Codice: SLPTXVCO0001	



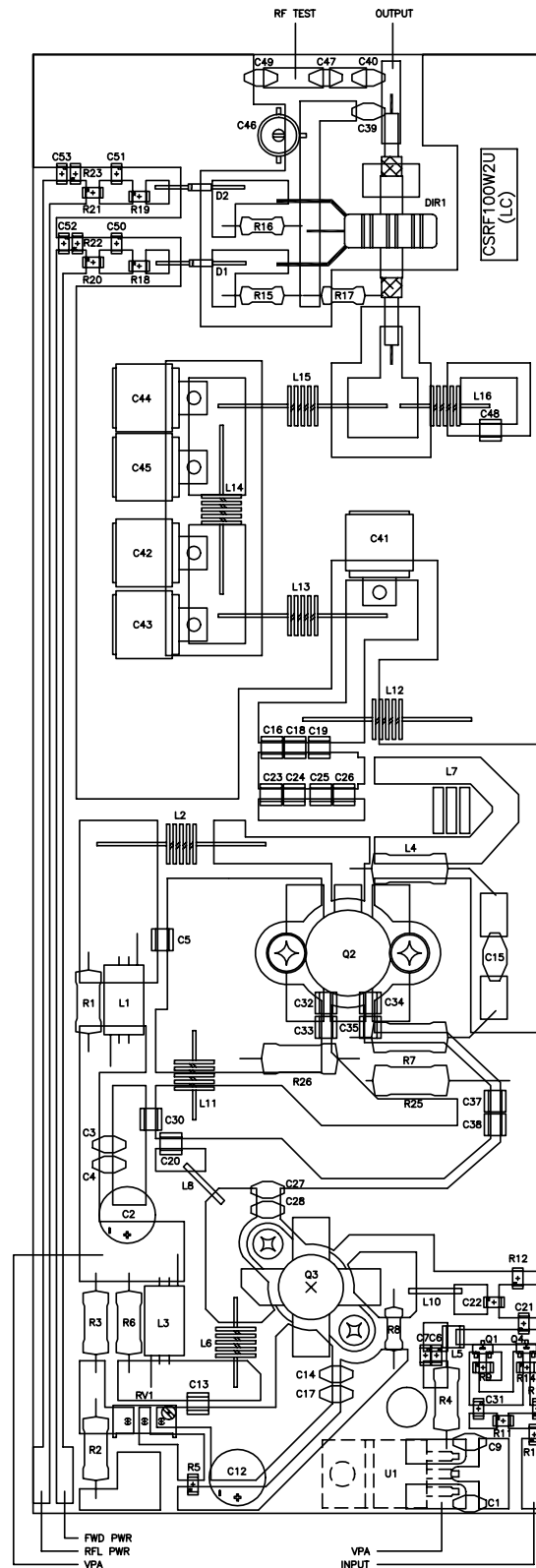
SLPTVCO0001 Bill Of Materials

Page1

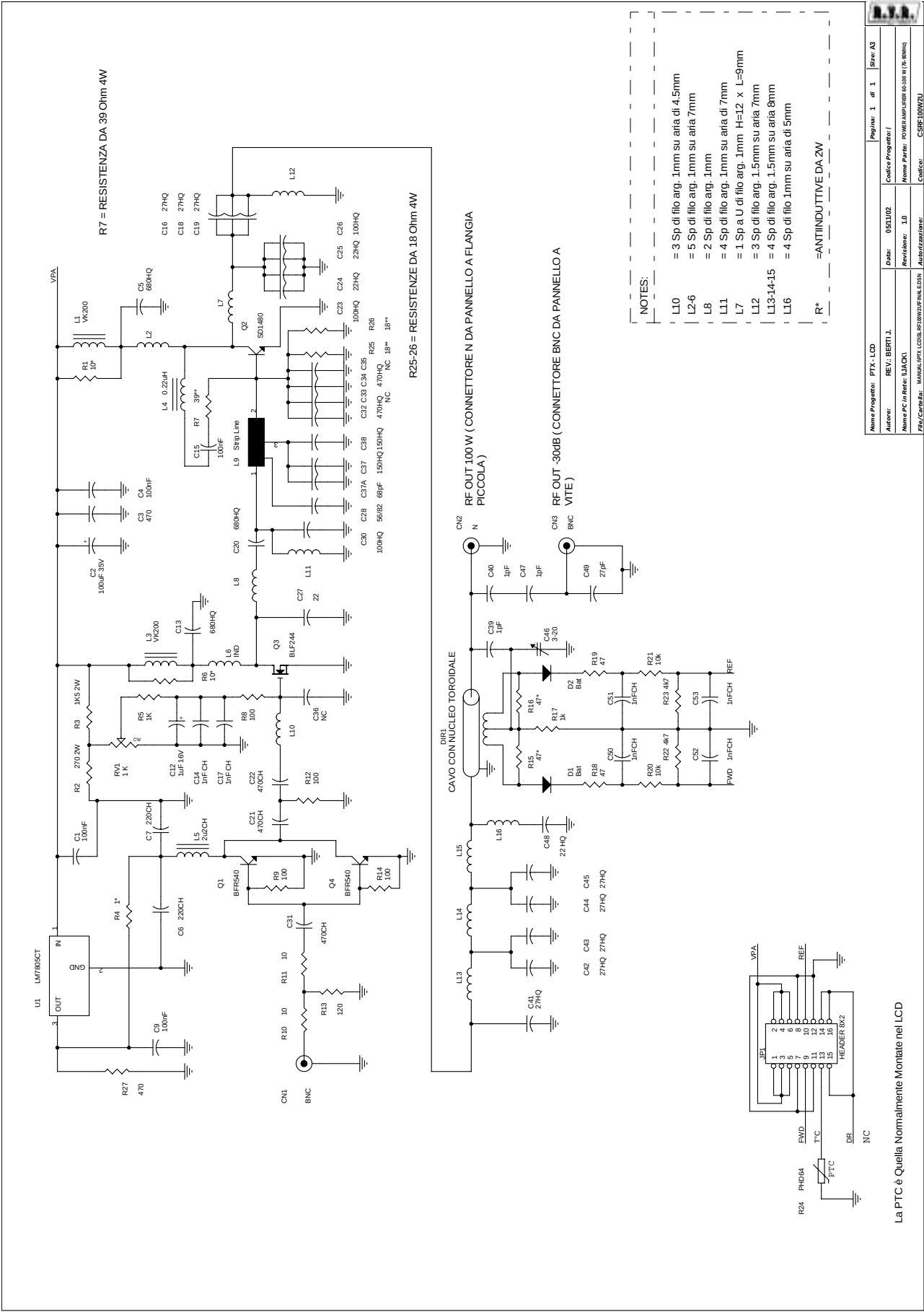
Item	Q.ty	Reference	Part
------	------	-----------	------

1	2	C1,C14	470pF
2	4	C2,C4,C5,C19	10uF
3	3	C3,C15,C18	10nF
4	1	C9	22pF
5	1	C10	33pF
6	1	C11	10pF
7	1	C12	3n3
8	1	C13	47pF
9	8	C16,C17,C20,C21,C22,C23,C24,C25	100nF
10	16	D1a,D1,D2a,D2,D3a,D3,D4a,D4,D5a,D5,D6a,D6,D7a,D7,D8a,D8	MMBV109
11	3	D9,D10,D11	HSMS2800
12	1	L1	RG405
13	2	L3,L2	2u2
14	2	L4,L5	22uH
15	1	Q1	BC847
16	2	Q3,Q2	MMBFJ310
17	1	Q4	MMBT918
18	1	R1	56
19	1	R2	100
20	2	R3,R11	4K7
21	1	R5	330K
22	2	R6,R8	150
23	1	R7	10
24	2	R12,R9	22
25	1	R10	10K
26	1	R13	100K
27	5	TP1,TP2,TP3,TP4,TP5	TPSMD

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Nome Progetto: PTX - LCD		Pagina: 1	di 1	Size: A4
Autore: REV. BERTI J.	Data: 30/07/01	Codice Progetto: /		
Nome PC in Rete: \JACK\	Revisione: 1.0	Nome Parte: POWER AMPLIFIER 60-100 W C76-90MHz2		
File/Cartella: MANULI\PTX_LCD\SLRF100W2U\LAYUT.DWG	Autore: /	Codice: CSRF100W2U		
Scala: /	Materiale: /	Trattamento: /	Profilo: /	



Nome Progetto: PTX - LCD		Revisione: 1	di	1	Size: A3
Autore: REV. BERTI J.		Data: 05/11/02		Codice Progetto: /	
Nome PC in Rete: IJACKA		Revisione: 1.0		Nome File: POWERAMPLIFIER 0.100 W (2.500W)	
File/Carichi: MANUALE PTX LCD RF FRONT END		Autore/Revisione:		Codice: CSRF100W2U	

SLRF100W2U Bill Of Materials

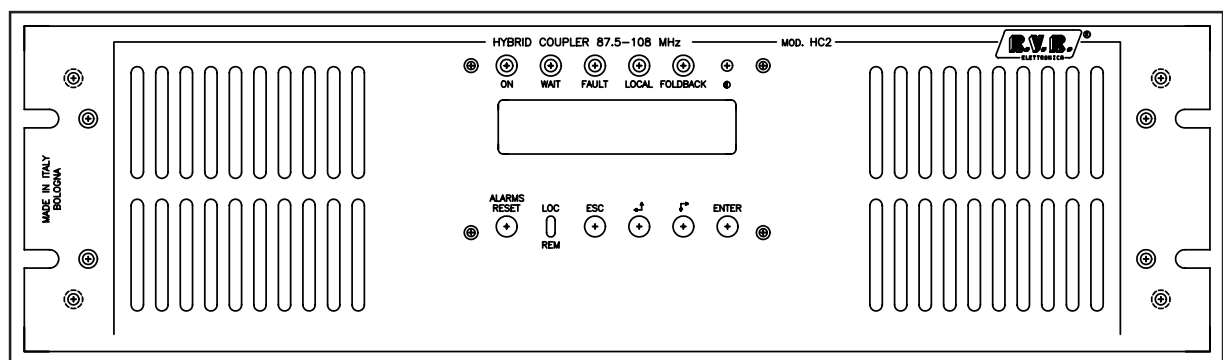
Page1

ItemQuantity Reference Part

1	2	CN1,CN3	BNC
2	1	CN2	N
3	4	C1,C4,C9,C15	100nF
4	1	C2	100uF 35V
5	2	C3,R27	470
6	3	C5,C13,C20	680HQ
7	2	C7,C6	220CH
8	1	C12	1uF 16V
9	2	C17,C14	1nF CH
10	8	C16,C18,C19,C41,C42,C43, C44,C45	27HQ
11	3	C21,C22,C31	470CH
12	3	C23,C26,C30	100HQ
13	2	C24,C25	22HQ
14	1	C27	22
15	1	C28	56/82
16	2	C32,C34	470HQ
17	3	C33,C35,C36	NC
18	2	C37,C38	150HQ
19	1	C37A	68pF
20	3	C39,C40,C47	1pF
21	1	C46	3-20
22	1	C48	22 HQ
23	1	C49	27pF
24	4	C50,C51,C52,C53	1nFCH
25	1	DIR1	TRANSMISSION
LINE			
26	2	D1,D2	Bat
27	1	JP1	HEADER 8X2
28	2	L1,L3	VK200
29	11	L2,L6,L7,L8,L10,L11,L12, L13,L14,L15,L16	IND
30	1	L4	0.22uH
31	1	L5	2u2CH
32	1	L9	Strip Line
33	2	Q1,Q4	BFR540
34	1	Q2	SD1480
35	1	Q3	BLF244
36	1	RV1	1 K
37	2	R1,R6	10*
38	1	R2	270 2W
39	1	R3	1K5 2W
40	1	R4	1*
41	2	R17,R5	1K
42	1	R7	39**
43	4	R8,R9,R12,R14	100
44	2	R11,R10	10
45	1	R13	120
46	2	R15,R16	47*
47	2	R18,R19	47
48	2	R20,R21	10k
49	2	R22,R23	4k7
50	1	R24	PHD64
51	2	R25,R26	18**
52	1	U1	LM7805CT

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HC2 LCD



User Manual

Manufactured by



Italy



HC2 LCD - User Manual
Versione 1.0L

© Copyright 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

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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

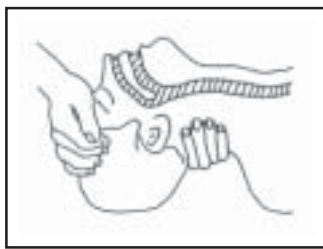


Figure 1



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

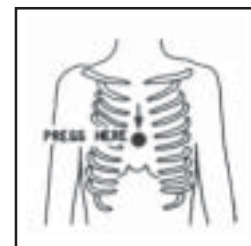


Figura 5

- 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.

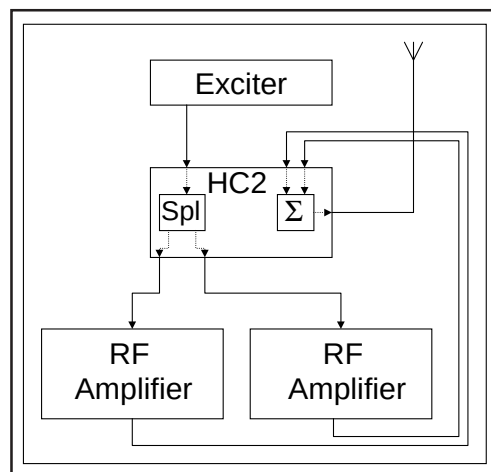
4. General Description

The HC2, produced by R.V.R. Elettronica, is a hybrid coupler for FM audio broadcasting realized in "Strip-Lines" technology. Its function is to split into two portions the RF signal coming from a RF exciter, adjusting the relative phases, to pass them through two external RF power amplifiers and then to combine the output of the amplifiers into a single RF amplified signal to be forwarded to the antenna output.

The HC2 is produced in two variants:

- HC2/1 For transmitters with 500 W + 500 W max output power (total 1 kW)
- HC2/2 For transmitters with 1 kW + 1 kW max output power (total 2 kW)

The variants are different essentially in the kind of used RF connectors and for the software configurations, that have to cope with different nominal RF power levels.



The nominal working principle of a FM transmitter based on a hybrid coupler scheme (like HC2) foresees that the used amplifiers shall produce the same RF power that will be added with the same phase. Possible differences in the power level or phase of the amplifiers generate the so-called *unbalancement power* that is in part dissipated inside the coupler. The HC2 guarantees the overall working of the transmitter even if one of the amplifiers is completely off-service. In such case, approximately half of the power generated by the surviving amplifier is routed to the antenna anyway; the other part of the delivered power (that is unbalancement power) is dissipated inside the combiner.

The HC2 is controlled by a microcontroller system, that includes a LCD display and a series of keys for the interaction with the user, that realizes the following functions:

- Measurement and visualization of the coupler's working parameters
- Activation and deactivation of the power output of the system
- Protection of the coupler with respect to potentially dangerous situations like exceeding emitted or unbalancement power, overdrive or overtemperature

- Detection of user-settable attention thresholds (e.g. output power being below a certain value), that are made externally available as digital states on the "telemetry" connector
- Communications with external devices

The management software of the HC2 is based on a menu system.

The user can navigate through the menu system using four buttons, ESC, move LEFT/UP, move RIGHT/DOWN and ENTER. A fifth button is used to reset the alarm counters, if any alarm has been triggered before.

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 on the front panel allows to select the LOCAL or REMOTE working mode:

- LOCAL mode allows 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, remote control is enabled, while the buttons on the front panel can be used only to read parameters and not to change them

The LOCAL working mode is signalled by a yellow LED on the front panel being lit.

The different working parameters are made available for the remote control applications on the telemetry connector, as voltage levels that are proportional to the value of the parameter under consideration. Digital output signals related to alarms or warnings are also present on the connector, together with the digital input like ON/OFF switching or alarms reset.

The hybrid coupler includes an input for optional external 24 V dc power supply. This power source will automatically be used to supply the CPU section in case the mains power goes off. In this way, it is possible to interact (locally or remotely) with the device even in absence of mains supply.

The HC2 can be connected to the exciter of the transmitter using a "interlock" cable, so that it is possible for it to deactivate RF power emission in case of malfunctioning of the transmitting system. An analogous effect can be reached also in case the exciter misses the interlock functionality, connecting the mains supply of the exciter to the auxiliary mains plug of the HC2 "AUX OUT AC LINE". This plug is in fact opened using a relay under the same conditions that cause the activation of the interlock.

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 combiner for the first time, we suggest to carefully read the whole manual.

5.1 Preparation

Unpack the HC2 and before any other operation check the unit for any shipping damage; in particular, check that all the controls and connectors on the front and rear panels are in good conditions.

Check the mains voltage selector on the rear panel: the selected value is indicated by an arrow. If required, extract the selector block levering with a screwdriver. Rotate the block until the correct printed value corresponds with the arrow, and then reinsert the fuse block.

If it is necessary, check the integrity and the value of the fuse inside the voltage changer block; the required fuse type is:

- Aux 6.3A 5X20 Mains 1A 5X20 (230-240V)
- Aux 6.3A 5X20 Mains 1A 5X20 (100-120V)

Connect the RF output cable of the exciter to the N-type input of the splitting section of the combiner. Connect two cables between the output N connectors of the splitting section of the combiner and the RF input of two suitable amplifiers. Connect two cables between the RF output of the amplifiers and the input connectors of the combining section of the coupler.

Connect the output connector of the combining section to the antenna feeder or to a dummy load with a power rating suitable for your application. Link, using a coaxial cable, the BNC "Alarms" connector to the "Interlock" connector of the exciter. Connect the "Fold back" connector to the "EXT AGC" input of the exciter, if such a functionality is present.

All the above connections are described in the documentation of the transmitting station, if the HC2 is supplied as a part of a complete transmitter.



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.

After all the connections have been made, connect a proper cable to the hybrid coupler's mains input plug.

5.2 Operation

To perform its intended purpose, the HC2 is always used in a transmitter comprising an exciter and two RF amplifiers. In the following description, we will in

general refer to these external devices.

As soon as the HC2 is supplied, verify that the ON LED is lit. The LCD display shows a presentation screen, and after a few seconds it will pass to the default screen, showing the values of the forward and reflected power.

Switch the exciter on (at its minimum power level) and wait for it to lock on the working frequency. When the PLL has locked, progressively increase its output power, while controlling the displays of the exciter, of the amplifiers and of the hybrid coupler. Keep increasing the exciter output overall output of the combiner reaches the desired value, that is at most the nominal power rating of the transmitting station.

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 hybrid coupler, and how the user can interact with it.

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

The management of the HC2 is performed by a generic software used in different classes of equipment produced by R.V.R. Elettronica SpA, like the HC combiners or the RF amplifiers PJ500M-C and PJ1000M.

For this reason, some options that are related to other kinds of devices are deactivated in the software version that is installed in the HC2 (see for example the P.A. menu).

Note that some of the parameters that are measured and can be read may be, in some circumstances, not available. This situation mostly 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 "==".

Figure 5-1 shows the complete flow diagram of the management software of the coupler, that can be basically seen as build up of a default screen, plus a series of submenus.

At power on, the LCD display will show the following presentation screen, indicating the name of the device:

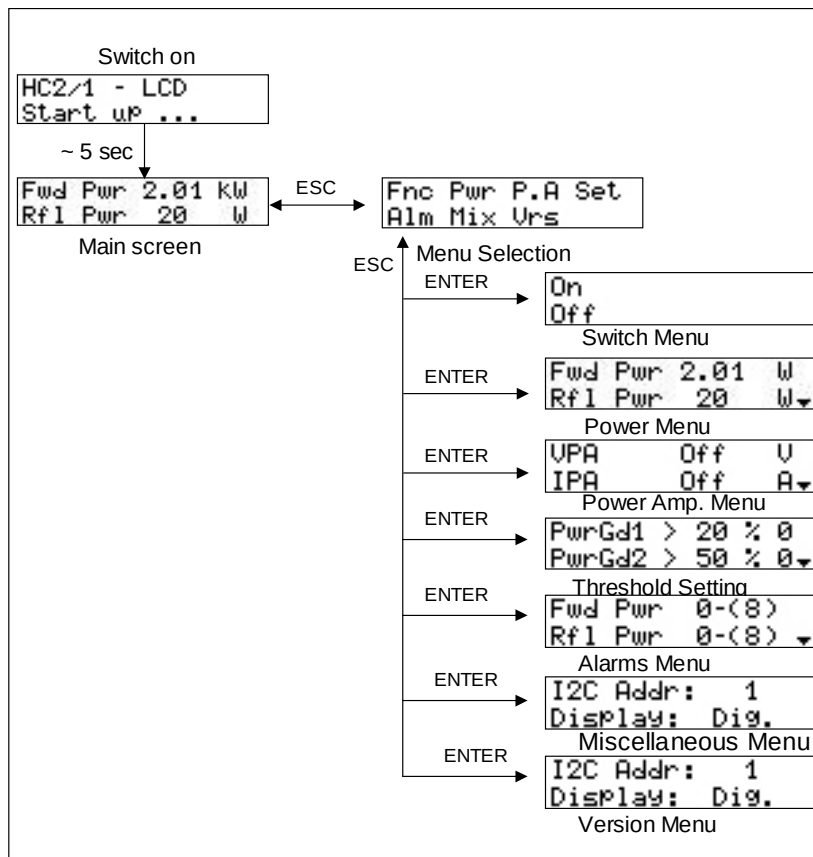


Figure 5-1: HC2's management software

```

HC2/1 - LCD
Start up ...
  
```

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

```

Fwd Pwr 2.01 kW
Rfl Pwr 20 W
  
```

The management software will remain indefinitely in this default screen, until the user pushes the ESC button.

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
  
```

Pushing again the ESC button, the software goes back to the default screen.

To enter into one of the submenus, just select the corresponding name (that will be indicated by a flashing underscore) with the LEFT and RIGHT buttons, and then push ENTER.

5.3.1 RF Power switch menu (Fnc)



From this menu, the user can “switch” ON and OFF the hybrid coupler.

The result of this command is that when the HC2 is put in OFF mode, the inner conductor of the “Alarm” connector is shorted to ground, so that the exciter is put in stand-by mode (this will happen only if provided with an interlock connector, and if correctly connected with the hybrid coupler). At the same time, the auxiliary mains output is opened, so that if an exciter is connected to it, it will be shut off.

When the hybrid coupler is switched OFF, the software waits a few minutes to permit the proper cooling of the device, and then sends a signal to the relays of the blowers to turn them off too.

Each two hours, while the machine is OFF, the software enables the blowers for a while to dissipate the heat generated by the circuitry and to avoid possible malfunctions of the blowers due to long inactivity periods.

Switching ON again the hybrid coupler, the interlock circuit is opened, reenabling the power emission in the connected exciter, the auxiliary mains plug supply is powered and the blowers are restarted.

5.3.2 Power menu (Pwr)

This multi-line scrollable menu allows the user to read all the measurements related to the behaviour of the power section of the combiner:

- Forward Power (Fwd Pwr)
- Reflected Power (Rfl Pwr)
- Standing Wave Ratio (SWR) (Not active)
- Input Power (Inp Pwr) (Not active)
- Rejected PWR (Rej PWR)

Depending on the configuration of the machine, some of the measures could be deactivated.

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

Fwd Pwr	2.01	W
Rfl Pwr	20	W
SWR	Off	
InP Pwr	Off	
Rej PWR	17	W

5.3.3 Power Amplifier Menu (P.A.)

This multi-line scrollable menu reports to the user some internal measurement of the device:

- Voltage (VPA) - Not active
- Current (IPA) - Not active
- Efficiency - Not active
- Temperature
- Mains voltage (Mains - percentage variation with respect to the nominal voltage)

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

VPA	Off	V
IPA	Off	A
Eff.	Off	%
Temp.	22.8	C
Mains	5	%

Please note that the first three lines of this screen are not active since they are not meaningful for a hybrid coupler.

5.3.4 Threshold setting menu (Set)

As described 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 on the 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 of the settable thresholds are related to the RF emitted power (**Power Good**), while the third is connected to the amount of reflected power (**Reflected Warning**).

The thresholds are expressed as percentage of full-scale value of the relevant

quantity.

The full scale values for the HC2 are the following:

- Forward power 1000W (HC2/1) 2000W (HC2/2)
- Reflected power 100W (HC2/1) 200W (HC2/2)

To change the values of the thresholds, execute the following procedure, after putting the combiner in LOCAL mode:

- 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 >	20 % 0
PwrGd2 >	50 % 0
RflWar >	70 % 0

In this example, the thresholds settings are (for a HC2/1):

- PwrGd 1 200 W (20% X 1000W)
- PwrGd2 500 W (50% X 1000W)
- RflWar 70 W (70% X 100W)

5.3.5 Alarms Menu (Alm)

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

It is constituted by a certain number of lines, each containing the name of a variable controlled by the system and the kind of intervention that is undertaken by the system in case the parameter surpasses its limit.

The latter can be of the kind: **X - (Y)**, **Wait**, or **Dis.** (Disabled).

The explanation of the protection system of the hybrid coupler is given separately in chapter 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	Dis.
U.P.A.	Dis.
I.P.A.	Dis.
Temp.	Wait
Rej PWR	Dis.
Mains	Wait
SWR	Dis.
Eff.	Dis.

The function of this menu is essentially a help for the technician to identify the causes of possible malfunctions of the transmitter..

5.3.6 Various menu

Two operations can be performed using this menu:

- 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 default address of I²C communication is relevant when the coupler is connected with other RVR' devices that use this protocol. We raccomand not to change this parameter if not necessary.

The visualitation mode can be **Digital** (the default mode described in chapter 5.3) or **Analog**:

Rfl Pwr	6 ▴
■ ■	

In analog mode, a little triangle indicates the reflected power level set in the threshold set menu (under RflWar), while the bar below shows the in real time level reflected power.

This last kind of visualitation is best used when the combiner output is connected to a device that has to be tuned, as a cavity.

5.3.7 Versions menu

This menu shows the hardware (H.V.) and software versions (S.V.) of the machine.

H.V.	1.00
S.V.	1.49

5.3.8 Protection sistem

The protection system implemented in hybrid coupler is based on two types of reactions, the “Foldback” and the temporary disabling.

5.3.8.1 Foldback

The foldback circuit controls the level of a dc voltage that is available on the dedicated BNC connector (F.BACK) on the rear of the HC2.

The foldback voltage remains approximately constant until one of the amounts that are connected to the foldback doesn't surpass its nominal value (full scale). When this happens, the foldback voltage is rised proportionally to the amount the threshold is surpassed, and a yellow LED is lit on the front panel, signalling the intervention of the circuit. In figure 5-2, X represents one of the variables connected to the foldback, X_0 is the full scale of the variable, V_{FB} is the voltage present on the BNC:

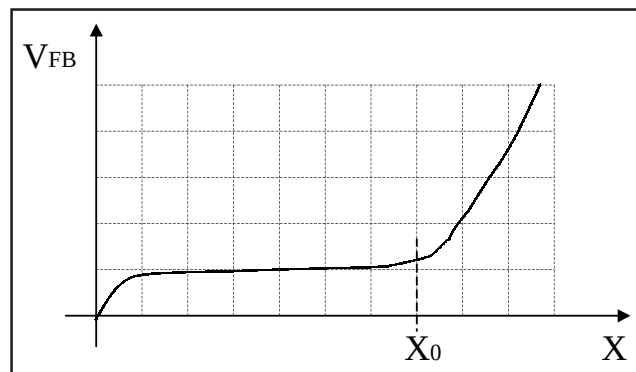


Figure 5-1: Fold back voltage as a function variable “X”

In the HC2, the variables connected to the foldback are:

- Forward power
- Reflected power
- Rejected power
- Temperature

The foldback voltage can be used by the transmitter's exciter to reduce accordingly the driving power. For example, RVR Elettronica's PTX-LCD is designed to use an external foldback signal of this kind.

In general, the reduction of the RF power generated by the exciter will reduce the variable that caused the foldback intervention, so that a new stability point is reached.

If any reason makes it impossible to reach a new stable point, the protection system of the HC2 will react with its Shut off/Restart procedure.

5.3.8.2 Shut off/Restart

The second kind of reaction of the protection system consists in forcing the transmitter in stand-by mode when one of the monitored variables surpasses its maximum allowed value.

To put the transmitter in stand-by, the hybrid coupler disables the exciter's RF power emission using the interlock circuit, thus disabling the overall transmitter RF power.

Depending on the kind of problem that caused the failure, after the transmitter has been inhibited, 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 system 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 in stand-by, waiting for the cycle time to expire, 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 made sure that the user doesn't reset possible alarms without knowing they happened

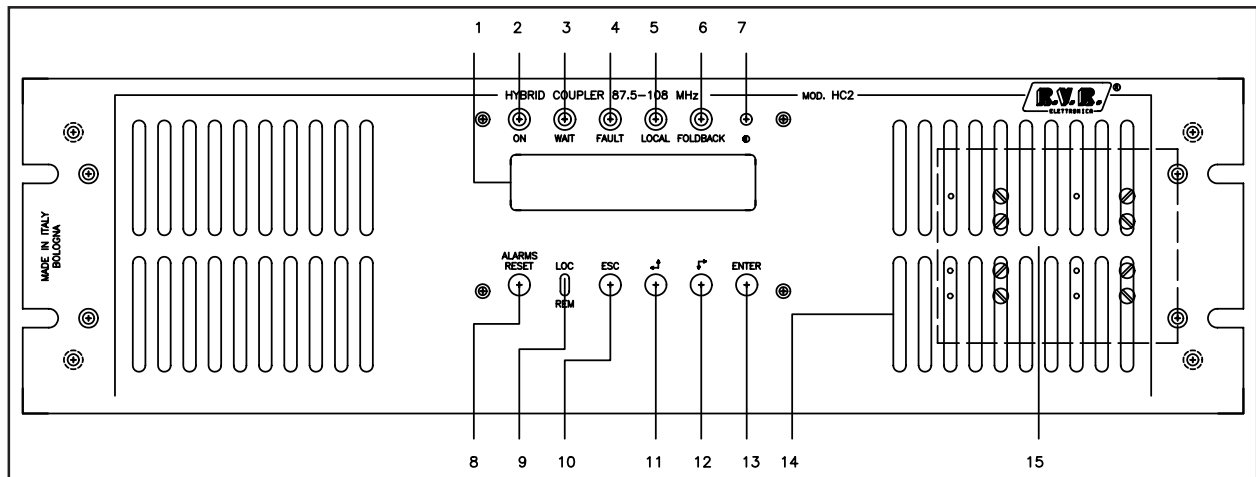
The alarm counters are reset by the system itself without the need for an external intervention after half an hour of undisturbed (i.e. without alarms) working of the hybrid coupler.

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6. Controls, Indicators e Connectors

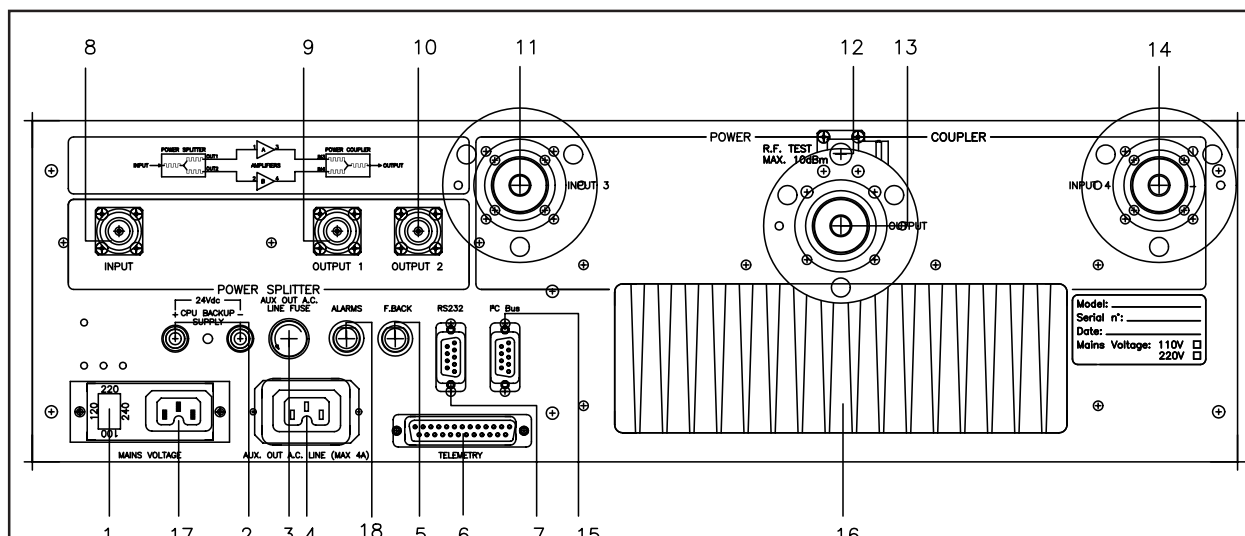
This chapter describes the front and rear panels of the HC2, with a short explanation of the different components, and the pinout of its connectors.

6.1 Front Panel



- | | |
|-----------------|---|
| [1] DISPLAY | Liquid Crystals Display |
| [2] ON | Green LED, lit when the hybrid coupler 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 the presence of a fault that cannot be automatically reverted. |
| [5] LOCAL | Yellow LED indicating that the hybrid coupler is in local control mode. |
| [6] FOLDBACK | Yellow LED indicating the intervention of the foldback function (automatic reduction of the output power if connected to an exciter that implements the function, for example the PTX-LCD). |
| [7] CONTRAST | Trimmer to regulate the contrast of the LCD display. |
| [8] ALARM RESET | Button used to manually reset the protection system. |
| [9] LOC/REM | Switch to select the local or remote control modes. |
| [10] ESC | Button to exit from a menu. |
| [11] LEFT/UP | Buttons used to navigate in the menu system and to modify the changeable parameters. |
| [12] RIGHT/DOWN | Buttons used to navigate in the menu system and to modify the changeable parameters. |
| [13] ENTER | Button used to accept a parameter's value or to enter into a menu. |
| [14] AIR IN | Air flow input for forced ventilation. |
| [15] PHASE ADJ. | Phase adjustment of the RF channels (depending on the hardware version) |

6.2 Rear panel

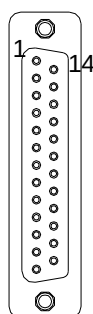


- | | |
|--------------------------------------|---|
| [1] VOLTAGE CHANGER & A.C. LINE FUSE | Fuse block and Line Voltage Selector. Use a small screwdriver to change the fuse or line voltage. Rotate the block and position it for desired voltage. |
| [2] 24 V | External 24 V dc power supply input for CPU backup power supply approx consumption 250mA |
| [3] FUSE | Protection Fuse for Auxiliary Out A.C. Power Line 4A max. |
| [4] AUX. OUT A.C. LINE | VDE-type Auxiliary Out A.C. Power Line to supply external devices (typically an exciter). |
| [5] F.BACK | BNC connector for "Fold Back" signal |
| [6] TELEMETRY | DB25 telemetry connector |
| [7] RS232 | DB9 connector for serial communication. Used for factory programming |
| [8] INPUT | N-type input connector (RF power from exciter) |
| [9] OUTPUT 1 | Power splitter Output 1 (7/8" EIA Flange) to drive Power Amplifier A. |
| [10] OUTPUT 2 | Power splitter Output 2 (7/8" EIA Flange) to drive Power Amplifier B. |
| [11] INPUT 1 | Power Combiner's Input 1 (N type in version HC2/1, 7/16" or 7/8" on request in version HC2/2) from Power Amplifier A. |
| [12] R.F. TEST | BNC RF monitor output. The output level is -60 dB below the power output in the band 87.5-108 MHz (this sample is used to verify the FM band). |
| [13] OUTPUT | Power Combiner's Output (N type in version HC2/1, 7/16" or 7/8" on request in version HC2/2). |
| [14] INPUT 2 | Power Combiner's Input 2 (N type in version HC2/1, 7/16" or 7/8" on request in version HC2/2) from Power Amplifier A. |
| [15] I ² C | DB9 connector for I ² C bus networking with other RVR devices |
| [16] HEAT SINK | Heat sink air flow output |
| [17] MAINS | Mains plug |
| [18] INTERLOCK | BNC connector to inhibit an external device, as an exciter. In case of fault, the inner connector is shorted to ground. |

6.3 Connectors Description

6.3.1 Telemetry Connector

Type: DB25 Female



PIN	Signal	Type	Notes
1	Unbal. Power	Ana Out	3.9V x 650 W
2	Ch_4	Disabled	
3	GND	GND	
4	Reflected Power	Ana Out	4.3V x 100W
5	OC_ECC	Dig Out OC	Active when interlock is active
6	OC_SET4	Disabled	
7	GND	GND	
8	IN_ON	Dig In	"ON" command
9	OC_SET1	Dig Out OC	Active when SET1 threshold surpassed
10	OC_WAIT	Dig Out OC	Active for "Wait" alarm presence
11	IN_RST	Dig In	"Alarms Reset"
12	OC_OFF	Dig Out OC	Active when the coupler is "OFF"
13	IN_INH	Dig In	Keep at GND potential to inhibit
14	TEMP	Ana Out	3.9V x 70°
15	Ch_5	Disabled	
16	Forward Power	Ana Out	4.3V x 1 kW
17	OC_FAULT	Dig Out OC	Active for "Fault" Alarm presence
18	OC_SET3	Dig Out OC	Active when SET3 threshold surpassed
19	Ch_3	Disabled	
20	IN_OFF	Dig In	"OFF" command
21	GND	GND	
22	OC_SET2	Dig Out OC	Active when SET2 threshold surpassed
23	LOC	Dig Out OC	Active when in local mode
24	VNS	+12 Vcc	Unregulated voltage
25	OC_ON	Dig Out OC	Active when the coupler is "ON"

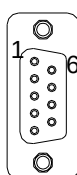
Notes:

- To give a command to the HC2 (ON, OFF, Reset), bind the relative pin to ground for approx 500 ms
- OC output (Open Collector) are "Active" when conducting
- For the HC2-2 variant (Nominal Output 2 kW), the following full scale values apply:

4	Reflected Power	Ana Out	4.3V x 200W
16	Forward Power	Ana Out	4.3V x 2 kW

6.3.2 RS232 Connector

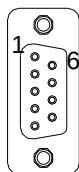
Type: DB9 Female - Used for factory programming



1	N.C.
2	TXD
3	RXD
4	Internally connected to 7 and 8
5	GND
6	N.C.
7	Internally connected to 4 and 8
8	Internally connected to 4 and 7
9	N.C.

6.3.3 I²C Connector

Type: DB9 Female - Used for I²C networking



1	NC	
2	SDA	Serial Data
3	SCL	Serial Clock
4	NC	
5	GND	GND
6	NC	
7	NC	
8	NC	
9	NC	

7. Technical Specifications

7.1 Physical and Environmental Specifications

Cabinet Dimensions	447.0 mm x 132.5 mm x 507.5 mm
Panel Dimensions	483 mm x 132.5 mm
Weight	17.5 Kg
Operating Temperature Range	-10 °C ÷ 50 °C
Humidity	90% Maximum, not condensing

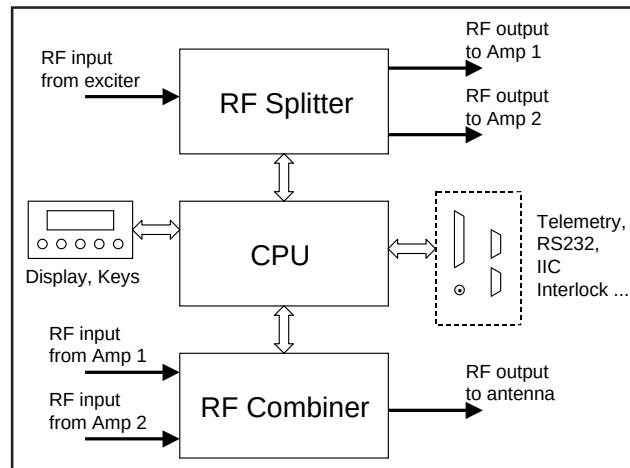
7.2 Electrical Specifications

AC power supply	117-230 V, 50-60 Hz										
Cooling system	forced ventilation										
Frequenci range	87.5 MHz ÷ 108 MHz										
Maximum output power	2 kW HC2/2 version 1 kW HC2/1 version										
Splitter section	<table> <tr> <td>Input impedance</td><td>50 Ohm</td></tr> <tr> <td>Input connector</td><td>"N-type"</td></tr> <tr> <td>Output impedance</td><td>50 Ohm</td></tr> <tr> <td>Output connector</td><td>2 x "N-type"</td></tr> <tr> <td>Adaptation</td><td>>16dB</td></tr> </table>	Input impedance	50 Ohm	Input connector	"N-type"	Output impedance	50 Ohm	Output connector	2 x "N-type"	Adaptation	>16dB
Input impedance	50 Ohm										
Input connector	"N-type"										
Output impedance	50 Ohm										
Output connector	2 x "N-type"										
Adaptation	>16dB										
Coupler section	<table> <tr> <td>Input impedance</td><td>50 Ohm</td></tr> <tr> <td>Input connector</td><td>2 x EIA 7/8" HC2/2 2 x N-type HC2/1</td></tr> <tr> <td>Output impedance</td><td>50 Ohm</td></tr> <tr> <td>Output connector</td><td>EIA 7/8"</td></tr> <tr> <td>Losses</td><td>< 0,25 dB per chann.</td></tr> </table>	Input impedance	50 Ohm	Input connector	2 x EIA 7/8" HC2/2 2 x N-type HC2/1	Output impedance	50 Ohm	Output connector	EIA 7/8"	Losses	< 0,25 dB per chann.
Input impedance	50 Ohm										
Input connector	2 x EIA 7/8" HC2/2 2 x N-type HC2/1										
Output impedance	50 Ohm										
Output connector	EIA 7/8"										
Losses	< 0,25 dB per chann.										

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8. Internal Description

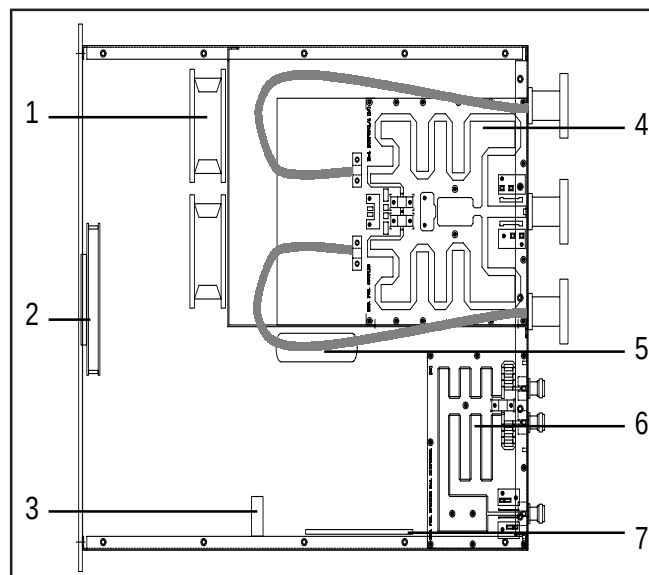
The hybrid coupler HC2 is a modularized device, in which different section are designed to perform a particular function.



This chapter give the necessary indications to identify the modules and to understand their functionalities.

8.1 Modules identification

The following figure represents a schematic upper view of the hybrid coupler. The different components are given in the following.



- 1 Fans
- 2 CPU section
- 3 Fans control relay
- 4 RF combiner
- 5 Transformer
- 6 RF splitter
- 7 Remote board

8.2 Modules description

8.2.1 Power supply

The power supply of the HC2 uses a mains transformer (70 VA) with selectable voltage primary circuit (110-120-230-240V) and two secondary windings. The first is a 3A 0-16V used to supply the remote card, the second is a 2A 11.5V that gives power to the CPU section.

The CPU section and the remote card have built-in bridge rectifiers and voltage regulators.

The mains transformer has also the function of a autotransformer for the supply at 115V of the fans.

The CPU section can also be supplied with external 24V dc; this power source is automatically selected by it if the main voltage is missing for any reason.

8.2.2 Splitter Section

The role of the RF splitter is to divide the RF signal provided by the exciter and to pass it to the couple of amplifiers.

The circuit is based on a Wilkinson-type scheme and is designed with strip-lines and coaxial cables. It includes the circuits to adjust the phases of the output feeding the external amplifiers, to maximize the overall output power and to minimize the rejected power.

The splitter includes a resistive termination that dissipates possible unbalancement power due to faults or different performances of the amplifiers.

8.2.3 Coupler section

The function of the coupler section is to add the RF power portions provided by the amplifiers and to pass it through the antenna output.

The circuit is based on a Wilkinson-type scheme and is designed with strip-lines and 50 Ohm coaxial cables.

The coupler section includes resistive terminations mounted on the heat sink that dissipate possible unbalancement power due to non-optimal adjustment, different performances of the amplifiers, or any malfunctioning in the transmitter.

8.2.4 Remote Board

This board is installed on the right side of the device. It is controlled by the CPU, and its function is to cut the power in the auxiliary mains plug in case of alarms.

8.2.5 CPU

This subsystem is composed of three parts: the CPU board in itself, the analog section and the interconnection and the EMI filter board.

This section implements all the software functions described in the previous part of the manual (measurement, protection, controls, data visualization, communications). The analog circuitry normalizes and measures the different parameters that are monitored by the device.

The CPU board interfaces itself with external devices using a special telemetry connector, a RS232 serial port and a IIC port.

8.2.6 External telemetry board (optional)

This optional device is designed to interface itself with the telemetry connector of the HC2, and its function is to give to the user a set of dry contacts connected to the working status of the machine. The contacts can be configured as Normally Open or Normally Closed and are triggered by the user settable thresholds, and by LOC/REM, WAIT, FAULT, ON, OFF, INHIBIT.

The user input (ON, OFF, ALARM RESET, INHIBIT) are also interfaced in this board using dedicated relays. The relays can be supplied either by the HC2 or by external power and for each user input a contact is provided that shall be shorted to ground to activate the signal.

ON, OFF and ALARM RESET are impulse type inputs, INHIBIT is a permanent type input: while it is grounded, the machine is inhibited and as soon as it's released the coupler (and the whole transmitter) is reenabled.

All the digital input and output are provided to the user on a socket.

The analog signals generated by the hybrid coupler are replicated on a DB connector hosted on the telemetry board.

8.3 Adjustment

The hybrid coupler is factory-adjusted so that the transmitter it is included in will work satisfyingly works over the whole FM band.

Cases may happen, that it is necessary to perform the RF adjustment of the HC2, for example if the RF interconnection cables with the amplifiers have been substituted with other of slightly different characteristics or length, or if it is desirable to optimize the transmitter's performances on a certain frequency.



WARNING: we suggest not to perform the operations described in this chapter to personnel lacking proper instrumentation and deep knowledge of the device and its working principles.

The variable capacitors used to adjust the phases in the HC2 can be installed in

two different positions, depending on the machine's version:

- directly on the splitter circuit
- on two printed circuits boards that can be accessed from the front panel of the coupler

In general, the rightmost capacitors are the ones used to adjust the RF path related to the amplifier connected to the rightmost output connector of the coupler. For reference, see the scheme silk.graphed on the rear panel of the HC2.

To efficiently adjust the capacitors, it is essential to use an isolated tool, e.g. a plastic screwdriver.

The following procedures are optimized for adjusting the coupler in both cases.

8.3.1 Capacitors on the splitter circuit

- 1) Remove the upper cover of the coupler
- 2) Switch on the transmitter, having the exciter set on the working frequency and at minimum power
- 3) On the coupler, set the display for the visualization of forward power
- 4) Set the variable capacitor in their middle position (Figure 3)
- 5) Gradually increase the exciter power until the overall output power of the transmitter reaches around the 80% of its nominal power
- 6) Adjust the variable capacitors (1) and (2) (Figure 4) related to the amplifier "A" (see the silk-graph on the rear panel of the coupler for reference), to maximize the forward power measured in the coupler

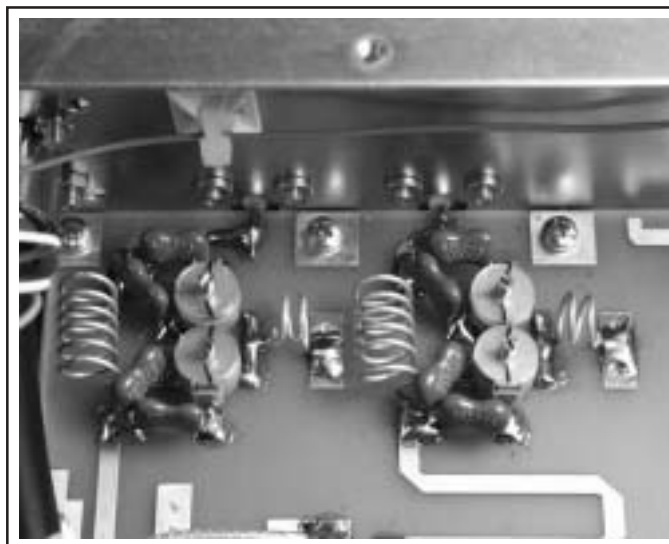


Figure 3

- 7) Adjust the variable capacitors (3) and (4) related to the amplifier "B", still maximizing the forward power measured by the coupler

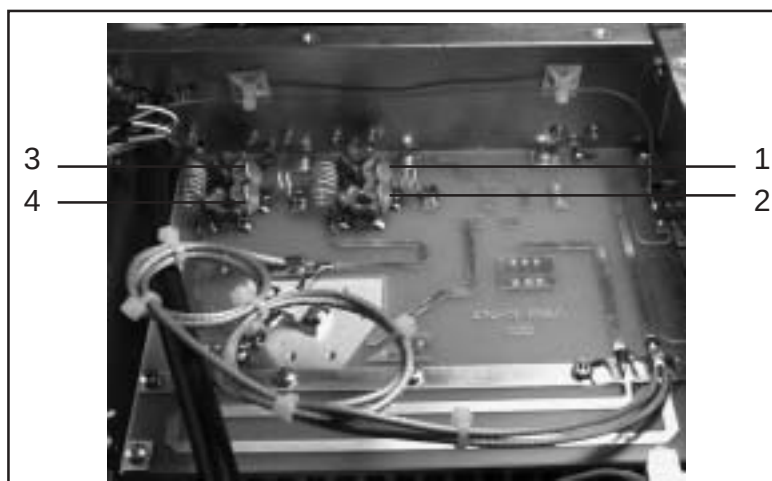


Figure 4

- 8) Repeat steps 6 and 7 until the transmitter's power reaches a value that cannot be further risen
- 9) Increase the exciter power and verify that the system can reach the station's nominal power
- 10) Switch off the transmitter
- 11) Put in place again the coupler's upper cover

Notes:

- The described procedure is the one optimized to adjust the coupler to work on a certain channel (frequency). When the coupler has to be adjusted on the whole FM band, start executing the procedure at 98.0 MHz, and then repeat it at 87.5 MHz and 108.0 MHz, until the best tradeoff is met.
- If the adjustment is done because one of the amplifiers has been substituted, it is normally sufficient to operate only on the capacitors related to the substituted amplifier.

8.3.2 Capacitors accessible from the front panel

The procedure to be followed in this case is the same as the previous one, with the following different points:

- It is not necessary to remove the cover of the coupler: the trimmer can be directly operated from the front panel through the holes intended for the ventilation air flow (figure 5)

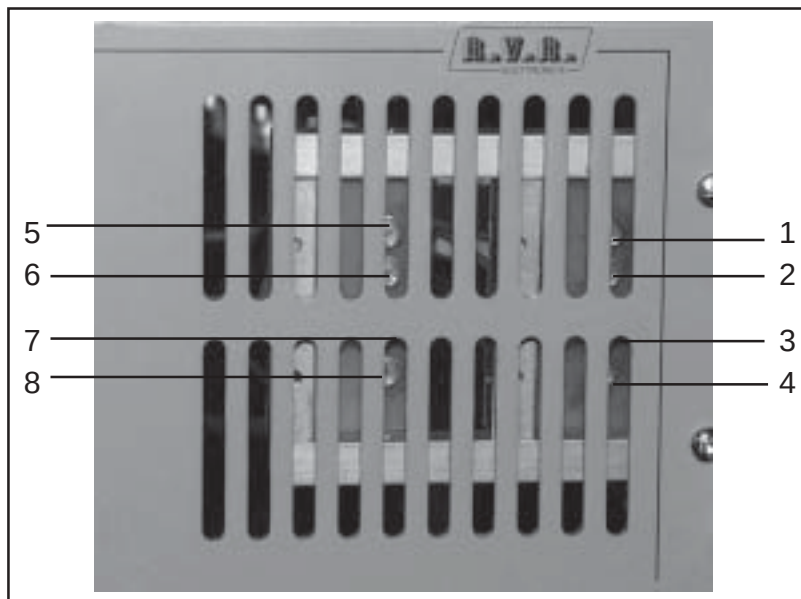


Figure 5

- For each amplifier, two *couples* of variable capacitors are present:
1,2,3 and 4 for the amplifier “A”, 5,6,7 and 8 for the amplifier “B” (see the silk-graph on the rear of the coupler for reference).
- Please remember to use an isolated screwdriver to adjust the capacitors to avoid misadjustments due to short-circuits.

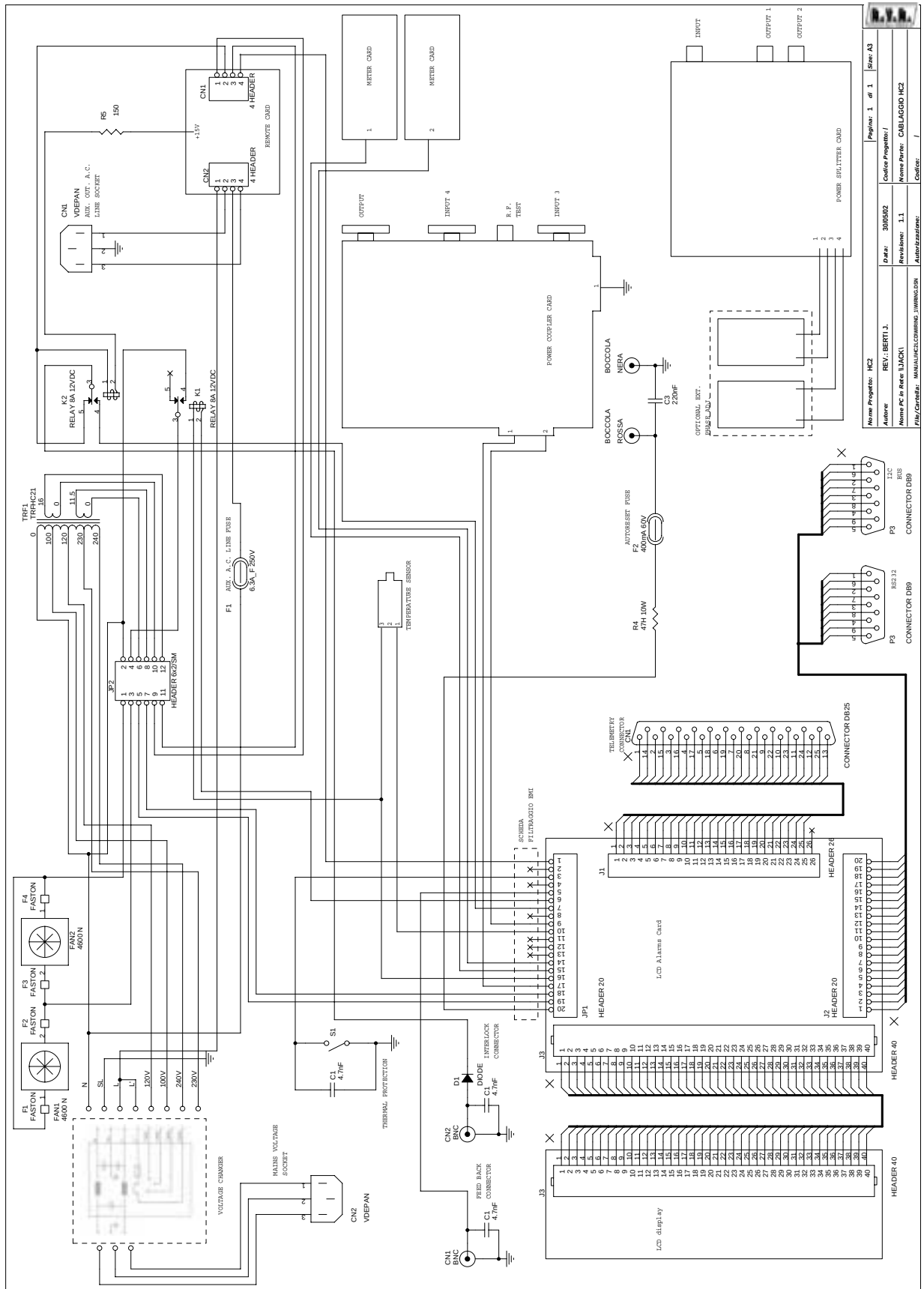
Appendix A Piani di montaggio, schemi elettrici, liste componenti / *Component layouts, schematics, bills of material*

Questa parte del manuale contiene i dettagli tecnici riguardanti la costruzione delle singole schede componenti il HC2. L'appendice è composta dalle seguenti sezioni:

This part of the manual contains the technical details about the different boards of the HC2. This appendix is composed of the following sections:

Description	RVR Code	Vers.	Pages
Wiring Diagrams		1.1	2
Power Splitter & Ext. Phase Adj.	CSSPL-INCH31+CSPHSHC35	1.0	6
Power Combiner	CSHYBPWRCL/B	1.1	4
LCD & Alarms Card	CSPROTf	1.1	10
Remote Card	SLREMOTEHC	1.0	4
EMI Filter	CSADPCNPRTpJ	1.0	4
Optional Ext. Telemetry Card	CSPWRGDPSS01	1.0	4
Optional Ext. Meter Card	CSPWR-MTRHC5	1.0	4

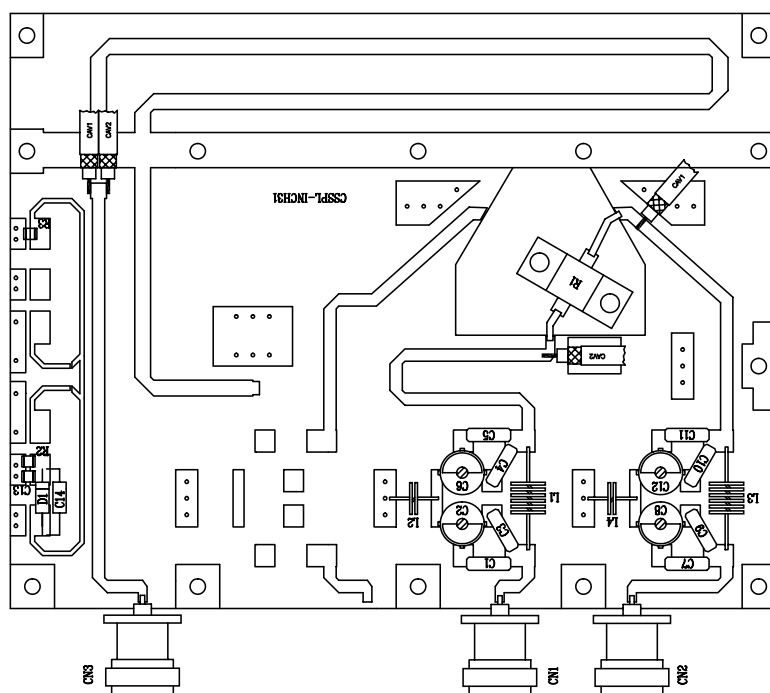
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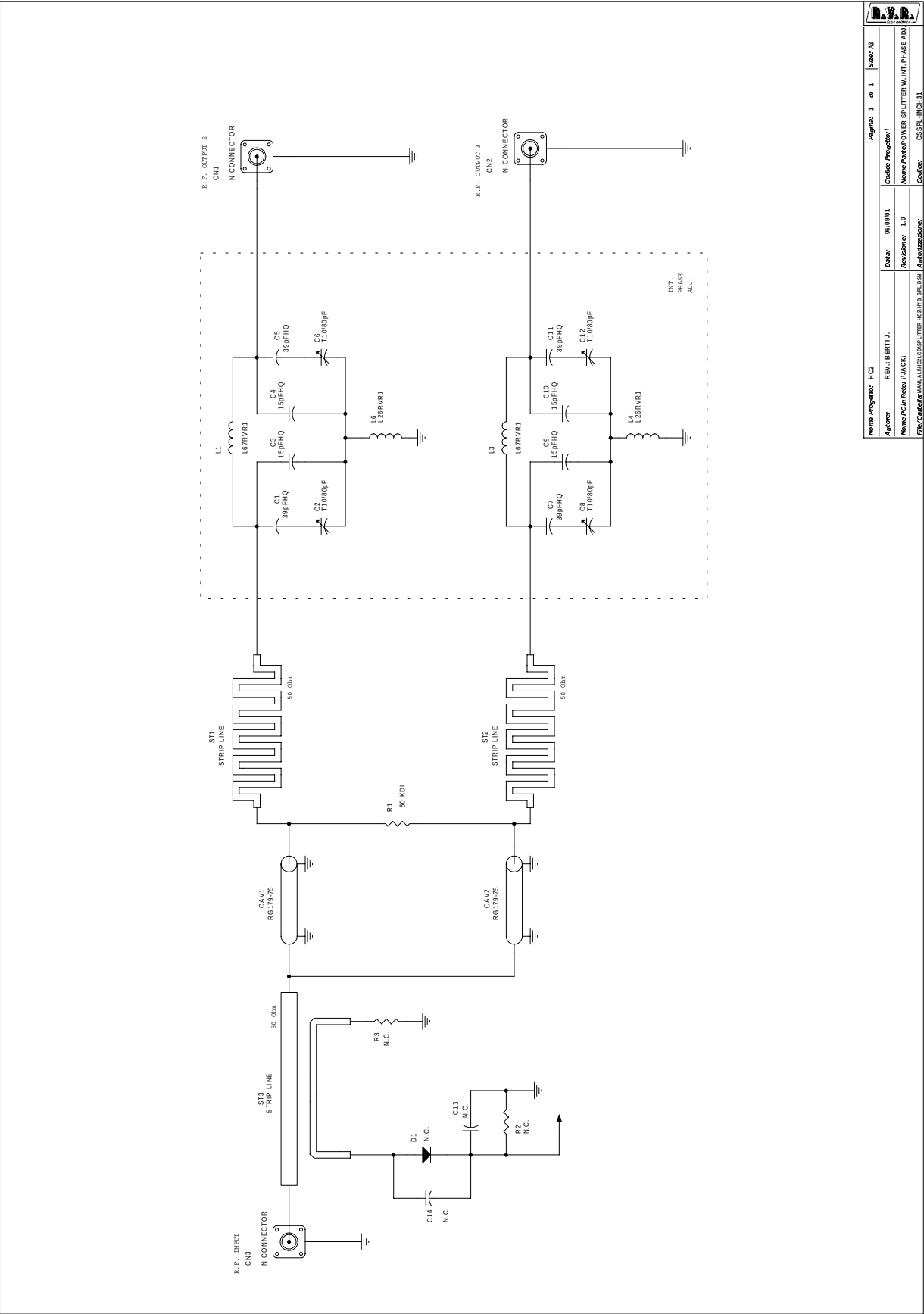
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File/Carrello/MANUALE/SPPLITTER		H2ALAYSPL2VING		Revisione		10
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				Trasmissione		CSPL1-INCH31



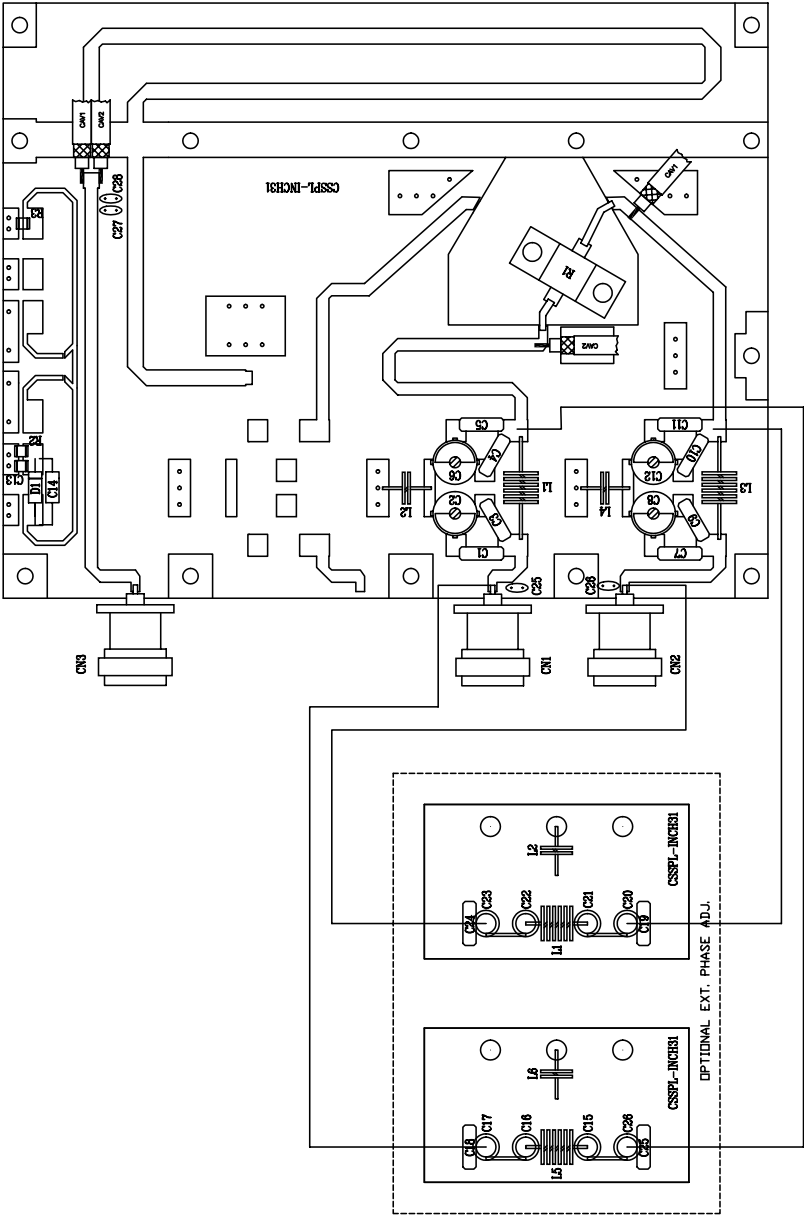
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Nome PC in Rede: LJA CAI		Nome Projeto: OVER SPLITTER W INT PHASE ADJ			
Fim/Contratar: ANUAL/INCLUIR LITEN HC2 H E S P, 3 DM		Revisao: 1.0			
		Codigo: CSSPLINHC31			

HYBRID POWER SPLITTER

Bill Of Materials

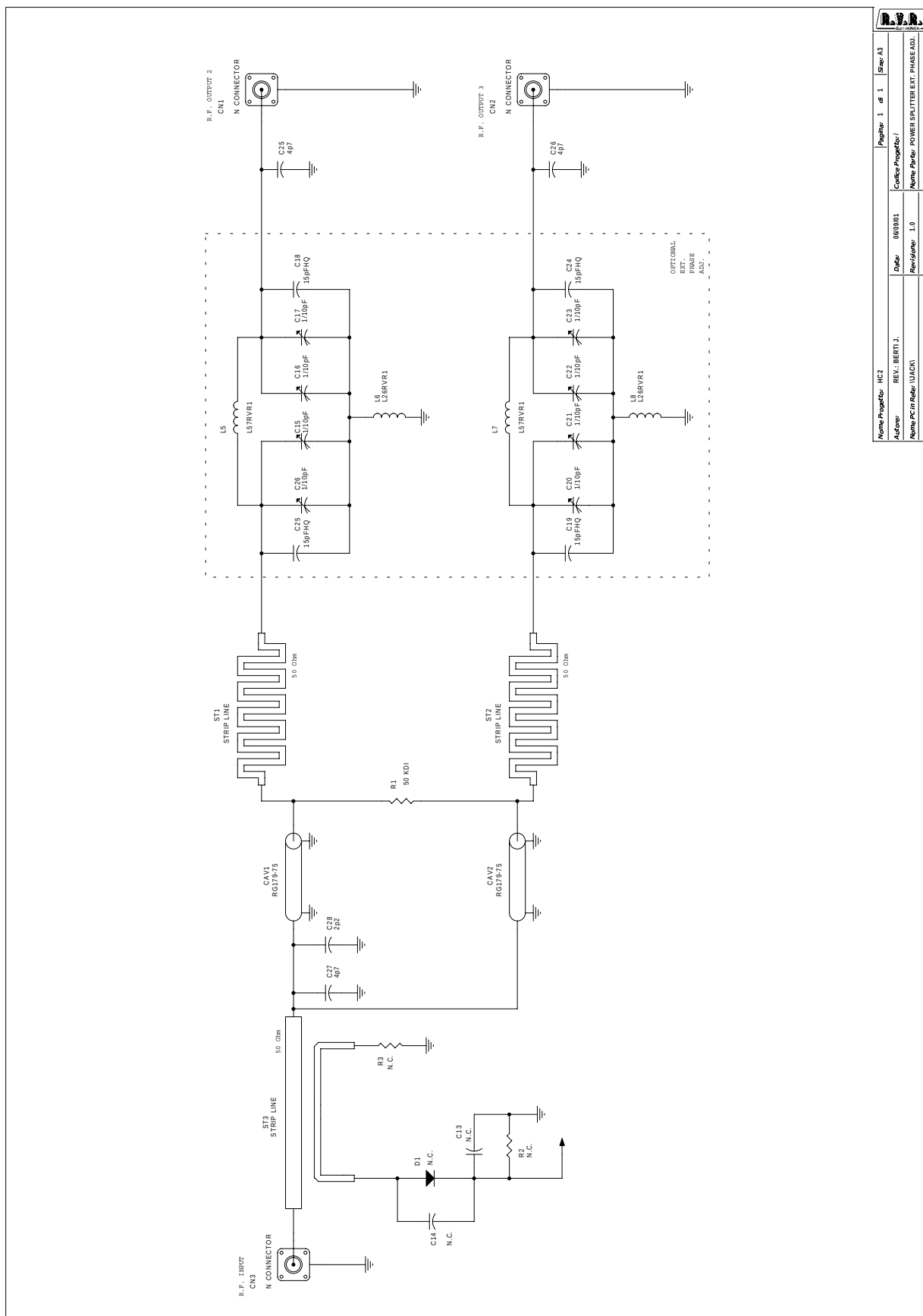
Page 1

Item	Q.ty	Reference	Part	DESCRIPTION	PART ORDER CDE
1	1	R1	50 KDI	RES. DI TERM. (KDI) 250W	
2	1	R3	N.C.	RESISTOR 1/4W 5%	
3	6	C2,C6,C8,C12	T10/80PF	TRIMMER CAPACITOR	
4	6	C3,C4,C9,C10	15PFHQ	CHIP CAPACITOR HQ	
5	6	C1,C5,C7,C11	39PFHQ	CHIP CAPACITOR HQ	
6	1	C14	68pF	CERAMIC CAPACITOR NP0	
7	1	C13	1nFCH	CHIP CAPACITOR	
8	2	L2,L4	L26RVR1	6 SP DIA 7 RAME SMAL 1.0mm	
9	2	L1,L3	L67RVR1	6 SP DIA 7 RAME SMAL 1.0mm	
10	2	CAV1,CAV2	RG179-75	CAOX CABLE RG179 75 Ohm	
11	3	CN1,CN2,CN3	N CONNECTOR	CONN. N A TELAIO	
12	1	D1	BAT83	HOT CARRIER DIODE	
13	3	ST1,ST2,ST3	STRIP LINE	STRIP LINE	
14	1	R2	47KCH	CHIP RESISTOR	



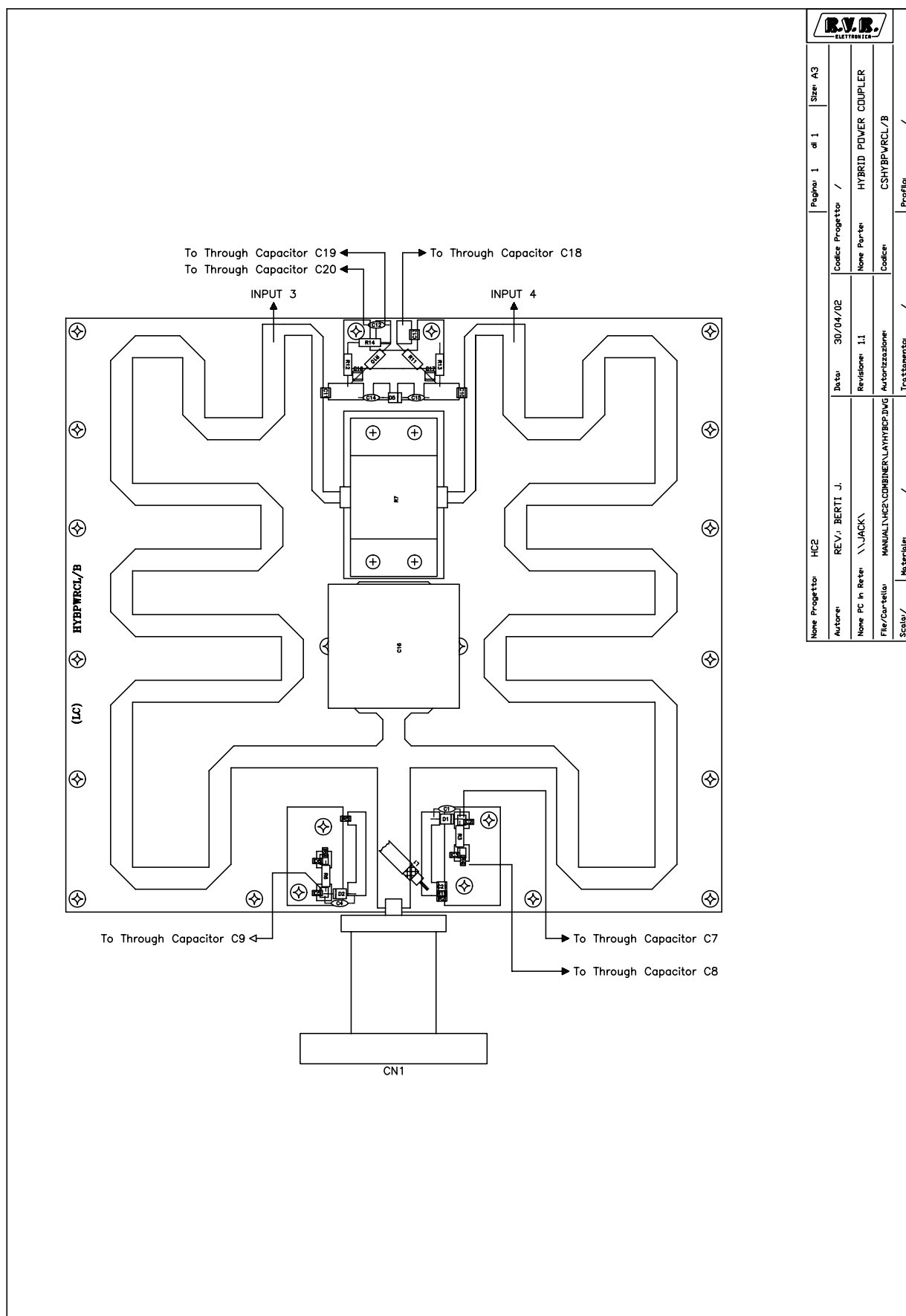
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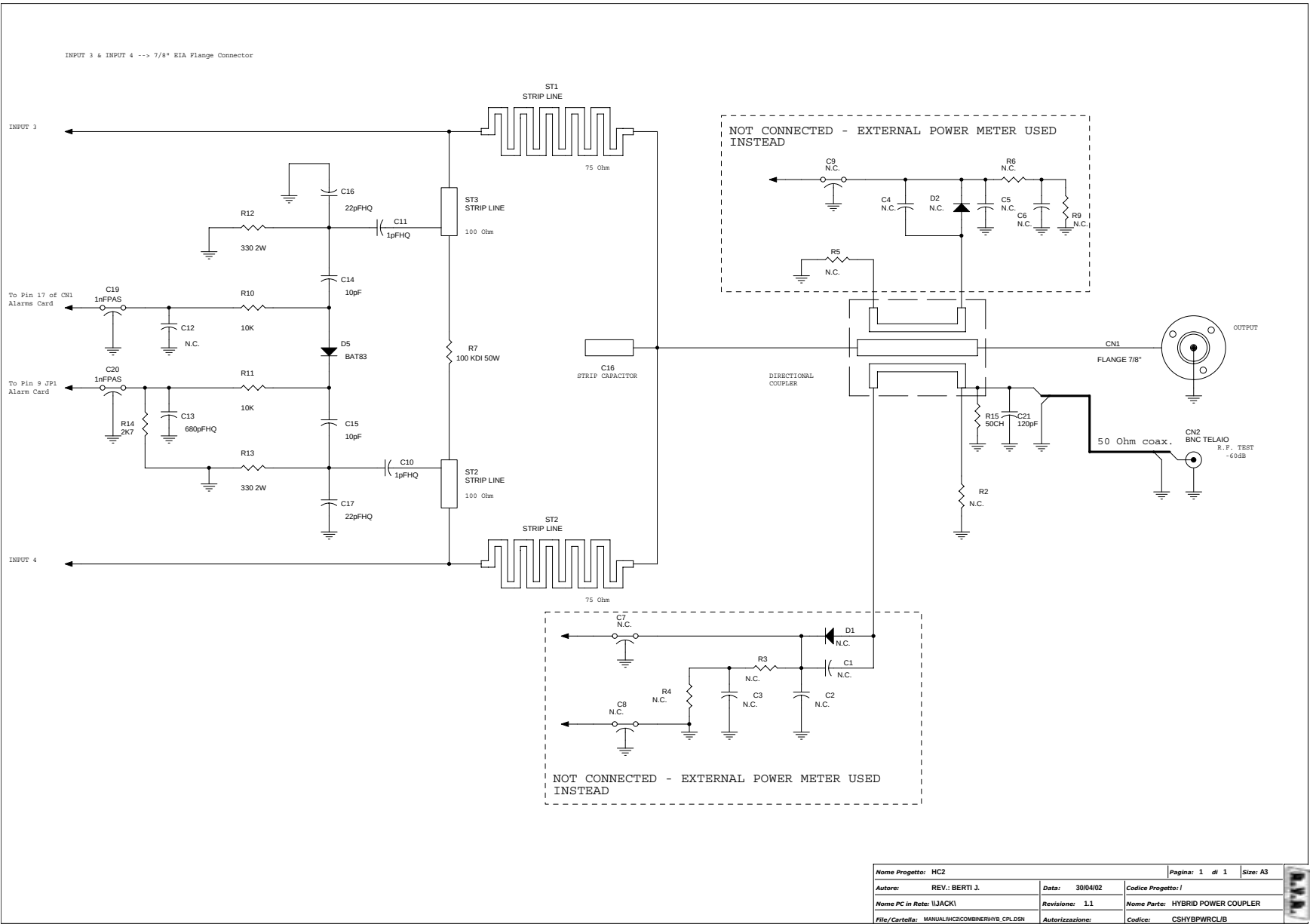
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Scala	/	Trattamento	/	Code Progetto
Materiali		CSSPL-INCH31/CSPHSHC35		
Profilo		/		



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File: C:\Programmi\R.V.A. ELETTRONICA\HC2\HC2.PLT		Autore: BERT J.		Codice: CSSPL-INHC31+SHC35	

Item	Q.ty	Reference	Part
1	2	CAV2, CAV1	RG179-75
2	3	CN1, CN2, CN3	N CONNECTOR
3	5	D1, R2, R3, C13, C14	N.C.
4	4	C18, C19, C24, C25	15pFHQ
5	8	C15, C16, C17, C20, C21, C22, C23, C22, C23, C26	1/10pF
6	3	C25, C26, C27	4p7
7	1	C28	2p2
8	2	L7, L5	L57RVR1
9	2	L6, L8	L26RVR1
10	1	R1	50 KDI
11	3	ST1, ST2, ST3	STRIP LINE





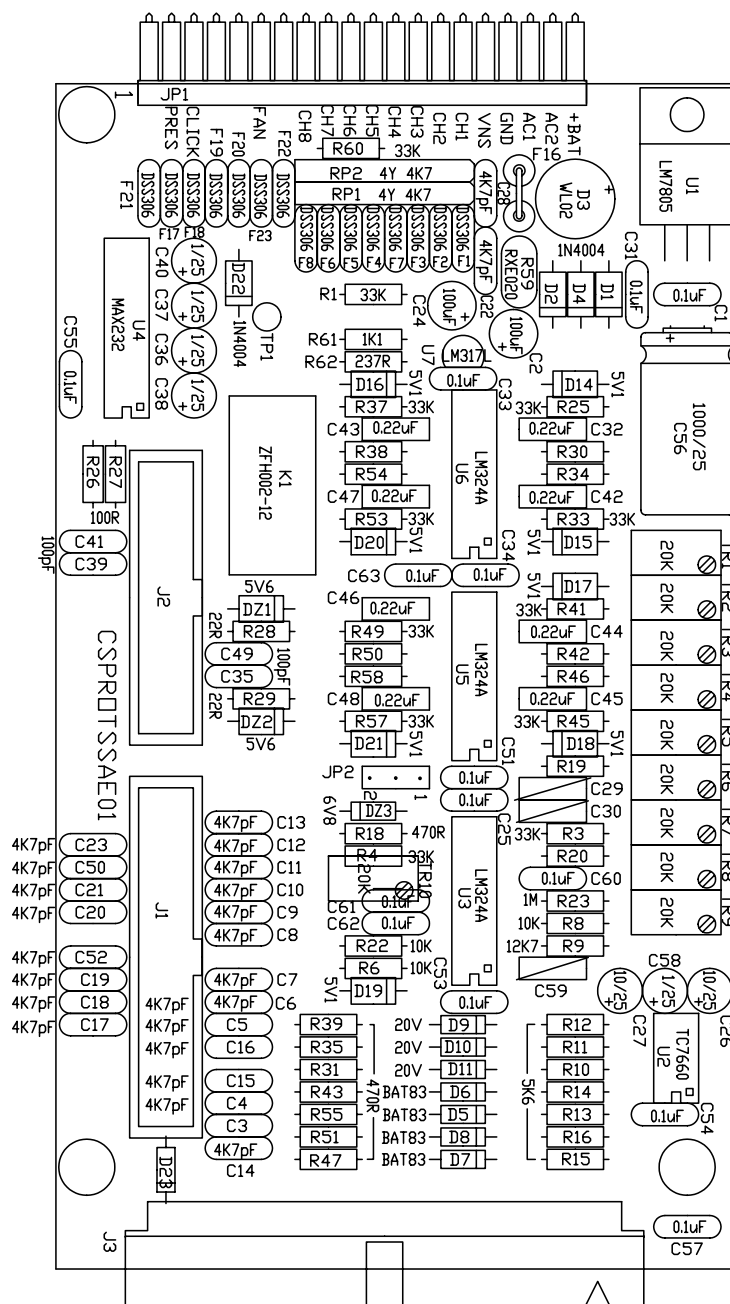
HYBRID POWER COUPLER

Bill Of Materials

Page1

Item	Q.ty	Reference	Part
1	1	CN1	FLANGE 7/8"
2	1	CN2	BNC TELAIO
3	18	D1, C1, R2, D2, C2, R3, C3, R4, C4, R5, C5, R6, C6, C7, C8, R9, C9, C12	N.C.
4	2	C11, C10	1pFHQ
5	1	C13	680pFHQ
6	2	C14, C15	10pF
7	2	C16, C17	22pFHQ
8	2	C19, C20	1nFPAS
9	1	C21	120pF
10	1	D5	BAT83
11	1	R7	100 KDI 50W
12	2	R11, R10	10K
13	2	R13, R12	330 2W
14	1	R14	2K7
15	1	R15	50CH
16	4	ST1, ST2, ST3, ST10	STRIP LINE

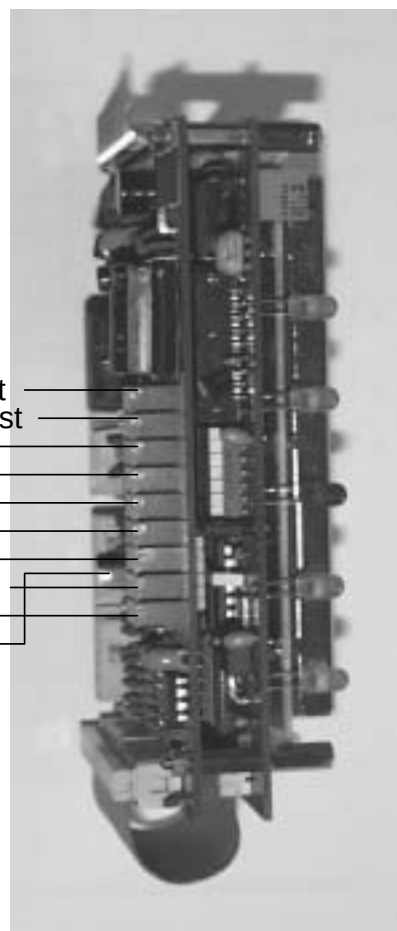
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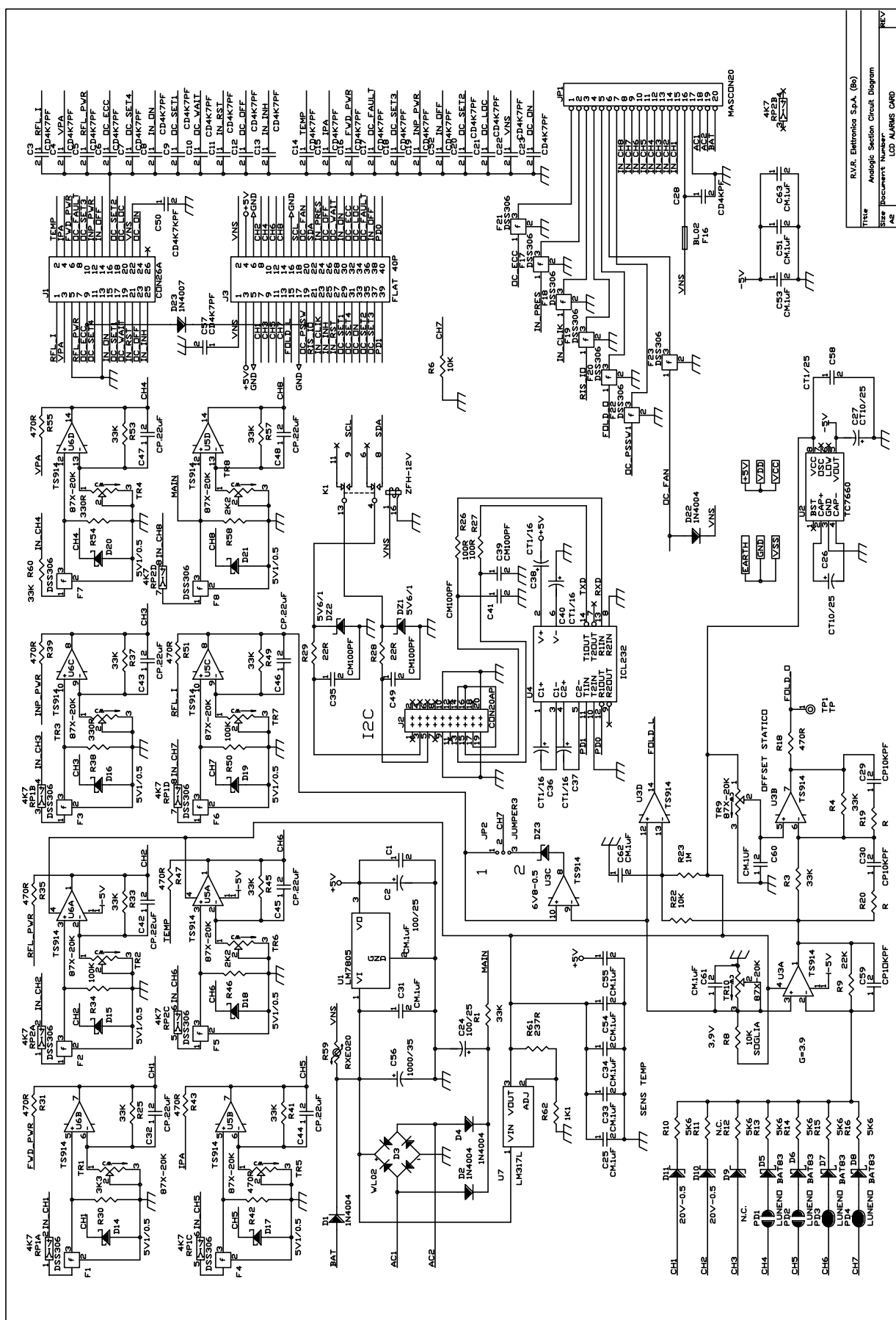


R.V.R. Elettronica S.p.A. (Bo)			
TITLE	Analogue Section Component Layout	REV	
DOCUMENT NUMBER	LCD Alarms Card	REV	
DATE:	3 NOVEMBRE 1999		

- 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
- TR10 - Foldback trip point adjust

NB: TR10 has to be adjusted to have 3.9V on PIN3 U3





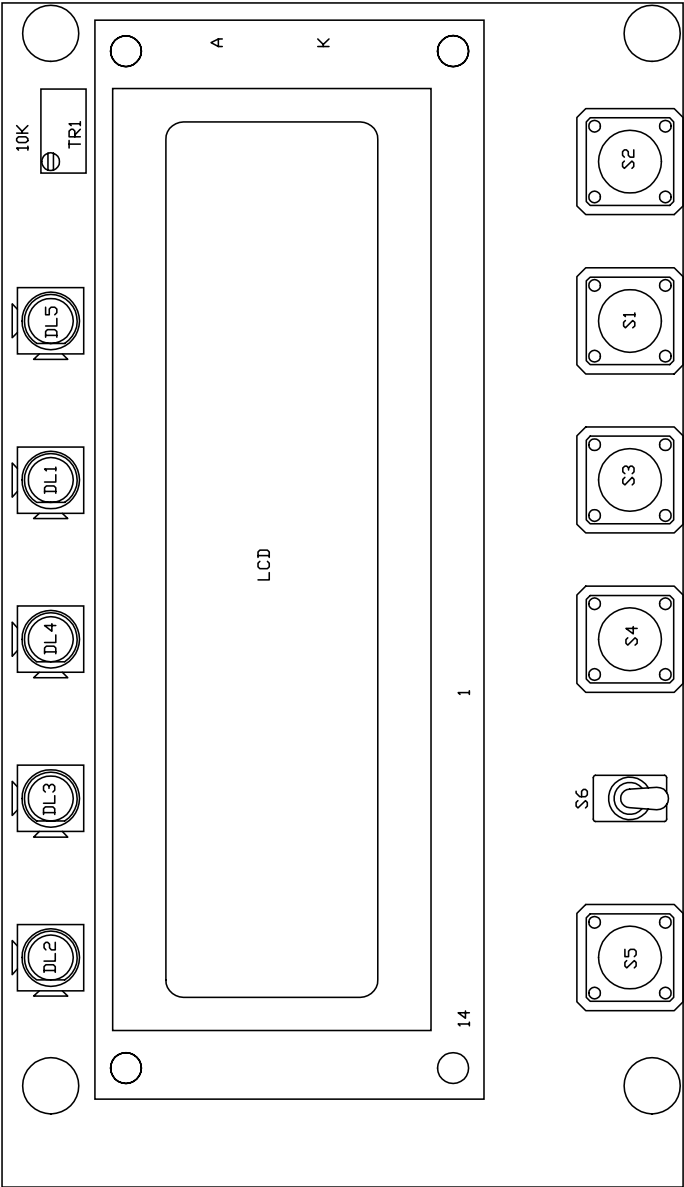
Rev	01
Doc	HC2
Proj	HC2
Aut	R.V.R. Elettronica S.p.A. (86)
Rev	01
Doc	HC2
Proj	HC2
Aut	R.V.R. Elettronica S.p.A. (86)

CPU Analog Section Bill Of Materials

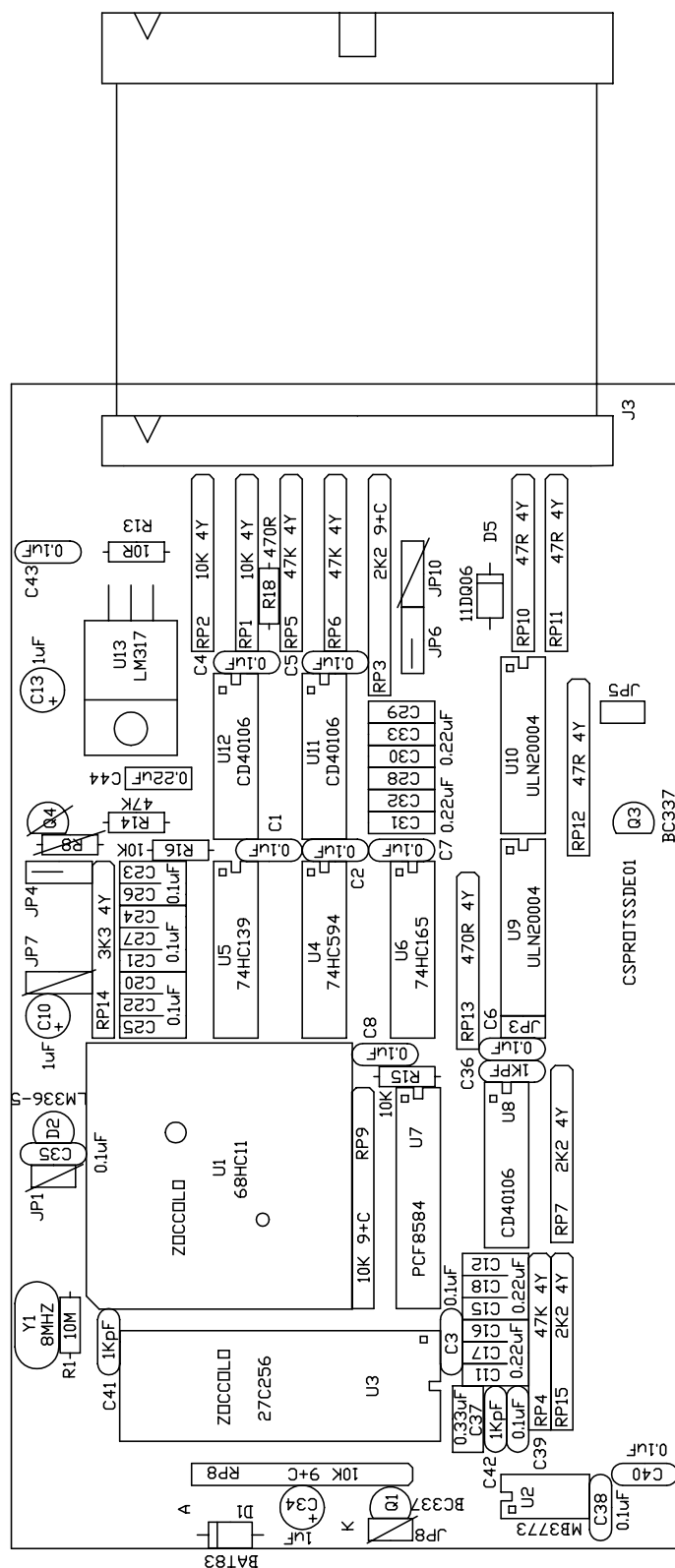
Item	Q.ty	Reference	Part
1	13	C1,C25,C31, CM.1UF C33,C34,C51, C53,C54,C55, C60,C61,C62,C63	
2	2	C2,C24	100/25
3	22	C3,C4,C5,C6,CD4K7PF C7,C8,C10, C11,C12,C13, C14,C15,C16, C17,C18,C19, C20,C21,C22, C23,C52,C57	
4	2	C26,C27	CT10/25
5	1	C28	CD4KPF
6	2	C29,C30	CP10KPF
7	8	C32,C42,C43,CP.22UF C44,C45,C46, 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	3	D9,D10,D11	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

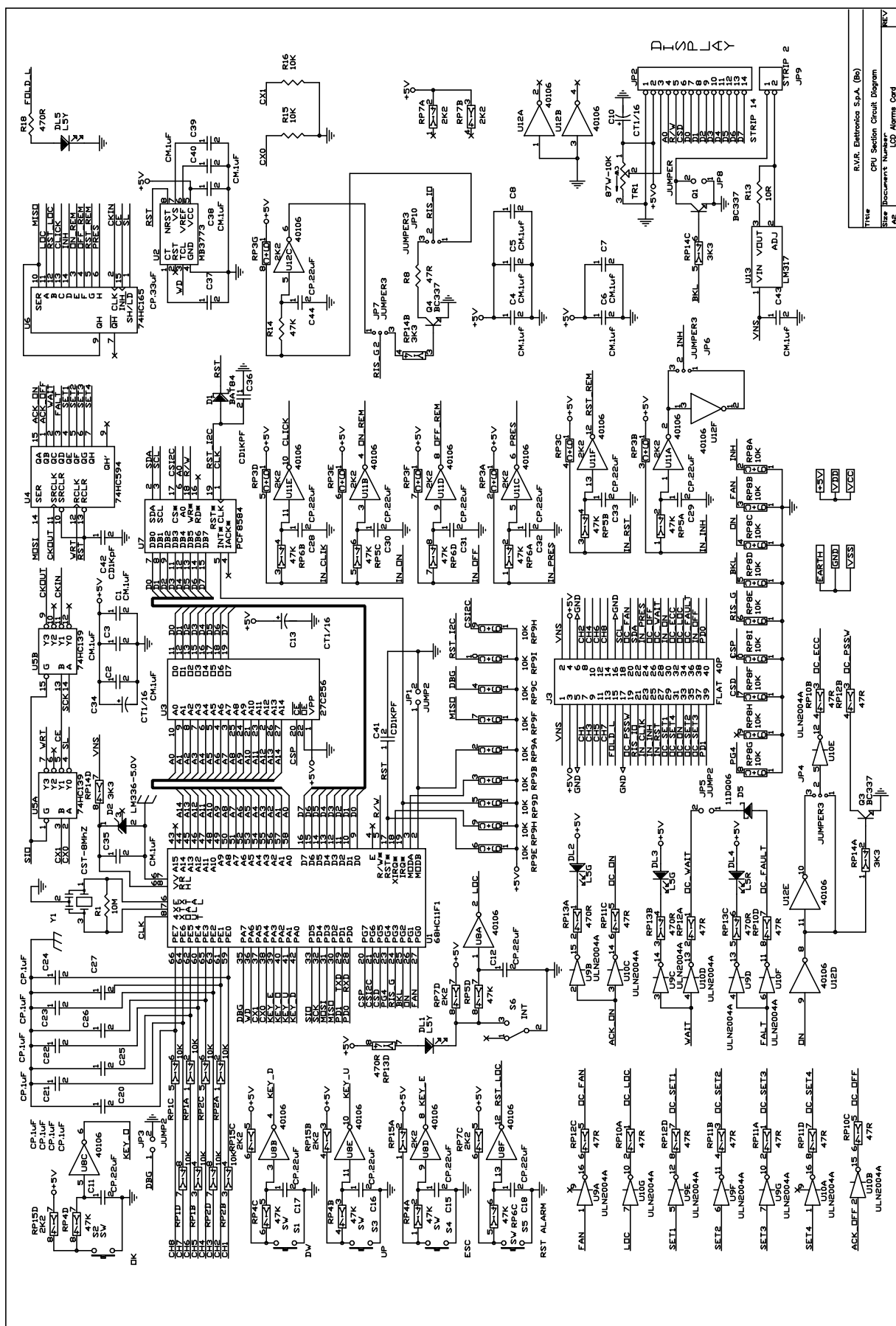
Item	Q.ty	Reference	Part
26	1	J2	CON20AP
27	1	J3	FLAT 40P
28	1	K1	ZFH-12V
29	4	PD1, PD2, PD3, PD4	LUNENO
30	2	RP1, RP2	4K7
31	12	R1, R3, R4, R25, R33, R37, R41, R45, R49, R53, R57, R60	33K
32	3	R6, R8, R22	10K
33	1	R9	22K
34	6	R10, R11, R13, R14, R15, R16	5K6
35	9	R18, R31, R35, R39, R42, R43, R47, R51, R55	470R
36	2	R19, R20	R
37	1	R23	1M
38	2	R26, R27	100R
39	2	R28, R29	22R
40	1	R30	3K3
41	2	R34, R50	100K
42	2	R38, R54	330R
43	2	R46, R58	2K2
44	1	R59	RXE020
45	1	R61	237R
46	1	R62	1K1
47	1	TP1	TP
48	10	TR1, TR2, TR3, TR4, TR5, TR6, TR7, TR8, TR9, TR10	87X-20K
49	1	U1	LM7805
50	1	U2	TC7660
51	3	U3, U5, U6	TS914
52	1	U4	ICL232
53	1	U7	LM317L
54	2	R12, D9	N.C.
55	1	D23	1N4007



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



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

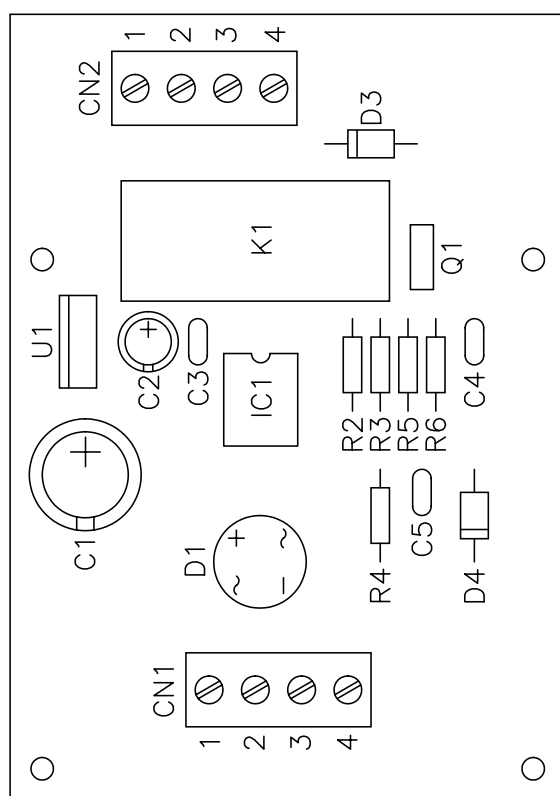


Scheda CPU Bill Of Materials
1999

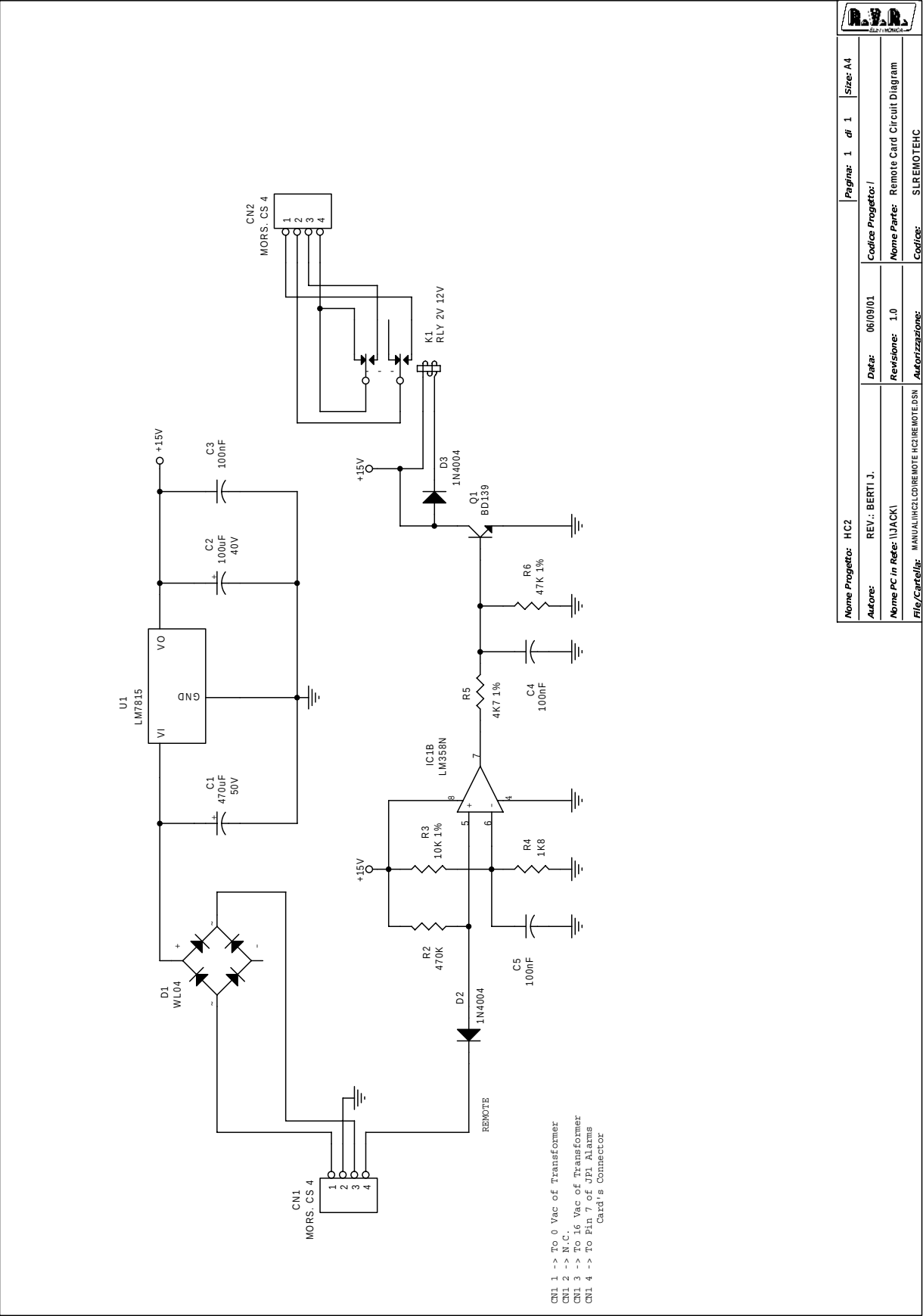
November 25,

Item	Q.ty	Reference	Part
1	13	C1,C2,C3, C4,C5,C6, C7,C8,C35, C38,C39,C40,C43	CM.1UF
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: HC2		Pagina: 1 di 1		Size: A4
Autore: D'ALESSIO D.		Data: 06/09/01		Coilice Progetto: /
Nome PC in Rete: \\\JACK		Revisione: 10		Nome Parte: Remote Card Component Layout
File/Cartella: MANUAL\MELCUD\MEMOTE		Autorizzazione: /		Coilice: CSREMOTEC
Scalco: /		Trasmissione: /		



Nome Progetto: HC2		Pagina: 1	di 1	Size: A4
Autore: REV: BERTI J.		Codice Progetto: /		
Nome PC in Rete: \\JACK\		Data: 06/09/01	Revisione: 1.0	Nome Parte: Remote Card Circuit Diagram
File/Cartella: MANUALE\HC2\DIAGRAM\HC2\RE.MOTE.DSN		Autorizzazioni:		Codice: SLREMOTHC

Remote Card Circuit Diagram

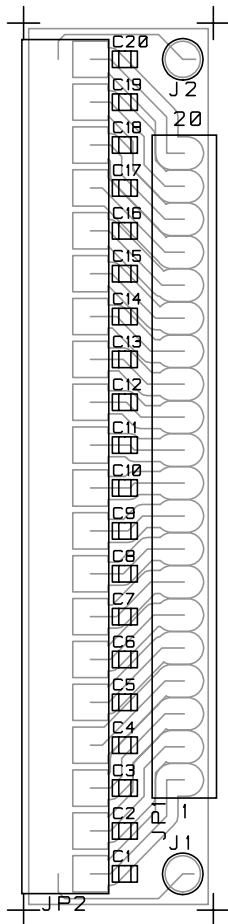
Bill Of Materials

Page 1

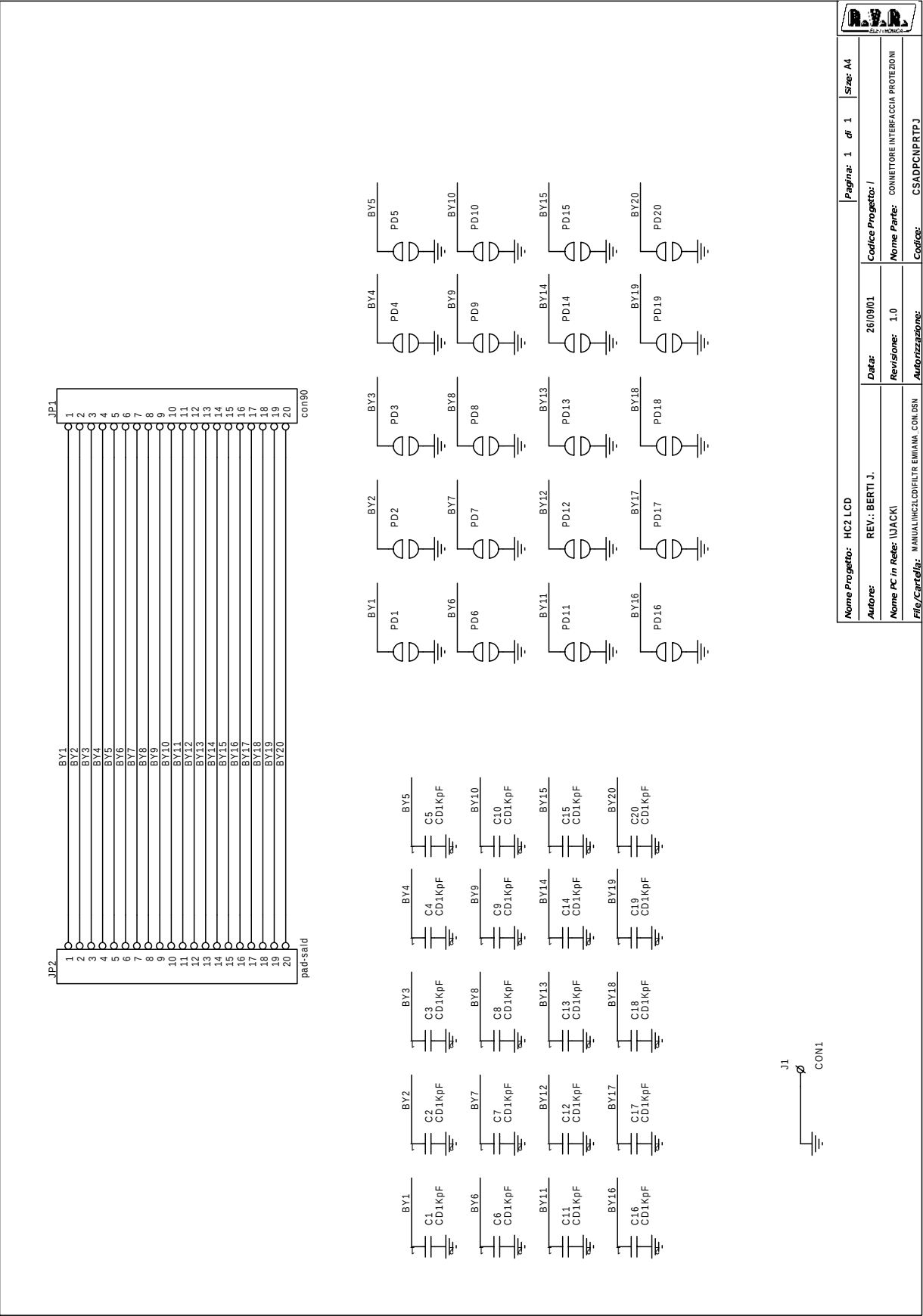
Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CDE
1	1	R4	1K8	RESISTOR 1/4W 5%	RSC1/4JK01,8
2	1	R5	4K7 1%	RESISTOR 1/4W 1%	RSM1/4FK04,7
3	1	R3	10K 1%	RESISTOR 1/4W 1%	RSM1/4FK0010
4	1	R6	47K 1%	RESISTOR 1/4W 1%	RSM1/4FK0047
5	1	R2	470K	RESISTOR 1/4W 5%	RSC1/4JK0470
6	3	C3,C4,C5	100NF	CERAMIC CAPACITOR	CKM104BK600P
7	1	C2	100UF	ELECTROLYTIC CAPACITOR	CEA107BM350
8	1	C1	470UF	ELECTROLYTIC CAPACITOR	CEA477BM350
9	2	CN1,CN2	MORS. CS 4	MORS. C.S. 4 CONT.	MORSKB04PPO
10	1	K1	RLY 2V 12V	RELAY 2 VIE 12V	RLDLFHA00212
11	2	D2,D3	1N4004	SILICON DIODE 400V	DIS1N4004
12	1	D1	WL04	DIODE BRIDGE 1.5A	PNRWL04
13	1	U1	LM7815	POS. STABILIZER	CILLM7815
14	1	Q1	BD139	NPN TRANSISTOR	TRNBD139
15	1	IC1	LM358N	DOUBLE OP. AMP.	CILLM358N

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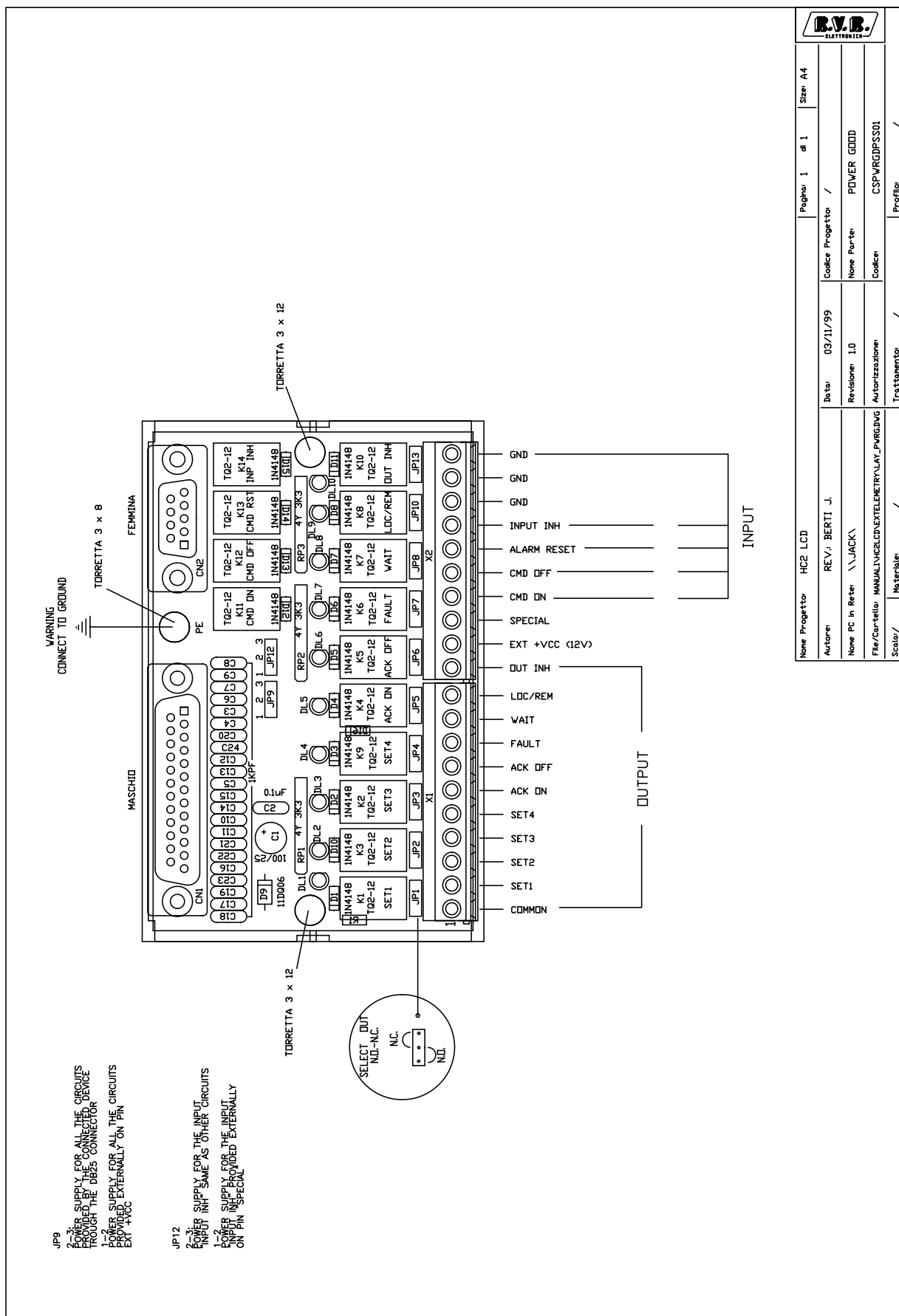


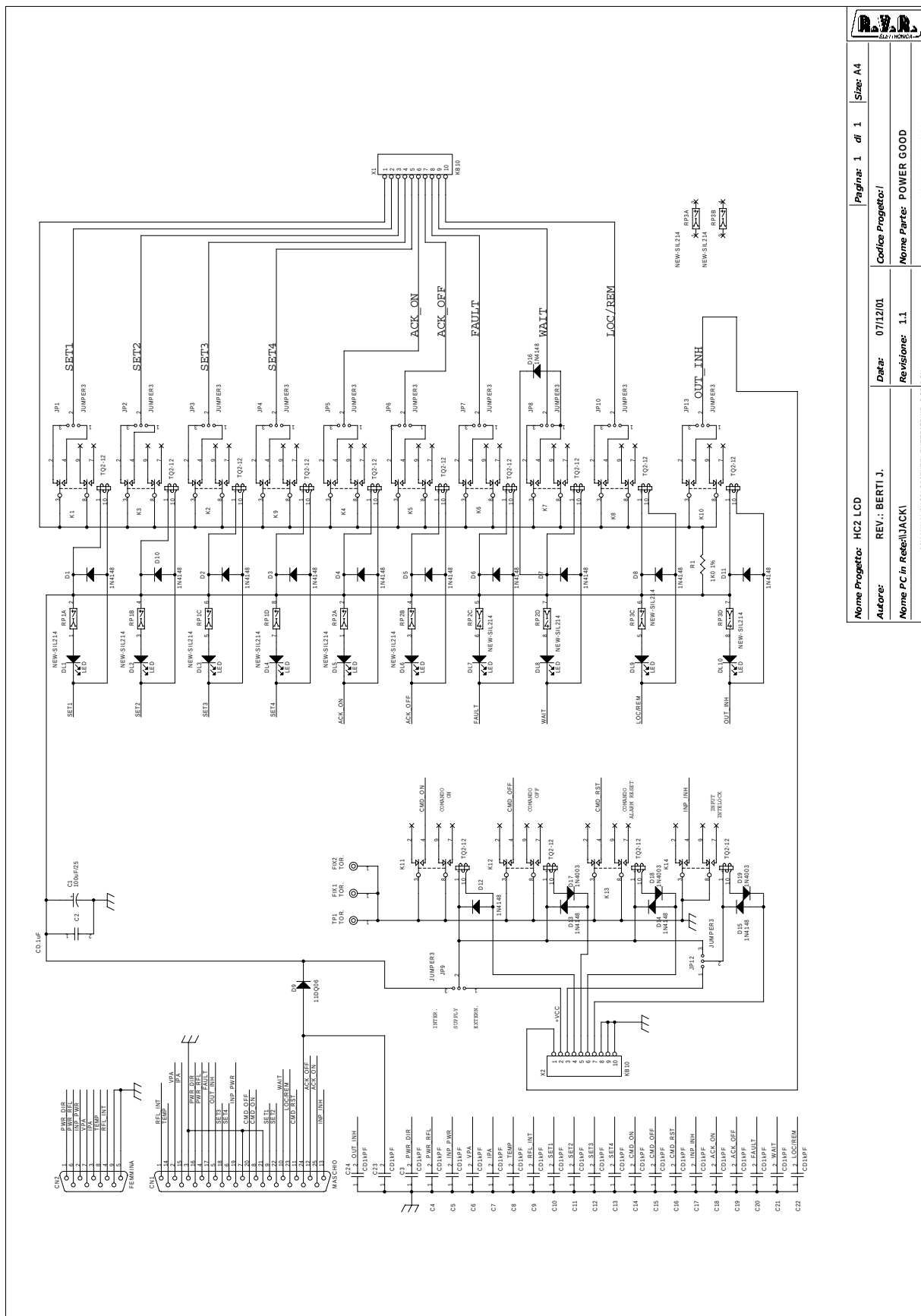
Nome Progetto		HC2 LCD	Pagina 1 di 1		Size: A4
Autore:	GRIPTECH - REV. BERTI J.		Codice Progetto		/
Nome PC in Rete:	\\JACK\		Nome Parte		CONNETTORE INTERFACCIA PROTEZIONI
File/Cartella:	MANUALI\HC2\CD\FILTR ENT\EMIDJG		Codice		CSADPCNPRTJ
Scala:	/		Trattamento		/
Materiale		/	Profilo		/



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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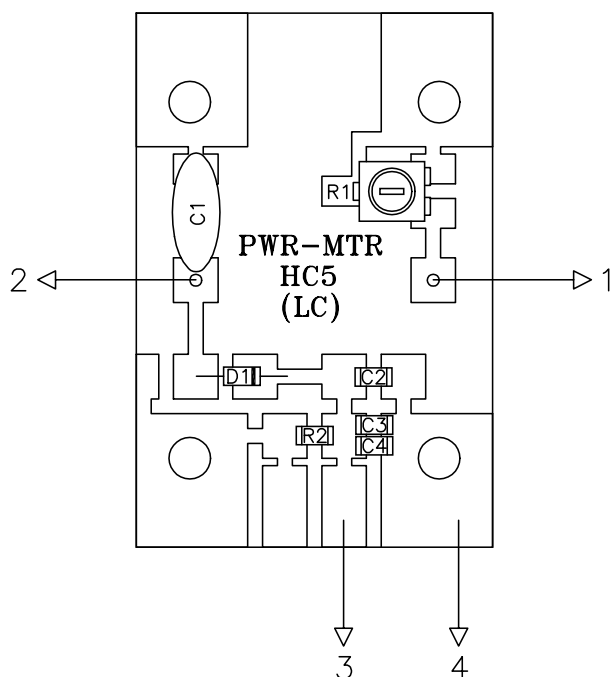


Nome Progetto: HC2 LCD		Pagina: 1	di 1	Size: A4
Autore: REV.: BERTI J.		Codice Progetto:		
Nome PC in Rete: (JACK)		Nome Parte: POWER GOOD		
File/Carrello: J:\MANUAL\HC2\DIETEMETRI\POWER GOOD		Codice: CSPWRGDPSS01		

POWER GOOD Item	Q.ty	Bill Of Materials Reference	Revised: November 25, 1999 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%
15	3	D17,D18,D19	1N4003

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DENOMINAZIONE

Power Meter Card Component Layout / Piano di Montaggio

DISPOSITIVO

SEMILAVORATO

MATERIALE

TRATTAMENTO

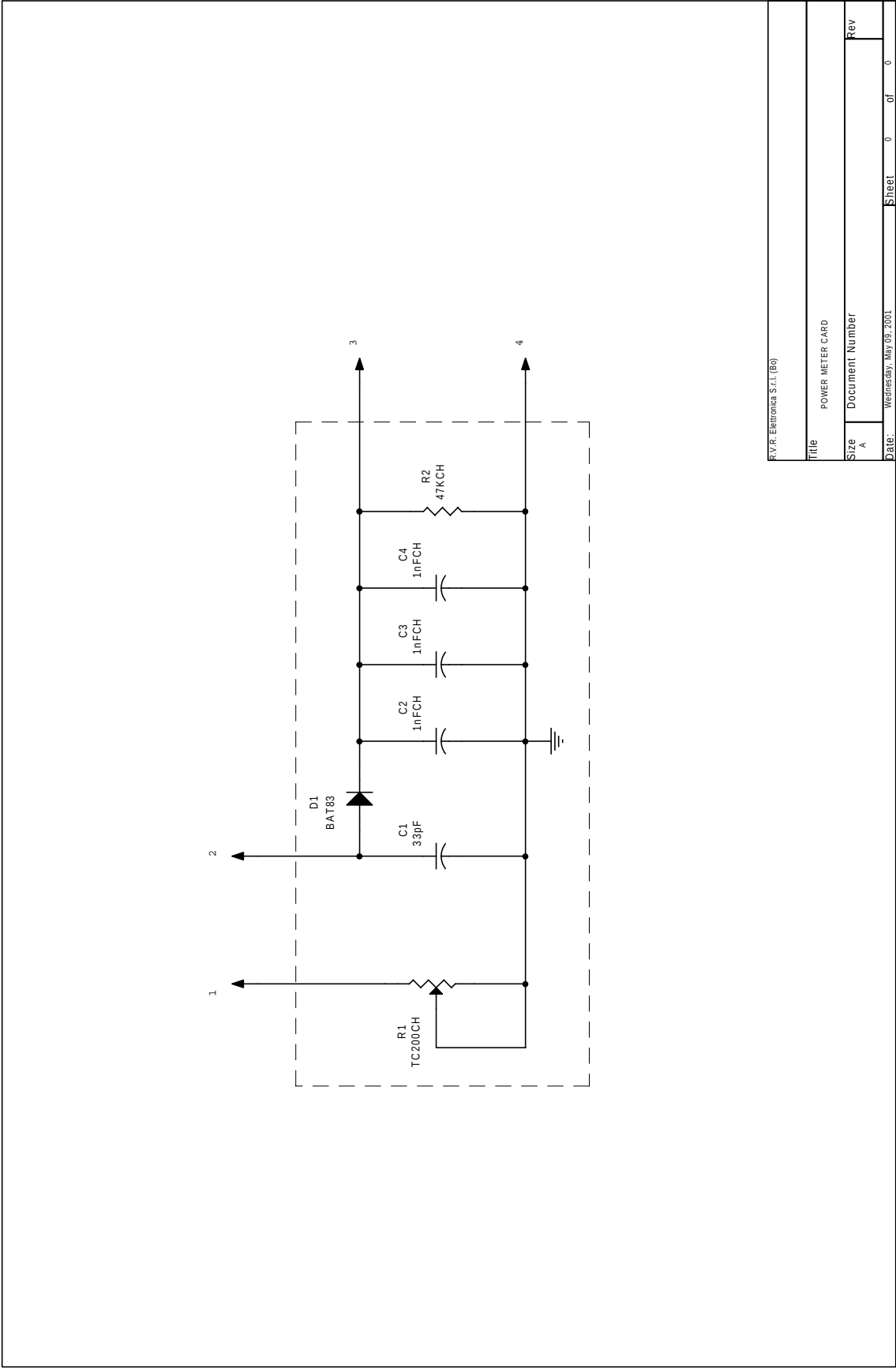
DISEGNATO

D'Alessio D. 03/09/97

SCALA

DISEGNO

TAVOLA n di



POWER METER CARD

Bill Of Materials

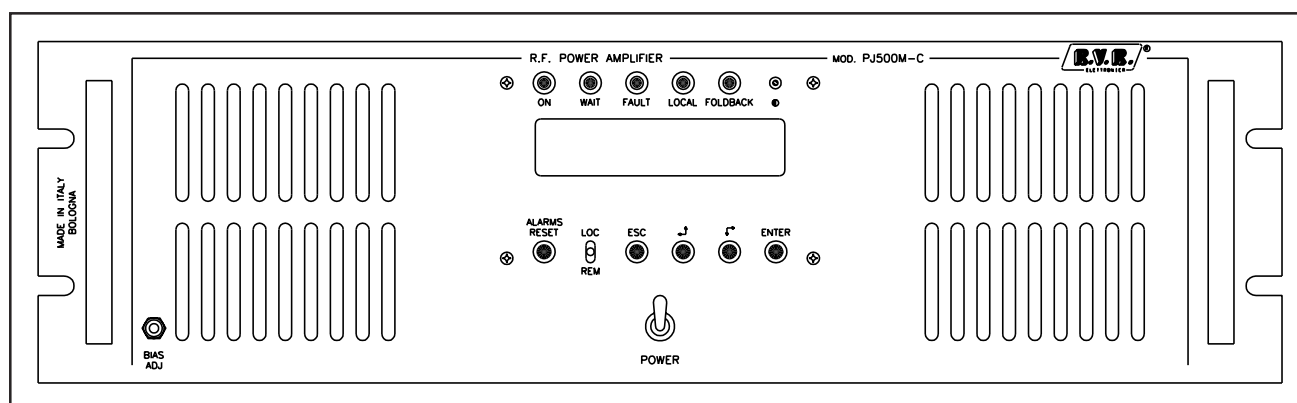
Page 1

Item	Q.ty	Reference	Part	DESCRIPTION	PART ORDER CDE
1	1	R2	47KCH	CHIP RESISTOR	
2	1	R1	TC200CH	TRIM. REG. VERT. CERMET SMD	
3	1	C1	33PF	CERAMIC CAPACITOR NP0	
4	3	C2,C3,C4	1NFCH	CERAMIC CHIP CAPACITOR	
5	1	D1	BAT83	HOT CARRIER DIODE	

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PJ500M-C



User Manual

LCD Version

Manufactured by



Italy



File name: 500LCD_CHAP_EN.P65
Version: 1.6L
Date: 29/01/2003

Revision History

Version	Date	Reason	Editor
1.4L	25/03/2002	MN700 PS Update	J. Berti
1.5L	14/10/2002	Frontal Bias Adjuist Update	J. Berti
1.6L	29/01/2003	A.G.C. Update	J. Berti

PJ500M-C - User Manual
Versione 1.6L

© Copyright 1999-2002
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

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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 24 (twentyfour) 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

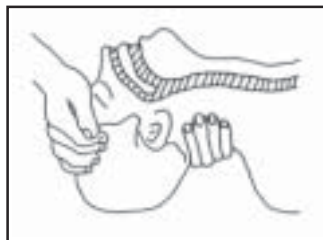


Figure 1



Figure 2

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



Figura 3

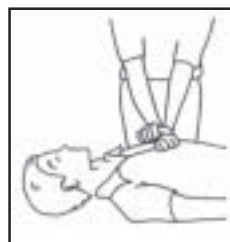


Figura 4

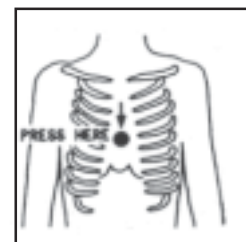


Figure 5

- 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 PJ500M-C/LCD is a 19" rack-mountable broadband MOSFET RF power amplifier. It works without adjustments on the whole 87.5 - 108 MHz FM band, and its power output is 500 W with a drive level of about 10 W.

The RF power section makes use of two modules, able to deliver more than 300 W 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 PJ500M-C/LCD 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 allows to control the machine using the buttons on the front panel, while remote control (that is using the telemetry connector) is disable. In REMOTE mode, buttons on the panel can be used only to read parameters, but they can be changed only remotely.

The PJ500M-C includes the *Automatic Gain Control* feature, that will can be used to fix the RF output power of the amplifier to the desired value so that environmental factors (e.g. temperature) or settings (frequency change) don't impact onto the delivered RF power. The AGC function can be seen as an add-on, meaning that it can be exploited or not depending on the user preferences. More informations about this are given in the manual.

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.

5. Installation and Use

This chapter is intended to summarize the necessary point 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 the unit for any shipping damage and check that all the controls and connectors on the front and rear panels are in good conditions.

Check the mains voltage selector on the rear panel: the position of the jumpers to chose between 220 and 110 mains voltage is indicated on the panel.

Check also the presence and the integrity of the fuses. The required value for the fuses are:

- RF MODULE 25 A 10X38
- A.C. LINE 10 A 6,3X32
- AUX OUT A.C. LINE 4 A 6,3X32

Verify that the mains switch is in the OFF position.

Connect to the RF input the RF output of a suitable exciter (e.g. RVR Elettronica PTX30) using a N-connectors terminated cable; the exciter shall be set for minimum power and OFF.

Turn the "Power Adj." multiturn trimmer on the front panel completely clockwise. This operation disables the intervention of the AGC

Link one of the ALARMS/INTERLOCK connectors to the INTERLOCK connector of the exciter, if available (it is, in RVR Elettronica 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.

The amplifier shall be mounted in one rack that contain a anti-strap device to not expose accidentally the mains conductors.



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 the amplifier on and verify the green "ON" LED being lit. The LCD display will indicate a first screen of presentation of the amplifier and next it will switch to a screen indicating the forward and reflected power.

Switch the exciter on (to minimum power level) and wait for it to lock on the working frequency. When the locked condition will be 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 500W. (Please note that, as result of the digitalization of measurements, it could happen that the displayed value is not exactly 500W, but a value comprised between 495 and 505; this is perfectly normal.)



At this point, the transmitter is set for its nominal power, **but the built-in AGC function is not controlling the output power of the amplifier**. Changes in the exciter's power, or in the environmental conditions could reduce the RF power generated by the amplifier.

To activate the AGC, increase the exciter's output level up to 10 W (the FWD power of the amplifier will reach 540W or more, but its internal limiter will make shure that no harm will be caused to the machine). The exciter's power can also be measured as the amplifier's input power in the "Power Menu", as described later in the manual. Now turn counterclockwise the PWR Adj. trimmer on the front panel of the PJ500M-C observing the reduction in the delivered power of the amplifier, until the desired level is reached.

If the amplifier has to be used at a lower power level, two ways can be followed:

- If the power reduction will be temporary (e.g. for tests), simply reduce the exciter's power until the required level is reached
- If the power reduction will be permanent (that is to have lower transmitted power by the station), first disable the AGC function turning clockwise the PWR Adj. trimmer of the amplifier. Than reduce the exciter's power proportionally to the wanted reduction in the output power of the transmitter. Finally turn the PWR Adj. trimmer counterclockwise until the desired output power is reached

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 in which mode microprocessor system controls the amplifier, and how the user can interact with it.

Note that the user can give commands to the device only when it's set in LOCAL mode using the switch [13] of Figure 1. 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 use interface of the software.

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

PJ 500 M-C LCD
Soft Start

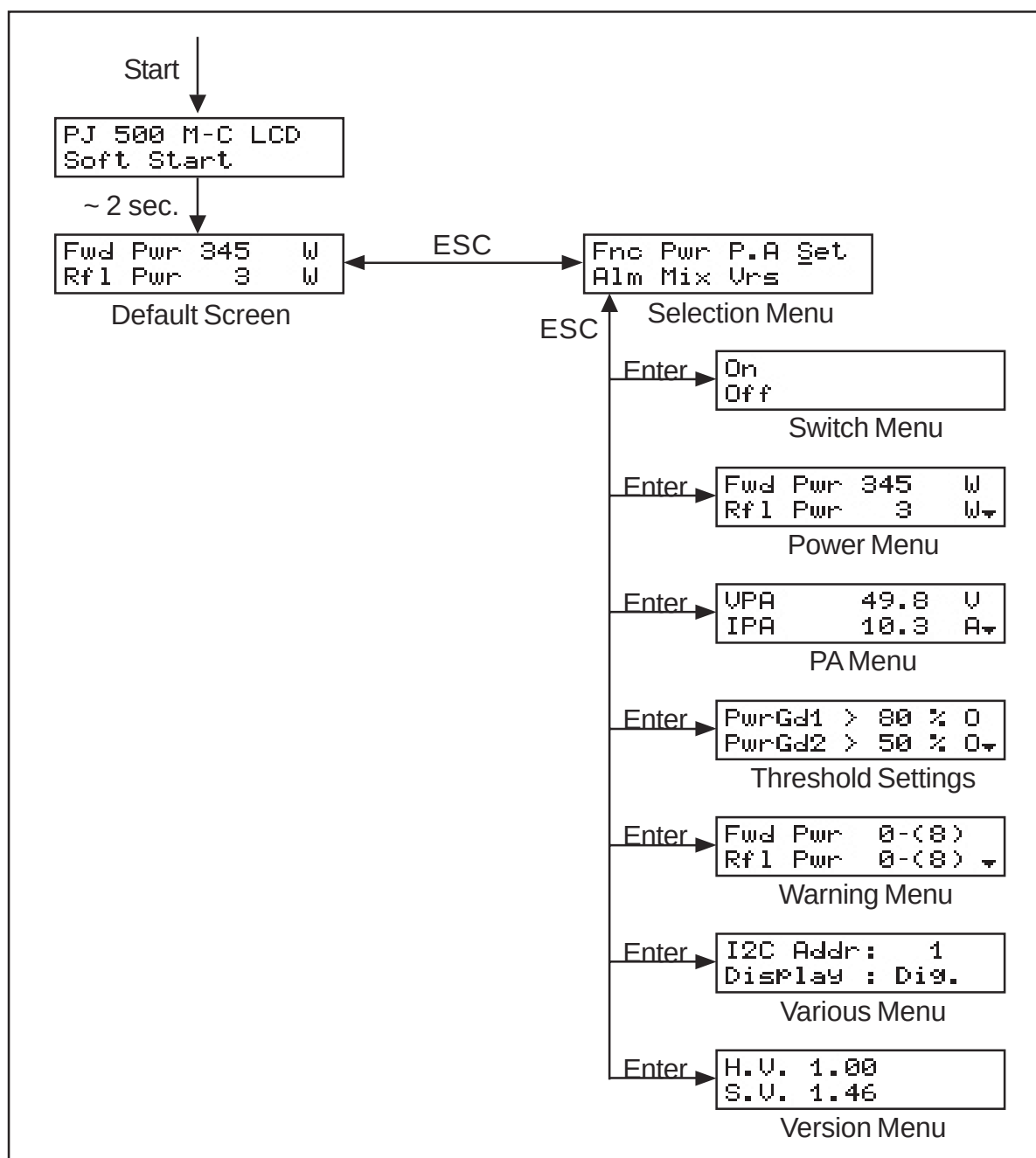


Figure 3 - Software flow diagram

After a few seconds, the main screen will be displayed, reporting the values of Forward power and Reflected power

Fwd Pwr	345	W
Rfl Pwr	3	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 flashing 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 mostly 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 behaviour 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	345	W
Rf1 Pwr	3	W
SWR	Off	
Inp Pwr	5.2	W
Int SWR	==	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	49.8	V
IPA	10.3	A
Eff.	72.3	%
Temp.	27.3	°C
Mains	+1	%

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 on the 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 quantity of reflected power (Reflected Warning).

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

The full-scale value for PJ500M-C are:

- Forward Power 500W
- Reflect Power 50W

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	>	40	%	0

In this example, the thresholds of the warnings are:

- PwrGd1 400W (80% X 500W)
- PwrGd2 250W (50% X 500W)
- Rf1War 20W (40% X 50W)

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 be: of the kind X - (Y), Wait, or Disabled.

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	0-(2)
Mains	Wait
SWR	Dis.
Eff.	Dis.

This menu is an help for technic reparator to define eventually problem of power amplificador.

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 :	Dig.

The default address of I2C communication is fundamental when the amplifier is connected whith other RVR' devices that use this protocol. It's raccomended not to 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 triangole indicates the reflected power level setting in threshold setting menu (RflWar) and the bar below 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 tuning.

5.3.7 Version menu

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

H.V.	1.00
S.V.	1.46

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 system 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

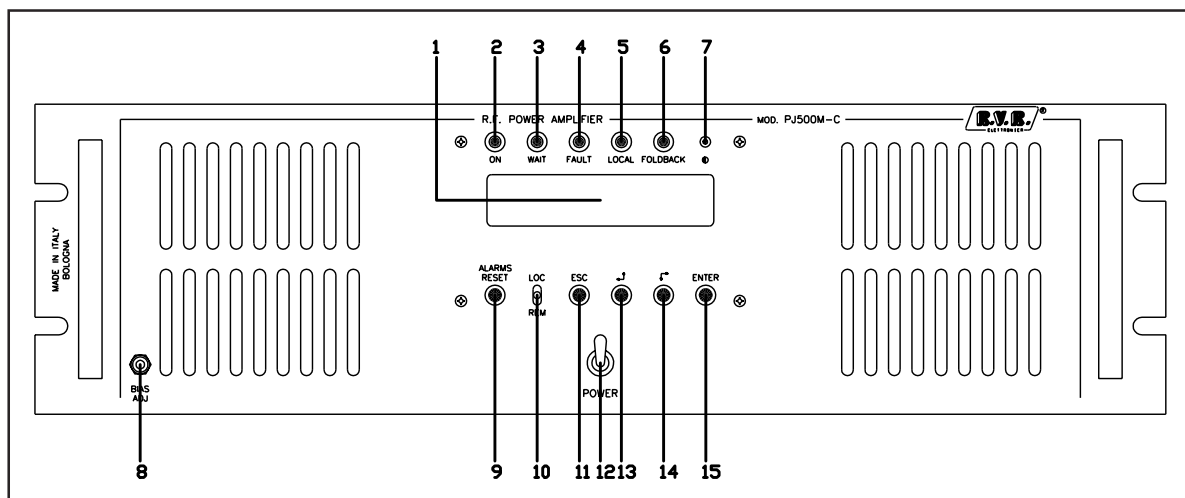
amplifier on and reset the alarm counters

- 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

6. Controls, Indicators and Connectors

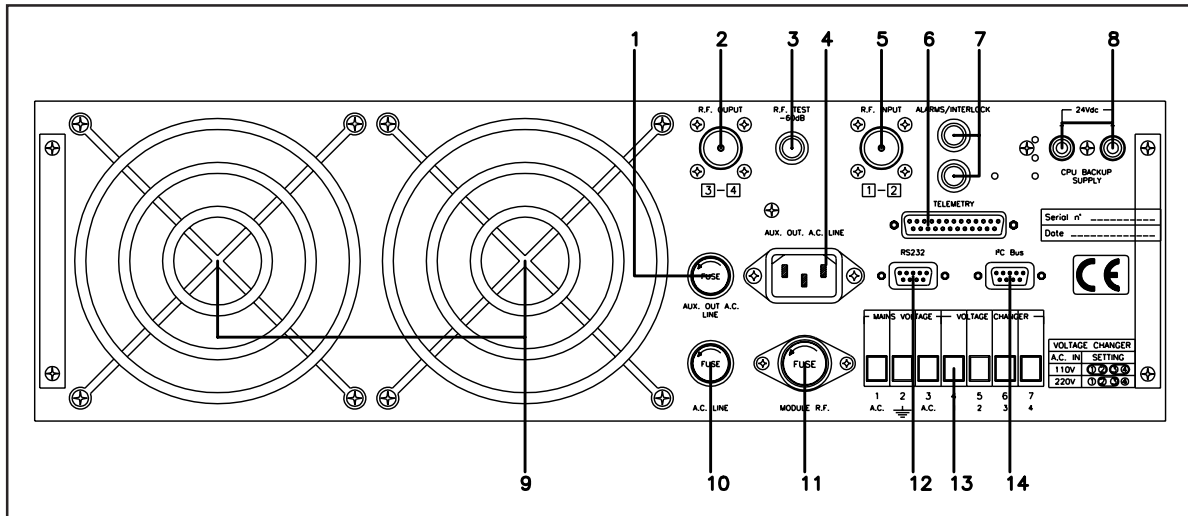
This chapter describes the front and rear panels of the PJ500M-C/LCD, with a brief indication of all the different components.



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 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] POWER RESET	Power adjust trimmer - A.G.C. Control
[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 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

6.2 Rear Panel



- [1] AUX FUSE Fuse protecting the auxiliary power output
- [2] RF OUT N-type RF output connector
- [3] RF TEST BNC RF monitor output. The output level is -60 dB below the power output in the band 87.5-108 MHz
- [4] AC OUTPUT VDE plug to supply external devices (normally an exciter)
- [5] RF INPUT N-type RF input connector
- [6] TELEMETRY DB25 telemetry connector
- [7] INTERLOCK/ALARMS
 BNC connectors to inhibit an external device, as an exciter. In case of fault, the inner connector is shorted to ground
- [8] 24 V External 24 V dc power supply input for CPU backup power supply
- [9] BLOWERS
- [10] MAINS FUSE Mains supply fuse
- [11] RF FUSE Fuse protecting the RF modules
- [12] RS232 DB9 connector to link the amplifier with external devices
- [13] MAINS PLUG Plug for mains supply and voltage setting
- [14] IIC DB9 connector for IIC bus networking

7. Technical Specifications

7.1 Dimensional and Environmental Specifications

Cabinet Dimensions	454.0 mm x 132.5 mm x 507.0 mm
Panel Dimensions	483 mm x 133 mm
Weight	30 Kg
Operating Temperature Range	-10 °C ÷ 50 °C
Umidity	95% Maximum, without condensation

7.2 Electrical Specifications

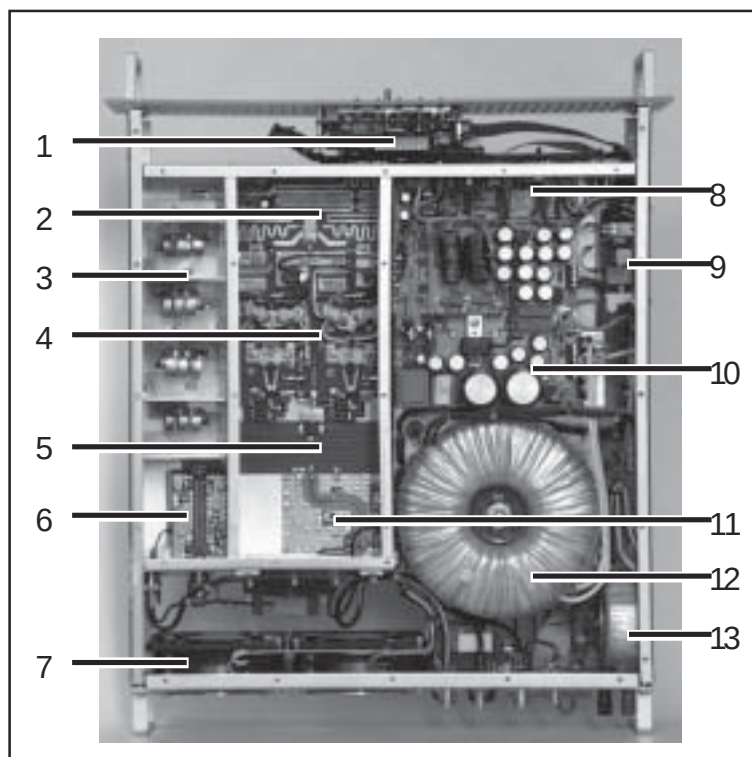
A.C. Power Supply	100-130 V, 50-60 Hz 198-250 V, 50-60 Hz
Cooling system	forced ventilation
Frequency Range	87.5 MHz ÷ 108 MHz
Output Power	500 W nominal
Drive Power	< 10 W for Pout = 500 W, typical 6 W
Input Connector	Standard Connector Type "N"
Input Impedance	50 Ohm
Output connector	Standard Connector Type "N"
Output Impedance	50 Ohm
Harmonic and Spurious Soppression	Respect all requirments FCC e CCIR

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8. Electrical description

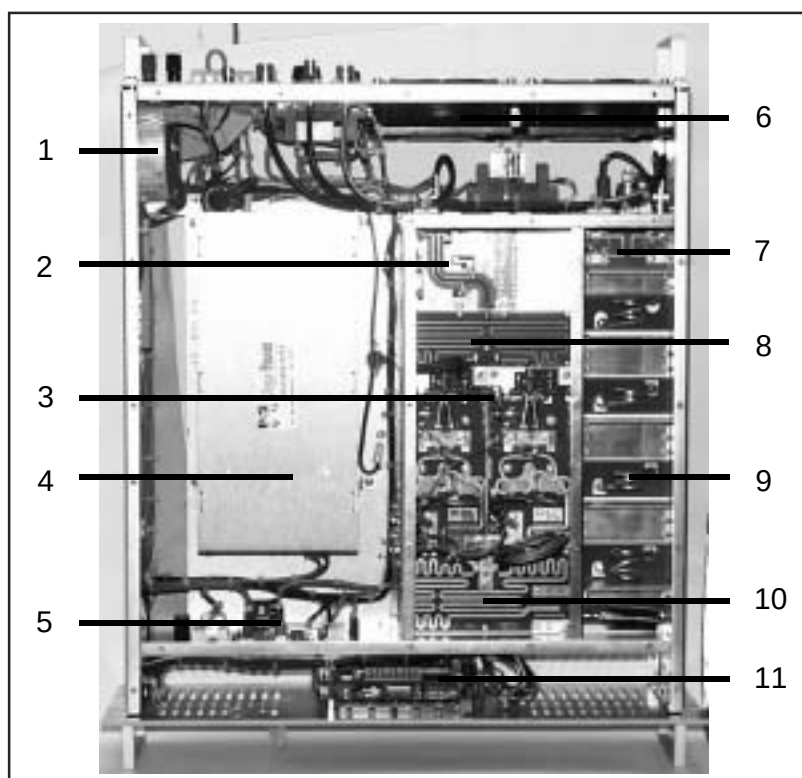
PJ500M-C/LCD is composed of different modules wired between them with connectors, allowing for easy servicing or module substitution.

Figure below shows the upper view of the device with the indication of the different components.



- [1] CPU
- [2] Wilkinson Combiner
- [3] Low-pass filter
- [4] Power amplifier Modules
- [5] Wilkinson splitter
- [6] Output directional coupler
- [7] Blowers
- [8] Bias Card
- [9] Soft Start Card
- [10] Switching power supply
- [11] Input directional coupler
- [12] Transformer (power)
- [13] Transformer (service)

8.1 PJ500M-C LCD with MN7000 Option



- [1] Transformer (service)
- [2] Input directional coupler
- [3] Power amplifier Modules
- [4] Switching power supply
- [5] Bias Card
- [6] Blowers
- [7] Output directional coupler
- [8] Wilkinson splitter
- [9] Low-pass filter
- [10] Wilkinson Combiner
- [11] CPU

8.2 Power supply

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

Housed inside to the PJ500M-C there are two transformers, both having a selectable input for voltages of 110 and 220 Volt.

The first has one output, 61-0-61 Volt for Switching Power Supply.

The second has three outputs: 18-0-18 V, 0-15 Volt, C 0-15V, the output A drive the Alarms Card and the Soft Card, the outputs B and C supply the Control Section of Switching Power Supply.

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

8.3 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.

8.4 Input directional coupler

The function of this circuit is to provide the measurement of the input power, that elaborated by the software for the protection of the amplifier. This card also hosts the temperature sensor, that is monitored by the software too.

8.5 RF Power Amplifier

The R.F. Power amplifier section is composed of the two 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).

8.6 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 half of it to each R.F. Power Amplifier module.

The Combiner Card is in turn 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.

8.7 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.

8.8 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 under the levels required by regulations.

8.9 Output Directional Coupler

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

8.10 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.

8.11 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.

The pin assignment is given in the following table.

Pin N°	Descrizione	Tipo	Fondo scala
1	SWR interno	Uscita analogica	3,9 V a 1/2 W
2	Tensione Amplificatore di Potenza	Uscita analogica	3,9 V a 50 V
3	GND		
4	Potenza riflessa	Uscita analogica	4,3 V a 50 W
5	Interlock	Uscita OC	
6	Set 4	Uscita OC	
7	GND		
8	Comando "On"	Input	
9	Set 1	Uscita OC	
10	WAIT	Uscita OC	
11	Reset allarmi	Input	
12	OFF	Uscita OC	
13	Interlock	Input	
14	Temperatura	Uscita analogica	3,9 V a 100°
15	Corrente Amplificatore di Potenza	Uscita analogica	3,9 V a 20 A
16	Potenza diretta	Uscita analogica	4,3 V a 500 W
17	FAULT	Uscita OC	
18	Set 3	Uscita OC	
19	Potenza in ingresso	Uscita analogica	3,9 V a 20 W
20	Comando "OFF"	Input	
21	GND		
22	Set 2	Uscita OC	
23	LOC	Uscita OC	
24	+ Vcc		
25	ON	Uscita OC	

8.12 External telemetry card (optional)

This optional device is designed to interface to the telemetry connector of the PJ500M-C/LCD, 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.

8.13 PFC Switching Power Supply (optional)

This optional module, replaces the assembly composed by the main transformer, the soft start board and the standard switching power supply. The data sheet of the module is included in the appendix of this manual.

Among the pros of this option are the active power factor correction (0.99), a better efficiency, and a reduction in weight of the machine.

The modified wiring diagram of the amplifier using this type of power supply is included in the technical appendix.

Appendix A **Piani di montaggio, schemi elettrici, liste componenti / Component layouts, schematics, bills of material/ Disposición de componentes, esquemas y lista de materiales**

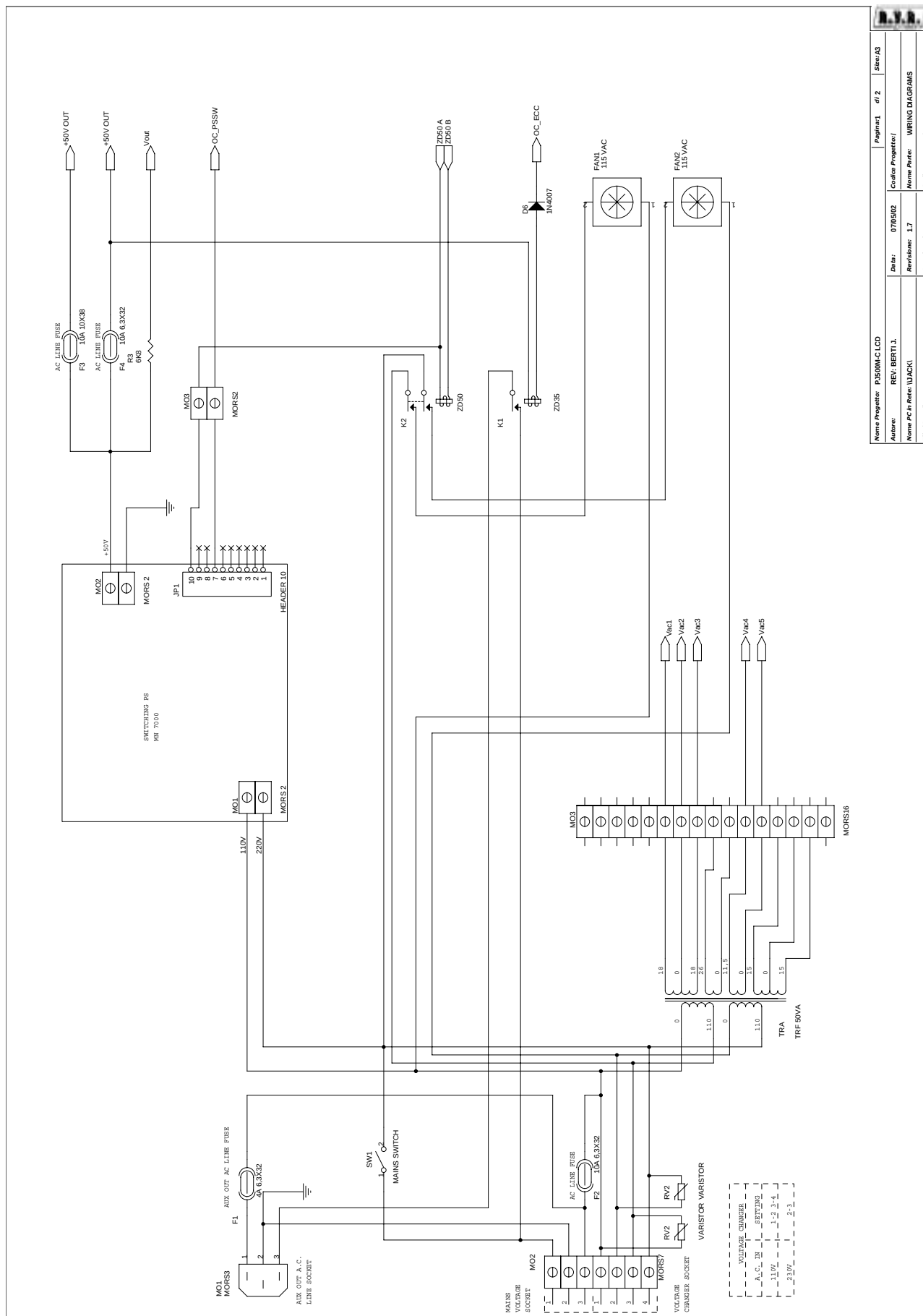
Questa parte del manuale contiene i dettagli tecnici riguardanti la costruzione delle singole schede componenti il PJ500M-C LCD. L'appendice è composta dalle seguenti sezioni:

This part of the manual contains the technical details about the different boards of the PJ500M-C LCD. This appendix is composed of the following sections:

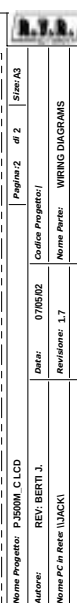
Esta parte del manual contiene los detalles técnicos a cerca de las diferentes tarjetas del PJ500M-C LCD. Este apéndice está compuesto de las siguientes secciones:

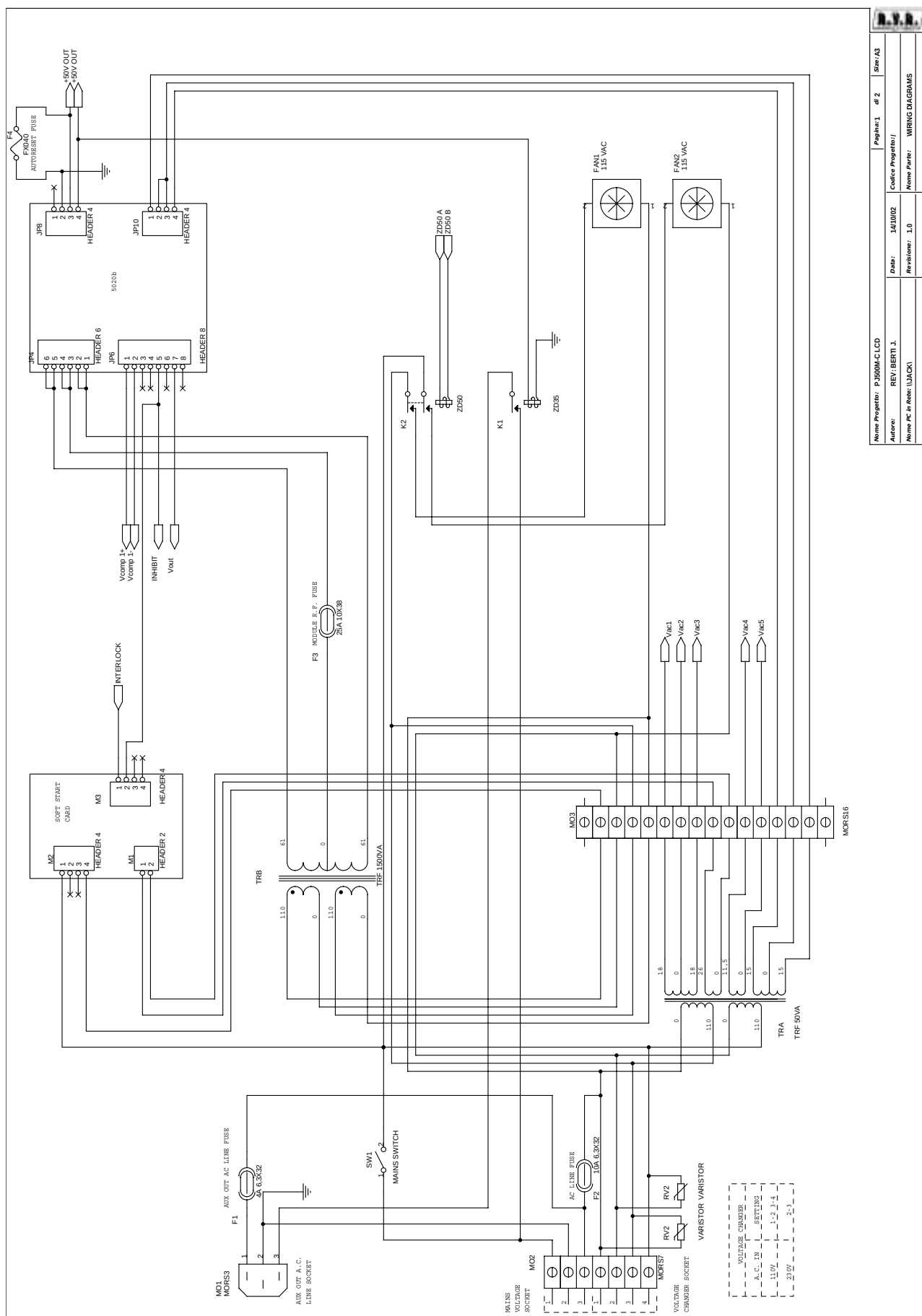
Description	RVR Code	Vers. Pages	
Wiring Diagrams		1.11	8
Wilkinson "2-Way" Splitter Card	PJ500M-CSPL-IN	1.1	4
R.F. Power Amplifier Module	PJ1KRF	1.3	4
Wilkinson "4-Way" Combiner Card	PJ500M-CCMB-OUT	1.2	4
Input Directional Coupler Card	CSMPIPJ5MCL	1.2	4
LPF+MEAS		1.0	4
	CSB1		
	CSBLFPJ1KM		
	CSLPFPJ1KM		
	CSDCLPFPJ1KM		
Output Directional Coupler Card	DRCPPJ1KM (Before January 2002)	1.1	4
Low Pass Filter	PJ1KLPF (Before January 2002)	1.1	4
Switching Power Supply	PSSW5020B	1.2	6
Soft Start Card	CSSOFTS	1.1	4
Bias Control Card (New Version)	CSBIASPJ5M01	1.3	6
Bias Control Card (Old Version)	CSBIASPJ5MCL01	1.1	4
CPU Section e Protection Card	CSPROTF	1.3	10
External Telemetry Card	CSPWRGDPSS01	1.1	4
Scheda Viti Passanti	CSFILPS	1.0	4
Scheda filtraggio EMI	CSADPCNPRTPJ	1.0	4

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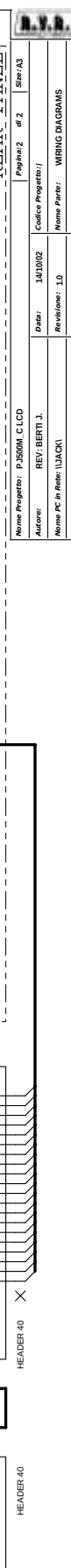


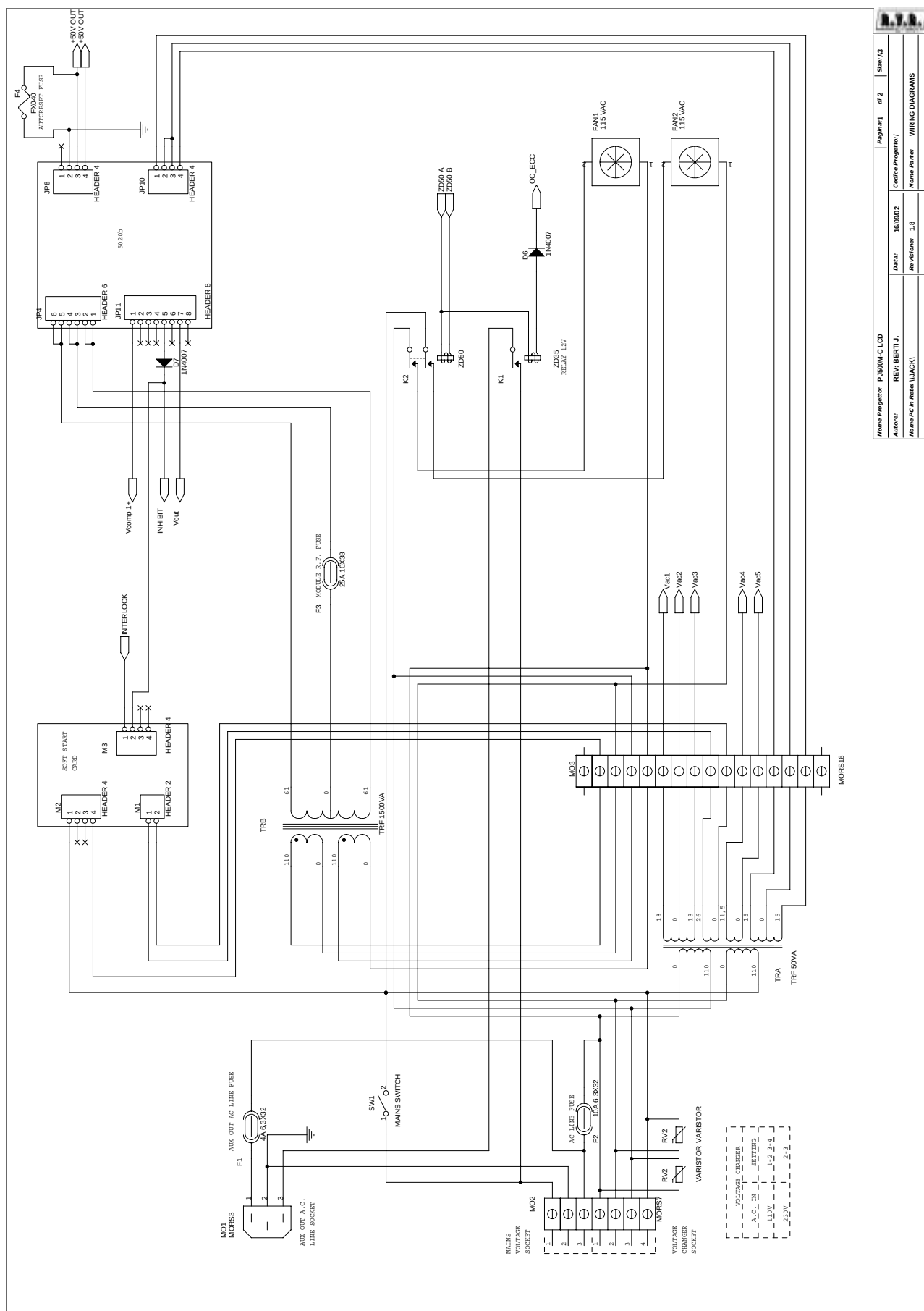
Nome Progetto:	PJ500M-C LCD	Page:	1	di 2	Sheet:	A3
Autore:	REV: BERTI J.	Data:	07/05/02	Cartella Progetto:		
Nome PC in Rete:	UACK	Revisione:	1.7	Nome File:	WIRING DIAGRAMS	
File/Carrello:		Autore:		Cartella:		





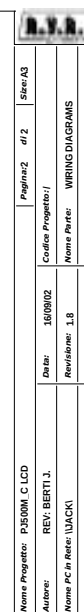
Nome Progetto: P.500M-C LCD	Page: 1	d. 2	Size: A3
Autore: REV. BERTI J.	Date: 14/10/02	Codice Progetto: I	
Nome PC in Rete: (LJACK)	Revisione: 1.0	Nome Parte: WIRING DIAGRAMS	
File/ Cartella: I:\MANUALI\PROGETTI\PJ500M-C\PJ500M-C.DWG	Autore/Revisione:	Codice:	



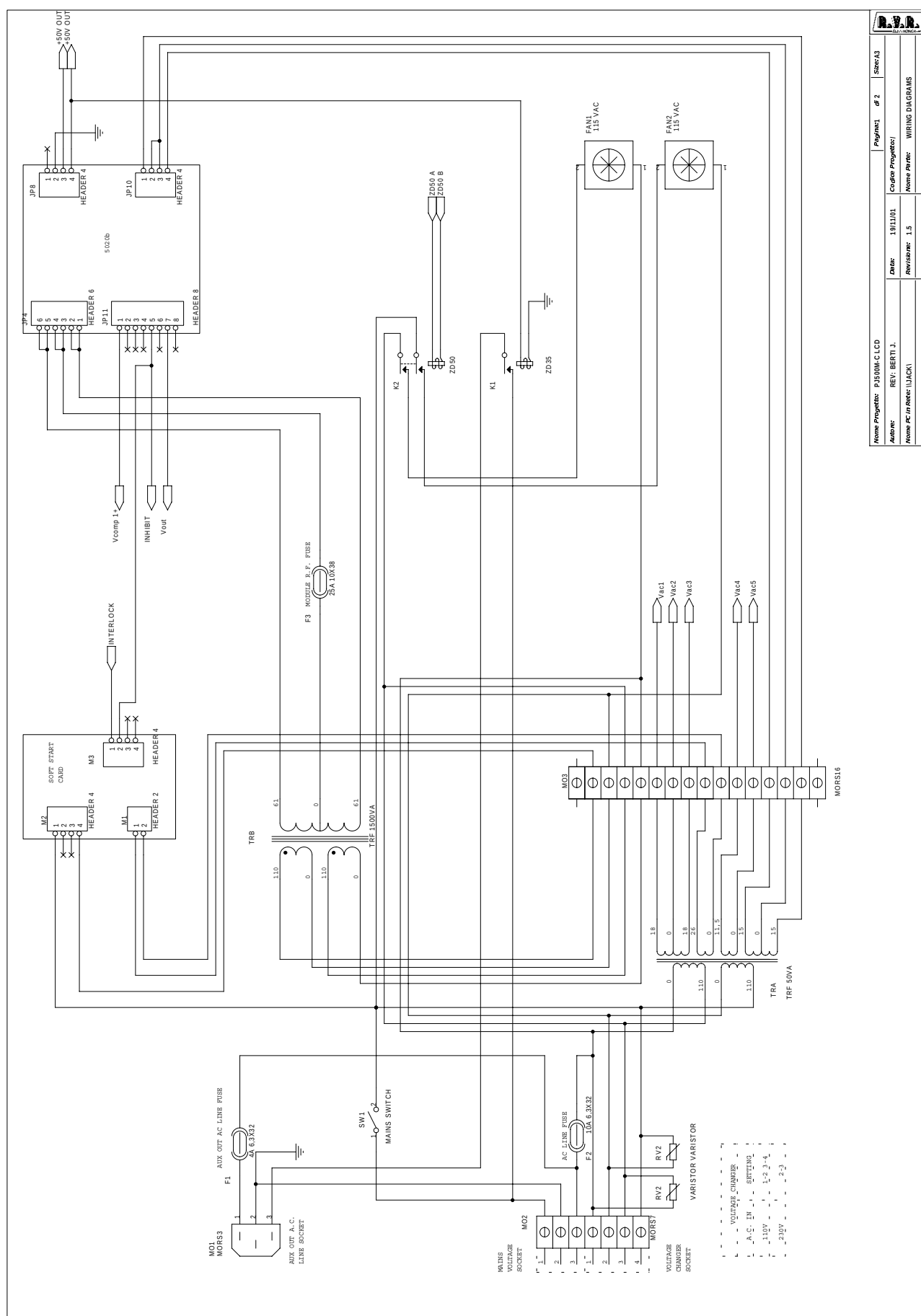


Versione precedente, solo per riferimento

Former version, for reference only

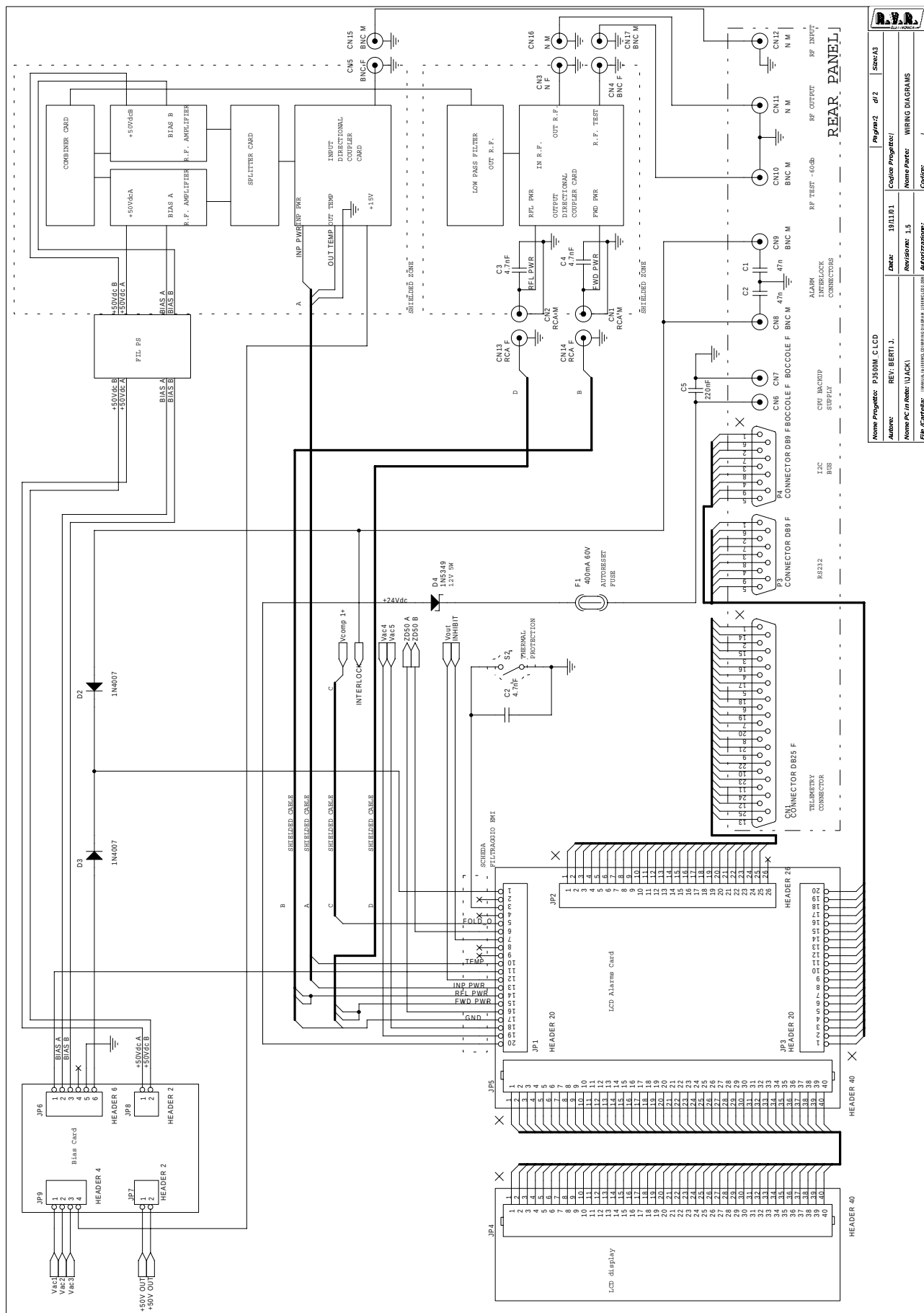


Technical Appendix



Versione precedente, solo per riferimento

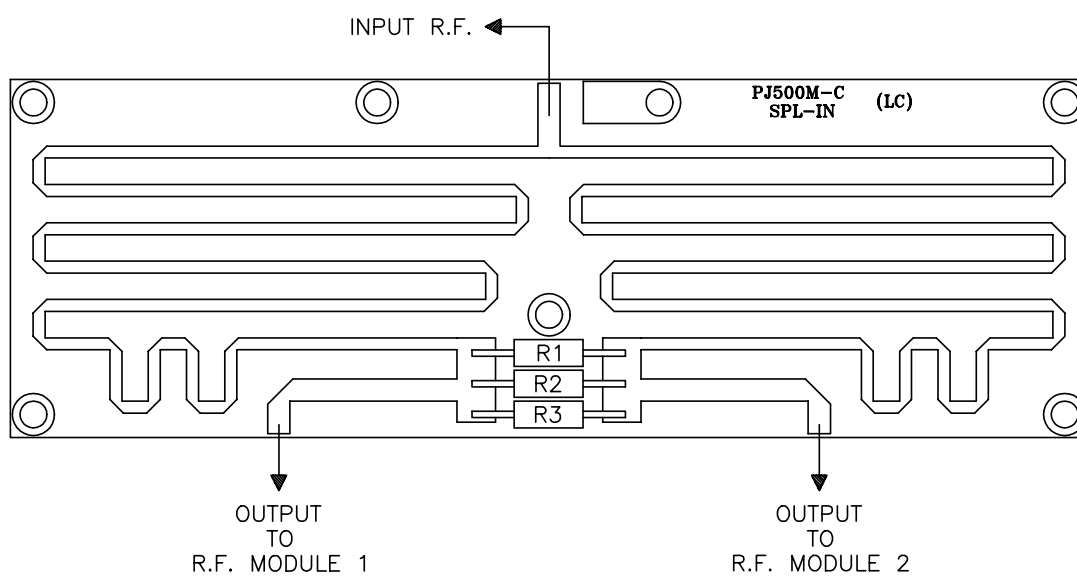
Former version, for reference only



R.V.R.	
Nome Progetto: PJ500M C LCD	Revisione: 1.5
Autore: REV BERTI J.	Autore: NOME PAPER
Nome PC in Rete: UACCI	Nome PC in Rete: UACCI
File Control:	File Control:
Revisione: 1.5	Revisione: 1.5
Nome Progetto: PJ500M C LCD	Nome Progetto: PJ500M C LCD
Autore: REV BERTI J.	Autore: NOME PAPER
Nome PC in Rete: UACCI	Nome PC in Rete: UACCI
File Control:	File Control:

Versione precedente, solo per riferimento

Former version, for reference only



DENOMINAZIONE
Wilkinson "2-Way" Splitter Card Component Layout / Piano di Montaggio
DISPOSITIVO

SEMILAVORATO

MATERIALE

TRATTAMENTO

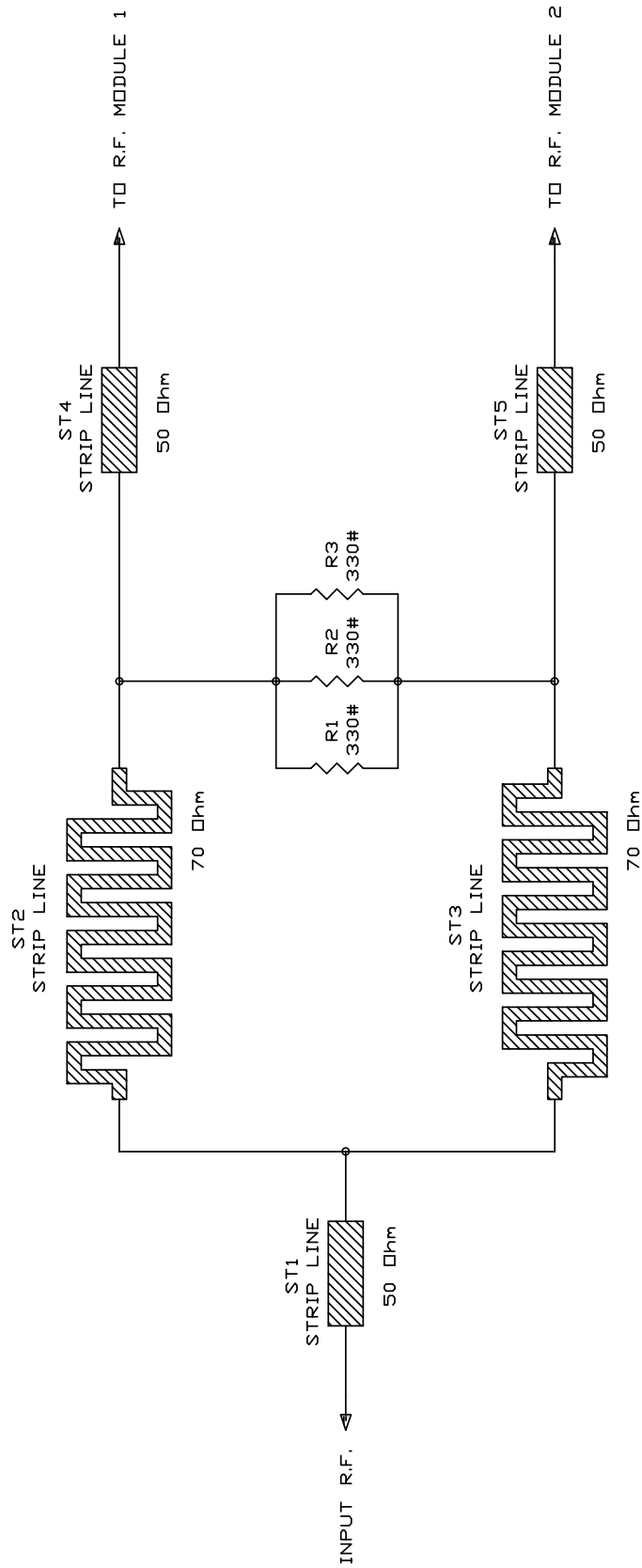
DISEGNATO

D'Alessio D. li 10/02/97

SCALA

DISEGNO

TAVOLA n di



R.V.R. Elettronica S.r.l. (Bo)

Title
Wilkinson "2-Way" Splitter Card

Size
A4

Document Number

REV

Date: February 10, 1997 Sheet of



Splitter Card Bill of Materials
Item Qty Reference

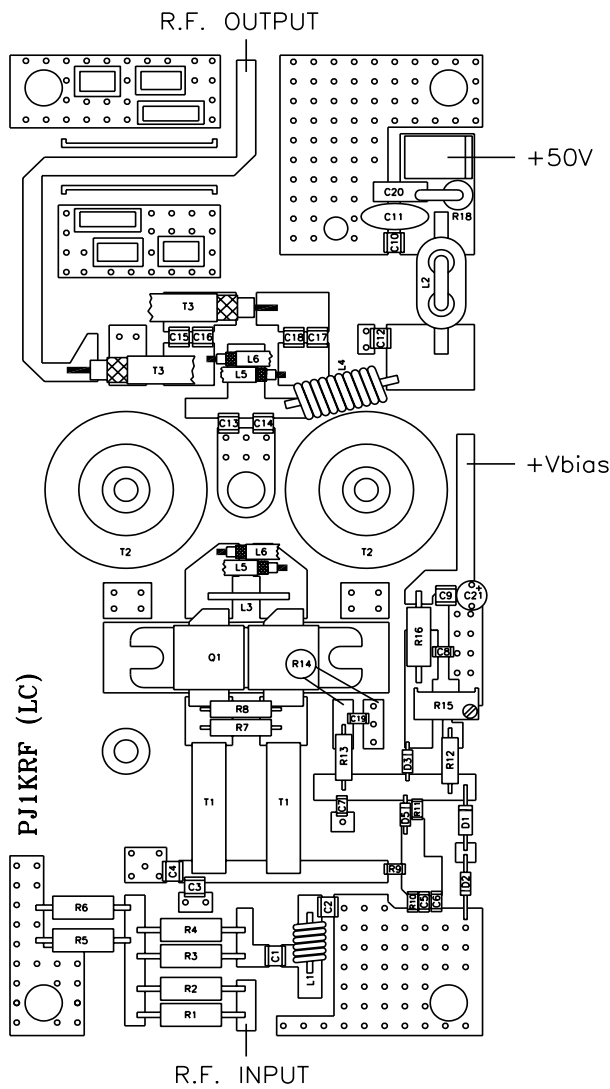
Part DESCRIPTION

PART ORDER CDE

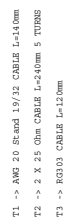
1	3	R1,R2,R3	330# RESISTOR 2W
2	5	ST1,ST2,ST3 ST4,ST5	STRIP LINE

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Nome Progetto		Pagina	di	Size
PJ500M LCD		1	1	A4
Autore		Data		Codice Progetto
D'ALESSIO D. - REV. BERTI J.		16/09/02		/
Nome PC in Rete		Revisione		Nome Parte R.F. POWER AMPLIFIER MODULE LAYOUT
\\JACK\		1.2		
File/Cartella		Autore		Codice
MANUAL\PJ500M LCD\MODULE_3LAYER.DWG		PJ1KRF		
Scale		Trattamento		Profilo
1:1		/		/



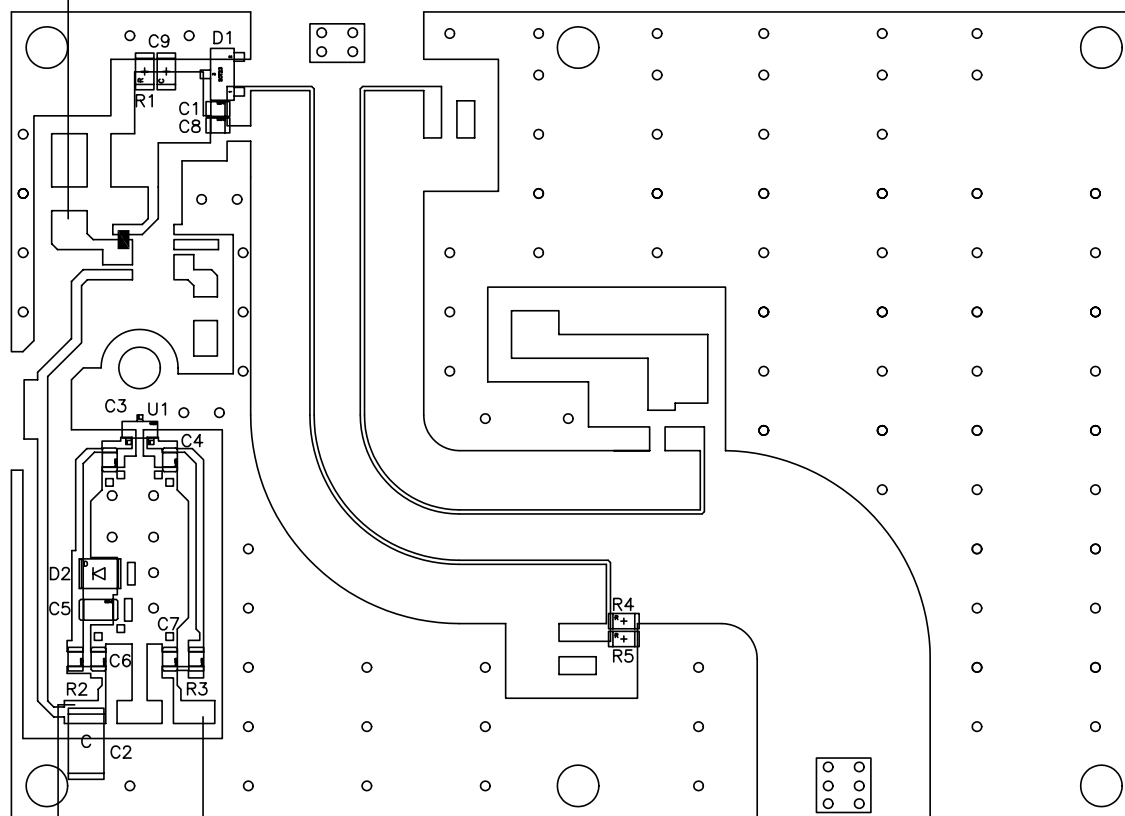
Name Progetto: PJ500M VERS. LCD		Pagina: 1 di 1		Size: A3	
Autore:	REV.: BERTI J.	Data: 16/09/02 Revisione: 1.2 Nome File: PJ500M PC in Rete (JACK) Autografo: 	Cliente Progetto: / Nome Parte: PFI POWER AMPLIFIER MODULE Codice: P11WR6		

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	
6	1	R12	270H 1W	RESISTOR 1W	
7	2	R5,R6	820#	RESISTOR 2W	
8	1	R11	1KCH	CHIP RESISTOR	
9	1	R10	1K5CH	CHIP RESISTOR	
10	1	R13	8K2 1%	RESISTOR 1/4W 1%	
11	1	R14	10KNTC	NTC	
12	1	R15	M1K	TRIMMER MULTIGIRI	
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	L64.5RVR0.7	6 SP DIA 4.5 RAME SMAL 0.7mm	
21	1	L4	L105RVR2	10 SP DIA 5 F 2mm	
22	1	L3	BU6012RVR2	BOB L60MM D12 FILO ARG 2MM	
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	1N4004	SILICON DIODE 400V	
27	1	D1	1N5342B	SILICON DIODE	
28	1	Q1	BLF278	VHF PUSH-PULL POWER MOS	
29	1	C21	470nF 25V	ELECTROLITIC CAPACITOR	

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FWD PWR



+15V

OUT TEMP



DENOMINAZIONE
Component Layout Misuratore Potenza Ingresso

DISPOSITIVO
PJ500M-C Vers. LCD

MATERIALE

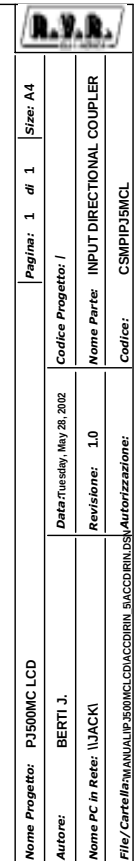
DISEGNATO
D'Alessio D. li 09/06/2000

DISEGNO
CSMPIPJ5MCL

TRATTAMENTO

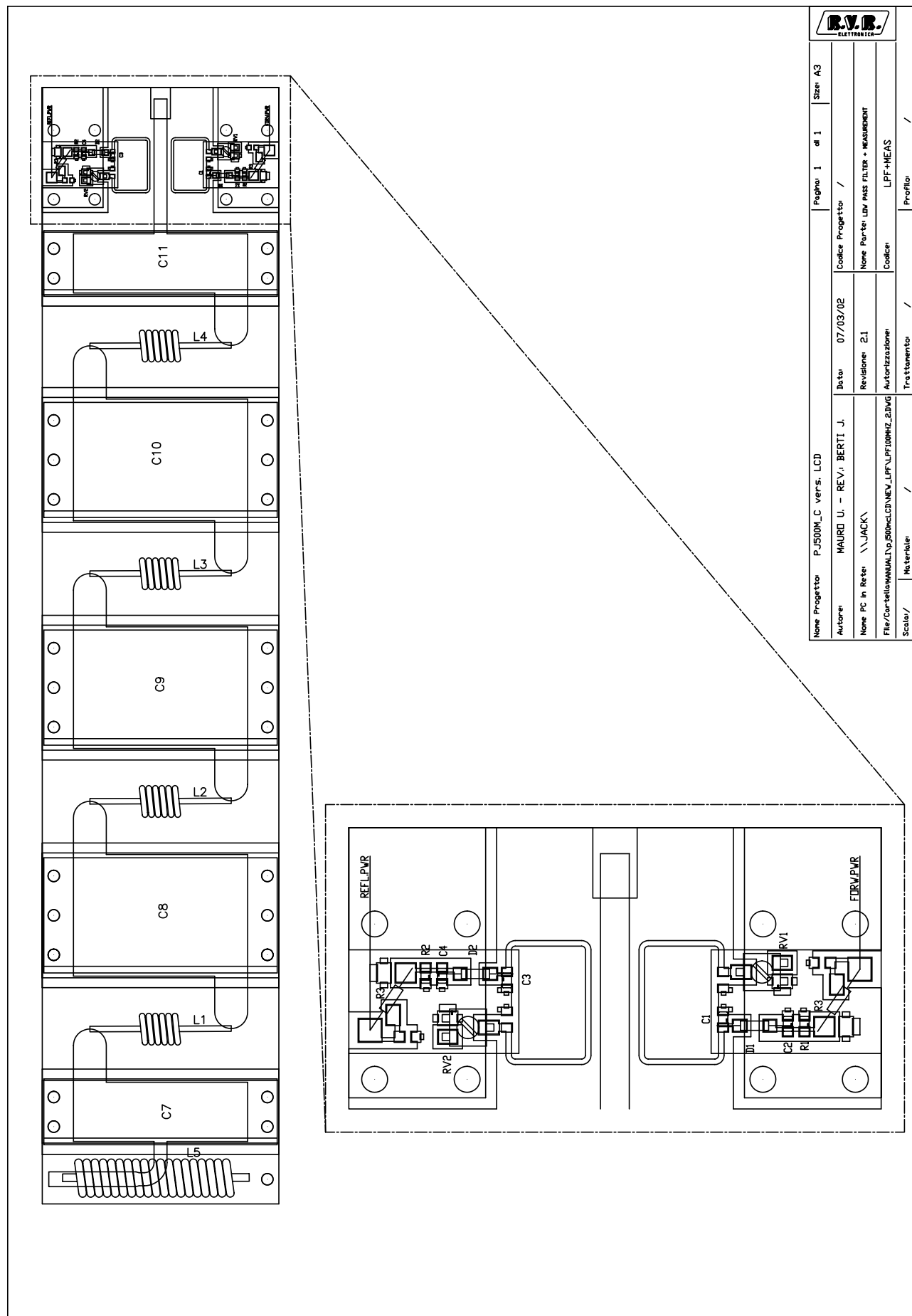
SCALA

TAVOLA n di

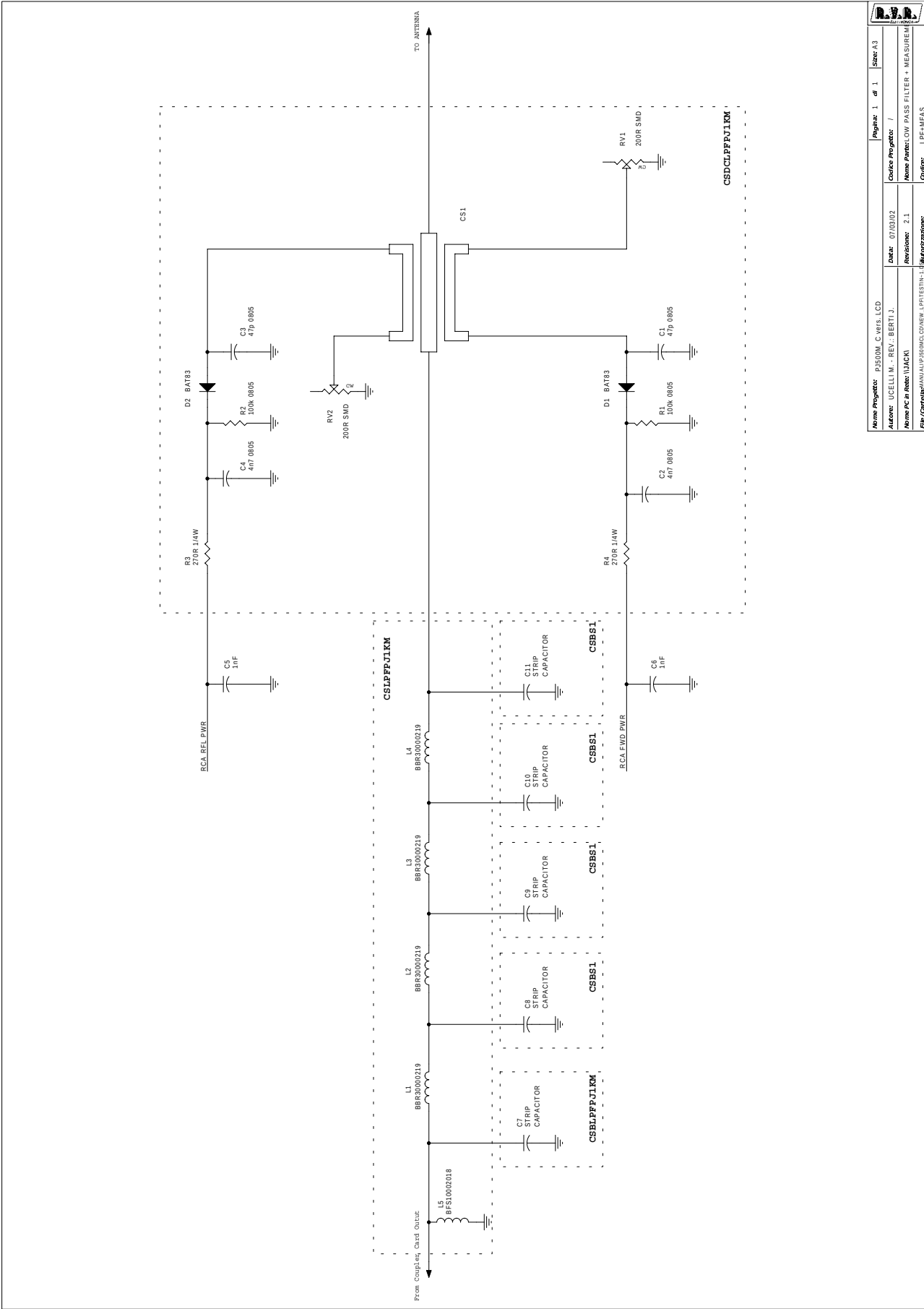


CSMPOPJ5MCL Bill Of Materials					Page	1
Item	Q.ty	Reference	Part	DESCRIPTION		
1	1	R1	4K7CH	CHIP RESISTOR 0805		
2	1	R2	220CH	CHIP RESISTOR 0805		
3	1	R3	51CH	CHIP RESISTOR 0805		
4	2	R4, R5	150H	CHIP RESISTOR 0805		
5	3	C1, C8, C9	15PFCH	CHIP RESISTOR 0805		
6	1	C2	10uFCH	16V TANTALIUM CHIP CAPACITOR		
7	1	C5	470NFCH	CHIP CAPACITOR 1206		
8	4	C3, C4, C6, C7	4N7FCH	CHIP CAPACITOR 0805		
9	1	D1	HP2800	DIODE SMD SOT23		
10	1	D2	Z9V1	ZENER DIODE		
11	1	U1	LM50CIM3	TEMPERATURE SENSOR		
12	1	C9	6P8FCH	CHIP CAPACITOR HQ		

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Nome Progettista PJ500M_C vers. LCD		Pagina 1	di 1	Size: A3
Autore:	MAURO U. - REV: BERTI J.	Codice Progettista /		
Nome PC in Rete:	\\JACK\	Revisione:	2.1	Nome Parte: LOW PASS FILTER + MEASUREMENT
File/Cartella/ANAL/Dp500mLCD/REV/LPF/LPF100MHZ_2.DWG		Autore/Revisione:	LPF+MEAS	
Scala:	Notefiler	Trattamento:	/	Profilo /



		Page: 1		di 1	Size: A3
Nome Progetto: PJ500M C.wts.LCD		Data: 07/03/02		Nome Progetto: /	
Autore: UCCELLI M. - REV. BERTI J.		Revisione: 2.1			
Nome PC e Nome U: JACK		Autore: L.P.F.+M.E.A.S.			
File Controlli: MANI.ALP.DSMCL.DNEW.LPRTSTN-1.L		Controlli: L.P.F.+M.E.A.S.			

PJ500M_C vers. LCD

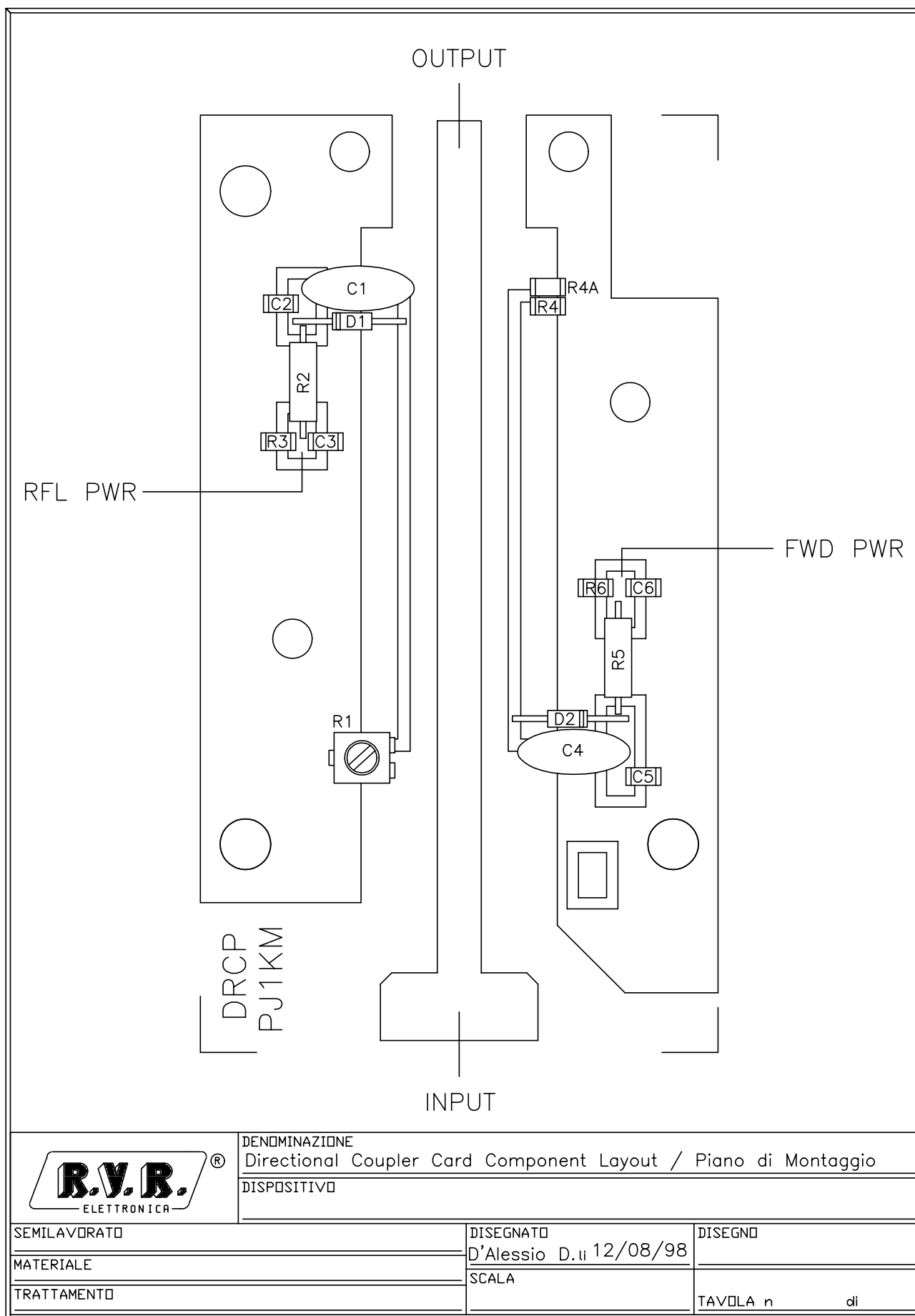
Bill Of Materials

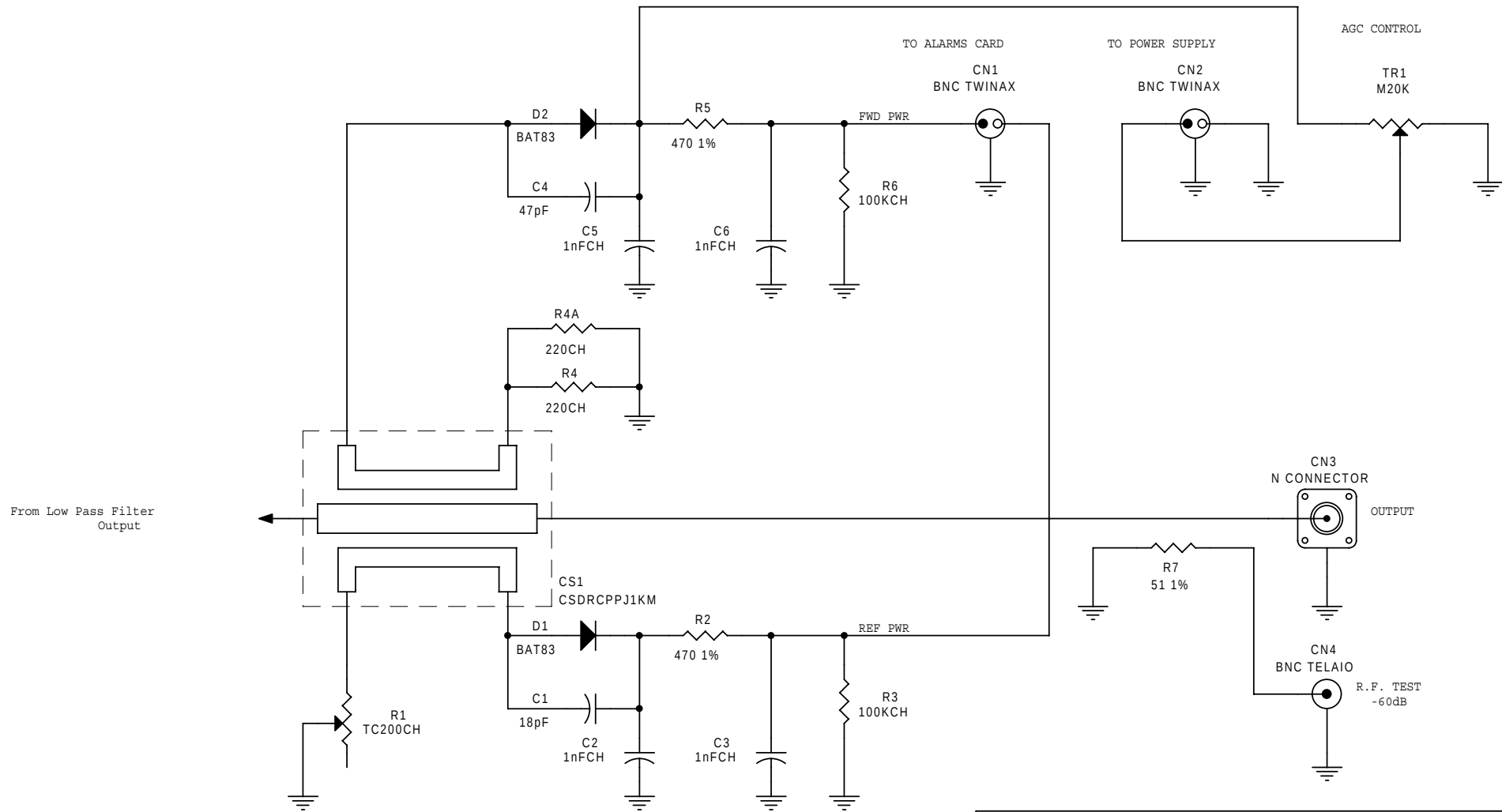
Page1

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 1/4W

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R.V.R. Elettronica S.r.l. (Bo)

Title
Directional Coupler Card Circuit DiagramSize
Custom Document Number

Rev

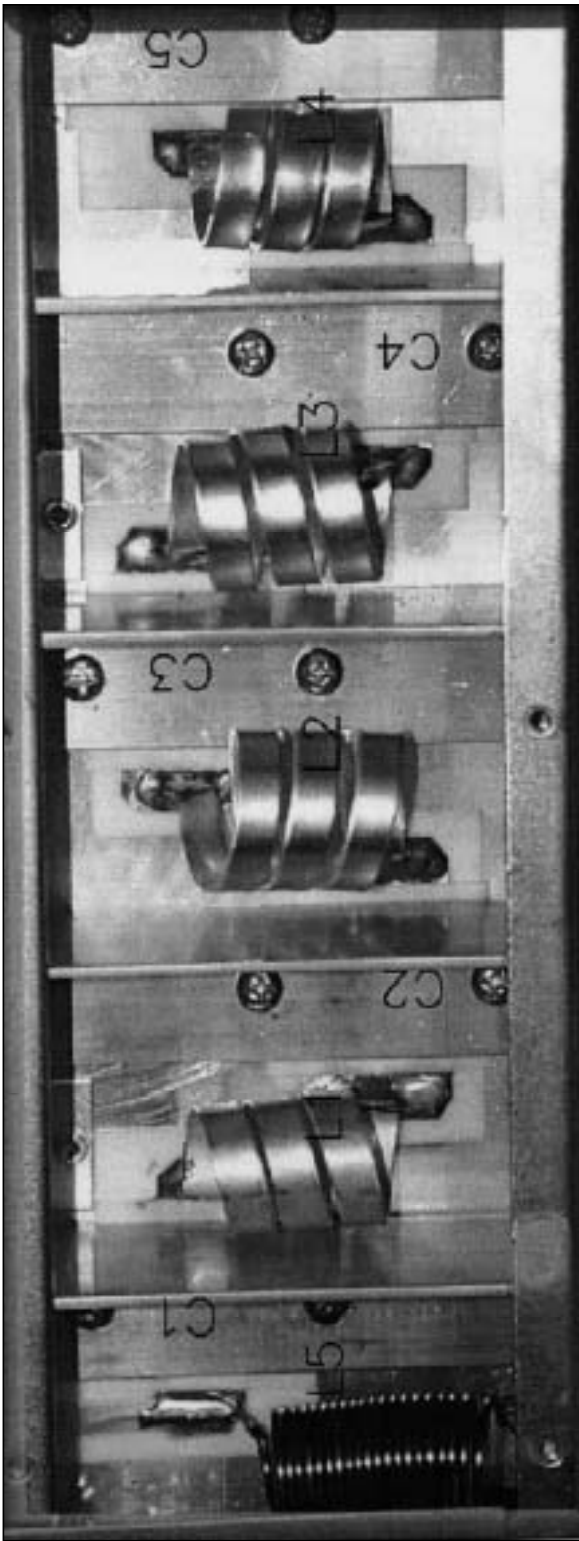
Date: Tuesday, December 05, 2000

Sheet 1 of 1

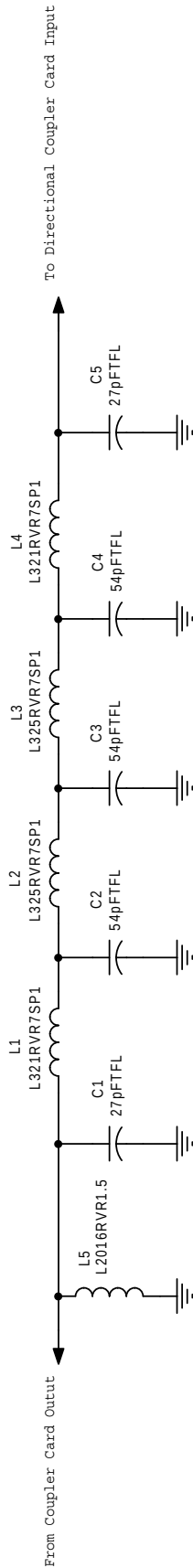
Item	Quantity	Reference	Part	DESCRIPTION	PART ORDER CODE
1	1	R7	51 1%	RESISTOR 1/4W 1%	
2	2	R4A,R4	220CH	CHIP RESISTOR	
3	2	R2,R5	470 1%	RESISTOR 1/4W 1%	
4	2	R3,R6	100KCH	CHIP RESISTOR	
5	1	R1	TC200CH	TRIM.REG.VER.CERMET SMD	
6	1	TR1	M20K	TRIMMER MULTIGIRI	
7	1	C1	18PF	CERAMIC CAPACITOR NP0	
8	1	C4	47PF	CERAMIC CAPACITOR NP0	
9	4	C2,C3,C5,C6	1NFCH	CERAMIC 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	CSDRCPJ1KM	CS DIR.COUPLER PJ1KM	

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



R.V.R. ELECTRONICA 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

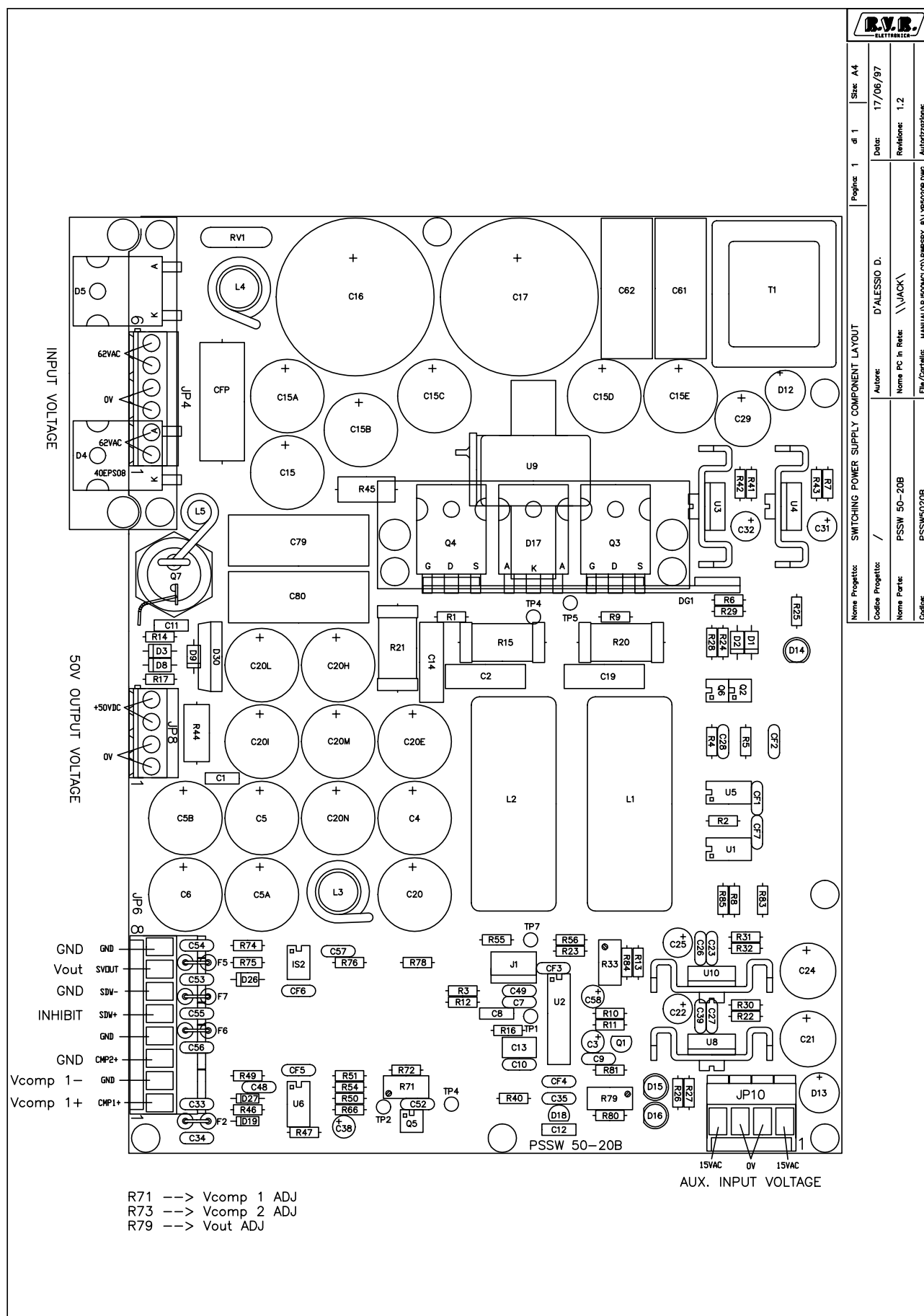
Bill Of Materials

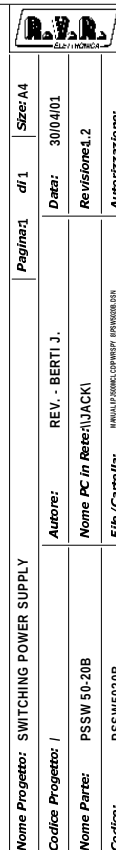
Page 1

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	

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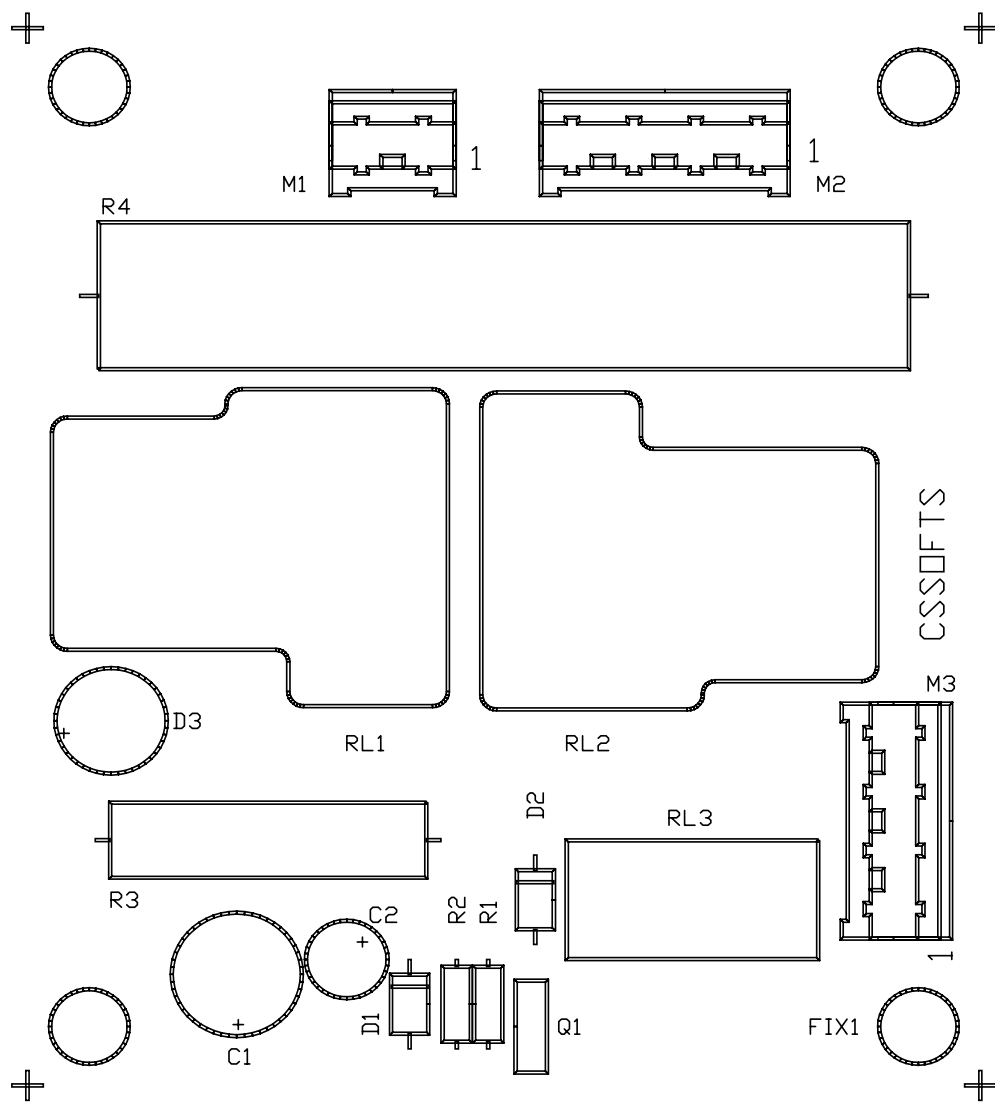


Item	Quantity	Reference	Part
1	1	CFP	1UF/250V
2	9	CF7, C23, C26, C27, C35, C39, C49, C52, C57	CM.1UF
3	2	C1, C12	CP.1UF
4	3	C2, C14, C19	MKP1NF/600
5	2	C3, C58	1UF/25
6	4	C4, C5, C6, C20	EKE1000/63
7	1	C7	1KPF
8	1	C8	CP10NF
9	8	C9, C33, C34, C48, C53, C54, C55, C56	100PF
10	1	C10	CM.33UF
11	1	C11	CP.22UF
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	1	C38	2.2UF/16
23	1	C50	1/16
24	2	R35, C60	NC
25	2	D1, D2	11DQ04
26	1	D3	27V/1W
27	3	D4, D5, D30	40EPS08

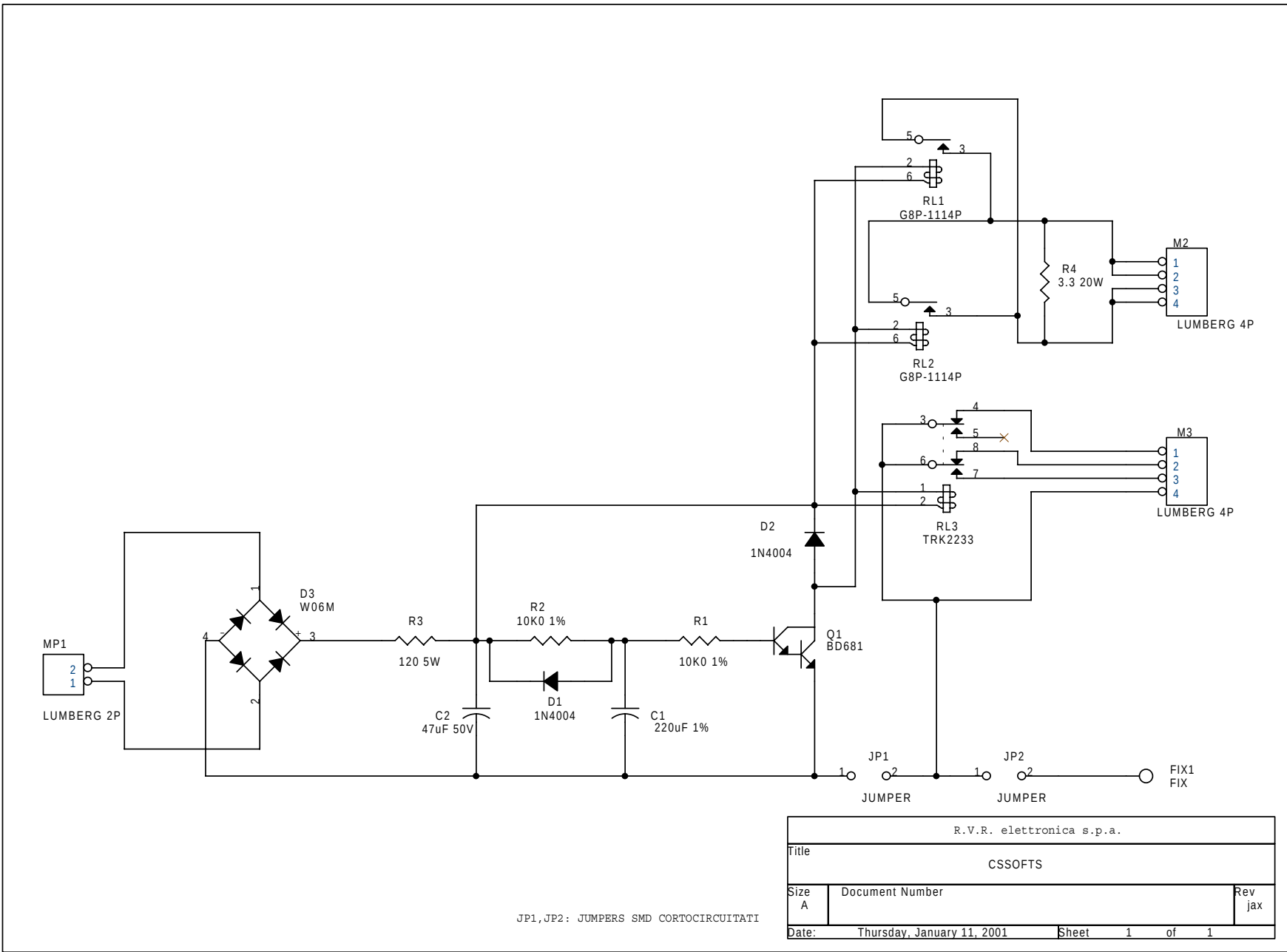
28	1	D8	30V/1W
29	4	D9, D10, D11, D26	1N4004
30	2	D12, D13	WL02
31	3	D14, D15, D16	LED V
32	1	D17	HFA50PA60C
33	1	D18	LM336-5V
34	4	D19, D27, D28, D29	1N4148
35	4	F2, F5, F6, F7	BL02
36	2	IS1, IS2	4N26
37	1	JP4	KRA6
38	1	JP5	STRIP
39	1	JP6	KB8
40	1	JP8	KRA4
41	1	JP10	KB4
42	2	L1, L2	140UH
43	2	L3, L4	BFV0720
44	1	L5	BFV0710
45	1	Q1	BC237
46	2	Q2, Q5	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	2	R47, R49	40K2
83	1	R51	10K
84	1	R54	180R
85	1	R55	301R
86	1	R56	511R
87	1	R66	549R

88	1	R71	87W/5K
89	1	R72	2K21
90	3	R76, R82, R83	1M
91	1	R77	87W-10K
92	1	R78	47K5
93	1	R79	87W-500R
94	1	R81	2K43
95	6	TP1, TP2, TP5, TP4/M, TP4, TP7	TP
96	1	T1	15V
97	1	U1	HCPL2611
98	1	U2	UC3823
99	3	U3, U4, U8	LM317
100	1	U5	TC427
101	2	U6, U7	LM358
102	1	U9	HTP50
103	1	U10	LM337
104	20	C41, C40, C51, C47, C46, C45, F3, R60, R64, R63, JP9, Q8, R70, R73, R69, R58, D20, D23, U11, TP3	NC



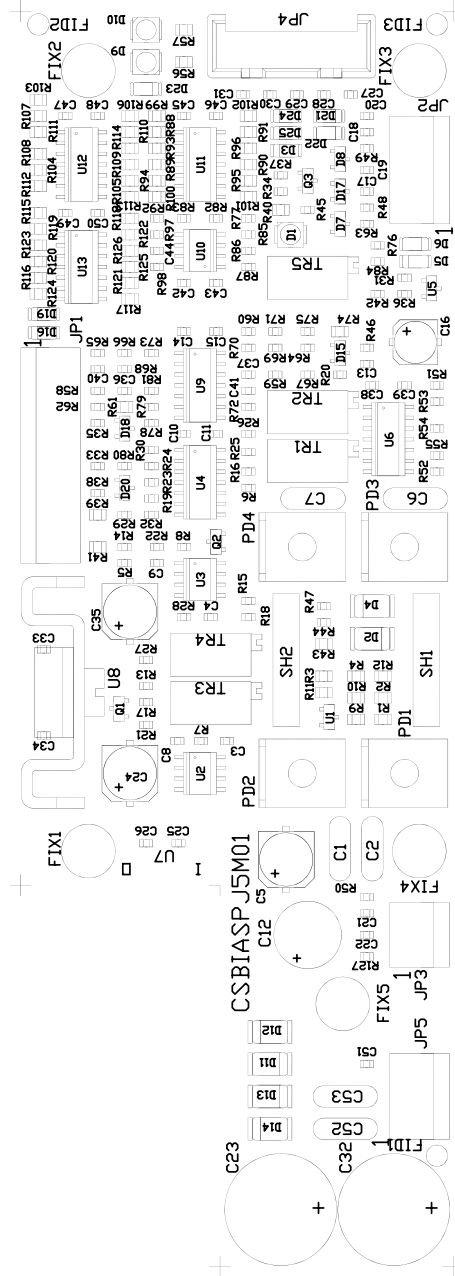
	DENOMINAZIONE soft start		
	DISPOSITIVO		
SEMILAVORATO	DISEGNATO D'Alessio D. li 4/12/00	DISEGNO	
MATERIALE	SCALA	TAVOLA n 1 di 1	
TRATTAMENTO	1:1		



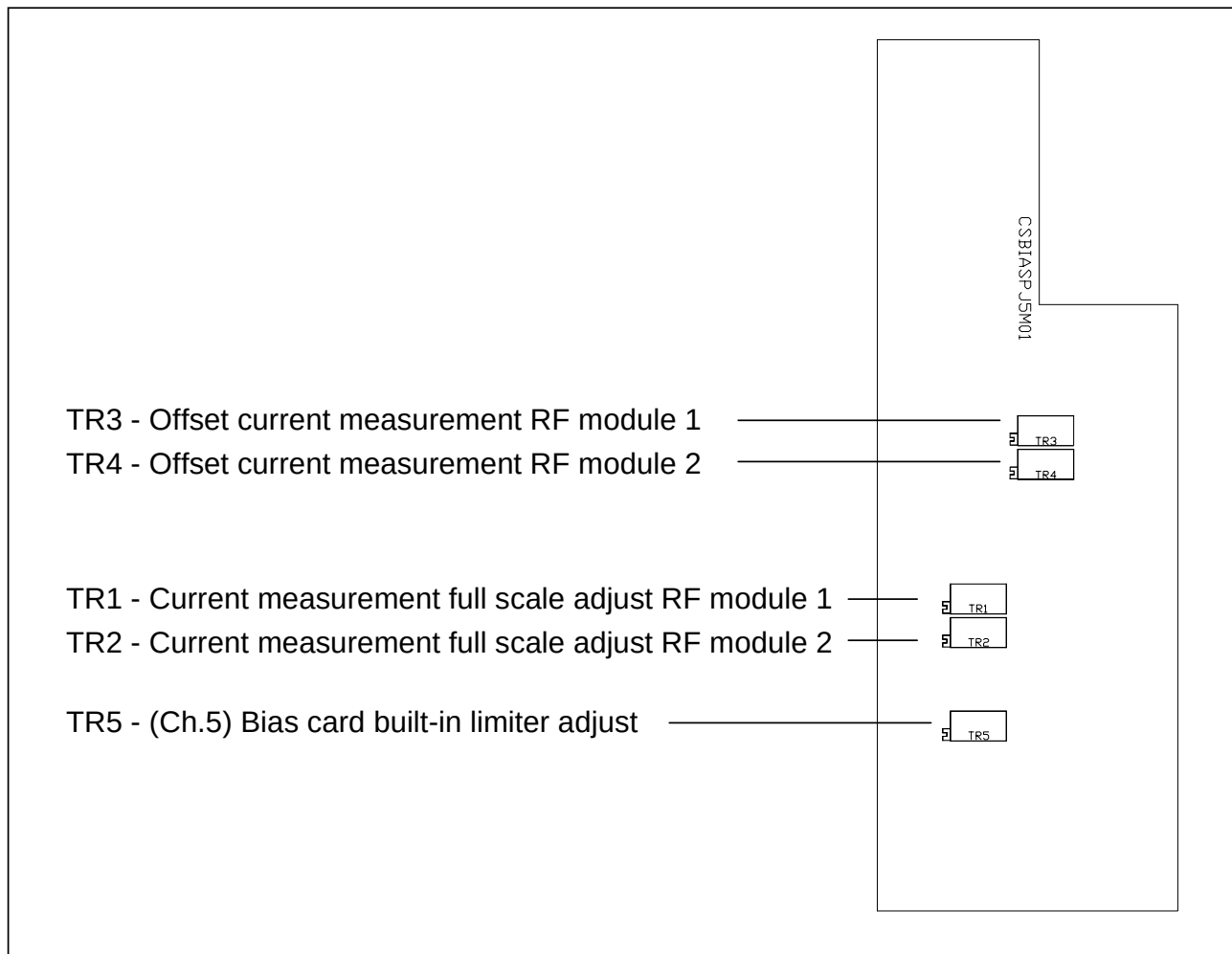
Item	Quantity	Reference	Part	
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2	1	C2	47UF 50V	COND. ELETTR.
3	2	D1,D2	1N4004	DIODO AL SILICIO
4	1	D3	W02M	PONTE DI DIODI
5	1	FIX1	FIX	
6	2	JP1,JP2	JUMPER 2P	
7	1	M1	LUMBERG 2P	MORS. 2 PIN
8	2	M2,M3	LUMBERG 4P	MORS. 4 PIN
9	1	Q1	BD681	TRANSISTOR
10	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

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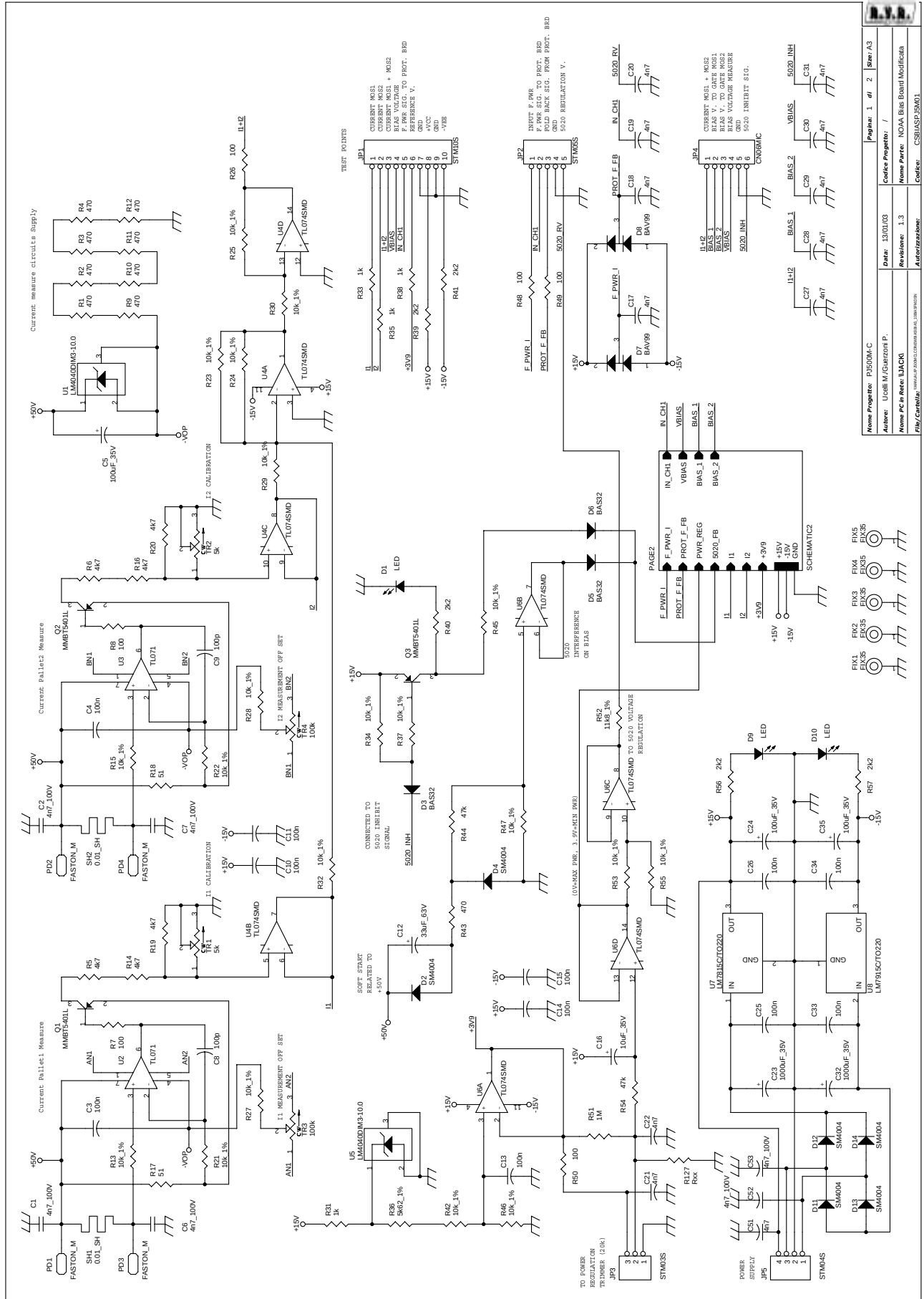


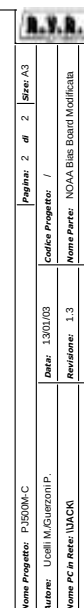
								
Nome Progetto		PJ500M-C	Pagina	1	di	1	Size	A4
Autore	REV. BERTI J.		Data	19/11/01				
Nome PC in Rete	\\JACK		Revisione	1.0				
File/Controlli	\\MANUALI\PJ500M\CD\NEWBIAS\BIAS\LAY\OUT\JP4\for\orizzazione		Nome Parte	MODIFIED NDA4 BIAS BOARD				
Scala/	Materiali /		Codice	CSBIASPJ5M01				
			Trattamento	/				
			Profilo	/				



Notes:

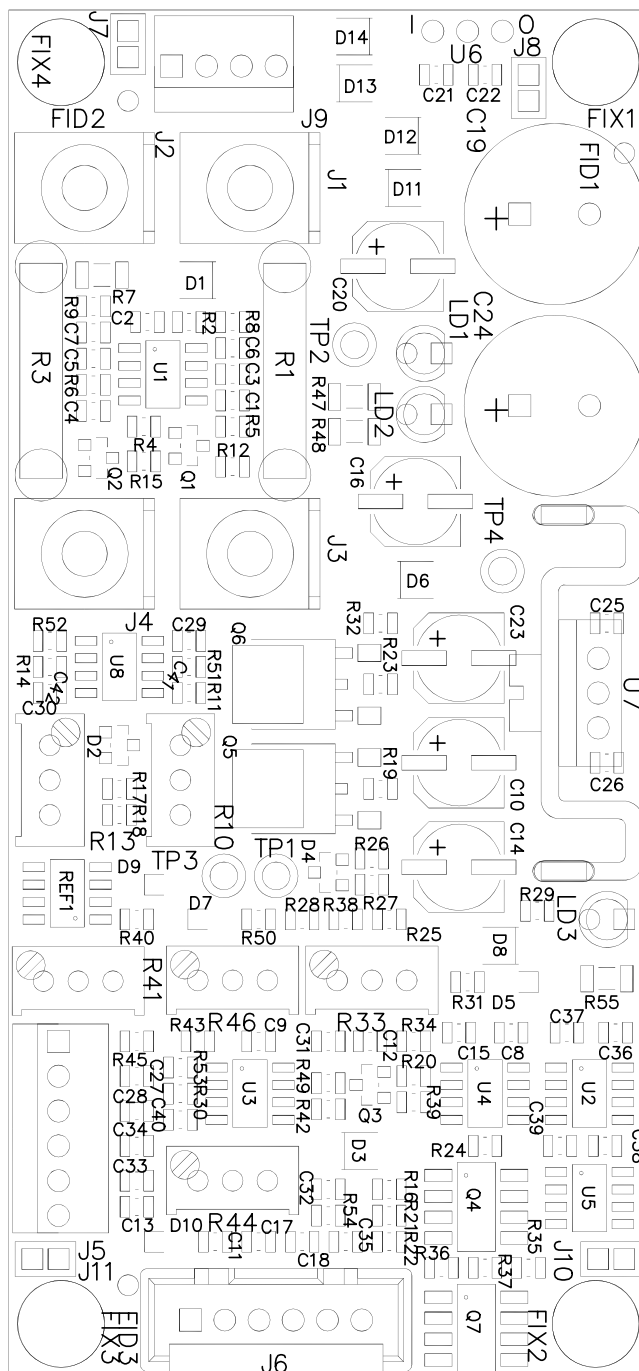
- TR1, TR2, TR3, and TR4 are not supposed to be user-adjustable components. They should only be adjusted by skilled personnel for maintenance.
- TR3 and TR4 are used to adjust the offset of the measurement of the current, that is the value measured when $I=0$. Adjust the trimmers so that the voltages on test points I1 and I2 on JP1 are 0V.
- TR1 and TR2 are used to adjust the full scale of the measurement of the current, that is the value measured when $I=10.5A$. Adjust the trimmers so that the voltages on test points I1 and I2 on JP1 are 4.0V.
- TR5 adjusts the power limiting built-in in the bias card. It is factory adjusted at 560W. To change it, turn the "PWR ADJ." trimmer on the completely clockwise (so that the AGC doesn't affect the system). Use adjust the exciter's power at 10W. Adjust TR5 to obtain the desired limiting value. Turning the trimmer counterclockwise rises the limiting value. Note that this trimmer's adjusting influences the value displayed by the CPU. This adjustment shall be performed using an external wattmeter, and after this operation the trimmer for the adjustment of the measurement in the CPU shall be readjusted.





Item	Q.ty	Reference	Part
1	6	C1,C2,C6,C7,C52,C53	4n7_100V
2	23	C3,C4,C10,C11,C13,C14, C15,C25,C26,C33,C34,C38, C39,C40,C41,C42,C43,C45, C46,C47,C48,C49,C50	100n
3	3	C5,C24,C35	100uF_35V
4	2	C8,C9	100p
5	1	C12	33uF_63V
6	1	C16	10uF_35V
7	12	C17,C18,C19,C20,C21,C22, C27,C28,C29,C30,C31,C51	4n7
8	2	C23,C32	1000uF_35V
9	2	C37,C36	Cxx
10	1	C44	1n
11	3	D1,D9,D10	LED
12	6	D2,D4,D11,D12,D13,D14	SM4004
13	3	D3,D5,D6	BAS32
14	2	D7,D8	BAV99
15	4	D15,D17,D18,D20	HSMS2800
16	3	D16,D21,D24	9V1SMD
17	3	D19,D22,D25	10VSMD
18	1	D23	5V1SMD
19	5	FIX1, FIX2, FIX3, FIX4, FIX5	FIX35
20	1	JP1	STM10S
21	1	JP2	STM05S
22	1	JP3	STM03S
23	1	JP4	CN06MIC
24	1	JP5	STM04S
25	4	PD1, PD2, PD3, PD4	FASTON_M
26	3	Q1,Q2,Q3	MMBT5401L
27	9	R1,R2,R3,R4,R9,R10,R11, R12,R43	470
28	8	R5,R6,R14,R16,R19,R20, R62,R76	4k7
29	10	R7,R8,R26,R48,R49,R50, R60,R77,R81,R98	100
30	35	R13,R15,R21,R22,R23,R24, R25,R27,R28,R29,R30,R32, R34,R37,R42,R45,R46,R47, R53,R55,R63,R64,R68,R69, R71,R75,R79,R80,R83,R84, R85,R86,R87,R92,R97	10k_1%
31	2	R17,R18	51
32	6	R31,R33,R35,R38,R66,R73	1k
33	1	R36	5k62_1%
34	42	R39,R40,R41,R56,R57,R74, R88,R89,R90,R91,R93,R94, R95,R96,R99,R100,R101, R102,R103,R104,R105,R106, R107,R108,R109,R110,R111, R112,R113,R114,R115,R116, R117,R118,R119,R120,R121, R122,R123,R124,R125,R126	2k2
35	3	R44,R54,R78	47k
36	1	R51	1M

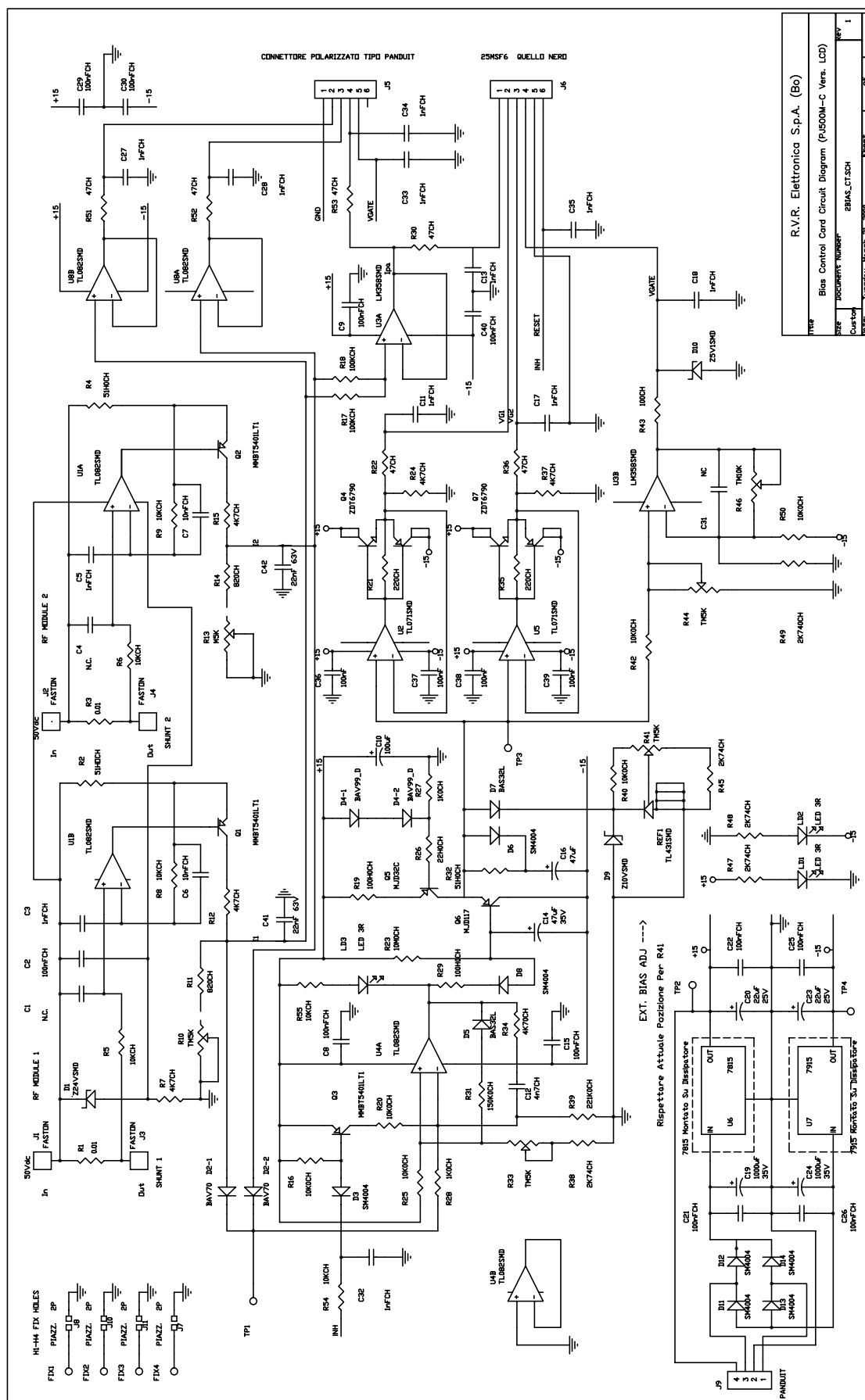
37	2	R52,R72	11k8_1%
38	3	R58,R59,R127	Rxx
39	1	R61	604H
40	2	R67,R65	0R
41	1	R70	47k_1%
42	1	R82	59k_1%
43	2	SH1,SH2	0.01_SH
44	2	TR1,TR2	5k
45	2	TR3,TR4	100k
46	1	TR5	20k
47	2	U1,U5	LM4040DIM3-10.0
48	2	U2,U3	TL071
49	6	U4,U6,U9,U11,U12,U13	TL074SMD
50	1	U7	LM7815C/TO220
51	1	U8	LM7915C/TO220
52	1	U10	TL072SMD



	DENOMINAZIONE		SCHEDA CONTROL BIAS M-C VERS.LCD
	DISPOSITIVO		CSBIASPJ5MCL01
SEMILAVORATO	DISEGNATO	DISEGNO	
MATERIALE	li		
TRATTAMENTO	SCALA	TAVOLA n di	

Versione precedente, solo per riferimento

Former version, for reference only



Versione precedente, solo per riferimento

Former version, for reference only

Bias Control Card Bill Of Materials

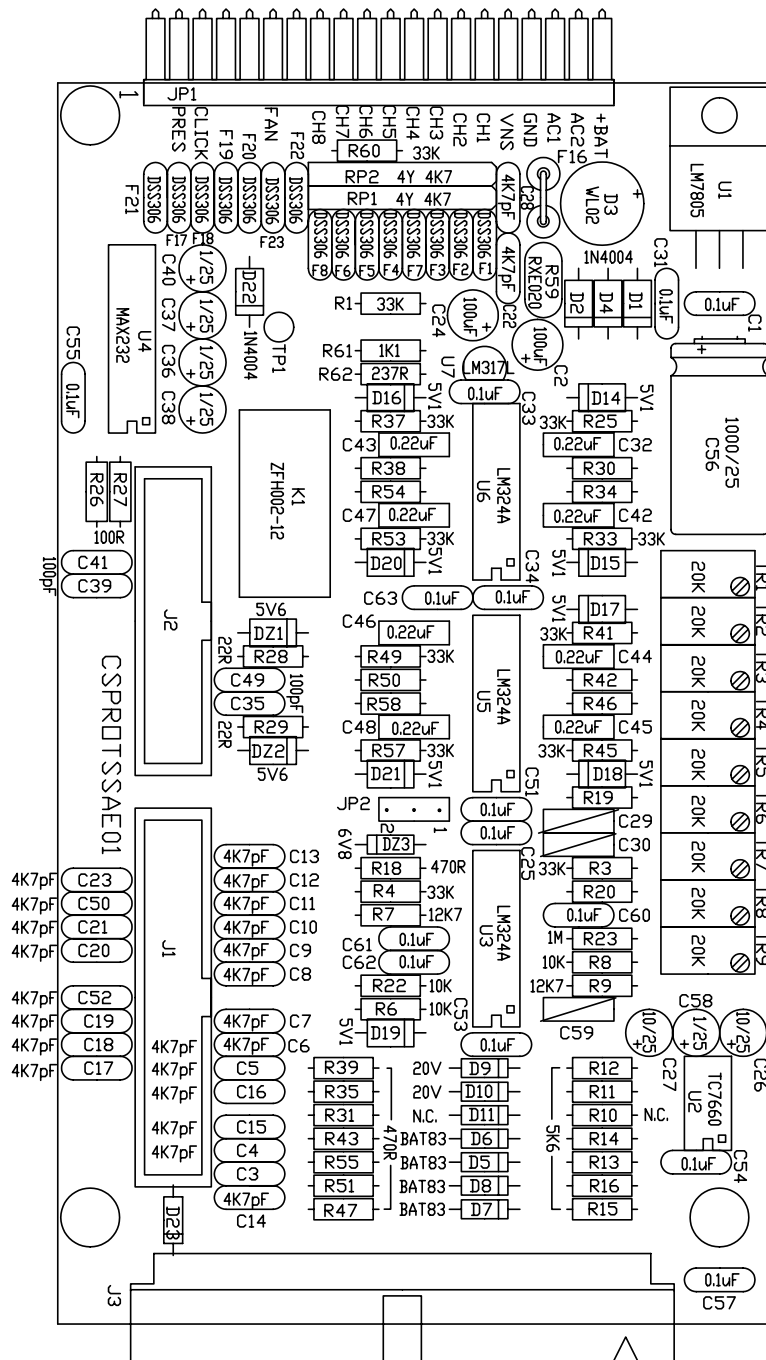
R.V.R. Elettronica s.p.a. (BO)

Item Q.tyReference Part

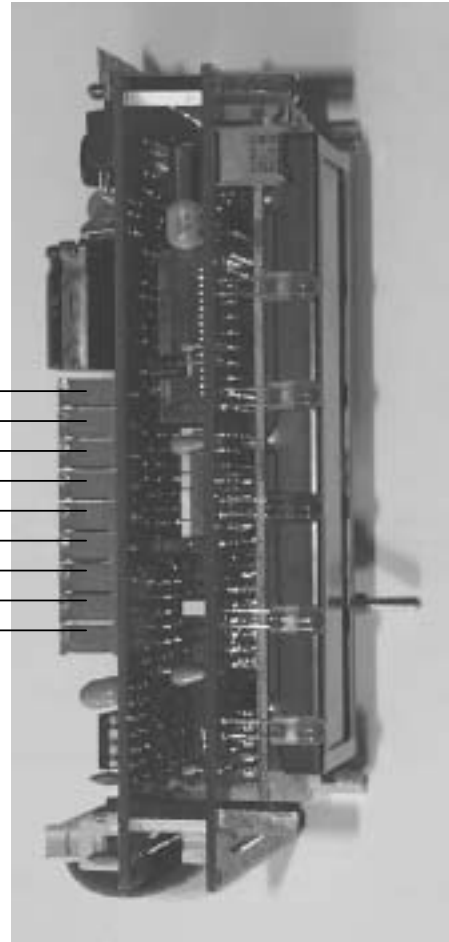
1	12	C3,C34,C35, 1nFCH C5,C11,C13, C17,C18,C27, C28,C32,C33	
2	11	C2,C8,C9, 100nFCH C15,C21,C22, C25,C26,C29, C30,C40	
3	2	C6,C7	10nFCH
4	1	C10	100uF
5	1	C12	4n7CH
6	2	C16,C14	47uF
7	2	C19,C24	1000uF
8	2	C20,C23	22uF
9	1	C31	NC
10	4	C36,C37,C38, 100nF C39	
11	1	D1	Z24VSMD
12	1	D2	BAV70
13	7	D3,D6,D8,D11, SM4004 D12,D13,D14	
14	1	D4	BAV99_D
15	2	D7,D5	BAS32L
16	1	D9	Z10VSMD
17	1	D10	Z5V1SMD
18	4	FIX1, FIX2, FIX3, FIX4	
19	4	J1,J2,J3,J4	FASTON
20	1	J5	PANDUIT
21	1	J6	25MSF6
22	1	J9	PANDUIT
23	3	LD1, LD2, LD3	LED 3R
24	3	Q1,Q2,Q3	MMBT5401LT1
25	2	Q4,Q7	ZDT6790
26	1	Q5	MJD32C
27	1	Q6	MJD117
28	1	REF1	TL431SMD
29	2	R1,R3	0.01
30	1	R2	51HOCH
31	2	R32,R4	51H0CH
32	6	R5,R6,R8,R9, 10KCH R54,R55	
33	5	R7,R15,R24, 4K7CH R37,R12	
34	4	R10,R33,R41,R44	TM5K
35	2	R27,R28	1K0CH
36			
37	1	R13	M5K
38	2	R11,R14	820CH
39	6	R16,R20,R25, 10K0CH R40,R42,R50	
40	2	R18,R17	100KCH
41	2	R19,R29	100H0CH
42	2	R35,R21	220CH

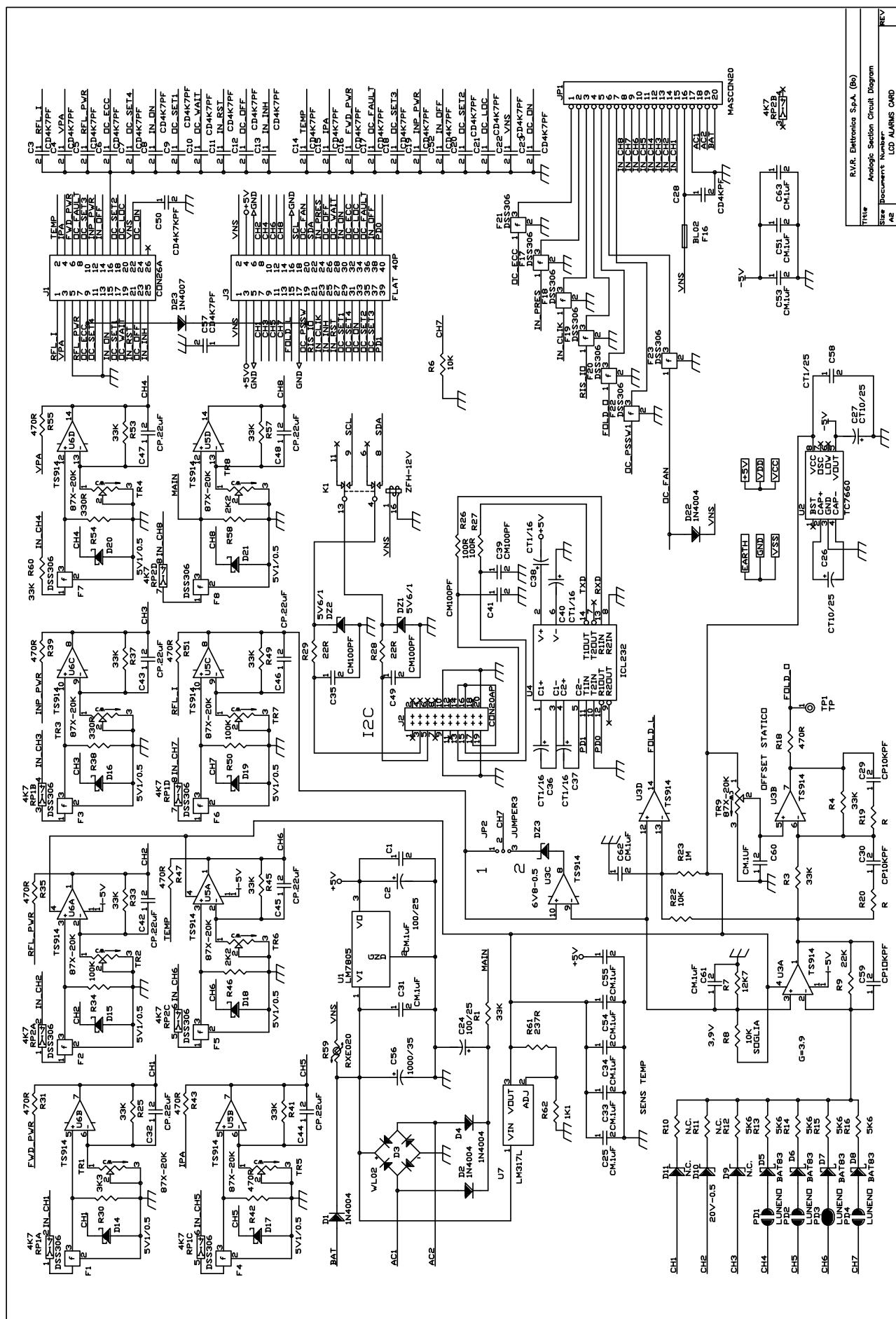
43	6	R22 , R30 , R36 , 47CH R51 , R52 , R53	
44	1	R23	10M0CH
45	1	R26	22H0CH
46	1	R31	150K0CH
47	1	R34	4K70CH
48	4	R38 , R45 , R47 , 2K74CH R48	
49	1	R39	221K0CH
50	1	R43	100CH
51	1	R46	TM10K
52	1	R49	2K740CH
53	4	TP1 , TP2 , TP3 , TestPoint TP4	
54	3	U1 , U4 , U8	TL082SMD
55	2	U2 , U5	TL071SMD
56	1	U3	LM358SMD
57	1	U6	7815
58	1	U7	7915
59	2	C1 , C4	N . C .

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 _____



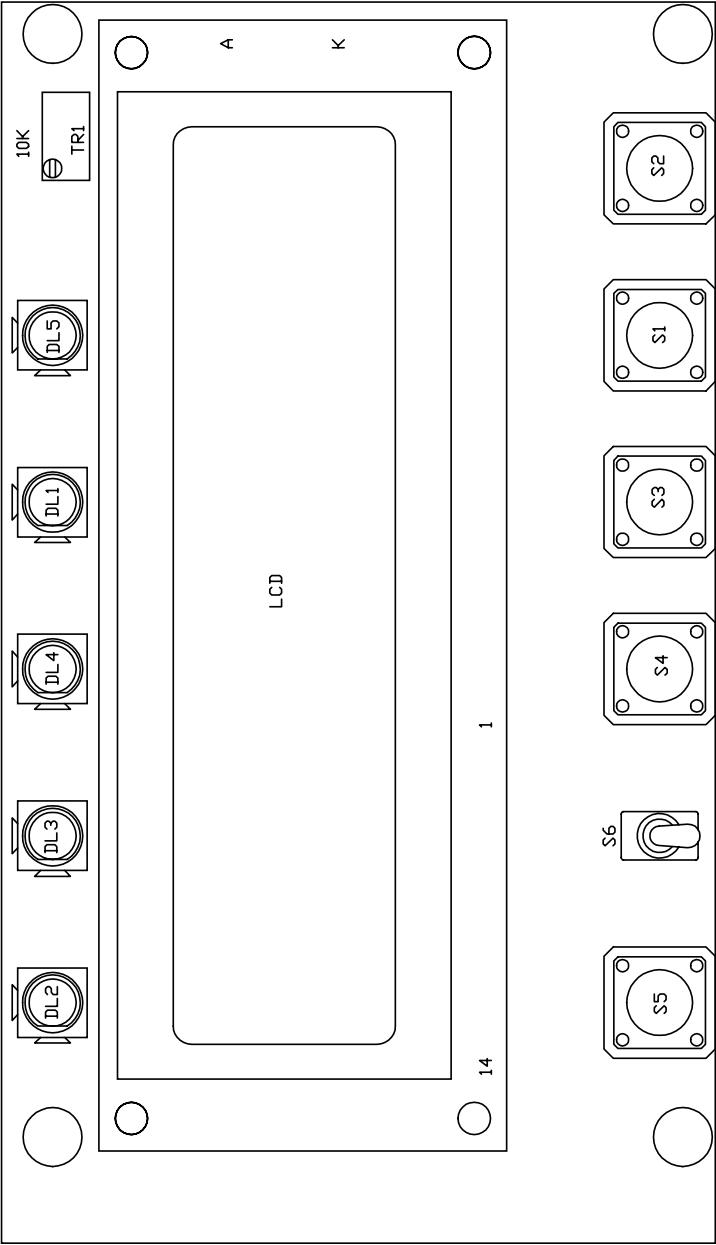


CPU Analog Section Bill Of Materials

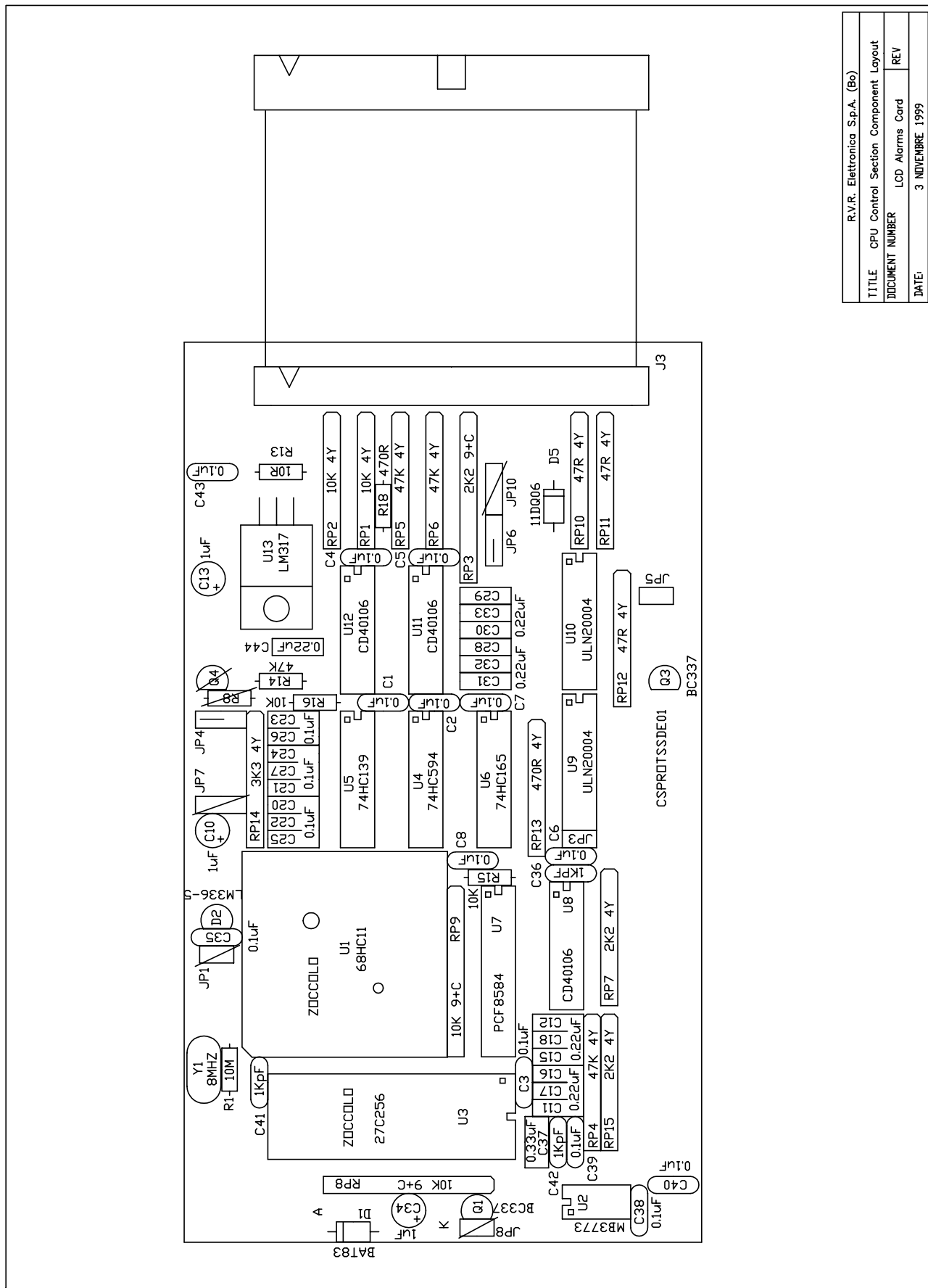
Item	Q.ty	Reference	Part
1	13	C1, C25, C31, C33, C34, C51, C53, C54, C55, C60, C61, C62, C63	CM.1UF
2	2	C2, C24	100/25
3	22	C3, C4, C5, C6, C7, C8, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C52, C57	CD4K7PF
4	2	C26, C27	CT10/25
5	1	C28	CD4KPF
6	2	C29, C30	CP10KPF
7	8	C32, C42, C43, C44, C45, C46, C47, C48	CP.22UF
8	4	C35, C39, C41, C49	CM100PF
9	4	C36, C37, C38, C40	CT1/16
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, D22	1N4004
17	1	D3	WL02
18	4	D5, D6, D7, D8	BAT83
19	2	D9, D10	20V-0.5
20	8	D14, D15, D16, D17, D18, D19, D20, D21	5V1/0.5
21	15	F1, F2, F3, F4, F5, F6, F7, F8, F17, F18, F19, F20, F21, F22, F23	DSS306
22	1	F16	BL02
23	1	JP1	MASCON20
24	1	JP2	JUMPER3
25	1	J1	CON26A

CPU Analog Section Bill Of Materials

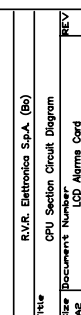
Item	Q.ty	Reference	Part
26	1	J2	CON20AP
27	1	J3	FLAT 40P
28	1	K1	ZFH-12V
29	4	PD1, PD2, PD3, PD4	LUNENO
30	2	RP1, RP2	4K7
31	12	R1, R3, R4, R25, R33, R37, R41, R45, R49, R53, R57, R60	33K
32	3	R6, R8, R22	10K
33	1	R7	12K7
34	1	R9	22K
35	5	R11, R16, R13, R14, R15, R16	5K6
36	9	R18, R31, R35, R39, R42, 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	Cord	REV
DATE:	3 NOVEMBRE 1999		



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



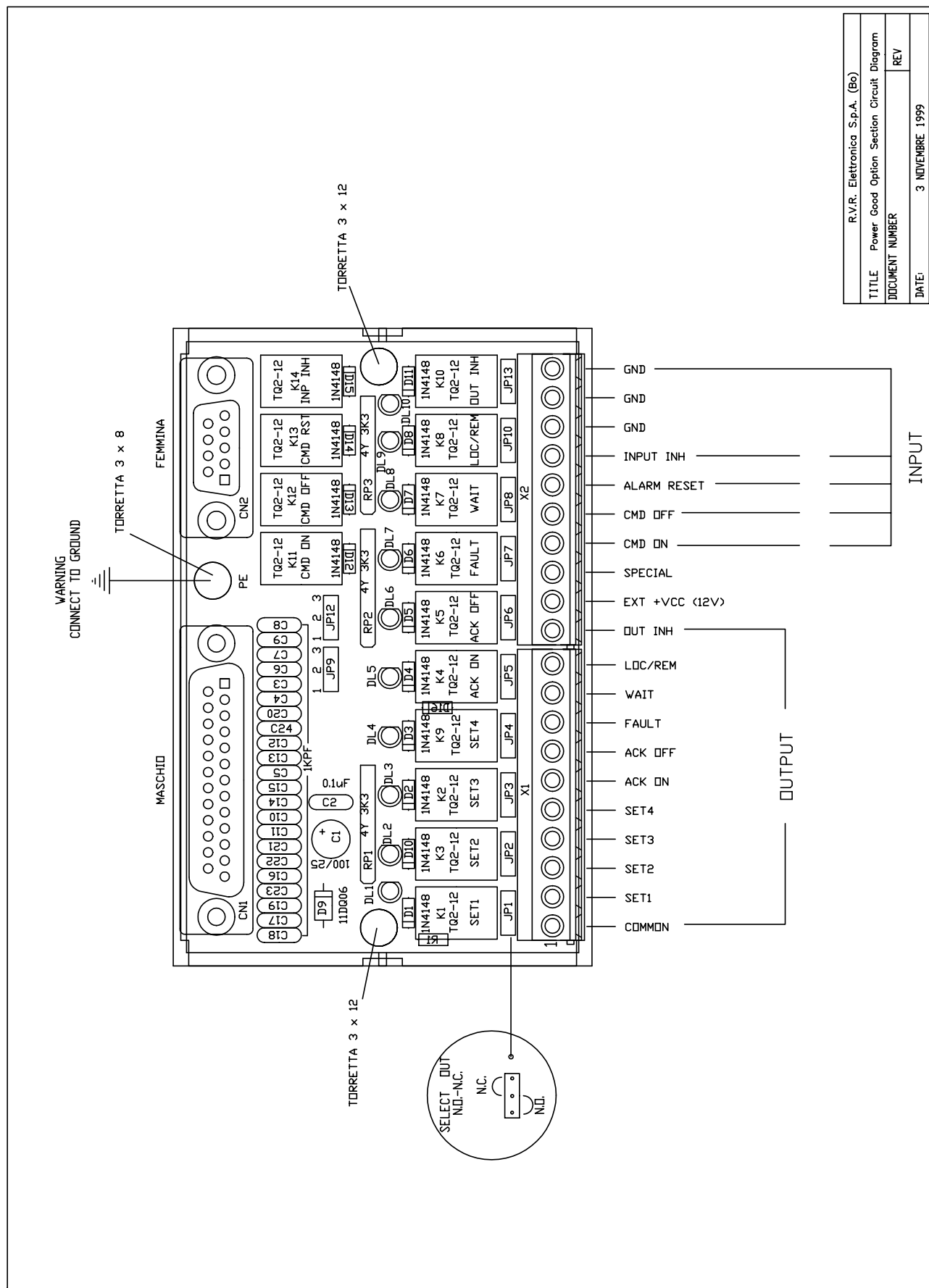
Scheda CPU Bill Of Materials
1999

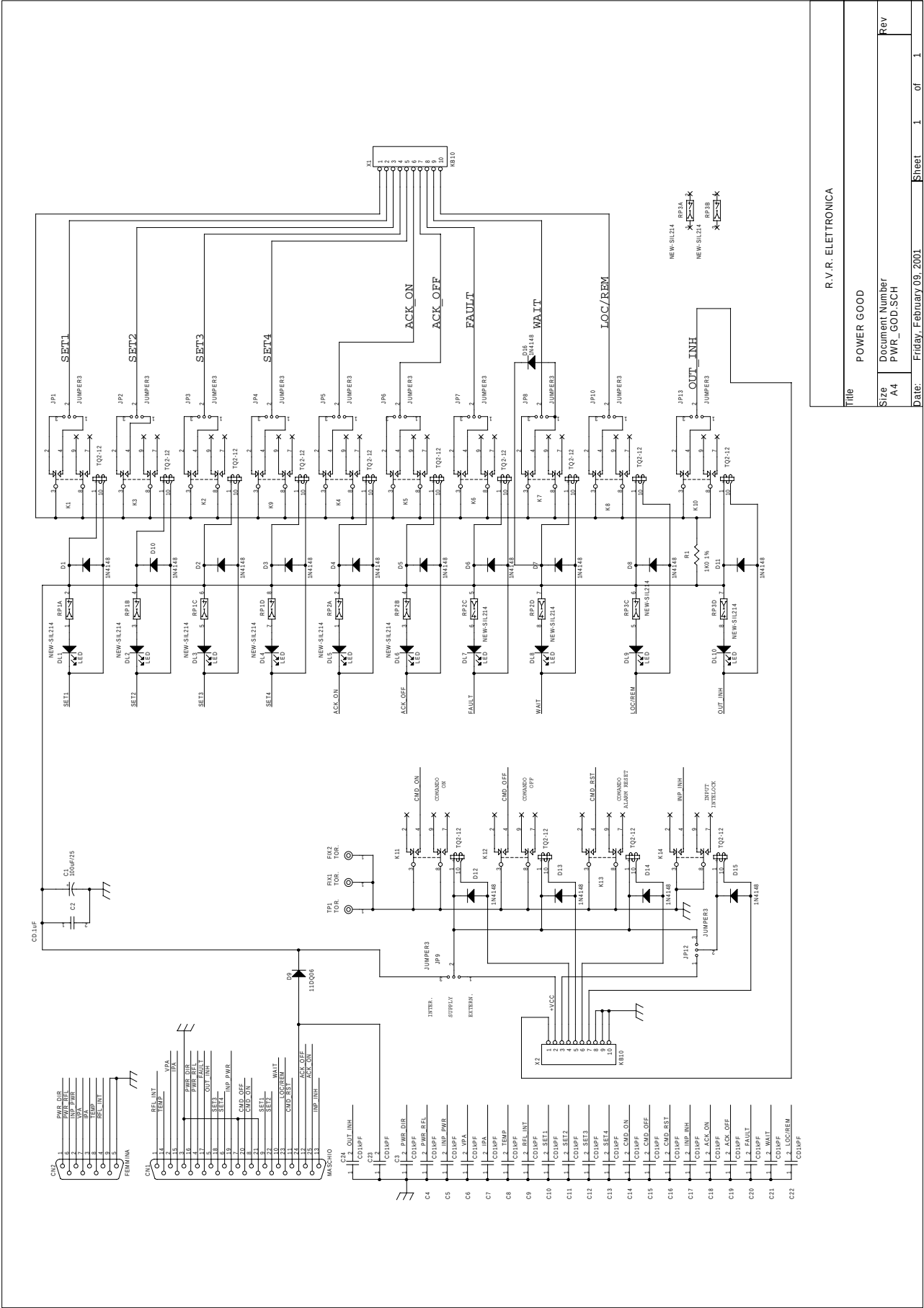
November 25,

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



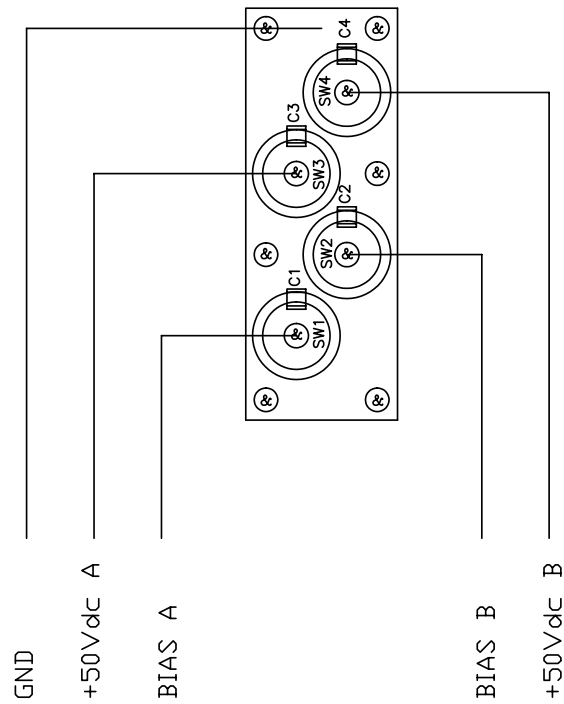


POWER GOOD Bill Of Materials Revised: November 25, 1999
Item Q.ty Reference Part

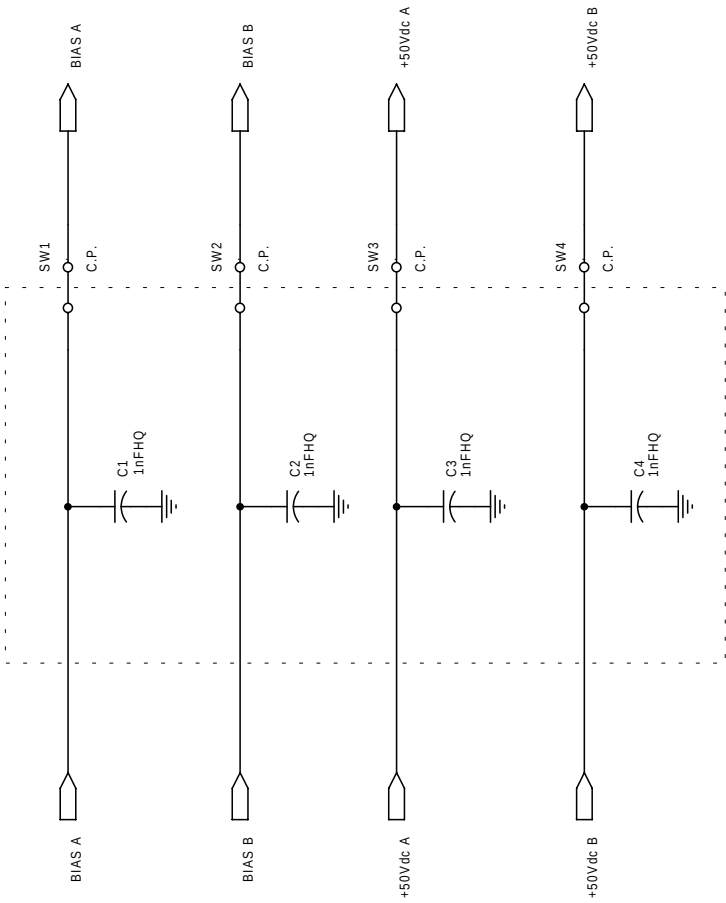
1	1	CN1	MASCHIO
2	1	CN2	FEMMINA
3	1	C1	100UF/25
4	1	C2	CD.1UF
5	22	C3,C4,C5, C6,C7,C8, C9,C10, C11, C12,C13,C14, C15,C16,C17, C18,C19,C20, C21,C22,C23,C24	CD1KPF
6	10	DL1,DL2,DL3, DL4,DL5,DL6, DL7,DL8,DL9, DL10	LED
7	15	D1,D2,D3,D4, D5,D6,D7,D8, D10,D11,D12, D13,D14,D15, D16	1N4148
8	1	D9	11DQ06
9	3	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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Nome Progetto		Pagina		Size	
PJ500M-C LCD		1	al 1	A4	
Autore	D'ALESSIO D.	Codice Progetto		/	
Nome PC in Rete	\\JACK\	Revisione		SCHEDA VITI PASSANTI	
File/Contenitori	MANUALI\PJ500M-C\CSFILPS\CSFILPS.DWG	Autorizzazione		CSFILPS	
Scala	/	Trattamento		/	
		Profilo		/	

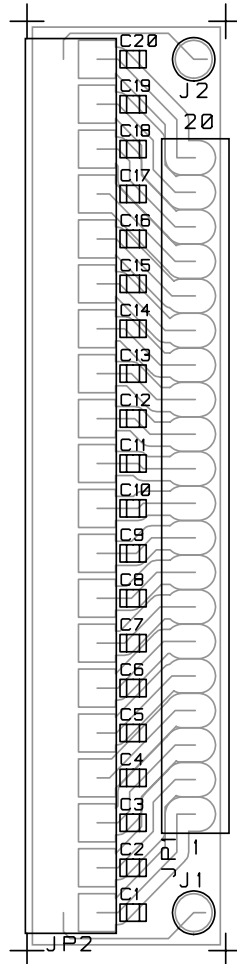


		Pagina: 1		di 1	Size: A4
Nome Progetto: PJ500MC LCD		Data: 03/08/01		Codice Progetto: /	
Autore: BERTI J.		Revisione: 1.0		Nome Parte: SCHEDA VITI PASSANTE	
Nome PC in Rete: \\JACK1		Autorizzazione:		Codice: CSFILPS	
File /cartella:		MANUALI PJ500MC LCD E PJ500M-C			

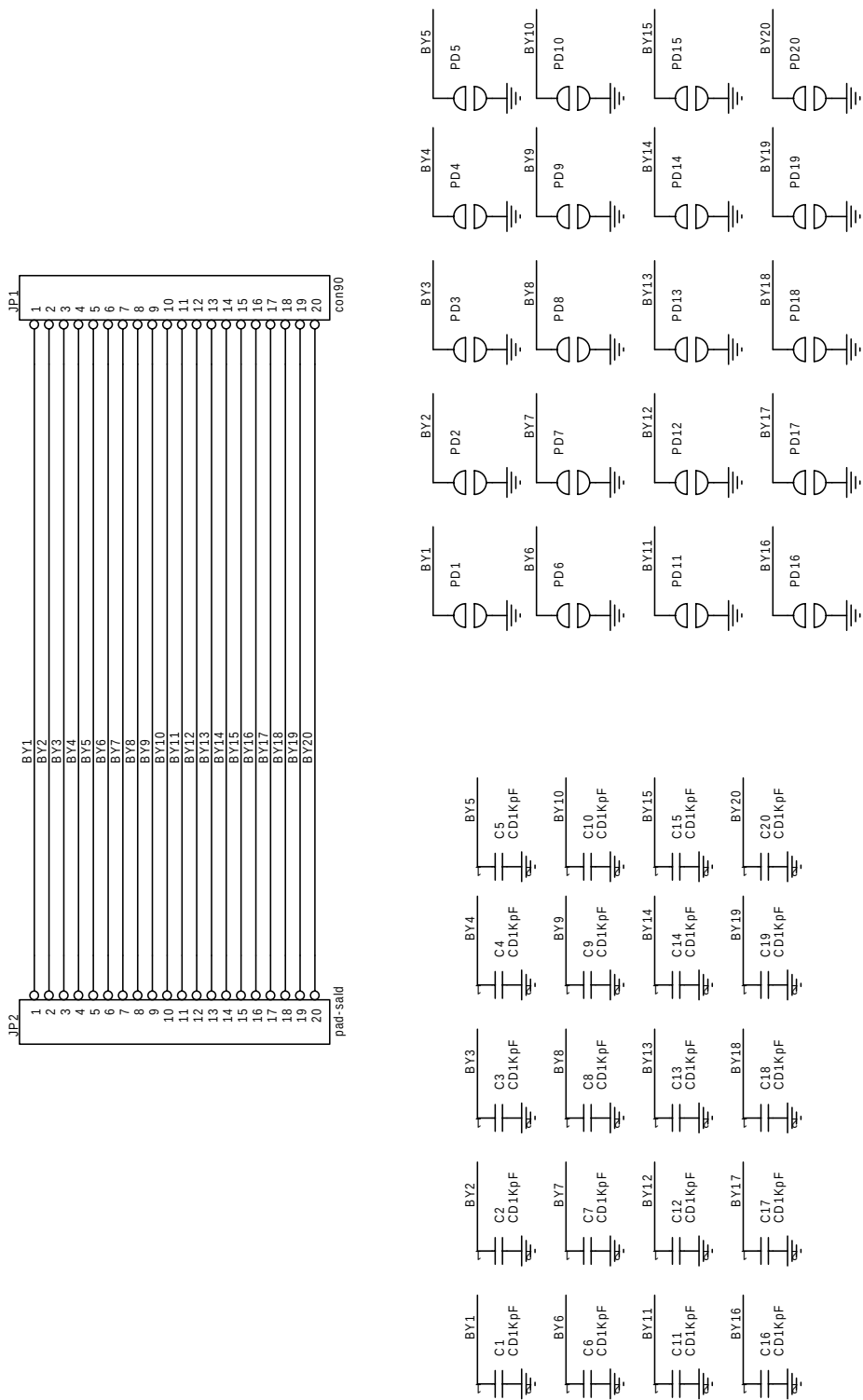
CSFILPS		Bill Of Materials		Page1
Item	Q.ty	Reference	Part	Description Part
1	4	C1,C2,C3,C4	1nFHQ	Cond. Chip HQ
2	4	SW1,SW2,SW3,SW4	C.P.	Viti passanti

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B.V.B. Elettrotecnica										
Nome Progetto			PJ500MC LCD			Pagina		1	di 1	Size A4
Autore			GRIPTECH - REV. BERTI J.			Data		09/10/01		
Nome PC in Rete			\\JACK\			Revisione		1.0		
File/Cartella			MANUALI/PJ500MCLCD/FILTR ENI/EM/DVG			Autorizzazione		Codice		
Scala/			Materiale /			Trattamento		/		
						Profilo		/		



		Pagina: 1 di 1		Size: A4
Nome Progetto: PJ500M LCD		Codice Progetto: /		
Autore: REV.: BERTI J.		Data: 09/10/01		
Nome PC in Rete: \\JACKI		Revisione: 1.0		
File / Carrelle / MANUAL / PJ500M / LCD / FILTRO EMIA / CON / DISN		Autore: /		
		Nome Parte: CONNETTORE INTERFACCIA PROTEZIONI		
		Codice: CSADPCNPTPJ		



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	
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		PD20	

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- Overload & Short Circuit Protection
- Thermal Protection
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- 5V, 100mA Standby Output



TWO-YEAR WARRANTY

STANDARD MODELS

(Other Outputs Available, Consult Factory)

MAX WATTS	OUTPUT VOLTAGE	OUTPUT CURRENT	PFC	MINIMUM LOAD	TOTAL REGULATION	MODEL NUMBER	INPUT VOLTAGE
800	24V	33A	✓	0A	1%	ML5000	85-264VAC
800	28V	29A	✓	0A	1%	ML6000	85-264VAC
800	48V	17A	✓	0A	1%	ML7000	85-264VAC
1000	24V	42A	✓	0A	1%	MN5000	85-264VAC
1000	28V	36A	✓	0A	1%	MN6000	85-264VAC
1000	48V	21A	✓	0A	1%	MN7000	85-264VAC
1200	24V	50A	✓	0A	1%	MP5000	170-264VAC
1200	28V	43A	✓	0A	1%	MP6000	170-264VAC
1200	48V	25A	✓	0A	1%	MP7000	170-264VAC

For modified versions, call our Modification Center at 954-346-2442 Ext. 400

SAFETY CERTIFICATIONS

AGENCY	STANDARD
UL	UL1950
CUL	CSA22.2, No. 950
DEMKO	EN60-950

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SPECIFICATIONS, ML/MN/MP SERIES

Typical at Nominal 115/230VAC Line, Full Load and 25°C Unless Otherwise Noted.

OUTPUT SPECIFICATIONS

Voltage Adjustment Range	±5%
Total Regulation ¹	1.0%
Ripple & Noise, Pk-Pk ²	1%
Holdup	15mS
Dynamic Response ³	300µS
Temperature Coefficient	±0.02%/°C
Minimum Load	0A
Overload Protection	Constant Current Limiting
Overvoltage Protection	Power Shutdown
Remote Sense	Up to 0.25V Per Wire

INPUT SPECIFICATIONS

Input Voltage Range	85-264VAC, Single Phase
Power Factor	0.99
Input Frequency	47-63Hz
Inrush Limiting	30A Peak
Input Current, Full Load	
800W	7.9A, 120VAC; 4.1A, 230VAC
1000W	9.9A, 120VAC; 5.2A, 230VAC
1200W	6.2A, 230VAC
Input EMI Filter, Conducted	EN55022 Curve B FCC20780 pt. 15J Curve B
Harmonic Distortion	EN61000-3-2
Input Immunity, Conducted	
Fast Transients, Line-Line	±2kV (EN61000-4-4 Level 3)
Surges, Line-Line	±2kV (EN61000-4-5 Level 2)
Surges, Line-Ground	±2kV (EN61000-4-5 Level 3)
Input Protection	Internal Fuse

GENERAL SPECIFICATIONS

Efficiency	85% at Full Load
Switching Frequency	150kHz Nominal
Isolation, class 1 ⁴	3000VAC Input - Output >1500VAC Input - Ground >50VDC Output - Ground
Safety Standards	EN60-950, UL1950, CSA22.2-950

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	0°C to 70°C Ambient
Densiting	2.5% / °C, 50°C to 70°C
Storage Temperature	-40°C to +85°C
Cooling	Integral Ball Bearing Fans

PHYSICAL SPECIFICATIONS

Case Material	Aluminum
Dimensions, inches(mm)	3.25 H x 5 W x 10.5 D (82.6 x 127 x 267)

NOTES:

- No load to full load, including line regulation and load regulation.
- Whichever is greater, 20MHz bandwidth. Measured with 0.1µF ceramic and 10µF tantalum capacitors in parallel across the output.
- +4% deviation recovering to within 1% for 25% load change.
- Input-output isolation figure is for isolation components only. 100% production Hsot tested.

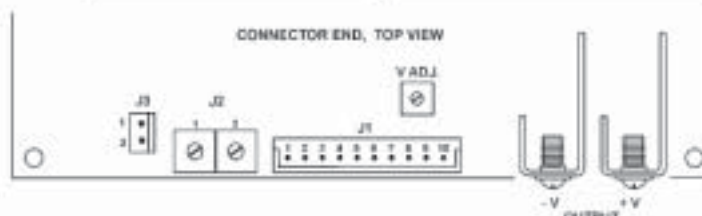
J1 CONTROL & SUPERVISORY SIGNALS			
PIN	FUNCTION	PIN	FUNCTION
1	+Sense	6	DC Power Good
2	-Sense	7	Inhibit (N.O.)
3	Remote Adjust	8	Not Used
4	Not Used	9	AC Power Fail
5	Current Sense	10	Control Common

J2: 12V, 500mA STANDBY SUPPLY	
PIN	FUNCTION
1	12V Return
2	+12VDC

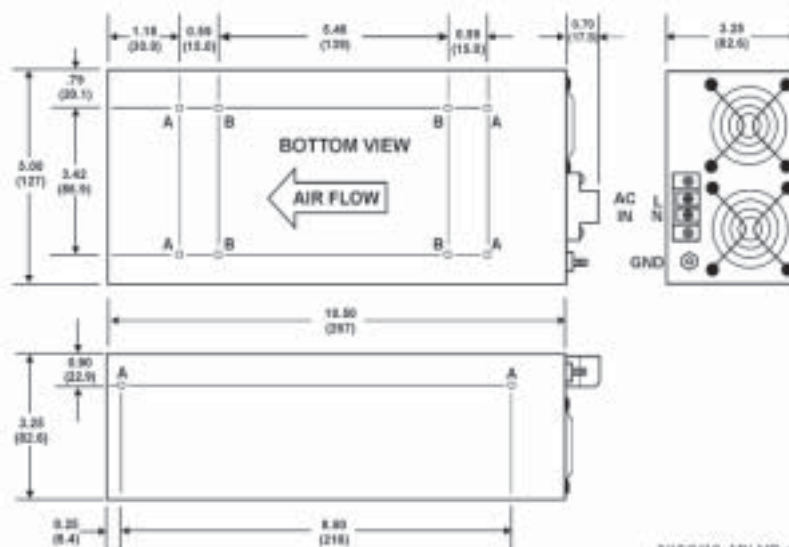
J3: 5V, 100mA STANDBY SUPPLY	
PIN	FUNCTION
1	+5VDC
2	5V Return

CONNECTORS	
J1: AMP 173981-0	10-PIN
J2: LMI 9105.102.02	2-PIN
J3: AMP 171825-2	2-PIN

MATING CONNECTOR KIT	
Kit provides mating connectors for all ML, MN and MP Series models.	
Order Kit No.: 775-1417-000	\$8.00



CASE OUTLINE



NOTE:

"A" Mounting holes are No. 6-32 threaded inserts. "B" mounting holes are M3 threaded inserts. Max. penetration is 0.25" (6.4mm).

ALL DIMENSIONS IN INCHES (mm).
All specifications subject to change without notice.

8/15/01 ML-MN-MP-06

DIV. OF UNIPower CORP. • 3900 Coral Ridge Drive, Coral Springs, Florida 33065, UNITED STATES • Tel: 954-346-2442 • Fax: 954-340-7901 • sales@unipower-corp.com
UNIPower EUROPE • Parkland Business Centre, Chartwell Road, Lancing, BN15 8UE, ENGLAND • Tel: +44(0)1903 766200 • Fax: +44(0)1903 764540 • info@unipower-europe.com