PJ5KPS

User & Technical Manual

Manifactured by R.V.R. ELETTRONICA **Italy**

PJ5KPS - Use and maintenance manual
Versione 1.5

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R.V.R. ELETTRONICA

Notification of intended purpose and limitations of product use

This product is a FM transmitter intended for FM audio broadcasting. It utilises operating frequencies not harmonised in the intended countries of use.
The user must obtain a license before using the product in intended country of use. Ensure respective country licensing requirements are complied with.
Limitations of use can apply in respect of operating freuency, transmitter power and/or channel spacing.

Declaration of Conformity

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

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1. Introduction

This manual describes the **PJ5KPS**, a solid-state RF amplifier designed for frequency modulation sound broadcasting, manufactured by **R.V.R. Elettronica**. The PJ5KPS amplifier constitutes the end power section for FM transmitters fitted with different possible configurations. A control system for the exciters is built into the machine so that in order to have a system with redundant exciters, all that needs to be done is to include two exciters in the transmitter such as, for example, the PTX30LCD exciters made by R.V.R. Elettronica.

The manual is structured as follows:

- Chapter 1: Presentation of the manual
- Chapter 2: Warranty conditions
- Chapter 3: Safety recommendations
- Chapter 4: Description of the machine and its operating principles
- Chapter 5: Guide for installation and use
- Chapter 6: Most frequent troubleshooting cases on starting up the machine
- Chapter 7: In-depth description of the operation of the modules of the apparatus. This chapter also contains the description of the pin configuration of the connectors and explains how to use the control unit menus, item by item.
- Chapter 8: technical notes.
- Appendix: It contains all the design details (wiring diagrams, assembly plans, etc.) of the PJ5KPS.

This manual is written as a general guide for those having previous knowledge and experience with this kind of equipment, well conscious of the risks connected with the operation of electrical 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. Elettronica SpA 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 device can irradiate radio frequency waves, and if it's not installed following the instructions contained in the manual and local regulations it could generate interferences in radio communications.
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.

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

Warranty shall not include:

1 danni verificatisi durante la spedizione della macchina alla R.V.R. per eventuali riparazioni;

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

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. Elettronica** within **5** (five) days from delivery date.

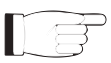
To claim your rights under this warranty, you shold follow this procedure:

1 Contact the dealer or distributor where you purchased the unit. Describe the problem and, so that a possible easy solution can be detected.

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.

2 If your dealer cannot help you, contact **R.V.R. Elettronica** and explain the problem. If it is decided to return the unit to the factory, **R.V.R. Elettronica** will mail you a regular authorization with all the necessary instructions to send back the goods.

3 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

4 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 ordered 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 the victim is not responsive

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

- Place victim flat on his backon a hard surface.
- Open airway: lift up neck, push forehead back (Fig. 3-1).
- clear out mouth if necessary and observe for breathing
- if not breathing, begin artificial breathing (Figure 3-2): tilt head, pinch nostrils, make airtight seal, four quick full breaths. Remember mouth to mouth resuscitation must be commenced as soon as possible

Figure 3-1

Figure 3-2

- Check carotid pulse (Fig 3-3); if pulse is absent, begin artificial circulation (Fig. 3-4) depressing sternum (Fig. 3-5)

Figure 3-3

Figure 3-4

Figure 3-5

- In case of only one rescuer, 15 compressions alternated to two breaths.
- If there are two rescuers, the rythm shall be of one brath each 5 compressions.
- Do not interrupt the rythm of compressions when the 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
- 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

- 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 PJ5KPS is a RF amplifier for frequency modulation sound broadcasting. It is a fully solid-state apparatus of modern design that uses MOSFET as active components in the FM amplifying modules. This chapter briefly describes the machine's main features.

4.1 Composition

The PJ5KPS amplifier is made up of modules inserted in a 19" rack. The main modules are as follows:

- 1 Control unit
- 5 1.2 kW RF amplifier modules
- 1 Control unit
- 1 or 2 Power supply unit carriages
- 1 Splitter/Input RF

The amplifier is supplied complete with all its parts, not really "modules", essential for its operation such as the fans for dissipating the heat generated by the machine inside the room and all the accessories for the electrical and RF wiring. As a rule, the amplifier is supplied as a complete transmitter therefore the two FM exciters that it manages will be provided and connected (a service exciter and a spare exciter).

4.2 Technical specifications

Frequency range	87.5 to 108.0 MHz
Nominal RF power	5000 W
Power supply voltage	380 Three-phase, 3F+N
Exciting power	Max. 30 W
Consumption	< 9.5 kW
Power factor	> 0.95

Additional important features of the PJ5KPS are as follows:

- The 1.2 kW amplifying modules are implemented by means of plug-in technology: the individual modules may be removed for performing maintenance operations, for instance, without having to turn off the transmitter. The transmitter keeps working at reduced power even if the module has been removed. This operation may be carried out without any risk of damaging the module itself, or the amplifier as a whole, thanks to the control system and to the RF connectors, the power supply and the purposely designed data-exchange. For further information refer to the maintenance section.
- Each module is controlled by a microprocessor-based card that checks and adjusts its operating mode. The resulting data are transmitted to the control unit.
- The control unit manages the changeover of the two exciters both in automatic and manual mode.

- The amplifier may be equipped with a dual power supply/rectifier module. Both modules operate in this case the configuration is in “hot stand-by” since both supply, when operating under normal conditions, half of the current required by the machine to work. When one module is absent or faulty, the module that is present supplies all the required current by itself. The sufficient dimensioning of each power supply unit guarantees that the machine will work efficiently at its nominal power level.
- The amplifier can work as usual even if the control unit is not present. In fact, the control unit may be substituted temporarily with an electromechanical interface by means of which the user may give the ON and OFF commands to the machine. However, in this case all the numeric type information will be missing and the power level remains the last one enabled before removing the control unit.

4.3 Options

The PJ5KPS envisages the following options:

- Single or dual power supply carriage
- Single or dual exciter
- N+1 configuration
- Different kinds of exciters
- Automatic restore after safety tripping or manual restore

4.4 Operating principles

This description is based on the block diagram shown in Figure 4-1.

The PJ5KPS amplifier essentially comprises three blocks:

- The power supply section
- The Splitter-Coupler section
- The RF amplifier section

The power supply section of the PJ5KPS amplifier is made up of one or two three-phase transformers, each one associated with a rectifier circuit for generating the non-stabilized voltage of 80V that supplies the RF modules. The transformers and the rectifier circuits are mounted on removable carriages together with power inductors that help achieve a power factor of about 94%.

The power supply unit carriage is dimensioned for supplying all the power required for the PJ5KPS to operate at full power. Therefore the configuration of the machine with two power supply unit carriages is a hot stand-by redundant one.

The power supply section is controlled by a microprocessor-based card installed in the rack.

The Splitter-Coupler section performs all the treatment of the RF signal except for the power amplification.

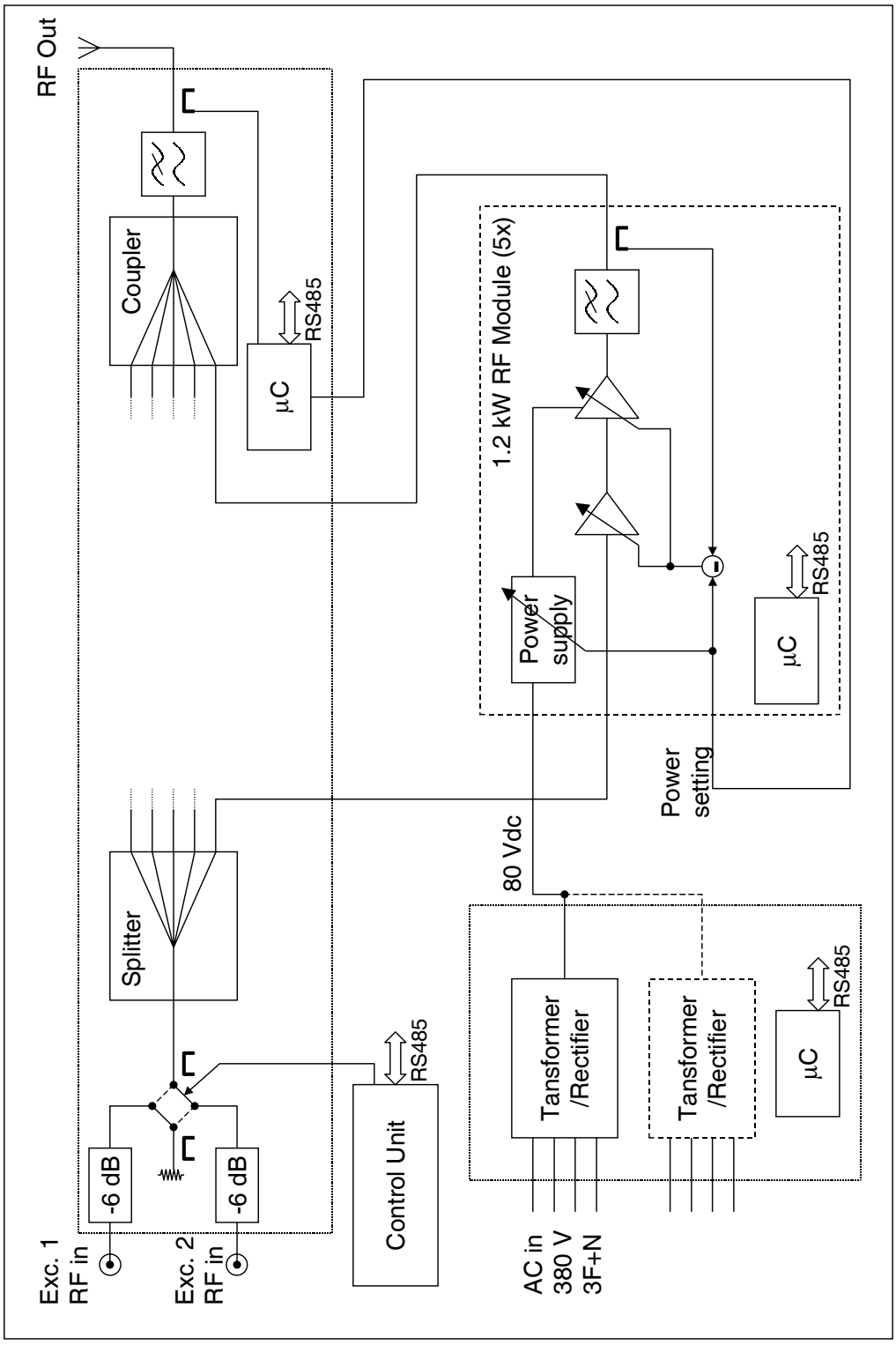


Figure 4-1 *Block diagram of the PJ5KPS*

The RF signals generated by two exciters (in the redundant configuration) are first attenuated by 6 dB to improve the uncoupling among the stages and then connected to a coaxial relay commanded by the control unit. One of the two signals is closed on a dummy load built into the machine whereas the other signal is connected to the input splitter. The power of both signals is measured by specific directional couplers.

The RF signal of the selected exciter is divided into five branches, each of which is passed to the input of an amplifying module.

The five RF amplifiers branches are recombined by the coupler at the output of the amplifying modules. The overall amplified RF signal is filtered by a low-pass filter for eliminating the harmonics and is therefore available at the output connector.

The Splitter-Coupler section is controlled by a microprocessor-based card, which makes the values detected at the various measuring points available for the user and for the diagnostics functions.

The machine contains five RF amplifier modules each of which is capable of supplying a maximum of 1.2 kW RF. Each module includes a switching mode power supply unit that regulates and stabilizes the power supply voltage supplied by the power supply section.

Each amplifying module contains a first stage with gain that varies according to the MOSFET BLF175. The RF signal amplified by the driver is then separated into four branches, amplified by four modules based on BLF 278, recombined and filtered by a low-pass filter.

Each RF amplifying module is controlled by a microprocessor-based card, connected to the other microprocessor-based cards of the machine by means of a RS485 type bus.

Each module runs the Automatic Power Control function for regulating the supplied power: the gain of the amplifying stages and the voltage supplied by the switching power supply unit are regulated so that the power that is output from the module corresponds, if possible, to the set level.

The overall power that the PJ5KPS must supply is controlled by the microprocessor-based card of the splitter-combiner section according to the settings made on the control unit for the NOMINAL POWER and LOWER POWER parameters.

5. Installation and use

This chapter contains the basic instructions for installing and using the PJ5KPS amplifier. If necessary, more in-depth information about the operating principles may be traced in the next chapters.

5.1 Assembly

For practical reasons and for transport safety, the machine is usually supplied disassembled to the customer. The assembly procedure is rather simple and can be carried out by any qualified technician.

Caution: In order to avoid the risk of damaging the machine and/or of injuring the operators, it is advisable to closely adhere to the instructions provided below. always respect all the safety regulations and standards in force.

Identify the machine components:

- The rack (various components are assembled, such as the coupler, the splitter, the control unit, the main blower) [Figure 5-1 a)]
- The 5 RF modules [Figure 5-1 b)]
- One or two transformer/rectifier carriages [Figure 5-1 c)]
- The exciters [Figure 5-1 d)]. (As a rule the amplifier is supplied as a complete transmitter. This example shows two PTXLCD exciters produced by R.V.R. Elettronica. Usually the exciters are pre-assembled inside the rack).

Check that all the components are in perfect working order. Should there be any kind of problem, for instance if there is any damage caused by the transport of the components, read the instructions associated with the Warranty at the beginning of this manual (chapter 2).

1. Install the rack in the location where the transmitter will work. The rack is mounted on wheels for simplifying its movement, therefore after having positioned it where expected, it is advisable to use the four screws at the bottom of the rack to steady it perpendicular to the ground.

   The transmitter is cooled by forced ventilation. The air outlet is on the machine's roof whereas in the standard configuration the air intake is envisaged at the back of the machine. If you opt for this solution, install the machine at least 50 cm. away from the back wall, so that air can flow under optimal conditions. The air inlet may also be delivered from the machine's roof, by removing the cover from the hole that is pre-cut in the roof for this purpose.

2. Remove the protection panels of the RF modules and the power supply unit carriages from the rack. Also remove the stop bar of the power supply unit carriages that is at the bottom of the rack.

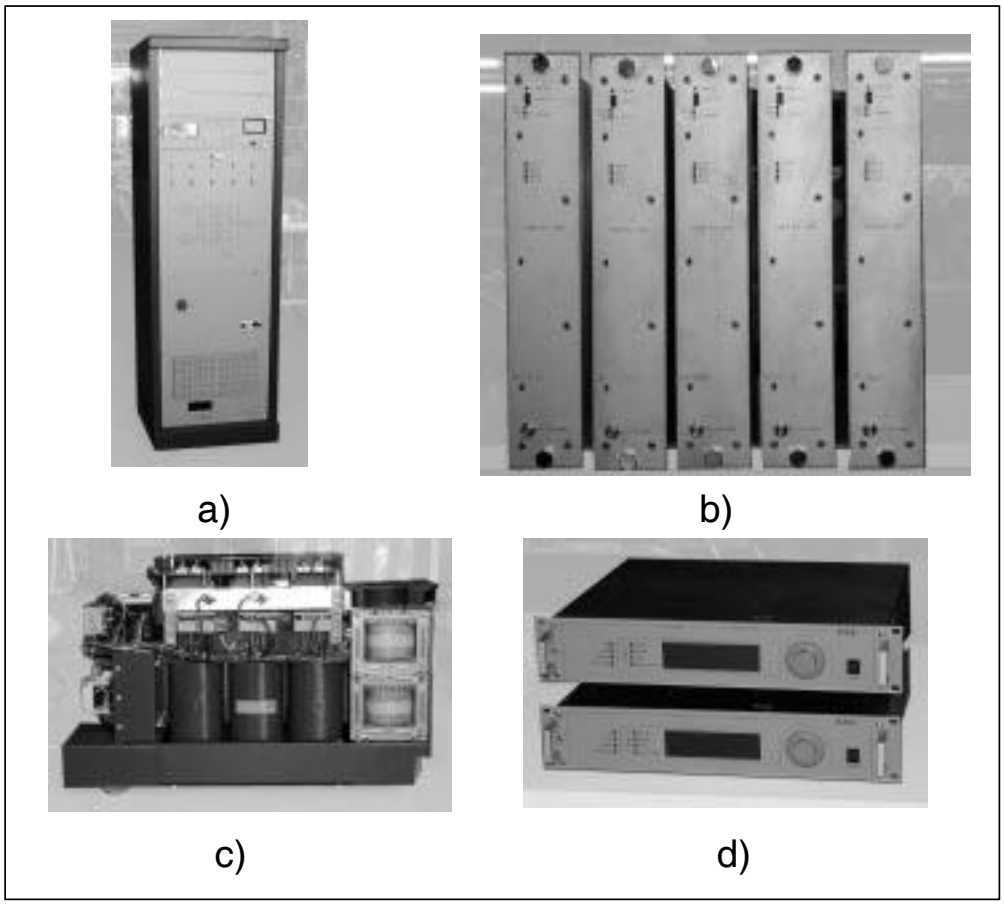


Figure 5-1 *Components of the PJ5KPS*

3 **Insert the first amplifying module into the RF modules compartment** [Figure 5-2].

Figure 5-2 *Inserting a RF module*

The modules have a groove at the top and one at the bottom: insert the modules so that the guides in the compartment fit into these grooves. Slide the module until the two fixing screws fit into their seats. Then tighten the fixing screws at the same time so that the module inserts into its compartment remaining parallel until it is perfectly in place.

4. Repeat the operation with the other four RF modules.
5. Insert the first transformer carriage into the left-hand side of the specific compartment. The carriage is mounted on three wheels (two are fixed on the front side and one pivoting rear wheel) to facilitate this operation. Move the carriage toward the left-hand wall of the rack [Figure 5-3] and then move it forward until the connectors at the back are perfectly in-serted into their seats.

The power supply unit carriage is very heavy and its barycenter is high, therefore be careful when handling it to avoid tipping it over.

6. If you have a redundant power supply unit, insert the second power supply unit carriage as you did with the first one.
7. Position the stop bar of the power supply unit carriages.
8. Make the necessary connections of the power supply unit carriages :
   - Power supply connector [Figure 5-4 a)]
   - Data connectors [Figure 5-4 b)]
9. Connect the machine's main power supply cable. Route the cable (5-pole type) through the raceway on the machine's roof [Figure 5-5 a)] and fix the conductors to the terminals of the master switch [Figure 5-5 b)]. The last operation is usually performed by removing the knob and the cover of the isolating switch.

Figure 5-3 *Power supply carriage connectors*

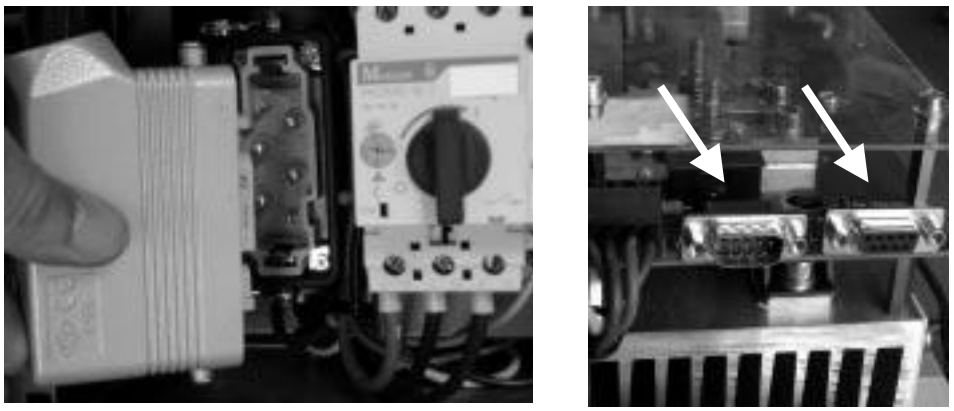


Figure 5-4 *Power supply carriage connectors*

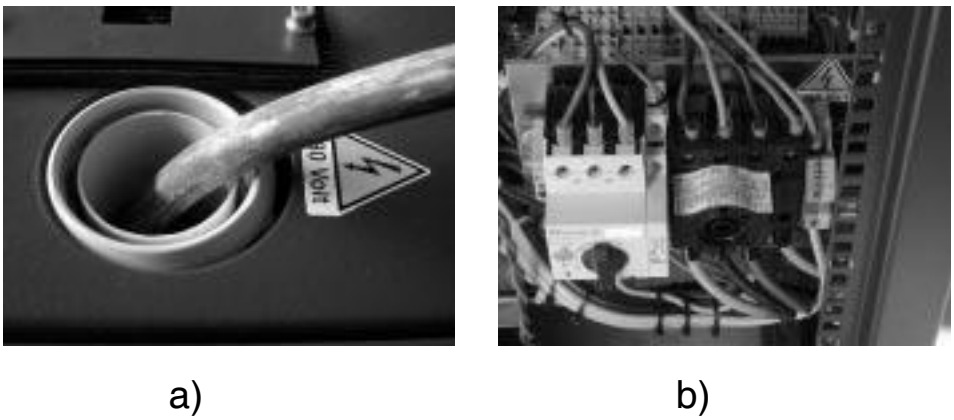


Figure 5-5 *Power supply cable*

Caution: The connection of the machine to the electric alimentation is performed fixing to a 5 poles cable with bare terminals to a terminal block. Making sure without any possibility of error that the cable is not under tension while working on it.
It is reccomended not to turn on the machine without first have connected the RF exit to the antenna or to the dummy load!
The PJ5KPS requires triphase alimentation (3F+ N) able to give 16A for phase. Keep this requirement in mind in connecting to the personal distribution board.

10. Reposition the protection panels of the RF modules and of the transformer/rectifier carriages.

11. If the PJ5KPS was not supplied complete with pre-assembled exciters, insert and connect the exciters into the appropriate housings. The connecting cables for the exciters are already inside the rack, namely:

    - Right/MPX bal. audio connection (XLR connector)

- Left/Mono audio connection (XLR connector)
- MPX unbal. audio connection (BNC connector)
- Power supply (VDE connector)
- Control connector (DB15 connector)

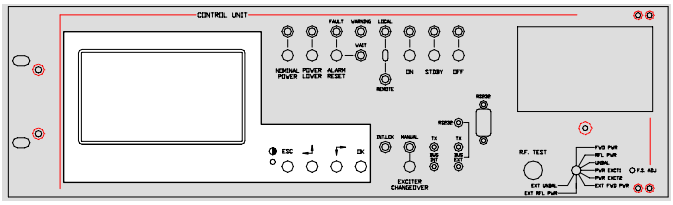
Now you may may perform the preliminary checks on the amplifier and start it up.

NB The connectors on the roof of the machine are not in parallel but directly connect to the eciters (L and R exciter 1, L and R exciter 2 etc). Keep this in mind to make the audio connections, that in some cases can require,for example, the use of an audio distributor.

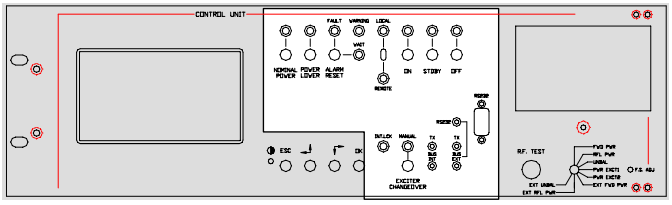
5.2 Amplifier check

The operator controls and checks the status of the PJ5KPS by means of the control unit. Three control groups are present on this unit:

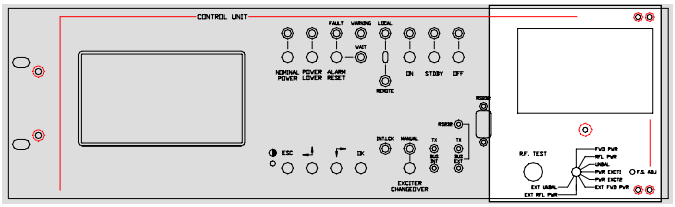
o **LCD and scroll buttons**



o **Buttons, selector switches and LEDs**



o **Analog instrument and rotary selector switch**



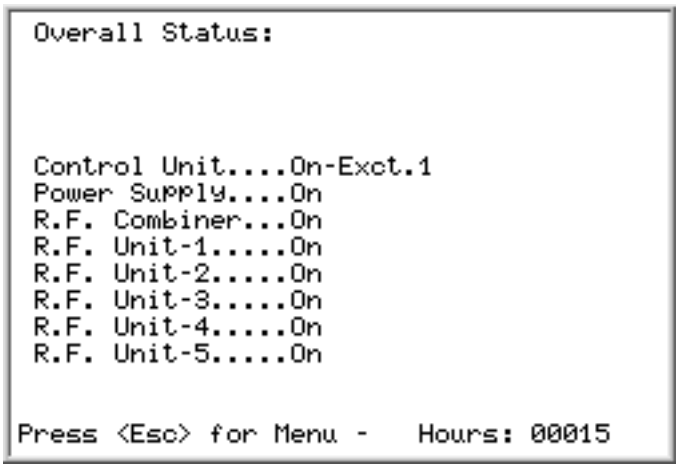


Figure 5-6 *Default screenful*

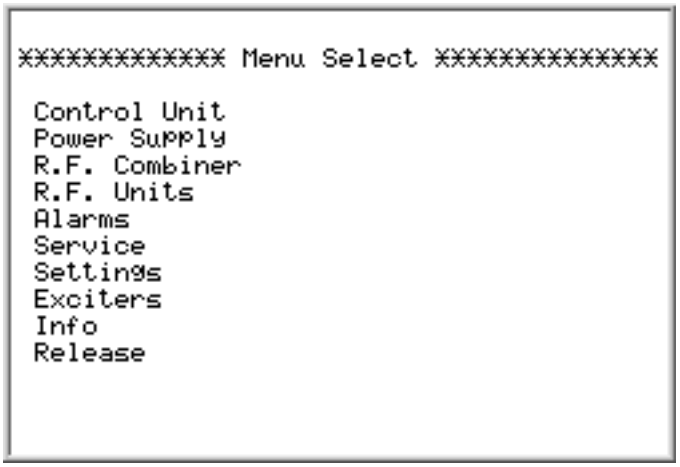


Figure 5-7 *Menu select screenful*

5.2.1 Display LCD

The operator uses the control software of the transmitter by means of a series of menus that are displayed on the LCD. Four specific keys are provided for scrolling through the menus, performing the settings and giving the commands:

Pulsante	**Descrizione**
OK	Click this button to access a sub-menu, to enter the editing mode or to confirm a modified value.
ESC	Click this button to exit from a menu or to cancel the modification of a value.
↓→	Click this button to scroll inside a menu (to the right or down) or to reduce the value of a parameter being modified.
←↑	Click this button to scroll inside a menu (to the left or up) or to increase the value of a parameter being modified.

When the operator is not using the various buttons to navigate, the LCD displays the preset screenful that shows the overall status of the machine's modules (Figure 5-6). The control unit acquires, every second, the status of the other modules by means of an RS485 serial bus. The activity at the bus is signaled by the "BUS INT" LEDs on the unit's panel.

As indicated on the preset screenful, push the ESC button to access the screenful for selecting the menus (Figure 5-7).

On reaching the selection screenful, move the cursor (full rectangle) using the arrow keys to display the concerned line. Then click OK to access the associated menu. Select the "General Status" menu to return to the preset screenful.

5.2.2 Buttons, selector switches and LEDs

The typical machine-control operations are performed using the buttons of the control unit's panel. Specific LEDs correspond to each button and selector switch for indicating the machine's status.

The functions performed by the controls are as follows:

Function	Description
OFF	Button for turning off the machine. A LED signals that the machine is OFF. In this status, the exciters and the fan are off and the RF amplifying modules are not powered.
STDBY	Button for setting the machine in standby. In this status the transmitter does not emit any power, but is ready to start the transmission: the main blower is on, the RF modules are not powered, the exciters are on but locked by means of an interlock. The stand-by is used to test the exciters, in fact in manual modality the operator could arrange them in base to the own requirements; coming from an “On” in manual modality, the system does not touch the interlock. Stand-by status is signalled from a LED. In manual and in stand-by the inhibit of the device doesn't intervene on the interlock of the exciters. This could necessary when the apparatus is in configuration n+1 for verify if the exciters are operational.
ON	Button for turning on the transmitter. The RF power supply is activated.
LOC/REM	Selector switch for setting the transmitter in remote or local mode. In local mode the buttons and the controls via the menus are active. In remote mode the buttons and the controls via the menus are inhibited and the commands may be given only remotely via the parallel interface or via the remote control software.
ALARM RESET	Button for zeroing the FAULT or WARNING alarms.
NOMINAL POWER	Click this button to set the transmitter for supplying the nominal power level. A specific LED signals this setting. The value that corresponds to the nominal level is set by the operator using the menu settings in Section 7.1.8.
POWER LOWER	Click this button to set the transmitter for supplying the reduced power level. A specific LED signals this set-ting. The value that corresponds to the reduced level is set by the operator using the menus.
EXCITER CHANGEOVER	Use this button to set the changeover system in manual or automatic mode. The signaling LED turns on when the manual mode is selected. On performing a changeover, the exciter connected to the amplifier is deviated toward the internal dummy load and vice-versa. The operator

	must use the exciters menu to perform the changeover in manual mode.
LEDs (Wait, Warning, Fault)	Other signaling LEDs are connected to the alarm states and to the serial data transmissions that take place among the microprocessorbased cards. The function of these LEDs is described further on in this manual.

5.2.3 Analog instruments

The control unit of PJ5KPS contains an analog meter with a rotating selector that are useful for an immediate display of the following parameters:

FWD PWR	Transmitter direct power
RFL PWR	Transmitter reflected power
UNBAL	Transmitter unbalancing power
PWR EXC1	Power supplied by the exciter currently connected to the amplifier. This value is measured by the machine in the splitter section
PWR EXC2	Power supplied by the exciter currently connected to the internal load. This value is measured by the amplifier in the splitter section
EXT FWD PWR	Direct power of an external combiner.
EXT RFL FWD	Reflected power of an external combiner.
EXT UNBAL	Unbalancing power of an external combiner. These three values are used when the transmitter is connected to a 1+1 system. The SET outputs may also be connected to these quantities.

5.3 First start

This section describes the procedure for powering-on the machine the first time.

For simplicity's sake, the automatic control capacities of the exciters are temporarily disabled.

Refer to chapter 5.4 that provides the instructions for turning on the PJ5KPS in the various cases.

5.3.1 Preliminary operation

Before activating this piece of equipment, the necessary connections must be performed, and in particular:

- Power supply
- Modulating signals (Audio or MPX, RDS...)
- RF load (antenna feeder or dummy load)

About to the connections of the power supply and the modulating signals, please refer to chapter 5.1.

The machine's RF output is the "EIA 1 5/8" flanged type and is accessed on the roof of the PJ5KPS. If a dummy load capable of dissipating the RF power generated by the transmitter is available, it is advisable to run the first tests by connecting to it rather than to the transmission antenna.

5.3.2 Power-on

When powering-on the transmitter the first time, perform the operations outlined in the table below.

The "Result" column indicates the immediate results of the operations performed plus a few indications that confirm that the machine is working efficiently.

Should any inconsistencies occur as compared to these indications, interrupt the procedure and identify the reason for the malfunction before resuming the procedure.

Operation	**Result**
Close the "Transformer Breaker" isolating switches	The power supply unit carriages are powered
Turn the "Mains" switch	The whole transmitter is powered. The machine is activated in the same status it was in when it was turned off the last time
Press the OFF key of the control unit	RF emission by the transmitter is inhibited; the exciters are off; the RF amplifier modules are off
Press the EXCITER CHANGEOVER key of the control unit	The automatic management for the exciters changeover is disabled. The MANUAL LED must be on (otherwise press the key again)
Press the STDBY key of the control unit	The exciters are turned on in interlock status. The RF amplifying modules stay disabled. Being in manual modality, the exciters could be unlocked to verify the operation (see 5.3.3).
Set the parameters of the control unit	This procedure is described in chapter 5.3.3 on in this manual. The control unit communicates the nominal power and reduced power values to the RF modules. It also handles the coaxial relays so that the on air exciter is the desired one and sets the exciter to ON mode
Set the exciters	Adhere to the instructions of the exciters used for setting the required work frequency on the exciters. Regulate the output power of the exciters to 20 W.
Press POWER LOWER and ON	The current exciter is activated (the interlock is released from the exciter) and its power emission is enabled. The power emitted by the PJ5KPS amplifier increases gradually until it attains the level that had been set previously as "Reduced power". Check the emitted power level by means of the analog instrument with the selector switched to FWD PWR position
Press NOMINAL POWER	Power supplied by PJ5KPS increases and attains the set nominal value. Check it on the analog instrument.

When the transmitter is on and works at its nominal power, the whole series of "accessory" checks and settings deemed necessary may be carried out before starting up the apparatus.

5.3.3 Control unit settings

The settings of the control unit that are required for starting up the machine, mentioned in the powering-on procedure, are the following:

1. Setting of the power levels
2. Setting of the on air exciter

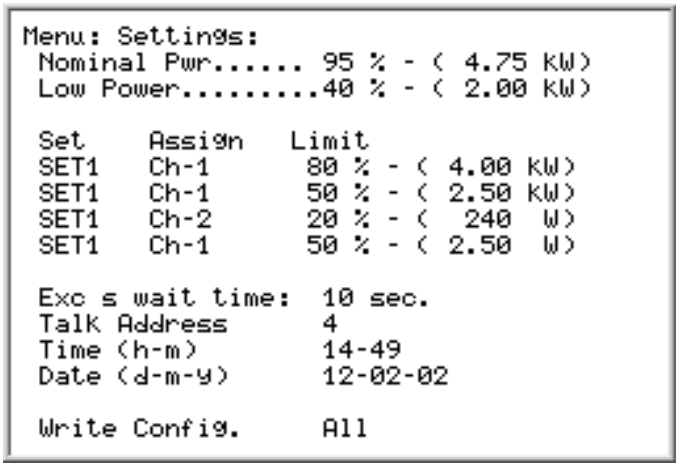


Figure 5-8 *Menù settings*

Before performing the first operation, click the ESC button. The display shows the screenful for selecting the menus [Figure 5-7]. Click the arrow keys until the cursor highlights the line associated with the Setting menu. Click OK: the software will show the associated screenful on the display [Figure 5-8].

On having accessed the Settings menu, use the arrow keys to select the nominal power line (Pwr. Out) and click OK. Use the arrow keys to decrease or increase the indicated percentage value up to the required level. Click OK again to set this value. Repeat the operation for the line associated with the reduced power level (Pwr. Lower).

NB The new power level is transmitted to the combiner module and then stored in EEPROM only when the ESC button is clicked.

When inside this menu, it is advisable to check the date and time lines and update them if necessary. Note: the date and time are used only for marking the events in the alarms register.

NB The date and time do not need to be updated in the transmitter in order for it to work efficiently.

On having completed these settings, click ESC to return to the selection screenful.

In order to set the on air exciter, select the Exciters menu [Figure 5-9]. Take into consideration the On Air Exciter line: the number to the right indicates the exciter being used. To change it simply highlight the line and click OK.

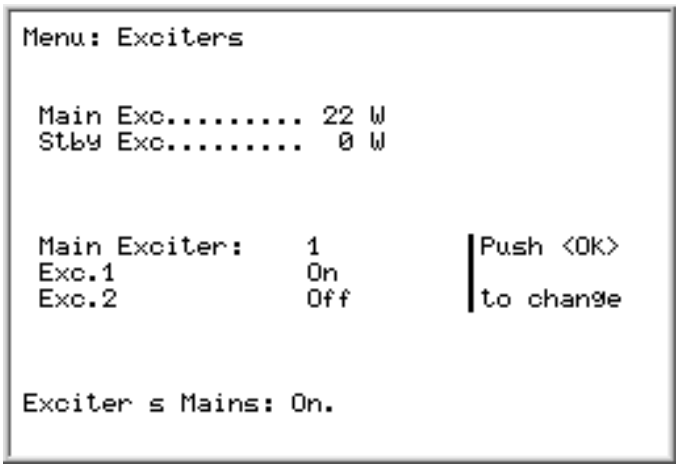


Figure 5-9 *Exciters Menu*

The exchange of the exciters is assisted from the software, that is when the commutation is carried out , the interlock comes systematized in the correct way independently from like they were. The interlock could be modified also manually in case of necessity.

5.4 Management of the exciters

The control unit can perform the automatic changeover between exciters if one malfunctions. The Manual LED on the panel indicates, when it is lighted up, that the automatic changeover function is disabled. In order to enable it, click the EXCITER CHANGEOVER button and check that the LED turns off. In funzione dello stato dell'automatismo del PJ5KPS, il comportamento della macchina sarà diverso. In questo capitolo sono descritti i diversi casi.

In function of the state of the PJ5KPS automatism, the behavior of the machine will be various. In this chapter are described the different cases.

5.4.1 Start-up from power-on with exciters in manual mode

When powering on the machine with the exciters in manual mode, the apparatus does not perform any check, both mute RF signals are active and the changeover relay remains in standby status. Use the exciters menu to activate an exciter.

This is why, if the transmitter is left in manual mode, any momentary power failure will cause the transmitter to be inactive when turned on again. Therefore it is advisable to leave the PJ5KPS in automatic mode when you are not performing maintenance operations.

5.4.2 From OFF to ON with exciters in manual

When switching from OFF (or STDBY) to ON with the exciters in manual mode, the apparatus does not perform any check and the exciter that is currently set to on air is the one that is aired.

If the mains signal is not OK, the exciters turn off automatically.

If the maximum drive power is exceeded during operations (> 35W), the PJ5KPS is set to fault status and power supply is cut to the exciters.A message in the alarms menu signals this fault.

When the apparatus is set to STDBY, the mute RF signals of the exciters are not activated and may be modified by the operator.

When the apparatus is set to EXT INT or AUX INT, the mute RF signals of the exciters are not activated and may be modified by the operator.

5.4.3 Automatic changeover

When the PJ5KPS is in the exciter automatic changeover mode, the power emitted by the on air exciter is checked constantly. If at any time the on air exciter is no longer good (i.e. power drops to below the preset level), the apparatus is kept operational whereas the exciter connected to the internal Dummy Load turns on. If the latter one is good (i.e. it is capable of supplying the required power), then the two exciters are changed over. Instead if the alternative exciter is not good, no changeover takes place, the control unit commands the mute RF of the exciter to Dummy Load, it waits 120 s. and repeats the attempt. This procedure is repeated indefinitely until one of the two exciters is considered to be good.

During the whole length of time during which there is no good exciter, the PJ5KPS keeps the WAIT LED on for signaling this status.

Each exciter is fitted with its own mute RF. On being commanded, the piloting signal must return to zero within 3 seconds at the most. If this does not occur, the fault is recorded by an error message that is entered in the alarms menu.

If the mains signal is not OK, the exciters turn off automatically. If the piloting power exceeds the limit during operations, the PJ5KPS is set to the FAULT status and the power supply of the exciters is turned off. A message in the alarms menu signals the fault. Keep in mind that the operator's intervention is required to exit from the FAULT status.

If the MAINS signal coming from the bus is not OK, the exciters are all turned off. As soon as the MAINS signal is regular again, the evaluation cycle of the exciters begins (see 5.4.4).

When the apparatus is set to STDBY, the mute RF signals of the exciters are activated and as such both exciters are inhibited. If the ON key is pressed, the system re-evaluates both exciters in the same manner as in the procedure from OFF to ON (see 5.4.4).

When the apparatus is set to EXT INT or AUX INT, the mute RF signals of the exciters are activated and therefore both exciters are inhibited. When the external interlocks are released, the system re-evaluates both exciters as during the phase from OFF to ON (see 5.4.4).

5.4.4 Phase from ON to OFF

When the apparatus is set to OFF status and you press the ON button, the power supply of the exciters is activated and the logic starts to evaluate the exciters. During the evaluation phase, the WAIT LED stays ON.

When the apparatus is turned OFF, it memorizes the exciter on air. Consequently when the machine restarts it can attempt to restore the previous conditions. On the machine restarting, if the exciter that is to be aired does not attain the preset power level whereas the spare one is operational, the apparatus performs the changeover when the evaluation time (120 s.) expires.

On the machine restarting, if both exciters do not attain the preset power level, the apparatus airs the one that had been present when the machine was turned off, after the evaluation time has expired.

5.4.5 Start-up with exciters in automatic mode

The sequence run by the PJ5KPS, when the power supply is activated while it is already in ON status and the exciters are in automatic mode, is identical to the one run for switching from OFF to ON. The only difference is that a screenful displays the countdown for determining the fault of the exciters. During this phase the manual/ automatic button is inhibited and in order to set the exciters to manual mode you must press the OFF button of the apparatus.

5.4.6 Audio alarm

The control unit of the PJ5KPS can manage a fault signal, for each exciter, which normally has an "Audio Alarm" meaning. The control software of the PJ5KPS does not intervene in triggering these signals since they must be checked by the exciters (or by any other connected devices).

The Audio Alarm signals are made up of two inputs for the logical signals on the parallel interface and on the "mute RF" command connector of the exciters.

The control unit manages these signals just like it manages the power good signals:

- Each "Audio alarm" signal is associated with its own exciter
- If the audio signal, associated with the exciter that is currently on air, enters an alarm status, the PJ5KPS waits for the time configured in the exciter menu before it attempts the restoring operation

- If the audio of the aired exciter is still in alarm status on the elapsing of the aforesaid time interval, the control unit checks if the audio of the exciter on the dummy load is regular. In this case the changeover between the exciters is performed.

Observe the following differences as compared to the case in which power is missing:

- The management of the "Audio alarm" signals is not active during the start-up phase and during the switching phase from OFF to ON, but only when the exciters are working in automatic.
- In the standard configuration, the aforesaid sequence continues until the audio signal associated with one of the exciters becomes regular again. In the "N+1" configuration, the switching attempt is performed only twice, after which the PJ5KPS enters the fault status.
- An Audio Alarm output is provided on the parallel interface: this signal is activated (with no delays) when the audio of the exciter that is currently on air is in alarm status.

5.5 Protection and alarms

The PJ5KPS contains a complete protection and alarms system, both at the individual modules level and at the control unit level.

The modules are fitted with a micro-processor-based system that manages any malfunctions locally. The associated information is communicated to the control unit for displaying and storing the events and for the centralized management of the events that require it.

Certain LEDs of the PJ5KPS panel are dedicated to the management of the alarms:

LED	Description
WARNING	This LED indicates a warning (something is not correctly working, but the amplifier is still working)
FAULT	This LED indicates a fault (the amplifier is shut off, the operator's intervention is required)
WAIT	This LED indicates the wait status (the amplifier is temporarily off, it will be restarted as soon as the reason that keeps it from working will be removed, or after a fixed amount of time depending on the reason of the intervention of the protection system)

The ALARM RESET button is used for resetting the alarms and restarting the machine.

A complete description of the alarms and protection system is given in chapter 7.5.

6. Troubleshooting

[This chapter will be filled in the next edition of the present manual]

7. Technical description

7.1 Software - Reference guide

This chapter gives a point to point description of the screens composing the software of the PJ5KPS.

NB Since the management software is able to control up to 10 modules, some of the menus configurate themselves for the number of modules. For example, in a PJ10KPS the menu Overall Status has ten “RF Unit” lines as in the general example reported in the manual, in the PJ5KPS only five of them will be shown.

7.1.1 Overall Status menu

This is the default menu appearing when the user switches the unit on.

This menu includes only indications, therefore the user cannot insert any input in its different lines.

Menu Line	Description
Timer	Indication of the start and stop times of the automatic power reduction feature - see “Settings” menu
Control Unit	Status of the control unit (Off or On) and indication of the exciter actually connected to the amplifier (Exct.1 or Exct.2)
Power Supply	Status of the power-supply cart (Off or On)
R.F. Combiner	Status of the RF combiner (Off or On)
R.F. Unit - N	Status of the Rf power amplifier number N (Off or On)
Hours	Timer counting the hours of operation of the transmitter. For example, this indication is useful in order to define when a maintenance operation can be made

From the predefined menu, by pressing the Esc key as indicated on the last line, you can shift to the exchange screen from which you can have access to all the other menus of the unit.

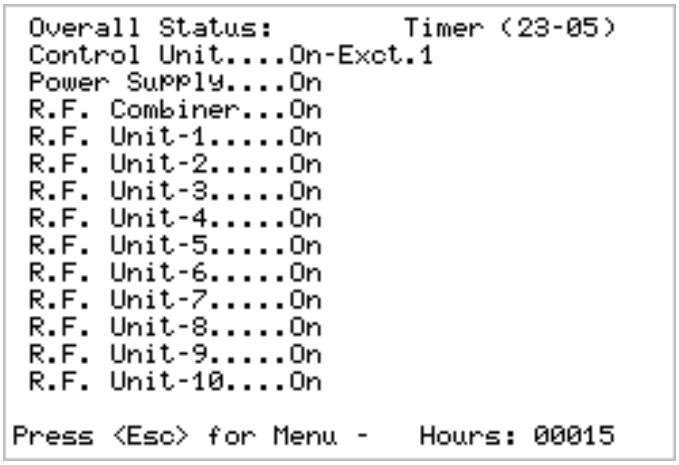


Figure 7-1 *Overall Status menu*

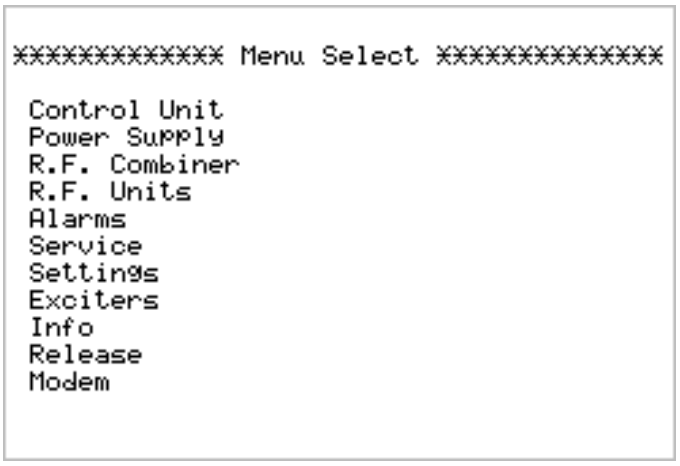


Figure 7-2 *Select menu*

7.1.2 Select menu

This is the exchange menu from which you can select the different sub-menus that compose the software.

In order to enter a sub-menu, select the correspondent line with the arrow buttons and press Enter.

Menu Line	**Description**
General Status	General status of the PJ5KPS
Power Supply	Status of the power-supply cart
R.F. Combiner	Status of the RF combiner
R.F. Units	Status of the RF power amplifiers
Alarms	Summary of the occured alarms
Service	Service menu for the switching on/off of the modules
Settings	Setting of the parameters (i.e. Power levels)
Exciters	Parameters of the exciters (i.e. output power, on air exciter)
Info	Information concerning the configuration of the PJ5KPS
Release	Information concerning the hardware and software versions of the modules composing the unit
Modem	Settings related to the optional telemetry system (see chap.9)

To return to the predefined menu, select General Status and press OK.

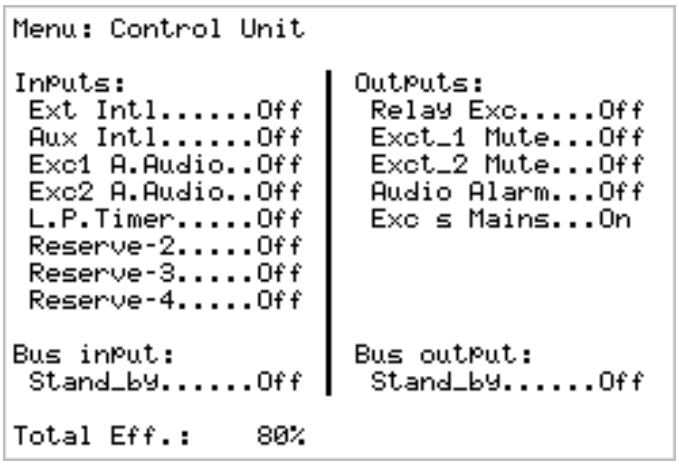


Figure 7-3 *Control Unit menu*

7.1.3 Control Unit menu

Informative menu on the inputs and the outputs of the control unit of the machine.

Linea menù	**Descrizione**
Ext Intl	Input status “external interlock” (JP4/4 parallel interface)
Aux Intl	Input status “auxiliary interlock” (JP4/5)
Exc1 A.Audio	Input status “audio alarm exciter 1” (JP4/8)
Exc2 A.Audio	Input status “audio alarm exciter 2” (JP4/9)
Reserve 1	Input status “Reserve 1” (JP8/2 parallel interface)
Reserve 2	Input status “Reserve 2” (JP8/3)
Reserve 3	Input status “Reserve 3” (JP8/4)
Reserve 4	Input status “Reserve 4” (JP8/5)
Relay Exc	Exciters exchange relay status (Off = exciter 1 on air)
Exc 1 Mute	Exciter 1 interlock status (Off = RF power enabled)
Exc 2 Mute	Exciter 2 interlock status (Off = RF power enabled)
Audio Alarm	Output Audio Alarm status (JP47/1)
Exc’s Mains	Exciters power supply status (On = power supply enabled)
Stand_by (In)	“Stand by” input line status
Stand_by (Out)	“Stand by” output line status from the control unit
Total Eff	Total efficiency of the machine

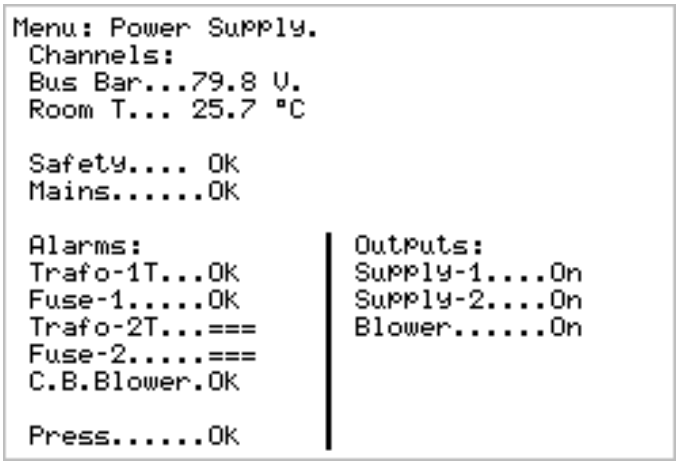


Figure 7-4 *Power Supply menu*

7.1.4 Power Supply menu

Information menu showing the status of the Power Supply / Rectifier carriage.

Linea menù	**Descrizione**
Bus Bar	Output voltage from the rectifier on the common 80V dc supply bus.
Room T.	Temperature of the air at the input of the unit
Safety	Status of the safety arrest button. On indicates the functioning is enabled, Off means the unit was arrested through the button
Mains	Status of the main voltage supply. On indicates that the voltage is within the functioning range of the unit and that the phase sequence is correct
Trafo-1T	Status of the AC fuses AC low voltage bus bar rectifier and interblock of module 1
Fuse-1	Status of the AC fuses AC low voltage bus bar rectifier and interblock of module 1
Trafo2-2T	Stesso significato di Trafo-1T. Quando il carrello alimentatore/ rettificatore 2 non è installato, viene indicato ===.
Fuse-2	Same function as Temp.1. When the supply/rectifier module 2 is not installed, === is indicated
C.B. Blower	Status of the magnetothermical "motor save" interruptor of the circuit breaker blower.
Supply-1	Control contactor of module 1
Supply-2	Control contactor of module 2
Blower	Control contactor of the power of the blower

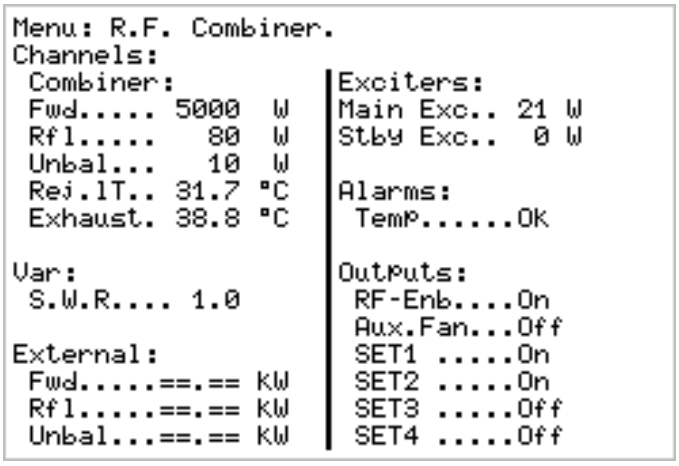


Figure 7-5 *R.F. Combiner menu*

7.1.5 R.F. Combiner menu

This menu contains the information related to the RF part of the complete transmitter. Here the user will find the most interesting parameters, like the overall emitted RF power and the reflected power.

Menu Line	**Description**
Fwd	Overall emitted RF power of the transmitter
Rfl	Reflected RF power of the transmitter
Unbal	Unbalancement RF power: sum of the power dissipated on the internal resistors due to unbalanecement in the RF modules
Rej.lT	Temperature of the load resistors dissipating the unbalancement power
Exhaust	Temperature of the exhaust air (top of the transmitter)
S.W.R.	Standing Wave Ratio, calculated by the Control Unit on the basis of the measured forward and reflected power
(External) Fwd	Forward power of an external transmitter (when configured for this function)
(External) Rfl	Reflected power of an external transmitter (when configured for this function)
(External) Unbal	Unbalancement power of an external transmitter (when configured for this function)
Main Exc	Output power of the exciter currently on air (the one connected to the input of the RF modules)
Stdby Exc	Output power of the exciter currently on the internal dummy load
Temp	Status of the temperature alarm (sensor included in the combiner)
RF-Enb	RF output enable: “On” means that the RF combiner unit is giving its permission for the regular operation of the transmitter
Aux Fan	Switch for an auxiliary fan (not used in the current configurations)
SET1	Status of the output “SET1”. See the Settings Menu
SET2	Status of the output “SET2”
SET3	Status of the output “SET3”
SET4	Status of the output “SET4”

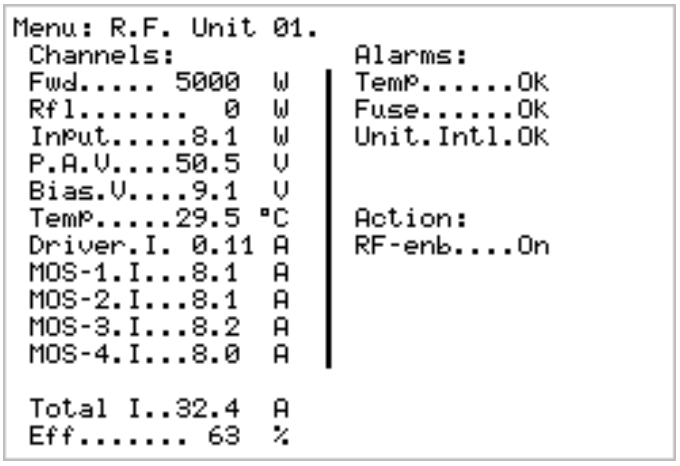


Figure 7-6 *R.F. Units menu*

7.1.6 R.F. Units menu

Information menu showing the status of the RF power amplifier modules. It is composed of 5 screens, one for each module, that can be scrolled using the arrow buttons.

Menu Line	**Description**
Fwd	Measurement of the forward power of the amplifier module
Rfl	Measurement of the forward power of the amplifier module
Input	Measurement of the driving power at the input of the amplifier module
V.P.A.	Measurement supply voltage of the module (generated from the switching power supply included in each module)
Driver	Measurement of the current absorbed by the preamplifier stage
MOS N	Measurement of the current absorbed by the MOS N amplifier module (each RF module contains 4 MOS modules)
I. Tot	Measurement of the total current absorbed by the RF module
Eff	Efficiency of the amplifier module, as a result of the ratio between the electrical power absorbed and the RF output power
Temp	Temperature alarm, Ok or Ko
Fuse	Status of the fuse of the RF module: Ok or Ko
Unit. Intl	State of the RF module interlock micro-switch
RF enb.	Enabled of power distribution from part of the module

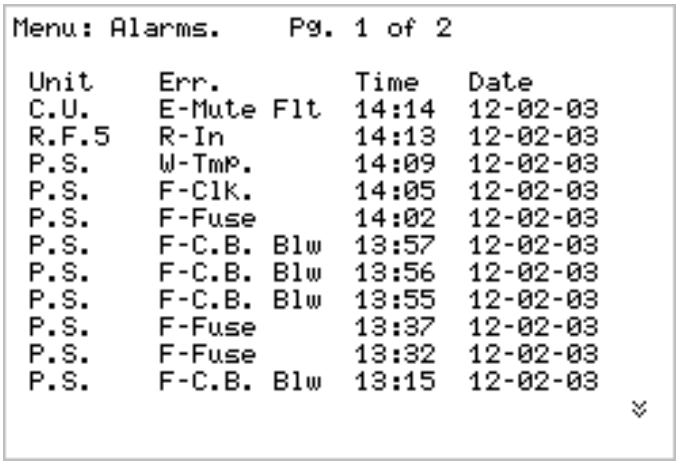


Figure 7-7 *Alarms menu*

7.1.7 Alarms menu

This screen describes all the registered events which are relevant to determine the probable causes of any disfunction. The screen is composed of a variable number of pages (up to 10) in function of the number of events occured. The last events in chronological order are shown in the first page and so on. To shift to the different pages, use the arrow buttons.

Menu Column	**Description**
Unit	Module of the system which generated the failure
Err	Type of failure and description. The type of failure can be W (Wait) - the unit goes in stand-by until the cause of the failure is removed, R (Retry) - the unit is locked for a predefined time lag after which a reset attempt is launched, or F (Fault) - the unit is completely locked and requires the intervention of the user in order to remove the cause of the failure.
Time	Time (hrs and minutes) at which the failure occured
Date	Date at which the failure occured

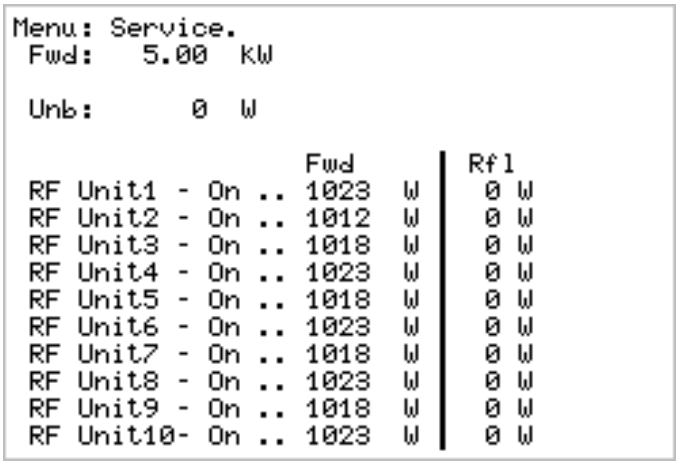


Figure 7-8 *Service menu*

7.1.8 Service menu

This menu is normally used during the maintenance operations. When this screen is visualized, the Control Unit checks the status of the modules of the unit more frequently in order to have a visualization of the different parameters as fast as possible. When this menu is entered, all the secondary functions are interrupted, therefore a possible alarm may not be visualized and registered immediately; when exiting this menu all the alarms which were temporarily put in "stand-by" are registered. If the user sets some modules in OFF modality, these will be automatically reactivated when exiting the menu. This menu is deactivated after 60 minutes if no key is selected.

Menu Line	**Description**
Fwd	Forward power globally emitted by the amplifier
Unb	Unbalancing power dissipated in the combiner module.
RF UnitN - On	Fields used to switch ON and OFF the amplifier modules. Before the removal of an amplifier module for its replacement or maintenance switch it off with the help of the corresponding line.
Fwd	Forward power generated by the RF module
Rfl	Reflect power from the RF module

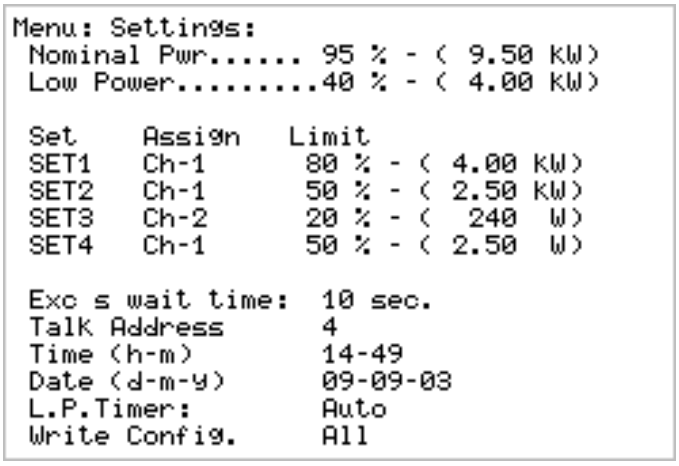


Figure 7-9 *Settings menu*

7.1.9 Settings menu

This menu is used for the settings of the unit. It is therefore the menu which is used more often apart from the possible maintenance operations.

Menu Line	Description
Pwr. Out	Setting of the level of nominal power, expressed as a percentage of the maximum power level. This is the level that the PJ5KPS must reach when the Power Nominal button is pressed, except in case of disfunction.
Pwr. Lower	Setting of the reduced power level, expressed as a percentage of the maximum power level. This is the level that the PJ5KPS must reach when the Power Lower button is pressed, except in case of disfunction.
SET1	Level (Limit) at which the "Power Good" SET1 is launched. This level is expressed as a percentage of the full-scale to which SET1 is connected, indicated in the column Assign
SET2	See SET1
SET3	See SET1
SET4	See SET1
Exct. Wait time	Delay before assuming the on air exciter is faulty
Talk Address	Address of the unit in the RS485 network
Clock	Visualization and setting of the internal clock of the unit
Calendar	Visualization and setting of the internal calendar of the unit
L.P. Timer	Setting of the automatic power reduction feature: this can be “Auto” (enabled) or “Manual” (disabled). The feature consists in reducing the power to the low power level and then returning to the nominal power at fixed times. The start and stop times are set in this menu selecting “Auto”.
Write Config	Button for the registration of the configurations in each module of the unit

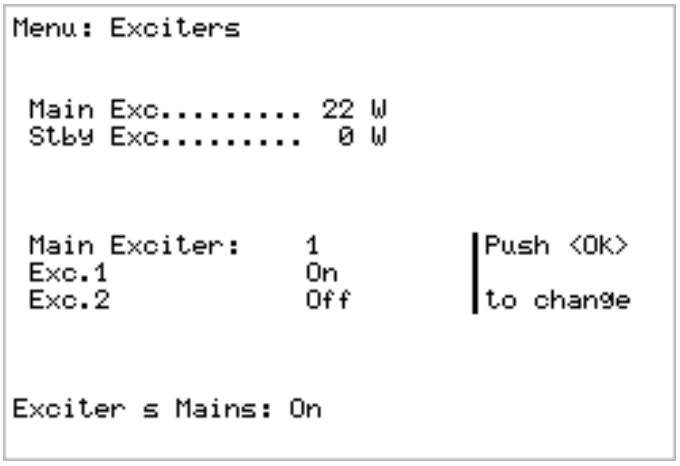


Figure 7-10 *Exciters menu*

7.1.10 Exciters menu

This menu is used to configure the settings of the exciters.

Menu Line	**Description**
Main Exc	Output power of the exciter currently on air
Stdby Pwr	Ouput power of the exciter currently on the internal dummy load
On Air Exciter	Visualization of the "on air" exciter. When positioning the cursor on this line, with the arrow buttons and by pressing Enter, it is possible to operate the switching between the on air exciter and the exciter on dummy load.
Exct.1	Status of the exciter 1. By positioning the cursor on this line with the arrow buttons and by pressing Enter it is possible to switch on and off the exciter.
Exct.2	Same as Exct.1 for the second exciter

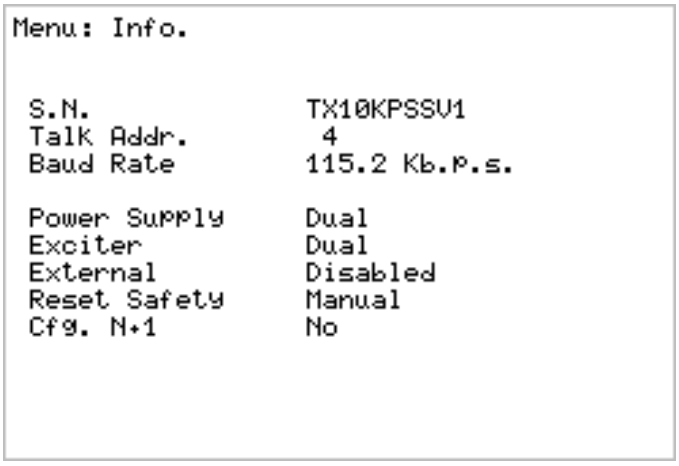


Figure 7-11 *Info Menu*

7.1.11 Info menu

This screen informs the user about the configuration of the transmitter.

Linea menù	**Descrizione**
Menu Line	**Description**
Type	Configuration type (model of the transmitter)
Talk Addr.	Address of the RS485 port of the transmitter
Baud Rate	Baud rate of the serial port
Power Supply	Number of the transformer/rectifier carriages in the transmitter: this can be “Single” or “Dual”
Exciter	Number of the exciters in the transmitter: this can be “Single” or “Dual”
External	Checking of the external Fwd, Rfl, Unbal values (Enabled or Disabled)
Reset Safety	Resetting of the machine after a trip caused by the safety button. It can be “Automatic” or “Manual”
Cfg. N+1	Configuration of the transmitter as a N+1 system

```
Menu: Release.

                Ad.   Cfg.   S.V.   H.V.
Control Unit     4    5000   3.60   1.0
Power Supply     1    5000   2.11   1.0
RF Combiner      4    5000   2.11   1.0
RF Unit-1        8    5000   2.11   1.0
RF Unit-2        9    5000   2.11   1.0
RF Unit-3       10    5000   2.11   1.0
RF Unit-4       11    5000   2.11   1.0
RF Unit-5       12    5000   2.11   1.0
RF Unit-6       13    5000   2.11   1.0
RF Unit-7       14    5000   2.11   1.0
RF Unit-8       15    5000   2.11   1.0
RF Unit-9       16    5000   2.11   1.0
RF Unit-10      17    5000   2.11   1.0
```

Figura 7-12 *Release Menu*

7.1.12 Release menu

This menu show the address, the kind of configuration, the software version and the hardware version of all the microprocessor boards of the transmitter.

```
Menu: Modem Type: Auto
I.D.   : 01   -  Name: Example_station
S.C.N.: +1234567890
Info   : NETWORKPROV  Dial: ATDT
Phone  : +2345678901
Phone  : +3456789012
Phone  : +4567890123
Phone  :
Phone  :
Phone  :
Phone  :
Phone  :
Phone  :
Phone  :
Level  : -65 dB       Status: RXMSG
Retry  : 2/5
```

Figura 7-13 *Modem Menu*

7.1.13 Modem menu

This screen informs the user about the configuration of the optional telemetry (see chap.9).

7.2 Parallel Interface

A parallel-type interface is mounted on the top of the PJ5KPS, in which the different signals are available through terminal blocks [Figure 7-13]. This interface is connected to the Control Unit from which it receives the different signals and to which the eventual comands are forwarded.

The card contains digital inputs, digital outputs and analog outputs. Among the digital inputs, a "copy" of all the possible orders that can be given locally to the unit by using the buttons of the control unit are displayed.

Figure 7-13 *The parallel interface*

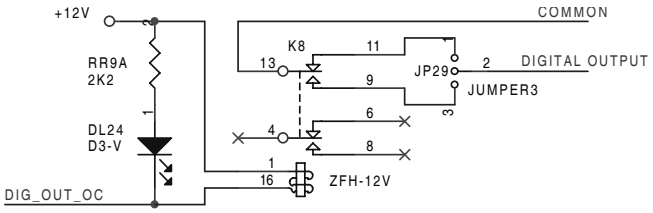
The digital outputs supply information concerning the status of the PJ5KPS.

The analog outputs enable the remote control of the most important parameters, for example the forward and reflected power.

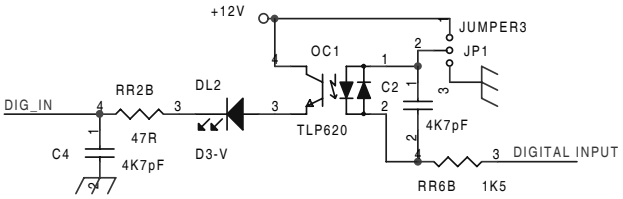
This interface was designed for a maximum configurability and adaptability to the telemetry systems to which it may be connected. For example, each digital input can be configurated through a jumper in order to be “active” when grounded or when connected to a supply source between +12V and +24V. The scheme of one generic digital input is shown in Figure 7-13 b). Please pay attention to the anti-parallele type optocouplers, so that if the jumper is closed between the pins 1 and 2, by grounding the DIGITAL INPUT, the input is active. On the contrary by closing 2 and 3, the input is active when the DIGITAL INPUT is connected to a positive voltage.

Each digital output can be configured individually as "Normally open " or "Normally closed " (NO or NC). In Figure 7-13 a) the scheme of a generic digital output is shown. Please note that when the jumper is closed between 1 and 2, the output is normally short-circuited with the common pin, while in the other case the circuit is normally open.

NB It is important to remember that the different commands can be given to the unit through the parallele interface only if the Local/Remote selector situated on the front pannel is on the "Remote" position.



a)



b)

Figura 7-15 *Digital I/O*

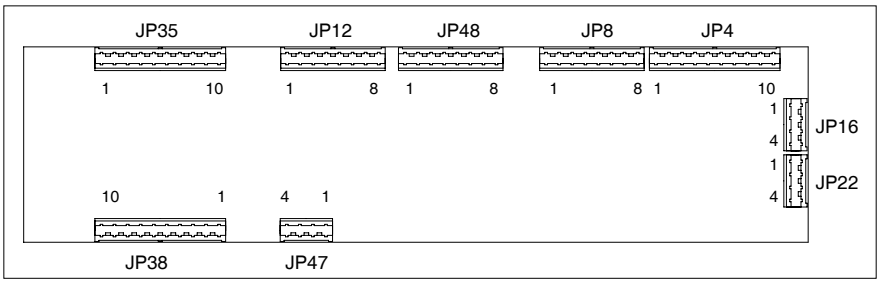


Figure 7-15 *Parallel interface terminal blocks*

The following table describes the function of each jumper of the parallel interface. The first column indicates the identifying number of the jumper as shown on Figure 7-14, the second indicates the name of the signal and the third column describes its function.

Mors.	Tipo	Nome	Descrizione
JP4/1	In	**ON**	Corresponds to the ON button of the control unit
JP4/2	In	**STDBY**	Corresponds to the STDBY button of the control unit
JP4/3	In	**OFF**	Corresponds to the OFF button of the control unit
JP4/4	In	**EXT INH**	External inhibition jumper. It is a "N.C." type jumper, which means that it must be active for the PJ5KPS to work.
JP4/5	In	**AUX INH**	Auxiliary external inhibition jumper. It is a "N.O." type jumper, which means that it must be not active for the PJ5KPS to work. It is "auxiliary" because even if nothing is connected to it the PJ5KPS works normally.
JP4/6	In	**NOM PWR**	Corresponds to the NOMINAL POWER button of the control unit

JP4/7	In	**LOW PWR**	Corresponds to the REDUCED POWER button of the control unit
JP4/8	In	**AUDIO ALARM EXC. 1**	Audio alarm of exciter 1. This input, when active, indicates an alarm on exciter 1. If the PJ5KPS is in automatic changeover modality, if the exciter 1 is on air and if this signal remains active for a time lag equivalent to the time setted in the Settings menu at line Exc. Wait time, the changeover procedure between the exciters will be started.
JP4/9	In	**AUDIO ALARM EXC. 2**	Same as AUDIO ALARM EXC. 1 for exciter 2.
JP4/10	/	**GND**	Grounding contact.
JP8/1	In	**ALARM RESET**	Corresponds to the ALARM RESET button on the control unit
JP8/2	In	**RESRV. 1**	Reserve 1 input. When this input is active, the failure is registered by the software in the Alarms menu. For example it can be connected to a switch that indicates that the door of the station is open or to a sensor of a power reserve of an electric generator. In this way, by consulting the menus of the unit, it is possible to trace the moment at which (time and date) the failure occured.
JP8/3	In	**RESRV. 2**	Same as JP8/2
JP8/4	In	**RESRV. 3**	Same as JP8/2
JP8/5	In	**RESRV. 4**	Same as JP8/2
JP8/6	In	**EXCITER CHANGEOVER CMD**	This comand launches the changeover procedure between the exciters. It has the same function as when you press the OK button when selecting line On air exciter in the menu Exciters. In order to launch the changeover between the exciters through this comand, the manual changeover modality should be formerly selected through the correspondent button on the control unit or through the JP8/7 jumper, having however the unit in "Remote" modality.
JP8/7	In	**EXCITER CHANGEOVER**	Corresponds to ther EXCITER CHANGEOVER button of the control unit
JP8/8	/	**GND**	Ground
JP16/1	Out	**+12V dc**	Power source. A maximum of 100 mA can be absorbed between this jumper and JP16/2. This power source can be used if the user wants to enter the comands following a positive logic (high voltage - active comand)
JP16/2	OUT	**+12V dc**	Same as JP16/1
JP16/3	/	**GND**	Ground
JP16/4	/	**GND**	Ground
JP22/1	I/O	**TX/RX +**	Bus RS 485. Please note that this serial port is operational only when the unit is in "Remote" modality.
JP22/2	I/O	**TX/RX -**	Bus RS 485
JP22/3	/	**LINE TRM**	Line termination for bus RS 485
JP22/4	/	**LINE TRM**	Line termination for bus RS 485
JP48/1	/	**GND**	Ground
JP48/2	/	**GND**	Ground
JP48/3	Out	**FWD PWR**	Forward power. Analogical output, 3.9V for 5000W
JP48/4	Out	**RFL PWR**	Reflect power. Analogical output, 3.9V for 1200W
JP48/5	Out	**OUT AIR TEMP**	Temperature of the air at the output of the chimney. Analogical output, 0V for -50°C, 3.9V for 100°C
JP48/6	Out	**V BUS**	Voltage at the output of the transformer/rectifier.Analogical output, 3.9V for 80V, 0V for 0V.
JP48/7	Out	**EFF.**	General efficiency. Analogical output, 3.9V for 100%, 0V for 0%.
JP48/8	Out	**OUT DAC 6**	Reserved for future applications.
JP12/1	Out	**CMN MUTE 1**	Common contact MUTE 1 (see JP12/2).

JP12/2	Out	**MUTE 1**	MUTE excitater 1. Digital output, active when exciter 1 is inhibited by the control unit. Like all the digital outputs on the parallele interface, it can be configurated through jumper as normally open or normally closed. This output has a common contact dedicated to this function (JP12/1).
JP12/3	Out	**CMN MUTE 2**	Common contact MUTE 2 (see JP12/4).
JP12/4	Out	**MUTE 2**	MUTE exciter 2. Digital output, active when exciter 2 is inhibited by the control unit. This output has a common contact dedicated to this function (JP12/3).
JP12/5	Out	**CMN LOCAL**	Common contact LOCAL (see JP12/6).
JP12/6	Out	**LOCAL**	LOCAL/REMOTE status. Digital output, active when the PJ5KPS is setted in local modality. This output has a common contact dedicated to this function (JP12/5).
JP12/7	Out	**CMN MAINS**	Common contact MAINS (see JP12/8).
JP12/8	Out	**MAINS**	MAINS alarm, active when are present problems on the alimentation
JP47/1	Out	**AUDIO ALARM**	"AUDIO" alarm (see JP4/8 and JP4/9). This output is active when the on air exciter is in audio alarm status. This output has a common contact dedicated to this function (JP47/2).
JP47/2	Out	**CMN AUDIO ALARM**	Common contact AUDIO ALARM (see JP47/1).
JP47/3	Out	**COMMON RL3**	Common contact shared from the outputs JP38/1-10.
JP47/4	Out	**COMMON RL3**	Parallel contact with JP47/3.
JP35/1	Out	**RESRV. 1**	Reserve 1. Digitale output, active when the INPUT RESERVE 1 input (JP8/2) is active. The common contact of this output is RL4 (JP35/5)
JP35/2	Out	**RESRV. 2**	Same as JP35/1, corresponds to INPUT RESERVE 2. The common contact of this output RL4 (JP35/5)
JP35/3	Out	**RESRV. 3**	Same as JP35/1, corresponds to INPUT RESERVE 3. The common contact of this output RL4 (JP35/5)
JP35/4	Out	**RESRV. 4**	Same as JP35/1, corresponds to INPUT RESERVE 4. The common contact of this output RL4 (JP35/5)
JP35/5	Out	**COMMON RL4**	Common contact shared between different digital outputs (JP35/1-4)
JP35/6	Out	**SET1**	Digital output, active when the parameter SET1 is active (see menu Settings). The common contact of this output RL5 (JP35/10).
JP35/7	Out	**SET2**	Same as JP36/6, corresponds to SET2. The common contact of this output is RL5 (JP35/10).
JP35/8	Out	**SET3**	Same as JP36/6, corresponds to SET3. The common contact of this output is RL5 (JP35/10).
JP35/9	Out	**SET4**	Similar to JP36/6, related to SET4. The common contact of this output is the RL5 (JP35/10).
JP35/10	Out	**CMN RL5**	Common contact shared between the different digital output (JP35/6-9)
JP38/1	Out	**EXC. ON AIR**	Digital output, active when the exciter 1 is on air, and not active when the exciter 2 is on air. common contact of this output is the RL3 (JP47/3).
JP38/2	Out	**AUTO/MAN**	Digital output, active when the PJ5KPS is in changeover mode as regards the exciters . The common contact of this output is RL3 (JP47/3).
JP38/3	Out	**LOWER POWER**	Digital output, active when the PJ5KPS is set for the lower power level. Common contact of this output is the RL3 (JP47/3).
JP38/4	Out	**NOMINAL POWER**	Digital output, active when the PJ5KPS is set for the nominal power

			level. common contact of this output is the RL3 (JP47/3).
JP38/5	Out	**OFF**	Digital output, active when the PJ5KPS is set for the lower power level. The common contact of this output is the RL3 (JP47/3).
JP38/6	Out	**STDBY**	Digital output, active when the PJ5KPS is set for the lower power level. The common contact of this output is the RL3 (JP47/3).
JP38/7	Out	**ON**	Digital output, active when the PJ5KPS is set on ON mode . The common contact of this output is the RL3 (JP47/3).
JP38/8	Out	**FAULT**	Digital output, active when the PJ5KPS is set on FAULT mode . The common contact of this output is the RL3 (JP47/3).
JP38/9	Out	**WAIT**	Digital output, active when the PJ5KPS is set on WAIT mode. The common contact of this output is the RL3 (JP47/3).
JP38/10	Out	**WARNING**	Digital output, active when the PJ5KPS is set on WARNING mode . The common contact of this output is the RL3 (JP47/3).

7.3 Power supply section

The power supply used by the PJ5KPS is AC threephase with neutral at 380 V. The power supply for the RF amplifier modules is DC 80 V, stabilized inside the modules themselves by a built-in switching power supply.

The power supply section of the PJ5KPS is composed of a threephase transformer and a rectifier circuit to feed the RF modules. Some features of the power supply section are the following:

- PF > 0.94. This value of the power factor is got thanks to specific solutions, such as power inductors use. The result is a wave shape of the absorbed current particularly cleaned and meeting the requirements of the most demanding users.
- Redundancy. Where an uninterrupted service is demanded, is possible to add a second power supply chart. The functionning of the max power output is warrantied by a power supply only, so the double power supply use allow to be used as back up in case of fault of one of them.
- Easy access. The power supply section is located on a chart with wheels for an easy take out from the cabinet and easy transportation. When the configuration of the equipment is with double power supply chart is possible to stop (take out and service) a section without turn off the equipment.
- The power supply section of the PJ5KPS is checked by a microprocessor card included in the rack of the equipment . This card manages one or two more power supply charts , the cooling blower and the several alarms systems such as the emergency "not aus" button.

7.3.1 Working Principles

The Power Supply is checked by a microprocessor unit completely indipendent in the alarming functions and activity respect to the control unit. The interchanges signals between the two units are present on a flat cable of 20 poles named “data communication and command bus”. The signals present on the bus that are related to the power supply section are: ON, Stby, Alarm, Tr+/Tr-.

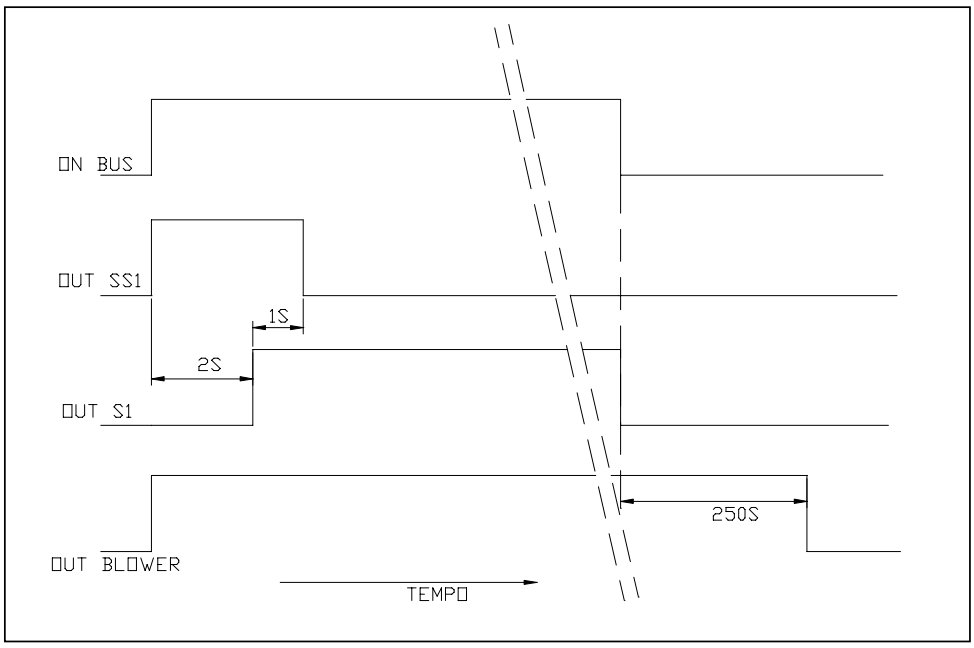


Figure 7-16 *Time chart of the carriages contactors*

Bus Command	Soft-Start contactor	Start Contactor	Fan Contactor	STDBY Output
OFF	0	0	0	Active
STDBY	0	1	1	Not Active
ON	0	1	1	Not Active

Table 7-1 *Time chart of the carriages contactors*

Signal	Function
ON	When the control of the power supply section notices a +12V on this signal, the start up cicled of the power supply carriages is activated. The cicle is divided in two phases: the first contactor enables the power transformer through power resistors, so that the possible current peak at start-up is reduced; two seconds later, the second contactor is excited, so that the transformer is directly fed. After an additional delay of a second, the first contactor is released. At this point, the start-up cicle is terminated and the STDBY line is released.
STDBY	When this signal is at ground, the RF modules are forced on a RF mute mode. The power supply section maintain on a stand-by position the control bus untill the start-up cicle is ended, or when the ON signal is not present, or at the end in all the coditions that are controlled by this section that can affect the safety of the equipment. When all the checked conditions are satisfactory the signal is released.
Alarm	When this signal is at ground the control unit checks all the devices present on the bus to register and and manage eventual alarms. When a signal or an alarm that affect the power supply section is revealed, the processor that is used to control it orders to the line to go down so to communicate to the control unit the event.
Tr+/Tr-	These signals are used for data communication. The levels meet RS485 standard , the speed is 115 kb/s. Please note that an eventual failure on these signals doesn't affect the complex functionning of the equipment.

In addition to the contactors that permit the soft-start function, this unit control the cooling blower function. This is switched on together with the On command, while, when the equipment is in OFF mode, the blower relay stops to be driven after about 4 minutes. This laboursaving device is used to avoid that temperature peaks to be present at the internal of RF modules. This procedure of post-ventilation is used for all conditions of equipment stops, both in case of human will or in case of alarm .

Table 7.1 contains a schematic of the output of the power supply section. The graphic display of the contactor status during the time is reported in the Picture 7-16.

7.3.2 Configurations

The power supply section of the PJ5KPS has the following configuration possibilities:

1 Equipment with single power supply carriage

2 Equipment with double power supply carriage

3 Equipment with automatic reset of the Safety function at the emergency button release

4 Equipment with reset of the Safety function to be done manually by pushing the button.

The standard configuration of the equipment includes the points 1 and 3.

7.3.3 Logic control Signals

The power supply section of the PJ5KPS constantly controls the logic signals that can be divided in general signals (related to the equipment in its complex) or carriages signals (related to the single power supply carriages). The status of these signals can be checked on the Power Supply Menu in the control unit.

When a fault is detected in one of the general signals, the PJ5KPS is blocked either temporarily blocked or until the intervention of the maintenance staff, depending on the type of signal. The general signals with relative meaning and managing mode are the following:

Signal	Function
Safety	This signal in alarm status when the emergency button is pushed. In this case the feed line to the several contactors is immediately sectioned, per cui si ha un arresto istantaneo di tutte le parti soggette a potenza; the exciters remain however operational. In the meantime a signal send a message to the control local unit of the current conditions. To restore the funtionning of the equipment the emergency button has to be reload.; if the equipment is configurate in mode 3), the start-up cicle is activated after two seconds. If the power supply is configurated in mode 4) it will be necessary to push the SAFETY RESET button to restart the equipment. The safety signal is not memorized on the events menu.

Mains	This signal is generated by an external device that control that the power supply current meets the limits of the functionning and that the R,S,T direction of progression of the phases is correct. If the mains is on alarm status, The equipment stops working , including the feeding of the exciters. When the signal return , an automatic restart occurs. All the time that an alarm of this type is present , a relative message in the menu alarm of the control unit is memorized.
Air pressure	A pressure sensor informs the local unit if the cooling air flow is not correct ; the intervention of the sensor stops the equipment temporarily with the disconnection of the power supply contactors of the power transformers . When the signal returns an automatic restart of the PJ5KPS takes place. An opportune message is memorized in the Alarm menu in the control unit of the unit all the times that this signal interveens.
Blower Motor Protector	The intervention of the ground protection of the motor protector put the equipment on Fault mode. This condition requires the presence of an operator to restore the functionning of the equipment . In order to attempt to restart it's necessary to reload the motor protector and push the ALARMS RESET of the control unit . Each time that this signal interveens an opportune message is memorized in the alarm menu of the control unit.

The “carriage signals” are related to the status of the single carriages. A possible alarm status in one of these signals has a different effect on the transmitter depending on the number of the included power supply carriages, single or dual. While in the first case the PJ5KPS is stopped in case of a fault, in the second case the spare carriages is still able to supply all the required power; in this case the fault is signaled by the LED Warning on the front panel.

The meanings of the carriage signals are the following:

Signal	**Function**
Fuse 1	This signal, meaning “Carriage 1 Fuse” signal is in fact composed of the series of all the safety interlocks of the carriage. If this signal is in the alarm status, it will be necessary to determine which of the following possible reasons is causing it: AC power fuse, microswitch of the chart connected. The magneto-thermic switch , command connector coils, control signals connector , threephase power connector.
Trafo 1 OH	This signal, meaning "Overheating transformer 1" (Trafo 1 Over Heat), is connected to the safety thermal switches. There are two different sensors: one is on the transformer lamellar plate, the other is on the rectifier heat dissipator. The intervention of one of these two devices stops temporarily the equipment on WAIT mode. When temperature goes below the threshold, the transmitter will automatically restart. The temperature of intervention is 90°C, and in case this alarm arises, it will be recorded with a message in the alarm menu on the control unit.
Fuse 2	As Fuse 1, for carriage 2
Trafo 2 OH	As Trafo 1 OH, for carriage 2

If the signal Fuse X is on alarm, in order to restore the regular functionning of the equipment it is necessary to identify the cause of the fault. The following table resumes the points to be verified in order to find the cause of malfunctionning :

Signal	Condition
Power fuse	Verify that the LED on the rectifier card is switched off [Figure7-18]
Chart microswitch	Verify that the power supply carriage is perfectly attached to the bottom and that pushes the microswitch [Figure 7-17 b)]
Magneto-thermic chart Switch	Verify that the switch is on position I [Figure 7-17 a)]
Control signals connectors	Verify that the plug is connected in the right way [Figure 7-18]
Command coils connector	Verify that the plug is connected in the right way [Figure 7-18]
Three-phase power connector	Verify that the plug is connected in the right way [Figure 7-17 a)] Note that the handle on the left side of the connector has to be pulled toward the front of the transmitter to block the connector in its place.

7.3.4 Control card

The functions of this microprocessor card are the following :

- Protection of the power supply section
- Communication with the control unit
- Analog parameters measurement

The card is installed in the rack under the RF modules site, in a metallic box where it's included the control card of RF combiner [Figure 7-18 a)]. This card needs two analogic tunings : air input temperature and Bus DC voltage (not stabilized). For the tuning use the Power Supply menu of the control unit and identify the appropriate trimmers in Figure [7-18 b)].

All the input digital signals are of "PNP" type, the common power supply is 12Vdc; the line of 12 Vdc is protected against the ground short circuit through a self-restoring fuse (ptc). An possible short circuit on this supply will cause trip the machine. Eventual messages of fault in corrispondence of a short circuit on this line won't be valid.

To restore the supply is necessary to remove the short circuit condition and switch OFF the equipment for about a minute in order to let the fuse self-restore.

7.3.5 Interface Board

The control card of the power supply is connected with the actuators through an interface board [Figure 7-19].

All the output signals from the control card are interfaced through power relays and signal relays. On the relay coils a signalling LED is present and indicates the command status on the control unit: the LED turned ON indicates that the coil is excited. All the power contacts are equipped with noise suppressing network.

The feeding of the relay is supplied from a line protected against the short circuit through self-reloading ground protections.

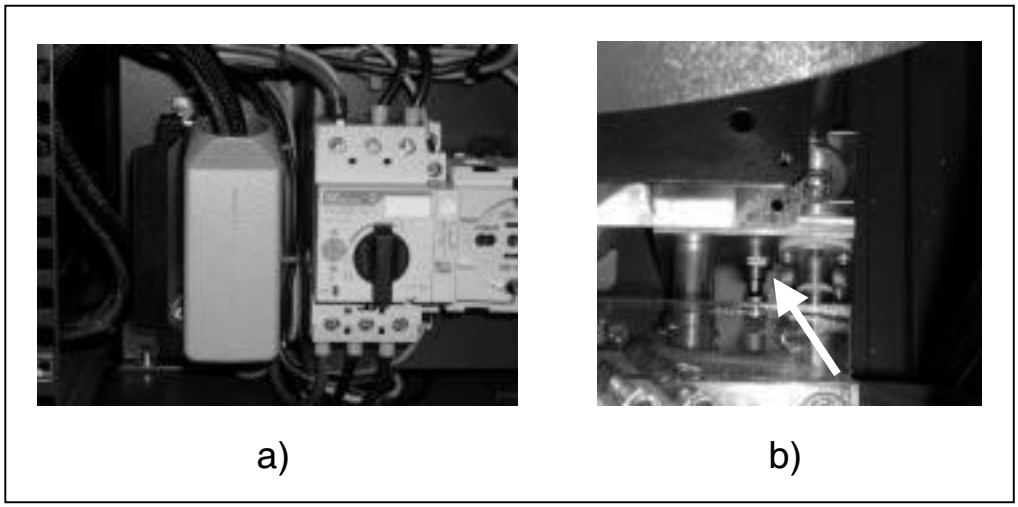


Figura 7-17 *Carriages check points*

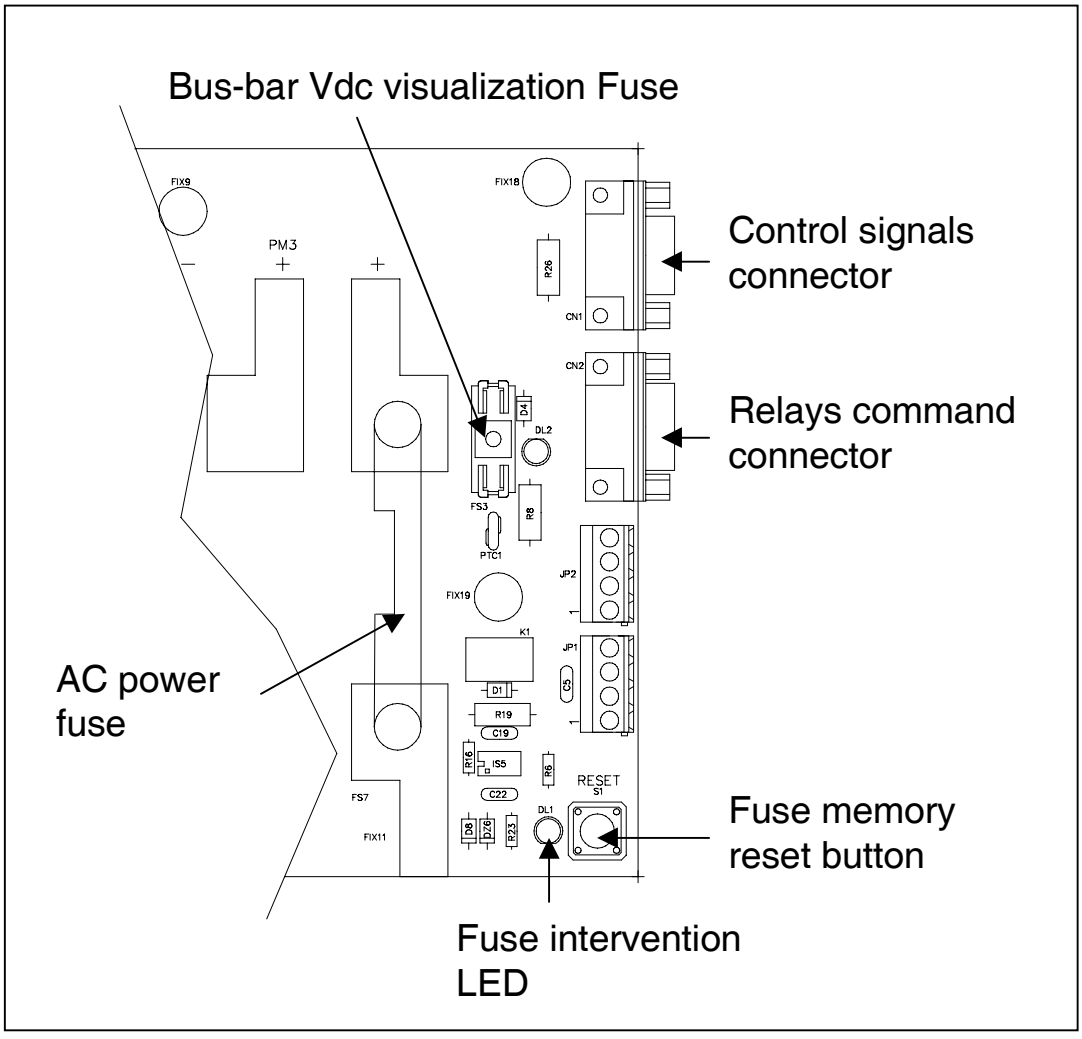


Figura 7-18 *Rectifiers board check points*

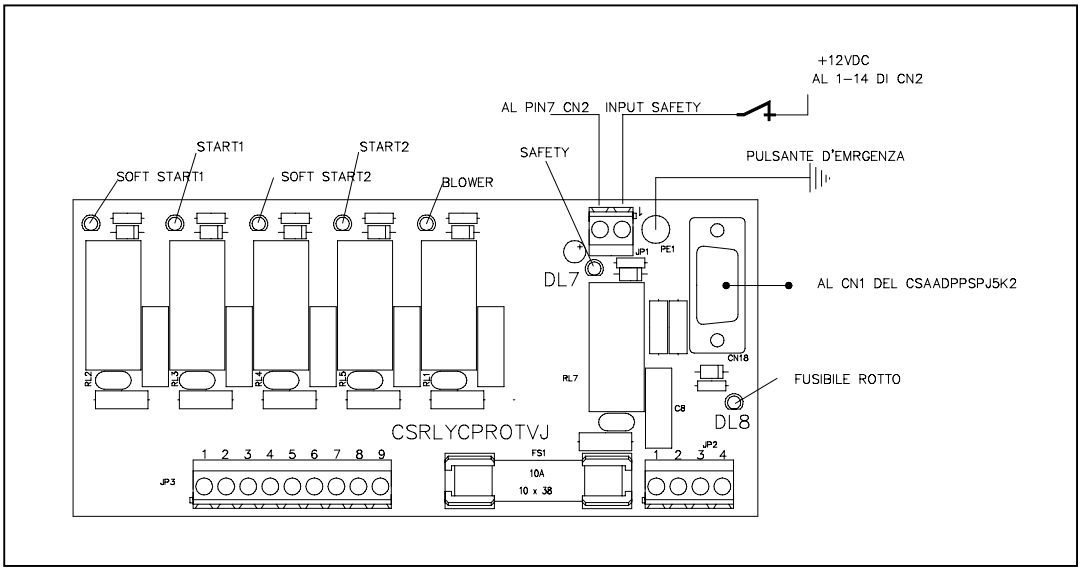


Figura 7-19 *Scheda di interfaccia relè*

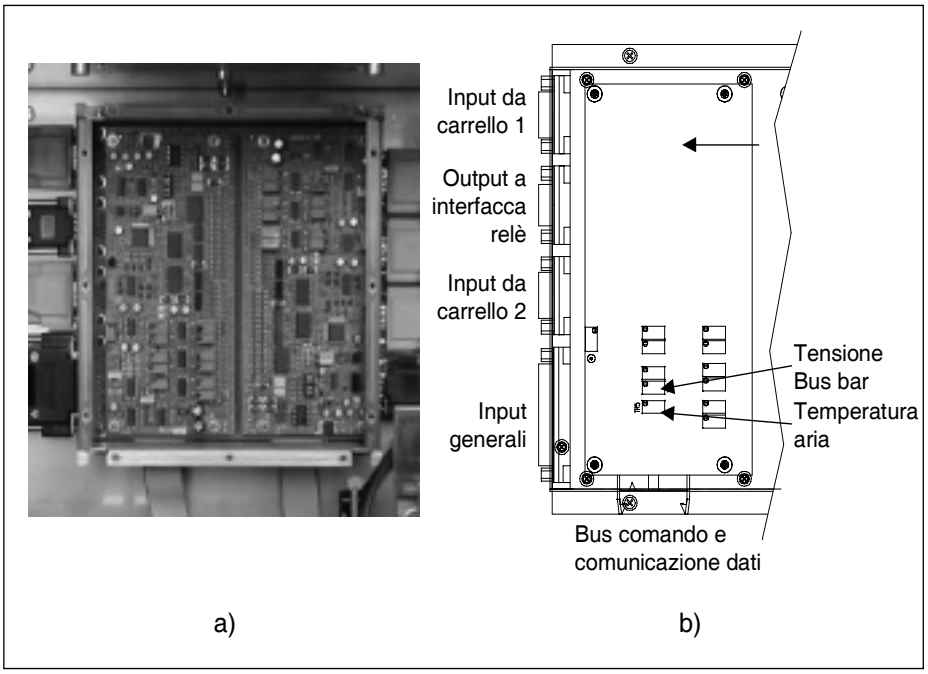


Figura 7-20 *Scheda di controllo alimentatore*

The signals coming from the control card are of "NPN" type, actives when ground directed. The function of the relay RL7 ("SAF" on the silk-screening) is to protect the personnel: it breaks the common power supply of the power contactors, That are supplied only when all the safety micro-switches are closed.

To protect the card is selected a FS1 fuse of the type 30x38 of 10A.

The turn on of the DL8 led indicates the fault of the FS1 fuse. This interface is connected to the local unit control through the CN18-CN1 connector.

7.3.6 Replacing the carriage

The following procedure has to be followed when it's necessary to replace a power supply carriage. Please note that if the transmitter is fitted with just one power supply carriage, it will be necessary to switch it off to replace the carriage, while if it has two of them it is possible to continue transmitting normally also during this operation.

1 Turn the power disconnecting switch on position 0(in the case of one power supply carriage)

2 Turn the carriage switch on position Off

3 Disconnect the threephase supply connector from the carriage, the connector of the control signals and the one of the command contactors .

4 Remove the screws that hold the bottom bar of the rack

5 Remove the carriage from its site

6 Insert the new carriage

7 Reassemble the bar and fix it in place with the screws

8 Reconnect the three connectors

9 Turn again the power disconnecting switch on position I

10 Turn the power switch on position I (if it had been turn Off previously)

7.4 RF Modules amplifier

The PJ5KPS has five RF amplifier modules able to supply 1.2 kW each. The modules are independent from each other, self-controlled and self-protected.

Each amplifier module includes a first stage with a variable gain , based on the MOSFET BLF175. The RF signal amplified by the driver is splitted in 4 by a Wilkinson splitter, then sent to 4 identical modules based on BLF278, combined again and filtered by a band-pass filter.

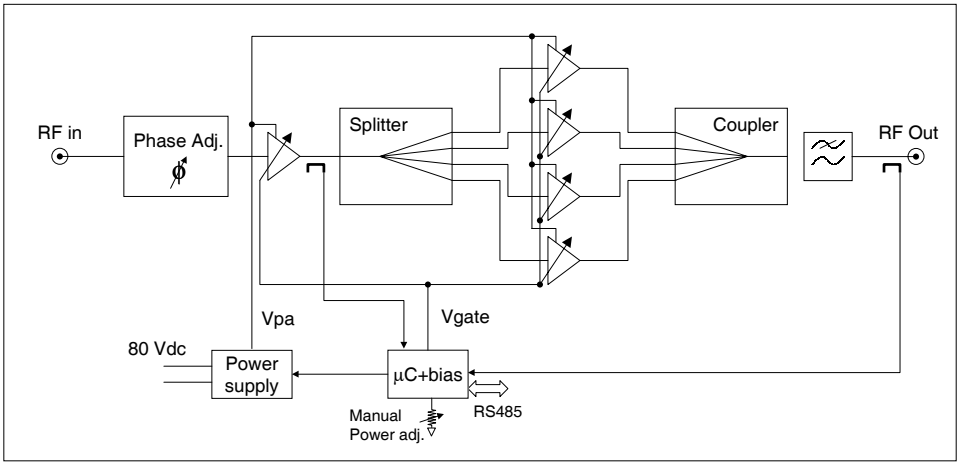


Figure 7-21 *Block diagram of a RF module*

Each RF amplifier module is controlled by a microprocessor card, connected through a RS485 bus to the other microprocessor cards of the machine.

The switching power supply included in each amplifier module generates the feeding supply of the active devices. The generated voltage is adjustable and commanded by a microprocessor card included in the module. The card adjusts the supply and the polarization current (gate) of the modules, thus controlling the emitted power.

On each module there is a trimmer for the manual adjustment of the power. The trimmer acts as a limiter. This means that if the automatic adjustment of the power sets a nominal output value, the trimmer can only reduce it, and not increase it.

7.5 Alarms

The menu Alarms of the control unit reports all the events connected to possible malfunctionning of the equipment or due to external causes.

Each registration contains the reference to the concerned module, the kind of event and its date and hour.

The module that detected the event is indicated by one of the following acronyms:

- C.U. Control Unit
- P.S. Power Supply
- R.F.X Amplifier module X (from 1 to 5)
- R.F.C Combiner/Splitter

The type of event allows to identify the origin and the consequence of the fault. The first letter of the type of event (eg F-C.B. Blw) can be one of the following :

E "Error", event that doesn't cause the interruption of the supply of power, but can reduce the functions of the equipment (e.g cannot be done the changeover function of the exciters)

F "Fault", event that causes the block of the equipment and requires the intervention of an operator for the restart.

W "Wait", event that causes the temporary block of the piece of equipment equipment, that will be removed as soon as the problem is solved.

R "Retry", event that causes a temporary block of the piece of equipment, that will effect a restart attempt after a fixed lapse of time.

The possible type of events are listed in Table 7-2

Code	Meaning
Control Unit	
E.Intl	The external interlock is active
A.Intl	The auxiliary interlock is active
Audio-1	The Audio alarm of exciter 1 is active
Audio-2	The Audio alarm of exciter 2 is active
Ris-1	The RESERVE 1 input is active
Ris-2	The RESERVE 2 input is active
Ris-3	The RESERVE 3 input is active
Ris-4	The RESERVE 3 input is active
Mute Flt	"Mute fault": the mute commands (i.e. the interlock commands for the exciters) are not working, they are not connected or the connection is wrong
Xchg Exc	A changeover of the exciters has been performed
Cfg. N+1	The machine is in Fault status because two changeover attempts have been performed (N+1 configuration)
Power Supply	
T1 -	The power supply carriage 1 is overheated
F1 -	One of the fuses or of the interlocks of the power supply carriage 1 is blown or not closed
Tmp.	The air inlet temperature is too high
W-T2	The power supply carriage 2 is overheated
T1 W-T2	The power supply carriage 1 and 2 are overheated
F1 W-T2	One of the fuses or interlocks of carriage 1 is blown or not closed, the power supply carriage 2 is overheated
Prs	The air pressure generated by the blower is not sufficient
F-F2	One of the fuses or of the interlocks of the power supply carriage 2 is blown or not closed
T1 F-F2	One of the fuses or interlocks of carriage 2 is blown or not closed, the power supply carriage 1 is overheated
F1 F-F2	One of the fuses or of the interlocks of both the power supply carriages 1 and 2 are blown or not closed
Mains	The AC power supply is out of its voltage range, or the phase sequence is not correct
C.B. Blw	The circuit breaker of the blower blocked it
Fuse	One of the fuses or of the interlocks of the power supply is blown or open
O.Tmp.	The power supply is overheated
Combiner .	
Fwd	Forward power above its limit
Rfl	Reflected power above its limit
O.dvr In	Overdrive (main exciter)
O.dvr Ld	Too much power dissipated on the internal dummy load (stand by exciter)
Unbal	Unbalancement power above its limit
Rej.l.T.	Overheating of the unbalancement (rejection) load resistors
Exhaust	Exhaust overheating
SWR	SWR above its limit
O.Tmp.	Internal overheating
R.F. Units	
Fwd	Forward power above its limit
Rfl	Reflected power above its limit
In	Input power above its limit
Tmp.	Overheat of the RF module
Drv. I	Driver current above its limit
Mos 1 I	Current of the MOS module 1
Mos 2 I	Current of the MOS module 2
Mos 3 I	Current of the MOS module 3
Mos 4 I	Current of the MOS module 4
Eff.	Efficiency too low
Fuse	Module's fuse broken
O.Tmp.	Overheating ov the module's heatsink

7.6 Combiner and divider

7.6.1 Control Unit

The RF combiner section too is equipped with it own microprocessor control unit. This is very important for the functionning of the whole transmitter because it checks the foldback line of the several RF modules. The value of the output power is managed directly by this micro controller. In case of fault of this control unit or if a problem arises in the communication bus, the transmitter will continue working at the same power level set in the field "nominal power" of the control unit.

To this unit is assigned the task to limitate and stabilize the output power. When one of the parameters reaches its safety limit for the right functionning of the machine, the power level decreases progressively. The feedback is completely of analogic type, made through a voltage present on the control bus. The voltage is between the maximum of 3.9 V (this indicates that the transmitter is supplying the maximum power) and 0 V (minimum power).

This section also controls the maximum permitted power level of the exciters, with a programmed alarm of “Fault” type. If this level is exceeded the transmitter turns itself OFF and the AC supply of the exciters is cut until the operator pushes the Alarms Reset button.

8. Technical Notes

This chapter contains the references to the technical appearances that more frequently could be necessary for intervene on the PJ5KPS.

8.1 Microcontrol board Trimmers

In the PJ5KPS are present microcontrol boards, one for each 1.2 kW module, one for the control of the power supply and one for the control of the combiner. The boards are identical, but in each the trimmers have diverged meaning. In figure 8.1, "RFM" refers to the RF module, "PS" to the power suplly and "CMB" to the combiner. TR12 is set so that VREF is 3.3 V.

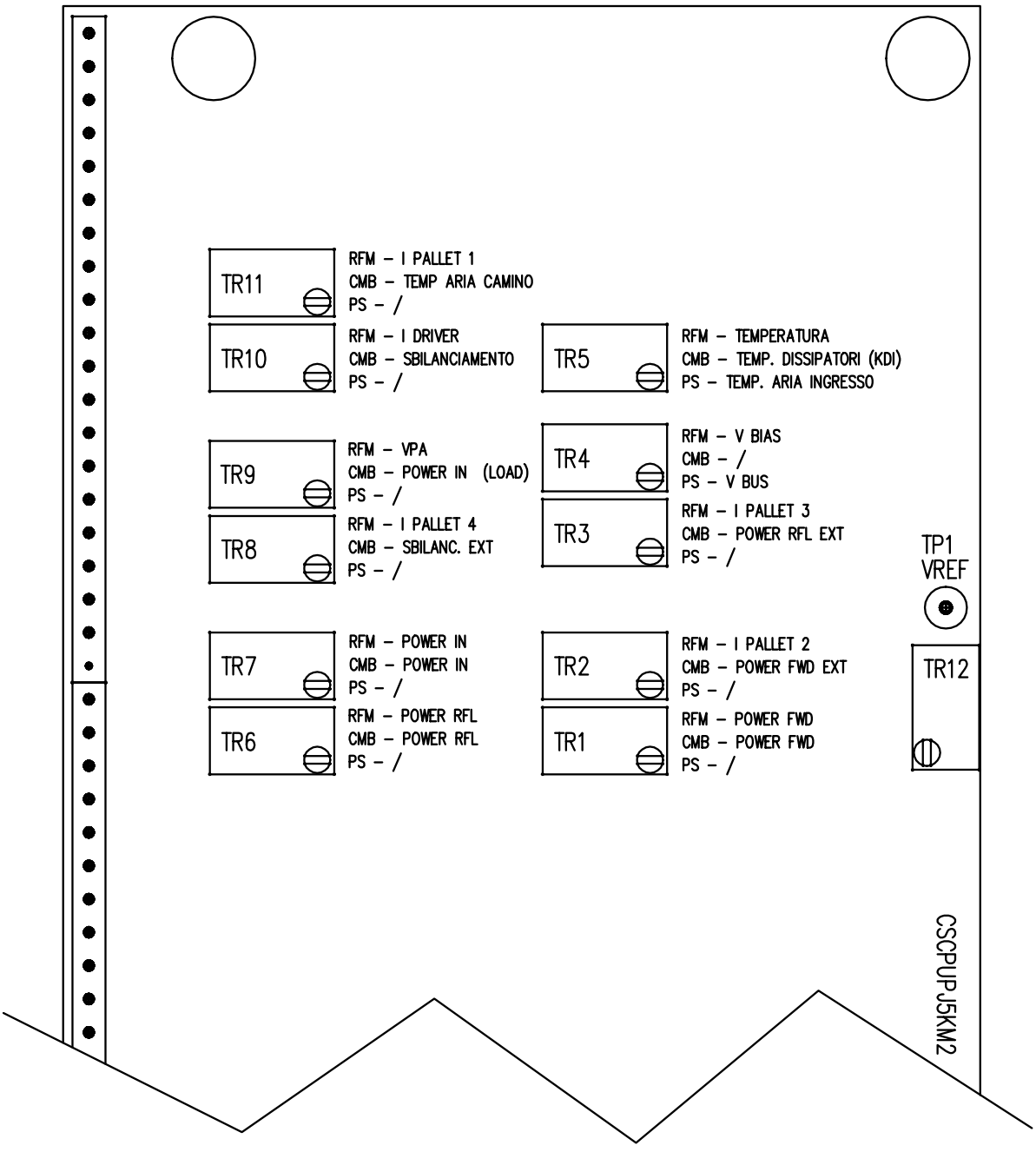


Figure 8-1 *Microcontrol board Trimmers*

8.2 Phase Adhutment of RF modules

Each PJ5KPS RF module have a dip-switch (accessible on the frontal panel) for the regulation of the phase of the RF signal generated. The phase of each RF module could be modified independently to steps of 1.6° from- 12.8° to +11,2° (Figure 8.2).

Normally, the modules comes furnished with the phase regulated for 0°, that it is the optimal position for the correct operation of the machine on all the frequency band. In some cases could result useful use the regulations of phase for minimize the unbalanced power dissipated. To this purpose, it preferable of use the SERVICE menu, in which this value comes adjourned in real time.

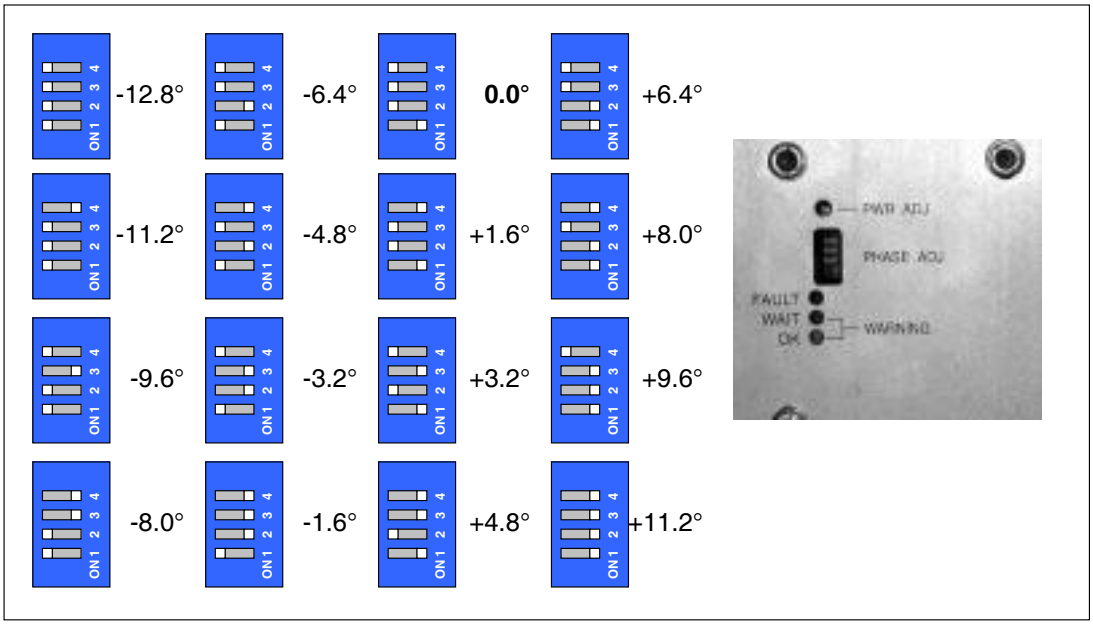


Figure 8-2 *1.2kW modules regulation phase*

8.3 Splitter board trimmers

On the entry splitter board are present two trimmers for the regulation of the measure of the emitted power from the two exciters.

These measures are those visible in the EXCITERS menu.

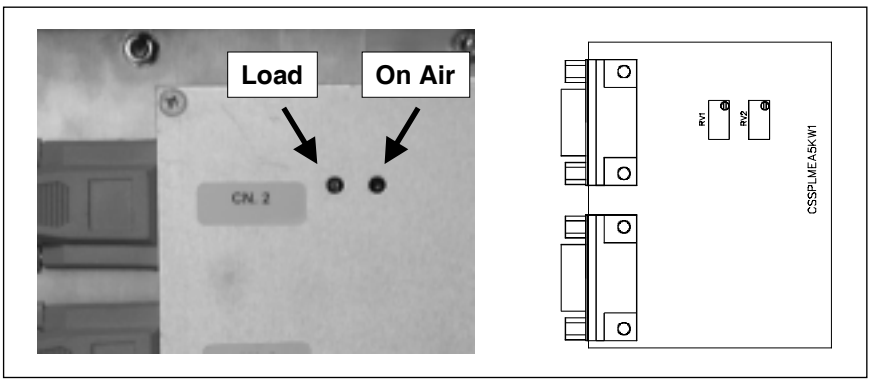


Figure 8-3 *Trimmers for the read power of exciters*

On the circuits of power measure of the exciters there are two compensators to maximize the directive and minimize the operation error measure of the frequency of operation.

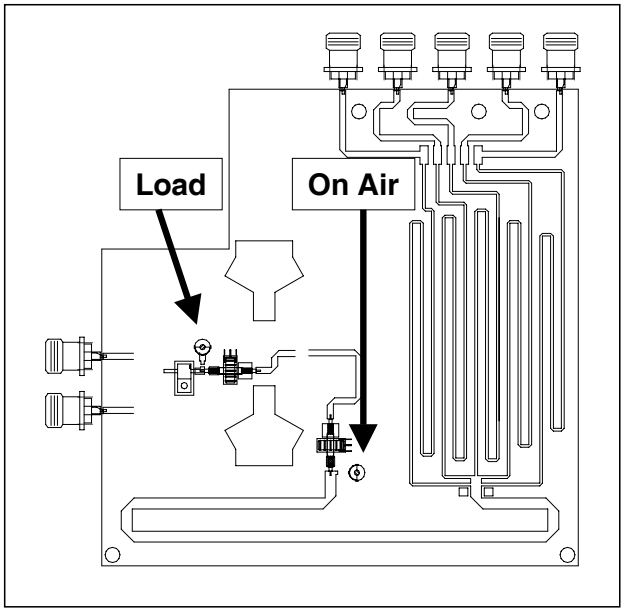


Figura 8-4 *Direttività testine di misura splitter*

8.4 Parallel Interface

The parallel interface present on the roof of the PJ5KPS is described into the X.X chapter. In following a small description reassumed the functions assigns to the clamps.

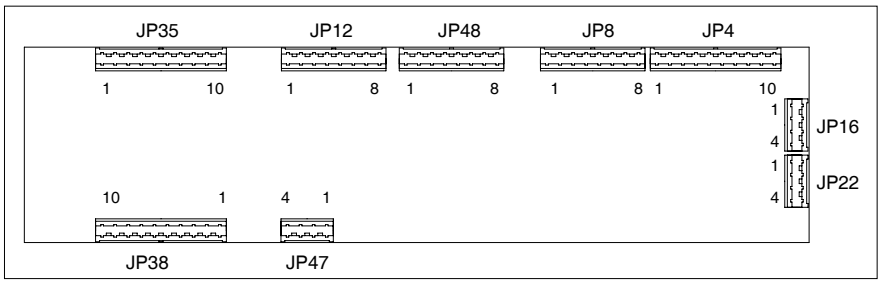


Figure 8-5 *Parallel interface clamps*

JP4	1	In	ON
	2	In	STDBY
	3	In	OFF
	4	In	EXT INH
	5	In	AUX INH
	6	In	NOM PWR
	7	In	LOW PWR
	8	In	AUDIO ALARM EXC. 1
	9	In	AUDIO ALARM EXC. 2
	10	/	GND
JP8	1	In	ALARM RESET
	2	In	RESRV. 1
	3	In	RESRV. 2
	4	In	RESRV. 3
	5	In	RESRV. 4
	6	In	EXCITER CHANGE CMD
	7	In	EXCITER CHANGEOVER
	8	/	GND
JP16	1	Out	+12V dc
	2	Out	+12V dc
	3	/	GND
	4	/	GND
JP22	1	I/O	TX/RX +
	2	I/O	TX/RX -
	3	/	LINE TRM
	4	/	LINE TRM
JP48	1	/	GND
	2	/	GND
	3	Out	FWD PWR
	4	Out	RFL PWR
	5	Out	OUT AIR TEMP
	6	Out	V BUS
	7	Out	EFF.
	8	Out	OUT DAC 6

JP12	1	Out	COMMON MUTE 1
	2	Out	MUTE 1
	3	Out	COMMON MUTE 2
	4	Out	MUTE 2
	5	Out	COMMON LOCAL
	6	Out	LOCAL
	7	Out	COMMON MAINS
	8	Out	MAINS
JP47	1	Out	AUDIO ALARM
	2	Out	COMMON AUDIO ALARM
	3	Out	COMMON RL3
	4	Out	COMMON RL3
JP35	1	Out	RESRV. 1
	2	Out	RESRV. 2
	3	Out	RESRV. 3
	4	Out	RESRV. 4
	5	Out	COMMON RL4
	6	Out	SET1
	7	Out	SET2
	8	Out	SET3
	9	Out	SET4
	10	Out	COMMON RL5
JP38	1	Out	EXC. ON AIR
	2	Out	AUTO/MAN
	3	Out	LOWER POWER
	4	Out	NOMINAL POWER
	5	Out	OFF
	6	Out	STDBY
	7	Out	ON
	8	Out	FAULT
	9	Out	WAIT
	10	Out	WARNING

Tabelle 8-1 *Function of the parallel interface clamps*

8.5 RF module I/O Interface

The control unit of the PJ5KPS communicates continually with all the microprocessor boards contained in the machine. All the boards are equal, but in function of the position in which are installed they use configuration software and different address. For the boards that control the RF amplifiers modules, the addresses have mailed from the respective boards of I/O interface, installed to the inside of the rack. This means that the modules are perfectly interchangeable, and they engage the address to the action of the insert in the rack automatically.

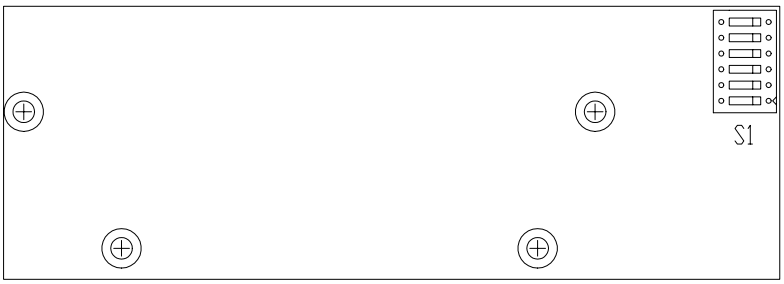


Figura 8-6 *Dip switch I/O interface board*

The address assigned to the module is mailed by a dip-switch on the interface board. In figure 8-7 are brought back the configurations assigned to the different settings. The RF module 1 (that more to left looking at the machine) have address 8, the 2 has address 9 and so on until at 17. The other addresses are reserved for future uses.

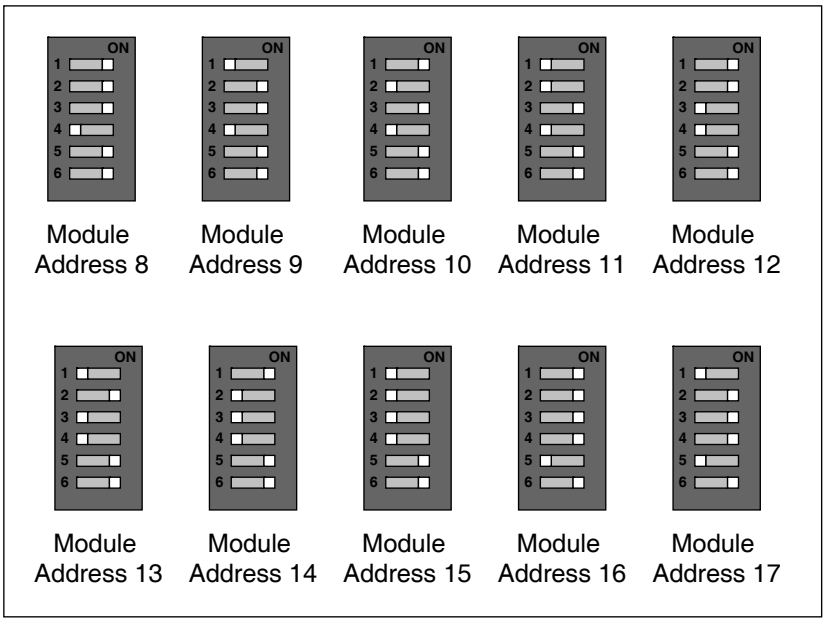


Figura 8-7 *Addresses regulation of RF modules*

8.6 Services supply

The services of PJ5KPS are supplied at 220V through a dedicated transformer.

Between the services, are included the microcontroller cards of RF modules, those of the combiner and power supply and the control unit.

Supplying the services of the PJ5KPS with an UPS (Uninterruptable Power Supply), the machine also in case of absence of mains power can be managed, naturally limitedly to the functions available (for example configuration or interrogation of the alarms registry). The normal configuration of the machine previews that the services are directly supply through the connection to the electrical mains of the machine, in order to insert an UPS is sufficient put it between the VDE on the roof, after have removed the bridge that comes supplied of series.

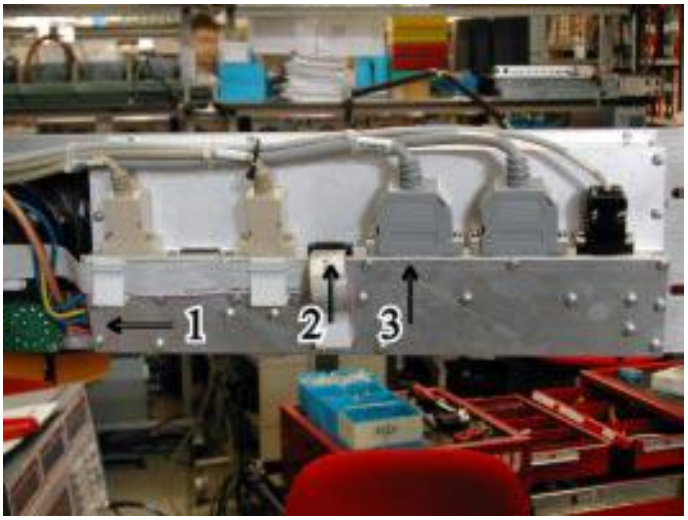
Figure 8-8 *Services supply*

8.7 Emergency CCU Board

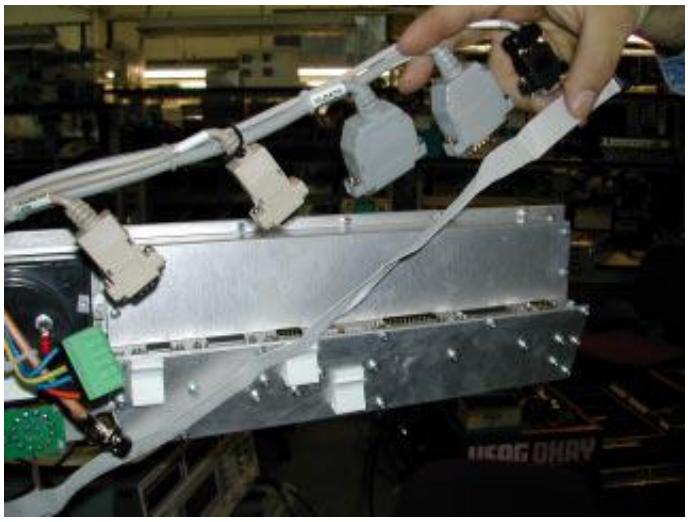
In the case the control unit presents a damage, it is possible assure the correct operation replacing, temporarily, the control panel with the card furnished together with the PJ5KPS.

To effect the substitution, execute the following instructions:

1) Switch-OFF the amplifier. Remove the screw on the left side of the LCD panel, open the panel and individualize the necessary connectors to the operation of the emergency card.

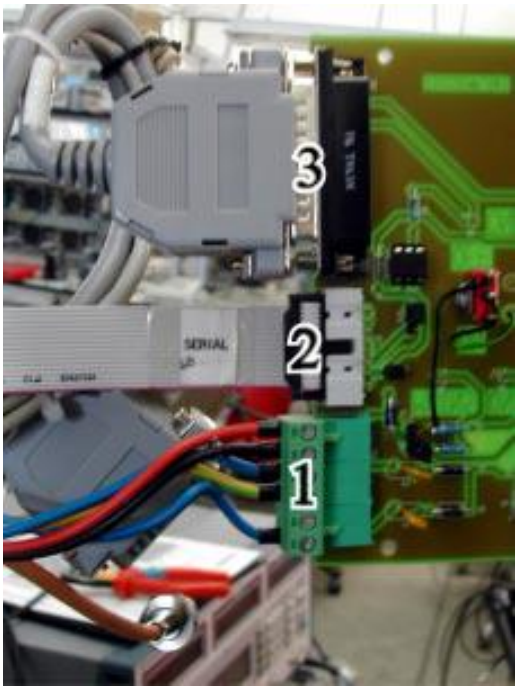


2) Disconnect all the cables connected to the unit control.



3) Unscrew the crews that fix the board to the rack and remove the panel from his place.

4) Connect the three connectors precedentely identified to the entries of the board, like represented in the photo.



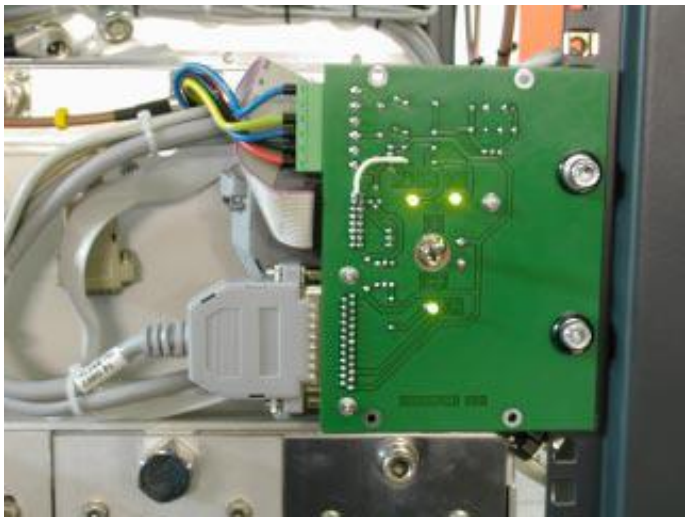
5) Fix the board to the rack, in the same position in which previously had fixed the central panel of control. Do attention to fix the side of the card from which the interrupter sticks out toward the outside of the amplier.

6) Switch-ON the apparatus with general switch and activate the operation of the board putting the interrupter on the ON position. The switch has built in way to

avoid the accidental operating; throw the interrupter toward the outside, go on the desired position and release the interrupter.

Now the emergency board is operative.

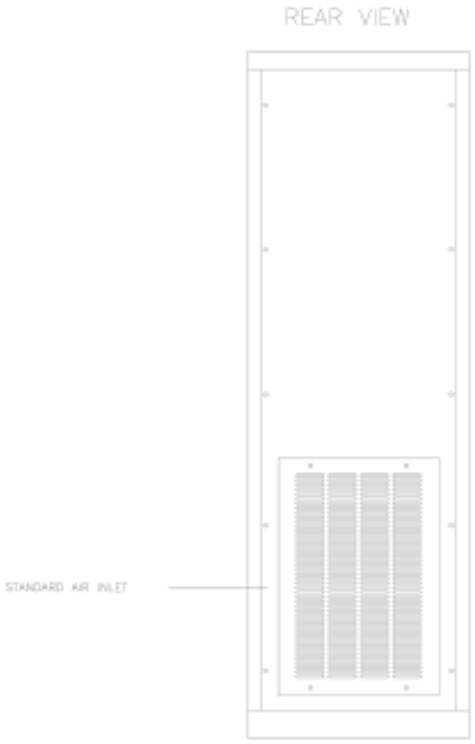
When be used the emergency board, the amplifier acts with the parameters previously adjusted (for example: the level of power). To modify the parameters is necessary use the unit control.



8.8 PJ5KPS Ventilation

Each amplifier PJ5KPS has furnished of an innternal fan, of inputy and output of the air.

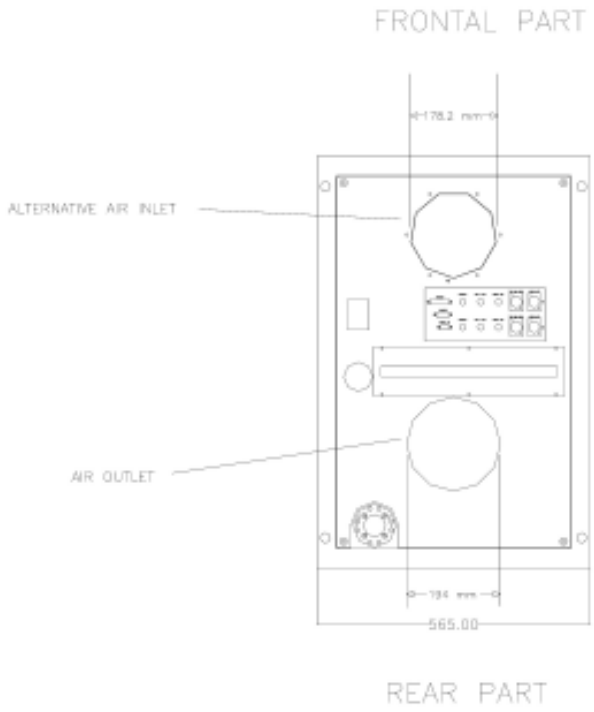
View of the chimney air inlet



View of the chimney air inlet

The current of output air is equal to 600 m^3/ h.

The input hole of the air is situated on the back cover of the rack, but on demand is possible have an ulterior chimney inlet air on the top cover of the rack.



Representation of the air inlet hole location and the additional

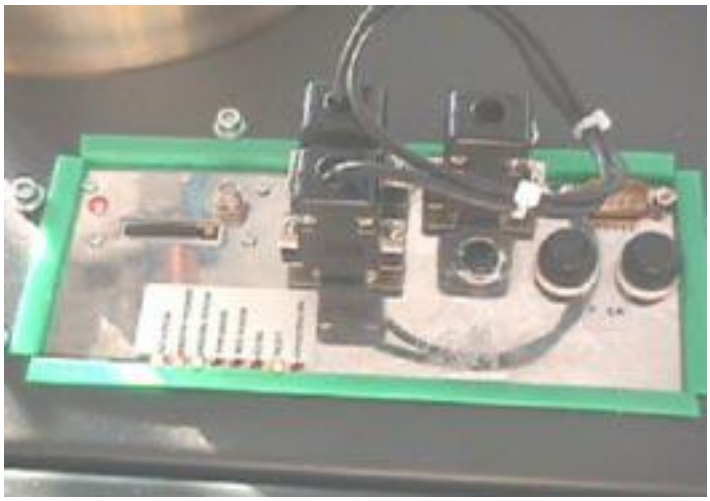
9. Digital Telemetry (TLC5KPS)

9.1 Foreword

R.V.R. Elettronica's plug-in series transmitters, like TX5KPS, may be optionally fitted with the TLC5KPS, a telemetry device that enables the user to remotely ceck all the machine's working parameters and control some of them, and provides the transmitter with the ability to trigger "alarms" when problems arise while the transmitter is on air, possibly sending GSM Short Messages (SMS) to the maintainer's cellular phone or to any other number stored in the machine's memory.

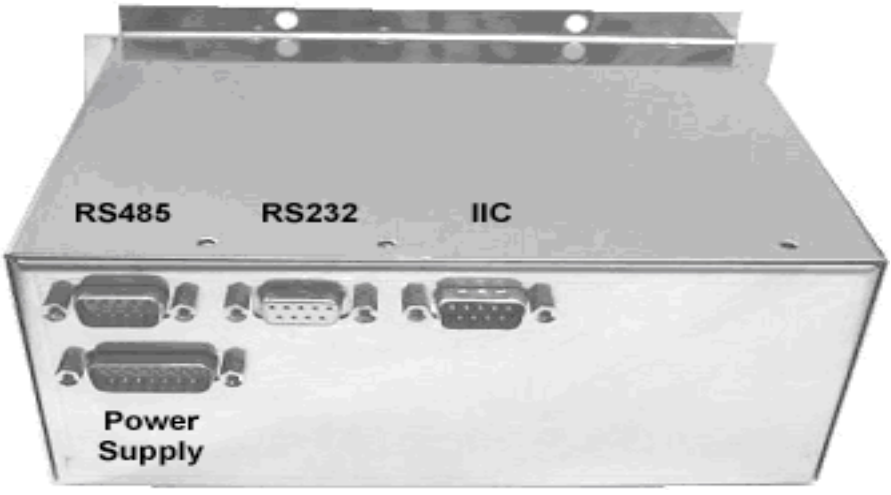
9.2 Installation

The TLC5KPS is installed in the rear part of the transmitter's rack, near to the low-pass filter and the RF output connector.

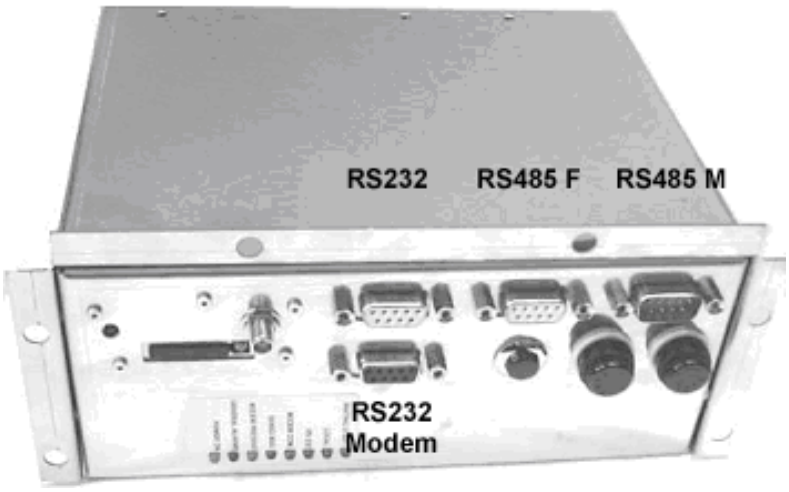


9.2.1 Connection

The bottom side of the TLC5KPS contains the following connectors:

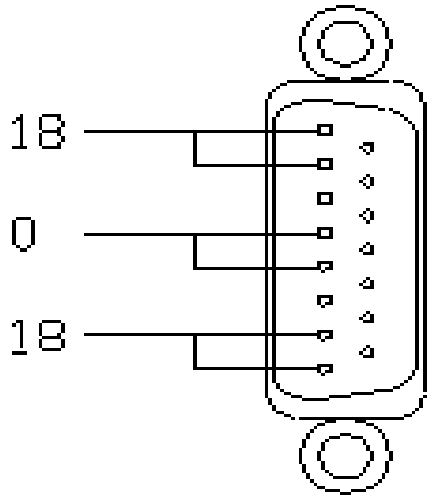


The upper side contains the following connectors:



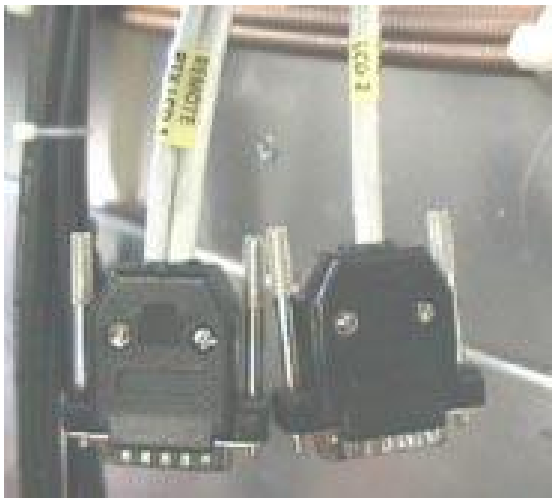
The following connections should be performed on the bottom side:

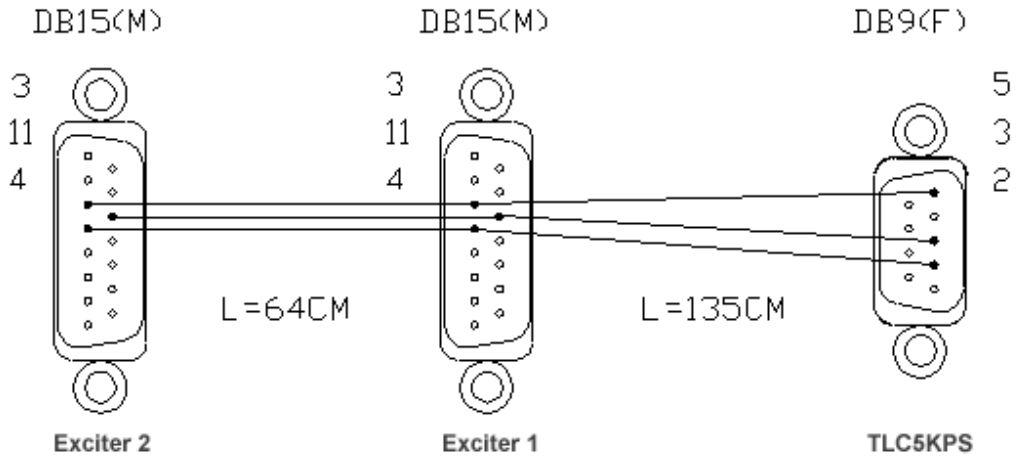
- **DB15 male**, providing the power supply (18 V, 0, 18 V AC). The power supply is provided through the terminal block of the parallel interface of the amplifier.



- **DB9 RS485** coming from the parallel interface

- **DB9 I2C** connected to the exciters

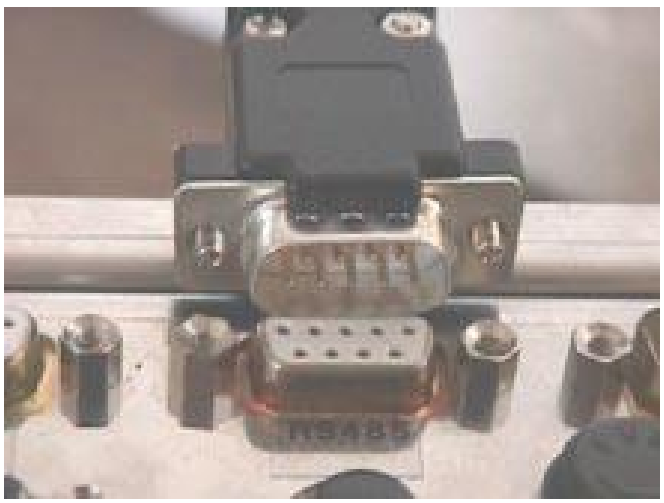


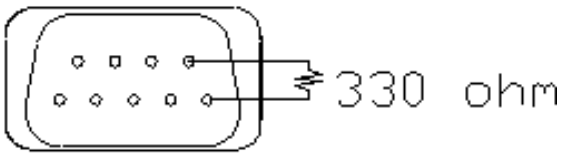


- **DB9 RS232** not connected

On the upper side:

- **RS485 Connector** with termination resistor. This connection is required, or malfunctioning in the communications will likely happen! The connector contains a 330 OHm resistor between PINs 1 and 6.





- **SMA connector** for the GSM antenna. The GSM modem can be directly installed inside the TLC5KPS: in this way the machine will provide the named SMA connector, the status LEDs of the modem and the slot for the GSM SIM card.

Please note that an external and possibly directive antenna for the GSM is always suggested, to provide the GSM modem with a good signal and ensure reliable data communications.

Please note that to fully deploy the features of this telemetry system, the you will need to sign a contract with a GSM service provider including DATA COMMUNICATIONS.

9.2.2 Devices settings

The use of the telemetry system requires the correct setting of the addresse in the connected pieces of equipment, since they communicate on a shared bus.

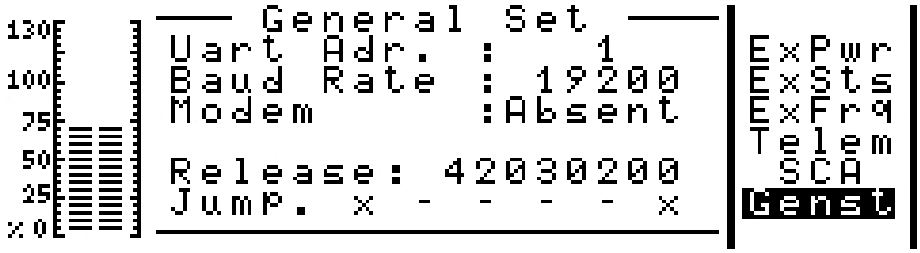
9.2.2.1 Exciters

Set the Uart address of exciter 1 to “1”, exciter 2 to “2”

To perform this setting, from the main menu click on “ADMIN”, then select Genst from the navigation bar, select “Uart Adr.” on the General Set menu and change it to “1” fro the exciter 1, “2” for the exciter 2.

9.2.2.2 Amplifier

Set the “Talk address” parameter to “3”.



To perform this setting, presss the button ESC on the Control Unit of the PJ5KPS. You will be presented with the “Menu Select” screenful. With the UP and DOWN buttons, select the line “Settings” and press the OK button.

In this menu, select the line “Talk Address” and press OK. With the UP and DOWN buttons change the parameter to “3” and press OK.

```
Menu: Settings:
 Nominal Pwr..... 90 % - ( 4.50 KW)
 Low Power.....50 % - ( 2.50 KW)

 Set     Assign   Limit
 SET1    Ch-1      80 % - ( 4.00 KW)
 SET2    Ch-1      50 % - ( 2.50 KW)
 SET3    Ch-2      20 % - (  240  W)
 SET4    Ch-1      50 % - ( 2.50  W)

 Exc s wait time:  10 sec.
 Talk Address      3
 Time (h-m)        14-49
 Date (d-m-y)      09-09-03
 L.P.Timer:        Auto
 Write Config.     All
```

9.2.3 Installing and configuring the PC software

Setting up the telemetry is best performed directly connecting a personal computer to the TLC5KPS.

You will need:

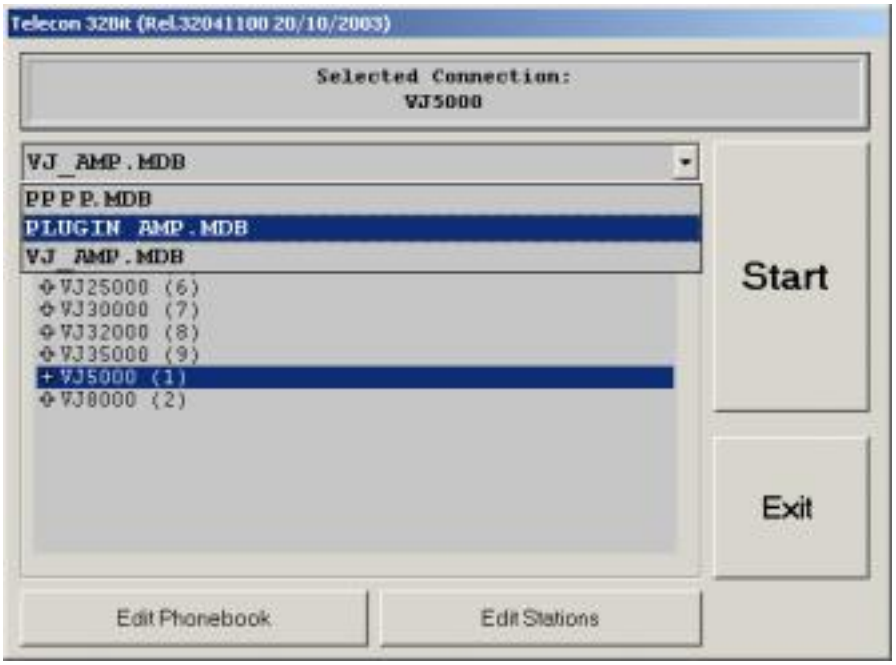
- A PC running on Windows 98 or newer (the software has been tested with 98, NT, 2000 and XP)
- The “Telecon 32bit” CD ROM, provided with the machine
- DB9 pin-to-pin cable long enough to link the PC to the TLC5KPS

Insert the CDROM in the PC, browse and executethe program setup_telecon.exe. Follow the instructions on screen to install the software on your PC.

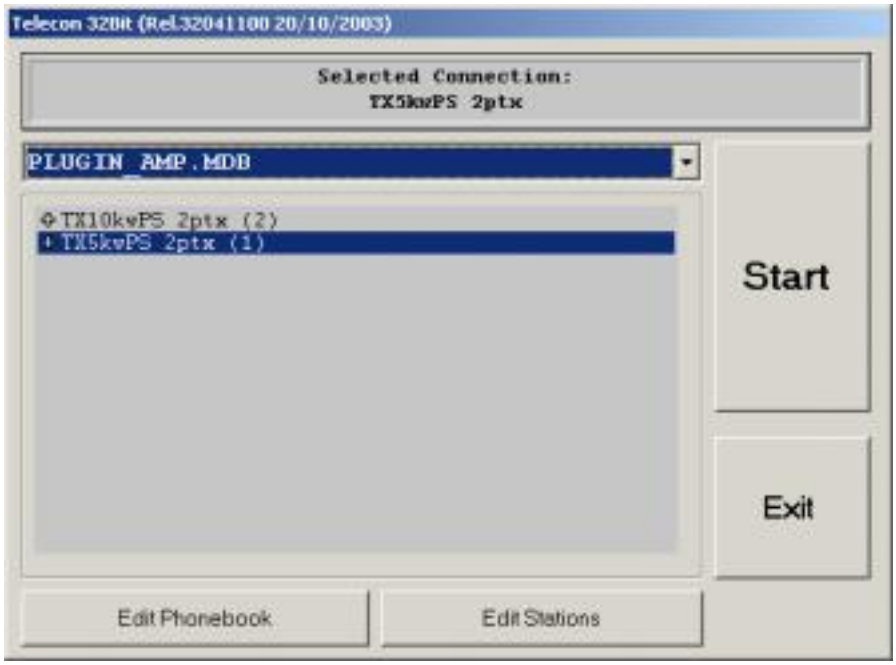
Please note that if you already have an installed version of the Telecon32bit software, the new software will just upgrade it and will not affect you installed station database.

Launch the Telecon program: Start -> Programs -> Telecon 32bit

You will be presented with the database selection screen.
On the Database combobox (the top line), selet the PLUGIN_AMP.MDB database.

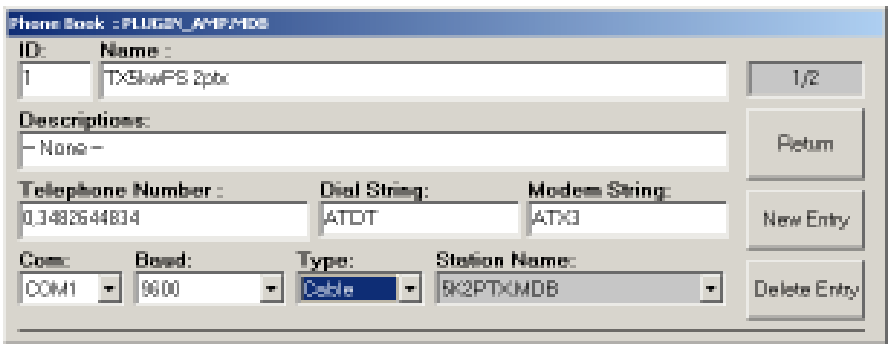


Then select the station TX5KWPS 2PTX station and click on “Edit Phonebook”.



The screenful the software will show allows you to configure all the aspects of the transmitter, like kind of modem, telephone number and so on.

Configure this screenful as shown in the following figure, that is select “Cable” and the COM port you will use.



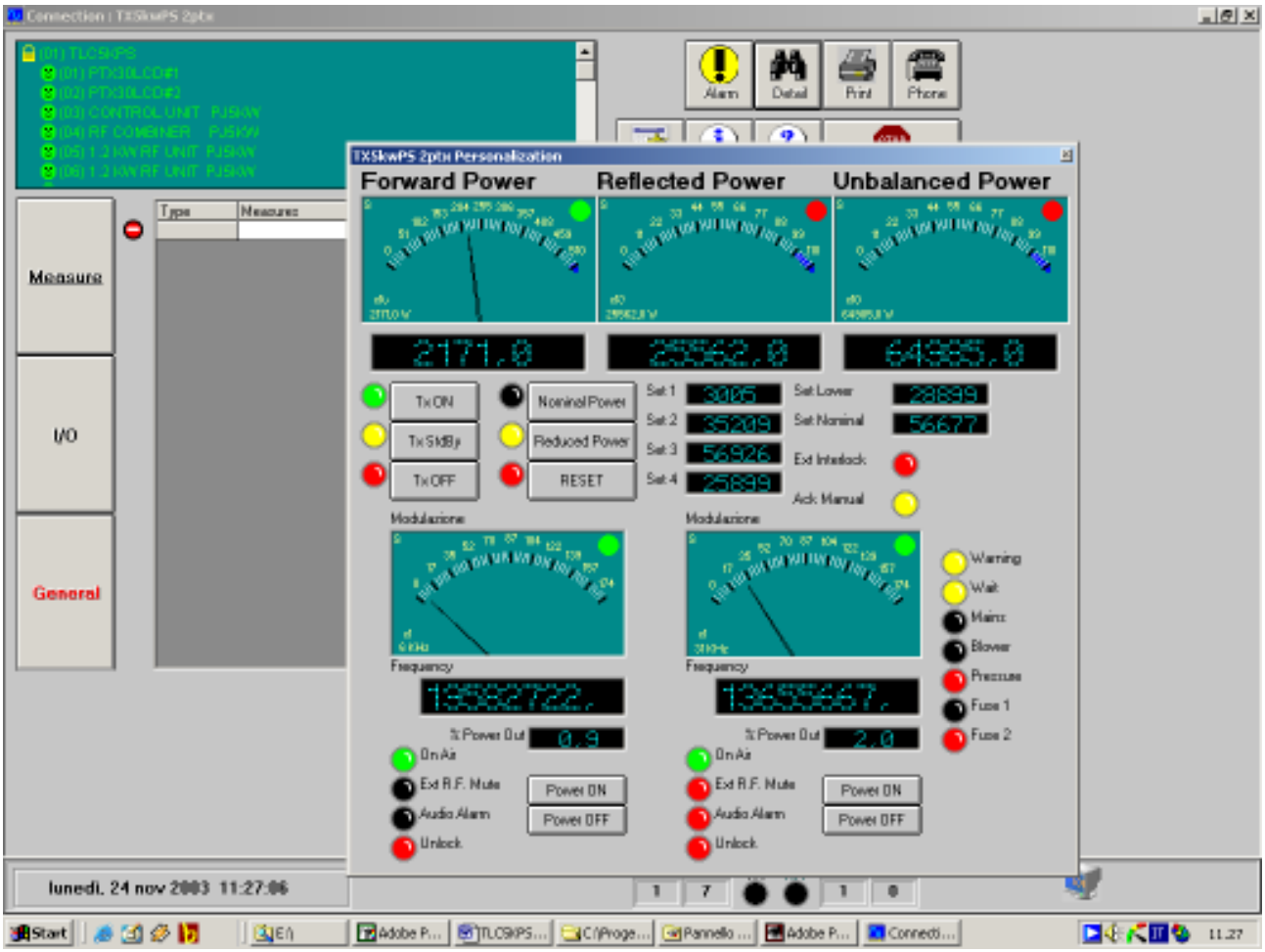
Click Return.

Connect the DB9 cable between the PC and the TLC5KPS telemetry unit.

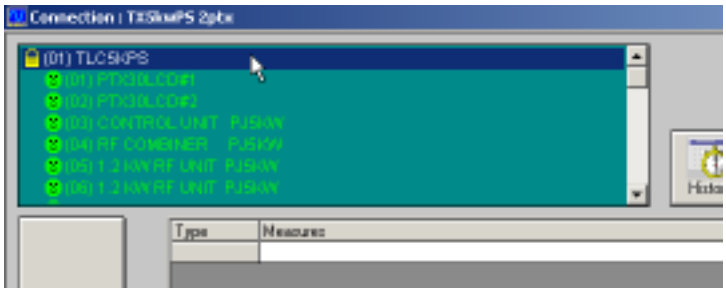
Click on Start. The PC will perform the connection with the transmitter and then will show the program screen and the “Detail screen” already opened.

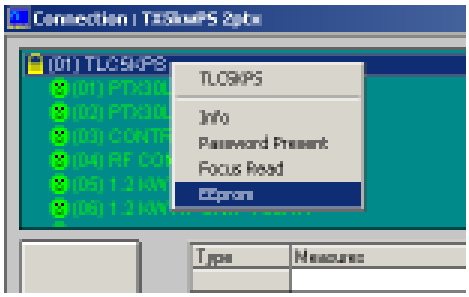
The TLC5KPS automatically detects the type of connection, that is direct connection, GSM modem or PSTN modem.
After 1-2 minutes, the Telecon software will have acquired all the data of the modules.

Note the smileys on the bottom blinking red and green to show ongoing communications.

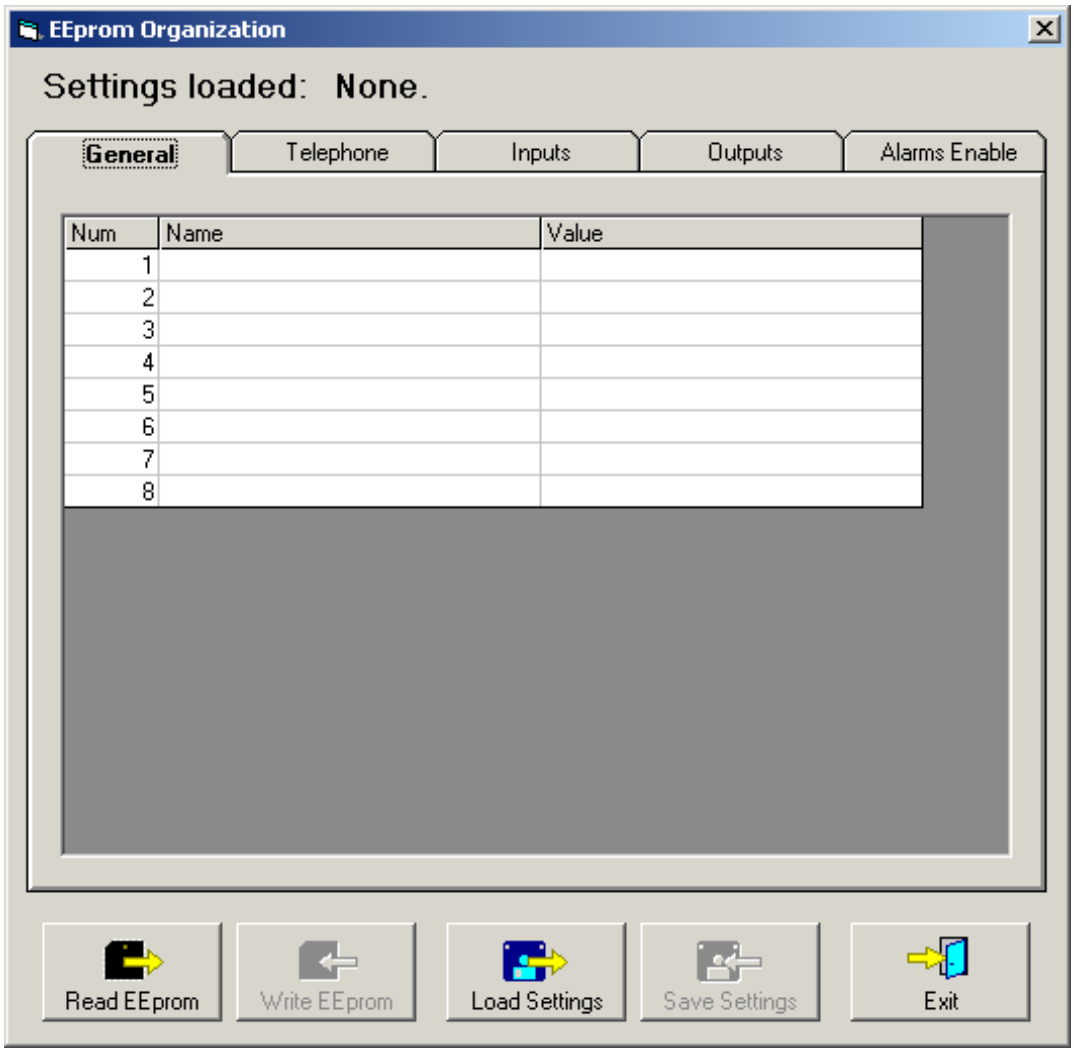


Double-click on TLCKPS. Then select EEprom and click on it.





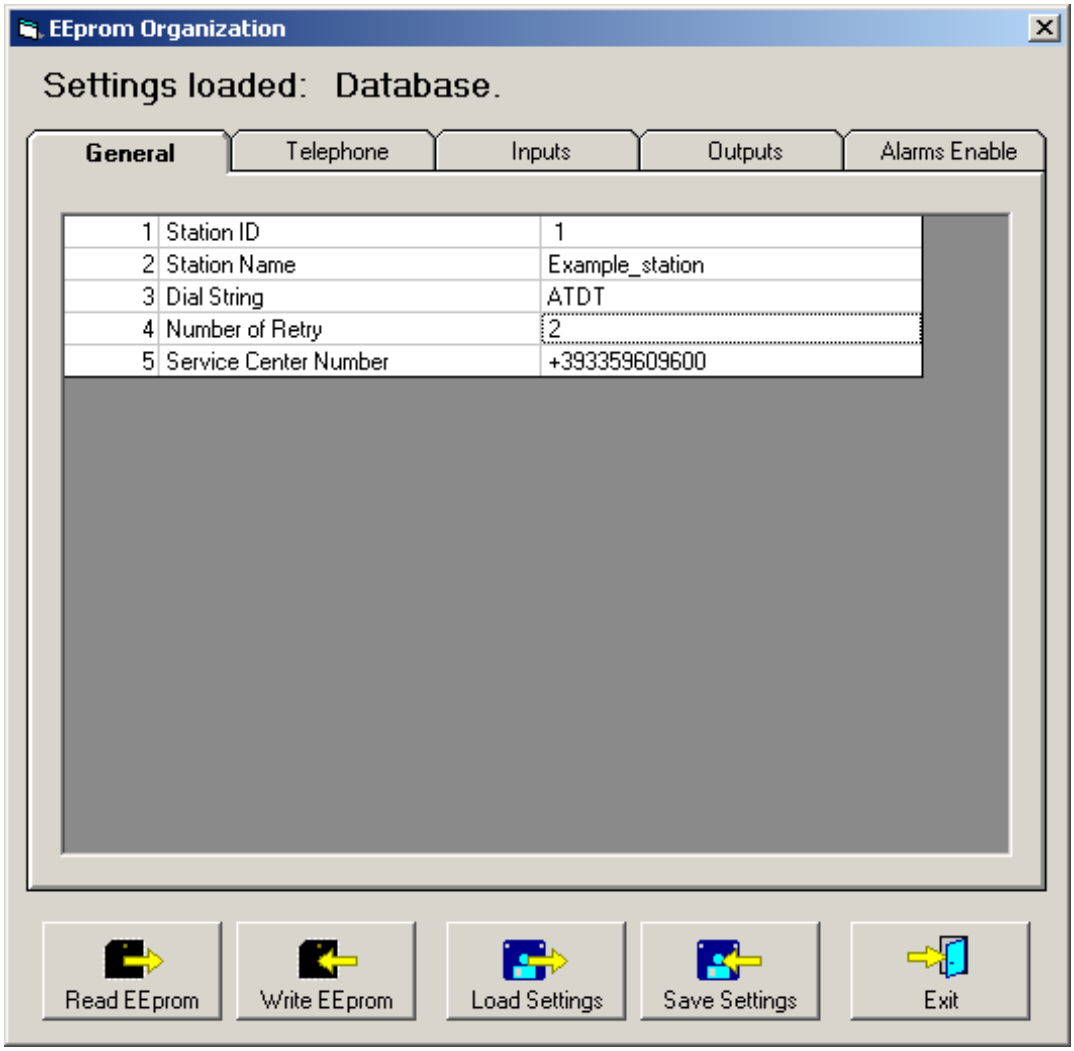
You will now see the EEprom organization window:



Click on READ EEPROM and then OK. Note blue progress bar indicating reading is in progress.

When the EEPROM reading will have been completed, the button WRITE EEPROM will also be available.

Click on the tab “General” and do the following settings (for example):

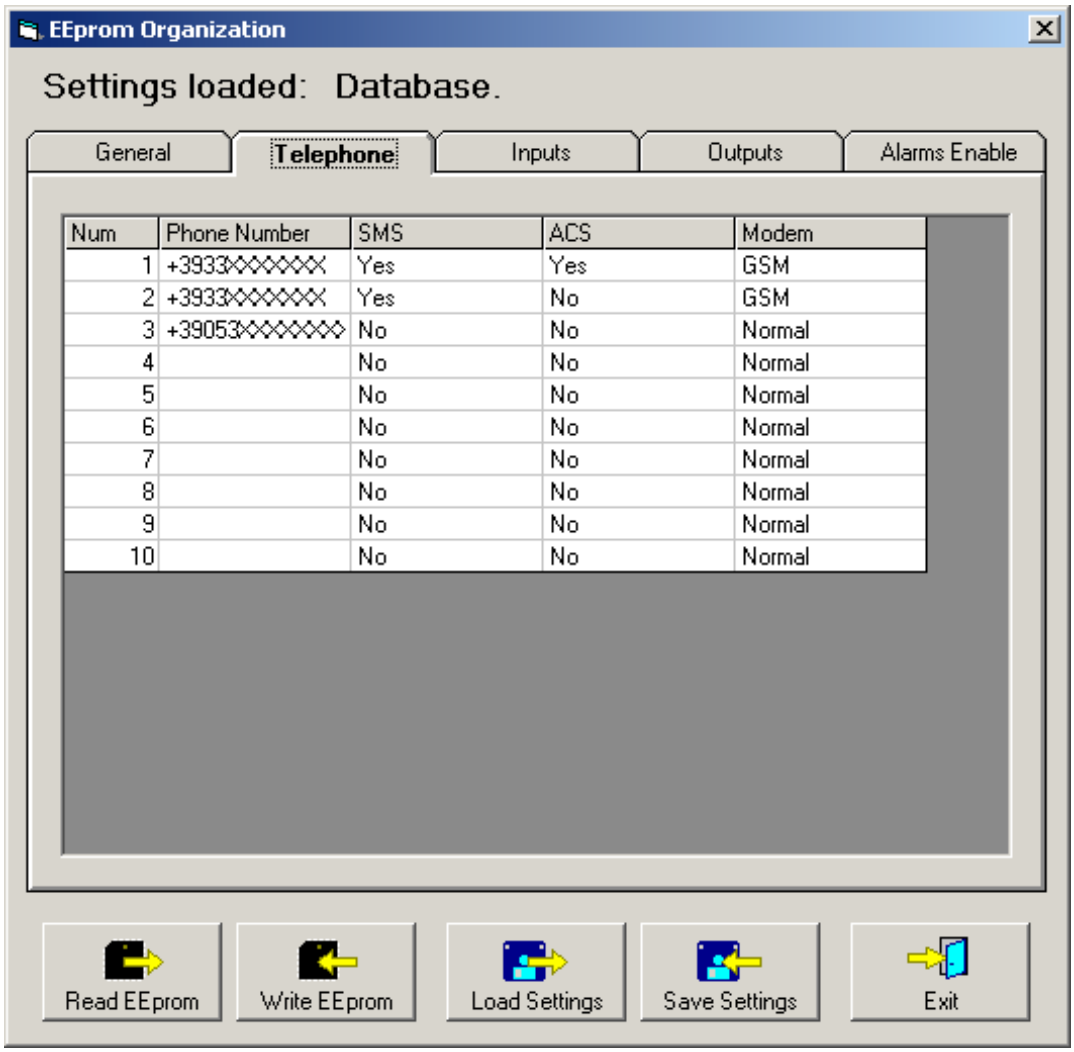


Station ID	ID for addressing pourpouse. Write if you only have 1
Station Name	Mnemonic name of the station, like place or frequency
Dial Sring	Normally, ATDT
Number of Retry	Number of messages to send. We suggest to set this value to at least 2, in case of problems with the SMS Service Center.

Then click on Telephone and fill it with the telephone numbers that will be known to the station. Yes or No in the SMS column specifies whether the number will receive a SMS in case of alarms, while the column ACS determines the numbers entitled to send commands via SMS to the station, avoiding interferences from unexperienced operators.

Finally, specify the kind of modem the station shall send the alarm to, so that it will determine whether to send a SMS or place a normal telephone call.

At this point, click on WRITE SETTINGS and then WRITE EEPROM: you will see the blue progress bar indicating the software is loading into the TLC5KPS.



The display of the control unit of the amplifier will show in the menu “MODEM” (firmware version 3.9 and up) the stored telephone numbers, the SMS service center number, the modem status and the kind of connection.

```
Menu: Modem Type: Auto
I.D.   : 01   -  Name: Example_station
S.C.N.: +1234567890
Info   : NETWORKPROV  Dial: ATDT
Phone  : +2345678901
Phone  : +3456789012
Phone  : +4567890123
Phone  :
Phone  :
Phone  :
Phone  :
Phone  :
Phone  :
Phone  :
Level  : -65 dB       Status: RXMSG
Retry  : 2/5
```

Wait about 2 or 3 minutes and check on the display or on the LED “MODEM PRESENT” on the top of the rack the correct update of the firmware configuration.

On the display you will read on the display the signal level and the status of the modem. Please note that it could be necessary to exit and reenter in the Modem menu (push ESC) to refresh it.

9.2.4 Alarms and commands

9.2.4.1 Alarms sent by the transmitter

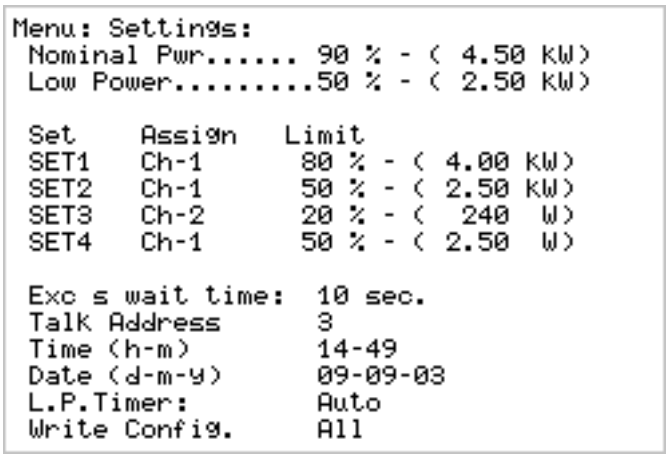
1. Forward Power
2. Reflected Power
3. Unbalanced Pwr
4. No Audio PTX1
5. No Audio PTX2
6. Mains Fault
7. Over temp 1
8. Over temp 2
9. Fuse1 PS
10. Fuse2 PS
11. Blower Fault
12. Fault Mod 1
13. Fault Mod 2
14. Fault Mod 3
15. Fault Mod 4
16. Fault Mod 5
17. Fault Mod 6 (only 10Kw)
18. Fault Mod 7 (only 10Kw)
19. Fault Mod 8 (only 10Kw)
20. Fault Mod 9 (only 10Kw)
21. Fault Mod 10 (only 10Kw)
22. Pressure Fault
23. Mains OK

9.2.4.2 SMS commands available

The commands that can be sent to the transmitter using SMS messages are the following:

Command	Reply	Description
INFO	Station: *"station name"* ID: *"ID number"* FWD: *"value"*- RFL: *"value"*- UNBAL: *"value"* TX On (*or* TX Off *or* TX StdBy)- Low Power / Nom Power Audio Present / Audio Absent Alarm Present / Alarm Absent	Information about the transmitter's status
TXON	Station: *"station name"* ID: *"ID number"* TX is On -	Switching on the transmitter
TXOFF	Station: *"station name"* ID: *"ID number"* TX is Off	Switching off the transmitter
LOWPWR	Station: *"station name"* ID: *"ID number"* LowPwr OK-	Low Power setting
NOMPWR	Station: *"station name"* ID: *"ID number"* NomPwr OK-	Nominal Power setting
ALARM	Station: *"station name"* ID: *"ID number"* Alarm: *"list of the alarms in memory"*	List of the alarms in memory
RESET	Station: *"station name"* ID: *"ID number"* ALARM RESET OK-	Resetting the alarms in memory
RESMOD	-- nothing --	Reset of the telemetry and modem restart

The Alarms for the RF power falling under a certain level and for the reflected power are connected to the Settings menu. Remember to adjust SET 1 SET2 and SET 3 in this menu to suit your need.



When all of these parameters have beenfinally configured, put the selector on the control panel of the control unit on the "Remote" position. The yellow "LOCAL" led will go off and the green led will go on. We suggest at this point to do some tests to verify the functionality of the system.

9.3 Technical details

9.3.1 Modules mapping

9.3.1.1 Control Unit

Configuration data Block

0x00	ID	Device ID	
0x01	RH	Hardware Release	
0x02	RS	Software Release	
0x03	In_Ana_Tot	Analog input number	= 2
0x04	Out_Ana_Tot	Analog output number	= 5
0x05	In_Dig_Tot	Digital input number	= 32
0x06	Out_Dig_Tot	Digital output number	= 32
0x07	Gen_Tot	General number	= 3

Analog input data block

0x08	INANA0	Input Power
0x09	INANA1	Load Power

Analog output data block

0x0A	OUTANA0	RF combiner output power
0X0B	OUTANA1	RF combiner reflected power
0x0C	OUTANA2	Air temperature
0x0D	OUTANA3	Power supply voltage
0x0E	OUTANA4	Efficiency

Digital input data block

0x0F	INDIG0-15	Bit0: Ext Interlock Bit1: Aux Interlock Bit2: StdBy-In Bit3: Service Request Bit4: Local / Remote Bit5: Manual / Auto exchange exciter Bit6: Low Power Bit7: Nominal Power Bit8: Fault Exc 1 Bit9: Fault Exc 2 Bit10: Manual Exchange

Digital output data block

0x11	OUTDIG0-15	Bit0: Fault Bit1: Wait Bit2: Warning Bit3: Audio Alarm Bit8: Ack On Bit9: Ack Std By Bit10: Ack Off Bit11: Ack Low Power Bit12: Ack Nominal Power Bit13: Ack Change Exciter Bit14: Ack Manual Excange
0x12	OUTDIG0-15	Bit0: On/Off Bit1: Stand By Bit2: Backligth Bit3: Relays Exciter Bit4: Mute Exciter 1 Bit5: Mute Exciter 2 Bit6: On/Off Exciter Bit8: Ack Res1 Bit9: Ack Res2 Bit10: Ack Res3 Bit11: Ack Res4

9.3.1.2 Hybrid Coupler

Configuration data Block

0x00	ID	Device ID	
0x01	RH	Hardware Release	
0x02	RS	Software Release	
0x03	In_Ana_Tot	Analog input number	= 10
0x04	Out_Ana_Tot	Analog output number	= 2
0x05	In_Dig_Tot	Digital input number	= 16
0x06	Out_Dig_Tot	Digital output number	= 16
0x07	Gen_Tot	General number	= 3

Analog input data block

0x08	INANA0	Forward Power
0x09	INANA1	Reflected Power
0x0A	INANA2	Input Power
0x0B	INANA3	Load Power
0x0C	INANA4	K.D.I. Temperature
0x0D	INANA5	Unbalanced Power
0x0E	INANA6	Air Temperature
0x0F	INANA7	External FWD Power
0x10	INANA8	External RFL Power
0x11	INANA9	External UNB Power

Analog output data block

0x12	OUTANA0	Reserved.
0X13	OUTANA1	Reserved.

Digital input data block

0x14	INDIG0-15	Bit0: On/Off Bit1: Std By Bit8: Over Temp.

Digital output data block

0x15	OUTDIG0-15	Bit4: Std By Bit5: Sqr Bit8: Fan Bit12: Set1 Bit13: Set2 Bit14: Set3 Bit15: Set4

9.3.1.3 1.2 kW R.F. Unit

Configuration data Block			
0x00	ID	Device ID	
0x01	RH	Hardware Release	
0x02	RS	Software Release	
0x03	In_Ana_Tot	Analog input number	= 11
0x04	Out_Ana_Tot	Analog output number	= 1
0x05	In_Dig_Tot	Digital input number	= 16
0x06	Out_Dig_Tot	Digital output number	= 16
0x07	Gen_Tot	General number	= 3
Analog input data block			
0x08	INANA0	Forward Power	
0x09	INANA1	Reflected Power	
0x0A	INANA2	Input Power	
0x0B	INANA3	Supply Voltage	
0x0C	INANA4	Bias Voltage	
0x0D	INANA5	Module Temperature	
0x0E	INANA6	Diriver Current	
0x0F	INANA7	Mosfet 1 Current	
0x10	INANA8	Mosfet 2 Current	
0x11	INANA9	Mosfet 3 Current	
0x12	INANA10	Mosfet 4 Current	
Analog output data block			
0x13	OUTANA0	Foldback	
Digital input data block			
0x14	INDIG0-15	Bit0: On/Off Bit3: Std-By-In Bit8: Over Temperature Bit11: State of Fuse	
Digital output data block			
0x15	OUTDIG0-15	Bit4: StandBy Bit5: Sqr Bit8: Led Red Bit9: Led Orange Bit10: Led Green	

9.3.1.4 Power Supply

Configuration data Block

0x00	ID	Device ID	
0x01	RH	Hardware Release	
0x02	RS	Software Release	
0x03	In_Ana_Tot	Analog input number	= 2
0x04	Out_Ana_Tot	Analog output number	= 0
0x05	In_Dig_Tot	Digital input number	= 16
0x06	Out_Dig_Tot	Digital output number	= 16
0x07	Gen_Tot	General number	= 3

Analog input data block

0x08	INANA0	Bus Volt
0x09	INANA1	Temperature

Analog output data block

--	--	--

Digital input data block

0x0A	INDIG0-15	Bit0: On/Off Bit1: StdBy-In Bit3: Mains Fault Bit8: Over Temperature 1 Bit9: C.B. Bit10: Fuse 1 Bit11: Over Temperature 2 Bit12: Fuse 2 Bit13: Restart Safety Bit14: Pressure

Digital output data block

0x0B	OUTDIG0-15	Bit4: StandBy Bit5: Sqr Bit8: Soft Start 1 Bit9: On 1 Bit10: Soft Start 2 Bit11: On 2 Bit15: Blower

9.3.2 Timings

Main routine timing	1ms
Modem detection cycle	34s
Modem init after restart	50s
Modem init when detected	50s.
Maximum answer time after a command	5min
Maximum complete measurement update	1,5s
No TX reply timeout on the RS485 before setting “local status”	3s
Display update time	1,5s

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

Questa parte del manuale contiene i dettagli tecnici riguardanti la costruzione delle singole schede componenti del PJ5KPS. L'appendice è composta dalle seguenti sezioni:

This part of the manual contains the technical details about the different boards of the PJ5KPS LCD. This appendix is composed of the following sections:

Descrizione	Codice RVR	Vers.	Pagg.
Modulo RF	SL042RF1001	1.1	3 (A4)
Accoppiatore direzionale modulo RF	SLDCLPFPJ1KM	1.1	3 (A4)
Misure splitter ingresso	SLSPLMEA5KW1	1.0	3 (A4)
Splitter modulo RF	SLSPLRFPJ5KM	1.0	3 (A4)
Scheda fusibili modulo RF	SLFUSRFPJ5KM	1.0	3 (A4)
Scheda misura sbilanciamento	SLPWRSENHC52	1.0	3 (A4)
Selettore misura analogica	SLMETPJ5KM4	1.0	3 (A4)
Interfaccia I/O modulo RF	SLIORFPJ5KM2	1.1	3 (A4)
Accoppiatore direzionale di uscita	SL042MT1001	1.0	3 (A4)
Interfaccia relè di potenza	SLRLYCPROTVJ	1.0	3 (A4)
Emergency CCU	SLCCUEMPJ5K2	1.0	3 (A4)
Schema del cablaggio	/	1.1	1 (A3)
Scheda microcontrollore	SLCPUPJ5KM2	1.0	7 (A3)
Adattatore CPU PS e combinatore	SLADPPSPJ5KM2	1.0	4 (A3)
Rettificatore trifase	SLRCTPJ5KMC	1.1	3 (A3)
Scheda CPU control unit	SLCCUPJ5KM2	1.0	6 (A3)
Scheda madre control unit	SLCCU1PJ5KM2	1.0	3 (A3)
Interfaccia parallela	SLINTREMPJ5KM	1.0	4 (A3)
Splitter/scambiatore ingresso	SLSPLINPJ5KW1	1.0	3 (A3)
Scheda CPU misura sbilanciamento	SLADKDIPJ5K2	1.0	3 (A3)
Adattatore CPU/bias modulo RF	SLADBSPJ5KM2	1.1	5 (A3)
Driver modulo RF	SLDRVRFPJ5M	1.0	3 (A3)
Alimentatore switching modulo RF	PSSW5040	1.2	5 (A3)

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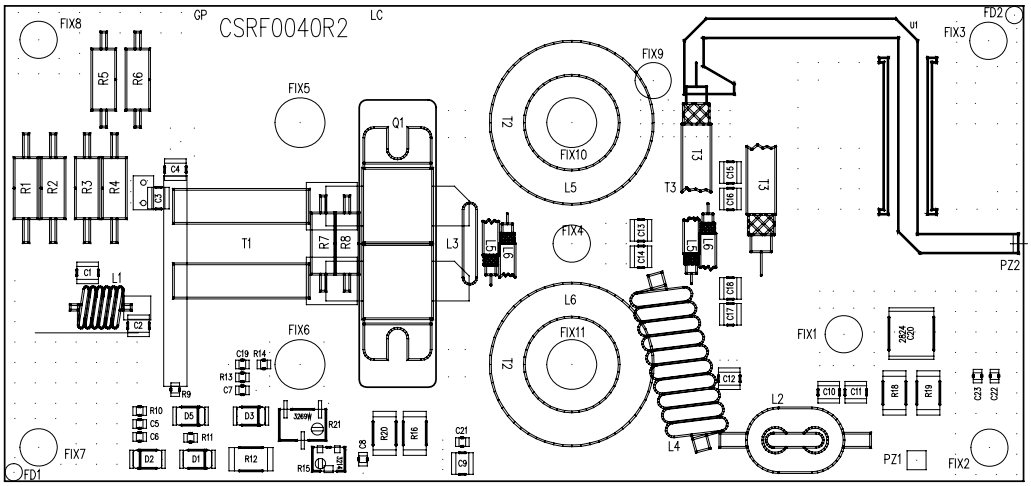
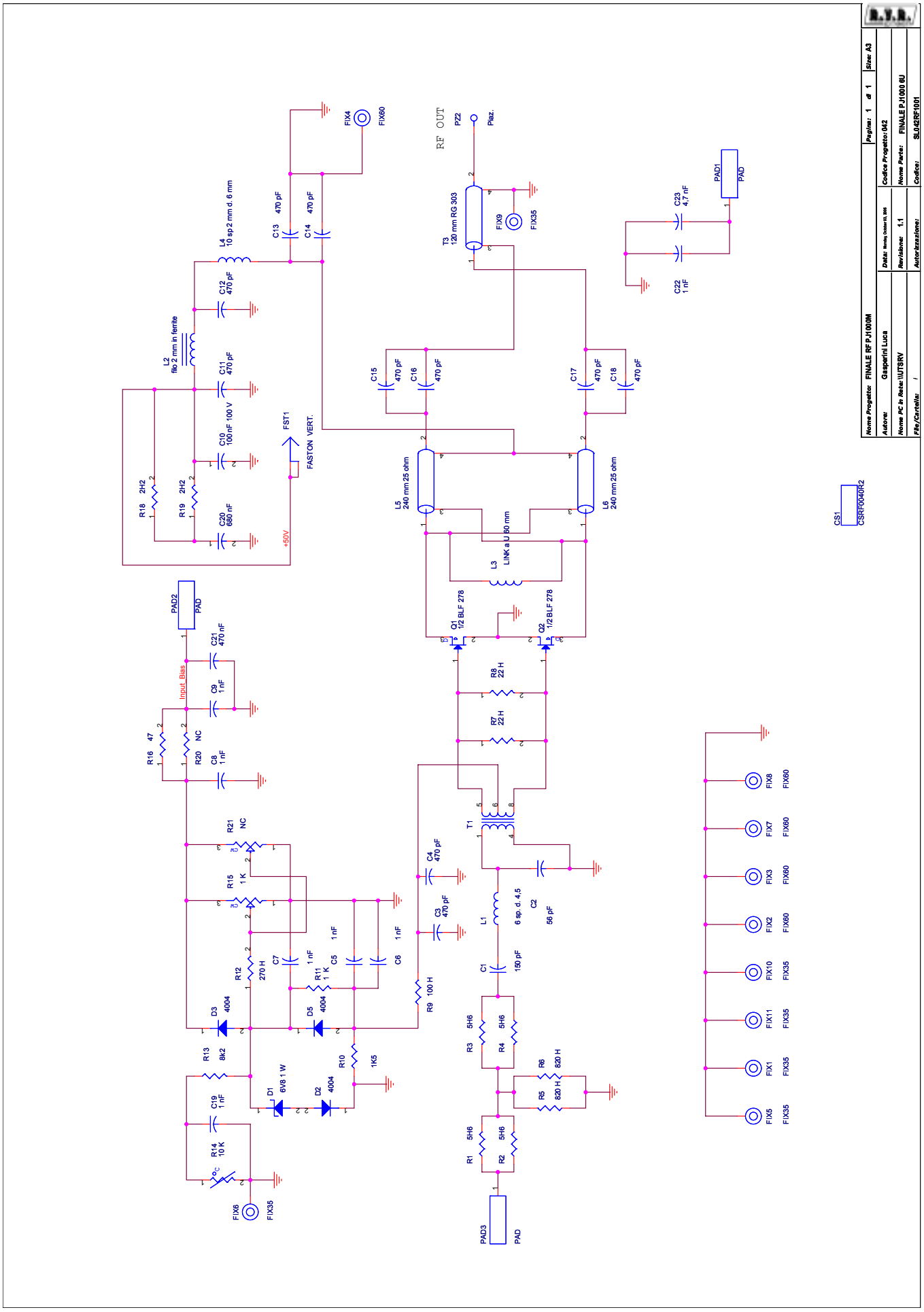


NOME PROGETTO: REVISIONE FINALE RF PJ1000M 6U			NOME PARTE: FINALE RF			
AUTORE: GASPERINI			DATA: 03/08/2005	REVISIONE: 1.0	SCALA: 1:1	SIZE: A4	PAGINA: 1 DI 1
ARCHIVIAZIONE ELETTRONICA: "CARTELLA PROGETTI" SU "UT_SRV"		CODICE PROGETTO: 042		CODICE DISEGNO: SL042RF1001		
MATERIALE: <>	TRATTAMENTO: <>		PROFILO: <>		STATO: PROGETTUALE	

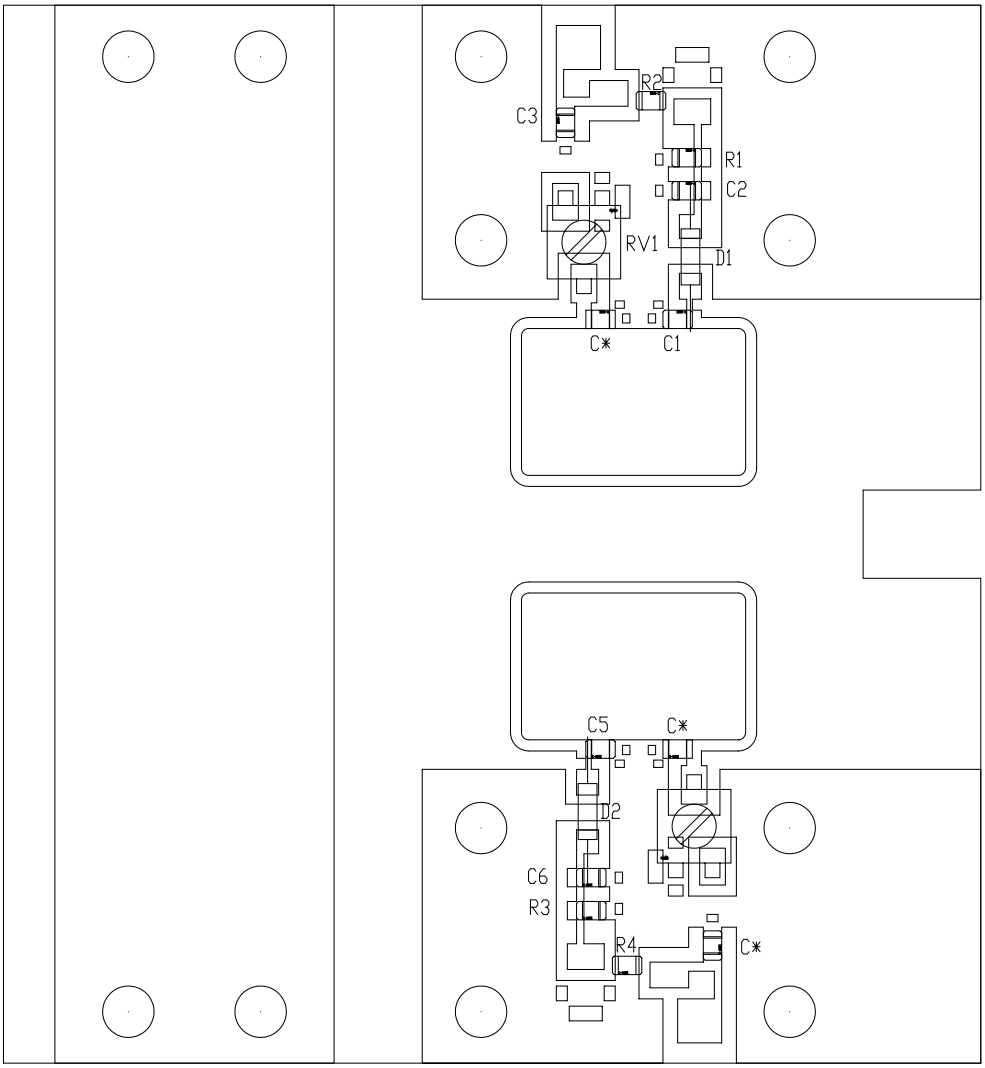


FINALE PJ1000 6U Revised: 03/10/2005
Revision: 1.1
SL042RF1001

Gasperini Luca

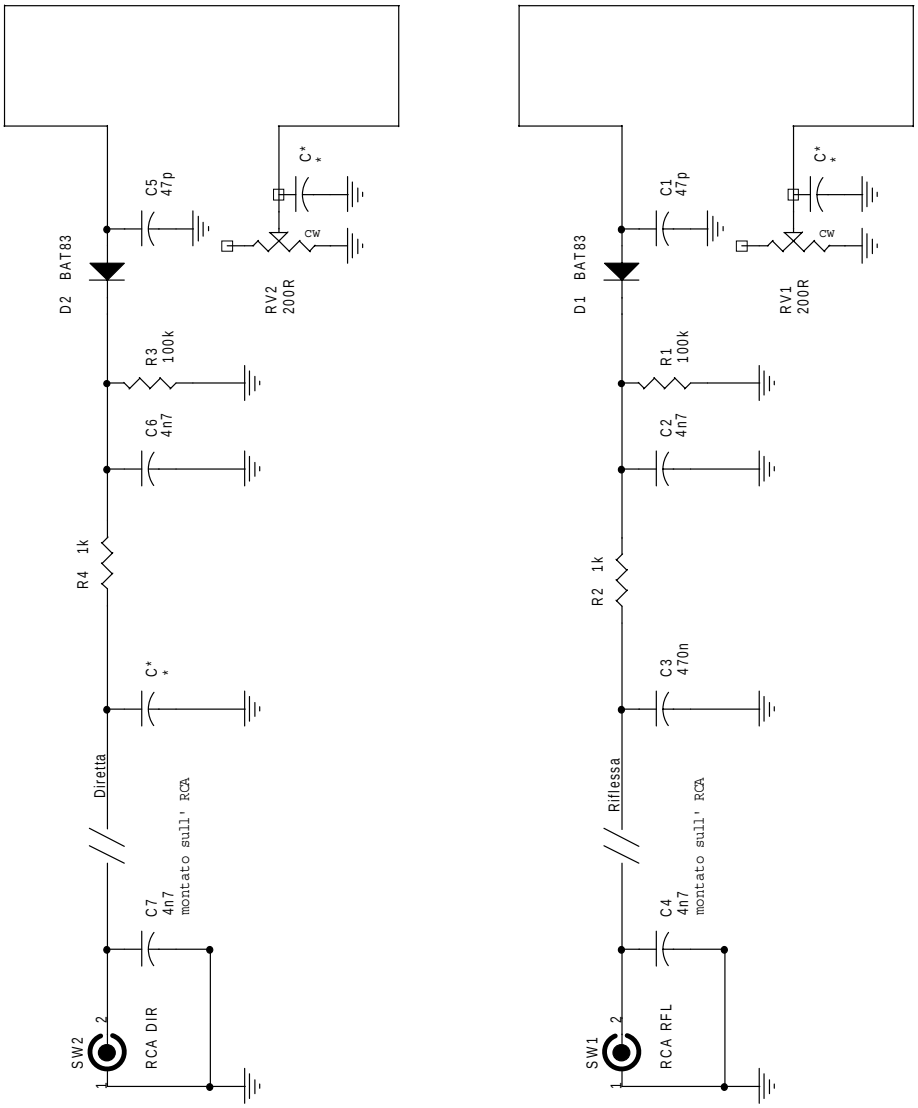
Item	Quantity	Reference	Part	{description}	Codice AS 400
1	1	C1	150 pF	Cond. SMD 1212 HQ	CHQ151JA301A
2	1	C2	56 pF	Cond. SMD 1212 HQ	CHQ560JA501
3	10	C3, C4, C11, C12, C13, C14, C15, C16, C17, C18	470 pF	Cond. SMD 1212 HQ	CHQ471JA201
4	6	C5, C6, C7, C8, C19, C22	1 nF	Cond. SMD 0805	CCC085102JNC
5	1	C9	1 nF	Cond. SMD 1212 HQ	CHQ102JA151A
6	1	C10	100 nF 100 V	Cond. ceramico multistrato p 5mm	CMS104MC101
7	1	C20	680 nF	Cond. SMD 2824	CPE684K101O
8	1	C21	470 nF	Cond. SMD 0805	CCC085474KXB
9	1	C23	4,7 nF	Cond. SMD 0805	CCC085472KXC
10	1	D1	6V8 1 W	MINIMELF SMD Zener Diode	DIZ6V8MELF
11	3	D2, D3, D5	4004	MELF SMD Diode	DIS4007SMA
12	6	FIX1, FIX5, FIX6, FIX9, FIX10, FIX11	FIX35	Foro fissaggio 3.5mm	
13	5	FIX2, FIX3, FIX4, FIX7, FIX8	FIX60	Foro fissaggio 6mm	
14	1	FST1	FASTON VERT.		
15	1	L1	6 sp. d. 4,5	Induttanza cilindrica	
16	1	L2	filo 2 mm in ferrite		
17	1	L3	LINK a U 60 mm	Induttanza cilindrica	
18	1	L4	10 sp 2 mm d. 6 mm	Induttanza cilindrica	
19	2	L5, L6	240 mm 25 ohm		
20	3	PAD1, PAD2, PAD3	PAD		
21	1	PZ2	Piaz.		
22	2	Q2, Q1	1/2 BLF 278	Trans. FET SOT23	TRNBLF278
23	4	R1, R2, R3, R4	5H6	Res. 2W	RSM002J005H6
24	1	R5,R6	820 H	Res. 2W	RSM002J0820H
25	2	R8, R7	22 H	Res. 1W	RSM001J0022H
26	1	R9	100 H	Res. SMD 0805 1%	RCH085J0100H
27	1	R10	1K5	Res. SMD 0805 1%	RCH085F001K5
28	1	R11	1 K	Res. SMD 0805 1%	RCH085F0001K
29	1	R12	270 H	Res. SMD 2512 1%	RCH200J0270H
30	1	R13	8k2	Res. SMD 0805 1%	RCH085F08K25
31	1	R14	10 K	Res. NTC SMD 0805	RNTC085K103K
32	1	R15	1 K	Trimmer 3269	RVT3269WK001
33	1	R16	47	Res. SMD 2512 1%	RCH252J0047H
34	2	R19, R18	2H2	Res. SMD 2512 1%	RCH252J002H2
35	1	R20	NC	Res. SMD 2512 1%	
36	1	R21	NC	Trimm. multi SMD PVG5 Murata	
37	1	T1			
38	1	T3	120 mm RG 303		
39	1	CS1	CSRF0040R2		CSRF0040R2

Riflessa



Diretta

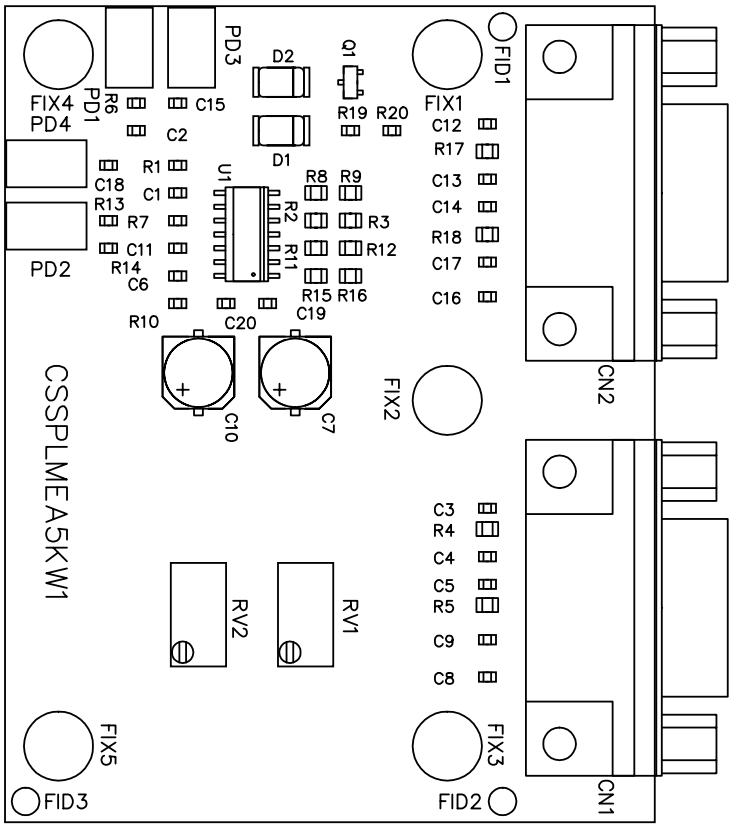
Nome Progetto:	PJ5KPS			Pagina: 1 di 1	Size: A4
Autore:	Guerzoni - Rev. Canazza	Data:	18/04/03	Codice Progetto:	<>
Nome PC in Rete:	\\UT_SRV	Revisione:	1.1 (DC)	Nome Parte:	Testina modulo 1 kW
File/Cartella:	DCLPFPJ1KM.DWG	Autorizzazione:		Codice:	DCLPFPJ1KM
Scala: <>	Materiale: <>	Trattamento:	<>	Profilo:	<>



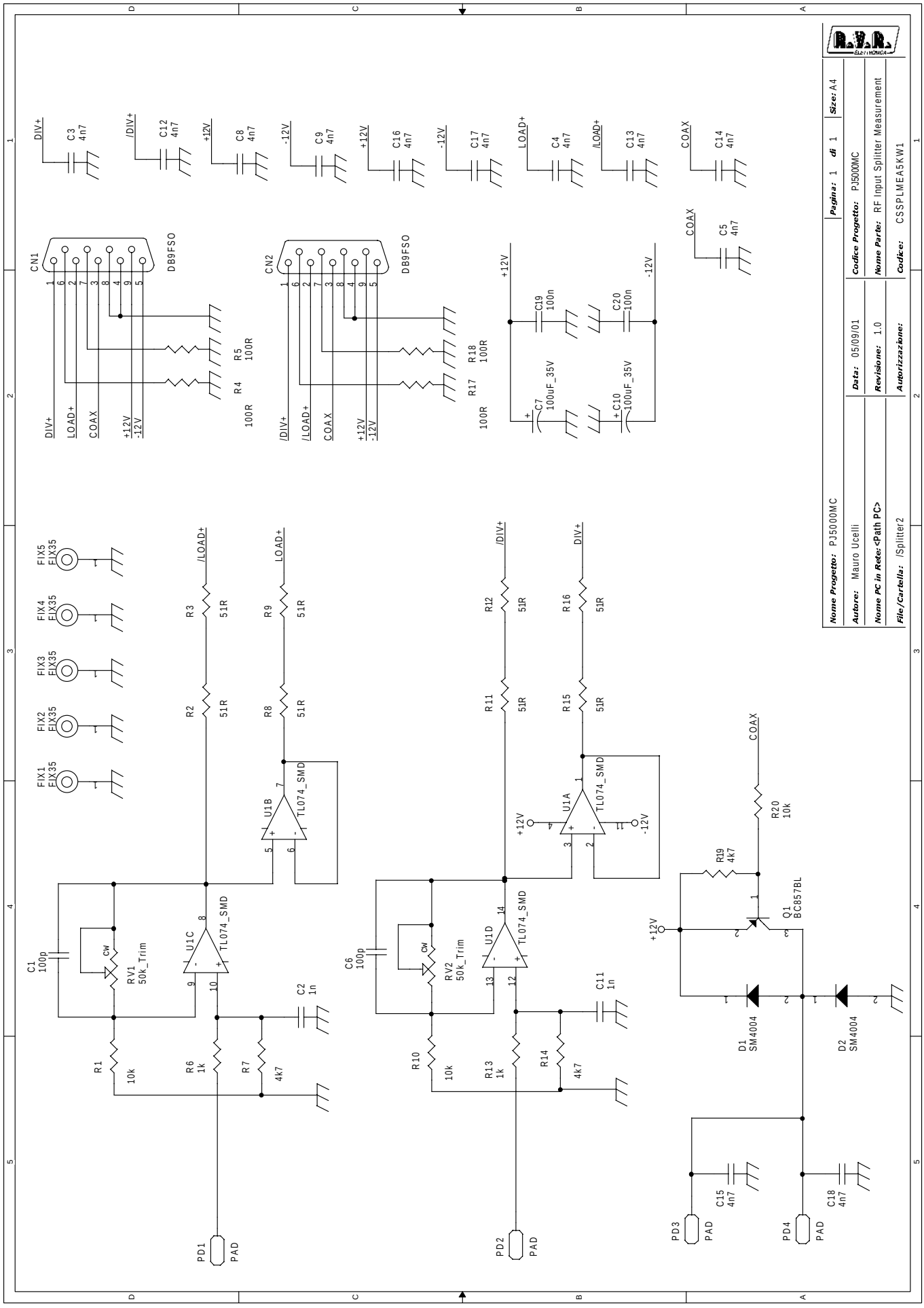
Nome Progetto: PJ5KPS		**Pagina:** 1 **di** 1	**Size:** A4
Autore: Ucelli Mauro - Rev.: Canazza	**Data:** 14/10/2002	**Codice Progetto:** <>	
Nome PC in Rete: \IUT_SRV	**Revisione:** 1.0 (DC)	**Nome Parte:** Dir. Coupler Module 1KW	
File/Cartella: DCLPFPJ1KM.DSN	**Autorizzazione:**	**Codice:** DCLPFPJ1KM	

SLDCLPFPJ1KM Bill Of Materials Page 1

Item	Q.ty	Reference	Part
1	1	C*	*
2	2	C5,C1	47p
3	4	C2,C4,C6,C7	4n7
4	1	C3	470n
5	2	D2,D1	BAT83
6	2	RV2,RV1	200R
7	2	R3,R1	100k
8	2	R2,R4	1k
9	1	SW1	RCA RFL
10	1	SW2	RCA DIR

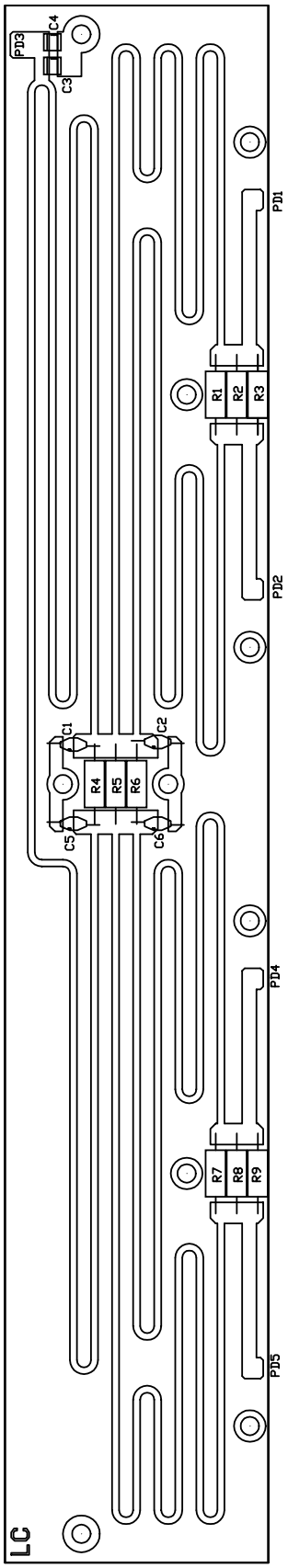


Nome Progetto:	PJ5KPS – Scheda misure splitter			Pagina: 1 di 1	Size: A4
Autore:	Ucelli – Rev.: Canazza	Data:	14/10/2002	Codice Progetto:	<>
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Scheda misure input splitter
File/Cartella:	SPLITLY.DWG	Autorizzazione:		Codice:	SLSPLMEA5KW1
Scala: 1:1	Materiale: <>	Trattamento:	<>	Profilo:	<>



CSSPLMEA5KW1 Bill Of Materials Page1

Item	Q.ty	Reference	Part
1	2	CN2,CN1	DB9FSO
2	2	C6,C1	100p
3	2	C11,C2	1n
4	12	C3,C4,C5,C8,C9,C12,C13, C14,C15,C16,C17,C18	4n7
5	2	C7,C10	100uF_35V
6	2	C19,C20	100n
7	2	D1,D2	SM4004
8	5	FIX1,FIX2,FIX3,FIX4,FIX5	FIX35
9	4	PD1,PD2,PD3,PD4	PAD
10	1	Q1	BC857BL
11	2	RV2,RV1	50k_Trim
12	3	R1,R10,R20	10k
13	8	R2,R3,R8,R9,R11,R12,R15, R16	51R
14	4	R4,R5,R17,R18	100R
15	2	R13,R6	1k
16	3	R7,R14,R19	4k7
17	1	U1	TL074_SMD



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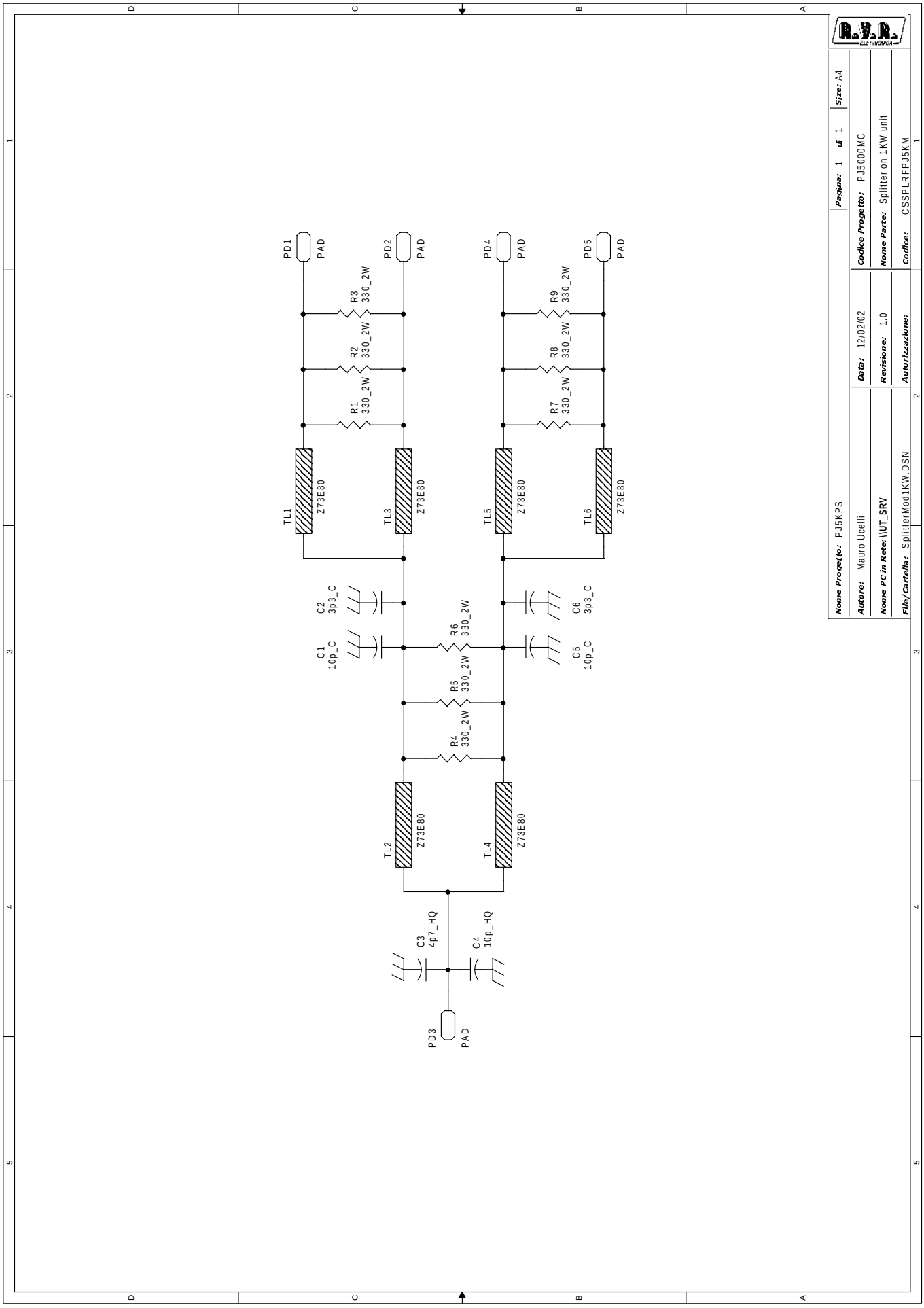
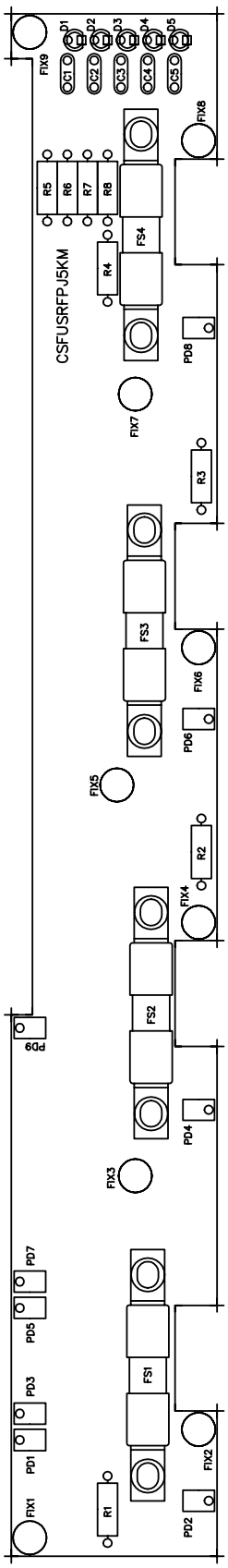
Autore:	Ucelli - Rev. Canazza	Data:	09/10/2002	Codice Progetto:	<>
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Splitter
File/Cartella:	CSSPLRFPJ5KM.DWG	Autorizzazione:		Codice:	SLSPLRFPJ5KM
Scala: <>	Materiale: <>	Trattamento:	<>	Profilo:	<>

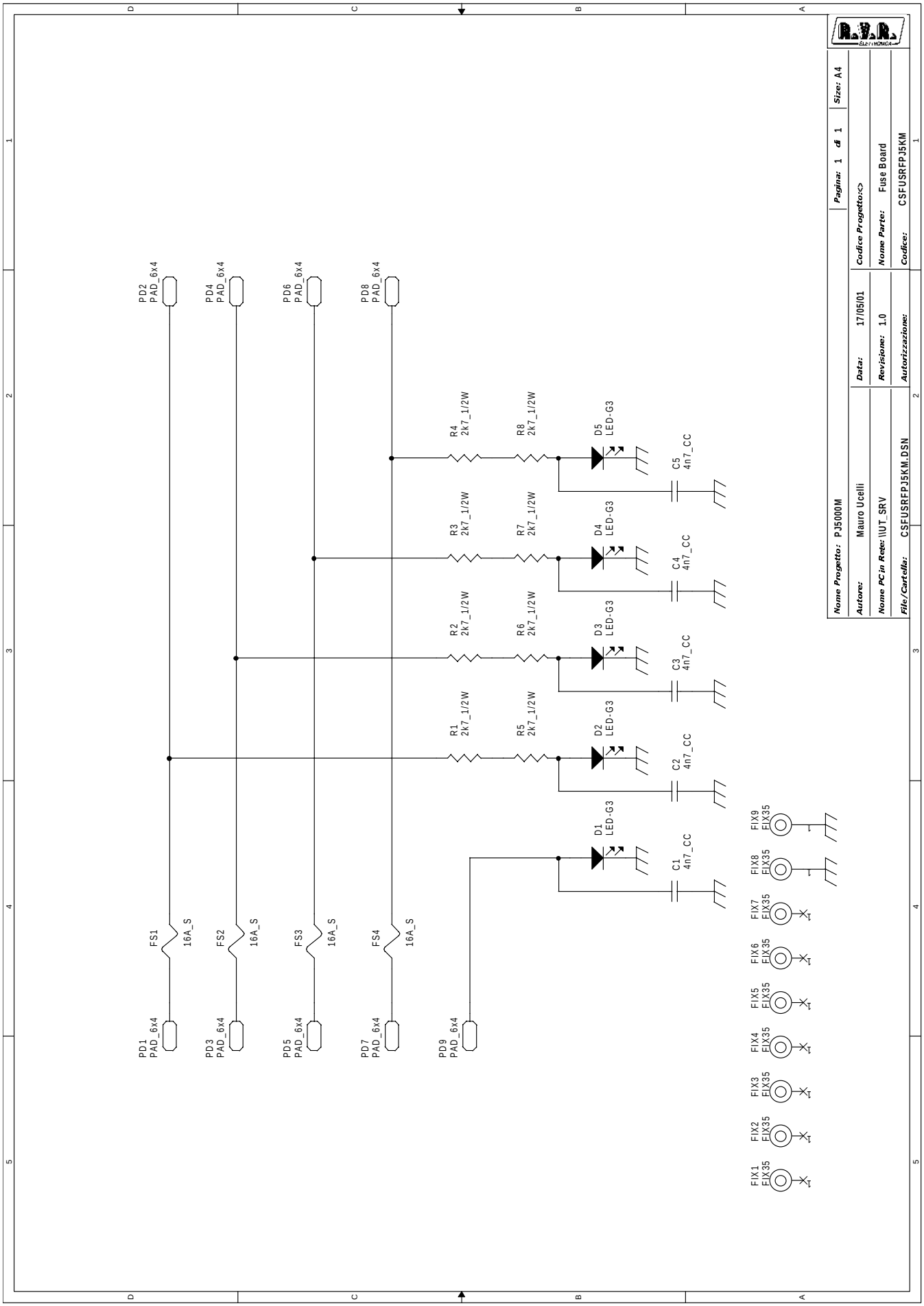


CSSPLRFPJ5KM Bill Of Materials Page 1

Item	Q.ty	Reference	Part
1	2	C5,C1	10p_C
2	2	C6,C2	3p3_C
3	1	C3	4p7_HQ
4	1	C4	10p_HQ
5	5	PD1,PD2,PD3,PD4,PD5	PAD
6	9	R1,R2,R3,R4,R5,R6,R7,R8, R9	330_2W
7	6	TL1,TL2,TL3,TL4,TL5,TL6	Z73E80

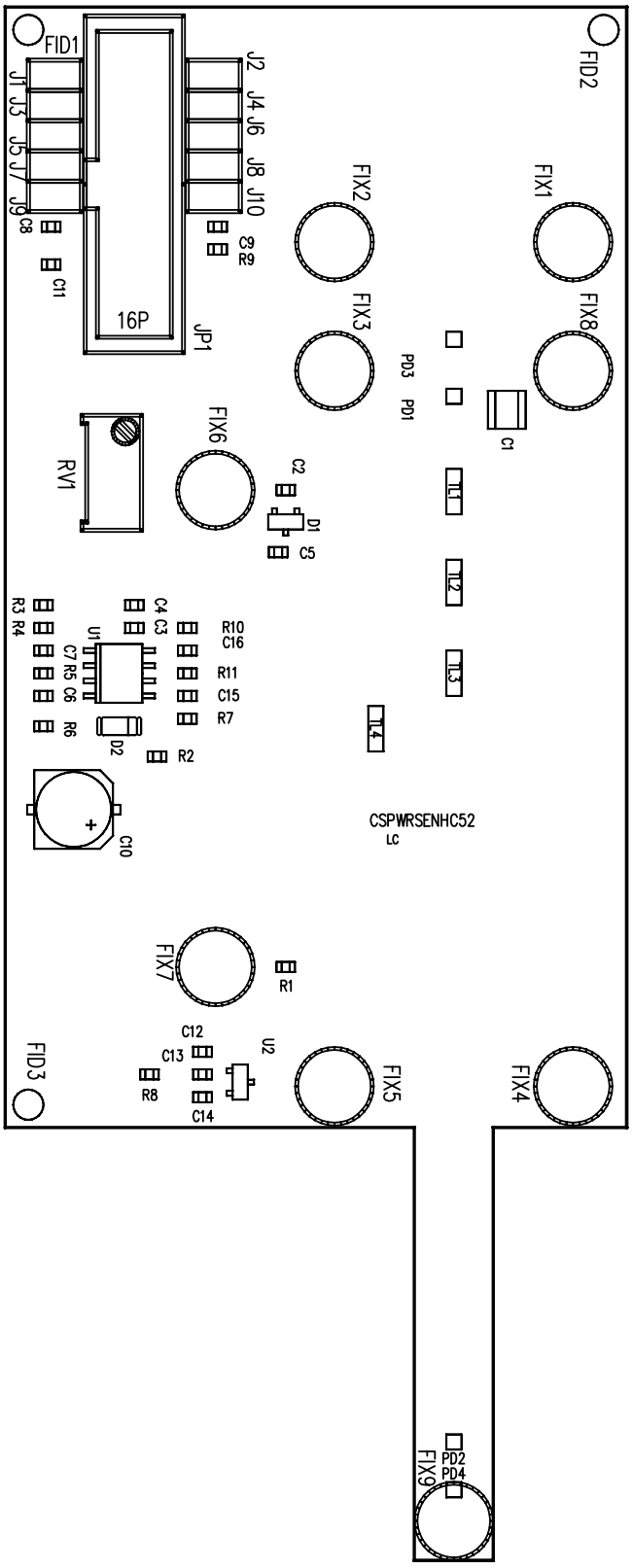


Nome Progetto:	PJ5KPS – Scheda fusibili modulo RF			Pagina: <Nr.>di <tot.>	Size: <Size>
Autore:	Ucelli – Rev.: Canazza	Data:	08/10/2002	Codice Progetto:	<>
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Scheda fusibili modulo RF
File/Cartella:	CSFUSRFPJ5KM.DWG	Autorizzazione:		Codice:	SLFUSRFPJ5KM
Scala: <>	Materiale: <>	Trattamento:	<>	Profilo:	<>

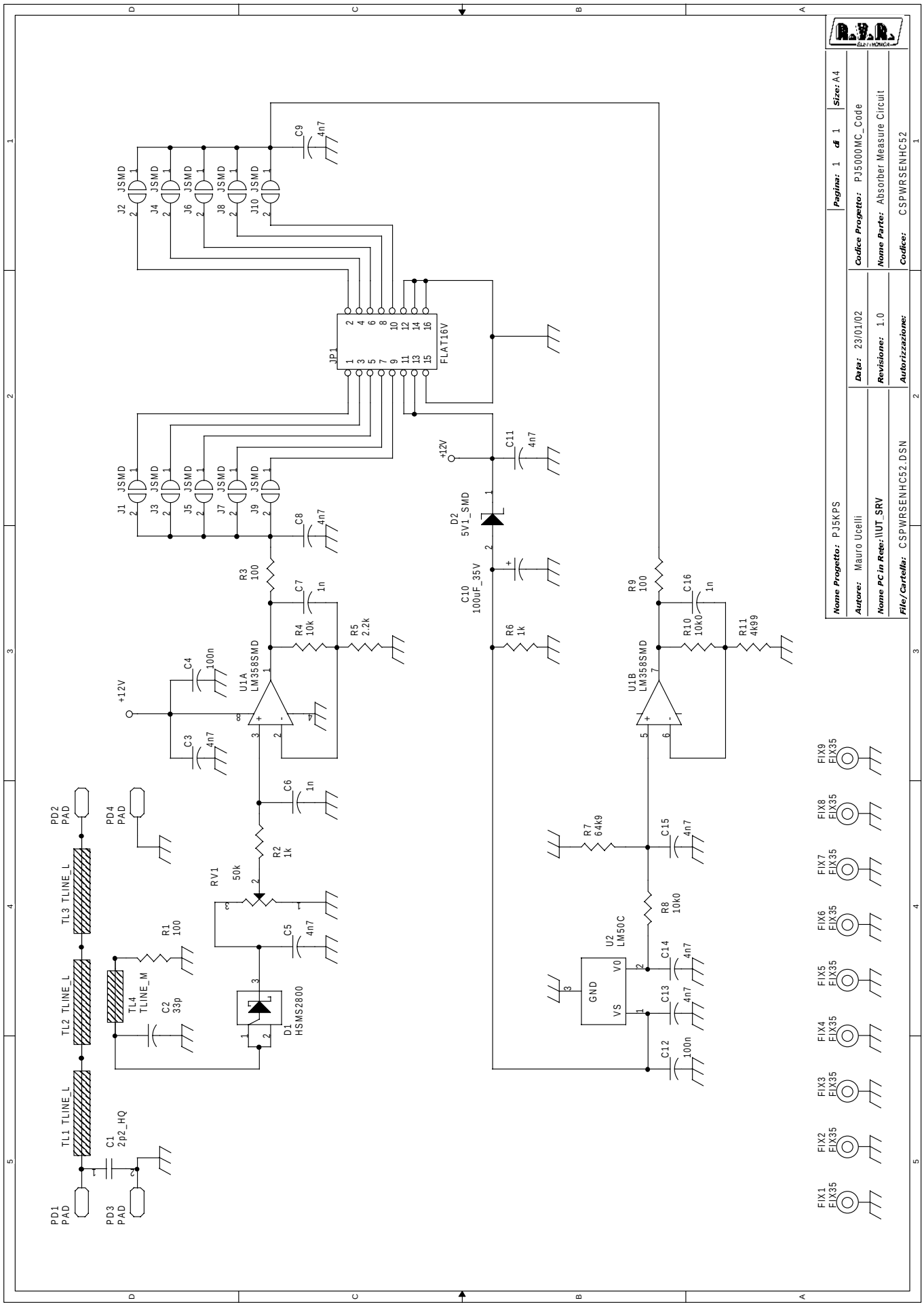


CSFUSRFPJ5KM Bill Of Materials Page1

Item	Q.ty	Reference	Part
1	5	C1,C2,C3,C4,C5	4n7_CC
2	5	D1,D2,D3,D4,D5	LED-G3
3	9	FIX1,FIX2,FIX3,FIX4,FIX5, FIX6,FIX7,FIX8,FIX9	FIX35
4	4	FS1,FS2,FS3,FS4	16A_S
5	9	PD1,PD2,PD3,PD4,PD5,PD6, PD7,PD8,PD9	PAD_6x4
6	8	R1,R2,R3,R4,R5,R6,R7,R8	2k7_1/2W

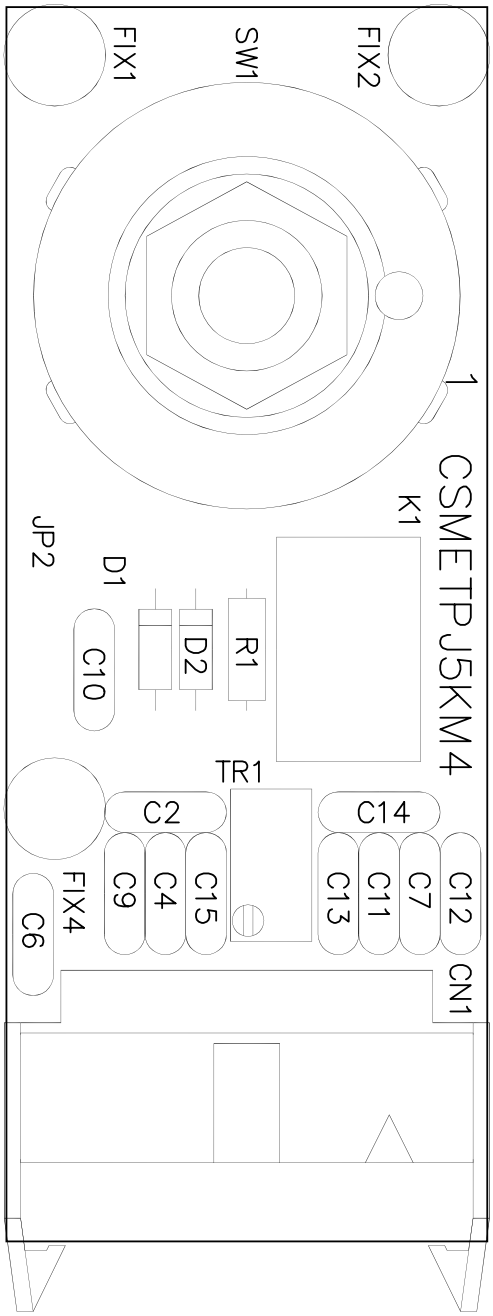


Nome Progetto:	PJ5KPS - Combinatore RF			Pagina: 1 di 1	Size: A4
Autore:	Ucelli - Rev.: Canazza	Data:	09/10/2002	Codice Progetto:	
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Misura absorbers
File/Cartella:	SENHC52_LY.DWG	Autorizzazione:		Codice:	SLPWRSEBHC52
Scala: <>	Materiale: <>	Trattamento:	<>	Profilo:	<>

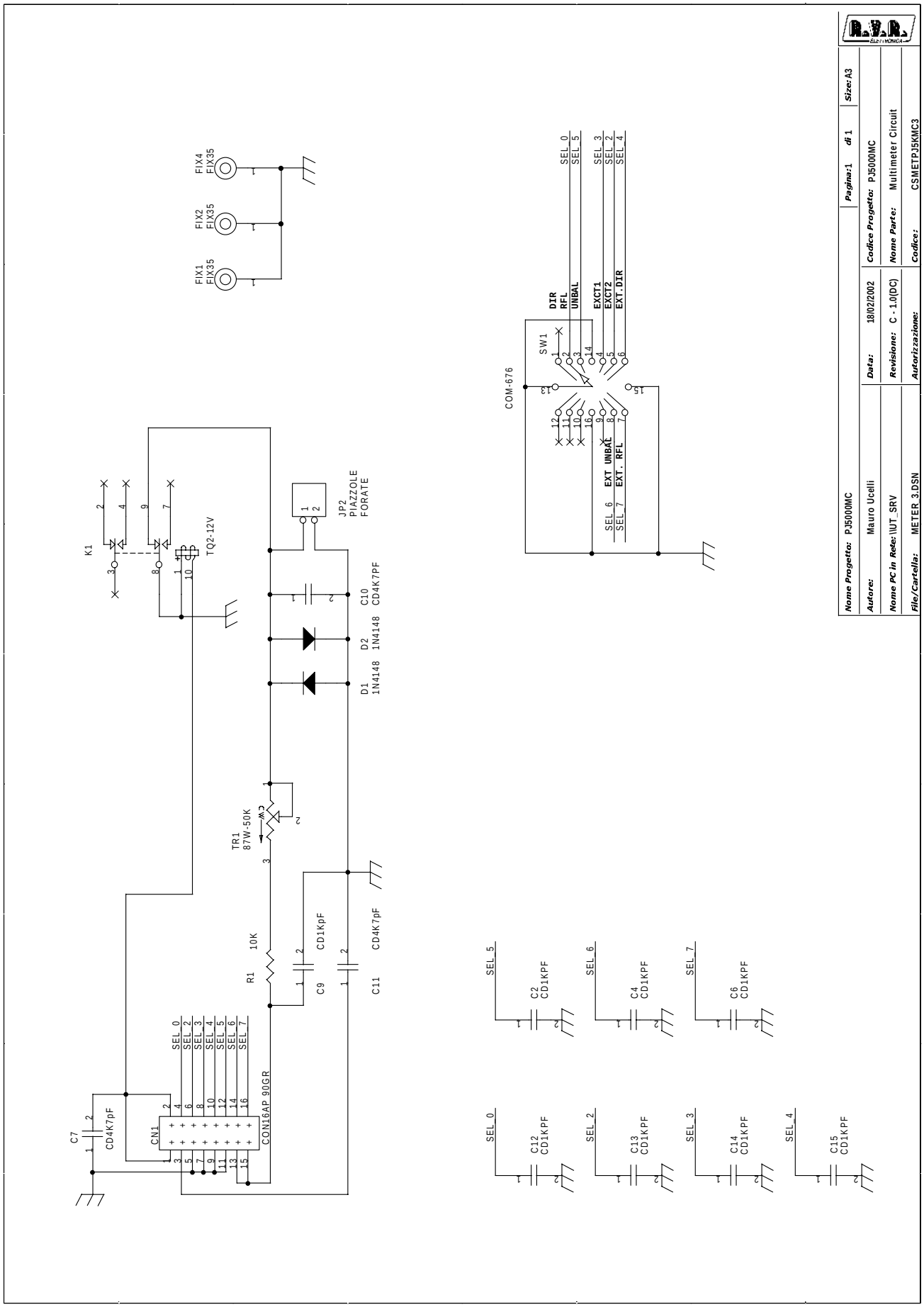


CSPWRSENHC52 Bill Of Materials Page1

Item	Q.ty	Reference	Part
1	1	C1	2p2_HQ
2	1	C2	33p
3	8	C3,C5,C8,C9,C11,C13,C14, C15	4n7
4	2	C12,C4	100n
5	3	C6,C7,C16	1n
6	1	C10	100uF_35V
7	1	D1	HSMS2800
8	1	D2	5V1_SMD
9	9	FIX1,FIX2,FIX3,FIX4,FIX5, FIX6,FIX7,FIX8,FIX9	FIX35
10	1	JP1	FLAT16V
11	10	J1,J2,J3,J4,J5,J6,J7,J8, J9,J10	JSMD
12	4	PD1,PD2,PD3,PD4	PAD
13	1	RV1	50k
14	3	R1,R3,R9	100
15	2	R6,R2	1k
16	1	R4	10k
17	1	R5	2.2k
18	1	R7	64k9
19	2	R8,R10	10k0
20	1	R11	4k99
21	3	TL1,TL2,TL3	TLINE_L
22	1	TL4	TLINE_M
23	1	U1	LM358SMD
24	1	U2	LM50C

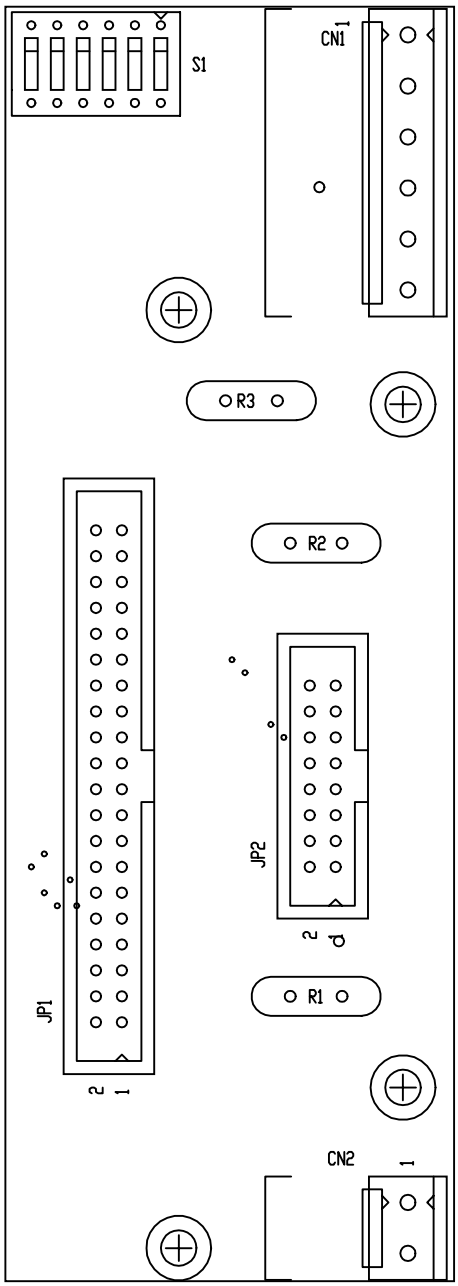


Nome Progetto:	PJ5KPS – Selettore strumento analogico			Pagina: 1 di 1	Size: A4
Autore:	Ucelli – Rev.: Canazza	Data:	08/10/2002	Codice Progetto:	<>
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Selettore strumento analogico
File/Cartella:	METPJ5_4LY.DWG	Autorizzazione:		Codice:	SLMETPJ5KM4
Scala: <>	Materiale: <>	Trattamento:	<>	Profilo:	<>

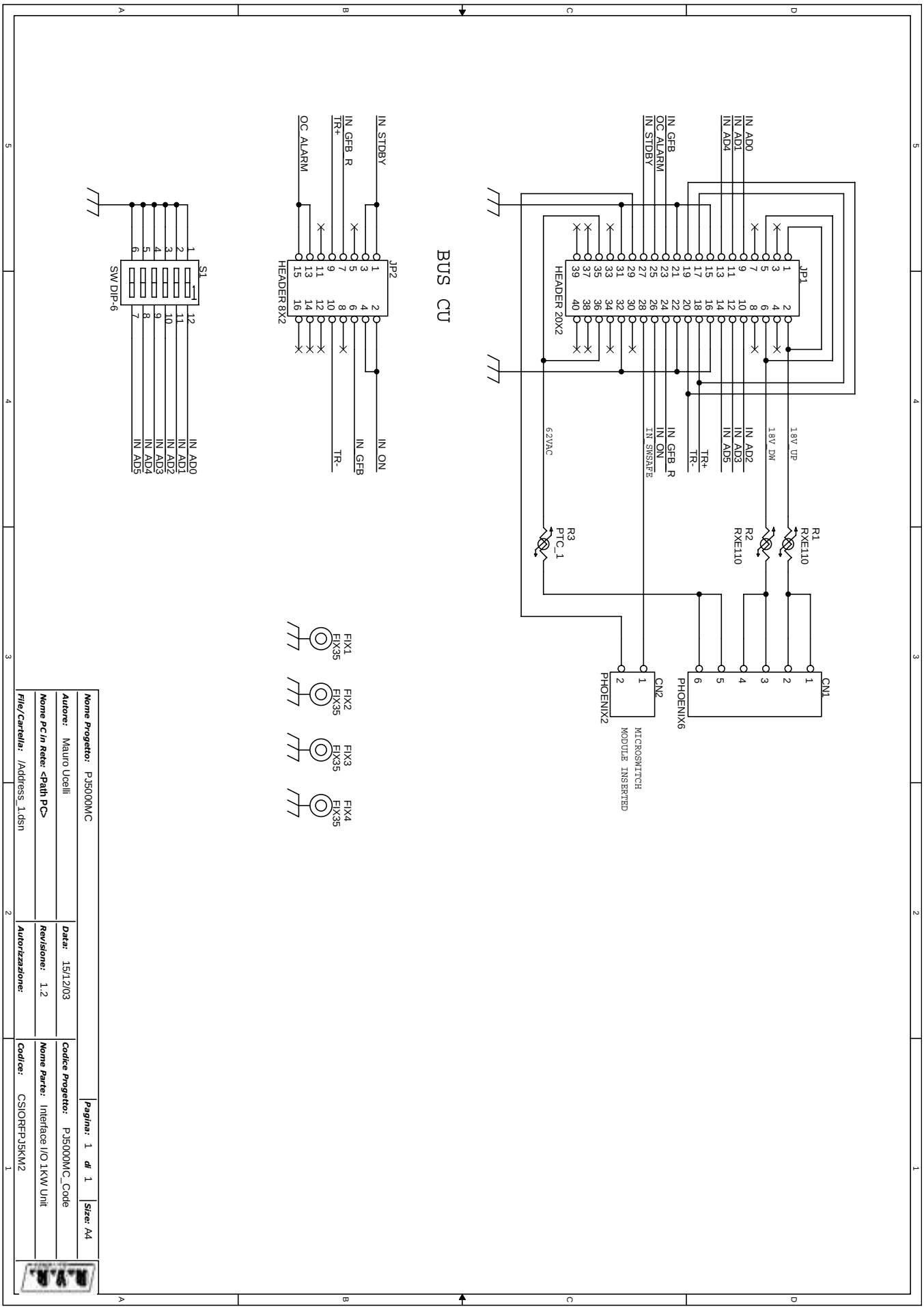


SLMETPJ5KM4 Bill Of Materials Page 1

Item	Q.ty	Reference	Part
1	1	CN1	CON16AP 90GR
2	8	C2,C4,C6,C9,C12,C13,C14, C15	CD1KpF
3	3	C7,C10,C11	CD4K7pF
4	2	D1,D2	1N4148
5	3	FIX1,FIX2,FIX4	FIX35
6	1	JP2	PIAZZOLE
7	1	K1	TQ2-12V
8	1	R1	10K
9	1	SW1	COM-676
10	1	TR1	87W-50K



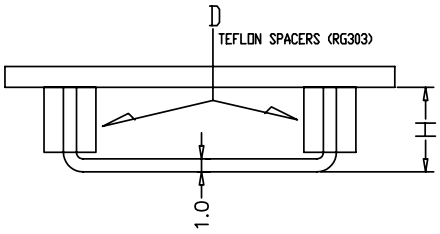
Nome Progetto:	PJ5KPS - Interfaccia I/O modulo RF			Pagina: 1 di 1	Size: A4
Autore:	Ucelli - Rev.: Canazza	Data:	14/10/2002	Codice Progetto:	<>
Nome PC in Rete:	\\UT_SRV	Revisione:	2 - 1.0 (DC)	Nome Parte:	Interfaccia I/O modulo RF
File/Cartella:	CSI0RFPJ5KM2.DWG	Autorizzazione:		Codice:	SLI0RFPJ5KM2
Scala: 1:1	Materiale: <>	Trattamento:	<>	Profilo:	<>

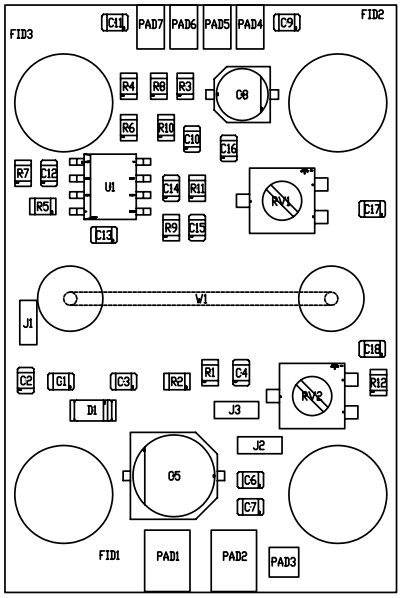


Interface I/O 1KW Unit Revised: 15/12/2003
CSIORFPJ5KM2 Revision: 1.2

Item	Quantity	Reference	Part
1			
2	1	CN1	PHOENIX6
3	1	CN2	PHOENIX2
4	4	FIX1,FIX2,FIX3,FIX4	FIX35
5	1	JP1	HEADER 20X2
6	1	JP2	HEADER 8X2
7	2	R2,R1	RXE110
8	1	R3	PTC_1
9	1	S1	SW DIP-6

W1 LINK CONFIGURATION



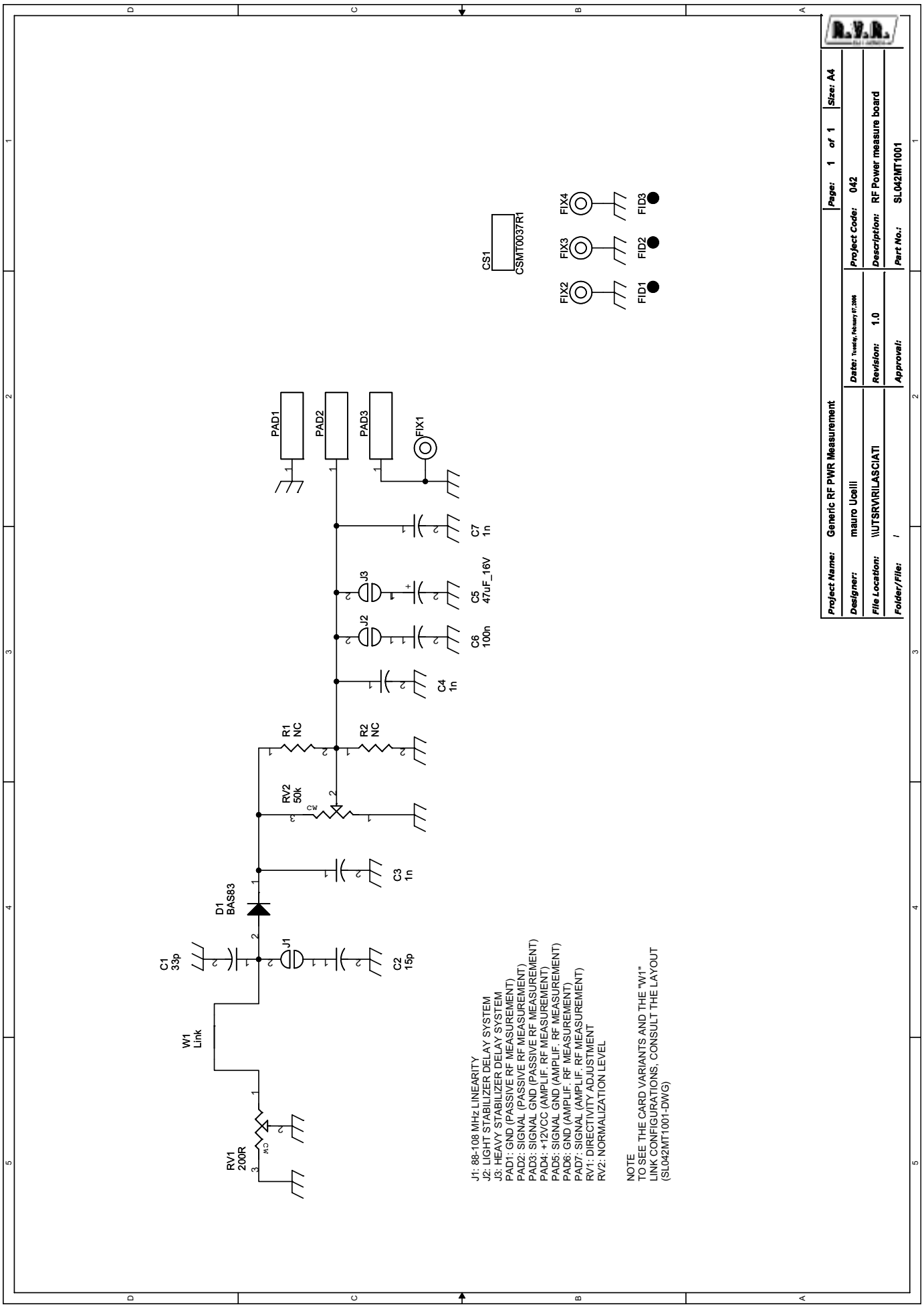


J1: 88-108 MHz LINEARITY
J2: LIGHT STABILIZER DELAY SYSTEM
J3: HEAVY STABILIZER DELAY SYSTEM
PAD1: GND (PASSIVE RF MEASUREMENT)
PAD2: SIGNAL (PASSIVE RF MEASUREMENT)
PAD3: SIGNAL GND (PASSIVE RF MEASUREMENT)
PAD4: +12VCC (AMPLIF. RF MEASUREMENT)
PAD5: SIGNAL GND (AMPLIF. RF MEASUREMENT)
PAD6: GND (AMPLIF. RF MEASUREMENT)
PAD7: SIGNAL (AMPLIF. RF MEASUREMENT)
RV1: DIRECTIVITY ADJUSTMENT
RV2: NORMALIZATION LEVEL

CONFIGURATIONS DETAIL

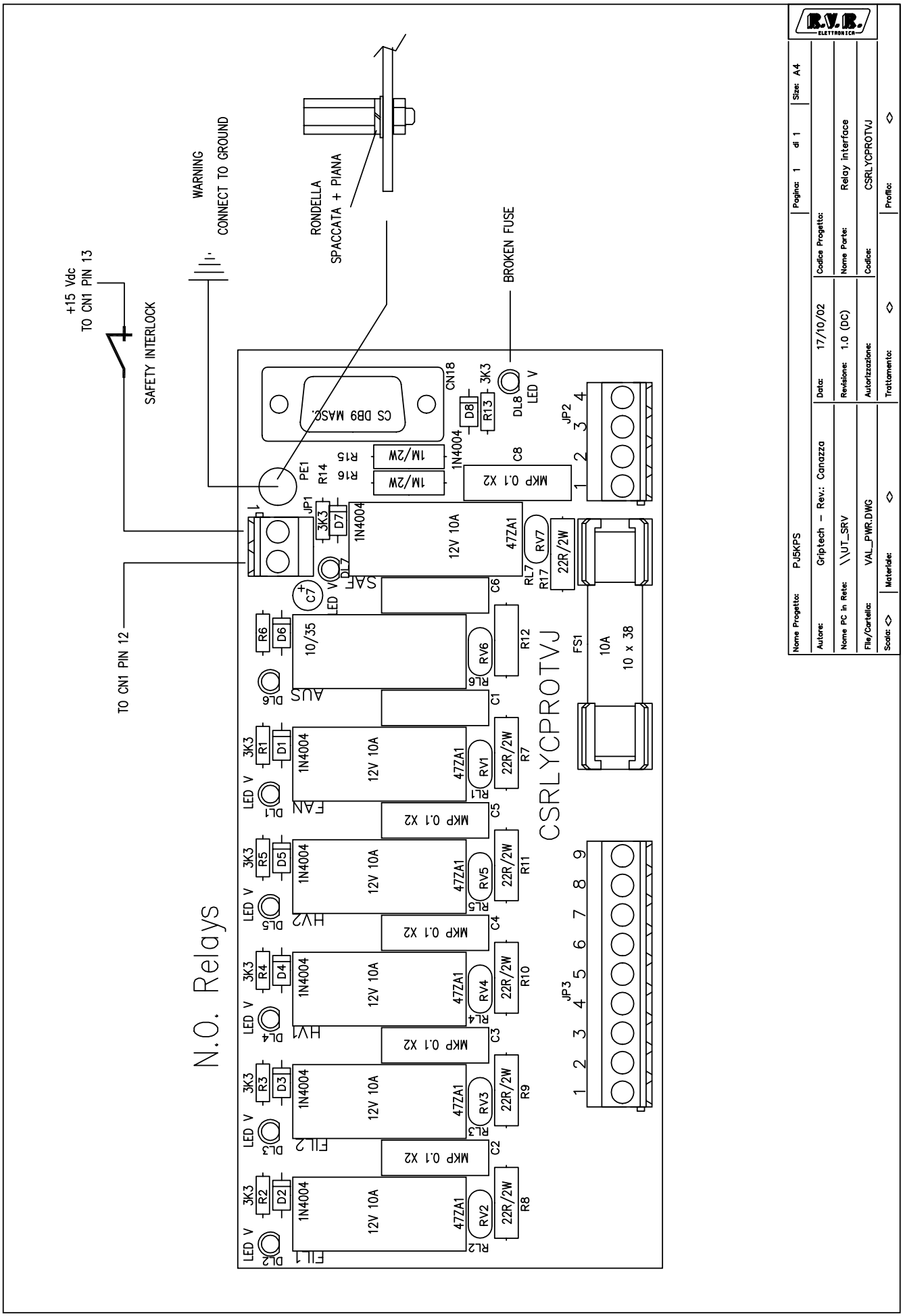
CARD CODE	H link W1 (mm)	D spacers W1	Jumper J1	Jumper J2	Jumper J3
SL042MT1001					
SL042MT1101	5.3		X		
SL042MT1201	3		X		
SL042MT1301	7.6		X		
SL042MT1401	8.5	X	X		X

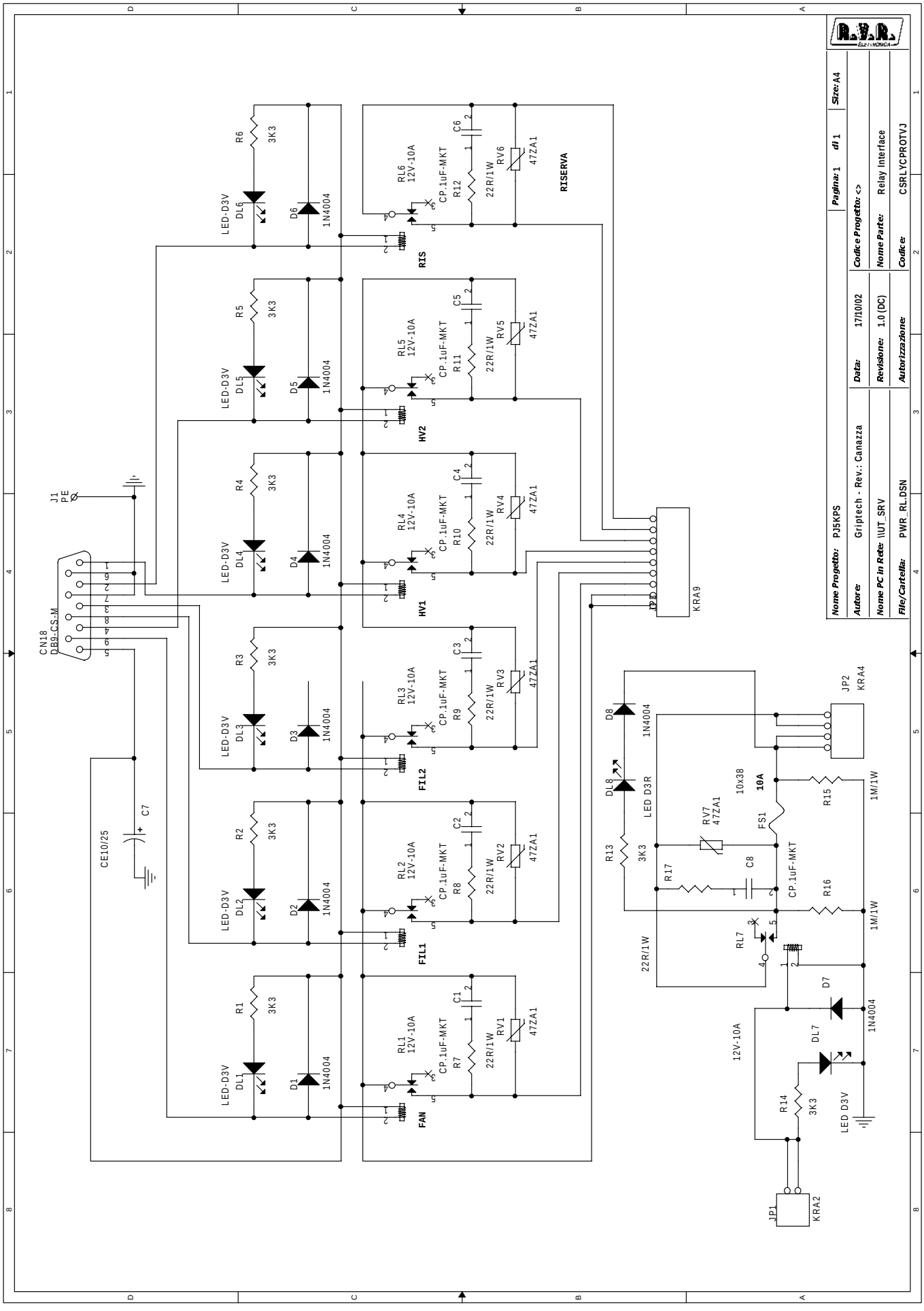
PROJECT NAME: POWER METER			PART No.: POWER METER			
DESIGNER: M. UCELLI			DATE: 19/01/2006	REVISION: 1.0	SCALE: 2:1	SIZE: A4	PAGE: 1 OF 1
FILE LOCATION: \\Utsrv\Rilasciati\2_Schede\SL042MT1001		PROJECT CODE: 042	CODE: SL042MT1001			
MATERIAL: <>	TREATMENT: <>		PROFILE: <>		STATE: EXECUTIVE	



RF Power measure board
SL042MT1001
Revision: 1.0
Generic RF PWR Measurement
042
Mauro Ucelli
19/01/2006

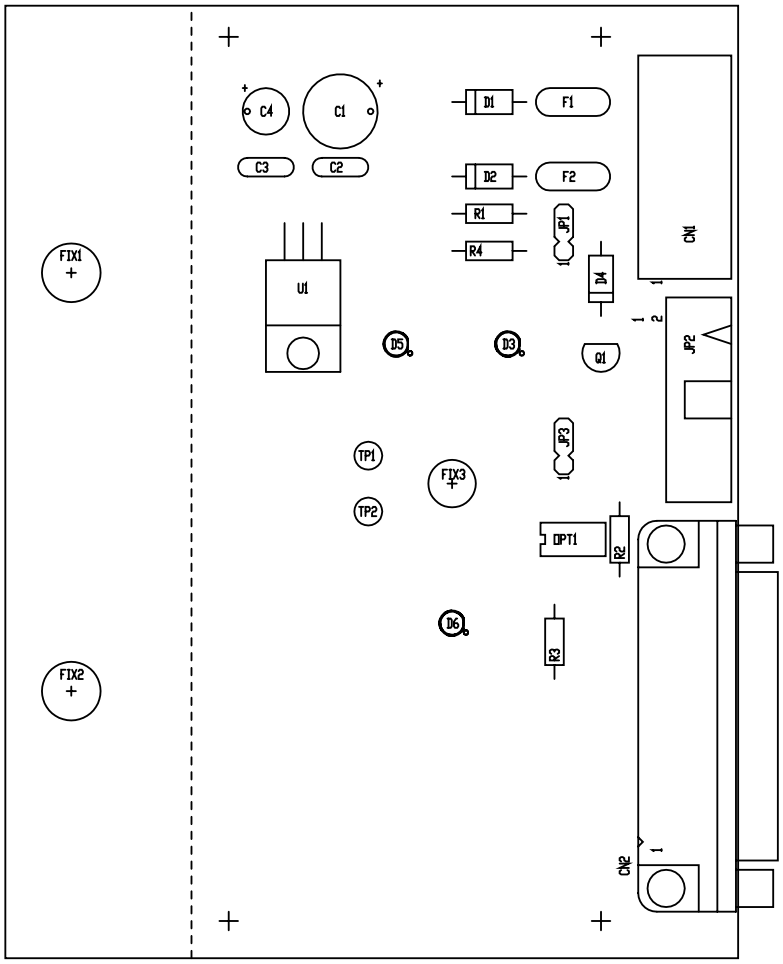
Item	Quantity	Reference	Part	Description	Code1
1	1	CS1	CSMT0037R1	Printed Circuit Board	CSMT0037R1
2	1	C1	33p	SMD 0805 COG Capacitor	CCC085330JCC
3	1	C2	15p	SMD 0805 COG Capacitor	CCC085150JCC
4	3	C3,C4,C7	1n	SMD 0805 Capacitor	CCC085102JNC
5	1	C5	47uF_16V	Elect. SMD d. 6.3mm Cap.	CES476C160
6	1	C6	100n	SMD 0805 Capacitor	CCC085104KXC
7	1	D1	BAS83	MINIMELF SMD Diode	DHCBAS83
8	3	FID1,FID2,FID3	FID		
9	4	FIX1,FIX2,FIX3,FIX4	FIX35	Fixing Hole 3.5mm	
10	3	J1,J2,J3	JSMD	SMD Pad to solder	
11	3	PAD1,PAD2,PAD3	PAD		
12	1	RV1	200R	Trimmer SMD	RVT4X4H0200V
13	1	RV2	50k	Trimmer SMD	RVT4X4K0050V
14	2	R1,R2	NC	SMD 0805 Res.	
15	1	W1	Link	Wire to solder	See the Layout



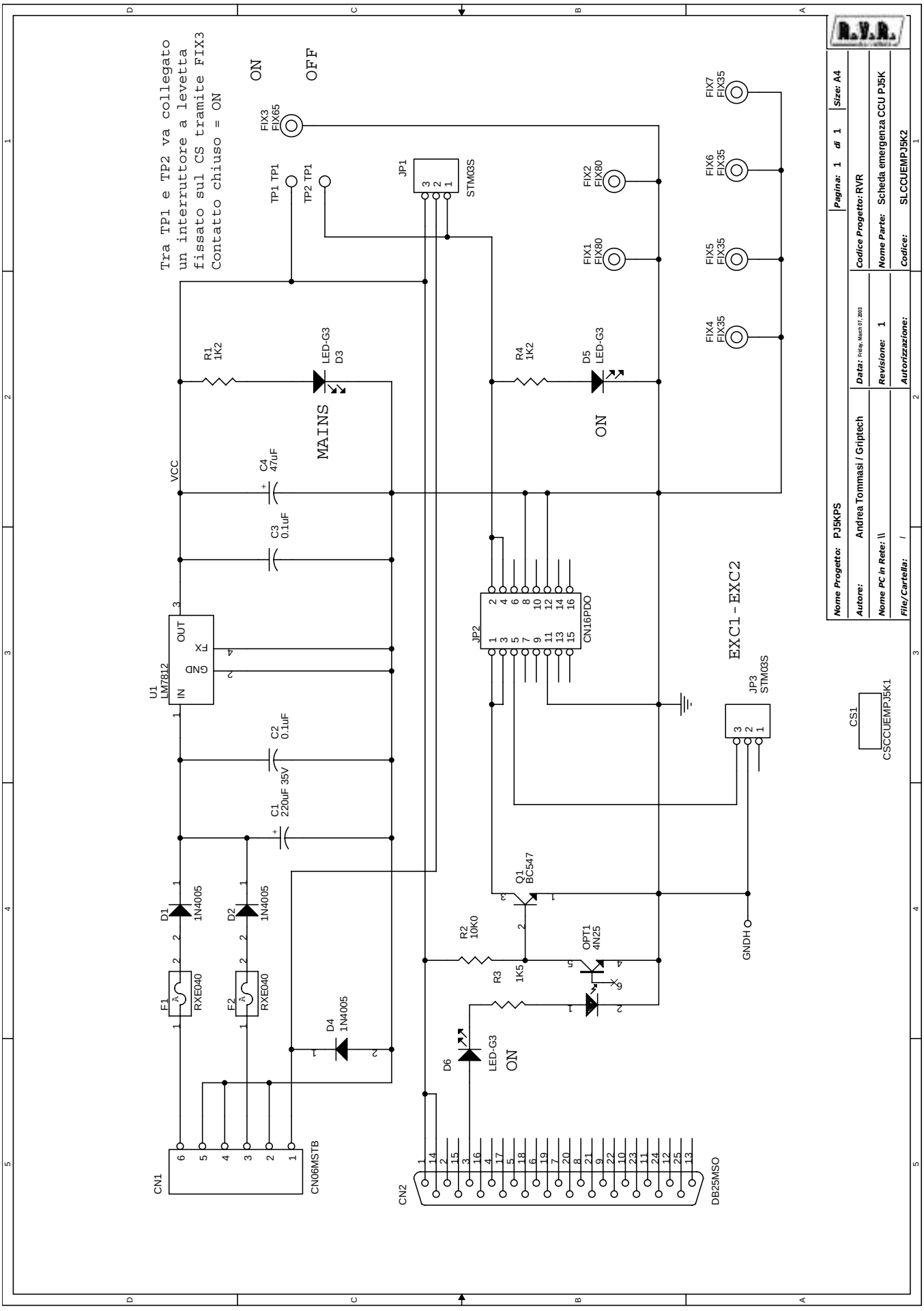


SLRLYCPROTVJ Bill Of Materials Page1

Item	Q.ty	Reference	Part
1	1	CN18	DB9-CS-M
2	7	C1, C2, C3, C4, C5, C6, C7	CE10/25
4	7	DL1, DL2, DL3, DL4, DL5, DL6, DL7	LED D3V
5	1	DL8	LED D3R
7	8	D1, D2, D3, D4, D5, D6, D7, D8	1N4004
8	1	FS1	10x38
9	1	JP1	KRA2
10	1	JP2	KRA4



NOME PROGETTO: PJ5KPS			NOME PARTE: SCHEDA EMERGENZA CCU PJ5K			
AUTORE: Poluzzi S.	DATA: 07/03/2003	REVISIONE: 2.0	SCALA: 1:1	SIZE: A4	PAGINA: 1 DI 1	
ARCHIVIAZIONE ELETTRONICA: "CARTELLA PROGETTI" SU "UT_SRV"		CODICE PROGETTO: /		CODICE DISEGNO: CSCCUEMPJ5K2		
MATERIALE: FR4-74 1.6mm Cu 35um	TRATTAMENTO: STANDARD COSTRUTTORE		PROFILO: /		STATO: /	

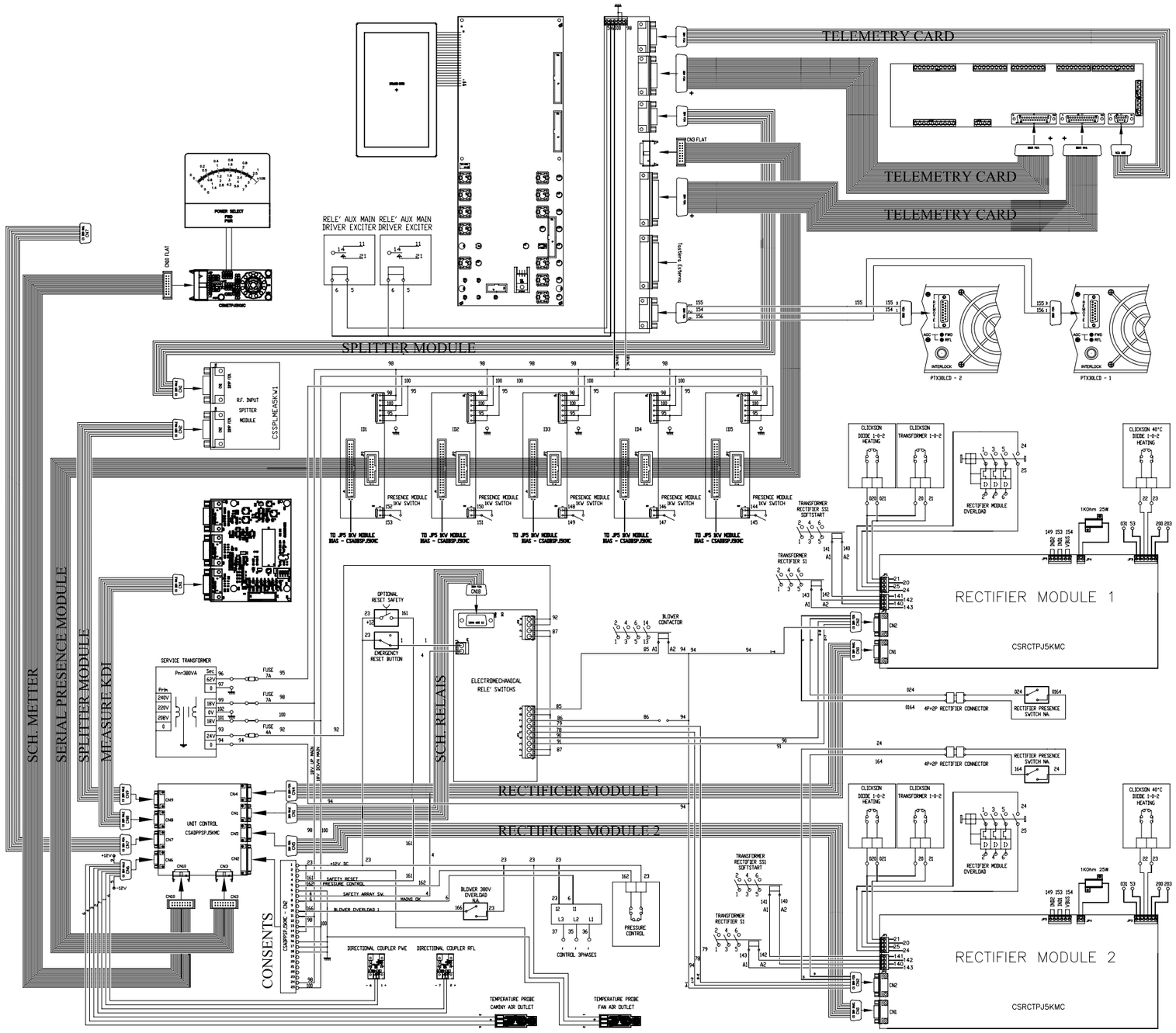


SLCCUEMPJ5K1 Revision: 1

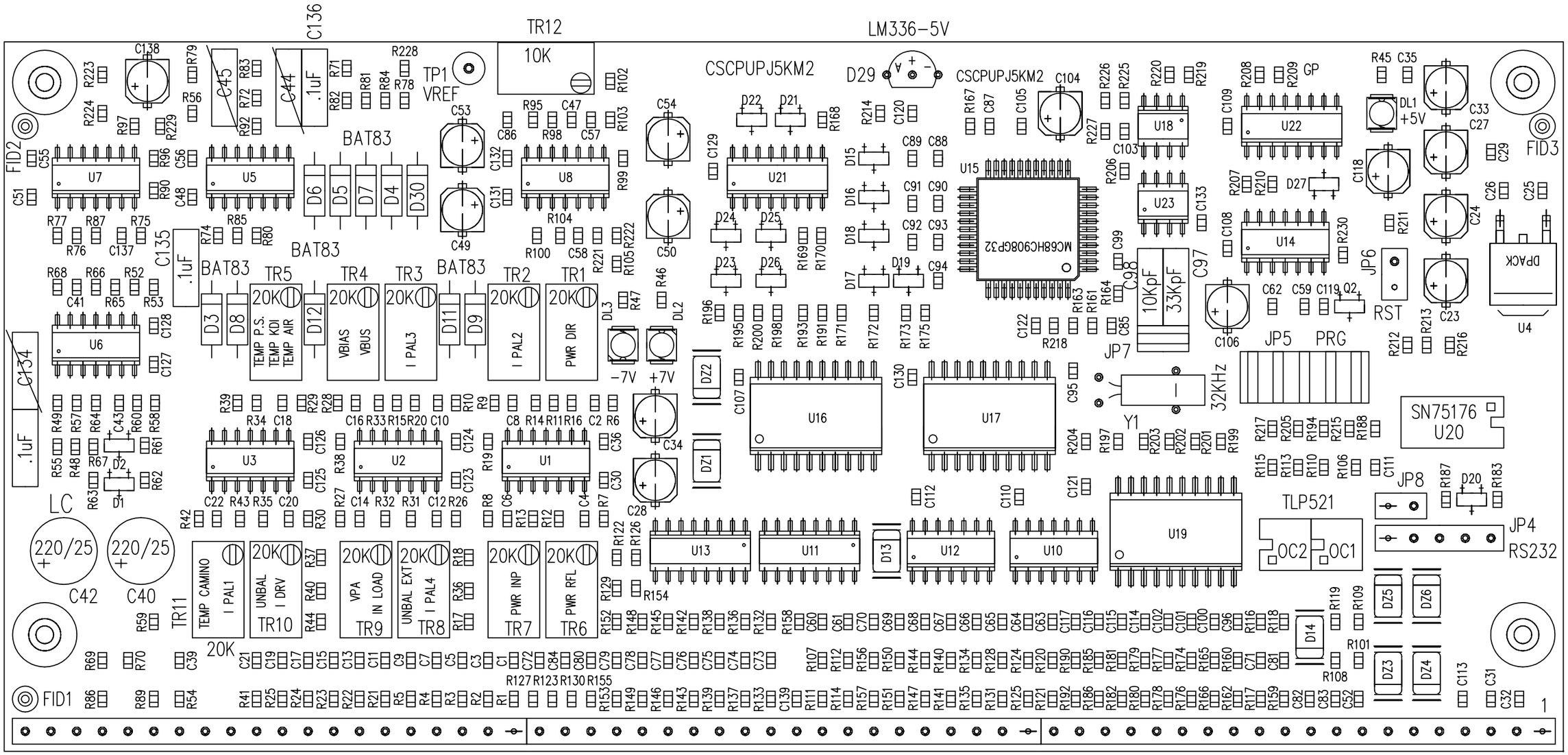
Andrea Tommasi / Griptech

Item	Quantity	Reference	Part	Description	
1	1	CN1	CN06MSTB	Conn. Phoenix MSTB a 6 poli	
2	1	CN2	DB25MSO	Connettore DB25 mas. cs 90°	
3	1	CS1	CSCCUEMPJ5K1	Circuito stampato	
4	1	C1	220uF 35V	Cond. Elettr. Dia 10 P5.08	
5	2	C2,C3	0.1uF	Cond. ceramico p 5mm	
6	1	C4	47uF	Cond. Elettr. Dia 6.5 P2.54	
7	3	D1,D2,D4	1N4005	Diodo plastico DO41	
8	3	D3,D5,D6	LED-G3	LED verde dia. 3mm	Nota 1
9	2	FIX1,FIX2	FIX80	Foro fissaggio 8mm	
10	1	FIX3	FIX65	Foro fissaggio 6.5mm	
11	4	FIX4,FIX5,FIX6,FIX7	FIX35	Foro fissaggio 3.5mm	
12	2	F1,F2	RXE040	Fusibile autorip. 7mm	
13	2	JP1,JP3	STM03S	Strip maschio 3 pin	
14	1	JP2	CN16PDO	Connettore 16 poli Flat cs a 90°	
15	1	OPT1	4N25	Optoisolatore DIP6	
16	1	Q1	BC547	Trans. NPN TO92	
17	2	R4,R1	1K2	Res. 1/4W	
18	1	R2	10K0	Res. 1/4W	
19	1	R3	1K5	Res. 1/4W	
20	2	TP1,TP2	NC	Test point	
21	1	U1	LM7812	Stabilizzatore TO220	
22	1	SW1	SW1V2P	Deviatore fissato nel foro e collegato tra TP1 e TP2 chiuso in pos. ON Con blocco della levetta E la levetta lato saldature	

Nota 1 I led vanno montati lato saldature a livello del CS



Nome Progetto:	PJ5KPS - Diagramma del Cablaggio			Pagina: 1 di 1	Size: A3
Autore:	Telecom - REV.: BERTI J.	Data:	06/11/02	Codice Progetto:	/
Nome PC in Rete:	\\UT_SRV	Revisione:	1.1 (DC)	Nome Parte:	/
File/Cartella:	LOWTENPJ5KMC.DWG	Autorizzazione:		Codice:	/
Scala: 1:5	Materiale: /	Trattamento:	/	Profilo:	/



Nome Progetto:	PJ5KPS - Scheda CPU			Pagina: 1 di 1	Size: A4
Autore:	Griptech - Rev.: Canazza	Data:	07/10/2002	Codice Progetto:	<>
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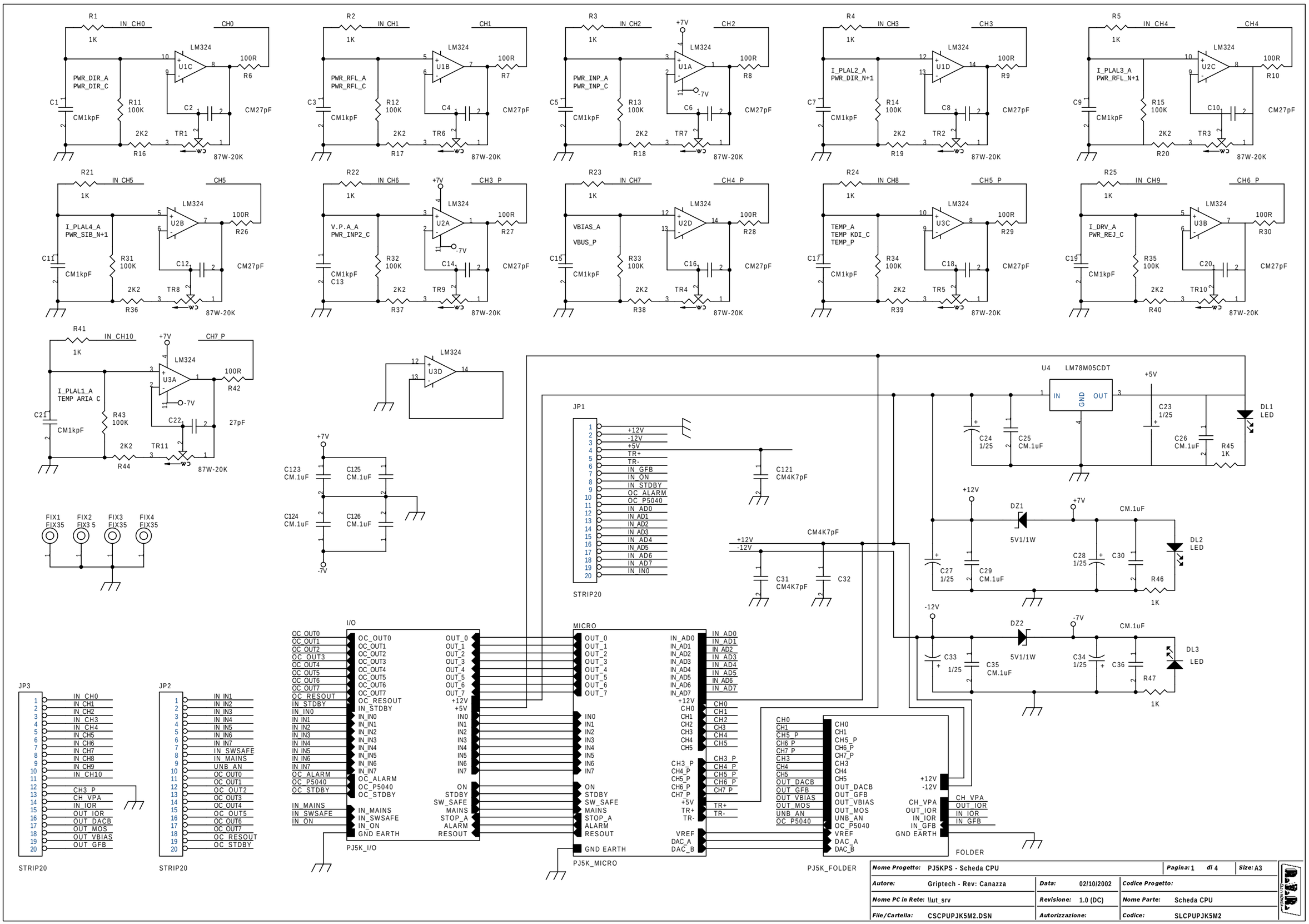
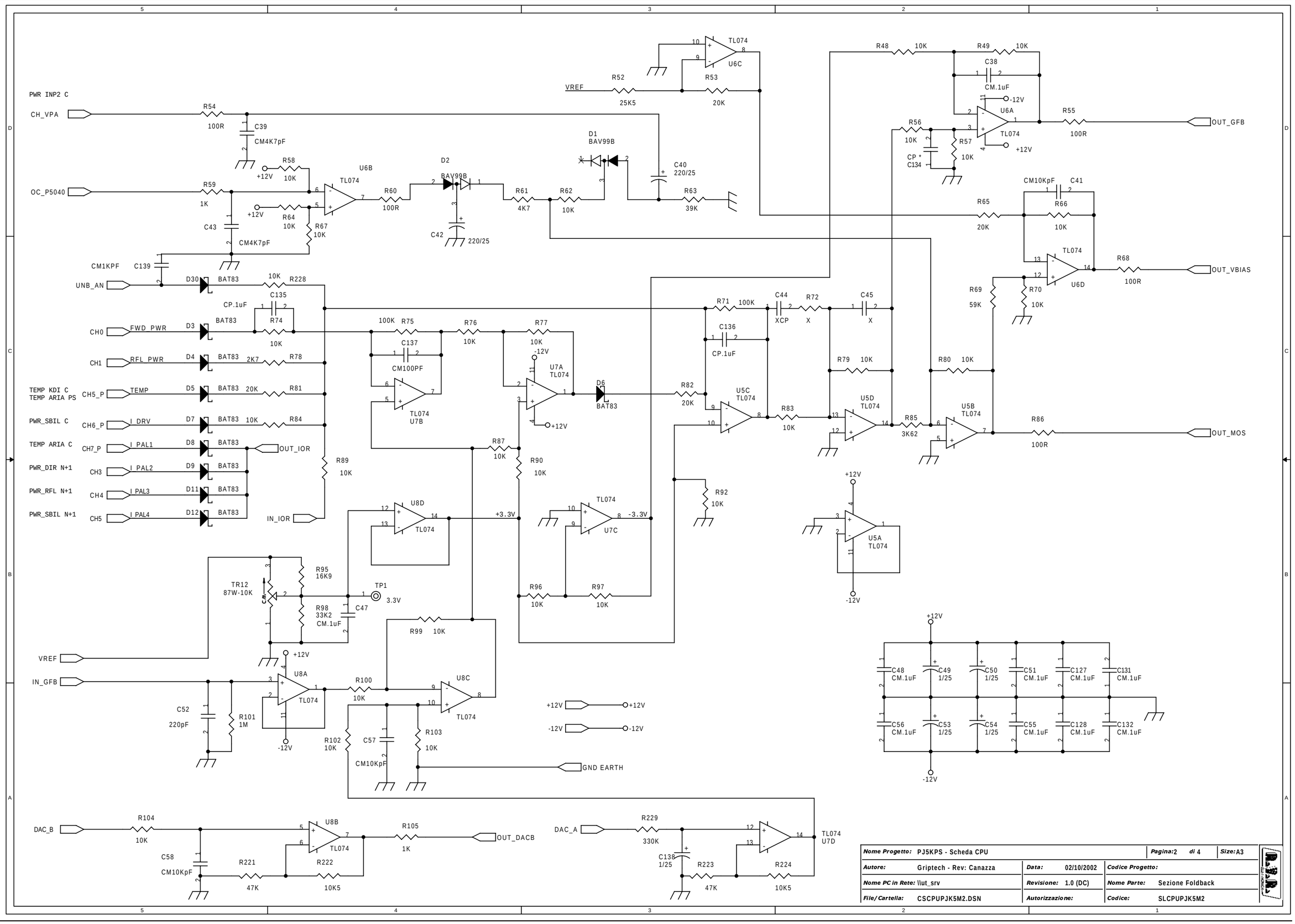
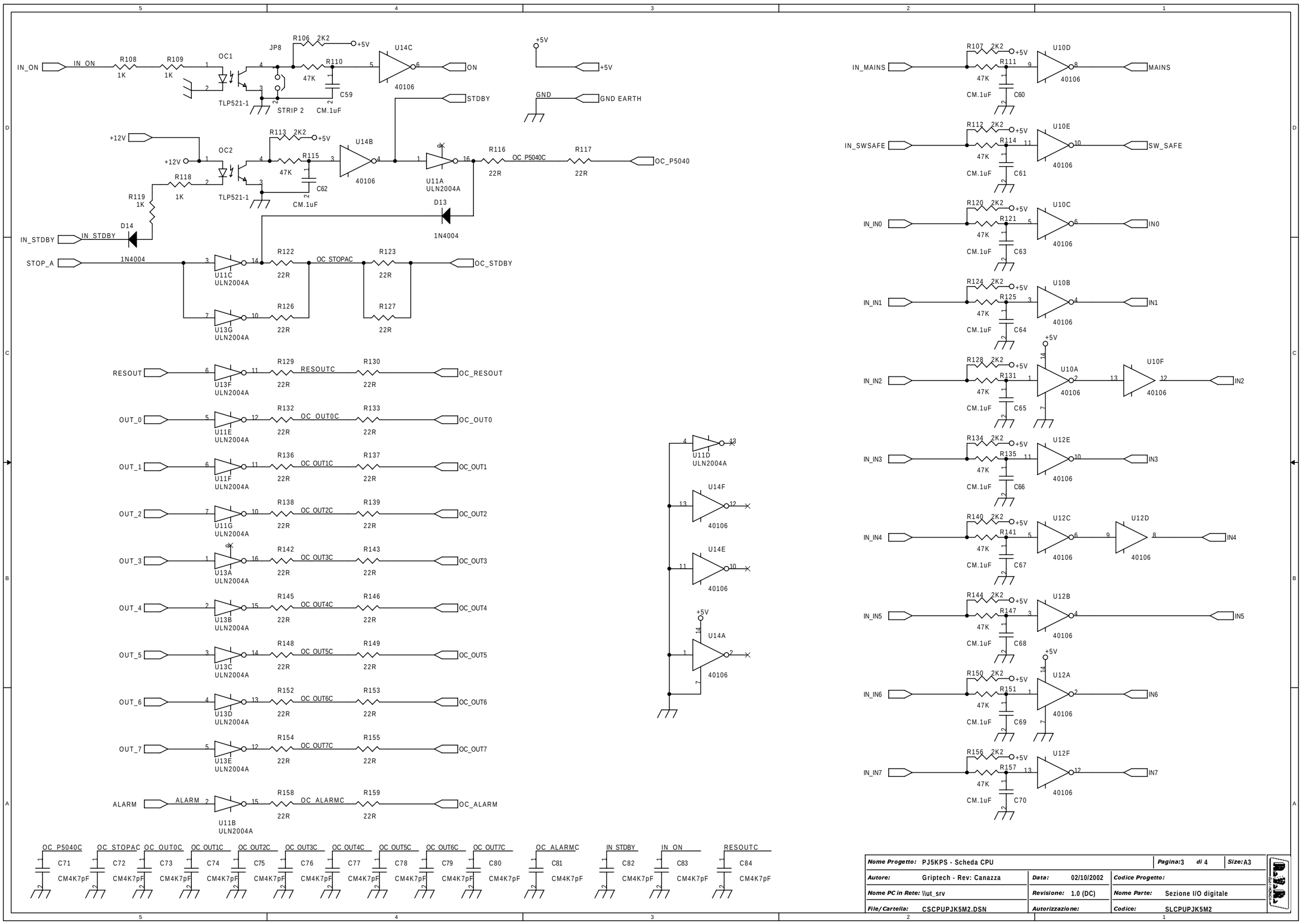
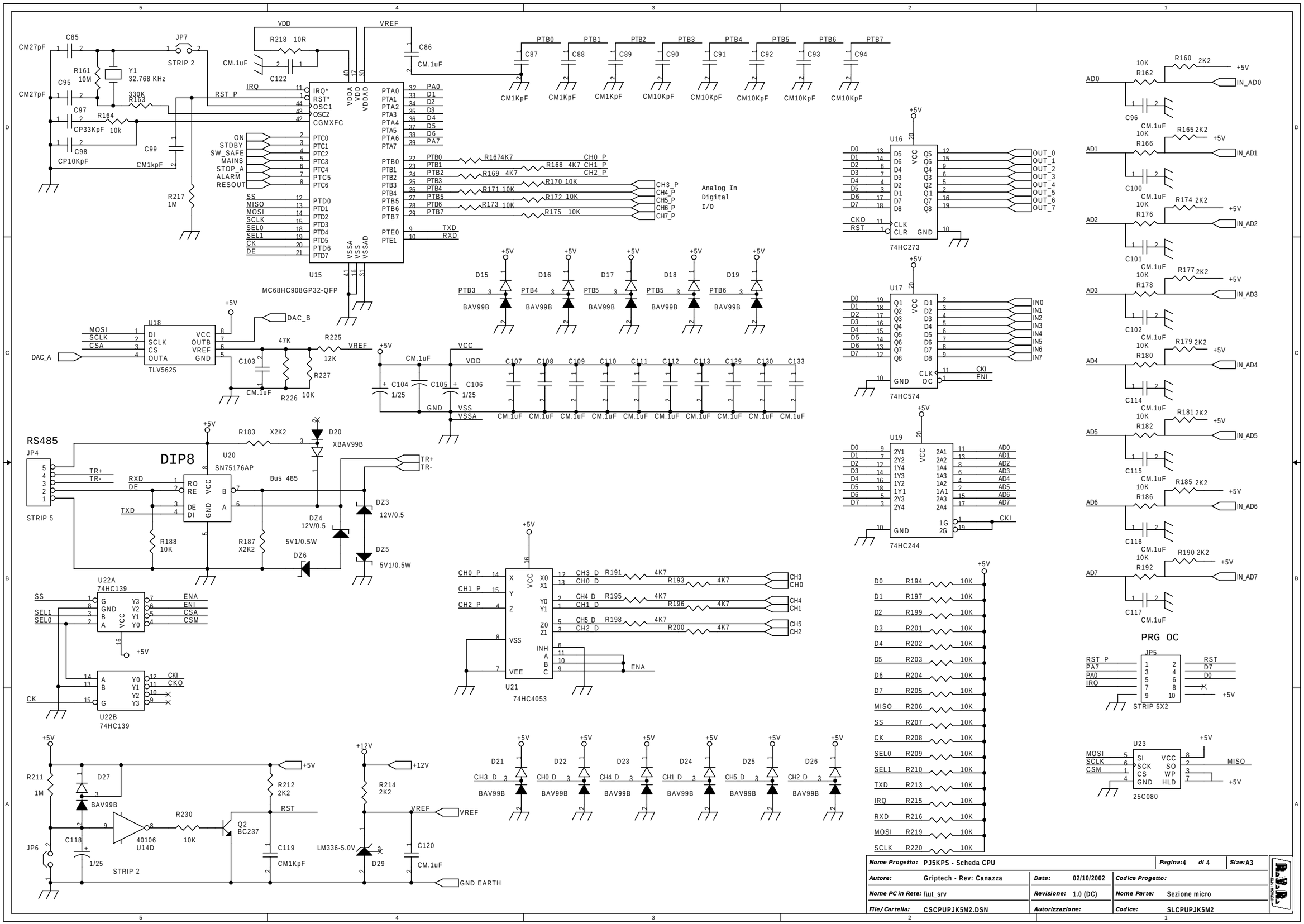
File/Cartella:	PJ5K_CPU_MNT.DWG	Autorizzazione:		Codice:	SLCPUPJ5KM2
Scala: <>	Materiale: <>	Trattamento:	<>	Profilo:	<>



Nome Progetto:	PJ5KPS - Scheda CPU			Pagina: 1 di 4	Size: A3
Autore:	Griptech - Rev: Canazza	Data:	02/10/2002	Codice Progetto:	
Nome PC in Rete:	\\ut_srv	Revisione:	1.0 (DC)	Nome Parte:	Scheda CPU
File/Cartella:	CSCPUPJK5M2.DSN	Autorizzazione:		Codice:	SLCPUPJK5M2


PWR INP2 C
CH_VPA
R54 100R
C39 CM4K7PF
R58 10K
+12V
OC_P5040
R59 1K
C43 CM4K7PF
R64 10K
R67 10K
U6B TL074
R60 100R
D2 BAV99B
C42 220/25
D1 BAV99B
C40 220/25
R61 4K7
R62 10K
R63 39K
VREF
R52 25K5
R53 20K
U6C TL074
R48 10K
R49 10K
C38 CM.1uF
-12V
U6A TL074
R56 10K
R57 10K
CP * C134
R55 100R
OUT_GFB
CM10KpF C41
R65 20K
R66 10K
TL074
R68 100R
OUT_VBIAS
R69 59K
R70 10K
U6D
CM1KPF C139
UNB_AN
D30 BAT83
R228 10K
C135 CP.1uF
R74 10K
CH0 FWD_PWR D3 BAT83
CH1 RFL_PWR D4 BAT83 2K7 R78
TEMP KDI C
TEMP ARIA PS
CH5_P TEMP D5 BAT83 20K R81
PWR_SBIL C
CH6_P I_DRV D7 BAT83 10K R84
TEMP ARIA C
CH7_P I_PAL1 D8 BAT83 OUT_IOR
PWR_DIR N+1
CH3 I_PAL2 D9 BAT83
PWR_RFL N+1
CH4 I_PAL3 D11 BAT83
PWR_SBIL N+1
CH5 I_PAL4 D12 BAT83
R89 10K
IN_IOR
R71 100K
C44 XCP
R72 X
C45 X
C136 CP.1uF
R75 100K
C137 CM100PF
R76 10K
R77 10K
U7A TL074
U7B TL074
D6 BAT83
R82 20K
U5C TL074
R83 10K
R79 10K
U5D TL074
R80 10K
R85 3K62
U5B TL074
R86 100R
OUT_MOS
R87 10K
R90 10K
U8D TL074
+3.3V
TL074 U7C
-3.3V
R92 10K
+12V
U5A TL074
-12V
TR12 87W-10K
R95 16K9
R98 33K2
C47 CM.1uF
TP1 3.3V
R99 10K
VREF
IN_GFB
U8A TL074
R100 10K
U8C TL074
C52 220pF
R101 1M
R102 10K
C57 CM10KpF
R103 10K
GND EARTH
R96 10K
R97 10K
C48 CM.1uF
C49 1/25
C50 1/25
C51 CM.1uF
C127 CM.1uF
C131 CM.1uF
C56 CM.1uF
C53 1/25
C54 1/25
C55 CM.1uF
C128 CM.1uF
C132 CM.1uF
DAC_B
R104 10K
U8B TL074
R105 1K
OUT_DACB
C58 CM10KpF
R221 47K
R222 10K5
DAC_A
R229 330K
C138 1/25
R223 47K
R224 10K5
TL074 U7D
Nome Progetto: PJ5KPS - Scheda CPU
Pagina: 2 di 4
Size: A3
Autore: Griptech - Rev: Canazza
Data: 02/10/2002
Codice Progetto:
Nome PC in Rete: \\ut_srv
Revisione: 1.0 (DC)
Nome Parte: Sezione Foldback
File/Cartella: CSCPUPJK5M2.DSN
Autorizzazione:
Codice: SLCPUPJK5M2

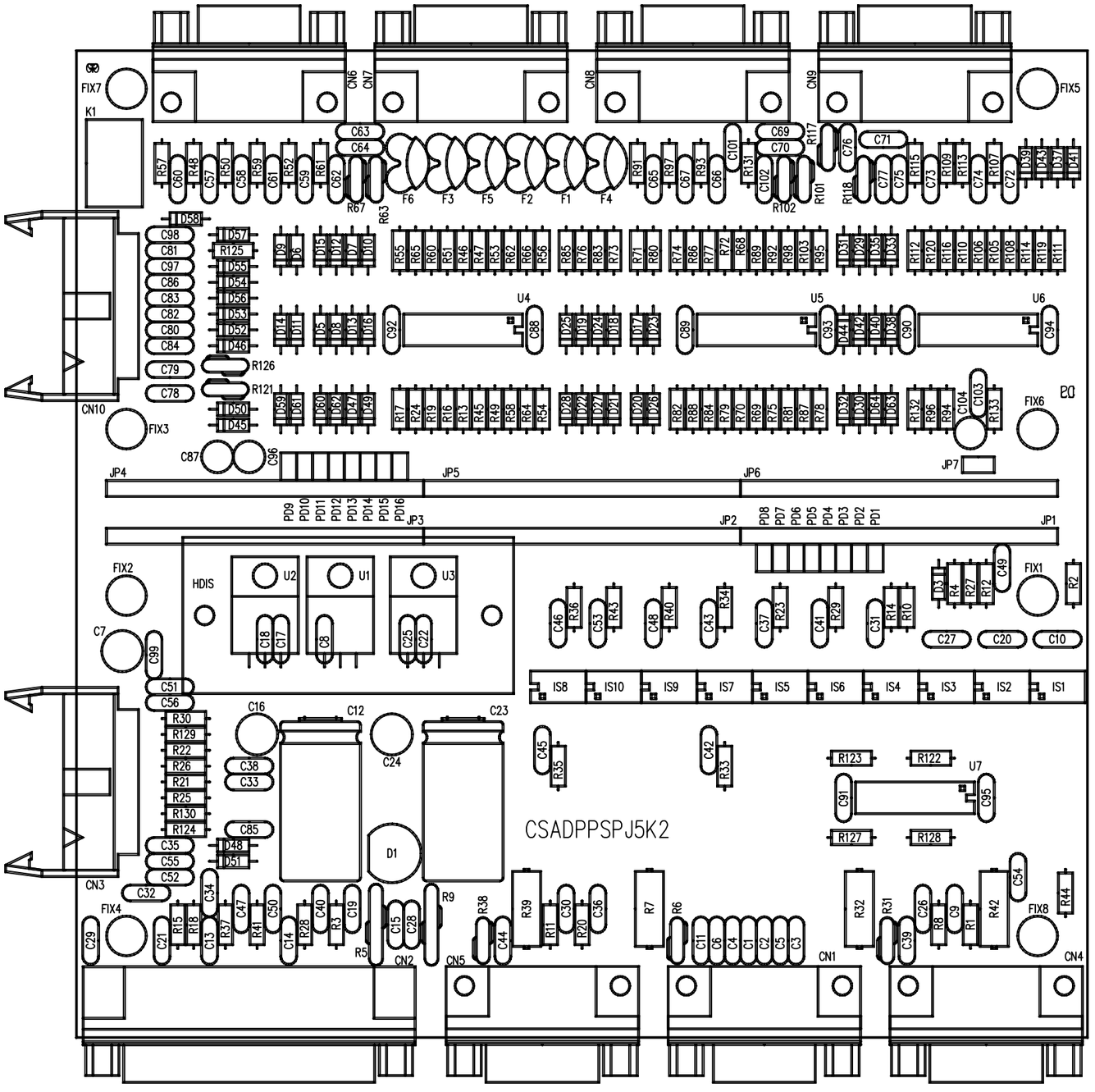

IN_ON
R108 1K
R109 1K
OC1
TLP521-1
JP8
STRIP 2
R106 2K2
+5V
R110 47K
C59 CM.1uF
U14C 40106
ON
STDBY
+5V
GND
GND EARTH
+12V
OC2
R113 2K2
R115 47K
C62 CM.1uF
U14B 40106
U11A ULN2004A
R116 OC_P5040C 22R
R117 22R
OC_P5040
R118 1K
R119 1K
D14
IN_STDBY
D13
1N4004
STOP_A
U11C ULN2004A
R122 22R
OC_STOPAC
R123 22R
OC_STDBY
U13G ULN2004A
R126 22R
R127 22R
RESOUT
U13F ULN2004A
R129 22R
RESOUTC
R130 22R
OC_RESOUT
OUT_0
U11E ULN2004A
R132 22R
OC_OUT0C
R133 22R
OC_OUT0
OUT_1
U11F ULN2004A
R136 22R
OC_OUT1C
R137 22R
OC_OUT1
OUT_2
U11G ULN2004A
R138 22R
OC_OUT2C
R139 22R
OC_OUT2
OUT_3
U13A ULN2004A
R142 22R
OC_OUT3C
R143 22R
OC_OUT3
OUT_4
U13B ULN2004A
R145 22R
OC_OUT4C
R146 22R
OC_OUT4
OUT_5
U13C ULN2004A
R148 22R
OC_OUT5C
R149 22R
OC_OUT5
OUT_6
U13D ULN2004A
R152 22R
OC_OUT6C
R153 22R
OC_OUT6
OUT_7
U13E ULN2004A
R154 22R
OC_OUT7C
R155 22R
OC_OUT7
ALARM
U11B ULN2004A
R158 22R
OC_ALARMC
R159 22R
OC_ALARM
U11D ULN2004A
U14F 40106
U14E 40106
U14A 40106
IN_MAINS
R107 2K2
R111 47K
C60 CM.1uF
U10D 40106
MAINS
IN_SWSAFE
R112 2K2
R114 47K
C61 CM.1uF
U10E 40106
SW_SAFE
IN_IN0
R120 2K2
R121 47K
C63 CM.1uF
U10C 40106
IN0
IN_IN1
R124 2K2
R125 47K
C64 CM.1uF
U10B 40106
IN1
IN_IN2
R128 2K2
R131 47K
C65 CM.1uF
U10A 40106
U10F 40106
IN2
IN_IN3
R134 2K2
R135 47K
C66 CM.1uF
U12E 40106
IN3
IN_IN4
R140 2K2
R141 47K
C67 CM.1uF
U12C 40106
U12D 40106
IN4
IN_IN5
R144 2K2
R147 47K
C68 CM.1uF
U12B 40106
IN5
IN_IN6
R150 2K2
R151 47K
C69 CM.1uF
U12A 40106
IN6
IN_IN7
R156 2K2
R157 47K
C70 CM.1uF
U12F 40106
IN7
OC_P5040C C71 CM4K7pF
OC_STOPAC C72 CM4K7pF
OC_OUT0C C73 CM4K7pF
OC_OUT1C C74 CM4K7pF
OC_OUT2C C75 CM4K7pF
OC_OUT3C C76 CM4K7pF
OC_OUT4C C77 CM4K7pF
OC_OUT5C C78 CM4K7pF
OC_OUT6C C79 CM4K7pF
OC_OUT7C C80 CM4K7pF
OC_ALARMC C81 CM4K7pF
IN_STDBY C82 CM4K7pF
IN_ON C83 CM4K7pF
RESOUTC C84 CM4K7pF
Nome Progetto: PJ5KPS - Scheda CPU
Pagina: 3 di 4
Size: A3
Autore: Griptech - Rev: Canazza
Data: 02/10/2002
Codice Progetto:
Nome PC in Rete: \\ut_srv
Revisione: 1.0 (DC)
Nome Parte: Sezione I/O digitale
File/Cartella: CSCPUPJK5M2.DSN
Autorizzazione:
Codice: SLCPUPJK5M2


U15
MC68HC908GP32-QFP
U16
74HC273
U17
74HC574
U19
74HC244
U18
TLV5625
U20
SN75176AP
DIP8
U21
74HC4053
U22A
74HC139
U22B
74HC139
U23
25C080
JP4
STRIP 5
JP5
STRIP 5X2
JP6
STRIP 2
JP7
STRIP 2
RS485
Bus 485
Analog In
Digital
I/O
PRG OC
Nome Progetto: PJ5KPS - Scheda CPU
Pagina: 4 di 4
Size: A3
Autore: Griptech - Rev: Canazza
Data: 02/10/2002
Codice Progetto:
Nome PC in Rete: \\ut_srv
Revisione: 1.0 (DC)
Nome Parte: Sezione micro
File/Cartella: CSCPUPJK5M2.DSN
Autorizzazione:
Codice: SLCPUPJK5M2

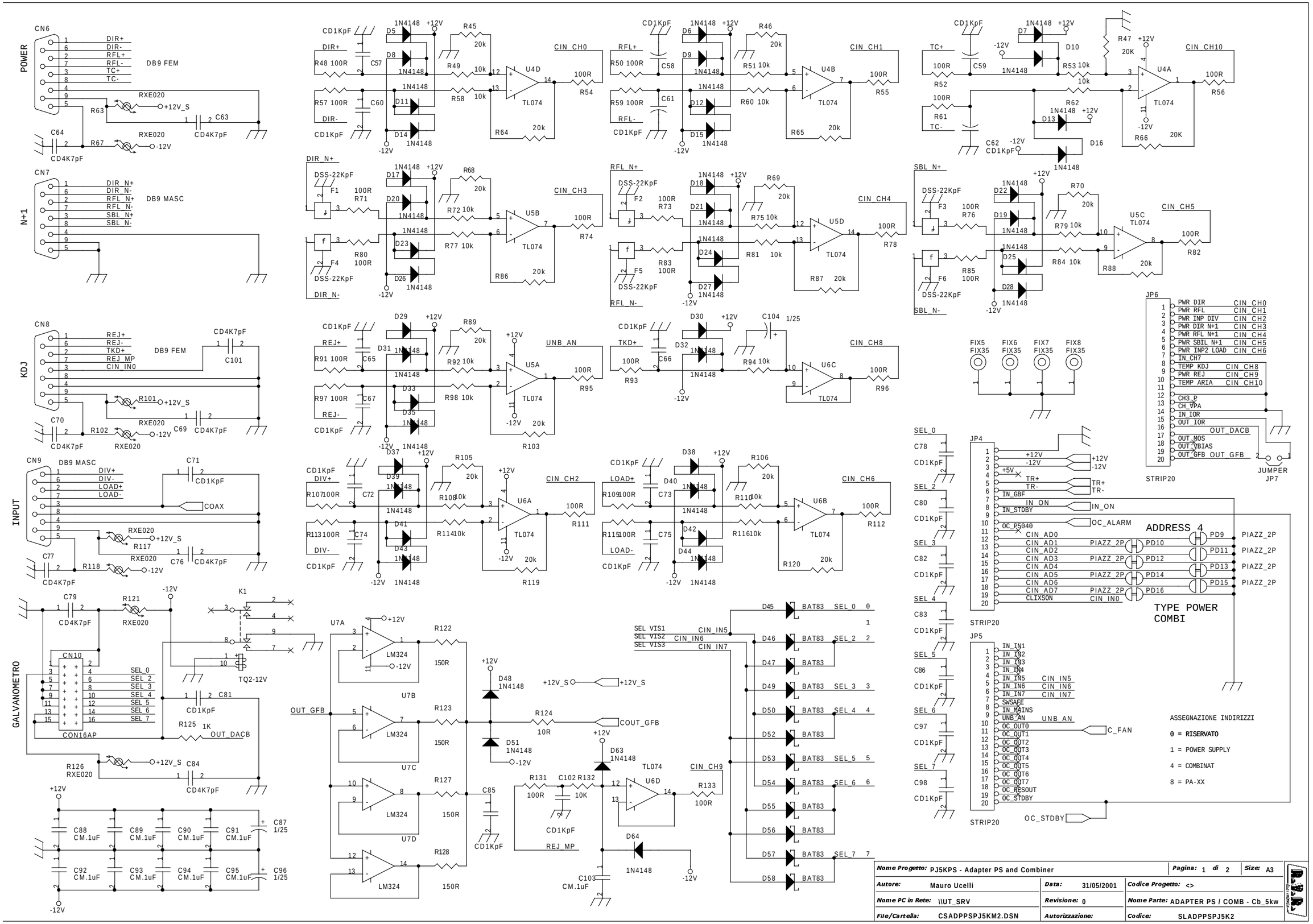
CSCPUPJ5KM2 Bill Of Materials

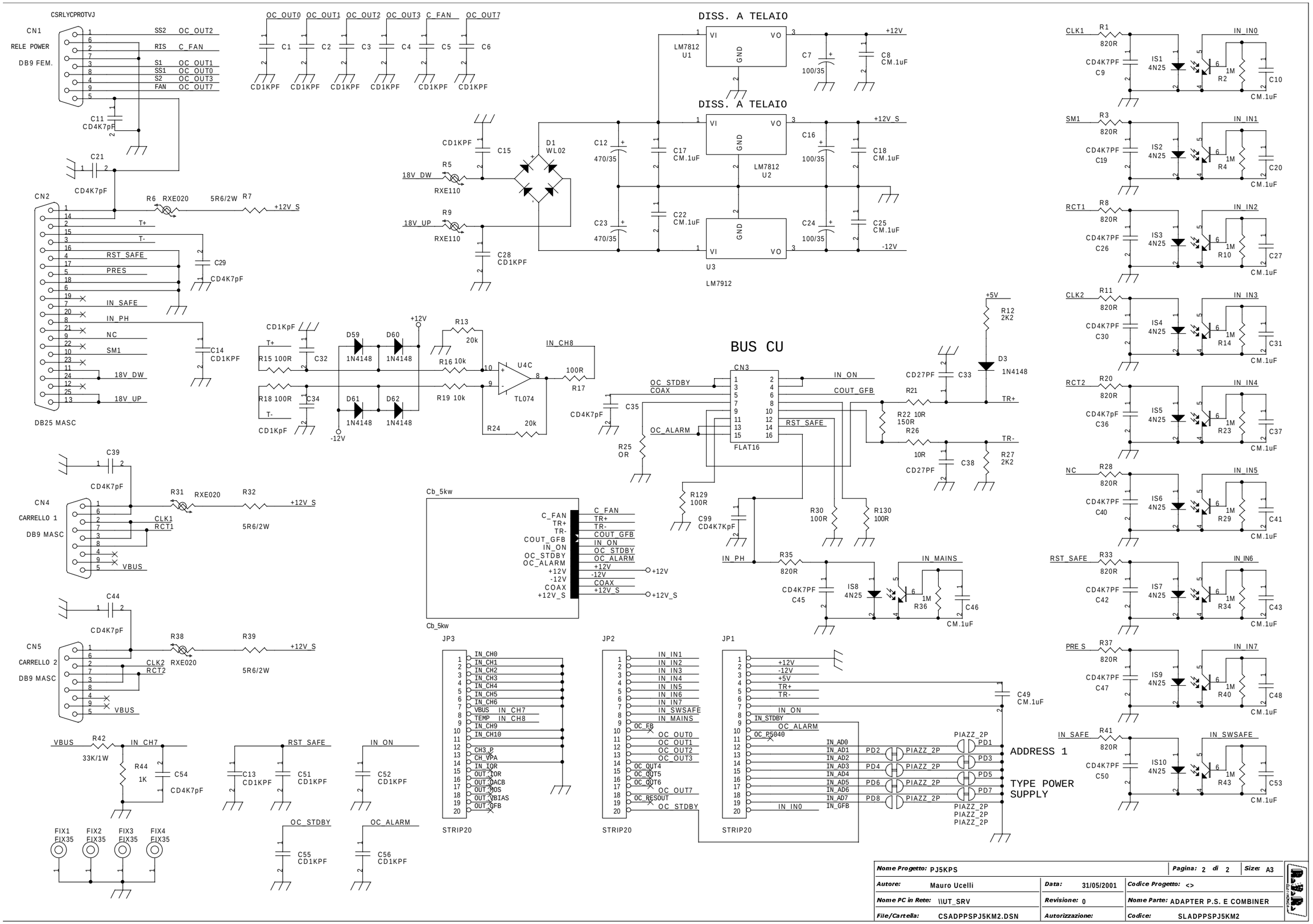
Item	Q.ty	Reference	Part
1	17	C1,C3,C5,C7,C9,C11,C13, C15,C17,C19,C21,C87,C88, C89,C99,C119,C139	CM1kpF
2	12	C2,C4,C6,C8,C10,C12,C14, C16,C18,C20,C85,C95	CM27pF
3	1	C22	27pF
4	14	C23,C24,C27,C28,C33,C34, C49,C50,C53,C54,C104, C106,C118,C138	1/25
5	55	C25,C26,C29,C30,C35,C36, C38,C47,C48,C51,C55,C56, C59,C60,C61,C62,C63,C64, C65,C66,C67,C68,C69,C70, C86,C96,C100,C101,C102, C103,C105,C107,C108,C109, C110,C111,C112,C113,C114, C115,C116,C117,C120,C122, C123,C124,C125,C126,C127, C128,C129,C130,C131,C132, C133	CM.1uF
6	19	C31,C32,C39,C43,C71,C72, C73,C74,C75,C76,C77,C78, C79,C80,C81,C82,C83,C84, C121	CM4K7pF
7	2	C42,C40	220/25
8	8	C41,C57,C58,C90,C91,C92, C93,C94	CM10KpF
9	1	C44	XCP
10	2	R72,C45	X
11	1	C52	220pF
12	1	C97	CP33KpF
13	1	C98	CP10KpF
14	1	C134	CP *
15	2	C136,C135	CP.1uF
16	1	C137	CM100PF
17	3	DL1,DL2,DL3	LED
18	2	DZ2,DZ1	5V1/1W
19	2	DZ4,DZ3	12V/0.5
20	2	DZ6,DZ5	5V1/0.5W
21	14	D1,D2,D15,D16,D17,D18, D19,D21,D22,D23,D24,D25, D26,D27	BAV99B
22	10	D3,D4,D5,D6,D7,D8,D9,D11, D12,D30	BAT83
23	2	D13,D14	1N4004
24	1	D20	XBAV99B
25	1	D29	LM336-5.0V
26	4	FIX1,FIX2,FIX3,FIX4	FIX35
27	3	JP1,JP2,JP3	STRIP20
28	1	JP4	STRIP 5
29	1	JP5	STRIP 5X2
30	3	JP6,JP7,JP8	STRIP 2
31	2	OC1,OC2	TLP521-1
32	1	Q2	BC237
33	20	R1,R2,R3,R4,R5,R21,R22, R23,R24,R25,R41,R45,R46, R47,R59,R105,R108,R109, R118,R119	1K
34	16	R6,R7,R8,R9,R10,R26,R27, R28,R29,R30,R42,R54,R55, R60,R68,R86	100R
35	13	R11,R12,R13,R14,R15,R31, R32,R33,R34,R35,R43,R71, R75	100K
36	33	R16,R17,R18,R19,R20,R36, R37,R38,R39,R40,R44,R106, R107,R112,R113,R120,R124, R128,R134,R140,R144,R150, R156,R160,R165,R174,R177, R179,R181,R185,R190,R212, R214	2K2
37	64	R48,R49,R56,R57,R58,R62, R64,R66,R67,R70,R74,R76, R77,R79,R80,R83,R84,R87, R89,R90,R92,R96,R97,R99, R100,R102,R103,R104,R162, R164,R166,R170,R171,R172, R173,R175,R176,R178,R180, R182,R186,R188,R192,R194, R197,R199,R201,R202,R203, R204,R205,R206,R207,R208, R209,R210,R213,R215,R216, R219,R220,R227,R228,R230	10K
38	1	R52	25K5
39	4	R53,R65,R81,R82	20K
40	10	R61,R167,R168,R169,R191, R193,R195,R196,R198,R200	4K7
41	1	R63	39K
42	1	R69	59K
43	1	R78	2K7
44	1	R85	3K62
45	1	R95	16K9
46	1	R98	33K2
47	3	R101,R211,R217	1M
48	15	R110,R111,R114,R115,R121, R125,R131,R135,R141,R147, R151,R157,R221,R223,R226	47K
49	26	R116,R117,R122,R123,R126, R127,R129,R130,R132,R133, R136,R137,R138,R139,R142, R143,R145,R146,R148,R149, R152,R153,R154,R155,R158, R159	22R
50	1	R161	10M
51	2	R229,R163	330K
52	2	R187,R183	X2K2
53	1	R218	10R
54	2	R222,R224	10K5
55	1	R225	12K
56	1	TP1	3.3V

57	11	TR1,TR2,TR3,TR4,TR5,TR6, TR7,TR8,TR9,TR10,TR11	87W-20K
58	1	TR12	87W-10K
59	3	U1,U2,U3	LM324
60	1	U4	LM78M05CDT
61	4	U5,U6,U7,U8	TL074
62	3	U10,U12,U14	40106
63	2	U11,U13	ULN2004A
64	1	U15	MC68HC908GP32-QFP
65	1	U16	74HC273
66	1	U17	74HC574
67	1	U18	TLV5625
68	1	U19	74HC244
69	1	U20	SN75176AP
70	1	U21	74HC4053
71	1	U22	74HC139
72	1	U23	25C080
73	1	Y1	32.768 KHz



Nome Progetto:	PJ5KPS - Adattatore Power Supply e Combiner			Pagina: 1 di 1	Size: A3
Autore:	Ucelli - Rev.: Canazza	Data:	08/10/2002	Codice Progetto:	
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Adapter PS e Comb
File/Cartella:	ADPPSP_2_LY.DWG	Autorizzazione:		Codice:	SLADPPSPJ5K2
Scala: <>	Materiale: <>	Trattamento:	<>	Profilo:	<>

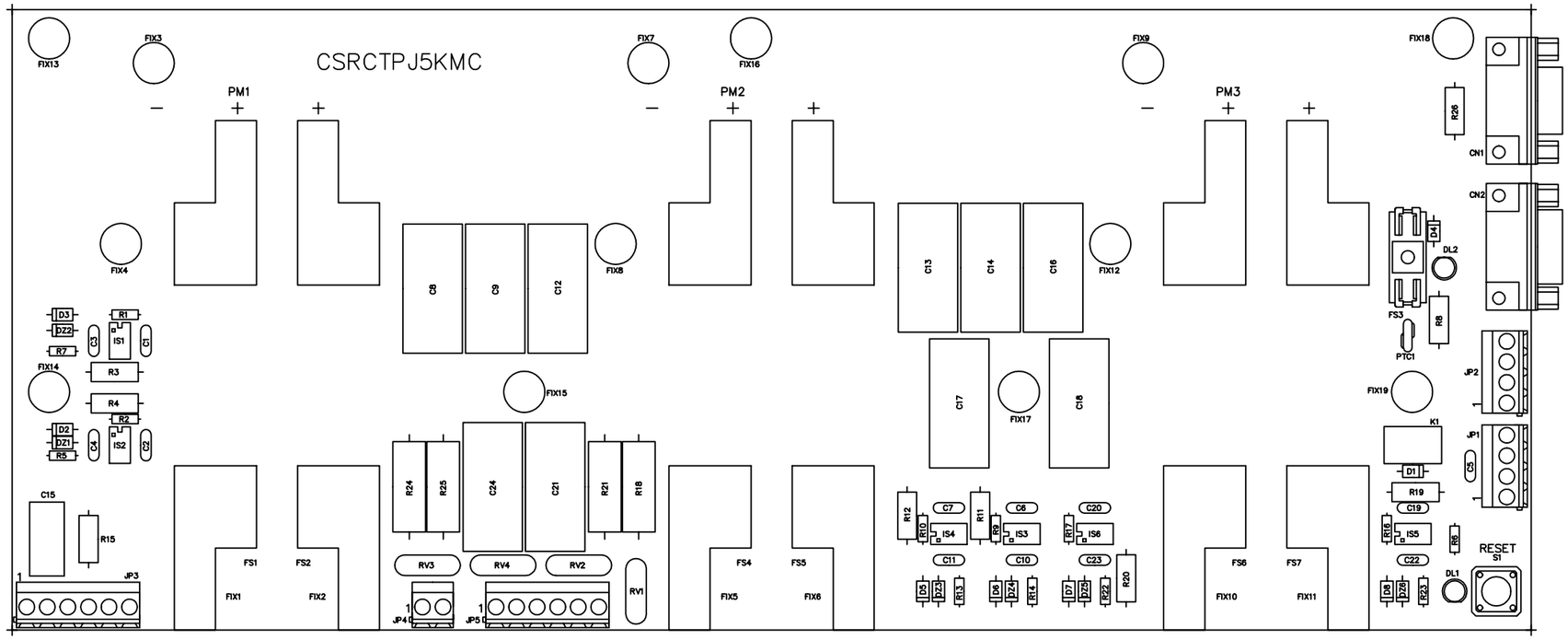

POWER
CN6
DB9 FEM
DIR+
DIR-
RFL+
RFL-
TC+
TC-
RXE020
+12V_S
-12V
CD4K7pF
N+1
CN7
DB9 MASC
DIR_N+
DIR_N-
RFL_N+
RFL_N-
SBL_N+
SBL_N-
KDJ
CN8
DB9 FEM
REJ+
REJ-
TKD+
REJ_MP
CIN_IN0
INPUT
CN9
DB9 MASC
DIV+
DIV-
LOAD+
LOAD-
COAX
GALVANOMETRO
CN10
CON16AP
SEL_0
SEL_2
SEL_3
SEL_4
SEL_5
SEL_6
SEL_7
TQ2-12V
OUT_DACB
COUT_GFB
CIN_CH0
CIN_CH1
CIN_CH2
CIN_CH3
CIN_CH4
CIN_CH5
CIN_CH6
CIN_CH8
CIN_CH9
CIN_CH10
UNB_AN
TL074
LM324
JP6
PWR DIR
PWR RFL
PWR INP DIV
PWR DIR N+1
PWR RFL N+1
PWR SBIL N+1
PWR INP2 LOAD
IN_CH7
TEMP KDJ
PWR REJ
TEMP ARIA
CH3_P
CH_VPA
IN_IOR
OUT_IOR
OUT_DACB
OUT_MOS
OUT_VBIAS
OUT_GFB OUT_GFB
JUMPER JP7
STRIP20
JP4
JP5
ADDRESS 4
TYPE POWER COMBI
ASSEGNAZIONE INDIRIZZI
0 = RISERVATO
1 = POWER SUPPLY
4 = COMBINAT
8 = PA-XX
OC_ALARM
OC_STDBY
C_FAN
Nome Progetto: PJ5KPS - Adapter PS and Combiner
Pagina: 1 di 2
Size: A3
Autore: Mauro Ucelli
Data: 31/05/2001
Codice Progetto: <>
Nome PC in Rete: \\UT_SRV
Revisione: 0
Nome Parte: ADAPTER PS / COMB - Cb_5kw
File/Cartella: CSADPPSPJ5KM2.DSN
Autorizzazione:
Codice: SLADPPSPJ5K2



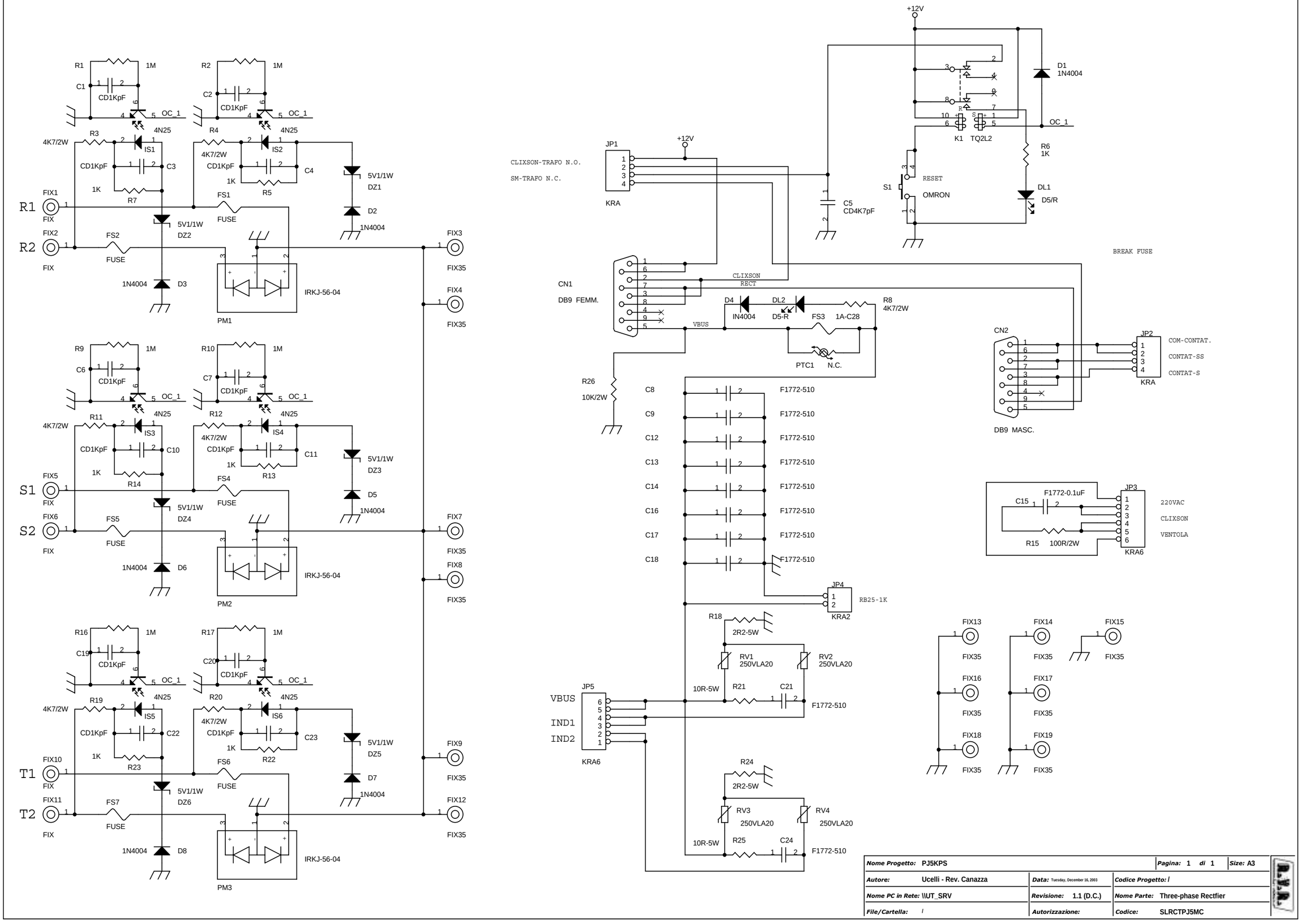
Nome Progetto: PJ5KPS		**Pagina:** 2 di 2	**Size:** A3
Autore: Mauro Ucelli	**Data:** 31/05/2001	**Codice Progetto:** <>	
Nome PC in Rete: \\UT_SRV	**Revisione:** 0	**Nome Parte:** ADAPTER P.S. E COMBINER	
File/Cartella: CSADPPSPJ5KM2.DSN	**Autorizzazione:**	**Codice:** SLADPPSPJ5KM2	

SLADPPSPJ5KM2 Bill Of Materials Page1

Item	Q.ty	Reference	Part
1	1	CN1	DB9 FEM.
2	1	CN2	DB25 MASC
3	1	CN3	FLAT16
4	4	CN4,CN5,CN7,CN9	DB9 MASC
5	2	CN6,CN8	DB9 FEM
6	1	CN10	CON16AP
7	38	C1,C2,C3,C4,C5,C6,C13, C14,C15,C28,C32,C51,C52, C55,C56,C57,C58,C59,C60, C61,C65,C66,C67,C71,C72, C73,C74,C75,C78,C80,C81, C82,C83,C85,C86,C97,C98, C102	CD1KPF
8	3	C7,C16,C24	100/35
9	25	C8,C10,C17,C18,C20,C22, C25,C27,C31,C37,C41,C43, C46,C48,C49,C53,C88,C89, C90,C91,C92,C93,C94,C95, C103	CM.1uF
10	26	C9,C11,C19,C21,C26,C29, C30,C35,C36,C39,C40,C42, C44,C45,C47,C50,C54,C63, C64,C69,C70,C76,C77,C79, C84,C101	CD4K7pF
11	2	C12,C23	470/35
12	2	C33,C38	CD27PF
13	3	K1,C34,C62	NC
14	3	C87,C96,C104	1/25
15	1	C99	CD4K7KpF
16	1	D1	WL02
17	47	D3,D5,D6,D7,D8,D9,D10, D11,D12,D13,D14,D15,D16, D17,D18,D19,D20,D21,D22, D23,D24,D25,D26,D27,D28, D29,D30,D31,D32,D33,D35, D37,D38,D39,D40,D41,D42, D43,D44,D48,D51,D59,D60, D61,D62,D63,D64	1N4148
18	12	D45,D46,D47,D49,D50,D52, D53,D54,D55,D56,D57,D58	BAT83
19	8	FIX1,FIX2,FIX3,FIX4,FIX5, FIX6,FIX7,FIX8	FIX35
20	6	F1,F2,F3,F4,F5,F6	DSS-22KpF
21	10	IS1,IS2,IS3,IS4,IS5,IS6, IS7,IS8,IS9,IS10	4N25
22	6	JP1,JP2,JP3,JP4,JP5,JP6	STRIP20
23	1	JP7	JUMPER
24	16	PD1,PD2,PD3,PD4,PD5,PD6, PD7,PD8,PD9,PD10,PD11, PD12,PD13,PD14,PD15,PD16	PIAZZ_2P
25	10	R1,R3,R8,R11,R20,R28,R33, R35,R37,R41	820R
26	10	R2,R4,R10,R14,R23,R29, R34,R36,R40,R43	1M
27	2	R5,R9	RXE110
28	11	R6,R31,R38,R63,R67,R101, R102,R117,R118,R121,R126	RXE020
29	3	R7,R32,R39	5R6/2W
30	2	R27,R12	2K2
31	20	R13,R24,R45,R46,R47,R64, R65,R66,R68,R69,R70,R86, R87,R88,R89,R103,R105, R106,R119,R120	20k
32	37	R15,R17,R18,R30,R48,R50, R52,R54,R55,R56,R57,R59, R61,R71,R73,R74,R76,R78, R80,R82,R83,R85,R91,R93, R95,R96,R97,R107,R109, R111,R112,R113,R115,R129, R130,R131,R133	100R
33	22	R16,R19,R49,R51,R53,R58, R60,R62,R72,R75,R77,R79, R81,R84,R92,R94,R98,R108, R110,R114,R116,R132	10k
34	3	R21,R26,R124	10R
35	1	R22	180R
36	1	R25	OR
37	1	R42	33K/1W
38	2	R125,R44	1K
39	4	R122,R123,R127,R128	150R
40	2	U1,U2	LM7812
41	1	U3	LM7912
42	3	U4,U5,U6	TL074
43	1	U7	LM324



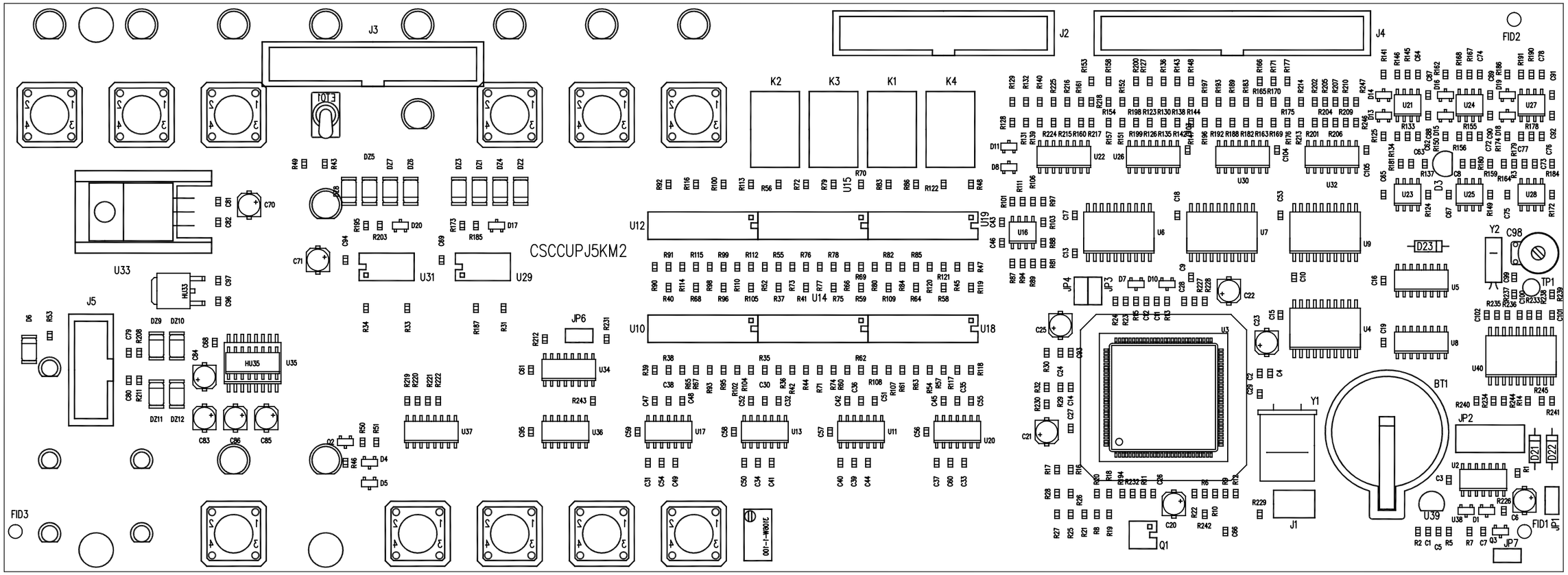
Nome Progetto:	PJ5KPS – Rectifier board			Pagina: 1 di 1	Size: A4
Autore:	Ucelli – Rev.: Canazza	Data:	17/10/2002	Codice Progetto:	
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Three–phase rectifier
File/Cartella:	RCTPJK5_LY.DWG	Autorizzazione:		Codice:	CSRCTPJ5KMC
Scala: <>	Materiale: <>	Trattamento:	<>	Profilo:	<>



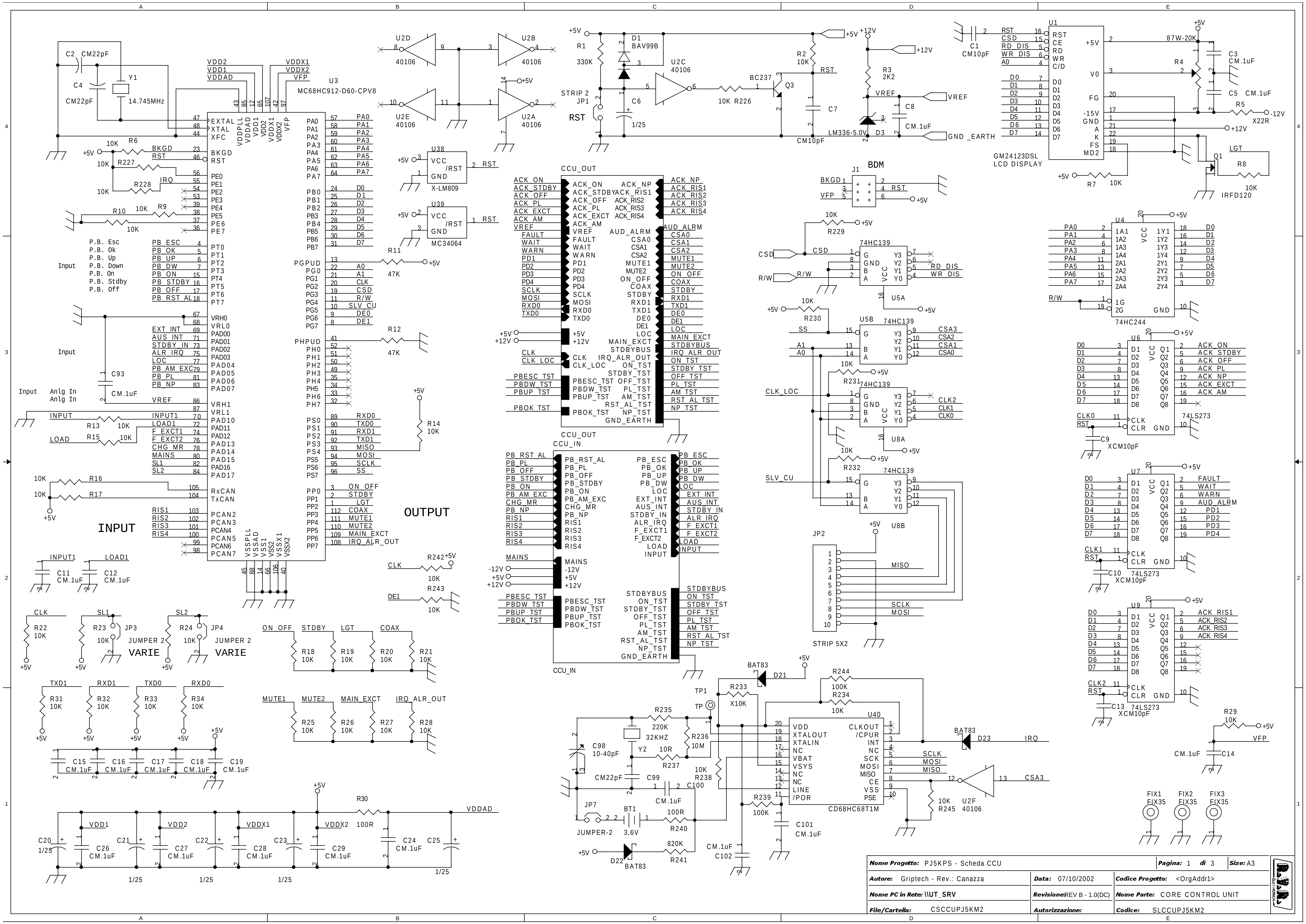
Nome Progetto: PJ5KPS			**Pagina:** 1 di 1 **Size:** A3
Autore: Ucelli - Rev. Canazza	**Data:** Tuesday, December 16, 2003	**Codice Progetto:** /	
Nome PC in Rete: \\UT_SRV	**Revisione:** 1.1 (D.C.)	**Nome Parte:** Three-phase Rectfier	
File/Cartella: /	**Autorizzazione:**	**Codice:** SLRCTPJ5MC	

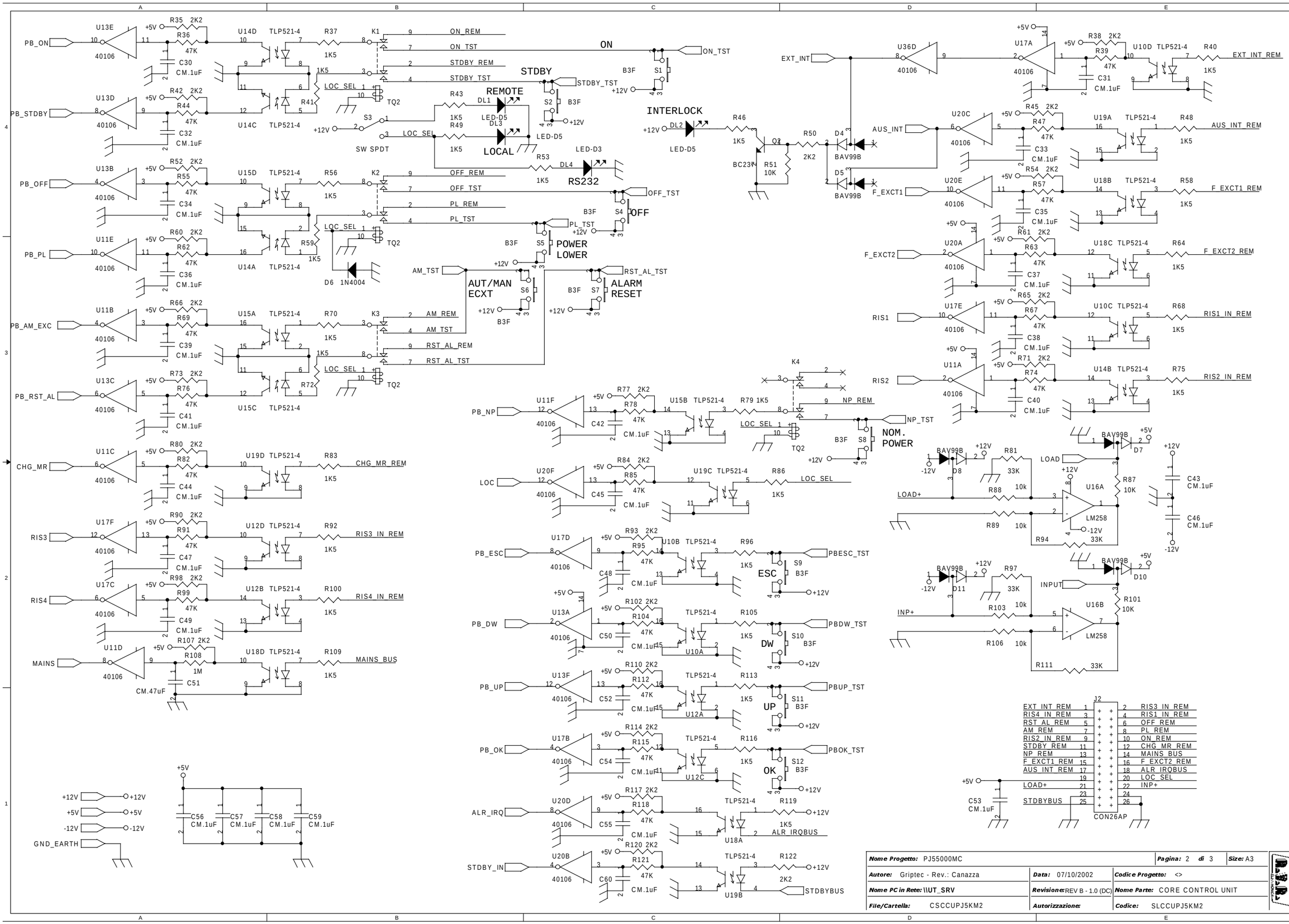
RCTPJ5KMC Bill Of Materials Page1

Item	Quantity	Reference	Part
1	1	CN1	DB9 FEMM.
2	1	CN2	DB9 MASC.
3	12	C1,C2,C3,C4,C6,C7,C10, C11,C19,C20,C22,C23	CD1KpF
4	1	C5	CD4K7pF
5	10	C8,C9,C12,C13,C14,C16, C17,C18,C21,C24	F1772-510
6	1	C15	F1772-0.1uF
7	1	DL1	D5/R
8	1	DL2	D5-R
9	6	DZ1,DZ2,DZ3,DZ4,DZ5,DZ6	5V1/1W
10	7	D1,D2,D3,D5,D6,D7,D8	1N4004
11	1	D4	IN4004
12	6	FIX1,FIX2,FIX5,FIX6, FIX10,FIX11	FIX
13	13	FIX3,FIX4,FIX7,FIX8,FIX9, FIX12,FIX13,FIX14,FIX15, FIX16,FIX17,FIX18,FIX19	FIX35
14	6	FS1,FS2,FS4,FS5,FS6,FS7	FUSE
15	1	FS3	1A-C28
16	6	IS1,IS2,IS3,IS4,IS5,IS6	4N25
17	2	JP2,JP1	KRA
18	2	JP3,JP5	KRA6
19	1	JP4	KRA2
20	1	K1	TQ2L2
21	3	PM1,PM2,PM3	IRKJ-56-04
22	1	PTC1	N.C.
23	4	RV1,RV2,RV3,RV4	250VLA20
24	6	R1,R2,R9,R10,R16,R17	1M
25	7	R3,R4,R8,R11,R12,R19,R20	4K7/2W
26	7	R5,R6,R7,R13,R14,R22,R23	1K
27	1	R15	100R/2W
28	2	R18,R24	2R2-5W
29	2	R25,R21	10R-5W
30	1	R26	10K/2W
31	1	S1	OMRON

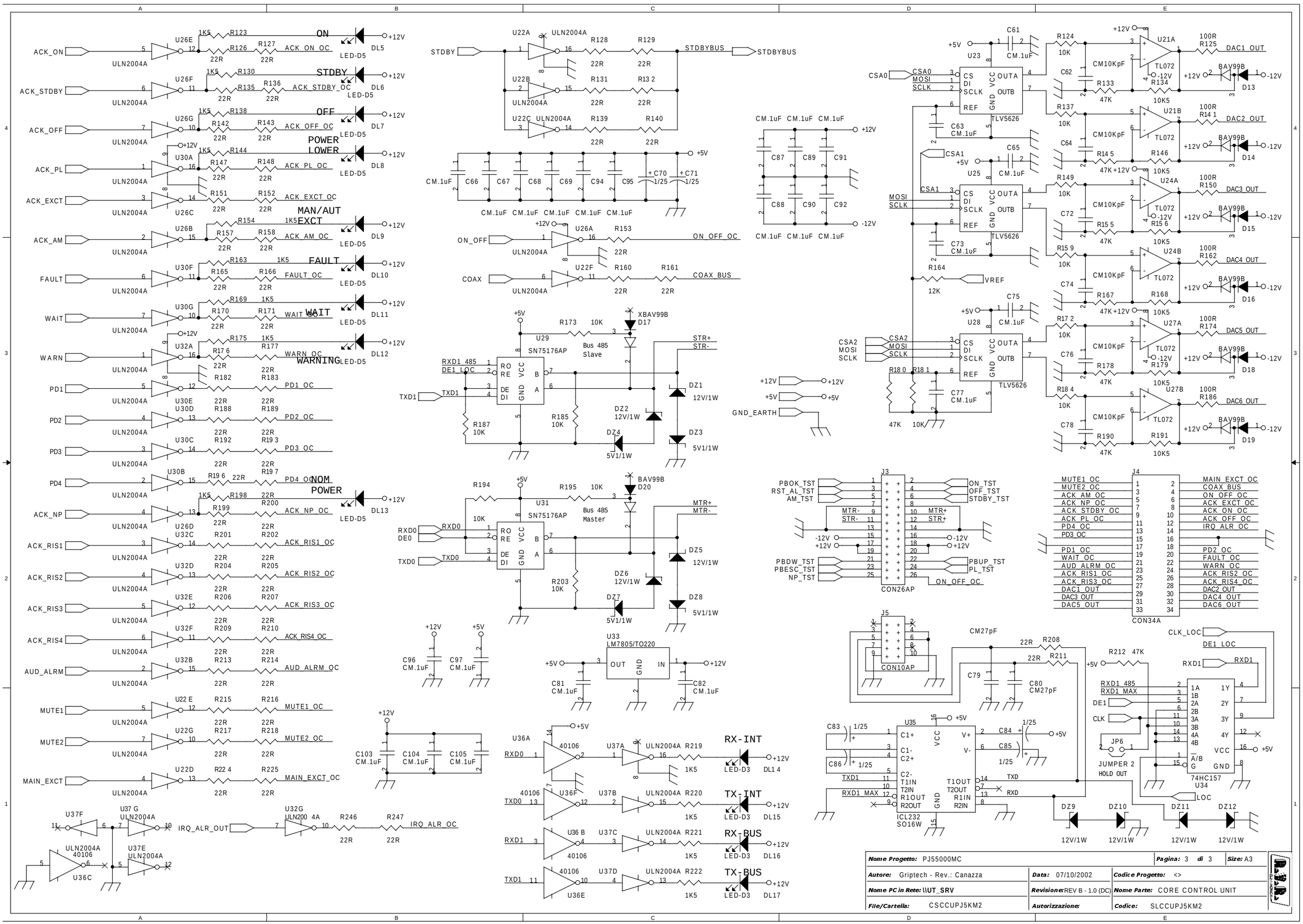


Nome Progetto:	PJ5KPS - Scheda CCU			Pagina: 1 di 1	Size: A3
Autore:	Griptech - Rev.: Canazza	Data:	07/10/2002	Codice Progetto:	<>
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Scheda CCU
File/Cartella:	PJ5_CCU_MNT.DWG	Autorizzazione:		Codice:	SLCCUPJ5KM2
Scala: <>	Materiale: <>	Trattamento:	<>	Profilo:	<>


Nome Progetto: PJ5KPS - Scheda CCU
Pagina: 1 di 3
Size: A3
Autore: Griptech - Rev.: Canazza
Data: 07/10/2002
Codice Progetto: <OrgAddr1>
Nome PC in Rete: \\UT_SRV
Revisione: REV B - 1.0(DC)
Nome Parte: CORE CONTROL UNIT
File/Cartella: CSCCUPJ5KM2
Autorizzazione:
Codice: SLCCUPJ5KM2
INPUT
OUTPUT
MC68HC912-D60-CPV8
CCU_OUT
CCU_IN
BDM
CD68HC68T1M
GM24123DSL
LCD DISPLAY



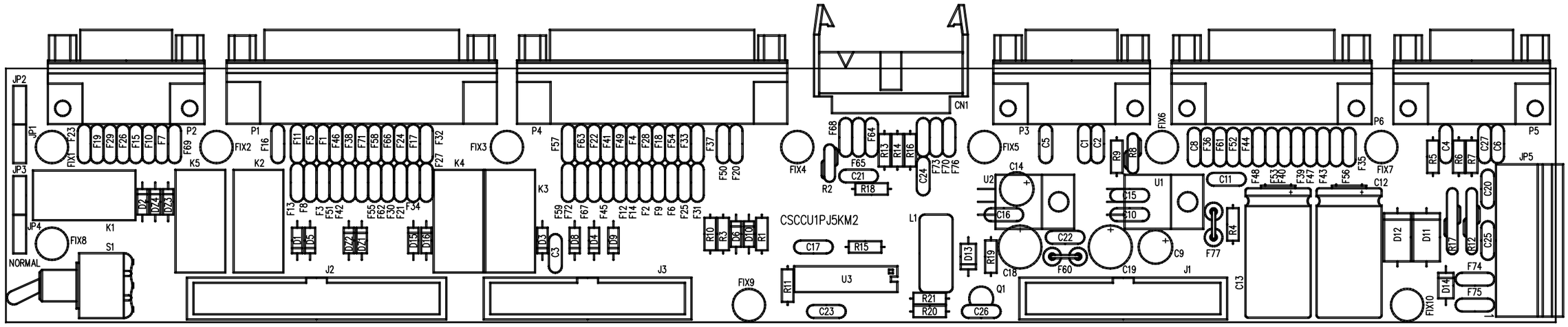
Nome Progetto: PJ55000MC	**Pagina:** 2 di 3 — **Size:** A3
Autore: Griptec - Rev.: Canazza	**Data:** 07/10/2002 — **Codice Progetto:** <>
Nome PC in Rete: \\UT_SRV	**Revisione:** REV B - 1.0 (DC) — **Nome Parte:** CORE CONTROL UNIT
File/Cartella: CSCCUPJ5KM2	**Autorizzazione:** — **Codice:** SLCCUPJ5KM2


ACK_ON
ACK_STDBY
ACK_OFF
ACK_PL
ACK_EXCT
ACK_AM
FAULT
WAIT
WARN
PD1
PD2
PD3
PD4
ACK_NP
ACK_RIS1
ACK_RIS2
ACK_RIS3
ACK_RIS4
AUD_ALRM
MUTE1
MUTE2
MAIN_EXCT
ULN2004A
ON
STDBY
OFF
POWER LOWER
MAN/AUT EXCT
FAULT
WAIT
WARNING
NOM POWER
LED-D5
+12V
STDBYBUS
ON_OFF
COAX
ON_OFF_OC
COAX_BUS
+5V
-12V
GND_EARTH
SN75176AP
Bus 485 Slave
Bus 485 Master
RXD1 485
DE1_LOC
TXD1
RXD0
DE0
TXD0
STR+
STR-
MTR+
MTR-
XBAV99B
BAV99B
DZ1
DZ2
DZ3
DZ4
DZ5
DZ6
DZ7
DZ8
12V/1W
5V1/1W
LM7805/TO220
CSA0
CSA1
CSA2
MOSI
SCLK
VREF
TLV5626
TL072
CM10KpF
DAC1 OUT
DAC2 OUT
DAC3 OUT
DAC4 OUT
DAC5 OUT
DAC6 OUT
PBOK_TST
RST_AL_TST
AM_TST
PBDW_TST
PBESC_TST
NP_TST
PBUP_TST
PL_TST
CON26AP
CON34A
CON10AP
MUTE1 OC
MUTE2 OC
ACK_AM OC
ACK_NP OC
ACK_STDBY OC
ACK_PL OC
PD4 OC
PD3 OC
PD1 OC
WAIT OC
AUD_ALRM OC
ACK_RIS1 OC
ACK_RIS3 OC
DAC1 OUT
DAC3 OUT
DAC5 OUT
MAIN EXCT OC
COAX BUS
ON_OFF OC
ACK_EXCT OC
ACK_ON OC
ACK_OFF OC
IRQ_ALR OC
PD2 OC
FAULT OC
WARN OC
ACK_RIS2 OC
ACK_RIS4 OC
DAC2 OUT
DAC4 OUT
DAC6 OUT
CLK_LOC
DE1 LOC
RXD1
JP6
JUMPER 2
HOLD OUT
74HC157
ICL232
SO16W
RX-INT
TX-INT
RX-BUS
TX-BUS
LED-D3
IRQ_ALR_OUT
Nome Progetto: PJ55000MC
Pagina: 3 di 3
Size: A3
Autore: Griptech - Rev.: Canazza
Data: 07/10/2002
Codice Progetto: <>
Nome PC in Rete: \\UT_SRV
Revisione: REV B - 1.0 (DC)
Nome Parte: CORE CONTROL UNIT
File/Cartella: CSCCUPJ5KM2
Autorizzazione:
Codice: SLCCUPJ5KM2

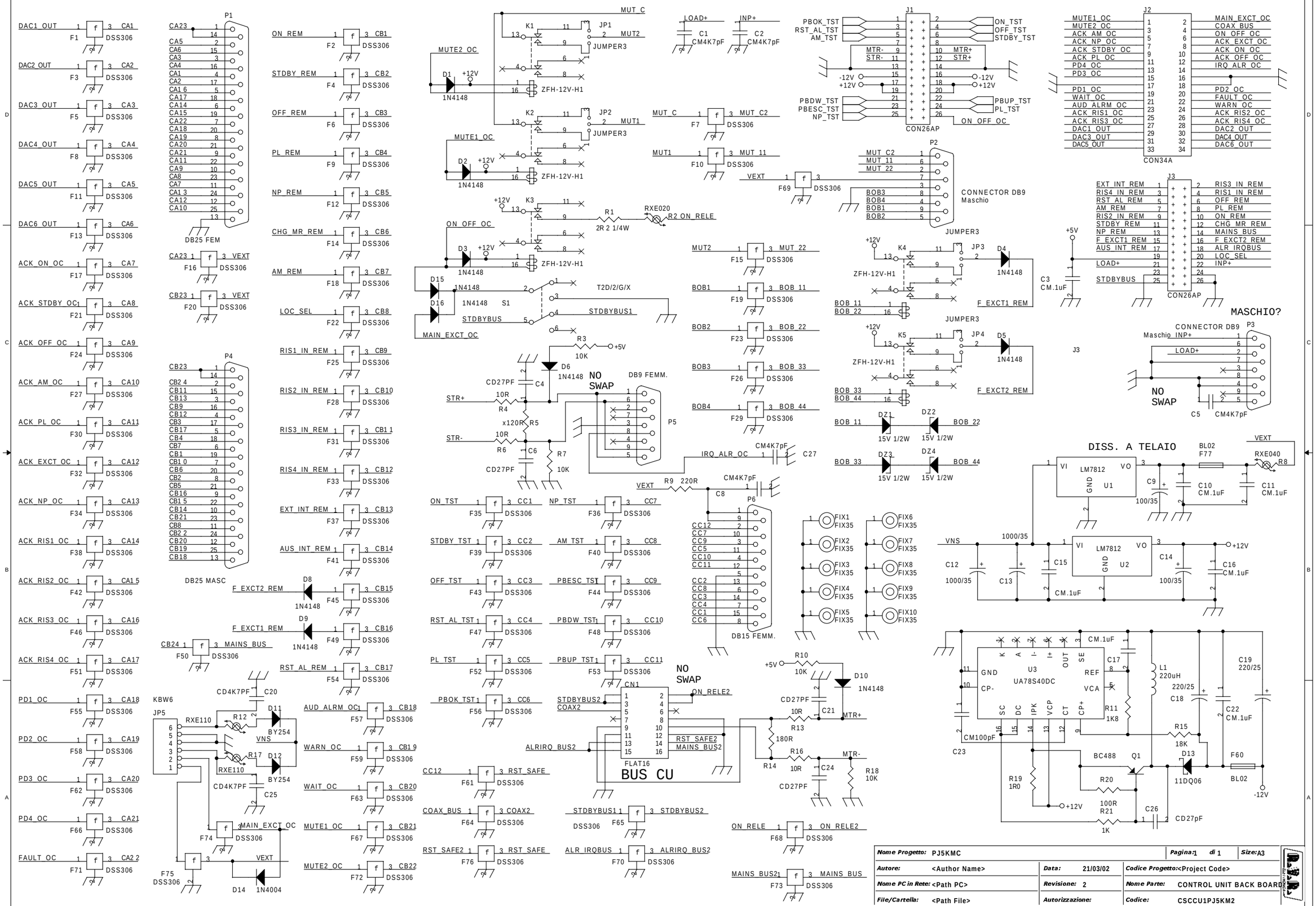
CSCCUPJ5KM2 Bill Of Materials Page1

Item	Q.ty	Reference	Part
1	1	BT1	3,6V
2	2	C7,C1	CM10pF
3	3	C2,C4,C99	CM22pF
4	75	C3,C5,C8,C11,C12,C14,C15, C16,C17,C18,C19,C24,C26, C27,C28,C29,C30,C31,C32, C33,C34,C35,C36,C37,C38, C39,C40,C41,C42,C43,C44, C45,C46,C47,C48,C49,C50, C52,C53,C54,C55,C56,C57, C58,C59,C60,C61,C63,C65, C66,C67,C68,C69,C73,C75, C77,C81,C82,C87,C88,C89, C90,C91,C92,C93,C94,C95, C96,C97,C100,C101,C102, C103,C104,C105	CM.1uF
5	12	C6,C20,C21,C22,C23,C25, C70,C71,C83,C84,C85,C86	1/25
6	3	C9,C10,C13	XCM10pF
7	1	C51	CM.47uF
8	6	C62,C64,C72,C74,C76,C78	CM10KpF
9	2	C80,C79	CM27pF
10	1	C98	10-40pF
11	12	DL1,DL2,DL3,DL5,DL6,DL7, DL8,DL9,DL10,DL11,DL12, DL13	LED-D5
12	5	DL4,DL14,DL15,DL16,DL17	LED-D3
13	8	DZ1,DZ2,DZ5,DZ6,DZ9,DZ10, DZ11,DZ12	12V/1W
14	4	DZ3,DZ4,DZ7,DZ8	5V1/1W
15	14	D1,D4,D5,D7,D8,D10,D11, D13,D14,D15,D16,D18,D19, D20	BAV99B
16	1	D3	LM336-5.0V
17	1	D6	1N4004
18	1	D17	XBAV99B
19	3	D21,D22,D23	BAT83
20	3	FIX1,FIX2,FIX3	FIX35
21	1	JP1	STRIP 2
22	1	JP2	STRIP 5X2
23	3	JP3,JP4,JP6	JUMPER 2
24	1	JP7	JUMPER-2
25	1	J1	BDM
26	2	J3,J2	CON26AP
27	1	J4	CON34A
28	1	J5	CON10AP
29	4	K1,K2,K3,K4	TQ2
30	1	Q1	IRFD120
31	2	Q3,Q2	BC237
32	1	R1	330K
33	59	R2,R6,R7,R8,R9,R10,R13, R14,R15,R16,R17,R18,R19, R20,R21,R22,R23,R24,R25, R26,R27,R28,R29,R31,R32, R33,R34,R51,R87,R88,R89, R101,R103,R106,R124,R137, R149,R159,R172,R173,R181, R184,R185,R187,R194,R195, R203,R226,R227,R228,R229, R230,R231,R232,R234,R238, R242,R243,R245	10K
34	27	R3,R35,R38,R42,R45,R50, R52,R54,R60,R61,R65,R66, R71,R73,R77,R80,R84,R90, R93,R98,R102,R107,R110, R114,R117,R120,R122	2K2
35	1	R4	87W-20K
36	1	R5	X22R
37	33	R11,R12,R36,R39,R44,R47, R55,R57,R62,R63,R67,R69, R74,R76,R78,R82,R85,R91, R95,R99,R104,R112,R115, R118,R121,R133,R145,R155, R167,R178,R180,R190,R212	47K
38	8	R30,R125,R141,R150,R162, R174,R186,R240	100R
39	40	R37,R40,R41,R43,R46,R48, R49,R53,R56,R58,R59,R64, R68,R70,R72,R75,R79,R83, R86,R92,R96,R100,R105, R109,R113,R116,R119,R123, R130,R138,R144,R154,R163, R169,R175,R198,R219,R220, R221,R222	1K5
40	4	R81,R94,R97,R111	33K
41	1	R108	1M
42	57	R126,R127,R128,R129,R131, R132,R135,R136,R139,R140, R142,R143,R147,R148,R151, R152,R153,R157,R158,R160, R161,R165,R166,R170,R171, R176,R177,R182,R183,R188, R189,R192,R193,R196,R197, R199,R200,R201,R202,R204, R205,R206,R207,R208,R209, R210,R211,R213,R214,R215, R216,R217,R218,R224,R225, R246,R247	22R
43	6	R134,R146,R156,R168,R179, R191	10K5
44	1	R164	12K
45	1	R233	X10K
46	1	R235	220K
47	1	R236	10M
48	1	R237	10R
49	2	R239,R244	100K

50	1	R241	820K
51	11	S1,S2,S4,S5,S6,S7,S8,S9, S10,S11,S12	B3F
52	1	S3	SW SPDT
53	1	TP1	TP
54	1	U1	GM24123DSL
55	6	U2,U11,U13,U17,U20,U36	40106
56	1	U3	MC68HC912-D60-CPV8
57	1	U4	74HC244
58	2	U5,U8	74HC139
59	3	U6,U7,U9	74LS273
60	6	U10,U12,U14,U15,U18,U19	TLP521-4
61	1	U16	LM258
62	3	U21,U24,U27	TL072
63	5	U22,U26,U30,U32,U37	ULN2004A
64	3	U23,U25,U28	TLV5626
65	2	U31,U29	SN75176AP
66	1	U33	LM7805/TO220
67	1	U34	74HC157
68	1	U35	ICL232
69	1	U38	X-LM809
70	1	U39	MC34064
71	1	U40	CD68HC68T1M
72	1	Y1	14.745MHz
73	1	Y2	32KHZ



Nome Progetto:	PJ5KPS - Scheda madre CCU			Pagina: 1	di 1	Size: A3	
Autore:	Griptech - Rev.: Canazza	Data:	07/10/2002	Codice Progetto:	<>		
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Schedra madre CCU		
File/Cartella:	CCU1PJK5_1_LY.DWG	Autorizzazione:		Codice:	SLCCU1PJ5KM2		
Scala: <>	Materiale: <>	Trattamento:	<>	Profilo:	<>		



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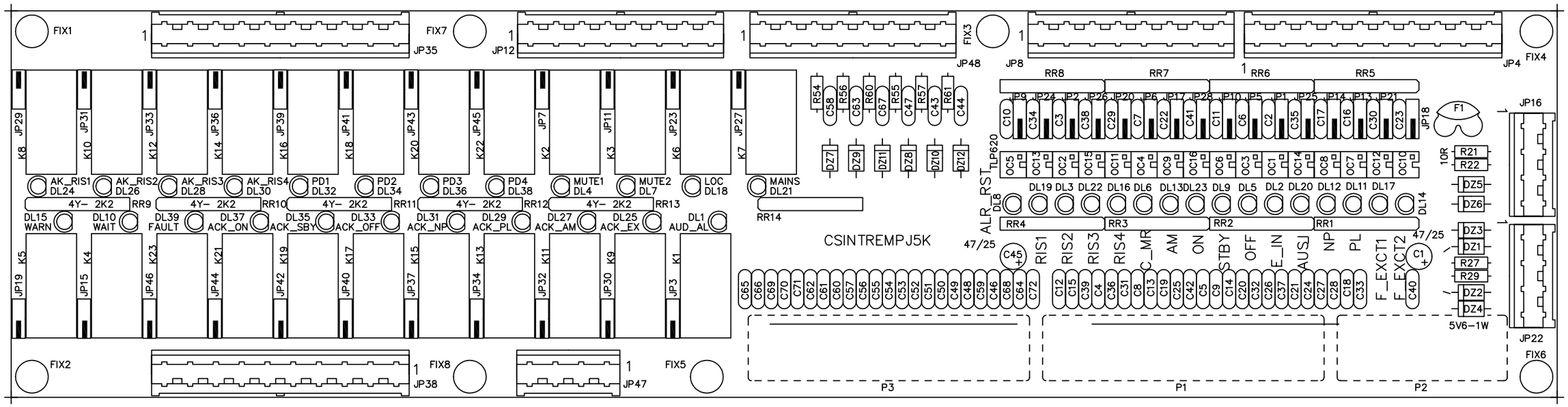
Autore: <Author Name>	**Data:** 21/03/02	**Codice Progetto:** <Project Code>	
Nome PC in Rete: <Path PC>	**Revisione:** 2	**Nome Parte:** CONTROL UNIT BACK BOARD	
File/Cartella: <Path File>	**Autorizzazione:**	**Codice:** CSCCU1PJ5KM2	

SLCCU1PJ5KM2

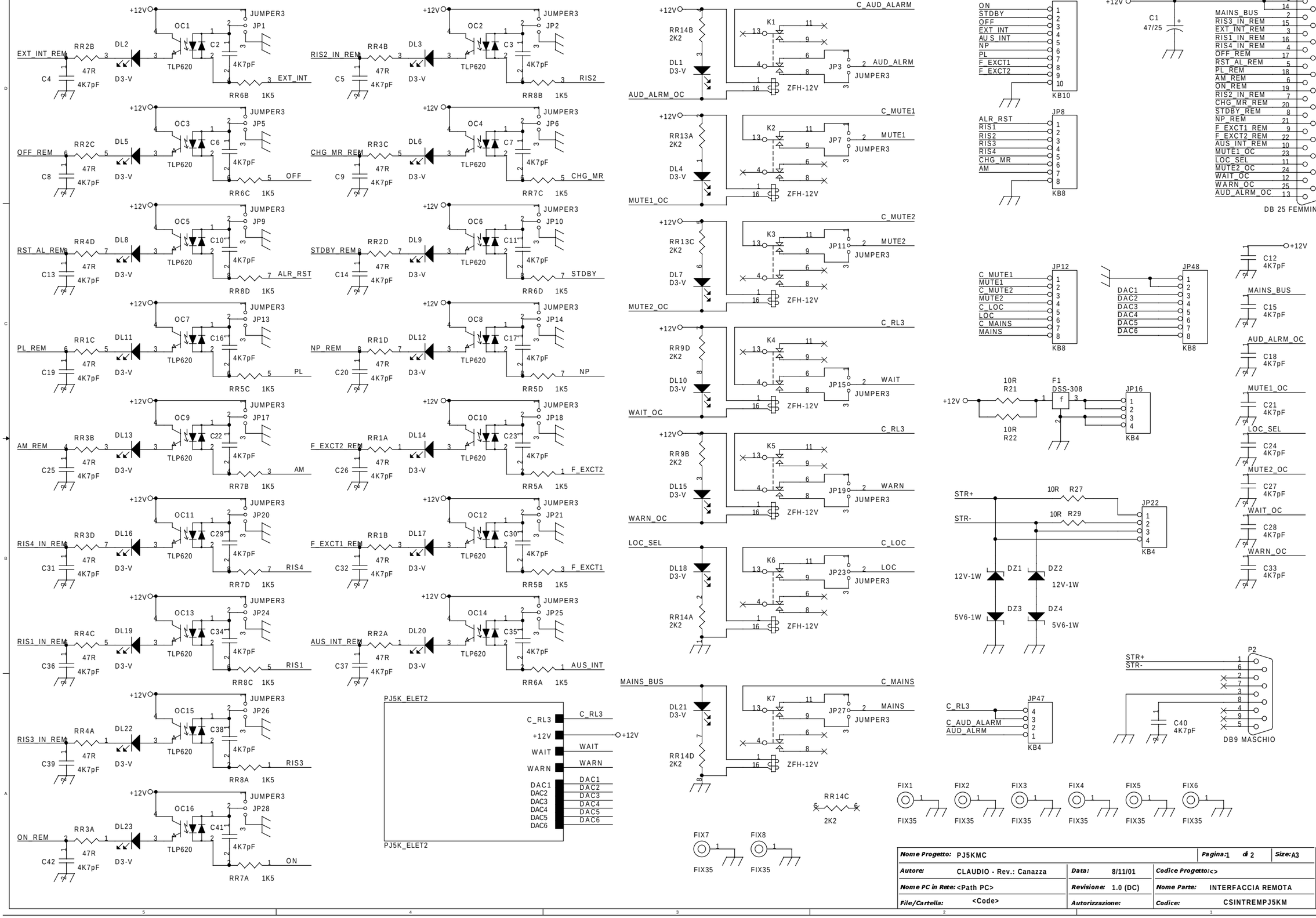
Bill Of Materials

Page1

Item	Q.ty	Reference	Part
1	1	CN1	FLAT16
2	5	C1,C2,C5,C8,C27	CM4K7pF
3	7	C3,C10,C11,C15,C16,C17, C22	CM.1uF
4	5	C4,C6,C21,C24,C26	CD27pF
5	2	C14,C9	100/35
6	2	C12,C13	1000/35
7	2	C19,C18	220/25
8	2	C25,C20	CD4K7PF
9	1	C23	CM100pF
10	4	DZ1,DZ2,DZ3,DZ4	15V 1/2W
11	11	D1,D2,D3,D4,D5,D6,D8,D9, D10,D15,D16	1N4148
12	2	D11,D12	BY254
13	1	D13	11DQ06
14	1	D14	1N4004
15	10	FIX1,FIX2,FIX3,FIX4,FIX5, FIX6,FIX7,FIX8,FIX9, FIX10	FIX35
16	75	F1,F2,F3,F4,F5,F6,F7,F8, F9,F10,F11,F12,F13,F14, F15,F16,F17,F18,F19,F20, F21,F22,F23,F24,F25,F26, F27,F28,F29,F30,F31,F32, F33,F34,F35,F36,F37,F38, F39,F40,F41,F42,F43,F44, F45,F46,F47,F48,F49,F50, F51,F52,F53,F54,F55,F56, F57,F58,F59,F61,F62,F63, F64,F65,F66,F67,F68,F69, F70,F71,F72,F73,F74,F75, F76	DSS306
17	2	F77,F60	BL02
18	4	JP1,JP2,JP3,JP4	JUMPER3
19	1	JP5	KBW6
20	2	J1,J3	CON26AP
21	1	J2	CON34A
22	5	K1,K2,K3,K4,K5	ZFH-12V-H1
23	1	L1	220uH
24	1	P1	DB25 FEM
25	2	P2,P3	CONNECTOR DB9
26	1	P4	DB25 MASC
27	1	P5	DB9 FEMM.
28	1	P6	DB15 FEMM.
29	1	Q1	BC488
30	1	R1	2R2 1/4W
31	1	R2	RXE020
32	4	R3,R7,R10,R18	10K
33	4	R4,R6,R13,R16	10R
34	1	R5	x120R
35	1	R8	RXE040
36	1	R9	220R
37	1	R11	1K8
38	2	R12,R17	RXE110



Nome Progetto:	PK5KPS – Interfaccia parallela			Pagina: 1 di 1	Size: A3
Autore:	Griptech – Rev.: Canazza	Data:	08/10/2002	Codice Progetto:	<>
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Interfaccia parallela
File/Cartella:	PJ5_REM_MNT.DWG	Autorizzazione:		Codice:	SLINTREMPJ5K
Scala: <>	Materiale: <>	Trattamento:	<>	Profilo:	<>


+12V
OC1
JUMPER3
JP1
EXT_INT_REM
RR2B
DL2
47R
D3-V
TLP620
C2
4K7pF
C4
4K7pF
EXT_INT
RR6B 1K5
OC2
JP2
RIS2_IN_REM
RR4B
DL3
C3
C5
RIS2
RR8B 1K5
OC3
JP5
OFF_REM
RR2C
DL5
C6
C8
OFF
RR6C 1K5
OC4
JP6
CHG_MR_REM
RR3C
DL6
C7
C9
CHG_MR
RR7C 1K5
OC5
JP9
RST_AL_REM
RR4D
DL8
C10
C13
ALR_RST
RR8D 1K5
OC6
JP10
STDBY_REM
RR2D
DL9
C11
C14
STDBY
RR6D 1K5
OC7
JP13
PL_REM
RR1C
DL11
C16
C19
PL
RR5C 1K5
OC8
JP14
NP_REM
RR1D
DL12
C17
C20
NP
RR5D 1K5
OC9
JP17
AM_REM
RR3B
DL13
C22
C25
AM
RR7B 1K5
OC10
JP18
F_EXCT2_REM
RR1A
DL14
C23
C26
F_EXCT2
RR5A 1K5
OC11
JP20
RIS4_IN_REM
RR3D
DL16
C29
C31
RIS4
RR7D 1K5
OC12
JP21
F_EXCT1_REM
RR1B
DL17
C30
C32
F_EXCT1
RR5B 1K5
OC13
JP24
RIS1_IN_REM
RR4C
DL19
C34
C36
RIS1
RR8C 1K5
OC14
JP25
AUS_INT_REM
RR2A
DL20
C35
C37
AUS_INT
RR6A 1K5
OC15
JP26
RIS3_IN_REM
RR4A
DL22
C38
C39
RIS3
RR8A 1K5
OC16
JP28
ON_REM
RR3A
DL23
C41
C42
ON
RR7A 1K5
47R
4K7pF
PJ5K_ELET2
C_RL3
+12V
WAIT
WARN
DAC1
DAC2
DAC3
DAC4
DAC5
DAC6
C_AUD_ALARM
RR14B 2K2
DL1 D3-V
K1
JP3
AUD_ALRM
AUD_ALRM_OC
C_MUTE1
RR13A 2K2
DL4 D3-V
K2
JP7
MUTE1
MUTE1_OC
C_MUTE2
RR13C 2K2
DL7 D3-V
K3
JP11
MUTE2
MUTE2_OC
C_RL3
RR9D 2K2
DL10 D3-V
K4
JP15
WAIT
WAIT_OC
C_RL3
RR9B 2K2
DL15 D3-V
K5
JP19
WARN
WARN_OC
C_LOC
RR14A 2K2
DL18 D3-V
K6
JP23
LOC
LOC_SEL
C_MAINS
RR14D 2K2
DL21 D3-V
K7
JP27
MAINS
MAINS_BUS
RR14C 2K2
JUMPER3
ZFH-12V
JP4
ON
STDBY
OFF
EXT_INT
AUS_INT
NP
PL
F_EXCT1
F_EXCT2
KB10
JP8
ALR_RST
RIS1
RIS2
RIS3
RIS4
CHG_MR
AM
KB8
P1
MAINS_BUS
RIS3_IN_REM
EXT_INT_REM
RIS1_IN_REM
RIS4_IN_REM
OFF_REM
RST_AL_REM
PL_REM
AM_REM
ON_REM
RIS2_IN_REM
CHG_MR_REM
STDBY_REM
NP_REM
F_EXCT1_REM
F_EXCT2_REM
AUS_INT_REM
MUTE1_OC
LOC_SEL
MUTE2_OC
WAIT_OC
WARN_OC
AUD_ALRM_OC
DB 25 FEMMINA
C1
47/25
JP12
C_MUTE1
MUTE1
C_MUTE2
MUTE2
C_LOC
LOC
C_MAINS
MAINS
KB8
JP48
DAC1
DAC2
DAC3
DAC4
DAC5
DAC6
KB8
C12 4K7pF
C15 4K7pF
C18 4K7pF
C21 4K7pF
C24 4K7pF
C27 4K7pF
C28 4K7pF
C33 4K7pF
10R R21
10R R22
F1 DSS-308
JP16
KB4
STR+
STR-
10R R27
10R R29
JP22
KB4
12V-1W DZ1
DZ2 12V-1W
5V6-1W DZ3
DZ4 5V6-1W
P2
DB9 MASCHIO
C40 4K7pF
C_RL3
C_AUD_ALARM
AUD_ALRM
JP47
KB4
FIX1
FIX2
FIX3
FIX4
FIX5
FIX6
FIX7
FIX8
FIX35
Nome Progetto: PJ5KMC
Pagina: 1 di 2
Size: A3
Autore: CLAUDIO - Rev.: Canazza
Data: 8/11/01
Codice Progetto: <>
Nome PC in Rete: <Path PC>
Revisione: 1.0 (DC)
Nome Parte: INTERFACCIA REMOTA
File/Cartella: <Code>
Autorizzazione:
Codice: CSINTREMPJ5KM

DAC5_OUT — C43 4K7pF
DAC6_OUT — C44 4K7pF
DAC3_OUT — C46 4K7pF
DAC4_OUT — C47 4K7pF
DAC1_OUT — C48 4K7pF
DAC2_OUT — C49 4K7pF
ACK_RIS3_OC — C50 4K7pF
ACK_RIS4_OC — C51 4K7pF
ACK_RIS1_OC — C52 4K7pF
ACK_RIS2_OC — C53 4K7pF
FAULT_OC — C54 4K7pF
PD1_OC — C55 4K7pF
PD2_OC — C56 4K7pF
PD3_OC — C57 4K7pF
PD4_OC — C60 4K7pF
ACK_PL_OC — C61 4K7pF
ACK_OFF_OC — C62 4K7pF
ACK_AM_OC — C65 4K7pF
ACK_EXCT_OC — C66 4K7pF
ACK_NP_OC — C69 4K7pF
ACK_ON_OC — C70 4K7pF
ACK_STDBY_OC — C71 4K7pF

+12V — RR9A 2K2 — DL24 D3-V — ACK_RIS1_OC
K8 — JP29 — JUMPER3 — ACK_RIS1 — C_RL4
ZFH-12V

+12V — RR13D 2K2 — DL25 D3-V — ACK_EXCT_OC
K9 — JP30 — JUMPER3 — ACK_EXCT — C_RL3
ZFH-12V

+12V — RR9C 2K2 — DL26 D3-V — ACK_RIS2_OC
K10 — JP31 — JUMPER3 — ACK_RIS2 — C_RL4
ZFH-12V

+12V — RR13B 2K2 — DL27 D3-V — ACK_AM_OC
K11 — JP32 — JUMPER3 — ACK_AM — C_RL3
ZFH-12V

+12V — RR10A 2K2 — DL28 D3-V — ACK_RIS3_OC
K12 — JP33 — JUMPER3 — ACK_RIS3 — C_RL4
ZFH-12V

+12V — RR12D 2K2 — DL29 D3-V — ACK_PL_OC
K13 — JP34 — JUMPER3 — ACK_PL — C_RL3
ZFH-12V

+12V — RR10C 2K2 — DL30 D3-V — ACK_RIS4_OC
K14 — JP36 — JUMPER3 — ACK_RIS4 — C_RL4
ZFH-12V

+12V — RR12B 2K2 — DL31 D3-V — ACK_NP_OC
K15 — JP37 — JUMPER3 — ACK_NP — C_RL3
ZFH-12V

+12V — RR11A 2K2 — DL32 D3-V — PD1_OC
K16 — JP39 — JUMPER3 — PD1 — C_RL5
ZFH-12V

+12V — RR11D 2K2 — DL33 D3-V — ACK_OFF_OC
K17 — JP40 — JUMPER3 — ACK_OFF — C_RL3
ZFH-12V

+12V — RR11C 2K2 — DL34 D3-V — PD2_OC
K18 — JP41 — JUMPER3 — PD2 — C_RL5
ZFH-12V

+12V — RR11B 2K2 — DL35 D3-V — ACK_STDBY_OC
K19 — JP42 — JUMPER3 — ACK_STDBY — C_RL3
ZFH-12V

+12V — RR12A 2K2 — DL36 D3-V — PD3_OC
K20 — JP43 — JUMPER3 — PD3 — C_RL5
ZFH-12V

+12V — RR10D 2K2 — DL37 D3-V — ACK_ON_OC
K21 — JP44 — JUMPER3 — ACK_ON — C_RL3
ZFH-12V

+12V — RR12C 2K2 — DL38 D3-V — PD4_OC
K22 — JP45 — JUMPER3 — PD4 — C_RL5
ZFH-12V

+12V — RR10B 2K2 — DL39 D3-V — FAULT_OC
K23 — JP46 — JUMPER3 — FAULT — C_RL3
ZFH-12V

+12V — C45 47/25 — C72 4K7pF — DZ5 BZW045V8 — DZ6 BZW045V8

P3 — DB25 MASCHIO
DAC5_OUT 1
DAC6_OUT 14
DAC3_OUT 2
DAC4_OUT 15
DAC1_OUT 3
DAC2_OUT 16
ACK_RIS3_OC 4
ACK_RIS4_OC 17
ACK_RIS1_OC 5
ACK_RIS2_OC 18
FAULT_OC 6
PD1_OC 19
PD2_OC 7
PD3_OC 20
PD4_OC 8
ACK_PL_OC 21
ACK_OFF_OC 9
ACK_STDBY_OC 22
ACK_ON_OC 10
ACK_NP_OC 23
ACK_EXCT_OC 11
ACK_AM_OC 24
12
25
13

JP35 — KB10
ACK_RIS1 1
ACK_RIS2 2
ACK_RIS3 3
ACK_RIS4 4
C_RL4 5
PD1 6
PD2 7
PD3 8
PD4 9
C_RL5 10

JP38 — KB10
ACK_EXCT 1
ACK_AM 2
ACK_PL 3
ACK_NP 4
ACK_OFF 5
ACK_STDBY 6
ACK_ON 7
FAULT 8
WAIT 9
WARN 10
WAIT
WARN

DAC1_OUT — R54 100R — DAC1 — DAC1
BZW045V8 DZ7 — C58 4K7pF

DAC2_OUT — R56 100R — DAC2 — DAC2
BZW045V8 DZ9 — C63 4K7pF

DAC3_OUT — R60 100R — DAC3 — DAC3
BZW045V8 DZ11 — C67 4K7pF

DAC4_OUT — R55 100R — DAC4 — DAC4
BZW045V8 DZ8 — C59 4K7pF

DAC5_OUT — R57 100R — DAC5 — DAC5
BZW045V8 DZ10 — C64 4K7pF

DAC6_OUT — R61 100R — DAC6 — DAC6
BZW045V8 DZ12 — C68 4K7pF

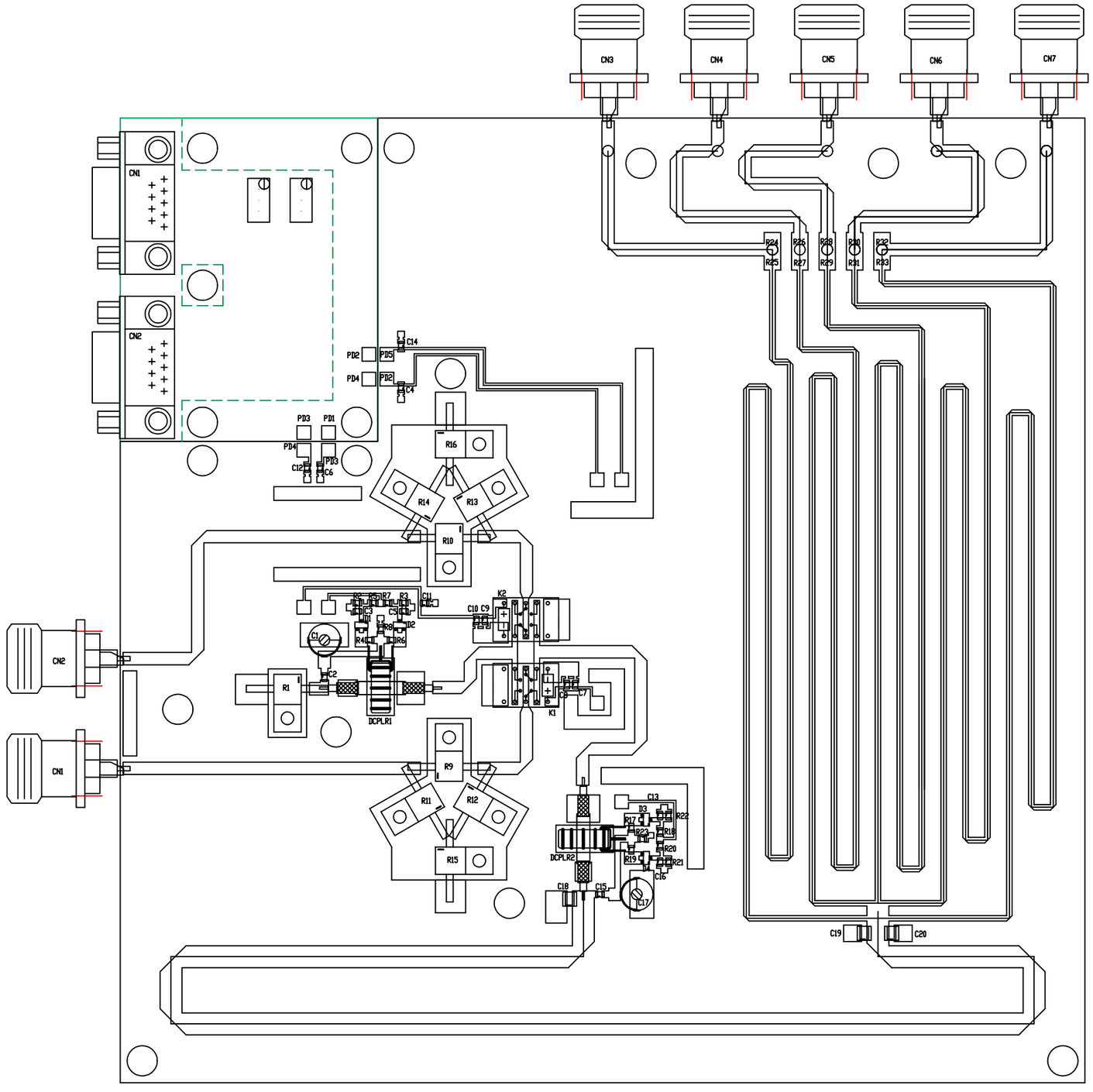
Nome Progetto: PJ5KMC		Pagina: 2 di 2	Size: A3
Autore: CLAUDIO - Rev.: Canazza	Data: 8/11/01	Codice Progetto: <Project Code>	
Nome PC in Rete: \\UT_SRV	Revisione: 1.0 (DC)	Nome Parte: INTERFACCIA REMOTA	
File/Cartella: CSINTREMPJ5K.DSN	Autorizzazione:	Codice: CSINTREMPJ5KM	

SLINTREMPJ5KM

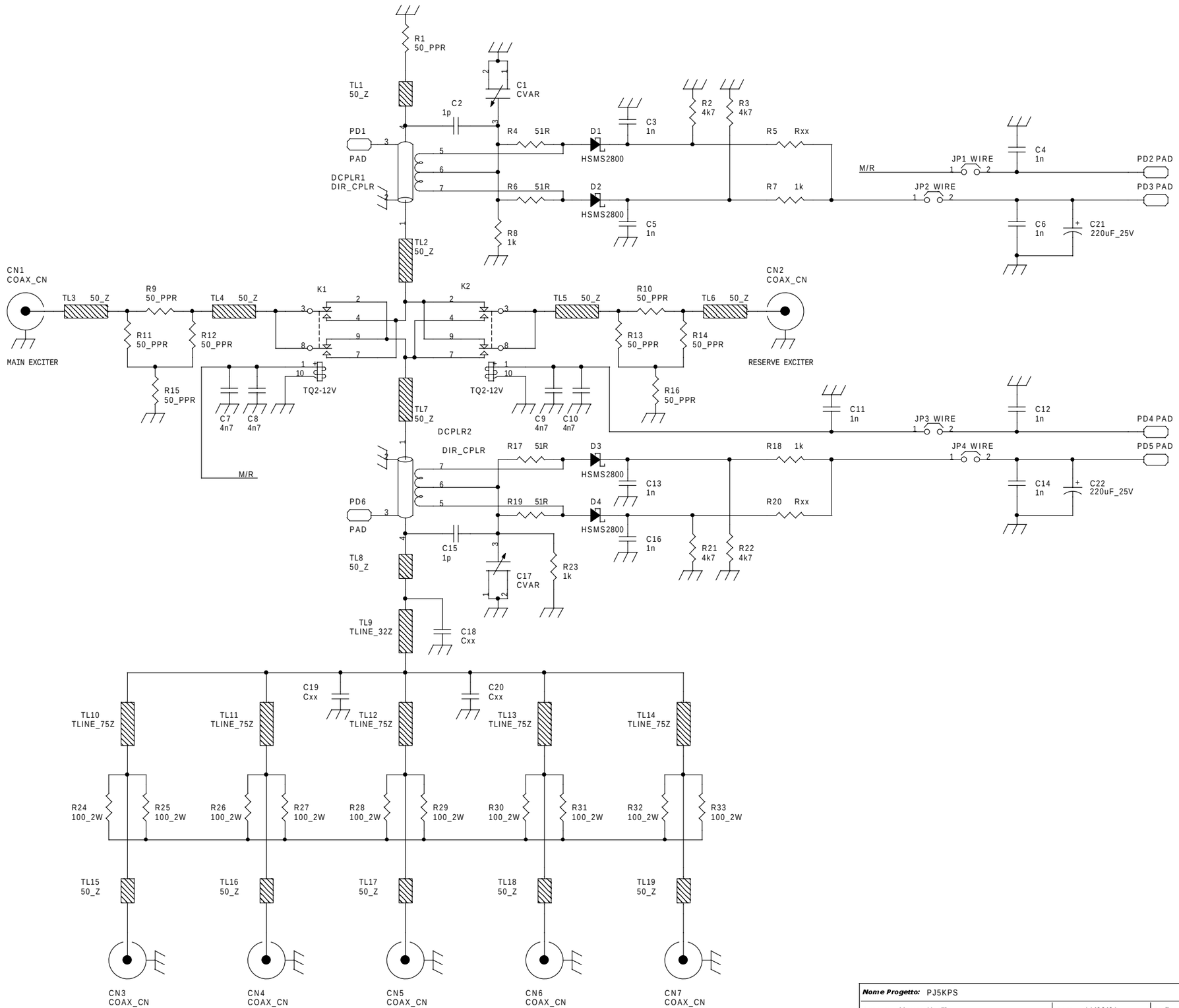
Bill Of Materials

Page1

Item	Q.ty	Reference	Part
1	2	C1,C45	47/25
2	70	C2,C3,C4,C5,C6,C7,C8,C9, C10,C11,C12,C13,C14,C15, C16,C17,C18,C19,C20,C21, C22,C23,C24,C25,C26,C27, C28,C29,C30,C31,C32,C33, C34,C35,C36,C37,C38,C39, C40,C41,C42,C43,C44,C46, C47,C48,C49,C50,C51,C52, C53,C54,C55,C56,C57,C58, C59,C60,C61,C62,C63,C64, C65,C66,C67,C68,C69,C70, C71,C72	4K7pF
3	39	DL1,DL2,DL3,DL4,DL5,DL6, DL7,DL8,DL9,DL10,DL11, DL12,DL13,DL14,DL15,DL16, DL17,DL18,DL19,DL20,DL21, DL22,DL23,DL24,DL25,DL26, DL27,DL28,DL29,DL30,DL31, DL32,DL33,DL34,DL35,DL36, DL37,DL38,DL39	D3-V
4	2	DZ2,DZ1	12V-1W
5	2	DZ4,DZ3	5V6-1W
6	8	DZ5,DZ6,DZ7,DZ8,DZ9,DZ10, DZ11,DZ12	BZW045V8
7	8	FIX1,FIX2,FIX3,FIX4,FIX5, FIX6,FIX7,FIX8	FIX35
8	1	F1	DSS-308
9	39	JP1,JP2,JP3,JP5,JP6,JP7, JP9,JP10,JP11,JP13,JP14, JP15,JP17,JP18,JP19,JP20, JP21,JP23,JP24,JP25,JP26, JP27,JP28,JP29,JP30,JP31, JP32,JP33,JP34,JP36,JP37, JP39,JP40,JP41,JP42,JP43, JP44,JP45,JP46	JUMPER3
10	3	JP4,JP35,JP38	KB10
11	3	JP8,JP12,JP48	KB8
12	3	JP16,JP22,JP47	KB4
13	23	K1,K2,K3,K4,K5,K6,K7,K8, K9,K10,K11,K12,K13,K14, K15,K16,K17,K18,K19,K20, K21,K22,K23	ZFH-12V
14	16	OC1,OC2,OC3,OC4,OC5,OC6, OC7,OC8,OC9,OC10,OC11, OC12,OC13,OC14,OC15,OC16	TLP620
15	1	P1	DB 25 FEMMINA
16	1	P2	DB9 MASCHIO
17	1	P3	DB25 MASCHIO
18	4	RR1,RR2,RR3,RR4	47R
19	4	RR5,RR6,RR7,RR8	1K5
20	6	RR9,RR10,RR11,RR12,RR13, RR14	2K2
21	4	R21,R22,R27,R29	10R
22	6	R54,R55,R56,R57,R60,R61	100R



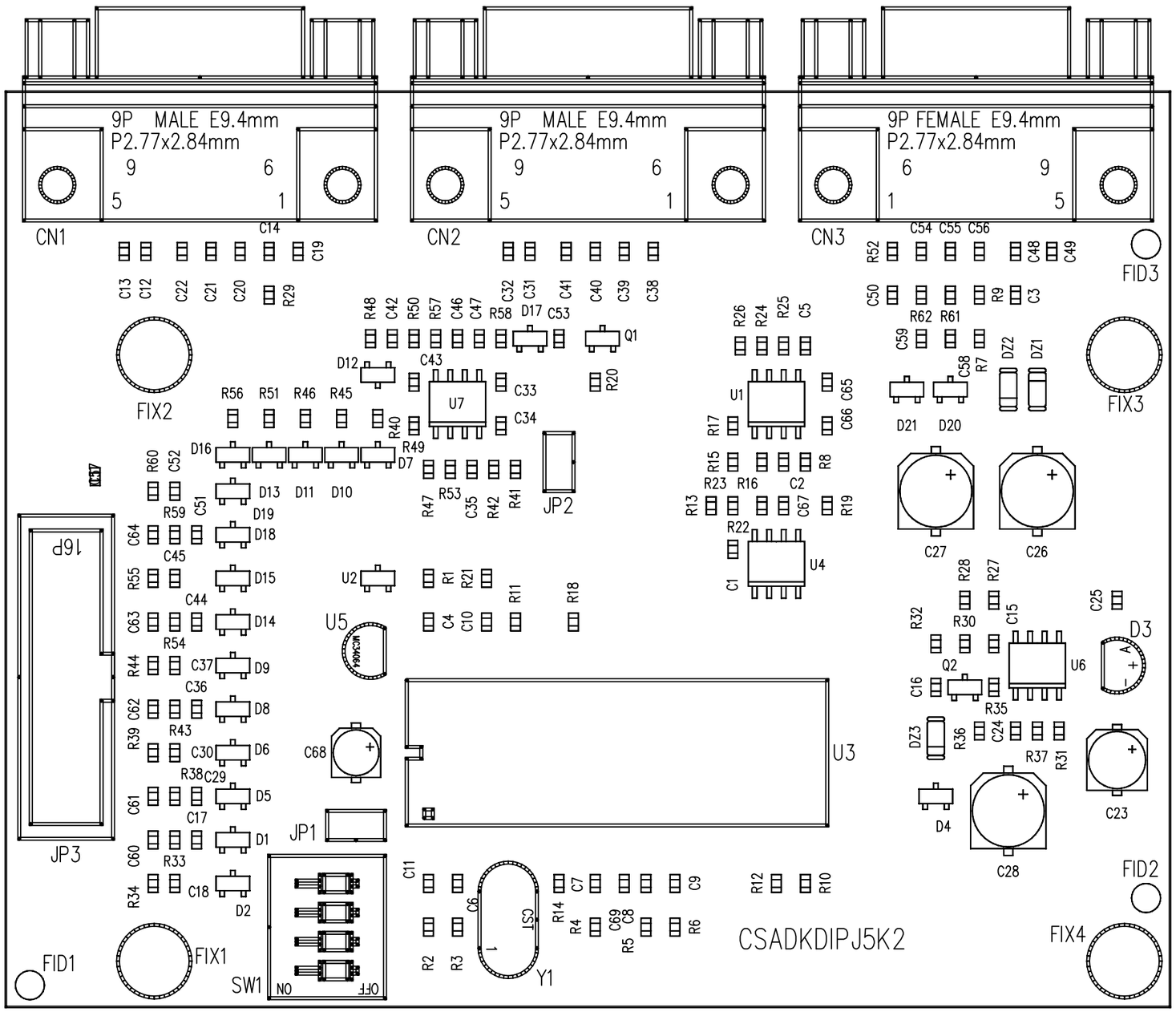
Nome Progetto:	PJ5KPS - RF input splitter			Pagina: 1 di 1	Size: A3
Autore:	Ucelli - Rev.: Canazza	Data:	08/10/2002	Codice Progetto:	<>
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Input splitter
File/Cartella:	CSSPLINP5KW1.DWG	Autorizzazione:		Codice:	SLSPLINP5KW1
Scala: <>	Materiale: <>	Trattamento:	<>	Profilo:	<>



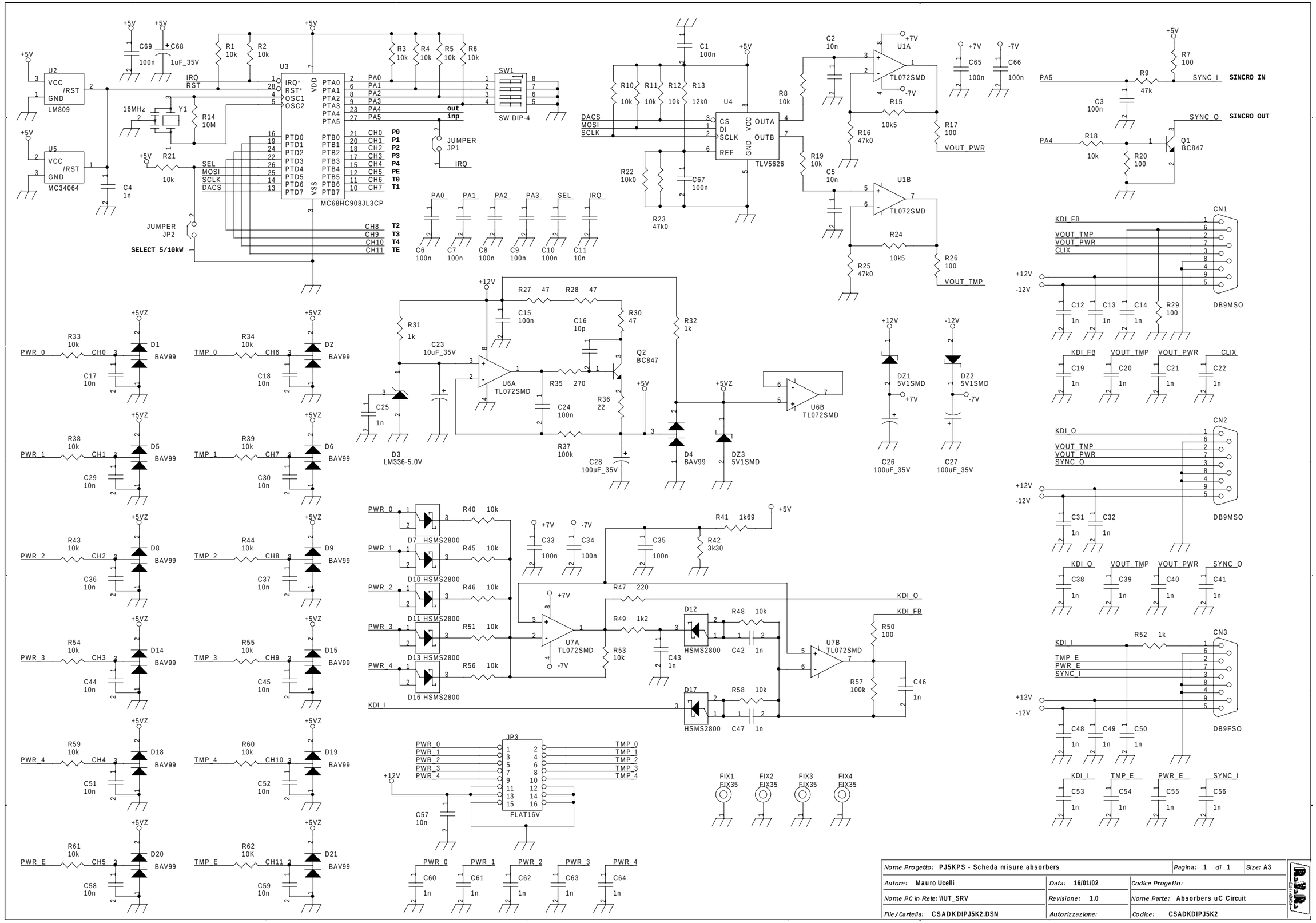
Nome Progetto: PJ5KPS		**Pagina:** 1 **di** 1	**Size:** A3
Autore: Mauro Ucelli	**Data:** 11/09/01	**Codice Progetto:** <>	
Nome PC in Rete: \\UT_SRV	**Revisione:** 1.0	**Nome Parte:** RF Section Input Splitter	
File/Cartella: SPLITTER1.DSN	**Autorizzazione:**	**Codice:** CSSPLINP5KW1	

CSSPLINP5KW1 Bill Of Materials Page1

Item	Q.ty	Reference	Part
1	7	CN1,CN2,CN3,CN4,CN5,CN6, CN7	COAX_CN
2	2	C1,C17	CVAR
3	2	C2,C15	1p
4	9	C3,C4,C5,C6,C11,C12,C13, C14,C16	1n
5	4	C7,C8,C9,C10	4n7
6	3	C18,C19,C20	Cxx
7	2	C22,C21	220uF_25V
8	2	DCPLR1,DCPLR2	DIR_CPLR
9	4	D1,D2,D3,D4	HSMS2800
10	4	JP1,JP2,JP3,JP4	WIRE
11	2	K1,K2	TQ2-12V
12	6	PD1,PD2,PD3,PD4,PD5,PD6	PAD
13	9	R1,R9,R10,R11,R12,R13, R14,R15,R16	50_PPR
14	4	R2,R3,R21,R22	4k7
15	4	R4,R6,R17,R19	51R
16	2	R20,R5	Rxx
17	4	R7,R8,R18,R23	1k
18	10	R24,R25,R26,R27,R28,R29, R30,R31,R32,R33	100_2W
19	13	TL1,TL2,TL3,TL4,TL5,TL6, TL7,TL8,TL15,TL16,TL17, TL18,TL19	50_Z
20	1	TL9	TLINE_32Z
21	5	TL10,TL11,TL12,TL13,TL14	TLINE_75Z



Nome Progetto:	PJ5KPS - Scheda misure absorbers			Pagina: 1 di 1	Size: A3
Autore:	Ucelli - Rev.: Canazza	Data:	09/10/2002	Codice Progetto:	<>
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Scheda misure absorbers
File/Cartella:	ADKDIP_LY.DWG	Autorizzazione:		Codice:	SLADKDIPK5K2
Scala: <>	Materiale: <>	Trattamento:	<>	Profilo:	<>


U2 LM809
U5 MC34064
C4 1n
C69 100n
C68 1uF_35V
16MHz
Y1
R14 10M
R21 10k
U3 MC68HC908JL3CP
IRQ
RST
SEL
MOSI
SCLK
DACS
R1 10k
R2 10k
R3 10k
R4 10k
R5 10k
R6 10k
SW1 SW DIP-4
out
inp
JUMPER JP1
JUMPER JP2
SELECT 5/10kW
PA0 PA1 PA2 PA3 PA4 PA5
CH0 P0
CH1 P1
CH2 P2
CH3 P3
CH4 P4
CH5 PE
CH6 T0
CH7 T1
CH8 T2
CH9 T3
CH10 T4
CH11 TE
C6 100n
C7 100n
C8 100n
C9 100n
C10 100n
C11 10n
C1 100n
R10 10k
R11 10k
R12 10k
R13 12k0
U4 TLV5626
R22 10k0
R23 47k0
C67 100n
C2 10n
C5 10n
R8 10k
R19 10k
U1A TL072SMD
U1B TL072SMD
R15 10k5
R16 47k0
R17 100
VOUT_PWR
R24 10k5
R25 47k0
R26 100
VOUT_TMP
C65 100n
C66 100n
R7 100
R9 47k
SYNC_I SINCRO IN
C3 100n
SYNC_O SINCRO OUT
R18 10k
R20 100
Q1 BC847
CN1 DB9MSO
KDI_FB
VOUT_TMP
VOUT_PWR
CLIX
C12 1n
C13 1n
C14 1n
R29 100
C19 1n
C20 1n
C21 1n
C22 1n
R27 47
R28 47
R30 47
R31 1k
R32 1k
C15 100n
C16 10p
C23 10uF_35V
C24 100n
C25 1n
R35 270
R36 22
R37 100k
C28 100uF_35V
Q2 BC847
U6A TL072SMD
U6B TL072SMD
D3 LM336-5.0V
D4 BAV99
DZ3 5V1SMD
DZ1 5V1SMD
DZ2 5V1SMD
C26 100uF_35V
C27 100uF_35V
D1 BAV99
D2 BAV99
D5 BAV99
D6 BAV99
D8 BAV99
D9 BAV99
D14 BAV99
D15 BAV99
D18 BAV99
D19 BAV99
D20 BAV99
D21 BAV99
C17 10n
C18 10n
C29 10n
C30 10n
C36 10n
C37 10n
C44 10n
C45 10n
C51 10n
C52 10n
C58 10n
C59 10n
D7 HSMS2800
D10 HSMS2800
D11 HSMS2800
D13 HSMS2800
D16 HSMS2800
D12 HSMS2800
D17 HSMS2800
R40 10k
R45 10k
R46 10k
R51 10k
R56 10k
R41 1k69
R42 3k30
C33 100n
C34 100n
C35 100n
R47 220
R49 1k2
R53 10k
C43 1n
U7A TL072SMD
U7B TL072SMD
R48 10k
R58 10k
C42 1n
C47 1n
R50 100
R57 100k
C46 1n
KDI_O
KDI_FB
KDI_I
JP3 FLAT16V
C57 10n
C60 1n
C61 1n
C62 1n
C63 1n
C64 1n
FIX1 FIX35
FIX2 FIX35
FIX3 FIX35
FIX4 FIX35
CN2 DB9MSO
CN3 DB9FSO
KDI_O
VOUT_TMP
VOUT_PWR
SYNC_O
KDI_I
TMP_E
PWR_E
SYNC_I
C31 1n
C32 1n
C38 1n
C39 1n
C40 1n
C41 1n
R52 1k
C48 1n
C49 1n
C50 1n
C53 1n
C54 1n
C55 1n
C56 1n
Nome Progetto: PJ5KPS - Scheda misure absorbers
Pagina: 1 di 1
Size: A3
Autore: Mauro Ucelli
Data: 16/01/02
Codice Progetto:
Nome PC in Rete: \\UT_SRV
Revisione: 1.0
Nome Parte: Absorbers uC Circuit
File/Cartella: CSADKDIPJ5K2.DSN
Autorizzazione:
Codice: CSADKDIPJ5K2

CSADKDIPJ5K2

Bill Of Materials

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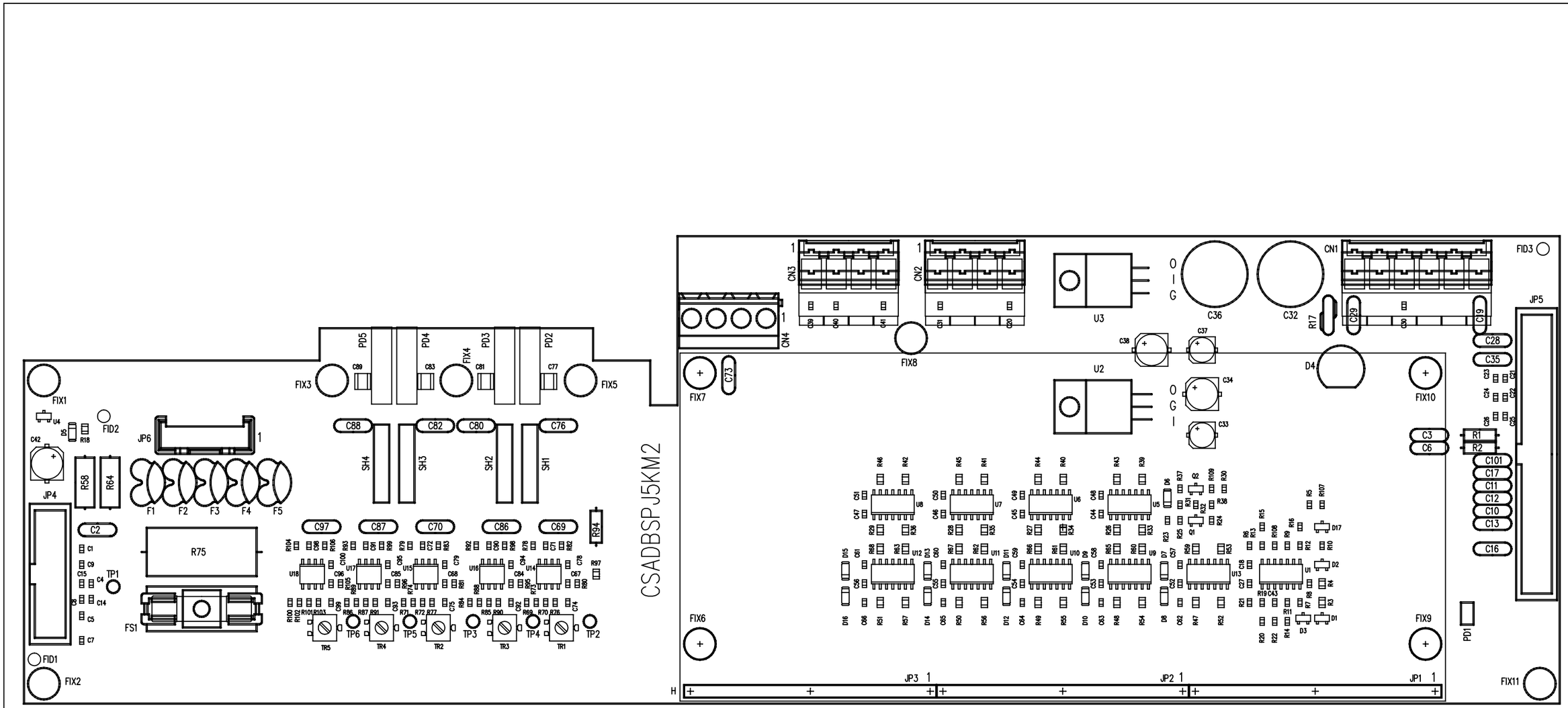
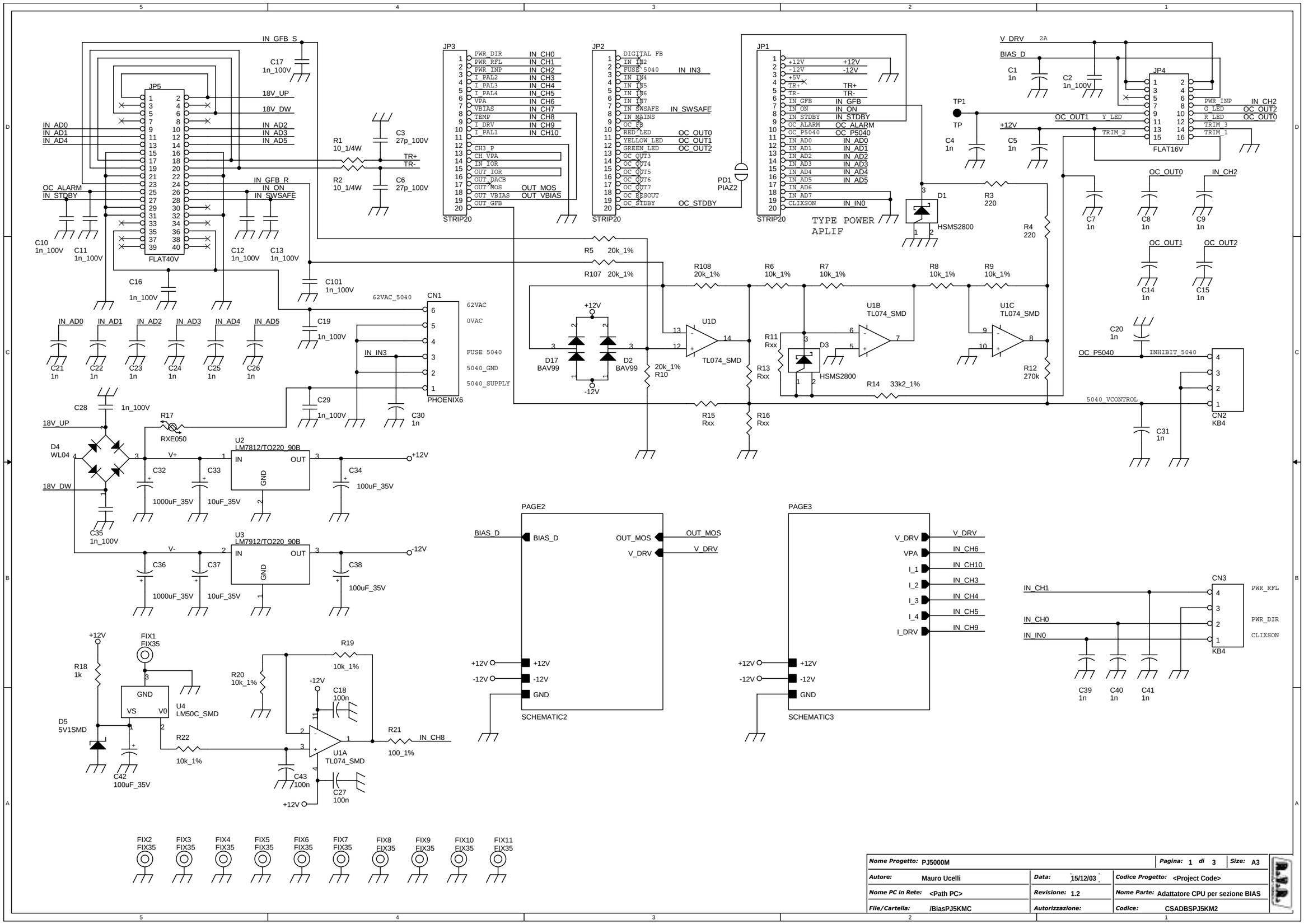
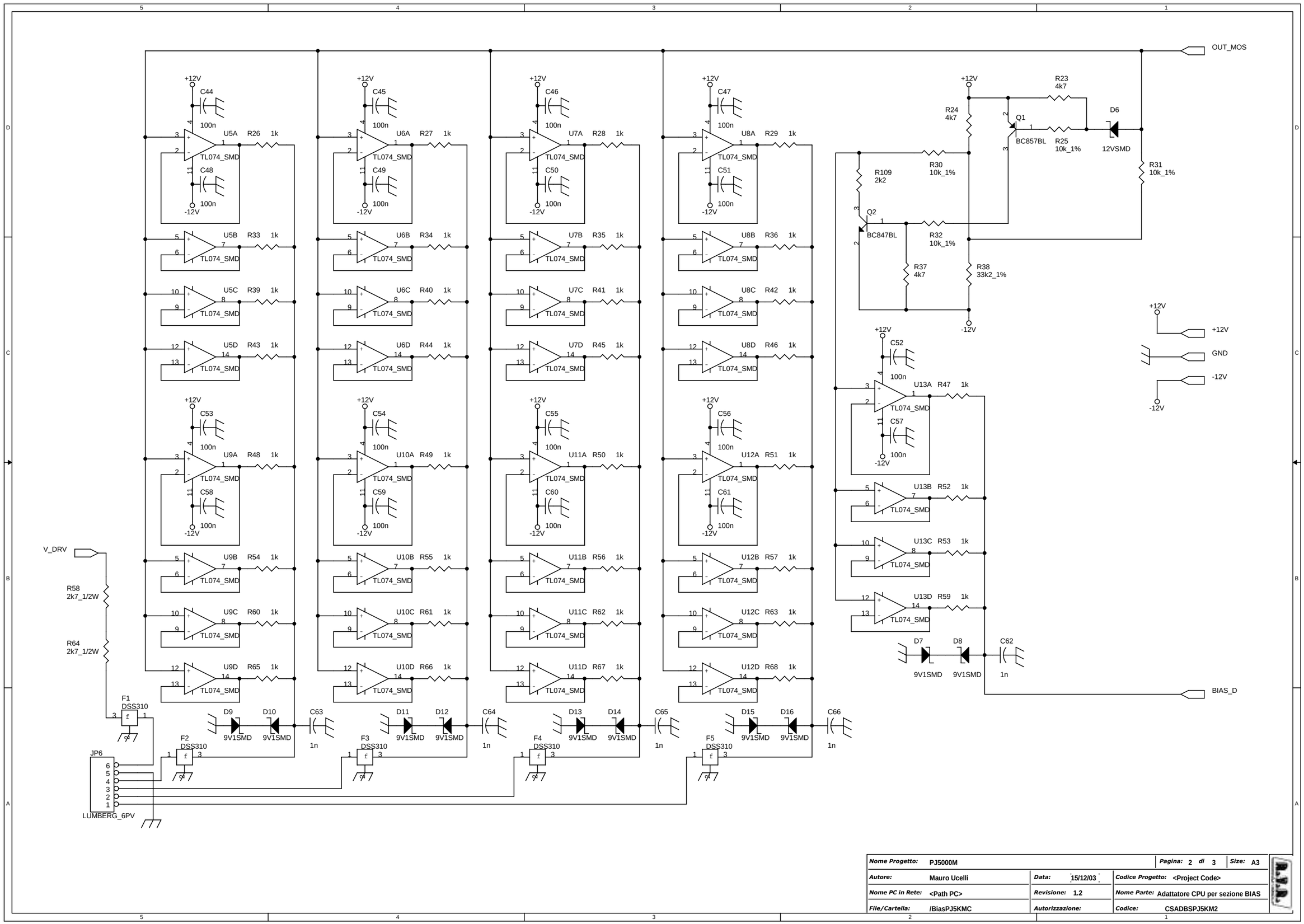
Item	Q.ty	Reference	Part
1	2	CN1,CN2	DB9MSO
2	1	CN3	DB9FSO
3	16	C1,C3,C6,C7,C8,C9,C10, C15,C24,C33,C34,C35,C65, C66,C67,C69	100n
4	16	C2,C5,C11,C17,C18,C29, C30,C36,C37,C44,C45,C51, C52,C57,C58,C59	10n
5	31	C4,C12,C13,C14,C19,C20, C21,C22,C25,C31,C32,C38, C39,C40,C41,C42,C43,C46, C47,C48,C49,C50,C53,C54, C55,C56,C60,C61,C62,C63, C64	1n
6	1	C16	10p
7	1	C23	10uF_35V
8	3	C26,C27,C28	100uF_35V
9	1	C68	1uF_35V
10	3	DZ1,DZ2,DZ3	5V1SMD
11	13	D1,D2,D4,D5,D6,D8,D9,D14, D15,D18,D19,D20,D21	BAV99
12	1	D3	LM336-5.0V
13	7	D7,D10,D11,D12,D13,D16, D17	HSMS2800
14	4	FIX1,FIX2,FIX3,FIX4	FIX35
15	2	JP2,JP1	JUMPER
16	1	JP3	FLAT16V
17	2	Q2,Q1	BC847
18	33	R1,R2,R3,R4,R5,R6,R8,R10, R11,R12,R18,R19,R21,R33, R34,R38,R39,R40,R43,R44, R45,R46,R48,R51,R53,R54, R55,R56,R58,R59,R60,R61, R62	10k
19	6	R7,R17,R20,R26,R29,R50	100
20	1	R9	47k
21	1	R13	12k0
22	1	R14	10M
23	2	R15,R24	10k5
24	3	R16,R23,R25	47k0
25	1	R22	10k0
26	3	R27,R28,R30	47
27	3	R31,R32,R52	1k
28	1	R35	270
29	1	R36	22
30	2	R57,R37	100k
31	1	R41	1k69
32	1	R42	3k30
33	1	R47	220
34	1	R49	1k2
35	1	SW1	SW DIP-4
36	3	U1,U6,U7	TL072SMD
37	1	U2	LM809
38	1	U3	MC68HC908JL3CP
39	1	U4	TLV5626
40	1	U5	MC34064
41	1	Y1	16MHz



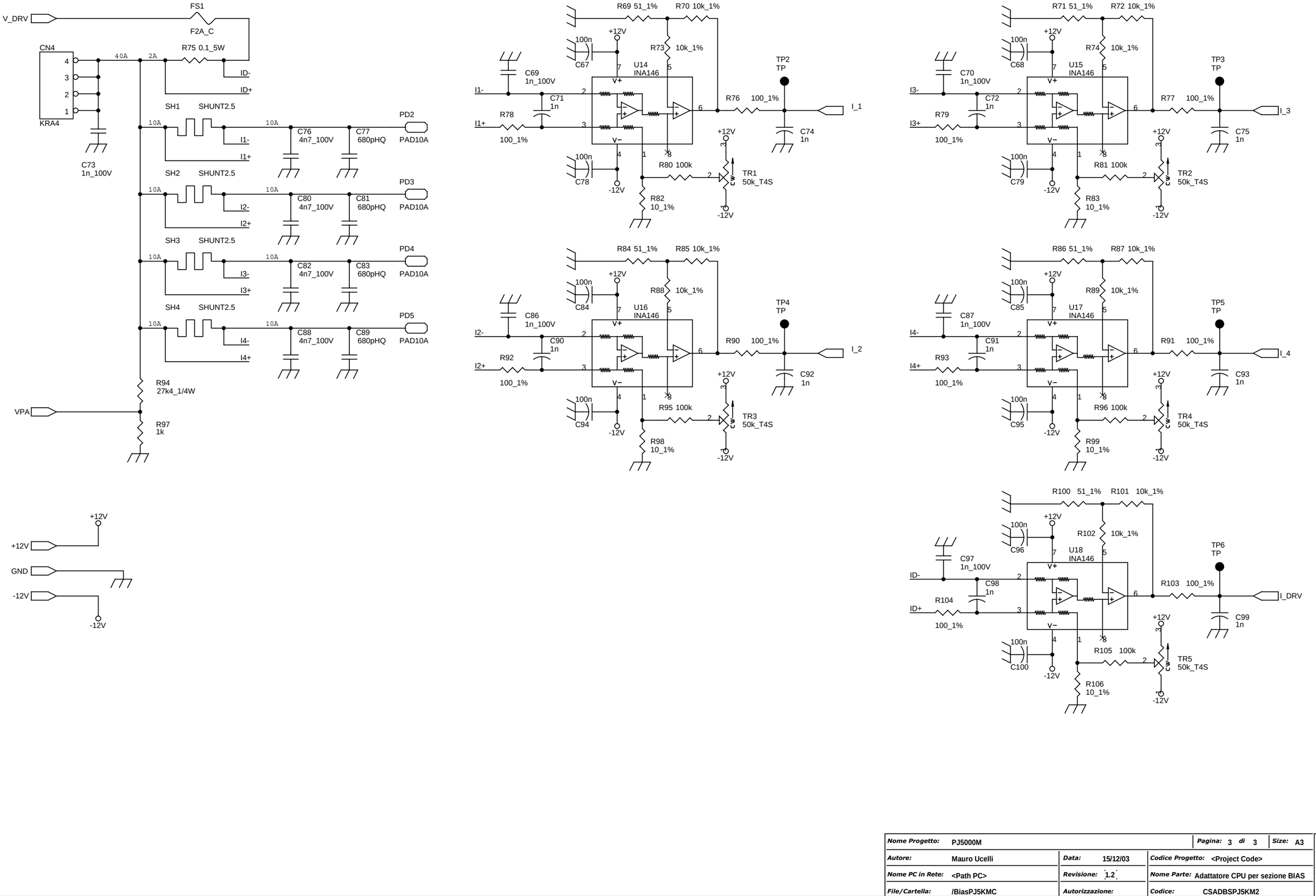
Nome Progetto: PJ5KPS - Adattatore CPU Bias		Pagina: 1 di 1	Size: A3
Autore: Ucelli - Rev.: Canazza	Data: 07/10/2002	Codice Progetto: <>	
Nome PC in Rete: \\UT_SRV	Revisione: 1.0 (DC)	Nome Parte: Adattatore CPU Bias	
File/Cartella: ADBSPJ_LAY□UT	Autorizzazione:	Codice: SLADBSPJ5KPS2	
Scala: <> Materiale: <>	Trattamento: <>	Profilo: <>	



Nome Progetto: PJ5000M		Pagina: 1 di 3	Size: A3
Autore: Mauro Ucelli	Data: 15/12/03	Codice Progetto: <Project Code>	
Nome PC in Rete: <Path PC>	Revisione: 1.2	Nome Parte: Adattatore CPU per sezione BIAS	
File/Cartella: /BiasPJ5KMC	Autorizzazione:	Codice: CSADBSPJ5KM2	



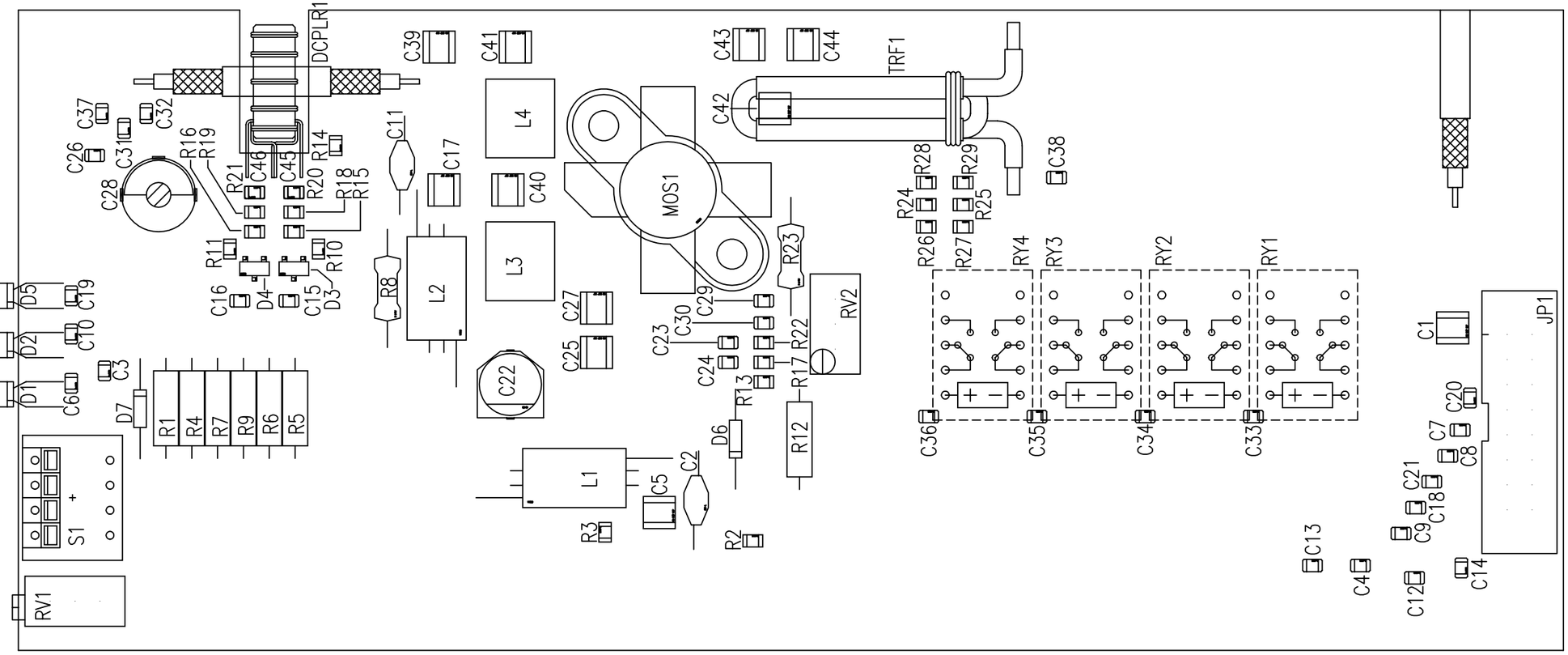
Nome Progetto: PJ5000M		Pagina: 2 di 3	Size: A3
Autore: Mauro Ucelli	Data: 15/12/03	Codice Progetto: <Project Code>	
Nome PC in Rete: <Path PC>	Revisione: 1.2	Nome Parte: Adattatore CPU per sezione BIAS	
File/Cartella: /BiasPJ5KMC	Autorizzazione:	Codice: CSADBSPJ5KM2	



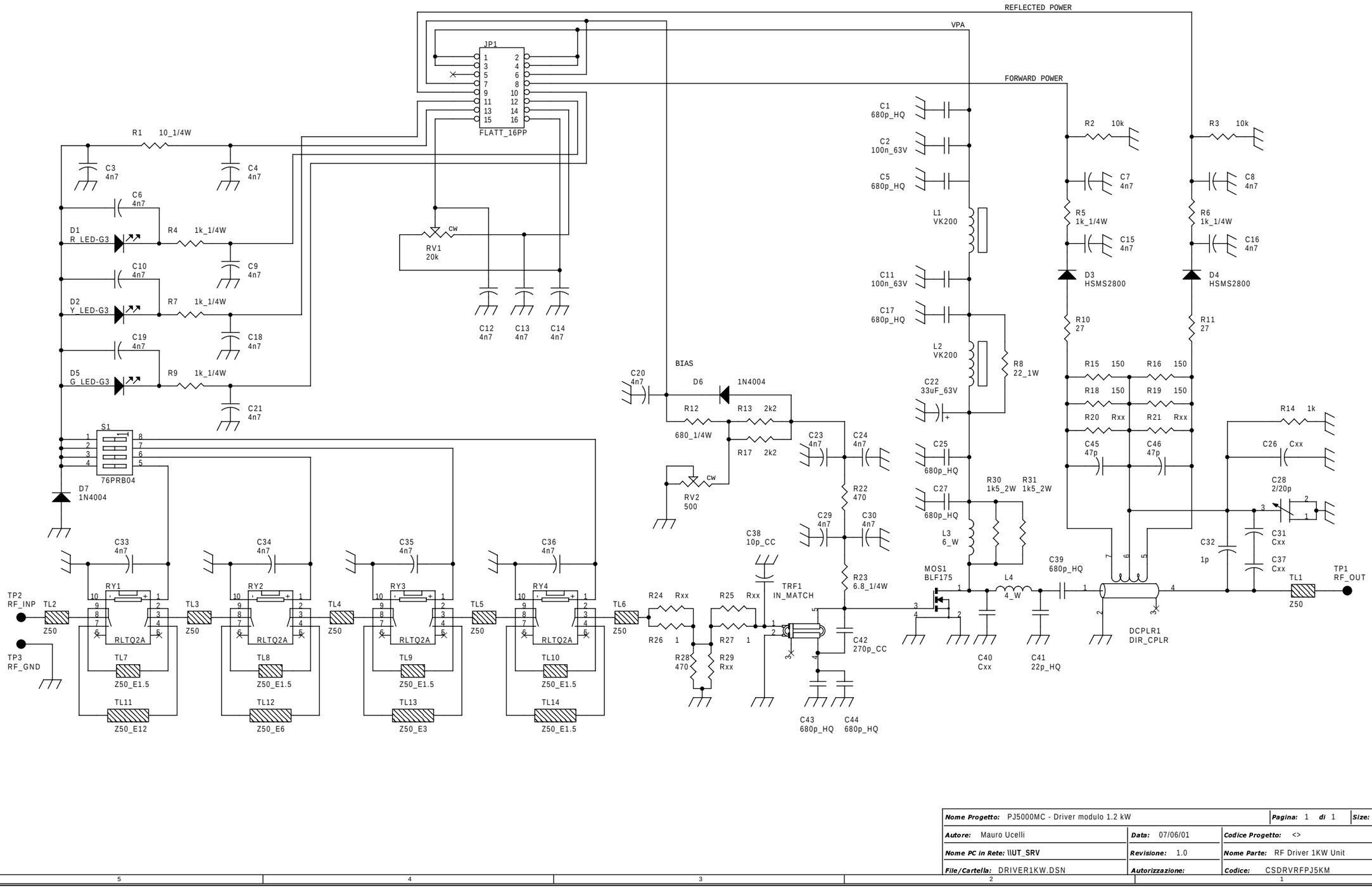
Nome Progetto:	PJ5000M			Pagina: 3 di 3	Size: A3
Autore:	Mauro Ucelli	Data:	15/12/03	Codice Progetto:	<Project Code>
Nome PC in Rete:	<Path PC>	Revisione:	1.2	Nome Parte:	Adattatore CPU per sezione BIAS
File/Cartella:	/BiasPJ5KMC	Autorizzazione:		Codice:	CSADBSPJ5KM2

CSADBSPJ5KM2 Bill Of Materials Page1

Item	Q.ty	Reference	Part
1	1	CN1	PHOENIX6
2	2	CN3,CN2	KB4
3	1	CN4	KRA4
4	35	C1,C4,C5,C7,C8,C9,C14, C15,C20,C21,C22,C23,C24, C25,C26,C30,C31,C39,C40, C41,C62,C63,C64,C65,C66, C71,C72,C74,C75,C90,C91, C92,C93,C98,C99	1n
5	18	C2,C10,C11,C12,C13,C16, C17,C19,C28,C29,C35,C69, C70,C73,C86,C87,C97,C101	1n_100V
6	2	C6,C3	27p_100V
7	31	C18,C27,C43,C44,C45,C46, C47,C48,C49,C50,C51,C52, C53,C54,C55,C56,C57,C58, C59,C60,C61,C67,C68,C78, C79,C84,C85,C94,C95,C96, C100	100n
8	2	C36,C32	1000uF_35V
9	2	C33,C37	10uF_35V
10	3	C34,C38,C42	100uF_35V
11	4	C76,C80,C82,C88	4n7_100V
12	4	C77,C81,C83,C89	680pHQ
13	2	D3,D1	HSMS2800
14	2	D2,D17	BAV99
15	1	D4	WL04
16	1	D5	5V1SMD
17	1	D6	12VSMD
18	10	D7,D8,D9,D10,D11,D12,D13, D14,D15,D16	9V1SMD
19	11	FIX1,FIX2,FIX3,FIX4,FIX5, FIX6,FIX7,FIX8,FIX9, FIX10,FIX11	FIX35
20	1	FS1	F2A_C
21	5	F1,F2,F3,F4,F5	DSS310
22	3	JP1,JP2,JP3	STRIP20
23	1	JP4	FLAT16V
24	1	JP5	FLAT40V
25	1	JP6	LUMBERG_6PV
26	1	PD1	PIAZ2
27	4	PD2,PD3,PD4,PD5	PAD10A
28	1	Q1	BC857BL
29	1	Q2	BC847BL
30	2	R1,R2	10_1/4W
31	2	R3,R4	220
32	4	R5,R10,R107,R108	20k_1%
33	21	R6,R7,R8,R9,R19,R20,R22, R25,R30,R31,R32,R70,R72, R73,R74,R85,R87,R88,R89, R101,R102	10k_1%
34	4	R11,R13,R15,R16	Rxx
35	1	R12	270k
36	2	R14,R38	33k2_1%
37	1	R17	RXE050
38	38	R18,R26,R27,R28,R29,R33, R34,R35,R36,R39,R40,R41, R42,R43,R44,R45,R46,R47, R48,R49,R50,R51,R52,R53, R54,R55,R56,R57,R59,R60, R61,R62,R63,R65,R66,R67, R68,R97	1k
39	11	R21,R76,R77,R78,R79,R90, R91,R92,R93,R103,R104	100_1%
40	3	R23,R24,R37	4k7
41	2	R64,R58	2k7_1/2W
42	5	R69,R71,R84,R86,R100	51_1%
43	1	R75	0.1_5W
44	5	R80,R81,R95,R96,R105	100k
45	5	R82,R83,R98,R99,R106	10_1%
46	1	R94	27k4_1/4W
47	1	R109	2k2
48	4	SH1,SH2,SH3,SH4	SHUNT2.5
49	6	TP1,TP2,TP3,TP4,TP5,TP6	TP
50	5	TR1,TR2,TR3,TR4,TR5	50k_T4S
51	10	U1,U5,U6,U7,U8,U9,U10, U11,U12,U13	TL074_SMD
52	1	U2	LM7812/TO220_90B
53	1	U3	LM7912/TO220_90B
54	1	U4	LM50C_SMD
55	5	U14,U15,U16,U17,U18	INA146



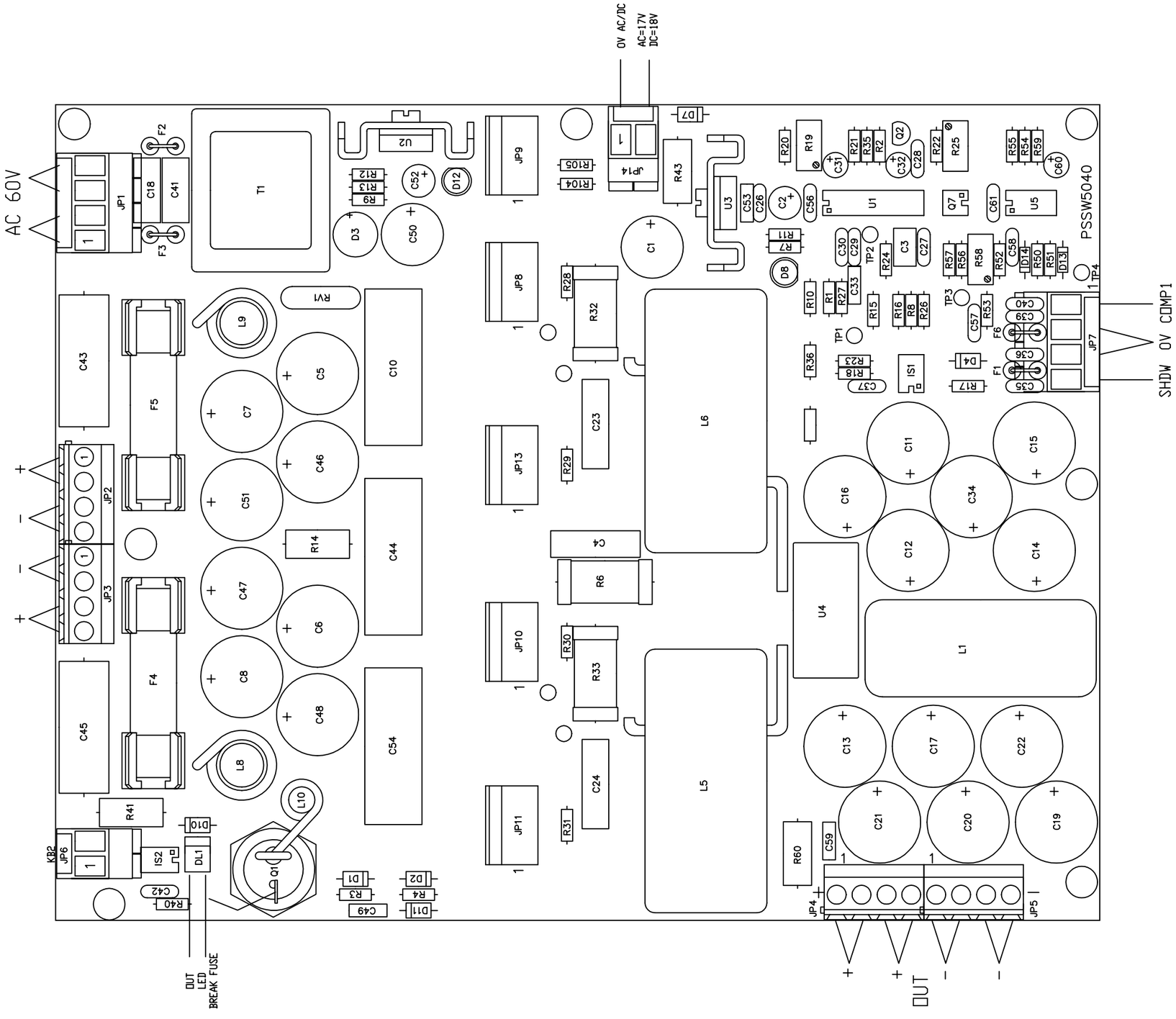
Nome Progetto:	PJ5KPS - Driver modulo RF 1.2 kW			Pagina: 1 di 1	Size: A3
Autore:	Ucelli - Re.: Canazza	Data:	08/10/2002	Codice Progetto:	<>
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Driver Modulo RF
File/Cartella:	CSDRVRFPJ5KM.DWG	Autorizzazione:		Codice:	SLDRVRFPJ5KM
Scala: <>	Materiale: <>	Trattamento:	<>	Profilo:	<>



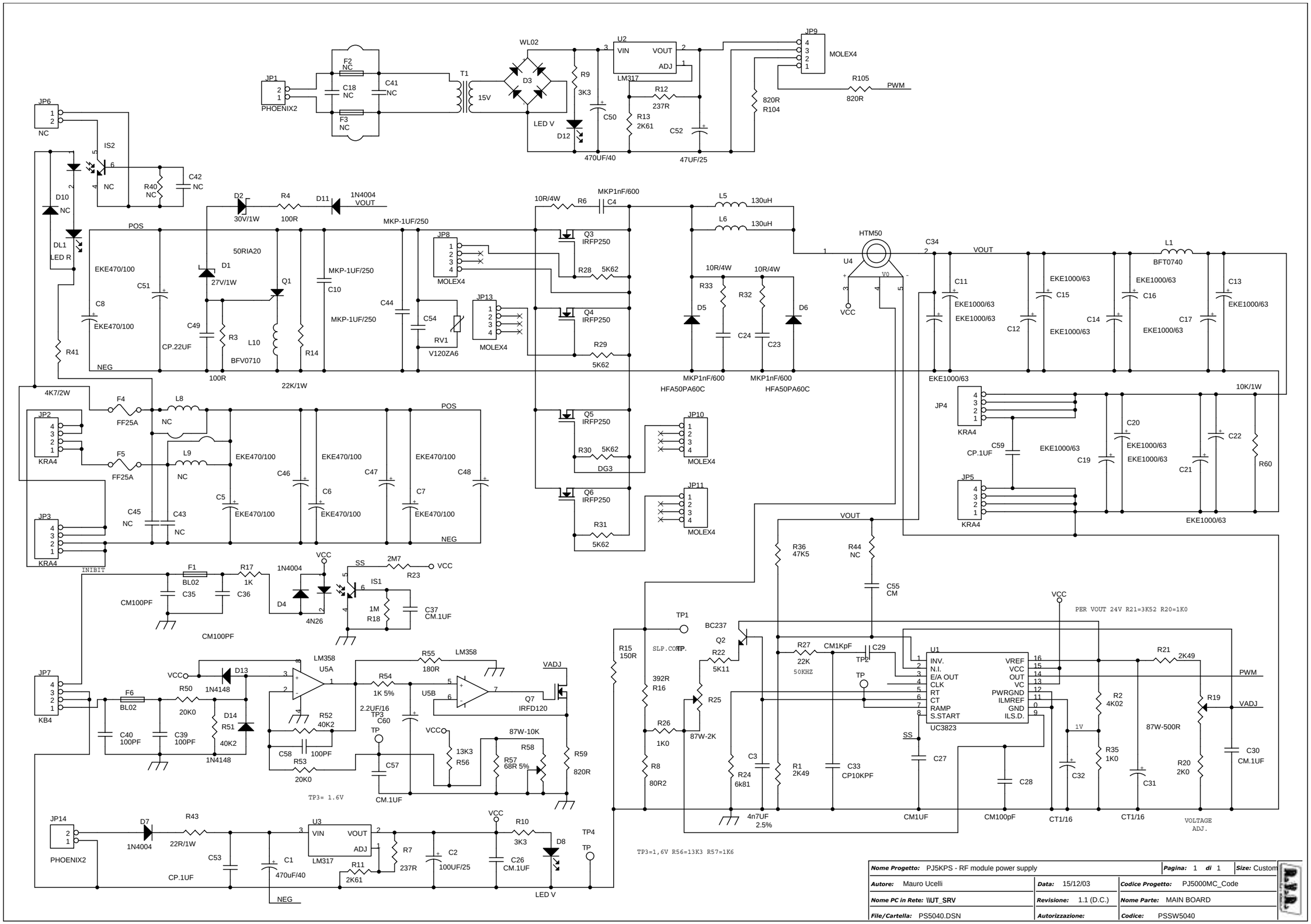
Nome Progetto: PJ5000MC - Driver modulo 1.2 kW		**Pagina:** 1 **di** 1	**Size:** A3
Autore: Mauro Ucelli	**Data:** 07/06/01	**Codice Progetto:** <>	
Nome PC in Rete: \\UT_SRV	**Revisione:** 1.0	**Nome Parte:** RF Driver 1KW Unit	
File/Cartella: DRIVER1KW.DSN	**Autorizzazione:**	**Codice:** CSDRVRFPJ5KM	

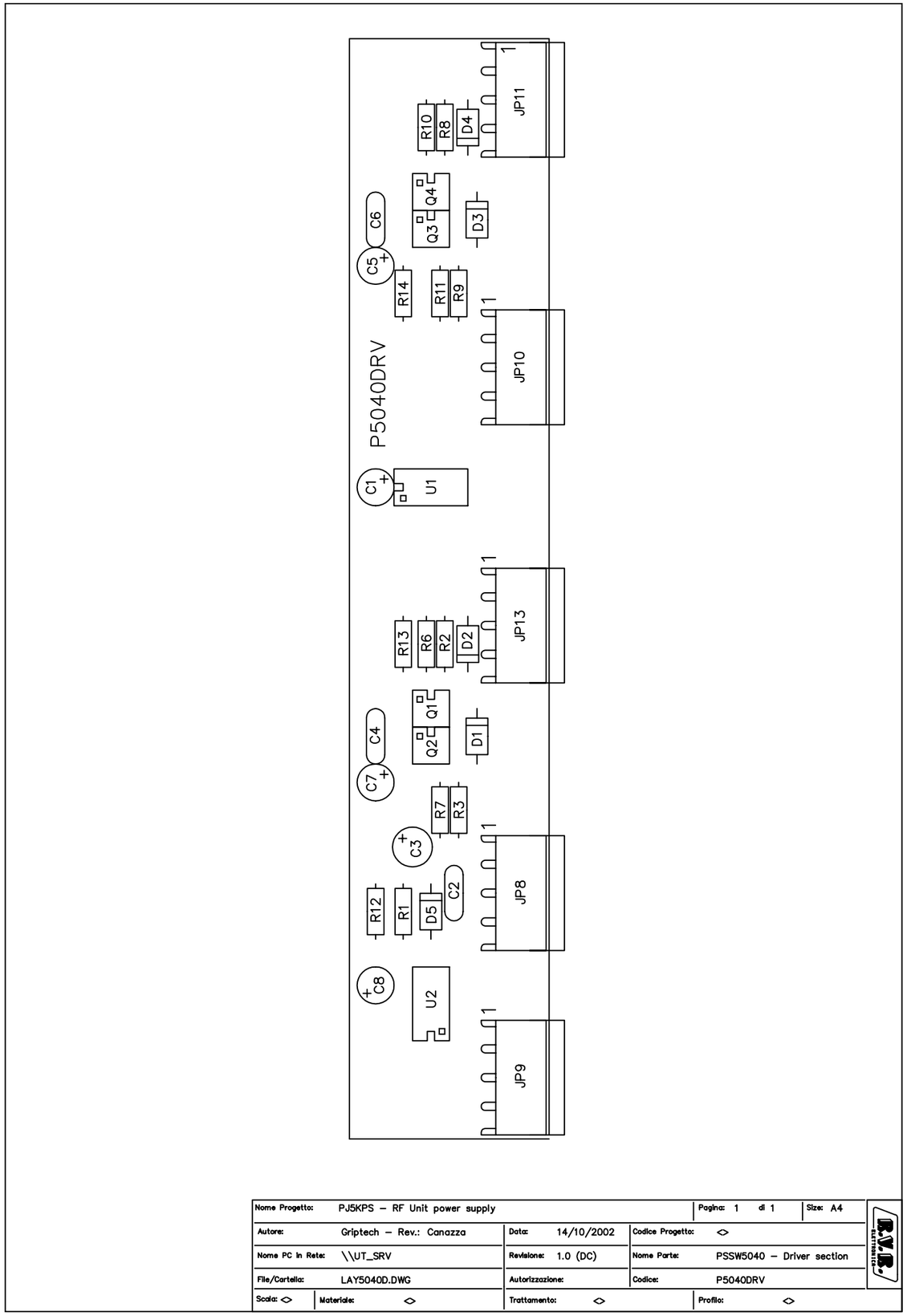
CSDRVRFPJ5KM Bill Of Materials Page1

Item	Q.ty	Reference	Part
1	8	C1,C5,C17,C25,C27,C39, C43,C44	680p_HQ
2	2	C11,C2	100n_63V
3	24	C3,C4,C6,C7,C8,C9,C10, C12,C13,C14,C15,C16,C18, C19,C20,C21,C23,C24,C29, C30,C33,C34,C35,C36	4n7
4	1	C22	33uF_63V
5	4	C26,C31,C37,C40	Cxx
6	1	C28	2/20p
7	1	C32	1p
8	1	C38	10p_CC
9	1	C41	22p_HQ
10	1	C42	270p_CC
11	2	C45,C46	47p
12	1	DCPLR1	DIR_CPLR
13	1	D1	R_LED-G3
14	1	D2	Y_LED-G3
15	2	D3,D4	HSMS2800
16	1	D5	G_LED-G3
17	2	D7,D6	1N4004
18	1	JP1	FLATT_16PP
19	2	L2,L1	VK200
20	1	L3	6_W
21	1	L4	4_W
22	1	MOS1	BLF175
23	1	RV1	20k
24	1	RV2	1K
25	4	RY1,RY2,RY3,RY4	RLTQ2A
26	1	R1	10_1/4W
27	2	R2,R3	10k
28	5	R4,R5,R6,R7,R9	1k_1/4W
29	1	R8	22_1W
30	2	R11,R10	27
31	1	R12	680_1/4W
32	2	R13,R17	2k2
33	1	R14	1k
34	4	R15,R16,R18,R19	150
35	5	R20,R21,R24,R25,R29	Rxx
36	2	R22,R28	470
37	1	R23	6.8_1/4W
38	2	R26,R27	1
39	2	R31,R30	1k5_2W
40	1	S1	76PRB04
41	6	TL1,TL2,TL3,TL4,TL5,TL6	Z50
42	5	TL7,TL8,TL9,TL10,TL14	Z50_E1.5
43	1	TL11	Z50_E12
44	1	TL12	Z50_E6
45	1	TL13	Z50_E3
46	1	TP1	RF_OUT
47	1	TP2	RF_INP
48	1	TP3	RF_GND
49	1	TRF1	IN_MATCH

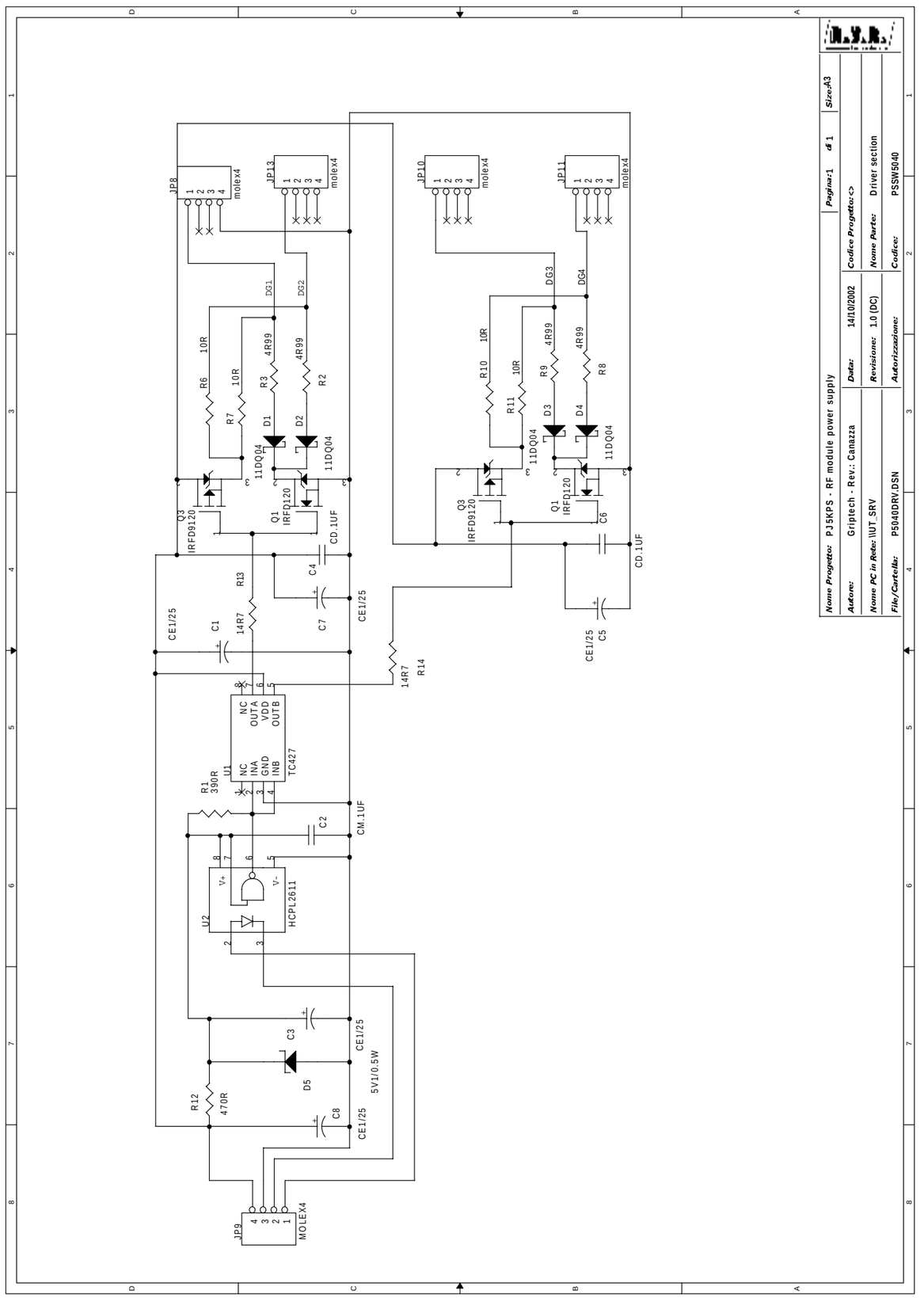


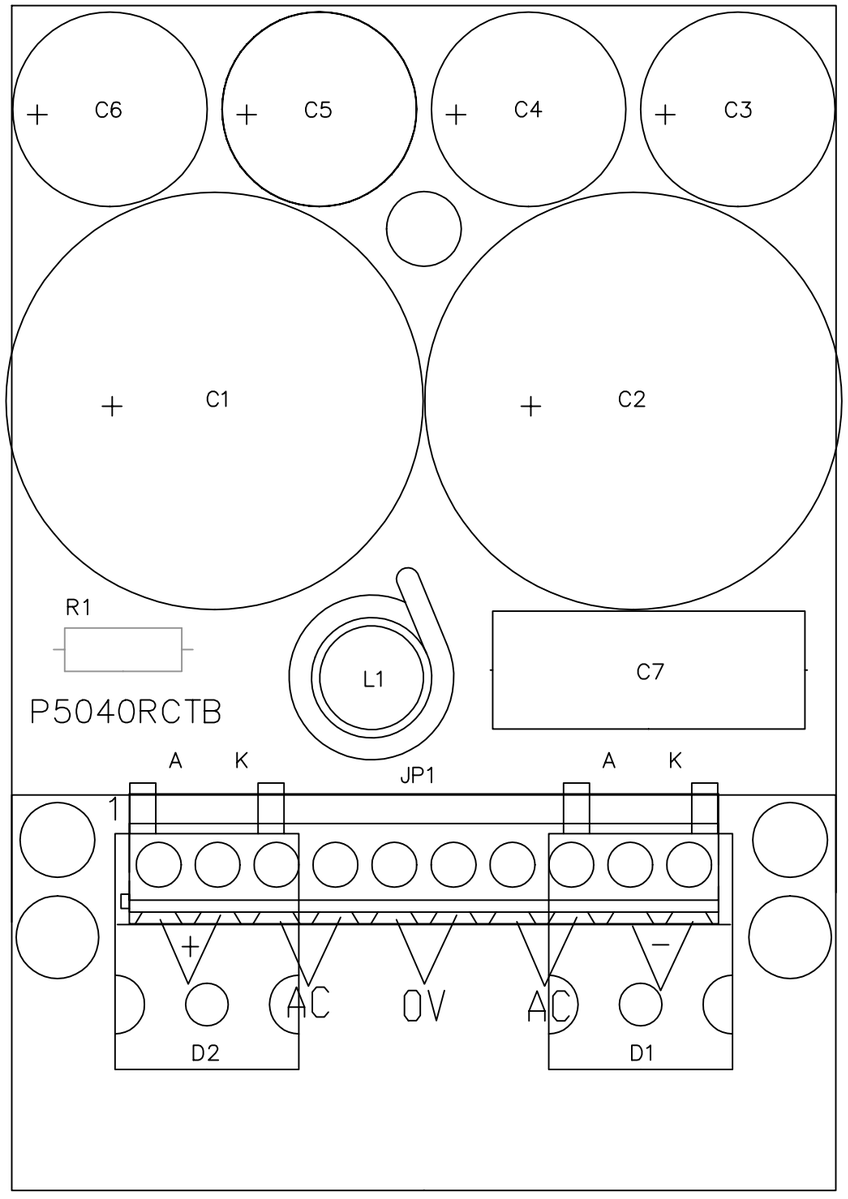
Nome Progetto:	PJ5KPS – RF Module power supply			Pagina: 1 di 1	Size: A3
Autore:	Griptech – Rev.: Canazza	Data:	14/10/2002	Codice Progetto:	<>
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Main section
File/Cartella:	LAY5040M.DWG	Autorizzazione:		Codice:	PSSW5040
Scala: <>	Materiale: <>	Trattamento:	<>	Profilo:	<>


JP1
PHOENIX2
F2
NC
F3
NC
C18
NC
C41
NC
T1
15V
WL02
D3
R9
3K3
LED V
D12
C50
470UF/40
U2
VIN
VOUT
ADJ
LM317
R12
237R
R13
2K61
C52
47UF/25
JP9
MOLEX4
R105
PWM
820R
820R
R104
JP6
NC
IS2
NC
R40
NC
C42
NC
D10
NC
DL1
LED R
R41
POS
NEG
EKE470/100
C51
C8
EKE470/100
CP.22UF
C49
R3
100R
L10
BFV0710
D1
50RIA20
27V/1W
Q1
R14
22K/1W
MKP-1UF/250
C10
MKP-1UF/250
C44
C54
RV1
V120ZA6
JP13
MOLEX4
D2
30V/1W
R4
100R
D11
1N4004
VOUT
MKP-1UF/250
JP8
MOLEX4
10R/4W
R6
MKP1nF/600
C4
Q3
IRFP250
R28
5K62
Q4
IRFP250
R29
5K62
L5
130uH
L6
130uH
10R/4W
10R/4W
R33
R32
D5
D6
C24
C23
MKP1nF/600
HFA50PA60C
MKP1nF/600
HFA50PA60C
HTM50
U4
VCC
C34
VOUT
C11
EKE1000/63
EKE1000/63
C12
C15
EKE1000/63
EKE1000/63
C14
C16
EKE1000/63
EKE1000/63
C17
L1
BFT0740
C13
EKE1000/63
EKE1000/63
4K7/2W
JP2
KRA4
F4
FF25A
F5
FF25A
L8
NC
L9
NC
EKE470/100
C5
EKE470/100
C46
C6
EKE470/100
C47
C7
EKE470/100
C48
POS
NEG
C45
NC
C43
NC
JP3
KRA4
INIBIT
Q5
IRFP250
R30
5K62
DG3
Q6
IRFP250
R31
5K62
JP10
MOLEX4
JP11
MOLEX4
JP4
KRA4
C59
CP.1UF
EKE1000/63
C19
C20
EKE1000/63
EKE1000/63
C21
C22
EKE1000/63
10K/1W
R60
JP5
KRA4
VOUT
R36
47K5
R44
NC
C55
CM
F1
BL02
R17
1K
CM100PF
C35
C36
CM100PF
1N4004
D4
4N26
SS
2M7
R23
VCC
IS1
1M
R18
C37
CM.1UF
JP7
KB4
F6
BL02
C40
100PF
C39
100PF
R50
20K0
D14
R51
40K2
1N4148
1N4148
D13
LM358
U5A
R52
40K2
R53
20K0
C58
100PF
R54
1K 5%
2.2UF/16
TP3
C60
C57
CM.1UF
TP3= 1.6V
R55
180R
LM358
U5B
VADJ
Q7
IRFD120
87W-10K
R58
R57
68R 5%
13K3
R56
R59
820R
TP1
SLP.CONTP.
BC237
Q2
R22
5K11
R15
150R
392R
R16
R25
R26
1K0
87W-2K
R8
80R2
R27
22K
50KHZ
CM1KpF
C29
TP2
TP
C3
R24
6k81
R1
2K49
C33
CP10KPF
4n7UF
2.5%
U1
INV.
N.I.
E/A OUT
CLK
RT
CT
RAMP
S.START
VREF
VCC
OUT
VC
PWRGND
ILMREF
GND
ILS.D.
UC3823
SS
C27
C28
CM1UF
CM100pF
1V
C32
CT1/16
CT1/16
R2
4K02
R35
1K0
R21
2K49
PWM
87W-500R
R19
VADJ
R20
2K0
C31
C30
CM.1UF
VOLTAGE
ADJ.
PER VOUT 24V R21=3K52 R20=1K0
TP1=1,6V R56=13K3 R57=1K6
JP14
PHOENIX2
D7
1N4004
R43
22R/1W
CP.1UF
C53
U3
VIN
VOUT
ADJ
LM317
C1
470uF/40
R11
2K61
R7
237R
C2
100UF/25
R10
3K3
C26
CM.1UF
D8
LED V
TP4
TP
NEG
Nome Progetto: PJ5KPS - RF module power supply
Pagina: 1 di 1
Size: Custom
Autore: Mauro Ucelli
Data: 15/12/03
Codice Progetto: PJ5000MC_Code
Nome PC in Rete: \\UT_SRV
Revisione: 1.1 (D.C.)
Nome Parte: MAIN BOARD
File/Cartella: PS5040.DSN
Autorizzazione:
Codice: PSSW5040

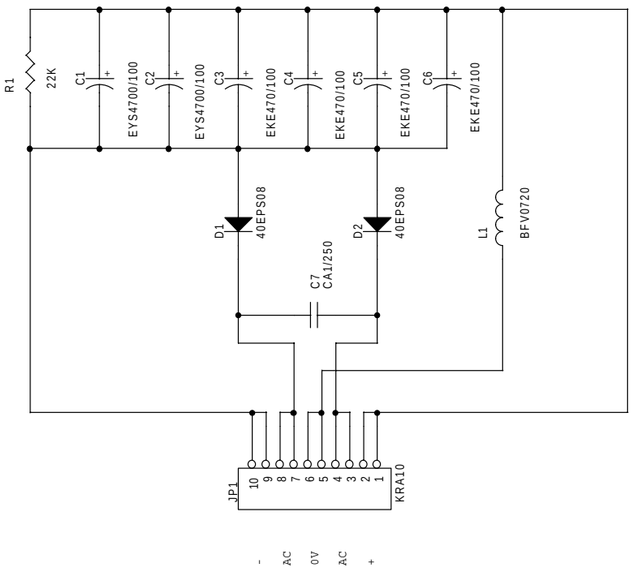


Nome Progetto:	PJ5KPS – RF Unit power supply			Pagina: 1 di 1	Size: A4
Autore:	Griptech – Rev.: Canazza	Data:	14/10/2002	Codice Progetto:	<>
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	PSSW5040 – Driver section
File/Cartella:	LAY5040D.DWG	Autorizzazione:		Codice:	P5040DRV
Scala: <>	Materiale: <>	Trattamento: <>		Profilo: <>	





Nome Progetto:	PJ5KPS – RF Module power supply			Pagina: <Nr.>di <tot.>	Size: <Size>
Autore:	Griptech – Rev.: Canazza	Data:	14/10/2002	Codice Progetto:	<>
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Rectifier sections
File/Cartella:	5040R.DWG	Autorizzazione:		Codice:	P5040RCTB
Scala: <>	Materiale: <>	Trattamento: <>		Profilo: <>	



Nome Progetto:	PJ5KPS - RF module power supply			Pagina: 1 di 1	Size: A3
Autore:	Griptech - Rev.: Canazza	Data:	14/10/2002	Codice Progetto:	<>
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Rectifier section
File/Cartella:	P5040RCT.DSN	Autorizzazione:		Codice:	P5040RCTB

PSSW5040 Bill Of Materials Page1

Item	Q.ty	Reference	Part
1	2	Q7, Q1	IRFD120
2	4	Q3, Q4, Q5, Q6	IRFP250
3	1	Q3	IRFD9120
4	5	C1,C3,C5,C7,C8	CE1/25
5	2	C1,C2	EYS4700/100
6	2	C1,C50	470UF/40
7	5	C2,C26,C30,C37,C57	CM.1UF
8	1	C2	100UF/25
9	1	C3	4n7UF
10	10	C3,C4,C5,C6,C7,C8,C46, C47,C48,C51	EKE470/100
11	2	C6,C4	CD.1UF
12	3	C4,C23,C24	MKP1nF/600
13	1	C7	CA1/250
14	3	C10,C44,C54	MKP-1UF/250
15	12	C11,C12,C13,C14,C15,C16, C17,C19,C20,C21,C22,C34	EKE1000/63
16	11	IS2,F2,F3,L8,L9,D10,C18, R40,C42,R44,C45	NC
17	1	C27	CM1UF
18	3	C28,C35,C36	CM100PF
19	1	C29	CM1KpF
20	2	C32,C31	CT1/16
21	1	C33	CP10KPF
22	3	C39,C40,C58	100PF
23	3	JP6,C41,C43	NC
24	1	C49	CP.22UF
25	1	C52	47UF/25
26	2	C53,C59	CP.1UF
27	1	C55	CM
28	1	C60	2.2UF/16
29	1	DL1	LED R
30	2	D2,D1	40EPS08
31	1	D1	27V/1W
32	4	D1,D2,D3,D4	11DQ04
33	1	D2	30V/1W
34	1	D3	WL02
35	3	D4,D7,D11	1N4004
36	1	D5	5V1/0.5W
37	2	D6,D5	HFA50PA60C
38	2	D12,D8	LED V
39	2	D14,D13	1N4148
40	2	F6,F1	BL02
41	2	F4,F5	FF25A
42	1	IS1	4N26
43	1	JP1	KRA10
44	2	JP1,JP14	PHOENIX2
45	4	JP2,JP3,JP4,JP5	KRA4
46	1	JP7	PHOENIX4
47	5	JP8,JP9,JP10,JP11,JP13	MOLEX4
48	1	JP12	JUMPER2
49	1	L1	BFT0740
50	1	L1	BFV0720
51	2	L6,L5	130uH
52	1	L10	BFV0710
53	1	Q1	50RIA20
54	1	Q2	BC237
55	1	RV1	V120ZA6
56	1	R1	22K
57	1	R1	390R
58	2	R21,R1	2K49
59	1	R2	4K02
60	4	R2,R3,R8,R9	4R99
61	2	R3,R4	100R
62	4	R6,R7,R10,R11	10R
63	3	R6,R32,R33	10R/4W
64	2	R12,R7	237R
65	1	R8	80R2
66	2	R9,R10	3K3
67	2	R11,R13	2K61
68	1	R12	470R
69	2	R13,R14	14R7
70	1	R14	22K/1W
71	1	R15	150R
72	1	R16	392R
73	1	R17	1K
74	1	R18	1M
75	1	R19	87W-500R
76	1	R20	2K0
77	1	R22	5K11
78	1	R23	2M7
79	1	R24	6k81
80	1	R25	87W-2K
81	2	R26,R35	1K0
82	1	R27	22K
83	4	R28,R29,R30,R31	5K62
84	1	R36	47K5
85	1	R41	4K7/2W
86	1	R43	22R/1W
87	2	R50,R53	20K0
88	2	R51,R52	40K2
89	1	R54	1K 5%
90	1	R55	180R
91	1	R56	13K3
92	1	R57	68R 5%
93	1	R58	87W-10K
94	3	R59,R104,R105	820R
95	1	R60	10K/1W
96	4	TP1,TP2,TP3,TP4	TP
97	1	T1	15V
98	1	U1	UC3823
99	1	U1	TC427
100	2	U3,U2	LM317
101	1	U2	HCPL2611
102	1	U4	HTM50
103	1	U5	LM358