PJ20KPS-C/PJ25KPS-C

User & Technical Manual

R.V.R.
ELETTRONICA

BROADCAST EQUIPMENT

C E

EC Declaration of conformity

R.V.R. Elettronica S.p.A. declares that this transmitter is in conformity to the essential requirements and to other relevant regulations settled by the 1999/5/CE directive.

Validity of the EC declaration of conformity.

WARNING: the conformity of this product is not valid if the product is used in conditions not authorized by R.V.R. Elettronica as described in the user manual.
Examples of conditions in which the conformity is not valid (indicative list):
The connection between the exciter and the amplifier (i) indicated in the present document is not done properly;
The components used are different from those used and recommended by R.V.R. Elettronica S.p.A.;
The additional devices used are not suitable and/or are generating signals which are not suitable to those supported by the product;
The product is used in operative conditions different from the normal working conditions for which the product was designed (temperature, humidity, supply voltage, …);
Any modification on parts of the product without any prior authorization from R.V.R. Elettronica S.p.A..

Limitations for the use of the product in the EEC member countries.

This product is a radio transmitter for FM broadcasting .
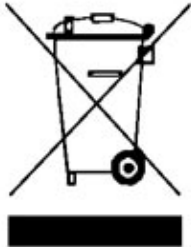It can work on operative frequencies which are not harmonized in the EEC member countries.
Whoever uses this product, should obtain the authorization from the spectrum local administrative authority before starting using it.
The user is responsible for the configuration of the working frequency, the output power, and for the other characteristics of the installation to which the transmitter described in the present documentation is part of, in order to respect the limitations described in the authorization received by the competent local authority.

Waste Electrical or Electronic Equipment (WEEE)

This symbol indicates that you should not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.

CAUTION

Do discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.

Index

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1. Introduction

This manual describes the PJ20KPS-C/PJ25KPS-C, a solid-state RF amplifier designed for frequency modulation sound broadcasting, manufactured by **R.V.R. Elettronica S.p.A.** Being the PJ20KPS-C/PJ25KPS-C a combination of two PJ10KPS-C or PJ12K5PS-C, in this manual is described the general operation of the transmitter and of the devices present in addition, instead of with regard to the single transmitter refer to the manual of PJ10KPS-C.

> **This manual is an integral part of the manual PJ10KPS-C
> and not replacement.**

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 S.p.A. 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.

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 S.p.A. 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 (twenty four) month warranty.

For components like tubes for power amplifiers, the original manufacturer's warranty applies. R.V.R. Elettronica S.p.A. extends to the original end-user purchaser all manufacturers warranties which are transferable and all claims are to be made directly to R.V.R. per indicated procedures.

Warranty shall not include:
1   You damn that are verified each other during the consignment of the machine to the R.V.R. for possible reparations;
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 should 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.

2   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.

3   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.

4   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

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

6   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
email: info@rvr.it
Web: www.rvr.it

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 back on 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

Figura 3-1   Figura 3-2

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

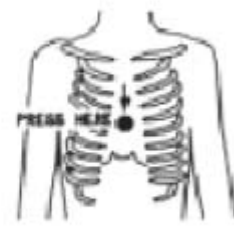Figura 3-3   Figura 3-4   Figura 3-5

*   In case of only one rescuer, 15 compressions alternated to two breaths.
*   If there are two rescuers, the rhythm shall be of one brath each 5 compressions.
*   Do not interrupt the rhythm of compressions when the second person is giving brath.
*   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 PJ20KPS-C/PJ25KPS-C 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 PJ20KPS-C/PJ25KPS-C transmitter is made up of modules inserted in a 19" rack. The main apparatuses are:

- 20 RF amplifier modules at 1.2 kW nominal (PJ20KPS-C)
- 20 RF amplifier modules at 1.4 kW nominal (High efficiency) (PJ25KPS-C)
- 1 Control unit called Master control unit (MCU)
- 1 Hybrid coupler -3dB
- 1 Dummy load
- 4 Power supply
- 1 Service rack (optional)

In standard configuration is supplied with two racks of 40 units as an option you can have a rack for 40 units of services that can be installed on the right (as shown) or to the left of the transmitter.

TX1   TX2   SERVICE
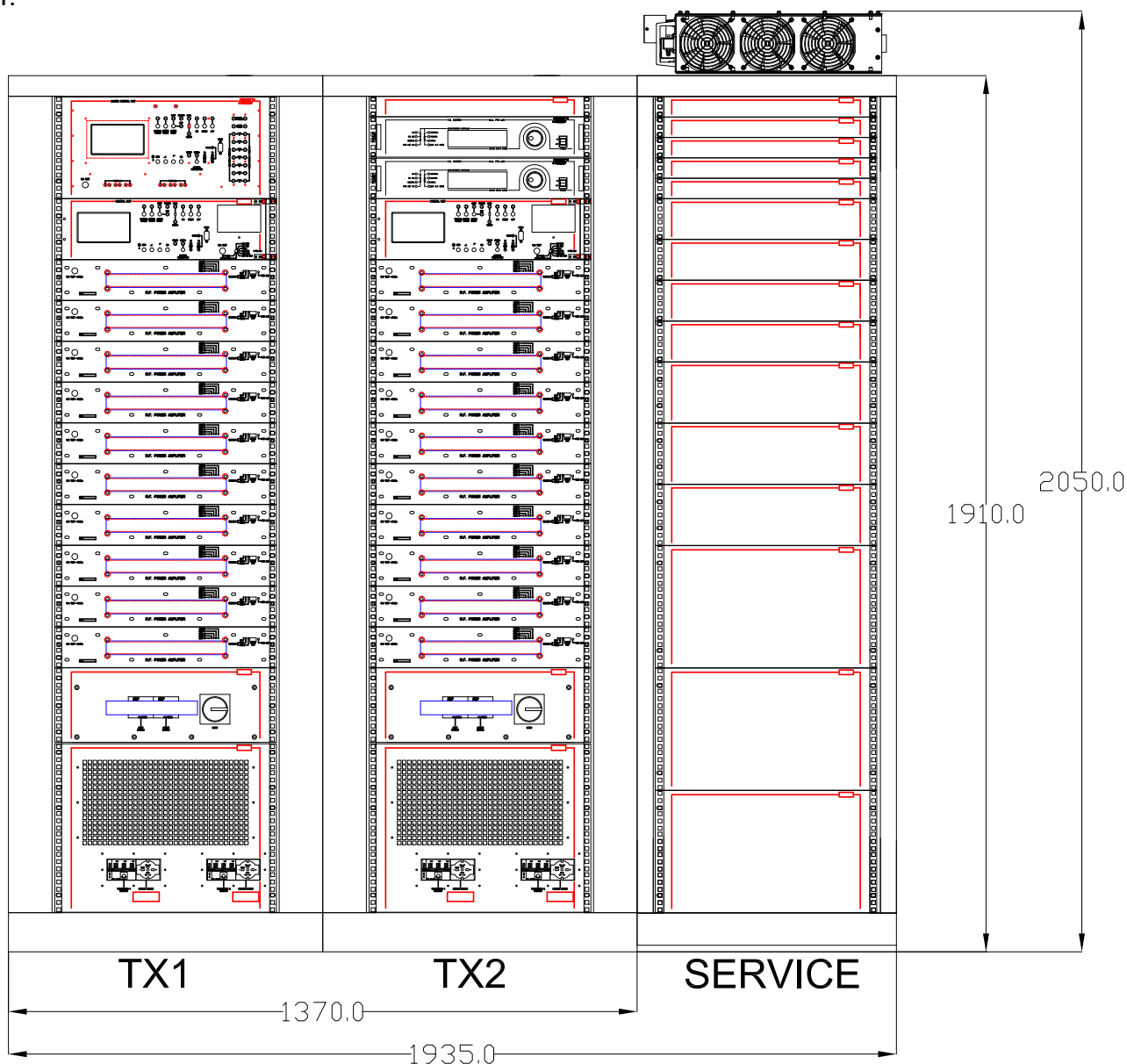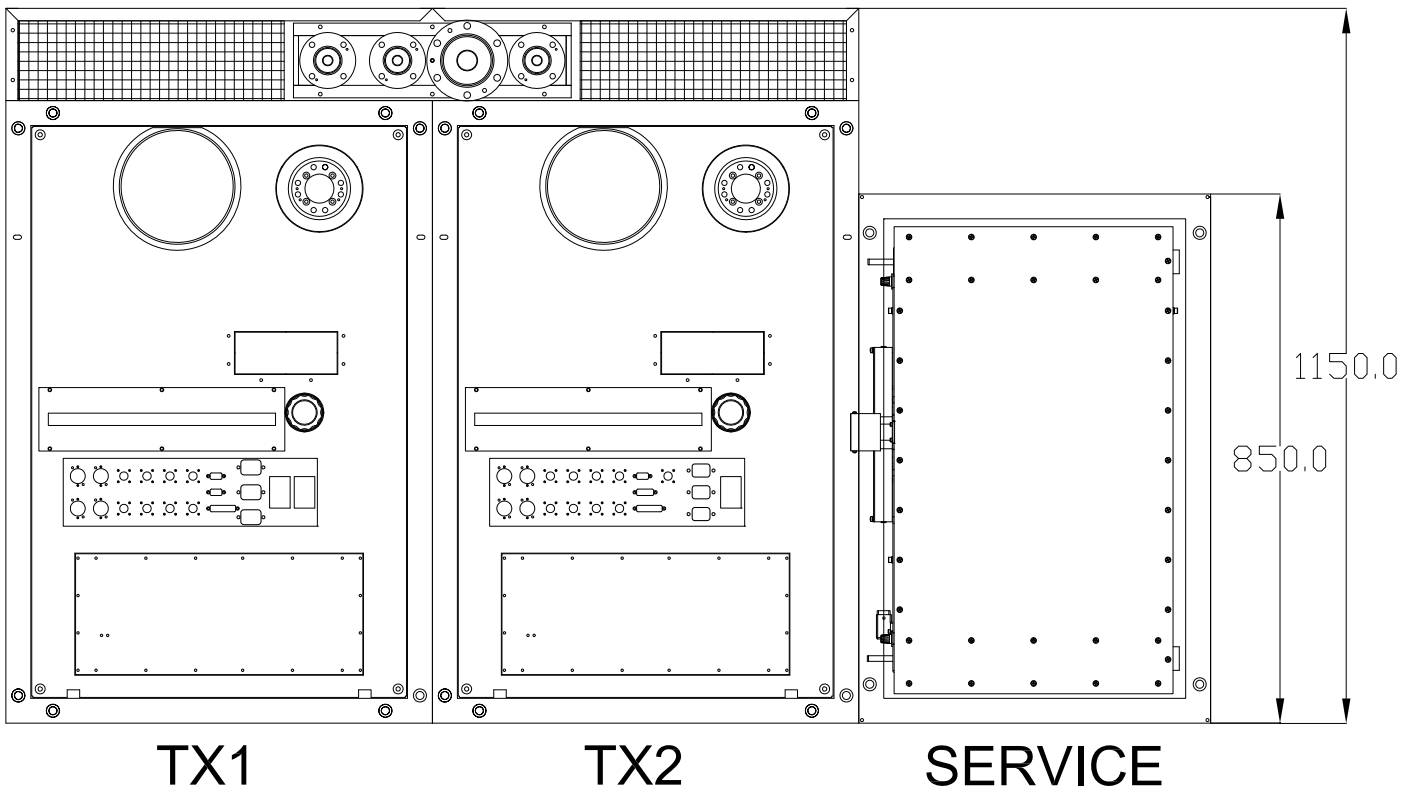
4.2   Technical specifications

	PJ20KPS-C	PJ25KPS-C
Frequency range	87.5 - 108.0 MHz	
Nominal RF power	20000 - 21000 W	25000 - 26250 W
Power supply voltage	220/380V Threephase, 3F+N	
Exciting power	Max. 100 W	
Consumption	35 Kw	37 Kw
Power factor	0.98	

5. Master control unit (MCU)

The operator controls and checks the status of the amplifier by means of the common contro unit (CCU).
NB: the following as an example the PJ20KPS-C, but the meaning applies in similar manners also for the PJ25KPS-C.
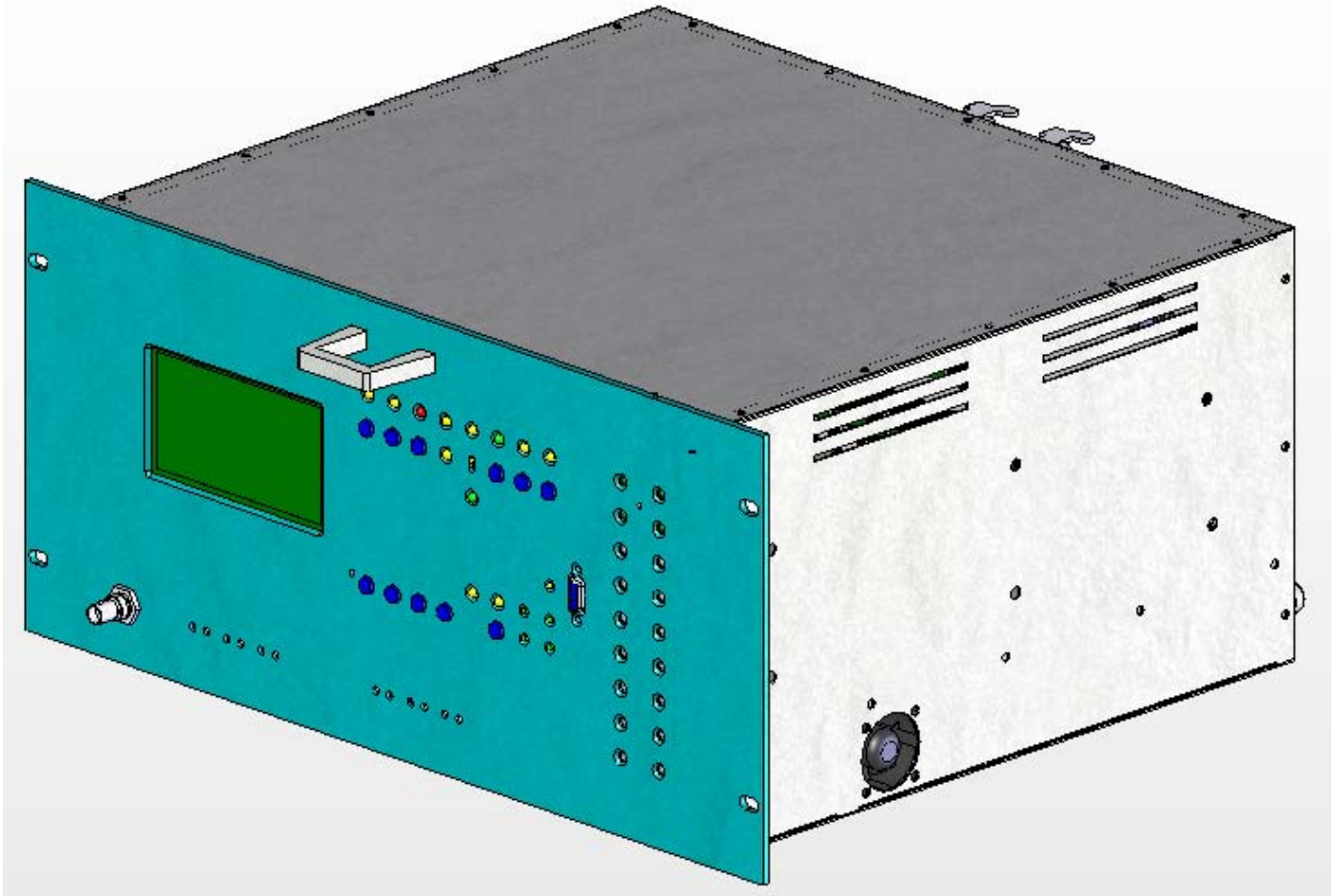
Three control groups are present on this unit:

• LCD and scroll buttons

• Buttons, selector switches and LEDs
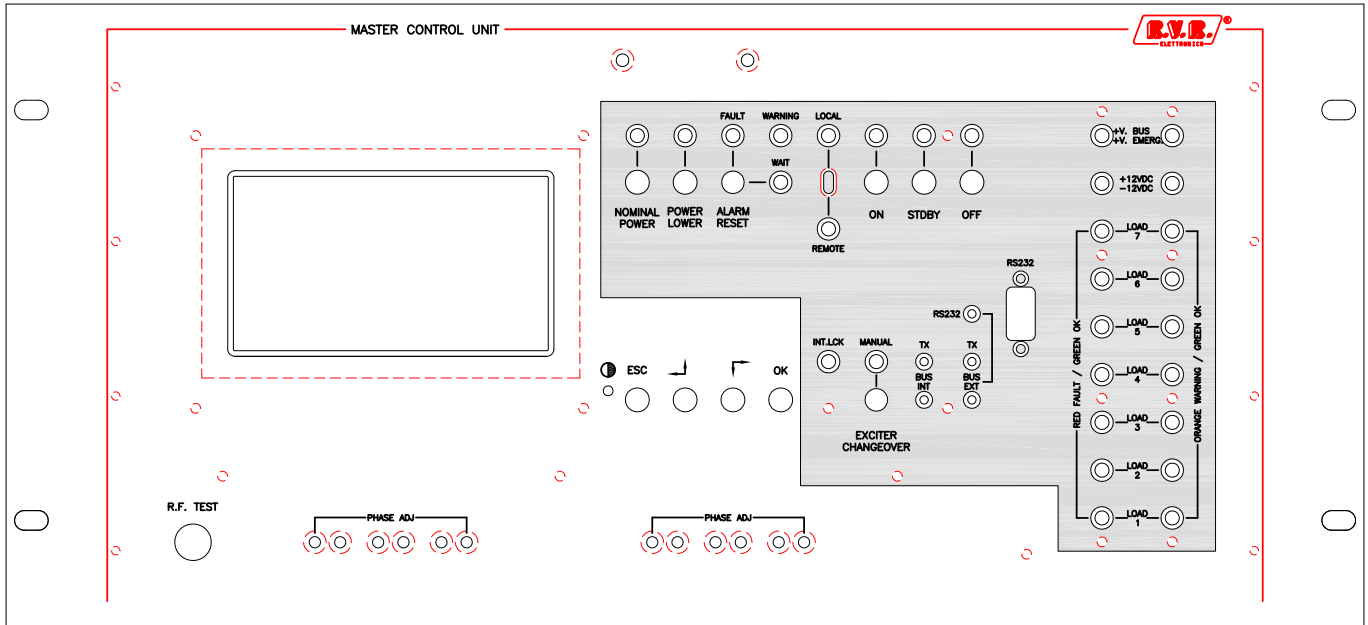
• Phase ADJ
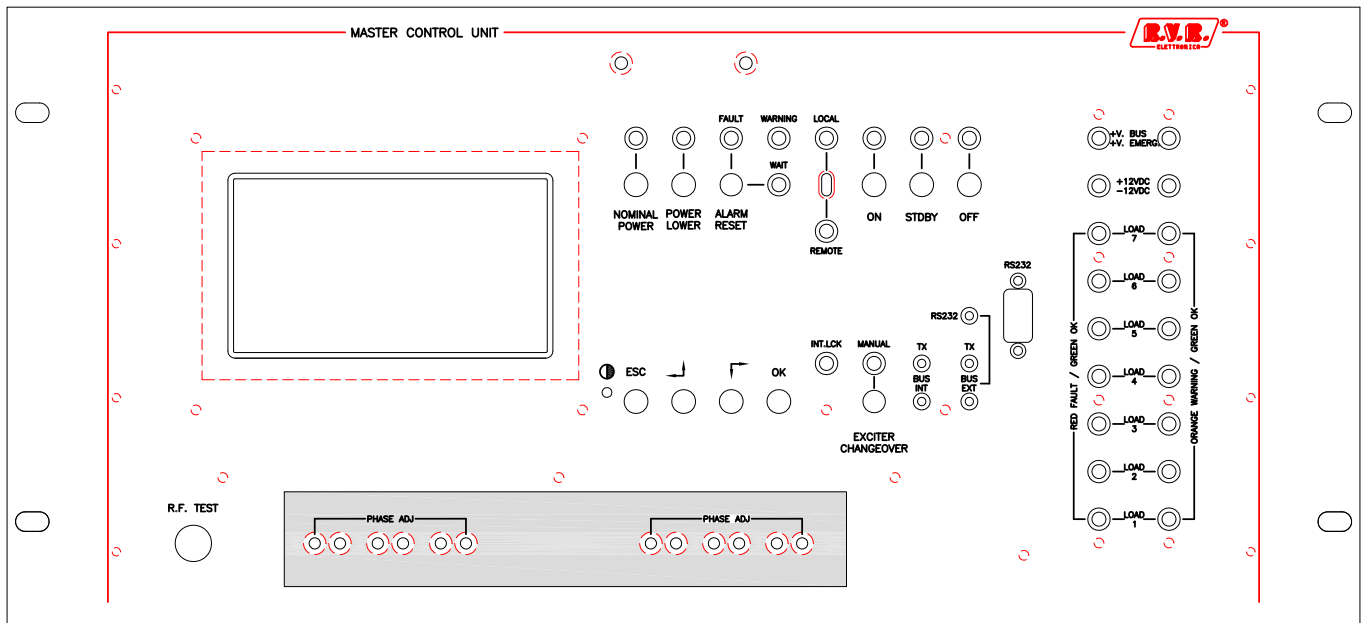
5.1   LCD Display

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:

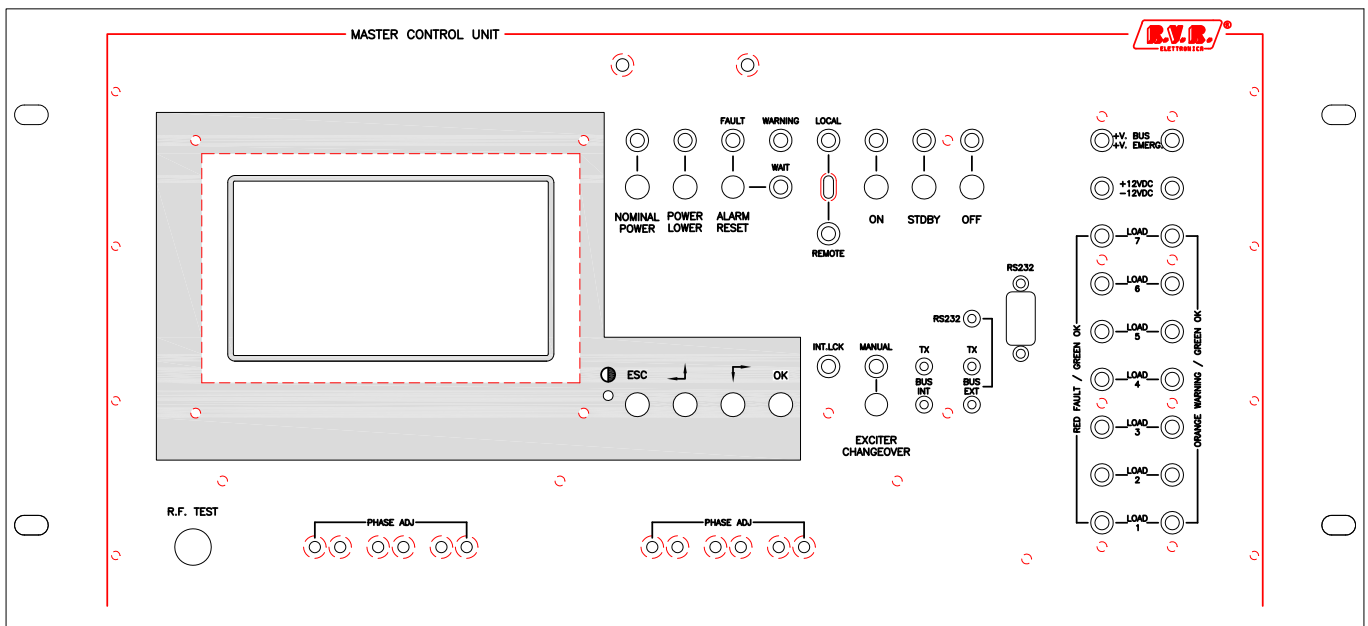| Pulsante	Descrizione
OK	Click this button to access a sub-menu, to enter the editing mode or to confirm a modified value.
ESC	Click this button to exit from a menu or to cancel the modification of a value.
⌐	Click this button to scroll inside a menu (to the right or down) or to reduce the value of 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.
◑	Trimmer for the regulation of the contrast of display the LCD

When the operator is not using the various buttons to navigate, the LCD displays the preset screenful that shows the "Output Power" that it indicates the forward and reflected output power (Figure 5-1).
As indicated on the preset screenful, push the ESC button to access at the "Overall Status" menù (Figure 5-2).

Figure 5-1

5.1.1   Overall Status Menù

This menu includes only indications, therefore the user cannot insert any input in its different lines.(Figure 5-2).

Menù Line	Description
Timer (when enabled)	Indication of the start and stop times of the automatic power reduction feature - see "Settings" menù
Master Control unit	Status of the master control unit (Off or On) and indication of the exciter actually connected to the amplifier (Exct.1 or Exct.2)
R.F. Combiner-1	Status of the RF combiner board RF1
R.F. Combiner-2	Status of the RF combiner board RF2
Control unit-1	State of the control unit of the TX1
Control unit-2	State of the control unit of the TX2
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

By pressing the Ok key as indicated on the last line, you can shift to the exchange screen from which you can have access to the "Select" menù (Figure 5-3).

Figure 5-2

Note: All control unit (that of TX1 and TX2) must be in REMOTE otherwise will come visualized "Time-out". If from LOCAL it is passed REMOTE, will have to pass approximately 30/40 sec. before being able to visualize the relative state.

5.1.2   Select Menù

This is the exchange menu from which you can select the different sub-menus that compose the software.(Figure 5-3).

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

Menù Line	Description
Master Control unit	General status of the PJ20KPS-C/PJ25KPS-C
R.F. Combiners	Status of RF combiners
Control Units	Status of the control units

Menù Line	Description
Alarms	Summary of the occured alarms
Service	Service menu
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 PJ20KPS-C/ PJ25KPS-C
Release	Information concerning the hardware and software versions of the modules composing the unit
Modem	Settings related to the optional telemetry system
Passwords	Setting and changing the password to change the parameters of the menu settings

To return to the predefined menu press key ESC many times.

Figure 5-3

5.1.3   Master Control Unit Menù

Informative menu on the inputs and the outputs of the MCU of the machine (Figure 5-4).

Menù Line	Description
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)
Mains	Indicates the status of phase control at the rear of the TX1. **Must be ON in order to ensure that the entire transmitter functions, otherwise remain locked and the only visual alarm, will be the LED WAIT lit on the MCU. There appears no alarm line in "Alarms Menu"**
L.P. Timer	Input status of the modality of automatic reduction of the power
Reserve-1	Input status "Reserve 1" (JP8/2)

Reserve-2	Input status "Reserve 2" (JP8/3)
Reserve-3	Input status "Reserve 3" (JP8/4)
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)
PG1	Status of output PG1
PG2	Status of output PG2
RFL1	Status of output RFL1
RFL2	Status of output RFL2
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 5-4

5.1.4   R.F. Combiners Menù

This menu contains the information related to the RF part of the complete transmitter. (Figure 5-5).

Menu Line	Description
Antenna Fwd	RF power emitted by the transmitter
Antenna Rfl	RF power Reflected antenna
Load-1 Fwd	RF power on the dummy load
Load-1 Rfl	RF power reflected on the dummy load
Load-1 Alr.	State of the clickson of 120° C on the dummy load: Alr means that if is protection activated the 120° C and the transmitter is immediately stopped and goes to FAULT. Only the intervention of a technician or a reset by telemetry (if the temperature alarm is no longer present) will restart the transmitter.
Load-1 Wrn.	State of the clickson of 50° C on the dummy load: Alr means that if is protection activated the 50° C, the transmitter continues to run but care is needed, probably load fans are not working or there is too much power on the unbalanced load.
Stand-by (In)	Not used
Stand-by 1 (Out)	Not used
Stand-by 2 (Out)	Not used

Figure 5-5

5.1.5   Control Units Menù

This menu contains information regarding the status of all machines that make up the trasmettiore (Figure 5-6 and 5-7).

Menu Line	Description
Control Unit 1 - Overall Status	
Control Unit	State of the control (Off or On) of TX1
Power Supply	State of Power supply board (On or Off) of TX1
R.F. Combiner	State of RF combiner board (Off or On) of TX1
R.F. Unit-x	State of RF amplifier module number N (Off or On) of TX1

In the angle low to right of the display the symbol is present his means that

an ulterior relative page to this menu is available (Figure 5-6 or 5-7), that it is possible to visualize using the key-arrow.

Menu Line	Description
Control Unit 2 - Overall Status	
Control Unit	State of the control (Off or On) of TX2
Power Supply	State of Power supply board (On or Off) of TX2
R.F. Combiner	State of RF combiner board (Off or On) of TX2
R.F. Unit-x	State of RF amplifier module number N (Off or On) of TX2

Figure 5-6

Figure 5-7

5.1.6   Alarms Menù

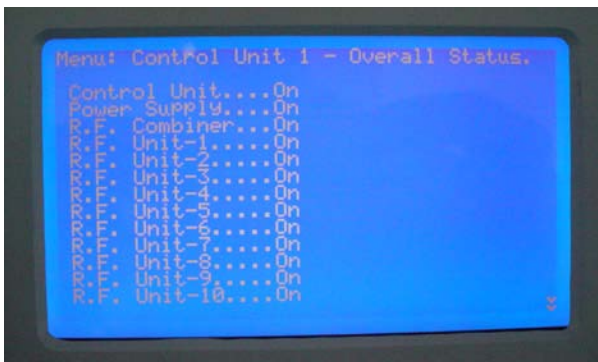This screen describes all the registered events which are relevant to determine the probable causes of any dysfunction. The screen is composed of a variable number of pages (up to 10) in function of the number of events occurred (Figure 5-9). The last events in chronological order are shown in the first page and so on. To shift to the different pages, use the arrow buttons

It is not possible to cancel the alarms visualized in this menu if not by personal RVR

Menu Column	Description
Unit	Module of the system which generated the failure
Err	Type of failure and description. For more information see chapter 5.4
Time	Time (hrs and minutes) at which the failure occured
Date	Date at which the failure occured

Figure 5-9

5.1.7   Service Menù

This menu is normally used during the maintenance operations. When this screen is visualized, the Master Control Unit interrogate each transmitter apparatus 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. This menu is deactivated after 60 minutes if no key is selected. (Figure 5-10).

Menu Line	Description
Fwd	Forward power globally emitted by the amplifier
Unb	Unbalancing power dissipated in the dummy load connected to the combiner
C.U.-1	Forward power supplied from the transmitter 1
C.U.-2	Forward power supplied from the transmitter 2
Load-1	Forward power on the dummy load of the transmitter

Figure 5-10

5.1.8 Settings Menù

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.(Figure 5-11).

Note: this menu is password protected, to make changes necessary to enter the user password in "Password Menu" (see chap. 5.1.13)

Menu Line	Description
Nominal Pwr	Setting of the level of nominal power, expressed as a percentage of the maximum power level. This is the level that the PJ20KPS-C/PJ25KPS-C must reach when the Power Nominal button is pressed, except in case of dysfunction
Low Power	Setting of the reduced power level, expressed as a percentage of the maximum power level. This is the level that the PJ20KPS-C/PJ25KPS-C must reach when the Power Lower button is pressed, except in case of dysfunction.
PG1	Level (Limit) at which the "Power Good" PG1 is launched. This level is expressed as a percentage of the full-scale to which PWG1 is connected, indicated in the column Assign
PG2	See PG1
RFL1	Level (Limit) at which the "Reflex" RFL1. This level is expressed as a percentage of the full-scale to which RFL1 is connected, indicated in the column Assign
RFL2	See RFL1
Exc' wait time	Delay before assuming the on air exciter is faulty
Talk Address	Address of the unit in the RS485 network
Time	Visualization and setting of the internal clock of the unit
Date	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	Command to write the configuration in the two RF boards combiner of the MCU. This must be done only in case of replacement of one of them.

Figure 5-11

5.1.9 Exciters Menù

This menu is used to configure the settings of the exciters (Figure 5-12).

Menu Line	Description
Main Exc	Output power of the exciter currently on air
Stdby Exc	Output power of the exciter currently on the internal dummy load
Main Exciter	Visualization of the "on air" exciter. When positioning the cursor on this line, with the arrow buttons and by pressing OK, 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 OK it is possible to switch on and off the exciter.
Exct.2	Same as Exct.1 for the second exciter

Figure-12

Nota: the exchange of the eccitatori and the relative cursor are available only if the logic of exchange is set to manual and the yellow LED is lit.

5.1.10 Info Menù

This screen informs the user about the configuration of the transmitter. (Figure 5-13).

Menu Line	Description
S.N.	Serial number of the transmitter
Talk Addr.	Address of the RS485 port of the transmitter,it must be obligatorily 3
Software V.	Software version installed in the CCU
Baud Rate	Baud rate of the serial port
User Code	Reserved for technical RVR
Exciter	Number of the exciters in the transmitter: this can be "Single" or "Dual"
Cfg. N+1	Configuration of the transmitter as a N+1 system

Figure 5-13

5.1.11 Release Menù

This menu show the address, the kind of configuration, the software version and the hardware version of all the microprocessor boards of the transmitter.(Figure 5-14).

Menu Line	Description
M. Ctrl. Unit	Information on the MCU
RF Combiner-1	Information of the RF combiner board RF 1
RF Combiner-2	Information of the RF combiner board RF 2
Ctrl. Unit-1	Information on the Control Unit of TX1
Ctrl. Unit-2	Information on the Control Unit of TX2

Figure 5-14

5.1.12 Modem Menù

This screen informs the user about the configuration of the optional telemetry GSM (Figure 5-14). The parameters on this screen can be displayed only if the selector switch on the CCU is located at a REMOTE location, if it is placed in the LOCAL screen appears as in Figure 5-15

Menu Line	Description
I.D.	Identification of the address of the transmitter, usually 1. In the case of multiple transmitters in N +1 configuration will be given numbers in ascending order, one for each transmitter
Name	Mnemonic name of the station, like place or frequency
S.C.N	Service center number of your mobile operator
Info	Name of service provider
Dial	Normally, ATDT
Phone	Phone numbers that will receive the alert messages
Level	GSM signal level
Status	State Modem
Retry	Number of messages to send. We suggest to set this value to at least 2, in case of problems with the SMS Service Centre.
Type	Modem type, usually GSM

Figure 5-14

Figure 5-15

5.1.13   Password Menù

This screen is used to set or change the password to access some functions (Figure 5-15a).

Menu Line	Description
System Administrator	For service personnel RVR
User Password	Here is inserted the user password to make changes in the "settings menu", otherwise you can only see it. The password is factory set to "0" (zero).
User Password change	Used to change the user password

Figure 5-15a

5.2   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.(Figure 5-16).
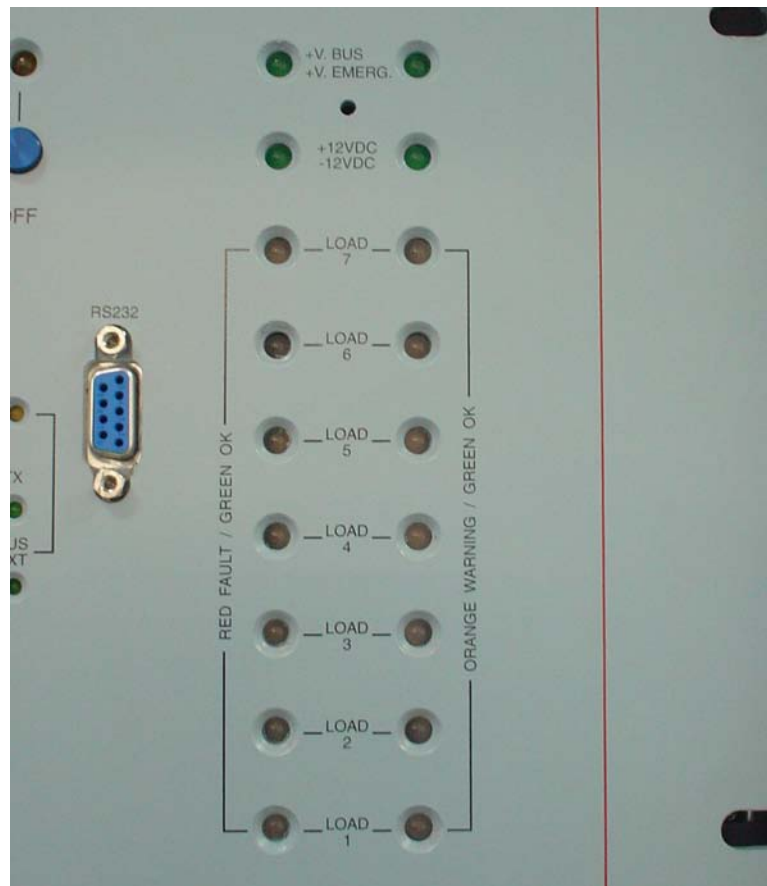

Figure 5-16

The functions performed by the controls are as follows:

Funzione	Descrizione
OFF	Button for turning off the machine. 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 modules are placed in a position of On, the pump turns on and the command must be set EXCITER CHANGEOVER automatic.The RF power supply is activated. If the command is set to MANUAL CHANGEOVER EXCITER (led on), exciters will block interlock and have to go through in "exciters menu" of CCU to enable them manually.The exciters should deliver a power of at least 15 W to start the transmitter.

	The power delivered by the RF modules will remain stuck at about 800-900 W for about 10 sec., After which it will begin the regular ramp up and reach the set power.
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 to reset the alarm type FAULT or WARNING.
POWER LOWER	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 (see 5.1.9)
NOMINAL POWER	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. (see 5.1.9)
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.
LED WARNING	This LED indicates an attention condition (something is not working properly, but the amplifier is still running)
LED FAULT	This LED indicates a fault (the amplifier is blocked, and required the intervention of an operator for the restoration)
LED WAIT	This LED indicates the status of waiting (the amplifier is temporarily disabled, but will be reactivated automatically when the blockage is removed, or after a set period of time depending on the type of protection)
LED INT.LCK	This LED indicates an external inhibition. This check is run on the parallel interface (JP4/4)
LED TX-BUS INT	These LEDs indicate the activity of the serial bus 485 through which the CCU acquires the status every second of the modules
LED RS-232 TX-BUS EXT	These LEDs indicate the communication between the CCU and a PC connected to the RS-232

+V. BUS	Indicates the presence of voltage at the output of the rectifier on the common bus supply module (80 V dc).
+V. EMERG.	Indicates the presence of voltage on the emergency buttons of the two transmitters in order to activate the relay when you press the button. If this voltage is not present on the transmitter will not start
+12VDC	Indicates the presence of +12 Vdc output of the voltage regulators in the MCU
-12VDC	Indicates the presence of -12 Vdc output of the voltage regulators in the MCU
LOAD 1	State of the temperature sensor on the dummy load N° 1 Green LED: OK Led Orange: WARNING. Alarm temperature of 50 ° C. The transmitter continues to run but be careful occore, load fans probably do not work or there is too much power on the unbalanced load. Red LED: FAULT. Alarm temperature of 120 ° C. The transmitter is immediately stopped and goes to FAULT. Only the intervention of a technician or a reset by telemetry (if the temperature alarm is no longer present) will restart the transmitter.
LOAD 2	How to LOAD 1 (Used only in PJ30KPS/PJ35KPS)
LOAD 3	How to LOAD 1 (Used only in PJ30KPS/PJ35KPS)
LOAD 4	How to LOAD 1 (Currently not used)
LOAD 5	How to LOAD 1 (Currently not used)
LOAD 6	How to LOAD 1 (Currently not used)
LOAD 7	How to LOAD 1 (Currently not used)

5.3   Phase ADJ

It 'a resonant circuit "LC" with variable capacitors on the back of front panel (Figure 5-17). The purpose of this circuit is to attenuate the power to the dummy load connected to the transmitter, by varying the phase of the input signal to each machine 10 Kw.

The calibration of this circuit is made in testing phase, but the working conditions with the connection of the transmitter antenna may require a revision, in this case proceed as follows:

The procedure is repeated by placing first in the wave exciter exciters 1 and then 2 or vice versa.

EXCITER 1

1) Insert the screwdriver into the hole in 1 ° and rotate 180 degrees clockwise (Pull out the screwdriver) and check the value of the power "Unbalanced" in the service menu (note: the contact of the screwdriver to the circuit "LC" to bring information out of the norm , then the readings will be effetuate screwdriver extract)

2) If we obtained a decrease in the value of unbalanced power, switch to the second capacitor at the 2 ° hole and also rotate 180 ° in a clockwise direction.

3) If the operations carried out in step 1 and 2 are still not sufficient to pass to the capacitors of TX2 (3 ° and 4 ° hole), but this time the rotations of the capacitors will need to be in the opposite direction to the previous ones that is in anti-clockwise.

4) If the operation described in step 1 results in an increase of power unbalanced instead of a decrease in the condenser rotate through 360 ° in an anticlockwise direction (180 ° to bring it back to the starting condition + 180 ° to correct the phase and proceed with the subsequent points.

Caution: in this case the operation described in step 3 will provide for a rotation of the capacitors in a clockwise direction (as the second pair of capacitors must move in the opposite direction to the first).

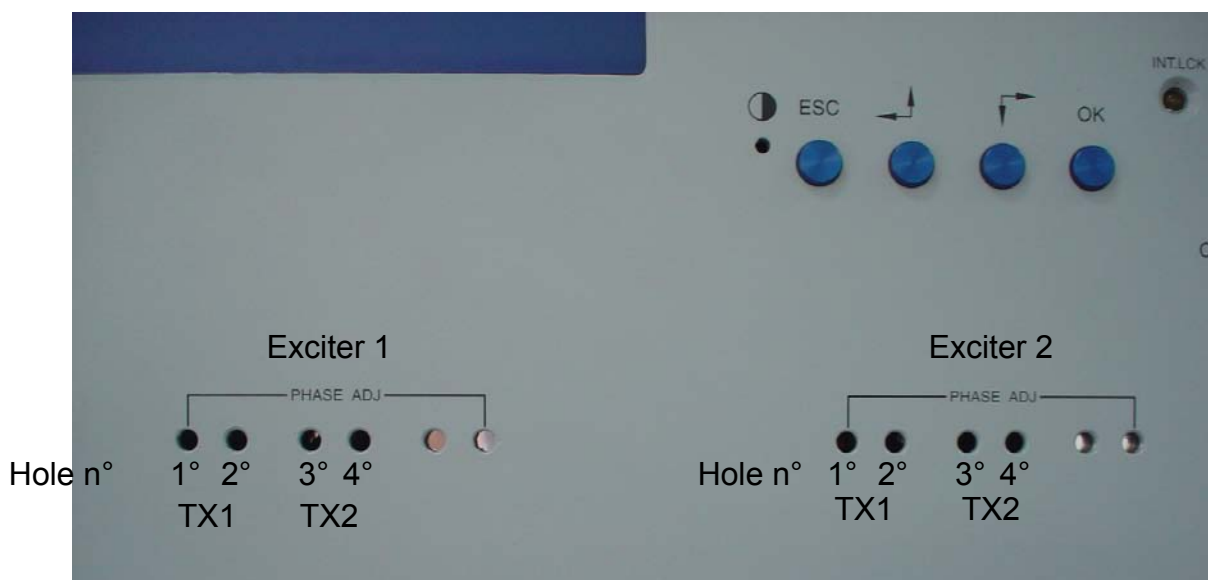Repeat the above operation for EXCITER 2.

Figure 5-17

5.4   Allarmi

The menu Alarms of the control unit reports all the events connected to possible malfunctioning 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:
• M.C.U.   (Master Control Unit)
• Combi 1   (Combiner/Divider 1)
• Combi 2   (Combiner/Divider 2)
• C.U. 1   (Control Unit TX1)
• C.U. 2   (Control Unit TX2)

The type of event allows to identify the origin and the consequence of the fault. The first letter of the type of event can be one of the following:

W   "Wait" event that causes the temporary block of the piece of 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. (Max. 8 attempts)

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

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).

D   "Derating", The transmitter has activated derating. The alarm derating may occur on the MCU module (system derating see Section 5.4.1) or on Form CU x (derating of single machine, refer to the manual PJ10KPS-C).

The possible event types are listed in the table below.

Code	Meaning
Master Control Unit	
-E.Intl	external interlock
-A.Intl	ausiliary interlock
-Audio-1	audio alarm of exciter 1 is active
-Audio-2	audio alarm of exciter 2 is active
-L.P.Tmr.	Low power timer active
-Ris-1	Reserve 1 input is active
-Ris-2	Reserve 2 input is active
-Ris-3	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 three changeover attempts havebeen performed (N+1 configuration)
Combiner-1	
-Fwd -Ant	Alarm forward power antenna
-Fwd -Ld1	Alarm forward power on load 1

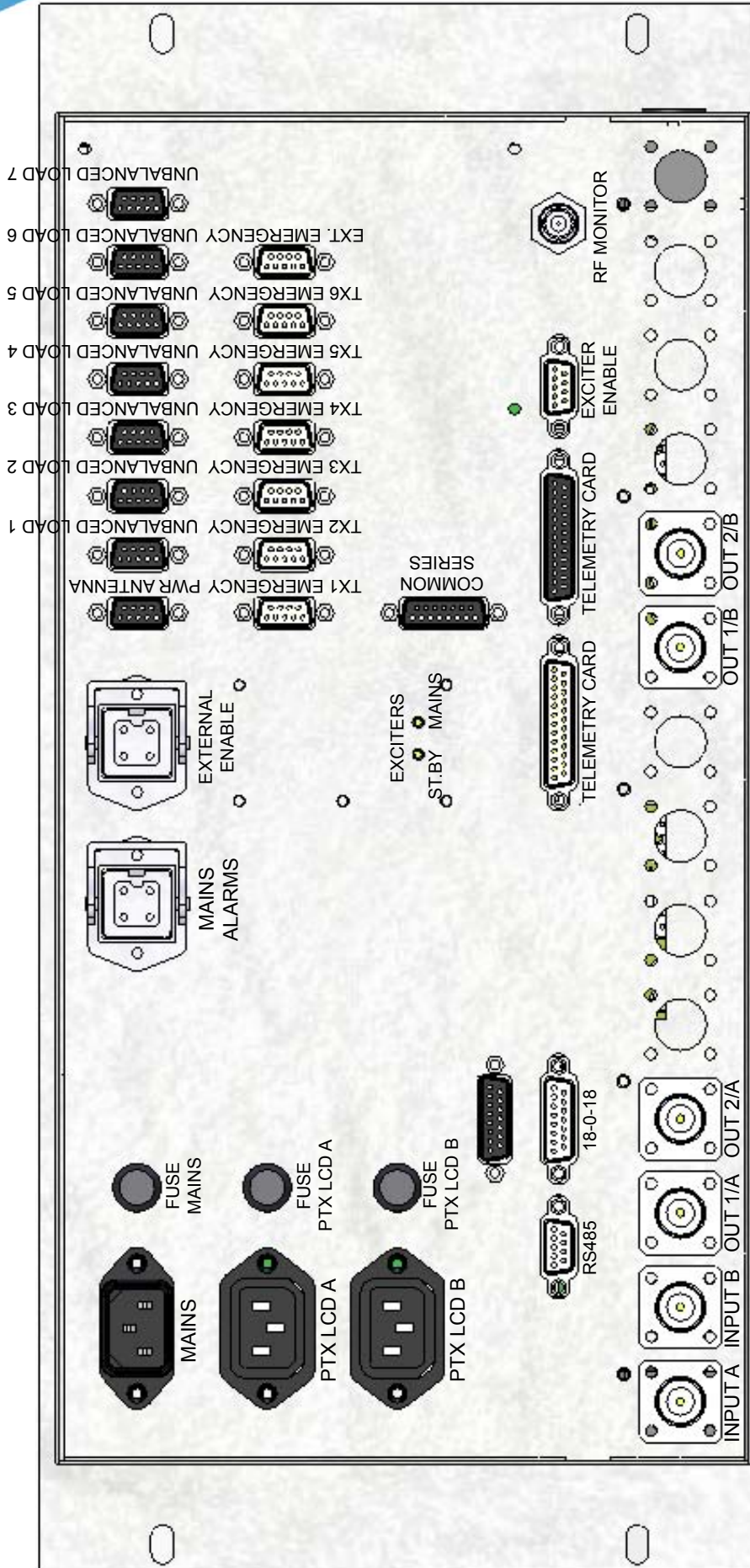| Combiner-2	
-Rfl -Ant	Alarm reflected power antenna
-Rfl -Ld1	Alarm reflected power on load 1
Control Unit	
-Fwd	forward power alarm module
-Rfl	reflected power alarm module
-In	alarm input power module
-Tmp.	high temperature alarm
-Drv. I	driver current above its limit
-Mos 1 I	high current alarm mos1
-Mos 2 I	high current alarm mos2
-Mos 3 I	high current alarm mos3
-Mos 4 I	high current alarm mos4
-Eff.	efficiency too low
-Fuse	module's fuse broken
-O.Tmp.	overheating on the module's heatsink
Various general	
-Derating	single transmitter derating (overall status menu)
-Sys derating	entire system derating (overall status menu)
-Replay err.	bad response from the interrogated module (overall status menu)
-Safety	pressed the emergency button (menu control unit)
Time-out	questioned the module does not respond (overall status menu)
Default Talk Address: 31	address for the default configuration (start of MCU)
Device not configured	control unit is not configured (at the start of MCU)
Waiting for Retry: xxxx sec.	to clear the hold press the ok button (menu ouyput power)
Start Up in Progress	Booting up (start of MCU)
Please Wait	Please wait ..... (start of MCU)

5.4.1   System Derating

In case of anomaly which involves a power unbalanced on the dummy load higher than 3300 W for a time longer than 1 min., it activates the procedure "Derating", which involves a lowering of the power supplied by the transmitter, to a value of about 7000 W.
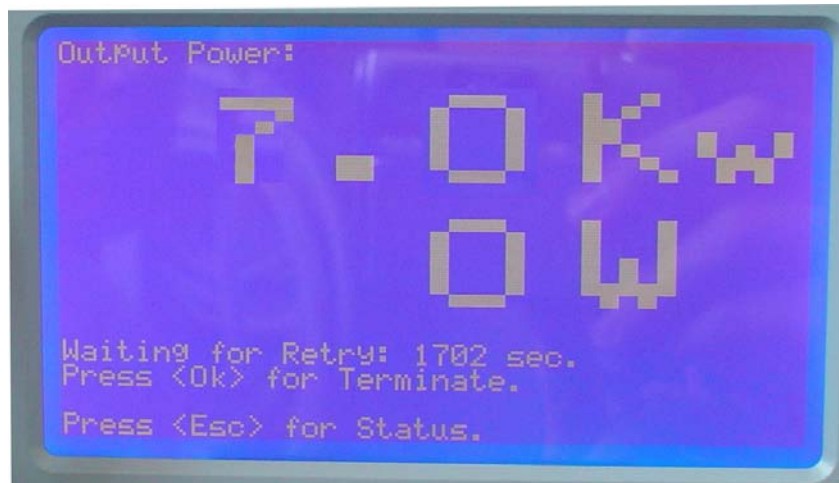

This state persists for 1800 sec. After this time, the MCU resets the nominal power.
If the unbalanced power 3300W still exceed the derating procedure is repeated.
If you do not want to wait until the time of the procedure, press the "OK".

5.5 Rear Panel

| MAINS	VDE power MCU
PTX LCD A	Not used
PTX LCD B	Not used
FUSE MAINS	Fuse MCU
FUSE PTX LCD A	Not used
FUSE PTX LCD B	Not used
MAINS ALARMS	Ilme connector for threephase control
EXTERNAL ENABLE	Free contact (NO or NC), which corresponds to the ON state of the MCU.
RS485	Connecting to the rs-485 bus
18-0-18	Power for GSM telemetry box
TELEMETRY CARD	Connecting to the board electromechanical telemetry
TELEMETRY CARD	Connecting to the board electromechanical telemetry
EXCITER ENABLE	Command to enable the exciter 1 or 2
COMMON SERIES	Connection of the common system bus for the different measures
PWR ANTENNA	Connect the meter to transmitter output
UNBALANCED LOAD 1	Connection to the dummy load 1 for measuring the power and alarms
UNBALANCED LOAD 2	How UNBALANCED LOAD 1 (only used in PJ30/35 KPS-C)
UNBALANCED LOAD 3	How UNBALANCED LOAD 1 (only used in PJ30/35 KPS-C)
UNBALANCED LOAD 4	Non usato
UNBALANCED LOAD 5	Non usato
UNBALANCED LOAD 6	Non usato
UNBALANCED LOAD 7	Non usato
TX1 EMERGENCY	Collegamento del pulsante di emergenza del TX1
TX2 EMERGENCY	Collegamento del pulsante di emergenza del TX2
TX3 EMERGENCY	Come TX1 emergency (usato solo nel PJ30/35 KPS-C)
TX4 EMERGENCY	Not used
TX5 EMERGENCY	Not used
TX6 EMERGENCY	Not used
EXT. EMERGENCY	Connection for a possible external emergency button
INPUT A	Input RF exciters A
INPUT B	Input RF exciters B
OUT 1/A	RF output for TX1
OUT 2/A	RF output for TX2
OUT 1/B	RF output for TX1
OUT 2/B	RF output for TX2
RF MONITOR	BNC for RF testing
EXCITER ST.BY	Trimmer for adjusting the reading of the power in the "menu exciters", of the exciter on the internal dummy load
EXCITER MAINS	Trimmer for adjusting the reading of the power in the "menu exciters" of the exciter on the air

6. Wiring diagrams MCU
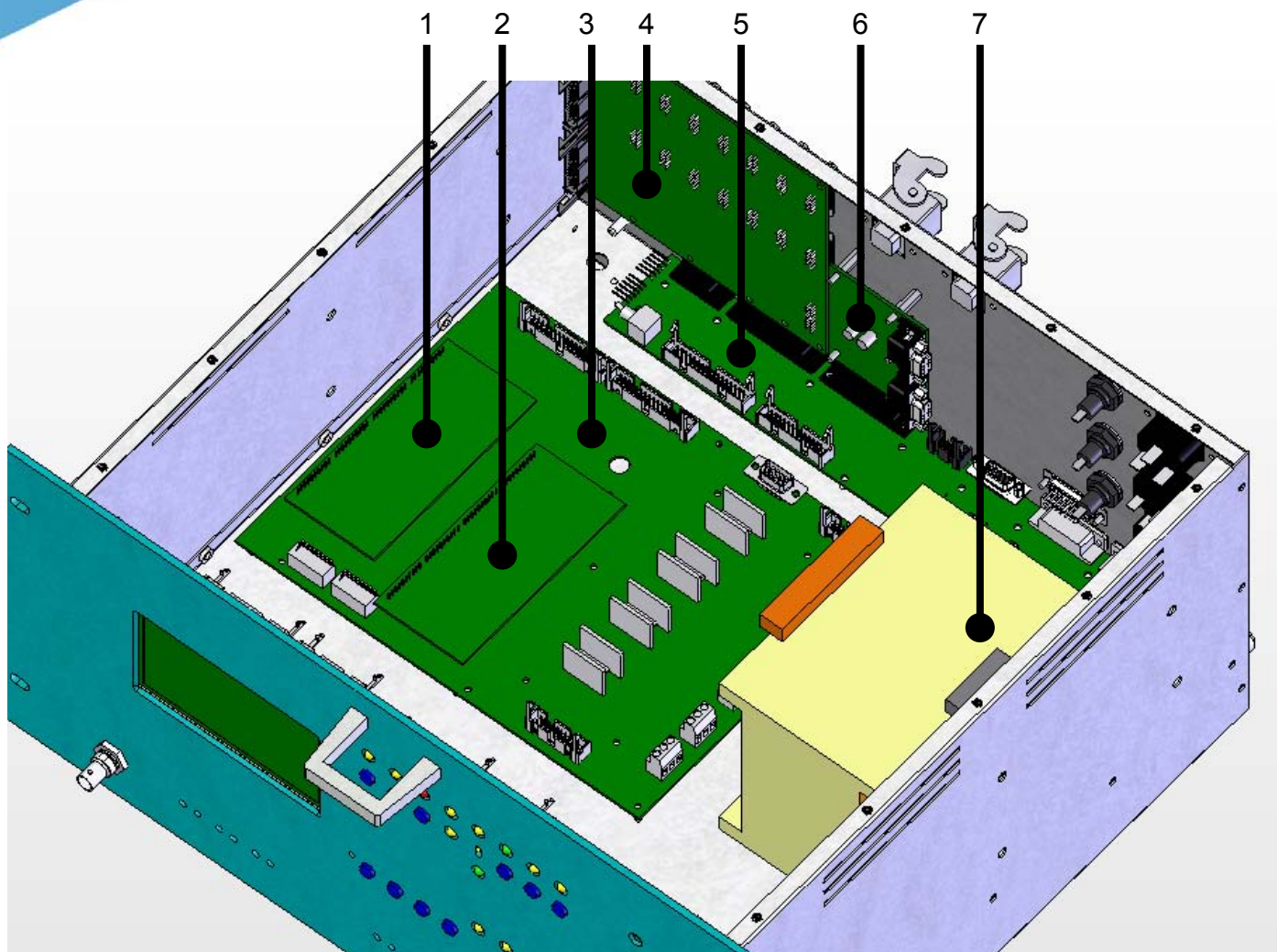
1	CPU board (Combiner 2)	SLCPUPJ5KM2
2	CPU board (Combiner 1)	SLCPUPJ5KM2
3	Main card	SL044IN1002
4	Rear panel card	SL044PC2002
5	Motherboard CCU	SLCCU1PJ5KM2
6	Card measures input splitter	CSSPLMEA5KW1
7	Transformer service	TRFSERVSPL30
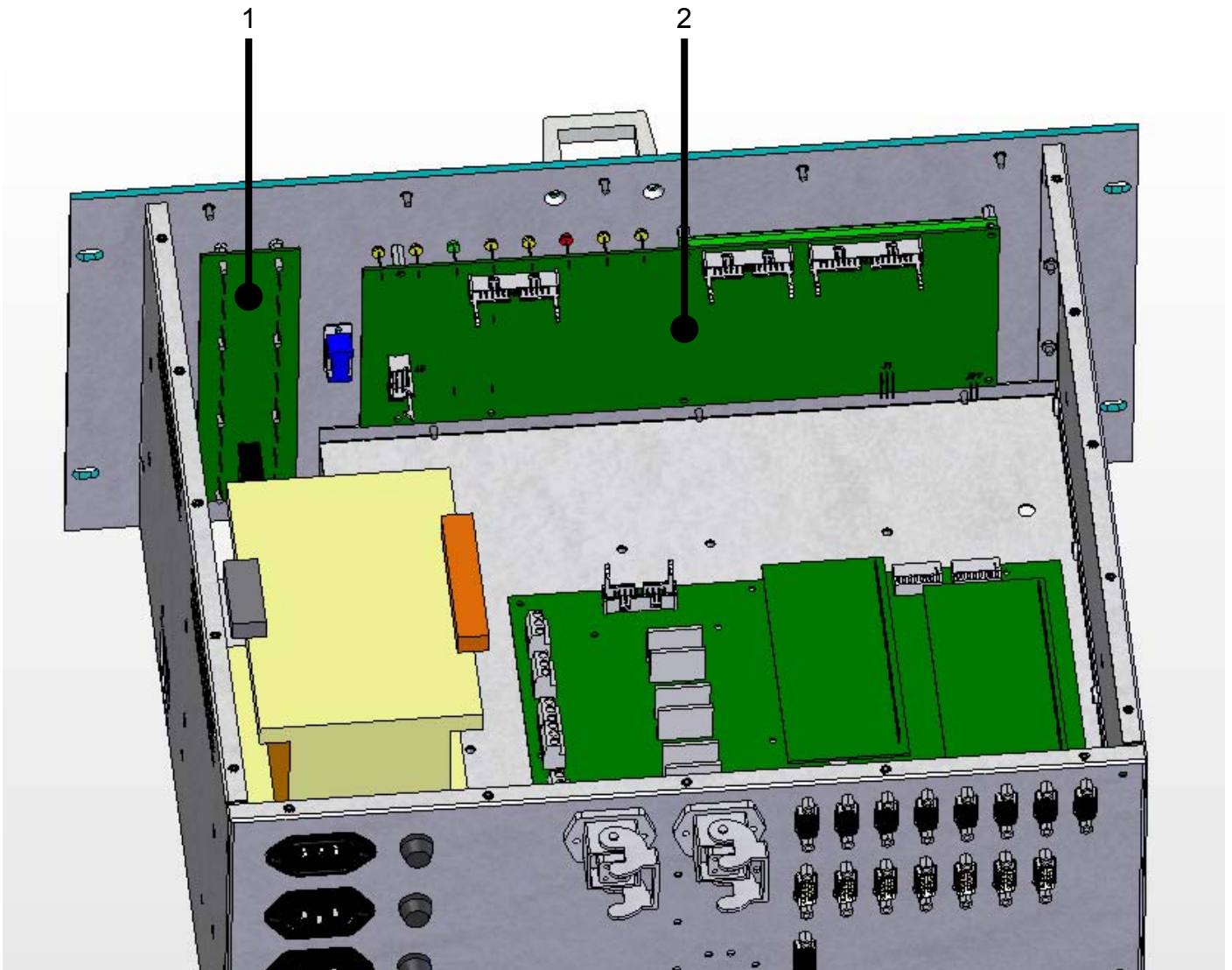
1	Synoptic panel board	SL044PC1001
2	CCU board	SLCCUPJ5KM2
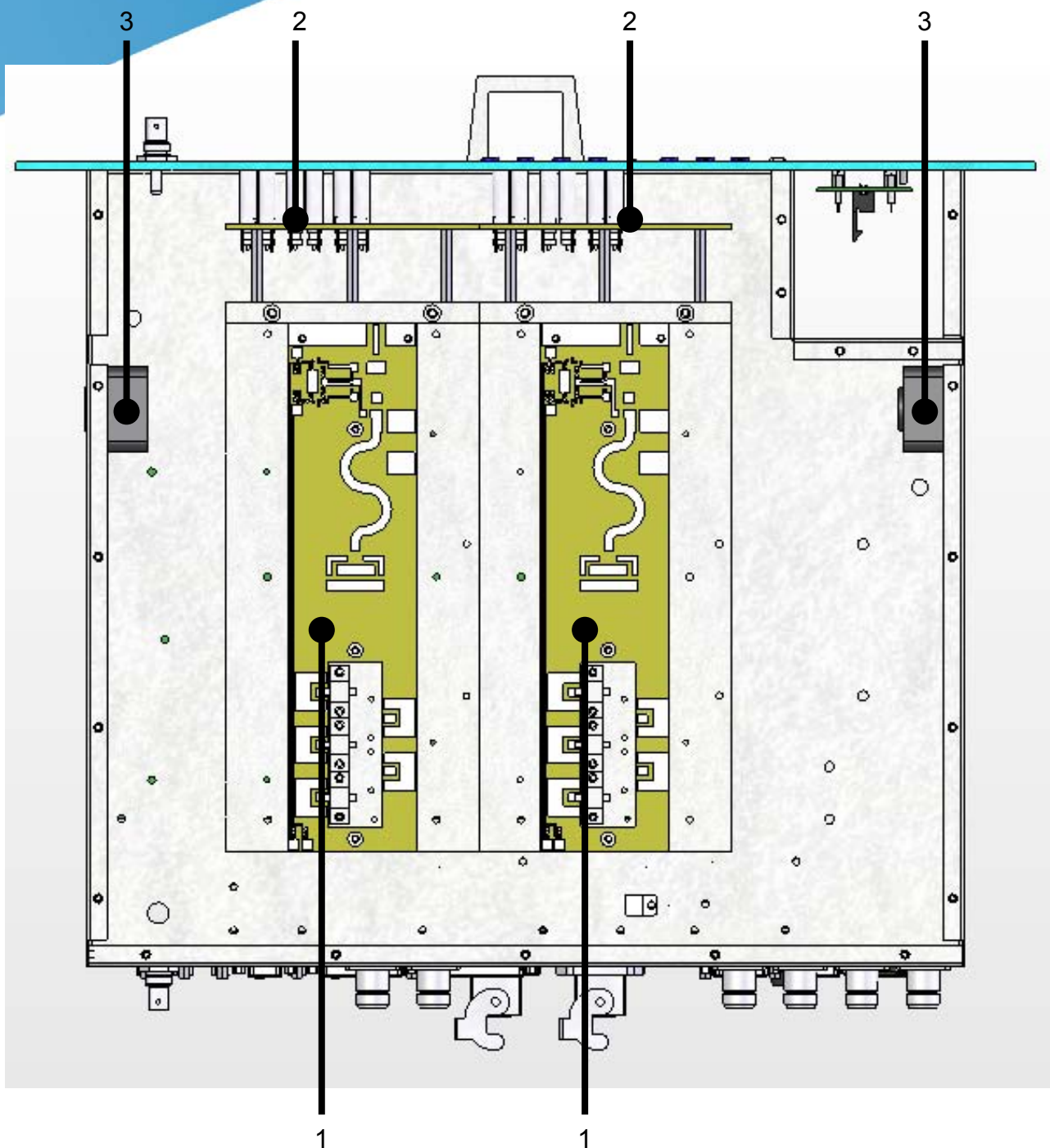
1	Splitter	SLSPLTHC3-01
2	Phase shifter	SLPHSHHC3-02
3	Fan	VTL109P0424J

6.1 CPU board (SLCPUPJ5KM2)
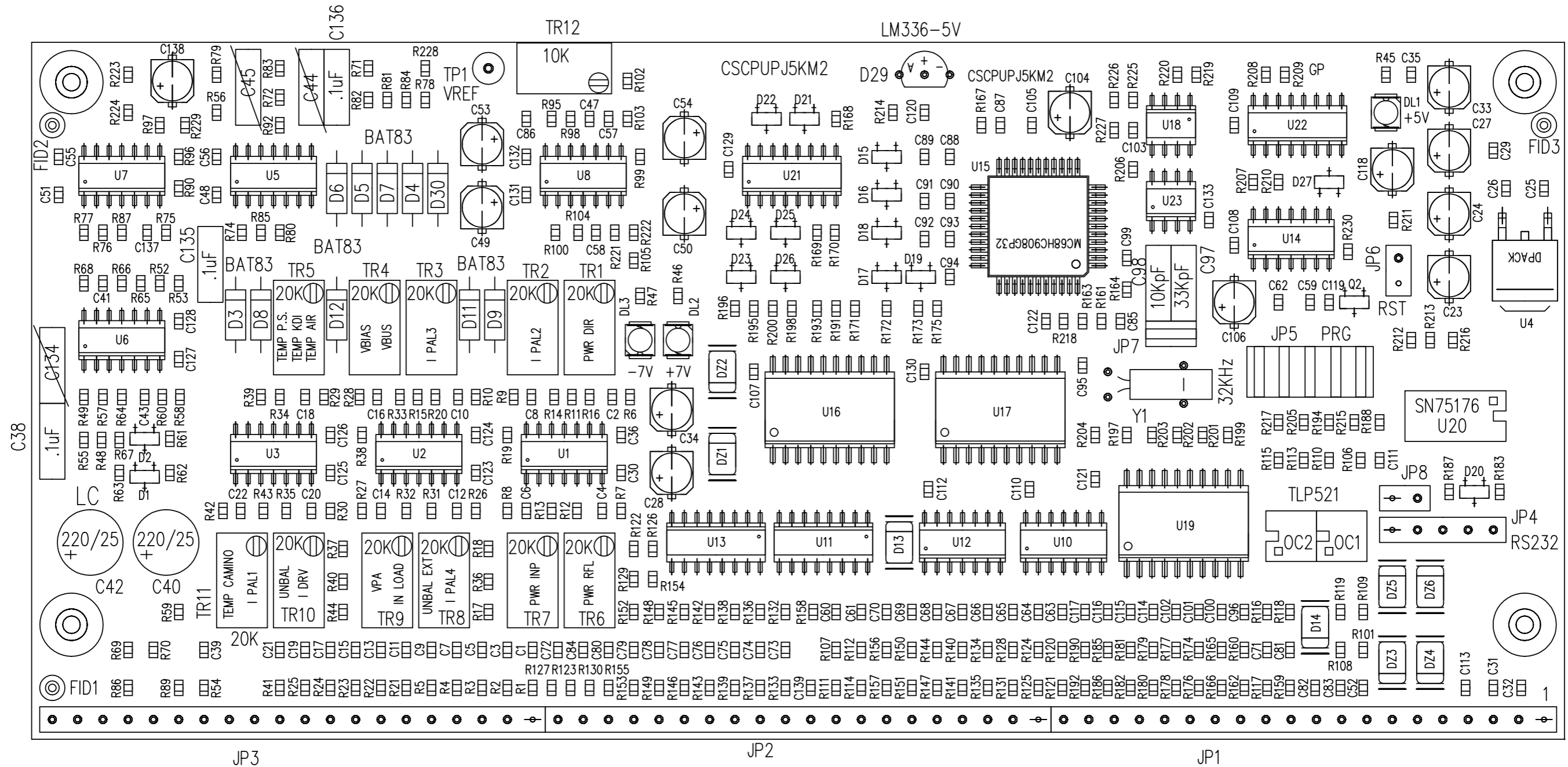
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Autore:	Griptech – Rev: Canazza	Data:	07/10/2002	Codice Progetto: <>	
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File/Cartella:	PJ5K_CPU_MNT.DWG	Autorizzazione:		Codice:	SLCPUPJ5KM2
Scala:<>	Materiale: <>	Trattamento: <>		Profilo: <>	

R.V.R.
ELETTRONICA
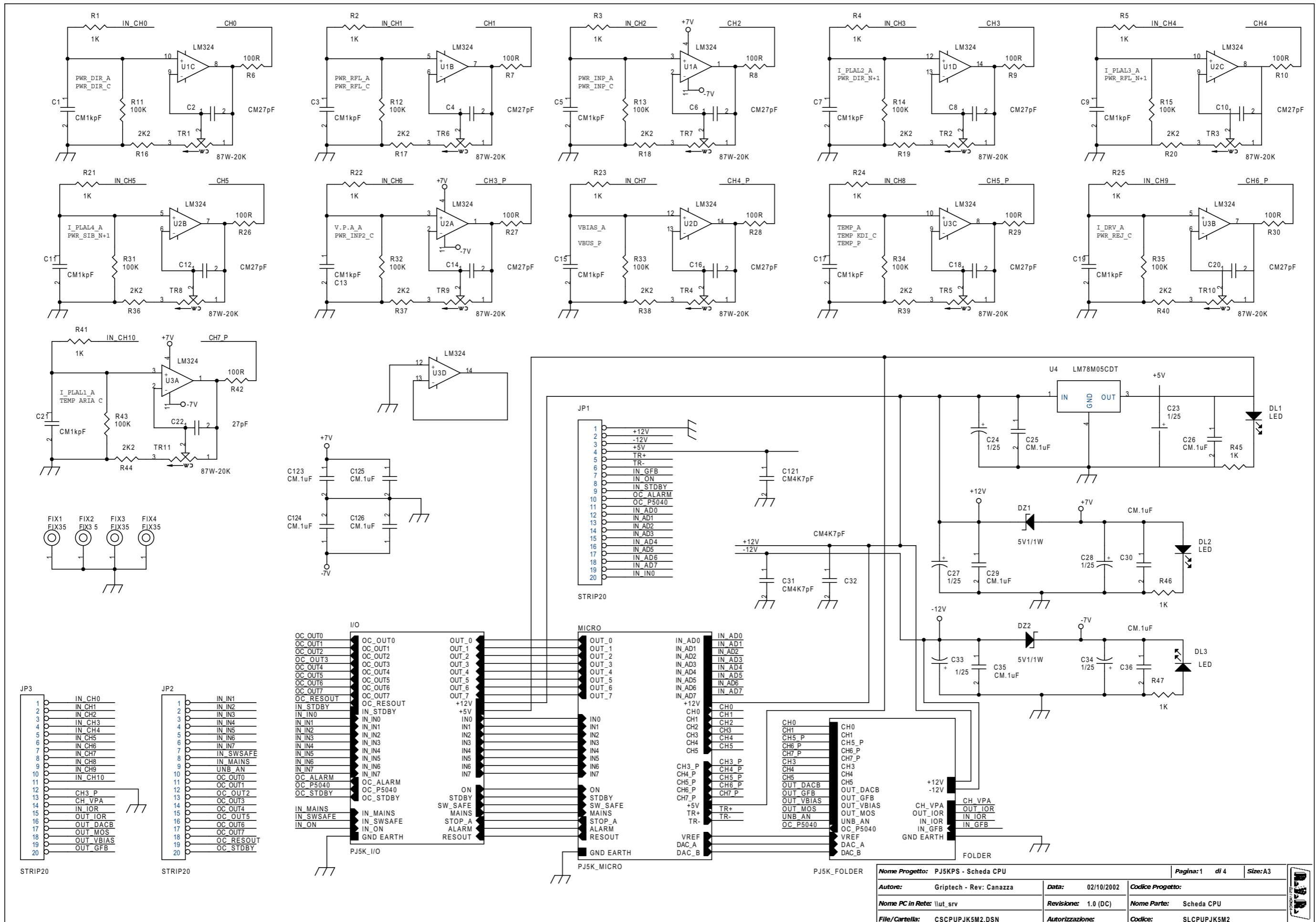
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File/Cartella:	CSCPUPJK5M2.DSN	Autorizzazione:		Codice:	SLCPUPJK5M2

R.V.R. ELETTRONICA

5 4 3 2 1

TL074
U6C
R52 25K5
VREF
R53 20K

R48 10K
R49 10K
C38 CM.1uF
-12V
U6A TL074
+12V
R55 100R
OUT_GFB

PWR INP2 C
CH_VPA
R54 100R
C39 CM4K7pF

R56 10K
R57 10K
CP * C134

D1 BAV99B
C40 220/25

R58 10K +12V
U6B TL074
D2 BAV99B
R60 100R
R61 4K7
R62 10K
R63 39K

OC_P5040
R59 1K
C43
+12V
R64 10K
R67 10K
CM4K7pF
C42 220/25

CM10KpF C41
R65 20K
R66 10K
R68 100R
OUT_VBIAS
TL074
U6D

CM1KPF C139
UNB_AN
D30 BAT83
R228 10K
C135 CP.1uF
R74 10K

R71 100K
C44 XCP
R72 X
C45 X
R69 59K
R70 10K

CH0 FWD_PWR D3 BAT83
R75 100K
C137 CM100PF
R76 10K
R77 10K -12V
U7A TL074
D6 BAT83
C136 CP.1uF
R82 20K
U5C TL074
R83 10K
U5D TL074
R85 3K62
U5B TL074
R86 100R
OUT_MOS

CH1 RFL_PWR D4 BAT83 R78 2K7
TEMP KDI C / TEMP ARIA PS CH5_P TEMP D5 BAT83 R81 20K
PWR_SBIL C CH6_P I_DRV D7 BAT83 R84 10K
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 IN_IOR

R79 10K
R80 10K
R87 10K
R90 10K
R89 10K
R92 10K
U7B TL074
+12V

+12V
U5A TL074
-12V

TL074
U7C
R96 10K
R97 10K
-3.3V

TR12 87W-10K
R95 16K9
TP1 3.3V
R98 33K2 C47 CM.1uF
U8D TL074 +3.3V

+12V
R99 10K
C48 CM.1uF C49 1/25 C50 1/25 C51 CM.1uF C127 CM.1uF C131 CM.1uF

VREF
IN_GFB
C52 220pF
R101 1M
U8A TL074 +12V -12V
R100 10K
U8C TL074
+12V -12V
R102 10K C57 CM10KpF R103 10K
C56 CM.1uF C53 1/25 C54 1/25 C55 CM.1uF C128 CM.1uF C132 CM.1uF

+12V +12V
-12V -12V
GND EARTH

DAC_B R104 10K
C58 CM10KpF
R221 47K R222 10K5
U8B TL074
R105 1K
OUT_DACB

DAC_A R229 330K
C138 1/25
R223 47K R224 10K5
TL074 U7D
OUT_ (U7D output)

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Autore: Griptech - Rev: Canazza	Data: 02/10/2002	Codice Progetto:	
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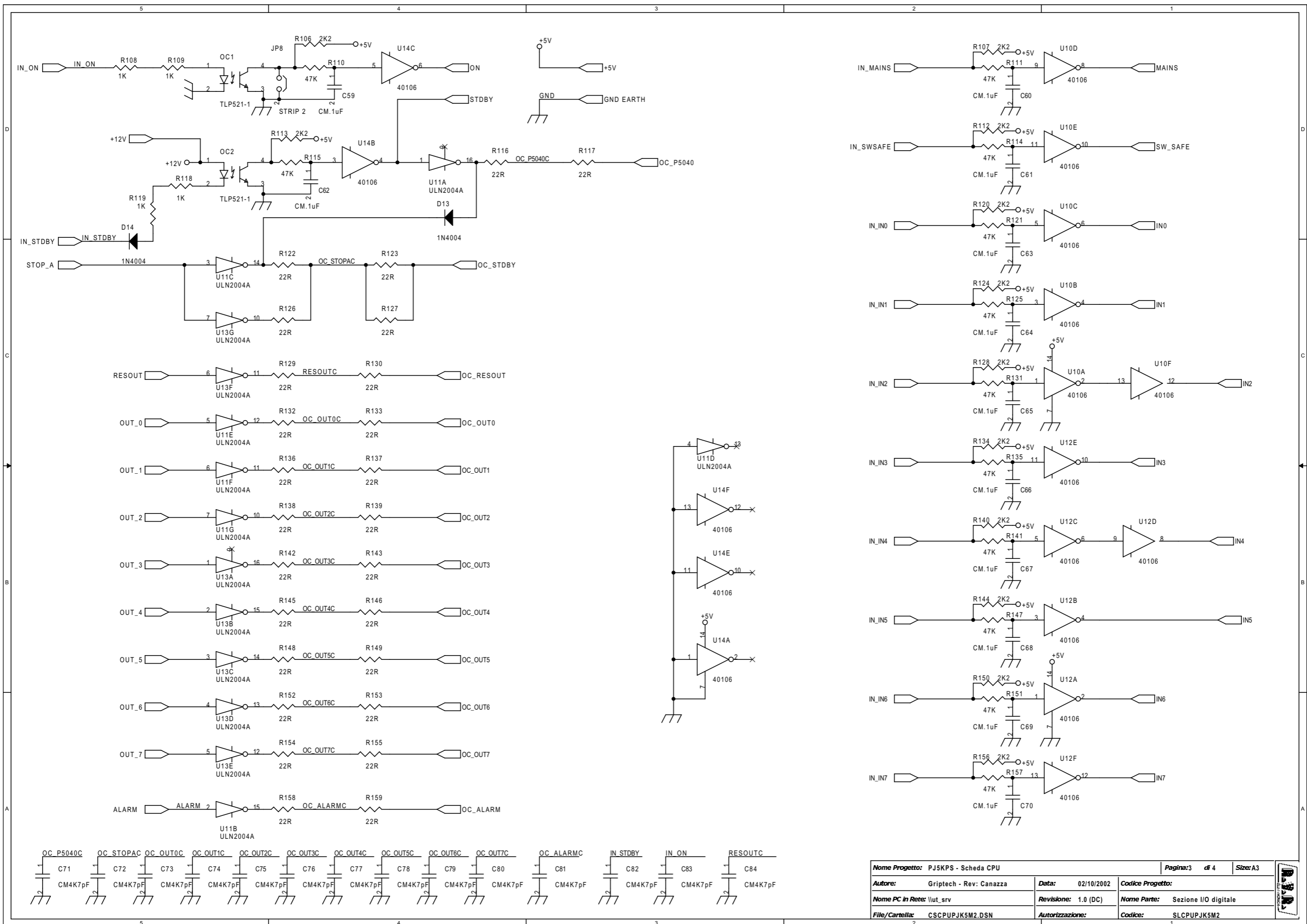
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File/Cartella:	CSCPUPJK5M2.DSN	Autorizzazione:		Codice:	SLCPUPJK5M2	

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                                 CSCPUPJ5KM2.txt
     ANALOG  Revised: Thursday, January 17, 2002
     CSCPUPJ5KM2           Revision: 1




     Bill Of Materials          October 15,2002      11:37:02  Page1

     Item     Quantity          Reference         Part
     _____

     1        17        C1,C3,C5,C7,C9,C11,C13,  CM1kpF
                        C15,C17,C19,C21,C87,C88,
                        C89,C99,C119,C139
     2        12        C2,C4,C6,C8,C10,C12,C14,         CM27pF
                        C16,C18,C20,C85,C95
     3        1         C22      27pF
     4        14        C23,C24,C27,C28,C33,C34,         1/25
                        C49,C50,C53,C54,C104,
                        C106,C118,C138
     5        55        C25,C26,C29,C30,C35,C36,         CM.1uF
                        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
     6        19        C31,C32,C39,C43,C71,C72,         CM4K7pF
                        C73,C74,C75,C76,C77,C78,
                        C79,C80,C81,C82,C83,C84,
                        C121
     7        2         C42,C40 220/25
     8        8         C41,C57,C58,C90,C91,C92,         CM10KpF
                        C93,C94
     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,  BAV99B
                        D19,D21,D22,D23,D24,D25,
                        D26,D27
     22       10        D3,D4,D5,D6,D7,D8,D9,D11,        BAT83
                        D12,D30
     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
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     32       1         Q2       BC237
                                         Pagina 1
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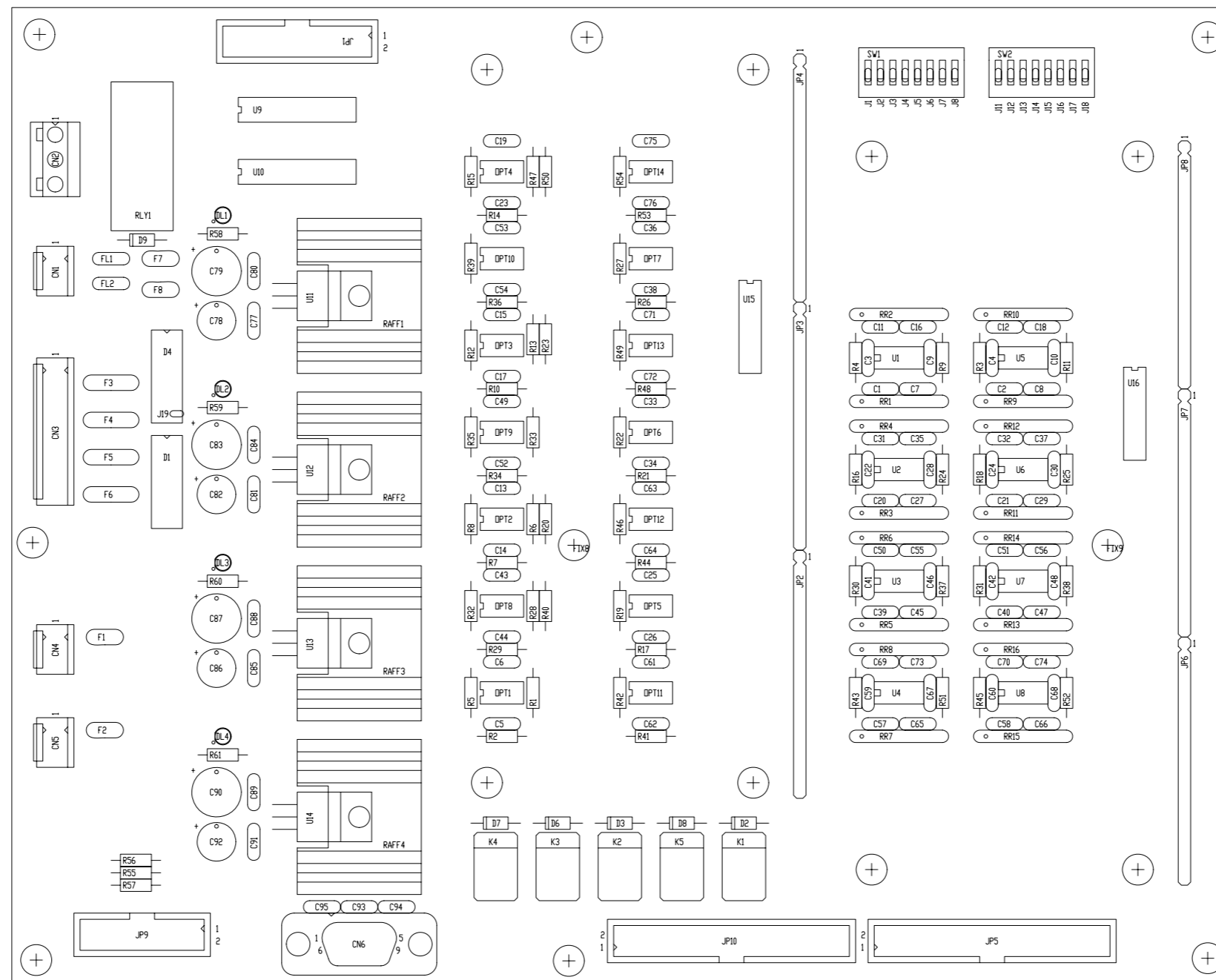
33	20	R1,R2,R3,R4,R5,R21,R22, 1K R23,R24,R25,R41,R45,R46, R47,R59,R105,R108,R109, R118,R119	
34	16	R6,R7,R8,R9,R10,R26,R27, R28,R29,R30,R42,R54,R55, R60,R68,R86	100R
35	13	R11,R12,R13,R14,R15,R31, R32,R33,R34,R35,R43,R71, R75	100K
36	33	R16,R17,R18,R19,R20,R36, R37,R38,R39,R40,R44,R106, R107,R112,R113,R120,R124, 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	

6.2   Main board (SL044IN1002)

CONNESSIOINI COMBINER 1 POTENZE DIRETTE E FAULT CLIKSON (90 GRADI)

CONNESSIOINI COMBINER 2 POTENZE RIFLESSE E WARNING CLIKSON (40 GRADI)

ASSEGNAZIONE INDIRIZZI

0 = RISERVATO

1 = POWER SUPPLY

4 = COMBINAT

8 = PA-XX

Nome Progetto:	Amplificatore 30/40/50/60 KW		Pagina: 1 di 2	Size: A2
Autore:	Tommasi A.	Data:	Codice Progetto: RVR044	
Nome PC in Rete:		Revisione: 1.0	Nome Parte: Main	
File/Cartella:		Autorizzazione:	Codice: SL044IN1002	

Item	Quantity	Reference	Part	Description	Code
1	3	CN1,CN4,CN5	CN02MR	Connettore Lumberg KB p. 5mm 2 pin	MORSKRA2
2	1	CN2	CN03KRA	Conn. tipo KRA a 3 poli	MORSKRA3
3	1	CN3	CN06MR	Connettore Lumberg KB p. 5mm 6 pin	MORSKRA6
4	1	CN6	DB9MSD	Connettore DB9 mas. cs	CNTDB9MCSD
5	1	CS1	CSIN0056R2	Circuito stampato	CSIN0056R2
6	32	C1,C2,C7,C8,C11,C12,C16, C18,C20,C21,C27,C29,C31, C32,C35,C37,C39,C40,C45, C47,C50,C51,C55,C56,C57, C58,C65,C66,C69,C70,C73, C74	1nF	Cond. ceramico p 5mm	CKM102KC600P
7	41	C3,C4,C6,C9,C10,C13,C15, C19,C22,C24,C25,C28,C30, C33,C36,C41,C42,C43,C46, C48,C49,C53,C59,C60,C61, C63,C67,C68,C71,C75,C77, C80,C81,C84,C85,C88,C89, C91,C93,C94,C95	0.1uF	Cond. ceramico p 5mm	CKM104KC600P
8	14	C5,C14,C17,C23,C26,C34, C38,C44,C52,C54,C62,C64, C72,C76	4.7nF	Cond. ceramico p 5mm	CKM472KC600P
9	4	C78,C82,C86,C92	100uF/25V	Cond. Elettr. Dia 8 P3	CEA107MA250V
10	4	C79,C83,C87,C90	470uF/35V	Cond. Elettr. Dia 10 P5.08	CEA477MC350V
11	4	DL1,DL2,DL3,DL4	LED-G3	LED dia. 3mm	LEDV03
12	2	D1,D4	KBL04	Ponte diodi KBL/KBU	PNRKBU04
13	6	D2,D3,D6,D7,D8,D9	1N4148	Diodo in vetro DO35	DIS1N4148
14	17	FIX1,FIX2,FIX3,FIX4,FIX5, FIX6,FIX7,FIX8,FIX9, FIX10,FIX11,FIX12,FIX13, FIX14,FIX15,FIX16,FIX17	FIX35	Foro fissaggio 3.5mm	
15	2	FL1,FL2	FEMIDSS	Filtro EMI Murata DSS210	FEA55F223160
16	2	F1,F2	RUE110	Fusibile autorip. RUE p5mm	FUSAUTRX110A
17	4	F3,F4,F5,F6	RUE300	Fusibile autorip. RUE p5mm	FUSAUTRU300A
18	2	F7,F8	RXE040	Fusibile autorip. RXE p5mm	FUSAUTRX040
19	1	JP1	CN20PD	Connettore 20 poli Flat cs	CNTMCS20A
20	6	JP2,JP3,JP4,JP6,JP7,JP8	STF20S	Strip femmina 20 pin	CNTSTF20SDB
21	2	JP5,JP10	CN34PD	Connettore 34 poli Flat cs	CNTMCS34A
22	1	JP9	CN16PD	Connettore 16 poli Flat cs	CNTMCS16A
23	11	J1,J2,J4,J5,J6,J8,J12, J14,J15,J16,J18	JSMDC	Pad SMD a saldare chiuso	
24	6	J3,J7,J11,J13,J17,J19	JSMD	Pad SMD a saldare	
25	5	K1,K2,K3,K4,K5	TQ2-12V	Rele' TQ2	RLD2V12V05AM
26	14	OPT1,OPT2,OPT3,OPT4,OPT5, OPT6,OPT7,OPT8,OPT9, OPT10,OPT11,OPT12,OPT13, OPT14	4N25	Optoisolatore DIP6	LED4N25
27	4	RAFF1,RAFF2,RAFF3,RAFF4	SK7625	Dissipatore TO220 SK76-25/B105	DSCTO220SK76
28	1	RLY1	RLYG2R2-12V	Rele' OMRON G2R-2	RLD2V12V5A
29	16	RR1,RR2,RR3,RR4,RR5,RR6, RR7,RR8,RR9,RR10,RR11, RR12,RR13,RR14,RR15,RR16	10K	Rete res. sip 4 res.	RRR4X20010K
30	14	R1,R6,R13,R20,R23,R28, R33,R40,R47,R50,R58,R59, R60,R61	2K2	Res. 1/4W 1%	RSM1/4F002K2
31	14	R2,R7,R10,R14,R17,R21, R26,R29,R34,R36,R41,R44, R48,R53	820H0	Res. 1/4W 1%	RSM1/4F0820H
32	19	R3,R4,R9,R11,R16,R18,R24, R25,R30,R31,R37,R38,R43, R45,R51,R52,R55,R56,R57	100H0	Res. 1/4W 1%	RSM1/4F0100H
33	14	R5,R8,R12,R15,R19,R22, R27,R32,R35,R39,R42,R46, R49,R54	1M0	Res. 1/4W 1%	RSM1/4F0001M
34	2	SW1,SW2	SWDIP8	Dip switch 8 vie	DSW8VO
35	8	U1,U2,U3,U4,U5,U6,U7,U8	TL072	Dual Op. DIP8	CILTL072
36	2	U9,U10	ULN2804	Octal Inv. Driver DIP18	CIDULN2804
37	2	U11,U12	LM7815	Stabilizzatore TO220	CIL7815P
38	1	U13	LM7812	Stabilizzatore TO220	CIL7812P
39	1	U14	LM7912	Stabilizzatore TO220	CIL7912P
40	2	U15,U16	CD40106	Ex trigger buffer	CID40106

6.2.1 Setting addresses the main board
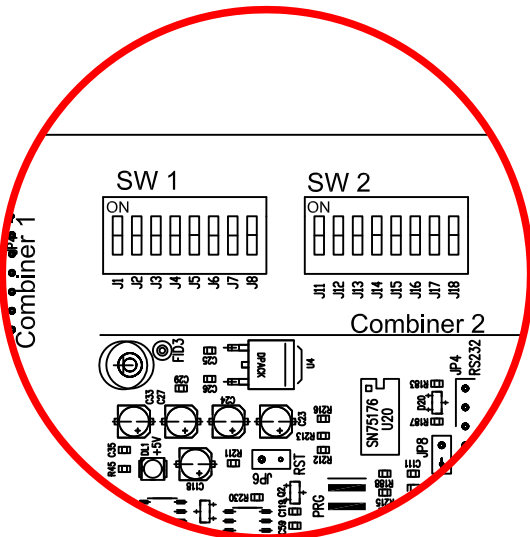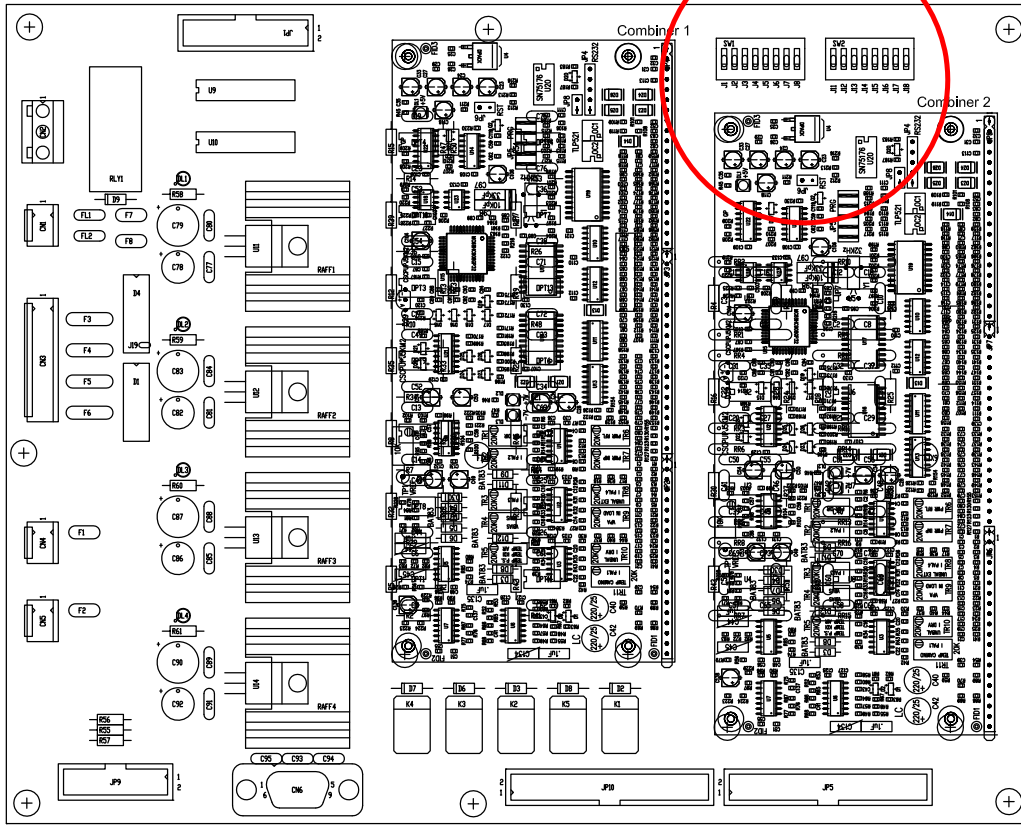
6.2.2   Connections main board

CONTROL UNIT CPU BOARD
(SCHEDA CONTROLLO LOGICA LCD)

RS 232

PWR ANTENNA   TX1 EMERGENCY   COMMON SERIES

UNBALANCED LOAD1 TX2 EMERGENCY

UNBALANCED LOAD2 TX3 EMERGENCY

UNBALANCED LOAD3 TX4 EMERGENCY

UNBALANCED LOAD4 TX5 EMERGENCY

UNBALANCED LOAD5 TX6 EMERGENCY

UNBALANCED LOAD6 EXT. EMERGENCY

UNBALANCED LOAD7   JP3   JP4

TELEMETRY CARD   TELEMETRY CARD   EXCITER ENABLE

DENOMINAZIONE
Schema di collegamento schede Splitter PJ30KPS

DISPOSITIVO
PJ30KPS

SEMILAVORATO	DISEGNATO		DISEGNO
	Recchi 25/02/11		
MATERIALE			
	SCALA	REVISIONE	TAVOLA	TOLLERANZA
TRATTAMENTO	1:1	00	1 di 1	+/- 0.1mm

6.3   Rear panel card (SL044PC2002)

Nome Progetto:	Amplificatore 30/40/50/60KW			Pagina: 1 di 1	Size: A3
Autore:	Tommasi A.	Data: Wednesday, September 20, 2006	Codice Progetto: RVR044		
Nome PC in Rete: \\		Revisione: 1.0	Nome Parte: Pannello posteriore		
File/Cartella: /		Autorizzazione:	Codice: SL044PC2002		
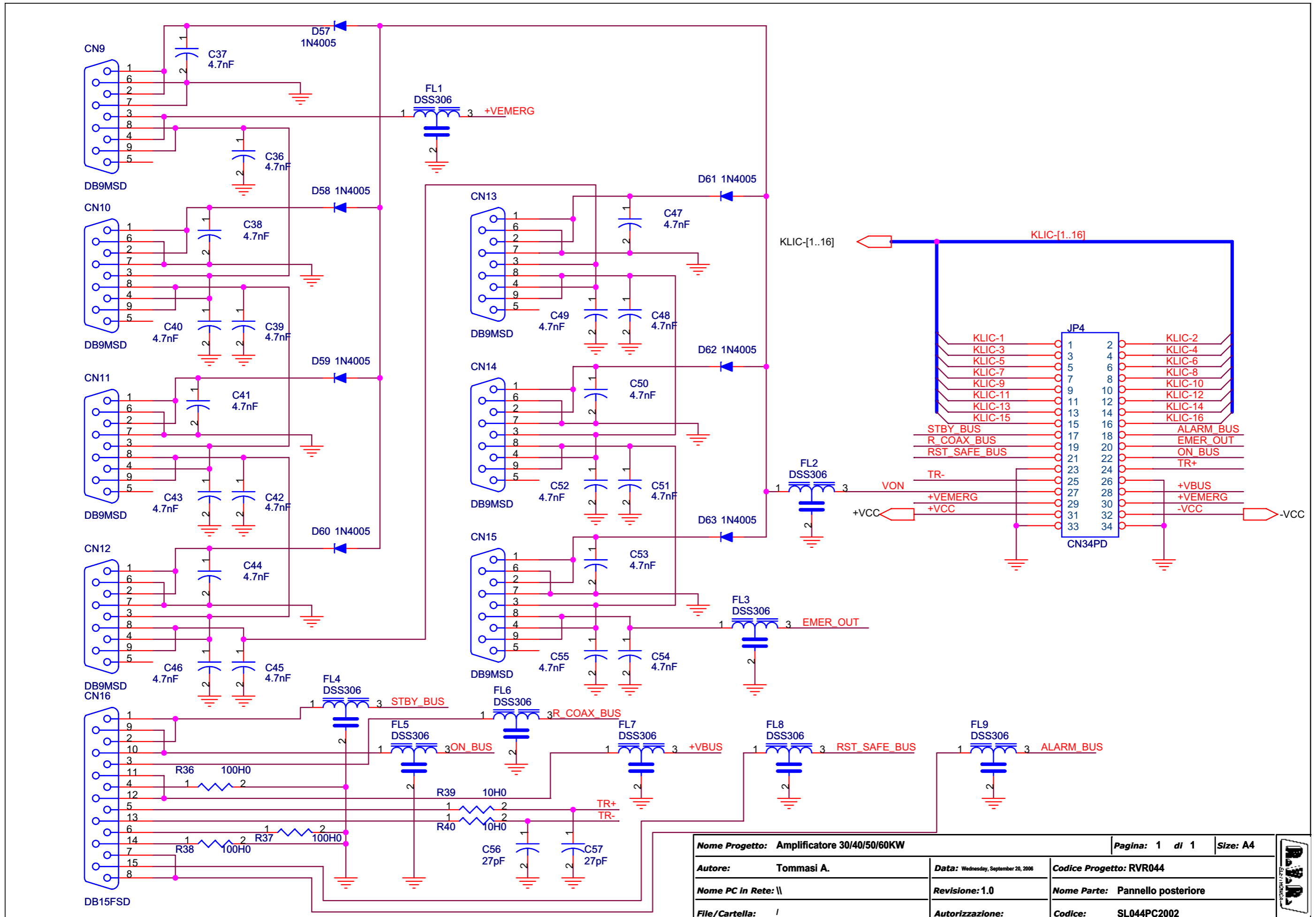
Nome Progetto:	Amplificatore 30/40/50/60KW		Pagina: 1 di 1	Size: A4
Autore:	Tommasi A.	Data: Wednesday, September 20, 2006	Codice Progetto: RVR044	
Nome PC in Rete: \\		Revisione: 1.0	Nome Parte: Pannello posteriore	
File/Cartella: /		Autorizzazione:	Codice: SL044PC2002	

1	8	CN1,CN2,CN3,CN4,CN5,CN6, CN7,CN8	DB9FSD	Connettore DB9 femm. cs	CNTDB9FCSD	RS 480-3976
2	7	CN9,CN10,CN11,CN12,CN13, CN14,CN15	DB9MSD	Connettore DB9 mas. cs	CNTDB9MCSF	RS 480-3932
3	1	CN16	DB15FSD	Connettore DB15 femm. cs	CNTDB15FCSD	RS 480-3982
4	1	CS1	CSPC0057R2	Circuito stampato	CSPC0057R2	
5	8	C1,C2,C3,C4,C5,C6,C7,C58	0.1uF	Cond. ceramico p 5mm	CKM104KC600P	
6	32	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,C59,C60, C61,C62	1nF	Cond. ceramico p 5mm	CKM102KC600P	
7	20	C36,C37,C38,C39,C40,C41, C42,C43,C44,C45,C46,C47, C48,C49,C50,C51,C52,C53, C54,C55	4.7nF	Cond. ceramico p 5mm	CKM472KC600P	
8	2	C56,C57	27pF	Cond. ceramico p 5mm	CKM270KC600C	
9	64	D1,D2,D3,D4,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,D34,D35,D36,D37,D38, D39,D40,D41,D42,D43,D44, D45,D46,D47,D48,D49,D50, D51,D52,D53,D54,D55,D56, D72,D73,D74,D75,D76,D77, D78,D79	1N4148	Diodo in vetro DO35	DIS1N4148	
10	7	D57,D58,D59,D60,D61,D62, D63	1N4005	Diodo plastico DO41	DIS1N4007	
11	8	D64,D65,D66,D67,D68,D69, D70,D71	5V1	1/2W Zener Diode	DIZ5V11/2W	
12	8	FIX1,FIX2,FIX3,FIX4,FIX5, FIX6,FIX7,FIX8	FIX35	Foro fissaggio 3.5mm		
13	9	FL1,FL2,FL3,FL4,FL5,FL6, FL7,FL8,FL9	DSS306	Filtro EMI Murata DSS210		Li usa Griptech CODIC
14	2	JP3,JP4	CN34PD	Connettore 34 poli Flat cs	CNTMCS34A	
15	40	R1,R2,R3,R4,R5,R6,R7,R8, R9,R10,R11,R12,R13,R14, R15,R16,R17,R18,R19,R20, R21,R22,R23,R24,R25,R26, R27,R28,R29,R30,R31,R32, R33,R34,R35,R41,R42,R43, R44,R45	220H0	Res. 1/4W 1%	RSM1/4F0220H	
16	3	R36,R37,R38	100H0	Res. 1/4W 1%	RSM1/4F0100H	
17	2	R39,R40	10H0	Res. 1/4W 1%	RSM1/4F0010H	
18	8	VR1,VR2,VR3,VR4,VR5,VR6, VR7,VR8	RXE020	Varistor	FUSAUTRX020	

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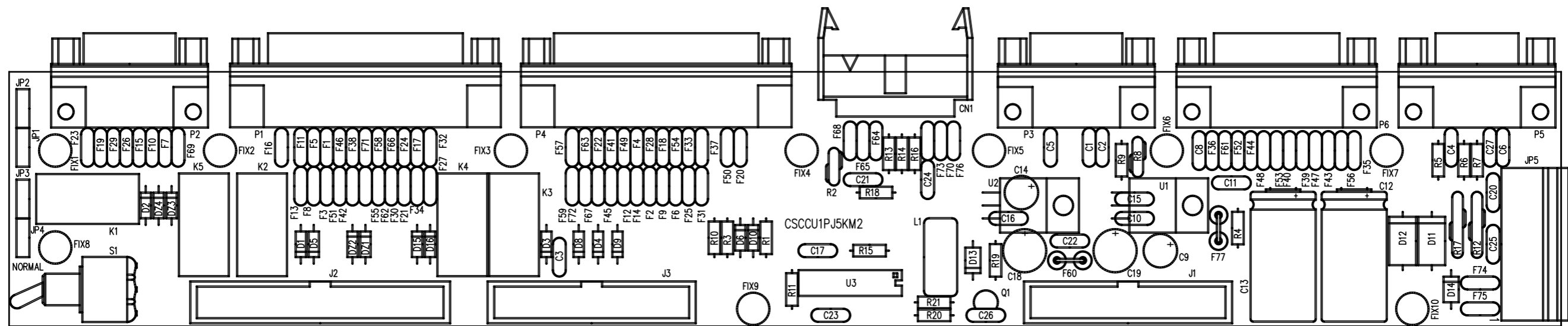
Nome Progetto:	PJ5KPS - Scheda madre CCU			Pagina: 1 di 1	Size: A3
Autore:	Griptech - Rev.: Canazza	Data:	07/10/2002	Codice Progetto: <>	
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Schedra madre CCU
File/Cartella:	CCU1PJK5_1_LY.DWG	Autorizzazione:		Codice:	SLCCU1PJ5KM2
Scala:<>	Materiale: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

CONTROL UNIT BACK BOARD
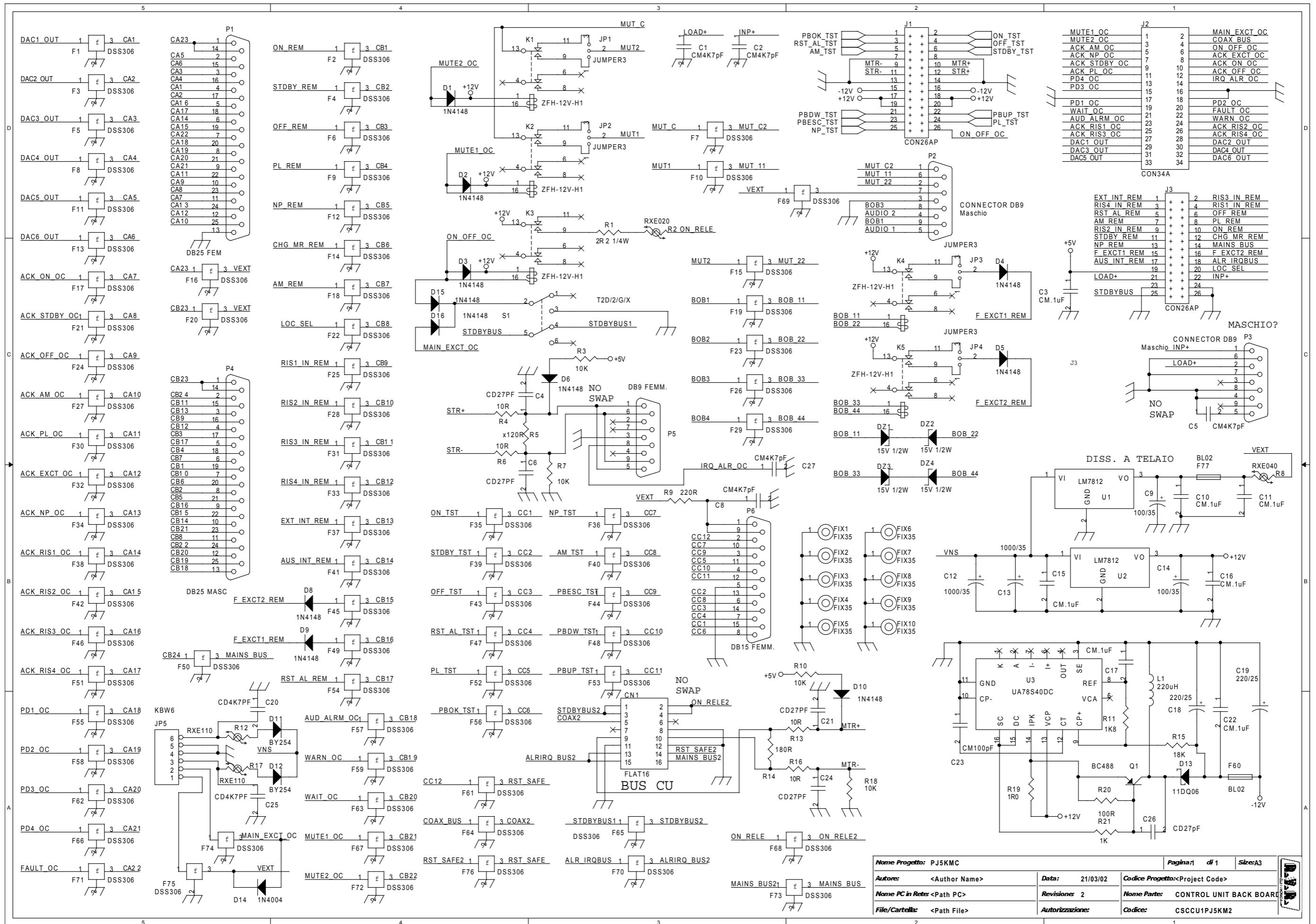
Name Progetto: PJ5KMC		Pagina:1 di 1	Size:A3
Autore: <Author Name>	Data: 21/03/02	Codice Progetto:<Project Code>	
Nome PC in Rete: <Path PC>	Revisione: 2	Nome Parte: CONTROL UNIT BACK BOARD	
File/Cartella: <Path File>	Autorizzazione:	Codice: CSCCU1PJ5KM2	

Item	Quantity	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	C9,C14	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	J3,J1	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
39	1	R14	180R
40	1	R15	18K
41	1	R19	1R0
42	1	R20	100R
43	1	R21	1K
44	1	S1	T2D/2/G/X
45	2	U1,U2	LM7812
46	1	U3	UA78S40DC

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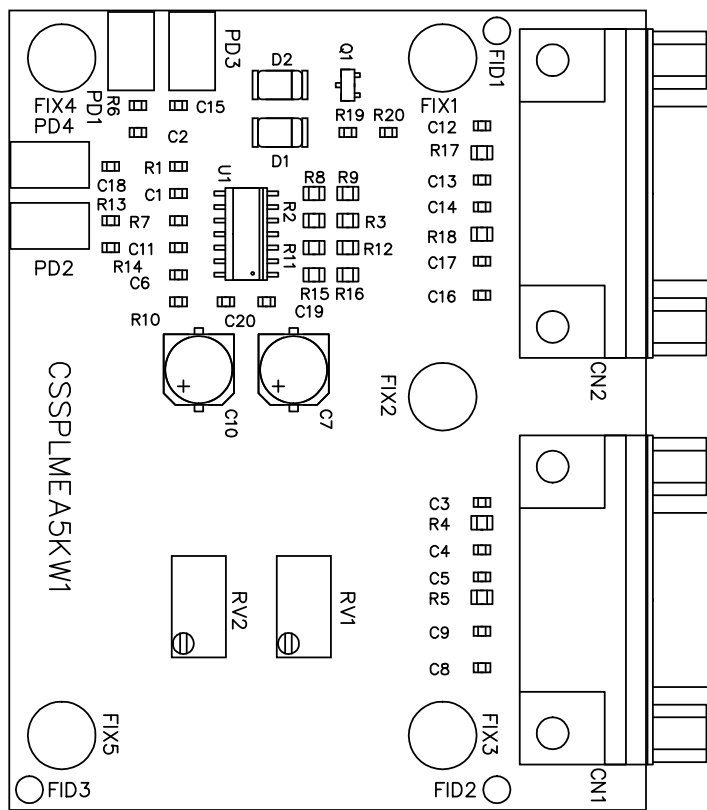
Nome Progetto:	PJ5KPS – Scheda misure splitter			Pagina: 1 di 1	Size: A4
Autore:	Ucelli – Rev.: Canazza	Data:	14/10/2002	Codice Progetto: <>	
Nome PC in Rete:	\\UT_SRV	Revisione:	1.0 (DC)	Nome Parte:	Scheda misure input splitter
File/Cartella:	SPLITLY.DWG	Autorizzazione:		Codice:	SLSPLMEA5KW1
Scala: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

6.6 Synoptic panel board (SL044PC1001)

Item	Quantity	Reference	Part	Description	Code
1	1	CS1	CSPC0055R1	Circuito stampato	CSPC0055R1
2	14	DL1,DL2,DL3,DL4,DL5,DL6, DL7,DL8,DL9,DL10,DL11, DL12,DL13,DL14	BILEDK	Doppio led Verde-Rosso	LEDB05
3	4	DL15,DL16,DL17,DL18	LED-G5	LED dia. 5mm	LEDV05
4	7	D1,D3,D5,D7,D9,D11,D13	BAS32	MINIMELF SMD Diode	DISBAS32MINI
5	7	D2,D4,D6,D8,D10,D12,D14	NC	MINIMELF SMD Diode	
6	8	FIX1,FIX2,FIX3,FIX4,FIX5, FIX6,FIX7,FIX8	FIX35	Foro fissaggio 3.5mm	
7	1	JP1	CN20PD	Connettore 20 poli Flat cs	CNTMCS20A
8	14	Q1,Q3,Q5,Q7,Q9,Q11,Q13, Q15,Q17,Q19,Q21,Q23,Q25, Q27	BC857	Trans. PNP SOT23	TRNBC857
9	14	Q2,Q4,Q6,Q8,Q10,Q12,Q14, Q16,Q18,Q20,Q22,Q24,Q26, Q28	BC847	Trans. NPN SOT23	TRNBC847
10	32	R1,R2,R3,R4,R5,R6,R7,R8, R9,R10,R11,R12,R13,R14, R15,R16,R17,R18,R19,R20, R21,R22,R23,R24,R25,R26, R27,R28,R29,R30,R31,R32	1K50	Res. SMD 0805	RCH085F001K5
11	28	R33,R34,R36,R37,R39,R40, R42,R43,R45,R46,R48,R49, R51,R52,R54,R55,R57,R58, R60,R61,R63,R64,R66,R67, R69,R70,R72,R73	10K0	Res. SMD 0805	RCH085F0010K
12	14	R35,R38,R41,R44,R47,R50, R53,R56,R59,R62,R65,R68, R71,R74	2K20	Res. SMD 0805	RCH085F002K2
13	1	SW1	PULCS1	Pulsante cs	PLC1V1M000M

6.7 CCU board (SLCCUPJ5KM2)
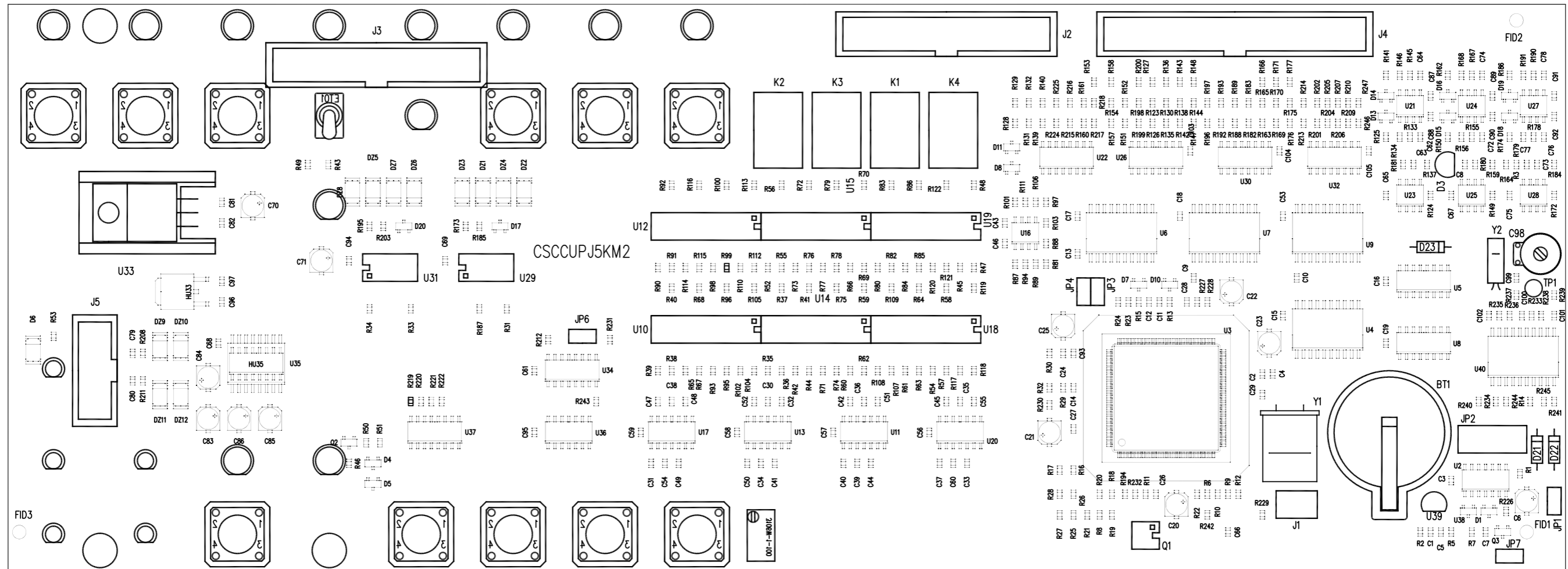
Nome Progetto:	PJ5KPS – Scheda CCU		Pagina: 1	di 1	Size: A3
Autore:	Griptech – Rev.: Canazza	Data: 07/10/2002	Codice Progetto: <>		
Nome PC in Rete:	\\UT_SRV	Revisione: 1.0 (DC)	Nome Parte:	Scheda CCU	
File/Cartella:	PJ5_CCU_MNT.DWG	Autorizzazione:	Codice:	SLCCUPJ5KM2	
Scala:<>	Materiale: <>	Trattamento: <>	Profilo: <>		
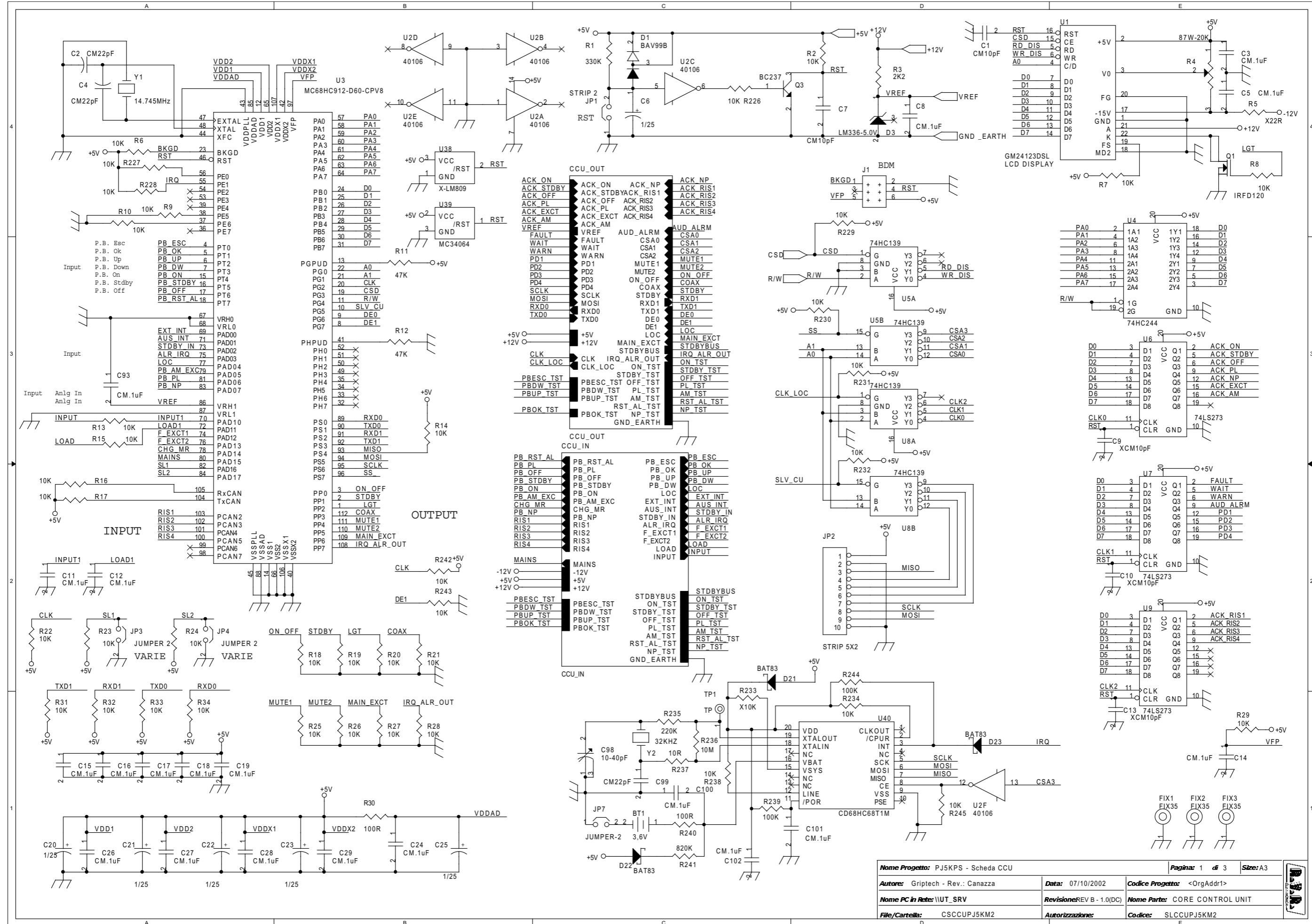
Nome Progetto:	PJ5KPS - Scheda CCU		Pagina: 1 di 3	Size: A3
Autore: Griptech - Rev.: Canazza		Data: 07/10/2002	Codice Progetto: <OrgAddr1>	
Nome PC in Rete: \\UT_SRV		Revisione REV B - 1.0(DC)	Nome Parte: CORE CONTROL UNIT	
File/Cartella: CSCCUPJ5KM2		Autorizzazione:	Codice: SLCCUPJ5KM2	

This page is a full-page electronic schematic diagram titled "CORE CONTROL UNIT" for the PJ20KPS-C/PJ25KPS-C. The schematic contains numerous component labels, signal names, and interconnections.

Left side signal labels (with ULN2004A buffers and LED drivers):

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, IRQ_ALR_OUT

LED indicators: ON, STDBY, OFF, POWER LOWER, MAN/AUT EXCT, FAULT, WAIT, WARNING, NOM POWER

DL5 through DL13, LED-D5; DL14-DL17 LED-D3

Output signals (OC): ACK_ON_OC, ACK_STDBY_OC, ACK_OFF_OC, ACK_PL_OC, ACK_EXCT_OC, ACK_AM_OC, FAULT_OC, WAIT_OC, WARN_OC, PD1_OC, PD2_OC, PD3_OC, PD4_OC, ACK_NP_OC, ACK_RIS1_OC, ACK_RIS2_OC, ACK_RIS3_OC, ACK_RIS4_OC, AUD_ALRM_OC, MUTE1_OC, MUTE2_OC, MAIN_EXCT_OC, IRQ_ALR_OC

RX-INT, TX-INT, RX-BUS, TX-BUS

Center section: STDBY, STDBYBUS, ON_OFF, ON_OFF_OC, COAX, COAX_BUS

Bus 485 Slave (U29 SN75176AP), Bus 485 Master (U31 SN75176AP)
STR+, STR-, MTR+, MTR-
DZ1-DZ8 (12V/1W, 5V1/1W)

U33 LM7805/TO220 voltage regulator

Connectors: J3 CON26AP, J4 CON34A, J5 CON10AP

Right side: DAC outputs DAC1_OUT through DAC6_OUT, U21A-U27B TL072 op-amps, TLV5626 DACs (U23, U25, U28), D13-D19 BAV99B

U35 ICL232 SO16W, U34 74HC157, JP6 JUMPER 2 HOLD OUT

DZ9-DZ12 12V/1W

Item	Quantity	Reference	Part
1	1	BT1	3,6V
2	2	C1,C7	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	U8,U5	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	U29,U31	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	14.75MHz
73	1	Y2	32KHz

6.8 Splitter board (SLSPLTHC3-01)
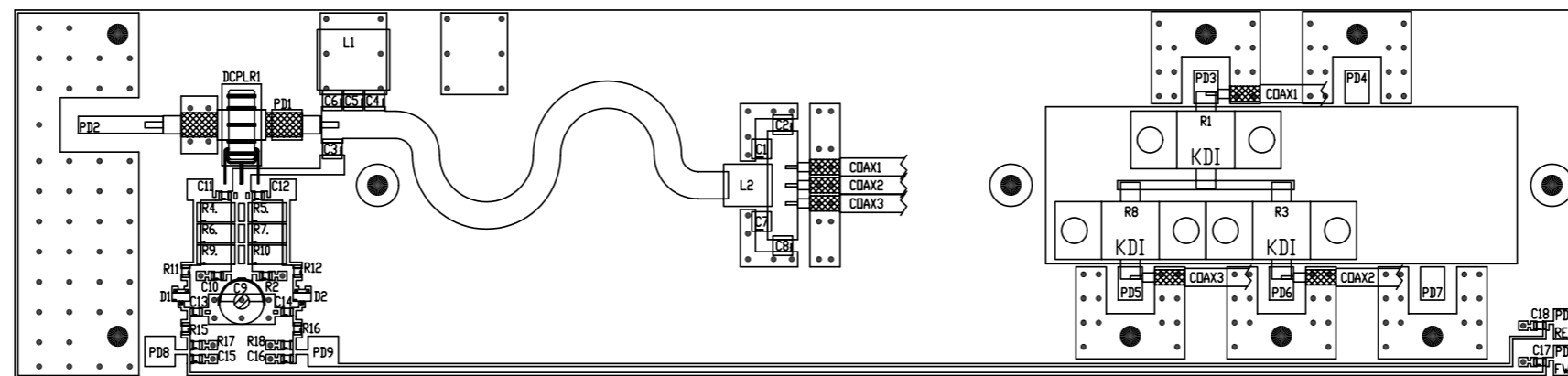
NOME PROGETTO:	HC3-6		NOME PARTE:	SCHEDA SPLITTER PER HC3-6			
AUTORE:	M. UCELLI		DATA: 19/04/2004	REVISIONE: 1.0	SCALA: 1:1	SIZE: A3	PAGINA: 1 DI 1
ARCHIVIAZIONE ELETTRONICA: "CARTELLA PROGETTI" SU "UT_SRV"		CODICE PROGETTO: 017		CODICE DISEGNO: SLSPLTHC3-01			
MATERIALE: /		TRATTAMENTO: /		PROFILO: /		STATO: ESECUTIVO	

Item	Quantity	Reference	Part	Description
1	3	COAX1, COAX2, COAX3	75Z	Cavo coax
2	1	CS1	CSSPLTHC5-01	Circuito stampato
3	4	C1, C5, C6, C7	10p	Cond. SMD 1212 HQ
4	2	C8, C2	2p2	Cond. SMD 1212 HQ
5	1	C3	1p	Cond. SMD 1212 HQ
6	1	C4	NC	Cond. SMD 1212 HQ
7	1	C9	6_60p	Comp. ceramico dia. 7mm
8	1	C10	2p2	Cond. SMD 0805
9	2	C12, C11	NC	Cond. SMD 0805
10	6	C13, C14, C15, C16, C17, C18	4n7	Cond. SMD 0805
11	1	DCPLR1	DIR_CPLR	Accopp. direz.
12	2	D1, D2	HSMS2800	Diodo Shottky SOT23
13	1	L1	NC	Induttanza cilindrica
14	1	L2	48nH	Induttanza cilindrica
15	11	PD1, PD2, PD3, PD4, PD5, PD6, PD7, PD8, PD9, PD10, PD11	PAD	
16	3	R1, R3, R8	50_250W	Resistenza KDI 2 fix
17	1	R2	1k	Res. SMD 0805
18	6	R4, R5, R6, R7, R9, R10	150	Res. SMD 2512
19	2	R12, R11	47	Res. SMD 0805
20	4	R15, R16, R17, R18	4k7	Res. SMD 0805
21	1	TL1	TLINE_L	Linea strip CS

6.9 Phase shifter (SLPHSHHC3-02)
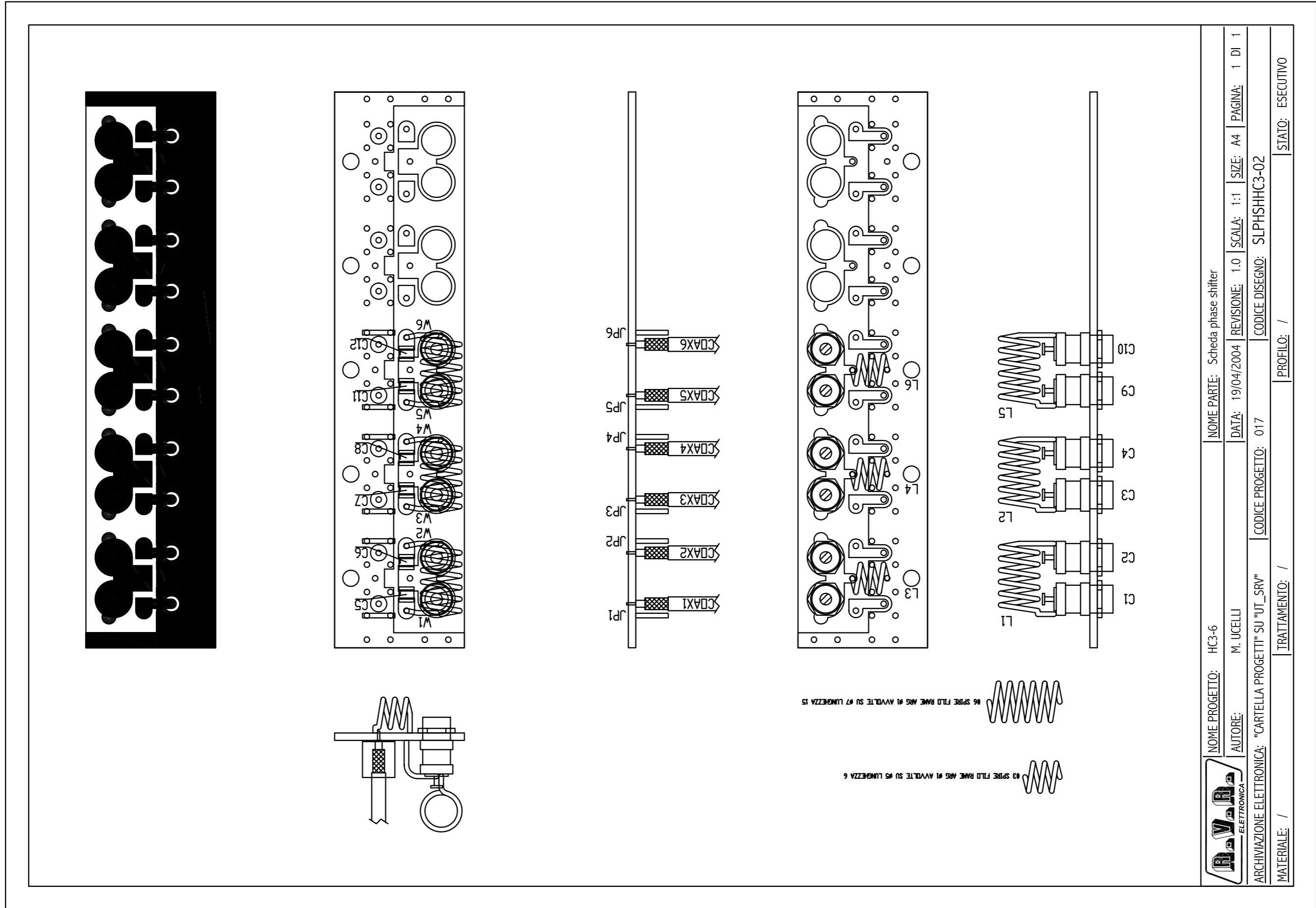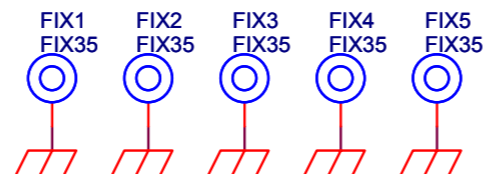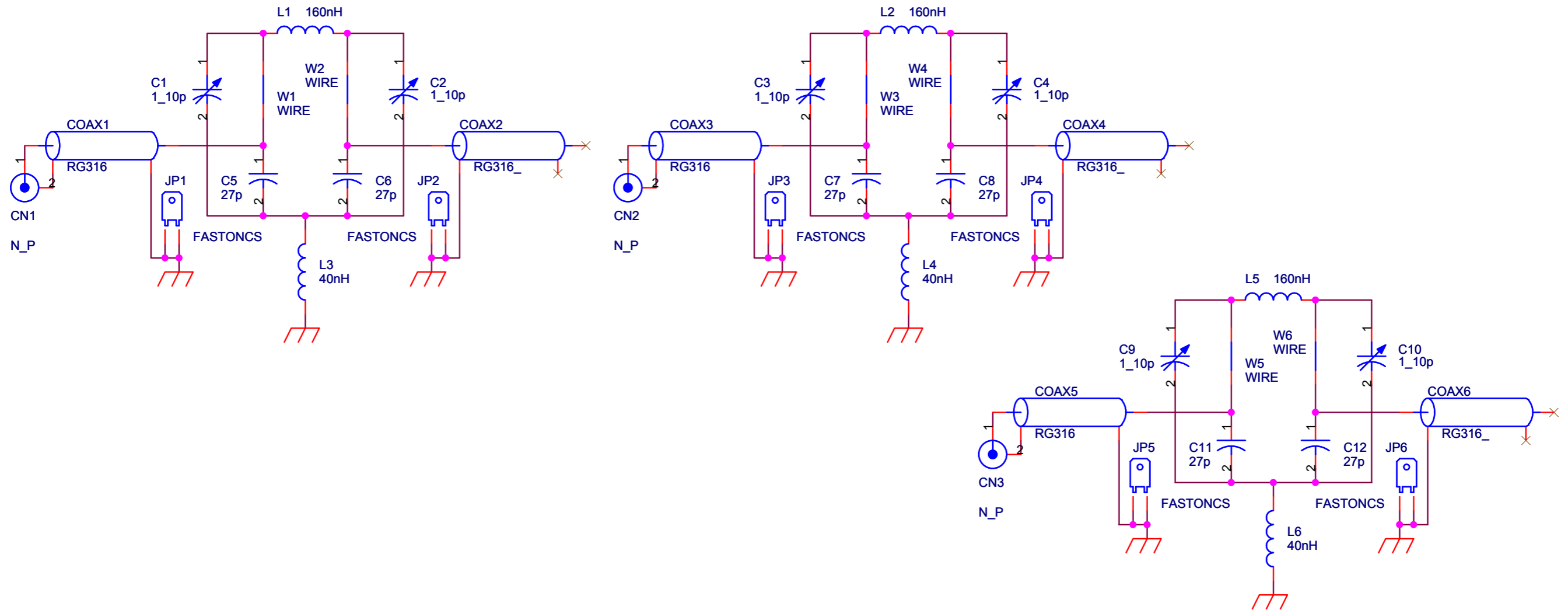
Nome Progetto:	HC3-6		**Pagina:** 1 *di* 1	**Size:** A4
Autore:	Mauro Ucelli	**Data:** 19/04/04	**Codice Progetto:** 017	
Nome PC in Rete:	\\UT_SRV\Progetti	**Revisione:** 1.0	**Nome Parte:** Phase Shifter for HC3-6	
File/Cartella:	Esecutivi\Schemi Elettrici\SLPHSHHC3-02	**Autorizzazione:**	**Codice:** SLPHSHHC3-02	

Item	Quan-tity	Reference	Part	Description
1	3	CN1, CN2, CN3	N_P	Conn. N da pannello per cavo RG316
2	3	COAX1, COAX3, COAX5	RG316	Cavo coax 50H RG316
3	3	COAX2, COAX4, COAX6	RG316_	Cavo coax 50H RG316 (595mm)
4	1	CS1	CSPHSH-HC5_03	Circuito stampato
5	6	C1, C2, C3, C4, C9, C10	1_10p	Comp. var. ad aria Tekelek 6mm
6	6	C5, C6, C7, C8, C11, C12	27p	Cond. SMD 1212 HQ
7	5	FIX1, FIX2, FIX3, FIX4, FIX5	FIX35	Foro fissaggio 3.5mm
8	6	JP1, JP2, JP3, JP4, JP5, JP6	FASTONCS	Faston da CS p. 5.08
9	3	L1, L2, L5	160nH	Induttanza cilindrica
10	3	L3, L4, L6	40nH	Induttanza cilindrica
11	6	W1, W2, W3, W4, W5, W6	WIRE	Filo a saldare

7. Electrical and mechanical parts

This chapter is a general view of the machine, so you can identify quickly the location of the various electrical and mechanical parts.

7.1 General views
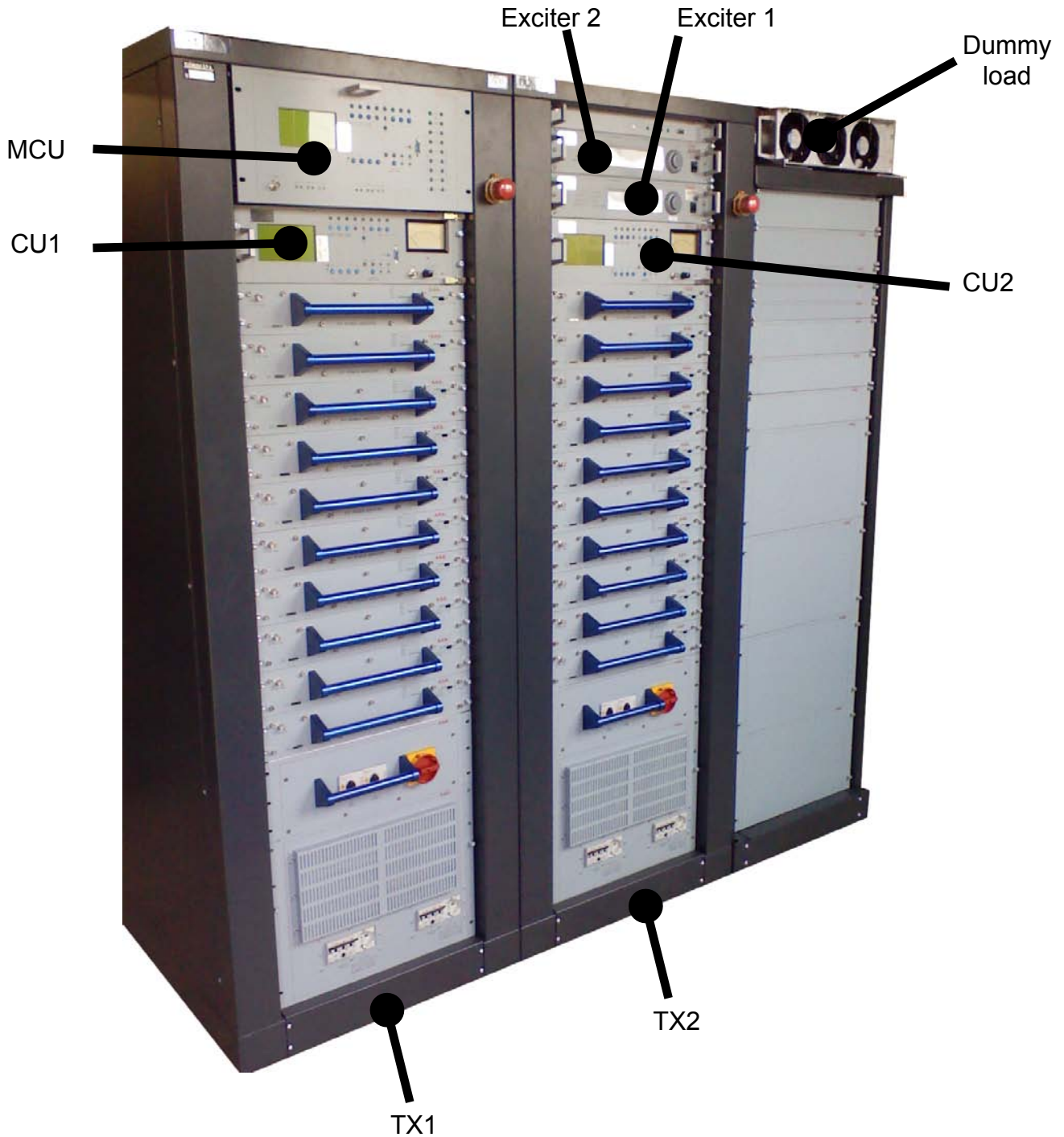
REAR VIEW PJ20KPS-C/PJ25KPS-C
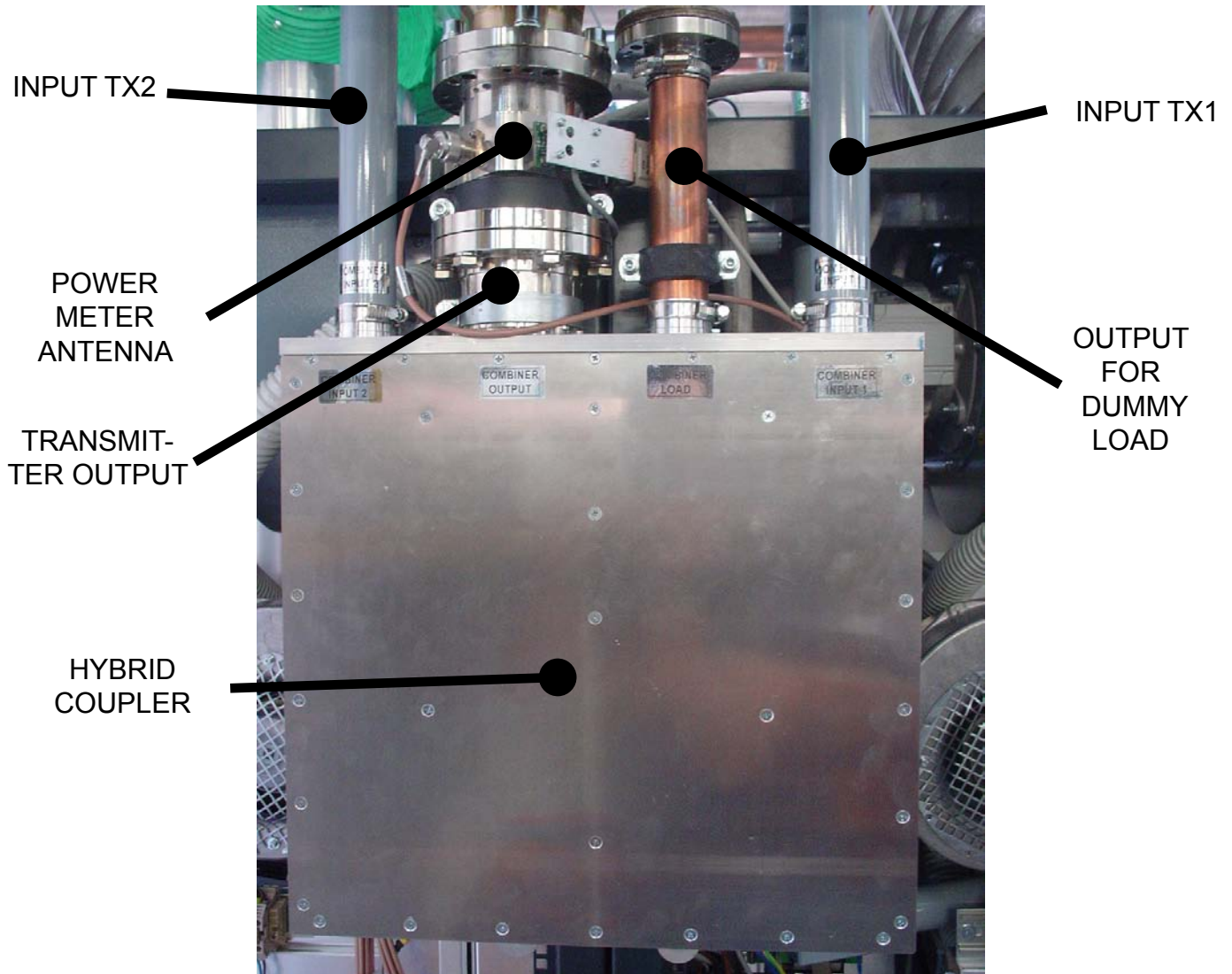
INPUT TX2

INPUT TX1

POWER
METER
ANTENNA

OUTPUT
FOR
DUMMY
LOAD

TRANSMIT-
TER OUTPUT

HYBRID
COUPLER

REAR VIEW TX1

TERMINAL
SERVICES
(UPS, MCU,
DUMMY LOAD)

PLATE CONNECTORS ON TX1

COMMON SERIES (TO TX2)

TX1 EMERGENCY

COMMON SERIES
(FROM TX1 TO MCU)

PLATE CONNECTORS ON TX1$_2$

TX2 EMERGENCY

COMMON SERIES
(FROM TX2 TO TX1)
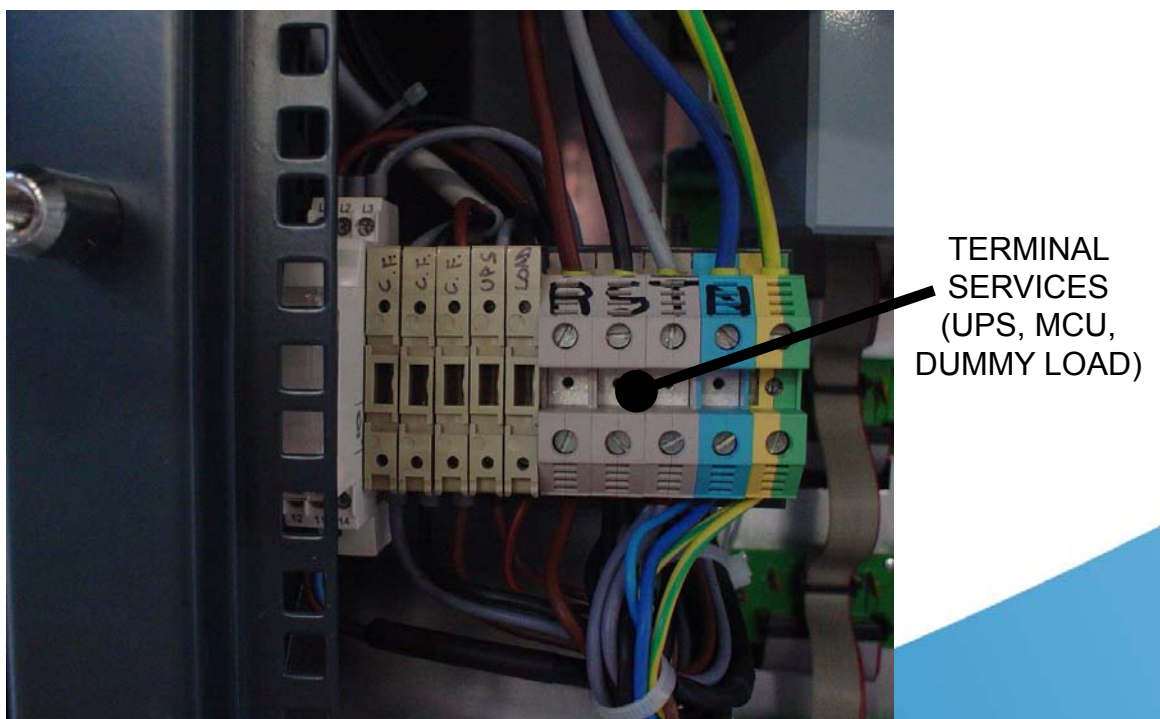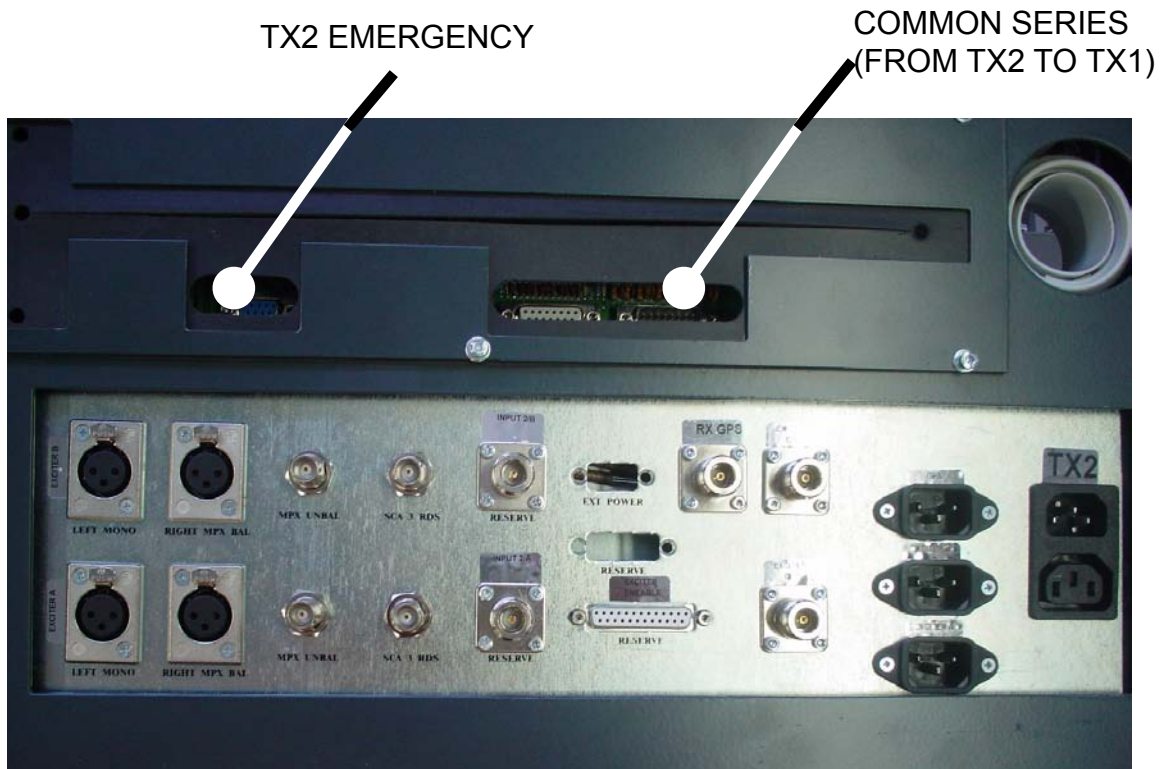
ELECTROMECHANICAL
TELEMETRY
BEHIND TX1
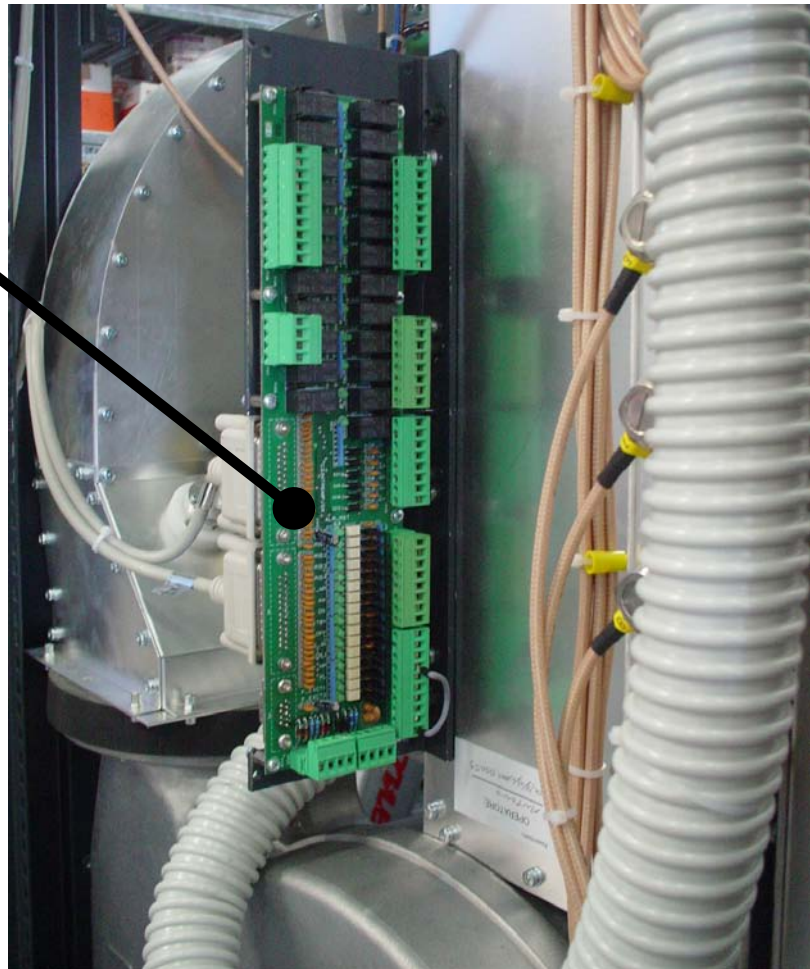
DETAILS OF FIXING THE COMBINATOR
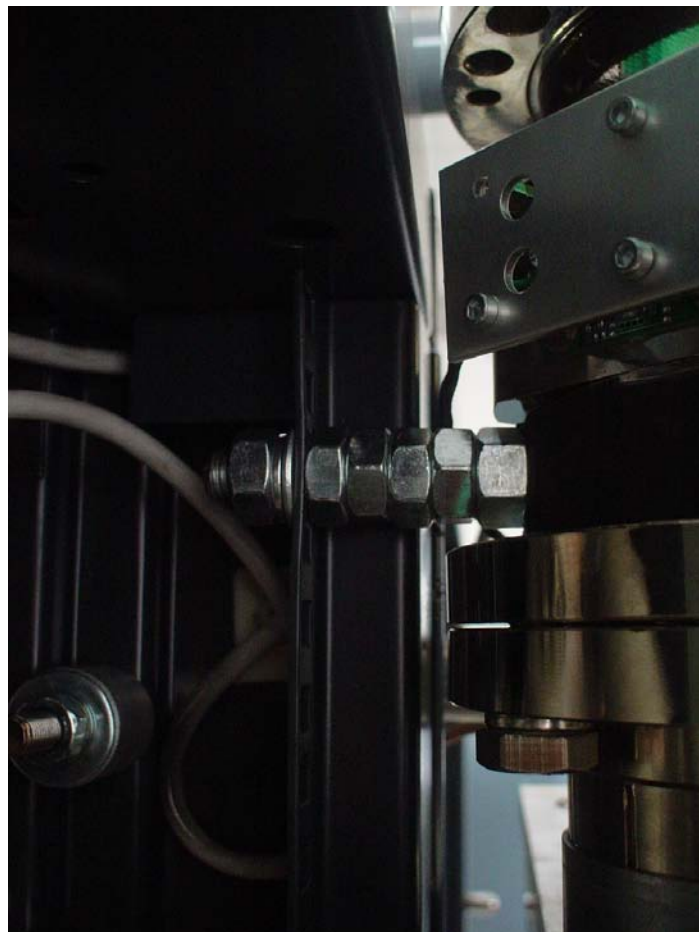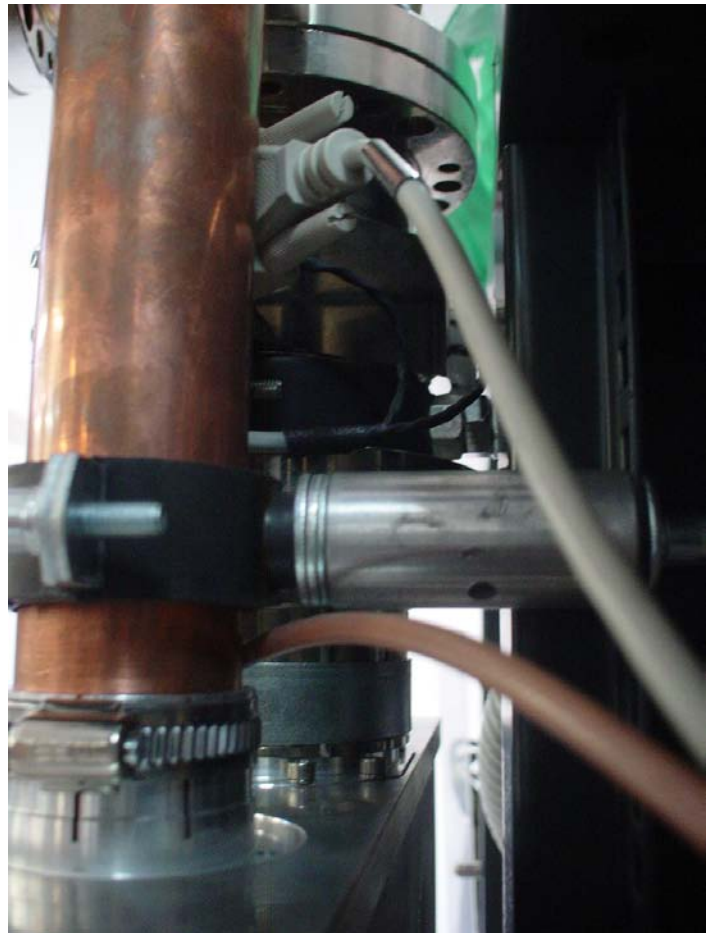
7.2 Low voltage and signals schematic
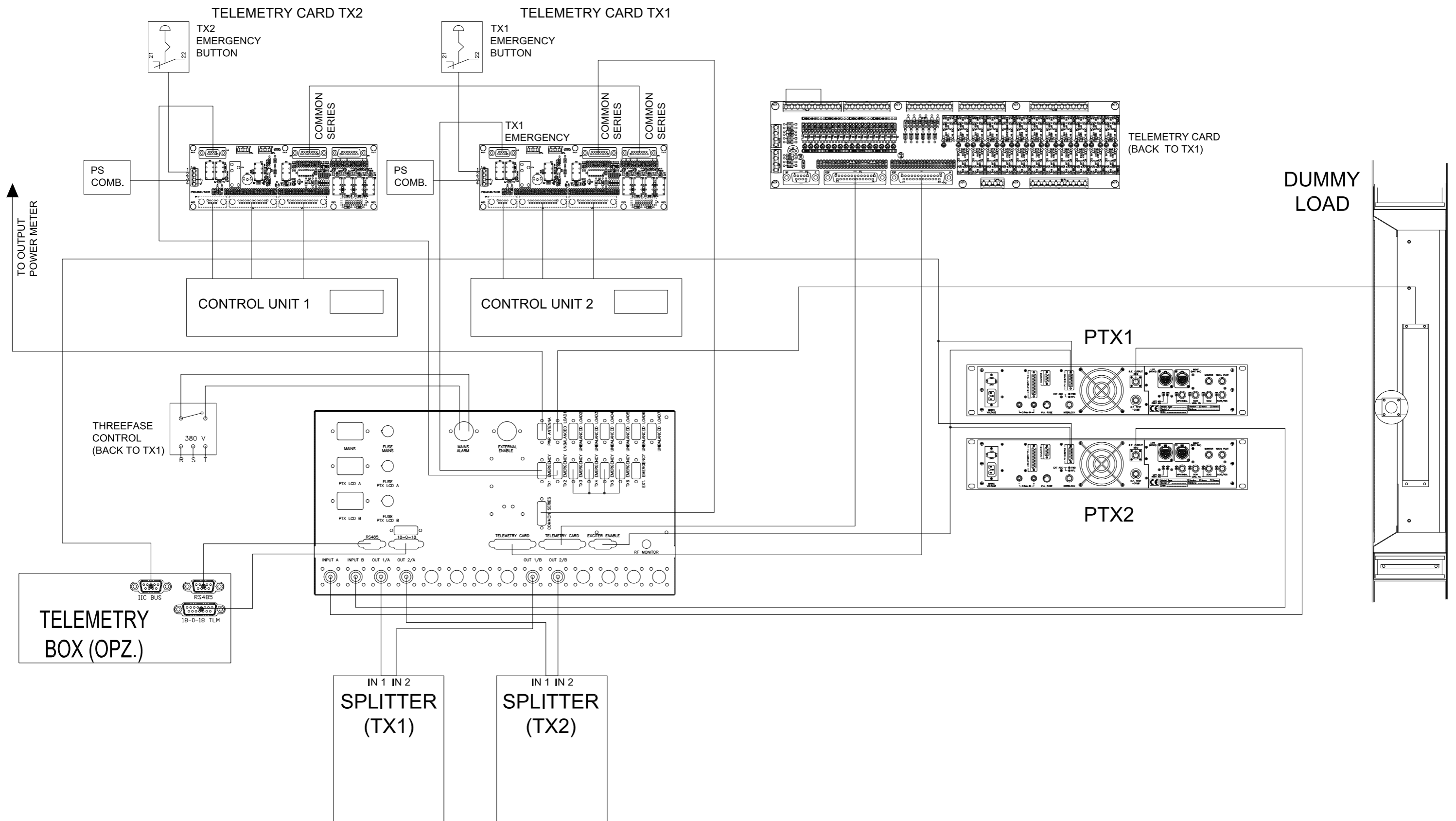
7.3 Power supply terminal services

MAINS

L3 L2 L1

L3 L2 L1 LOAD 1 UPS

| | | R | S | T | N | GND |

11 12

MAINS
ALARM

2A   10A
FUSE
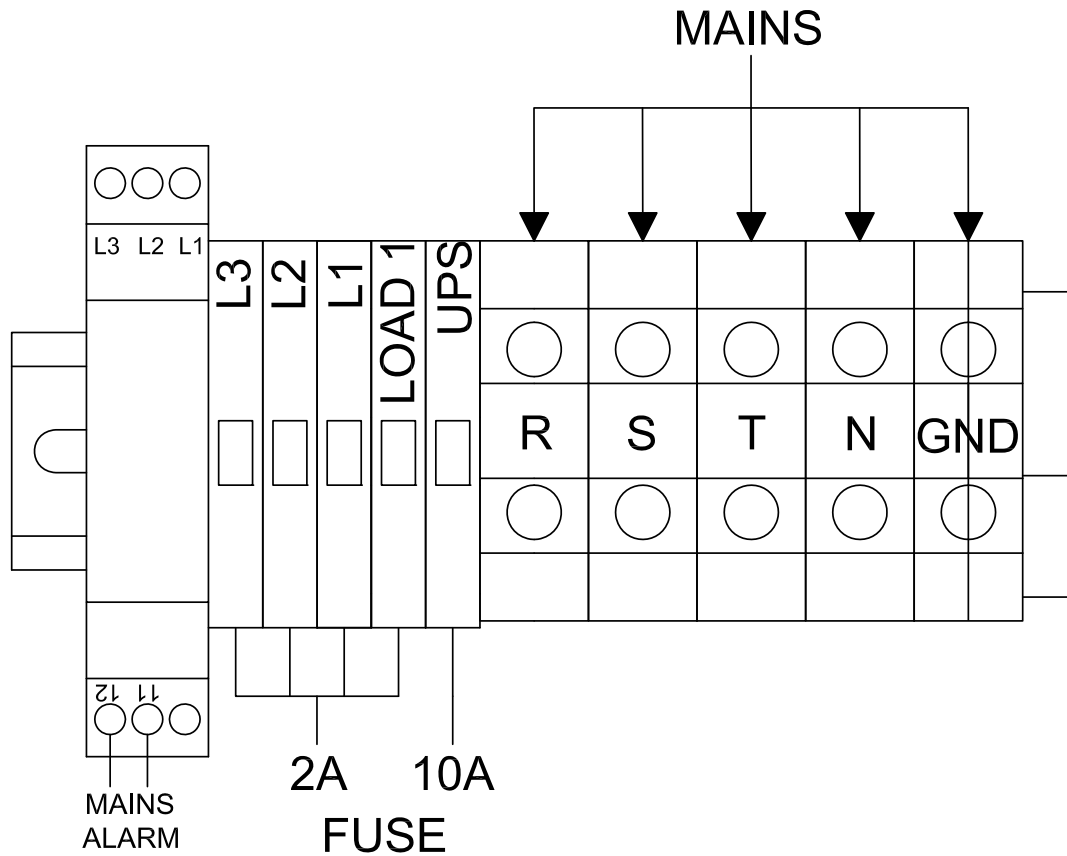
DENOMINAZIONE:		
Morsettiera di alimentazione Servizi PJ20KPS-C		
N° PROGRAMMA		MACCHINA
——		——

SEMILAVORATO: ——			AUTORE	CODICE DISEGNO
MATERIALE: ——	PESO [KG] 0.65		Nicolini Daniele	MORINGRCKH2O
		SCALA 1:5	REVISIONE 0	CODICE AS400 —
TRATTAMENTO: ——	DATA 19/04/2012			
TOLLERANZA GENERALE SECONDO UNI ISO 2768–f		FORMATO A4	(	)

TELECOM italia®

7.4   Parallel Interface (MCUPJBUSADP1)

In place of the parallel interface standard (which is still present, but is located in the rear of the transmitter) is present this parallel interface which serves to manage the communication bus of rs-485 between the individual machines and the MCU and to manage the buttons emergency of the various machines in such a way that block, in case of emergency, the entire transmitter.

BUS PJXK
PIN ASSEGNATI
J1
LATO SALDATURE
FLAT16
CON BLOCCAGGI

PIN ASSEGNATI LATO SALDAT
P1
LATO SALDAT
DB 25 FEMMINA
PIN ASSEGNATI

PIN ASSEGNATI LATO SALDAT
P3
DB25 MASCHIO

FIX1 FIX2 FIX3 FIX4 FIX5 FIX6
FIX35 FIX35 FIX35 FIX35 FIX35 FIX35
+12V
+C1 47/25

U1D 40106
U1E 40106
U1F 40106
U1C 40106
U1A 40106
U1B 40106

C2 CD0.1uF

R1 10K
R2 1M
R4 1M5 JP2
R6 1M JP3 2P
R8 820K JP4
R9 470K JP5
R10 100K

JP1 2P
C3 1uF/25

Q1 BC237
K3 ZFH-12V
1N4004 D3

BZ1 BUZZER

K1
K2
R3 10R JP12 2P
+15VBUS
2K2
D2
R7
DL2 D3-V
1N4004
ZFH-12V

D1 1N4004
2K2 R5
DL1 D3-V
ZFH-12V +12V

C17 CD4K7pF
C19 CD4K7pF
C22 CD4K7pF
C25 CD4K7pF
C28 CD4K7pF
C30 CD4K7pF
C33 CD4K7pF
C35 CD4K7pF
C36 CD4K7pF
C38 CD4K7pF
C40 CD4K7pF
C42 CD4K7pF
C44 CD4K7pF
C46 CD4K7pF
C48 CD4K7pF
C51 CD4K7pF
C53 CD4K7pF
C55 CD4K7pF
C57 CD4K7pF
C59 CD4K7pF
C60 CD4K7pF
C61 CD4K7pF

C18 CD4K7pF
C21 CD4K7pF
C23 CD4K7pF
C26 CD4K7pF
C29 CD4K7pF
C32 CD4K7pF
C34 CD4K7pF
C37 CD4K7pF
C39 CD4K7pF
C41 CD4K7pF
C43 CD4K7pF
C47 CD4K7pF
C49 CD4K7pF
C52 CD4K7pF
C56 CD4K7pF
C58 CD4K7pF

C20 CD4K7pF
C24 CD4K7pF
C27 CD4K7pF
C31 CD4K7pF

K4
R11 10R
C16 CD0.1uF
+15VBUS 2K2
D5
R12
DL4 D3-V
1N4004
ZFH-12V
K7

+12V
R16 10R
+15VBUS 2K2
D7
R18
DL5 D3-R
1N4004
ZFH-12V

K9
R21 10R
+12V
2K2
D8
R22
DL6 D3-R
1N4004
ZFH-12V

BUS MCU VERSO AMPLI
PIN ASSEGNATI
P5
R13 0R
R14 0R
R15 0R
R17
R19 10R
C8 CD27PF
C9 CD27PF

DSS306 f F1
DSS306 f F2
DSS306 f F3 +15VBUS
DSS306 f F4
DSS306 f F5
DSS306 f F6

JP10 2P
TERM DI LINEA
R20 180R
MASCHIO DB15

C10 CD4K7pF C11 CD4K7pF C12 CD4K7pF
C14 CD4K7pF C15 CD4K7pF C13 CD4K7pF

OC1 TLP620
R24 47R
DL3 D3-V
C6 CD4K7pF
C7 CD4K7pF
R23 1K5
JP8
KRA3
+12V
JP6 3P
2P

+12V BZW045V8 DZ1
BZW045V8 DZ2
C5 CD4K7pF

PIN ASSEGNATI
P6
FEMMINA DB15

C45 CD4K7pF
C50 CD4K7pF
C54 CD4K7pF

K5
C4 CD4K7pF
ZFH-12V

PIN ASSEGNATI LATO SALDAT
P2
DB9 MASCHIO

JP7 LOC-REM
KRA3

K6 RELE EMERG
D6 1N4004
ZFH-12V

PIN ASSEGNATI
P4
DB FEMMINA

EMERG
JP9
KRA4
1-2 FUNG EMERG
3-4 BOB OUT RELE

K8
ZFH-12V
JP11 2P +12V
BY PAS EMRG

Nome Progetto:	MCU COMBINER		Pagina: 1 di 1	Size: A3
Autore:	<Author Name>	Data: 30 LUGLIO 2005	Codice Progetto: PJXK_BUSADP.DSN	
Nome PC In Rete:	<Path PC>	Revisione: <Rev.>	Nome Parte: <Part Name>	
File/Cartella:	<Path File>	Autorizzazione:	Codice: <Code>	

7.5   Plate connectors

PLATE CONNECTORS ON TX1
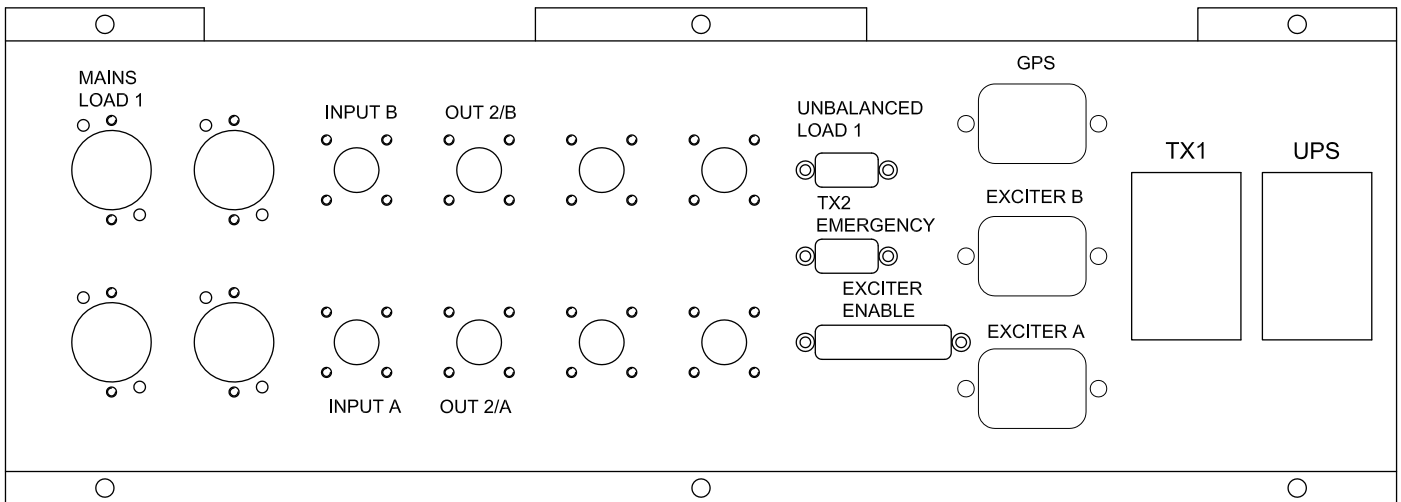
MAINS LOAD 1	Power dummy load
INPUT A	Input RF Exciter A from TX2
INPUT B	Input RF Exciter B from TX2
OUT 2/A	RF output from the MCU to the splitter of TX2 (IN1)
OUT 2/B	RF output from the MCU to the splitter of TX2 (IN2)
UNBALANCED LOAD 1	Control signals of the dummy load
TX2 EMERGENCY	Link to the electromechanical telemetry card of TX2
EXCITER ENABLE	Control signals for the exchange of the exciter and i2c bus
GPS (OPZ.)	Output power GPS receiver (optional) in the UPS (if installed)
EXCITER B	Output power EXCITER B under UPS (if installed)
EXCITER A	Output power EXCITER A under UPS (if installed)
TX1	Power input / output services TX1 (there is a jumper)
UPS	UPS connection (optional). If not present, make a bridge

PLATE CONNECTORS ON TX2
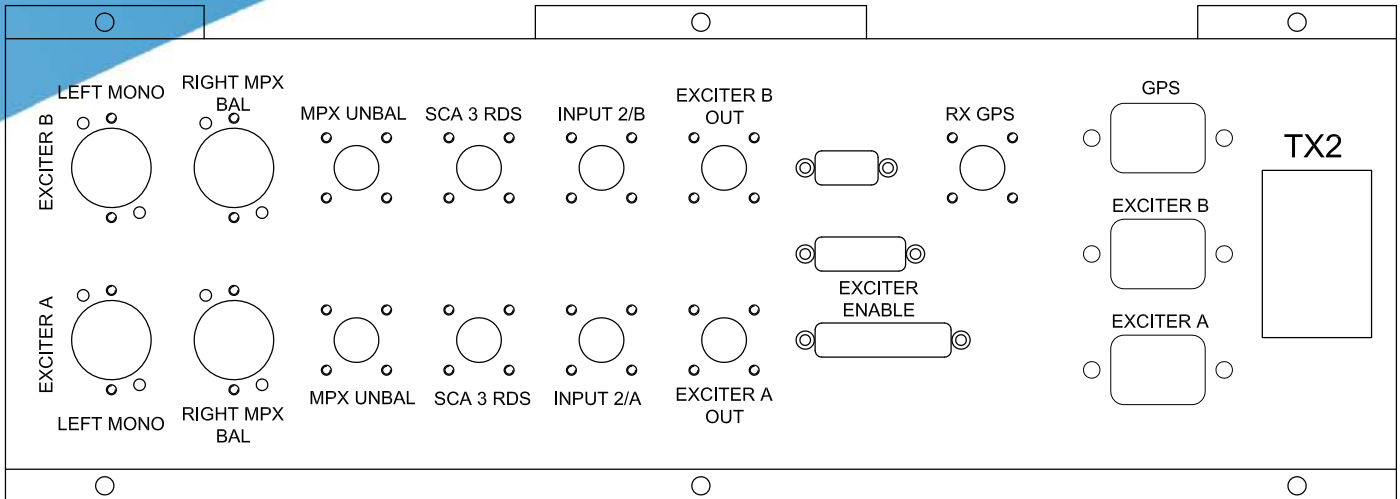
EXCITER A:	
LEFT MONO	Input audio signals for EXCIER A
RIGHT MPX BAL	
MPX UNBAL	
SCA 3 RDS	
EXCITER B:	
LEFT MONO	Input audio signals for EXCIER B
RIGHT MPX BAL	
MPX UNBAL	
SCA 3 RDS	
INPUT 2/A	RF input to the splitter (IN1)
INPUT 2/B	RF input to the splitter (IN2)
EXCITER A OUT	RF output from the EXCITER A to the MCU
EXCITER B OUT	RF output from the EXCITER B to the MCU
EXCITER ENABLE	Control signals for the exchange of the exciter and i2c bus
RX GPS	GPS Antenna Input (optional)
GPS	Input power GPS receiver (optional) under UPS (if installed)
EXCITER B	Input power EXCITER B under UPS (if installed)
EXCITER A	Input power EXCITER A under UPS (if installed)
TX2	Power input / output services TX2 (there is a jumper)

7.5.1   DB25 pinout (exciter enable)

TX1

EXCITER ENABLE
(on the top)
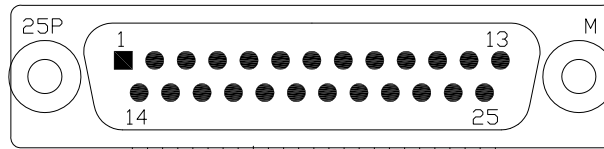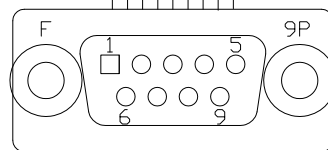
EXCITER
ENABLE
(from MCU)
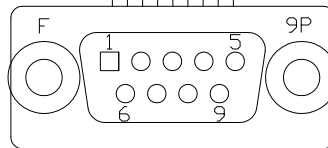
I2C BUS
(from GSM
telemetry)

Exciter enable (DB-9)	I2C BUS (DB-9)	Exciter enable (DB-25)
1 (Common)		1
2 (Ptx 2)		2
6 (Ptx 1)		14
	2 (SDA)	10
	3 (SCL)	11
	5 (GND)	13

TX2

EXCITER ENABLE
(on the top)
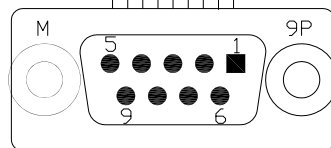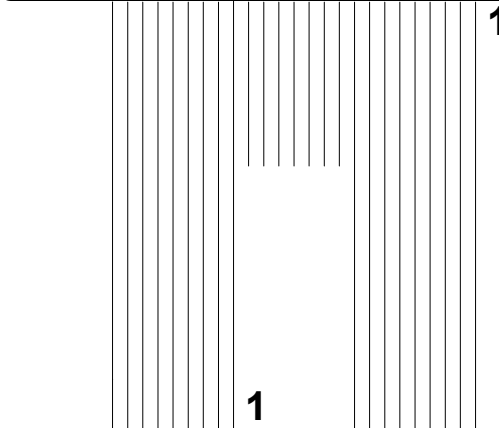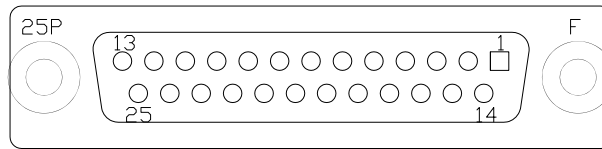
I2C BUS
(to I2C cable of
cabling)
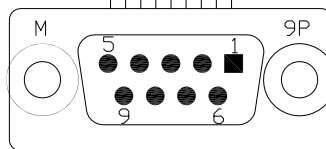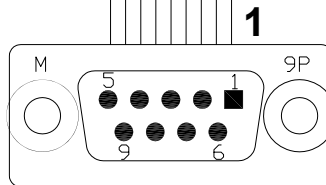
EXCITER
ENABLE
(to the cable exciter enable,
originally connected to the
Control Unit)

Exciter enable (DB-25)	Exciter enable (DB-9)	I2C BUS (DB-9)
1	1 (Common)	
2	2 (Ptx 2)	
14	6 (Ptx 1)	
10		2 (SDA)
11		3 (SCL)
13		5 (GND)

7.6   Hybrid coupler (COUP3DB20KF)

Input TX 2
Flange 1+5/8 panel

Combiner output
Flange 3+1/8 panel

Output to dummy load
Flange 1+5/8 panel

Input TX 1
Flange 1+5/8 panel

Internal view

ANTENNA

TX 2

HYBRID

TX 1
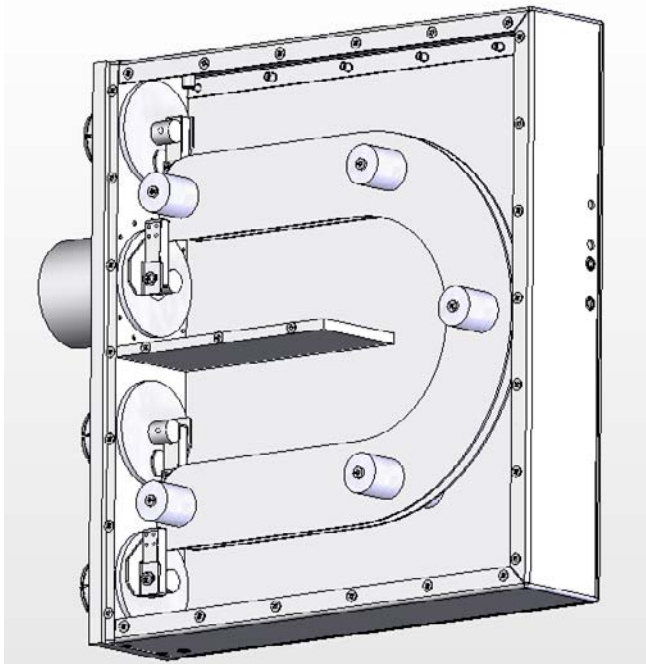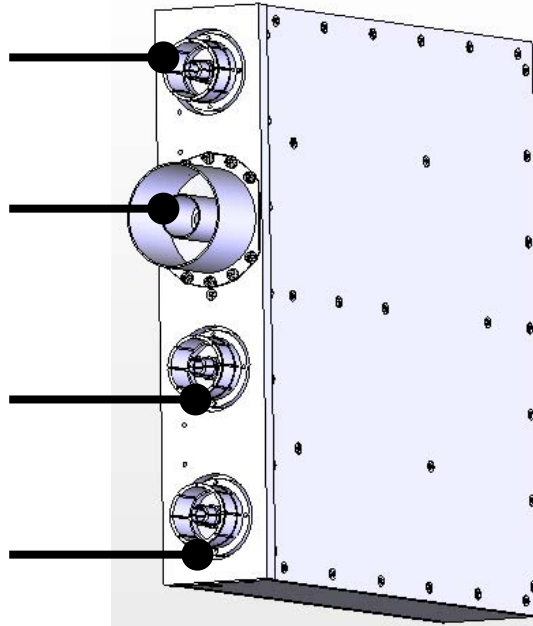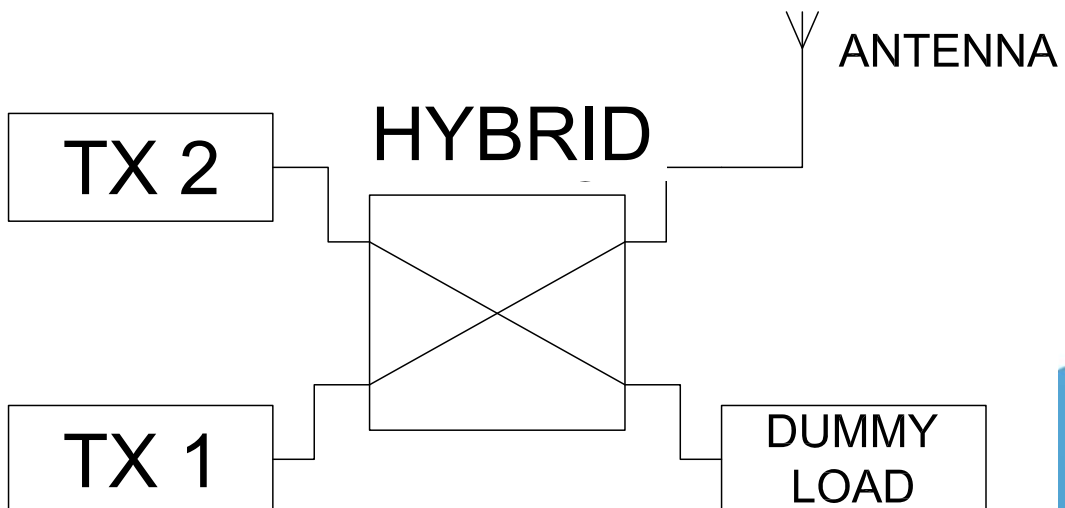
DUMMY
LOAD

7.7 Dummy load (PF1KDI5KWH2O)
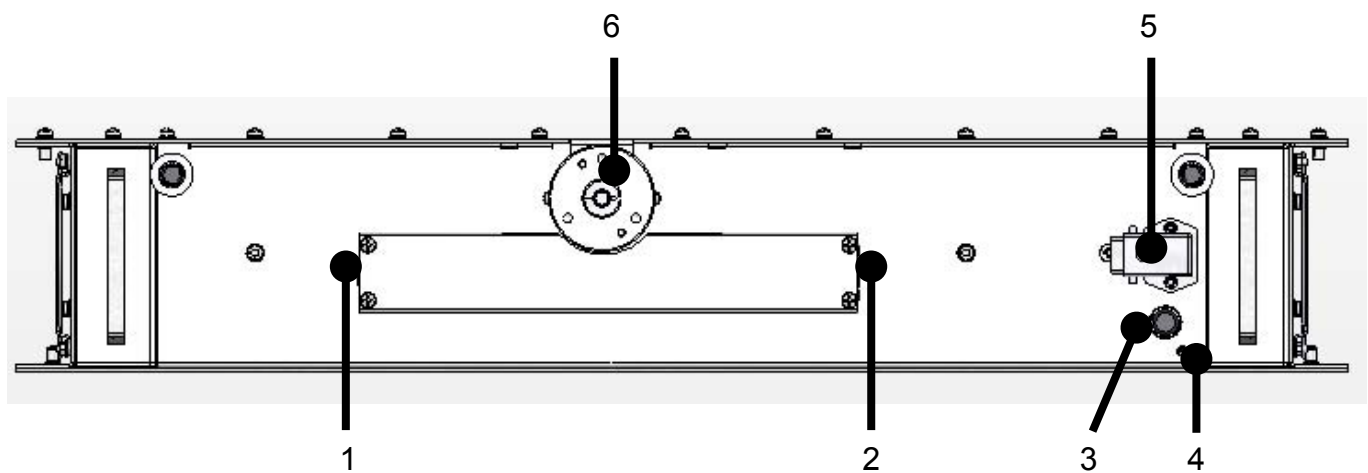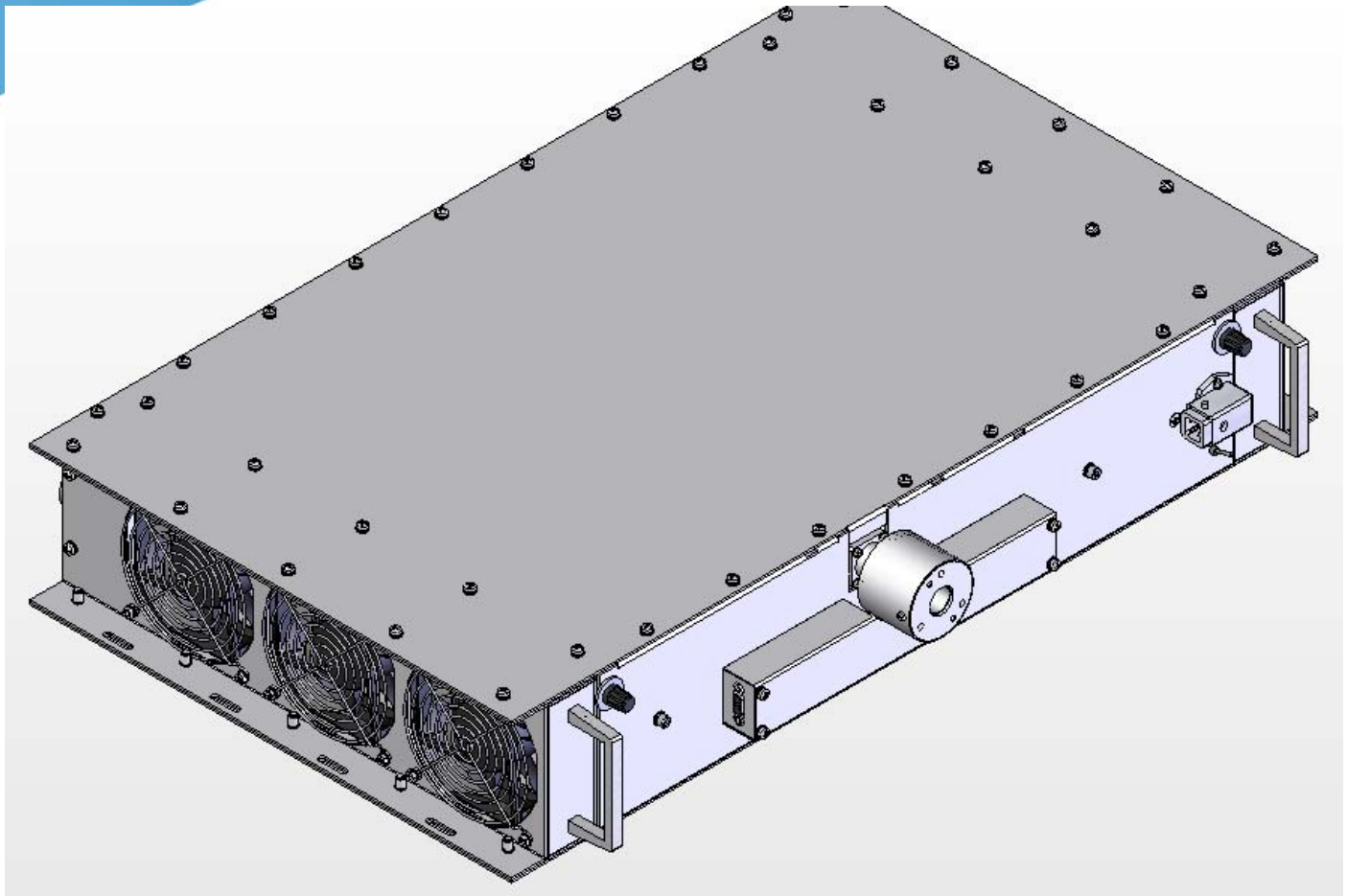
1	DB-9 connector for input heads FWD and RFL	/
2	DB-9 connector "UNBALANCED LOAD 1"	/
3	Fuse protection fans	10A
4	Command AUTO / MANUAL to operating cooling fans	/
5	Connector ilme power load	/
6	RF input connector (flange 7/8 "EIA)	/
7	KDI resistor 100 Ω 800 W (termination)	RDT800J0100
8	KDI resistor 100 Ω 800 W (passing)	RDR800J0100
9	Temperature sensor 50° NA	SETBIMET50NA
10	Load cooling fan drawers	ventole: VTL9GL1224J
11	Temperature sensor 120° NC (FAULT)	SETBIMET12NC
12	Temperature sensor 50° NC (WARNING)	SETBIMET50NC

11   12
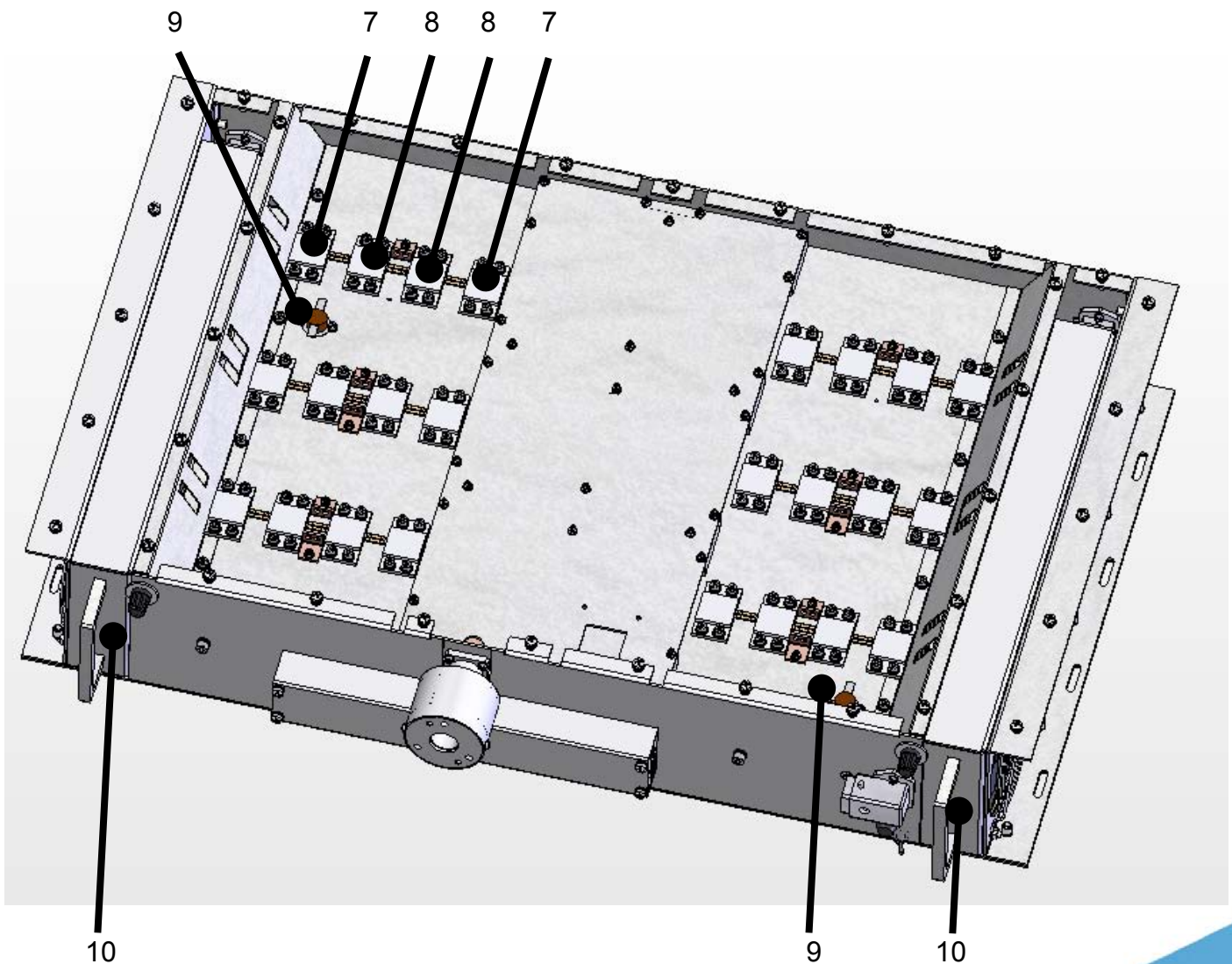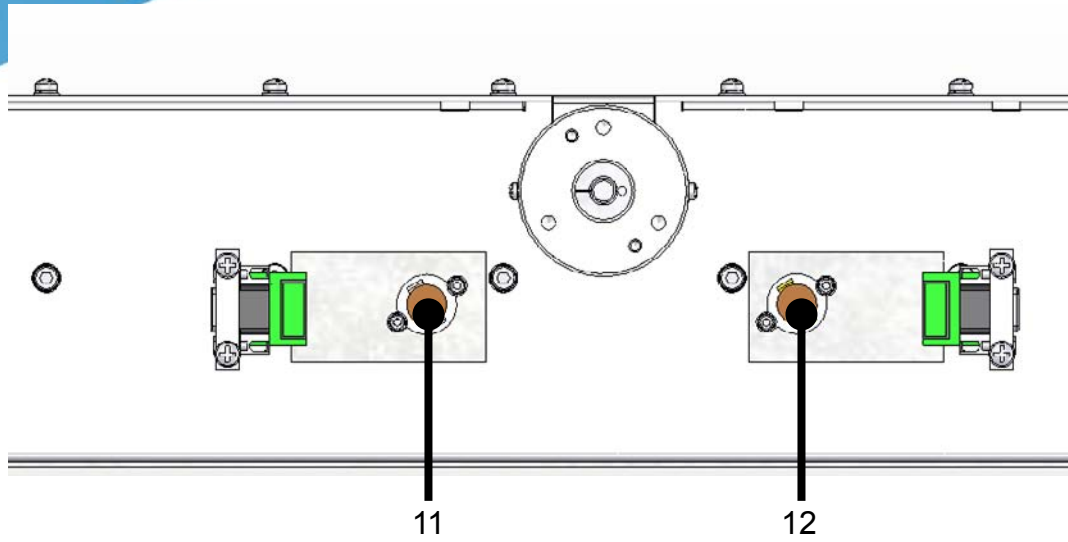
7.8   GSM Telemetry (opzional)

R.V.R. Elettronica's plug-in series transmitters, may be optionally fitted with the telemetry device that enables the user to remotely check 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. Telemetry is installed on the top of TX1.

The bottom part of the telemetry contains the following connectors:
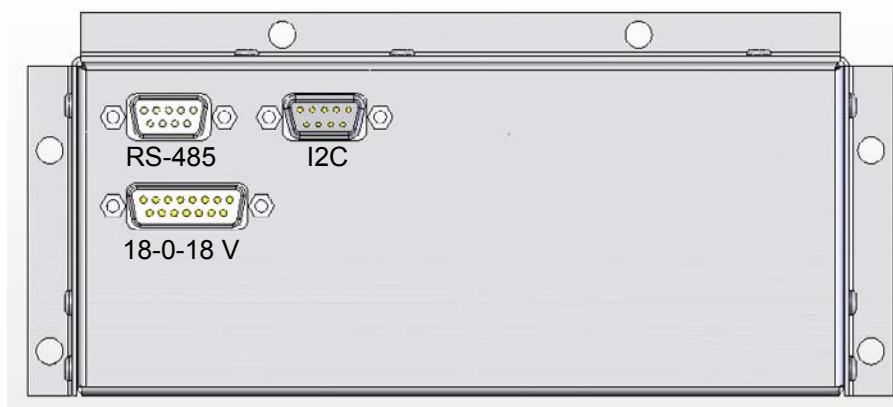
RS-485	DB9 male connector for connecting the RS-485 bus from the CCU
I2C	DB9 male connector for connecting the I2C bus from the CCU
18-0-18 V	DB15 male to connect power from the CCU

The top of the telemetry contains the following connectors:

SMA connector for GSM antenna or external directional antenna

Bridge to connect the GSM modem

Insert the SIM card slot

Power on | General alarms | Modem present | Send msg | Modem com. | RS-232 | Local | Waiting start

MODEM   RS-232

RESET /PRG   FUSE 2A   FUSE 2A
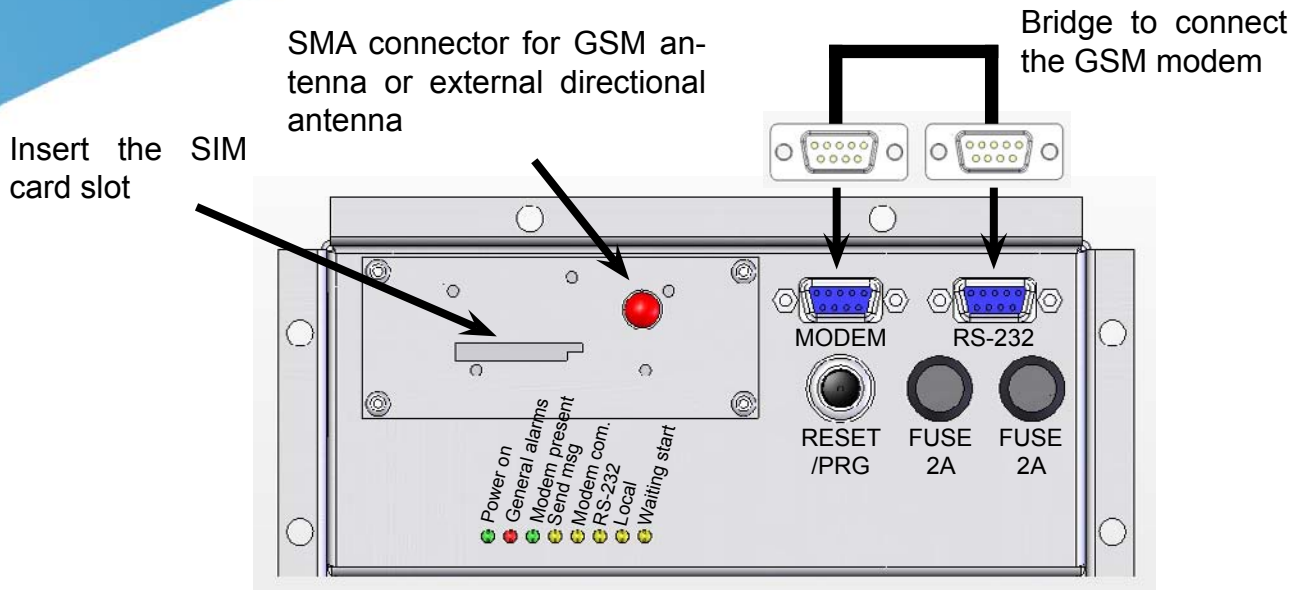
Modem	DB 9 female connector connected to the modem internal GSM
RS-232	DB 9 female connector to connect the GSM modem, with telemetry, or to connect with the PC via RS-232 to the transmitter
Reset/prg	Button to reset the telemetry or programming
Fuse 2A	Fuse protection
Fuse 2A	Fuse protection
Power on	The LED on indicates that the telemetry is powered
General alarms	The LED on indicates that the memory of the telemetry alarms are present
Modem present	The LED on indicates that the GSM modem is present and correctly detected by the telemetry
Send sms	The LED on indicates that the GSM modem is sending SMS messages
Modem com.	The LED on indicates that the modem is connected
RS-232	The LED blinks when you connect your PC to the RS-232 telemetry to communicate with the transmitter using the "Telecon 32bit"
Local	The LED on indicates that the transmitter is in LOCAL (via the selector switch on the CCU) and telemetry will not send alert messages or you can remotely connect to the transmitter
Waiting start	The LED blinks for about 45 on first boot. During this period, the telemetry, it analyzes the whole machine to check status and does not send alerts

Note: you need to enter the bridge supplied with the telemetry between the connector MODEM and RS-232 to connect the GSM modem, otherwise will not work

Nota: 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.

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.

Set the Uart address of exciter 1 to "1", exciter 2 to "2".

To make this adjustment, from the main menu of the exciter place the cursor light on the "Admin" and click on it.

Scroll down the menu next to the item "GenSt", click on it and select "Uart Adr." and set it to 1 on the first exciter (the lower) and 2 on the second (if present).
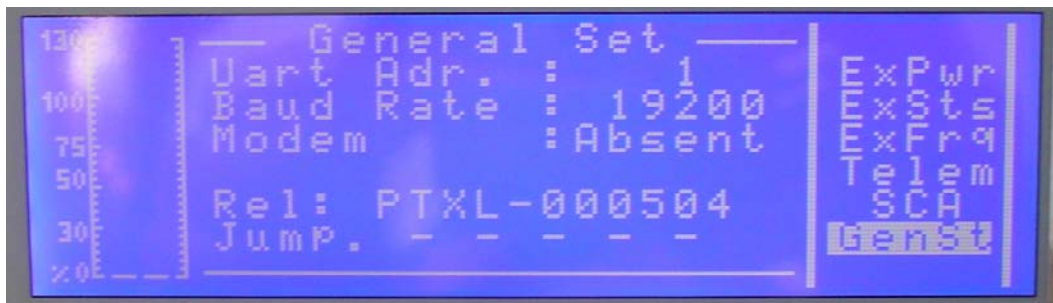
We must now set the address on the CCU, which must be absolutely 3 (this address is already set to factory).

From the main menu (the one that shows the direct and reflected power), press the ESC key and then OK and move the cursor bright, on the "Settings" menu and press OK. Select the line "Talk Address" and press OK, with the UP 'and DOWN keys' set the parameter 3.

7.8.1 Installing and configuring the PC software

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.

Then run the program Station_upgrade.exe, which will update the list of stations.

Follow the instructions on screen to install the update.

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.

WARNING: The transmitter must be in REMOTE otherwise there can't be connected to the telemetry.

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.
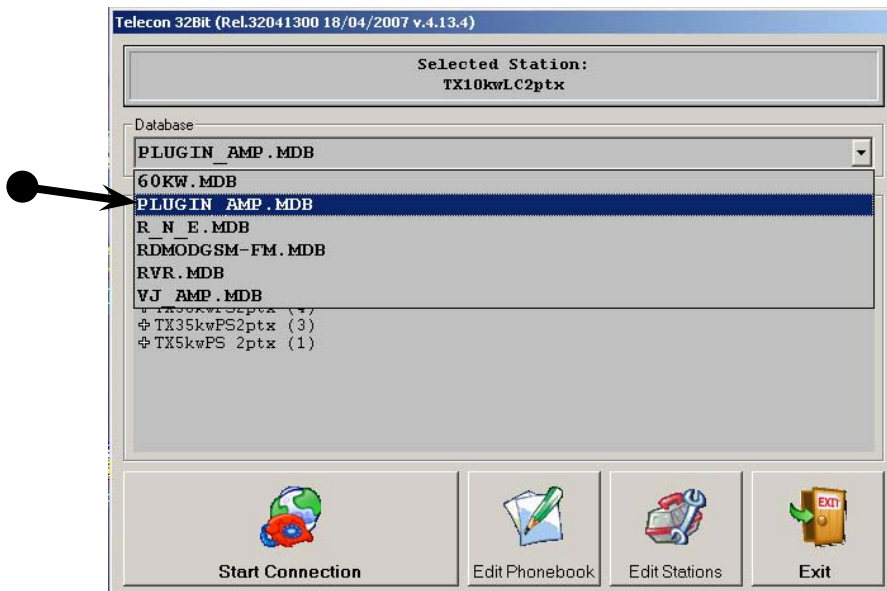
Then select the station "TX20kwPS2ptx" per il PJ20KPS-C o "TX25kwPS2ptx" per il PL25KPS-C and click on "Edit Phonebook".
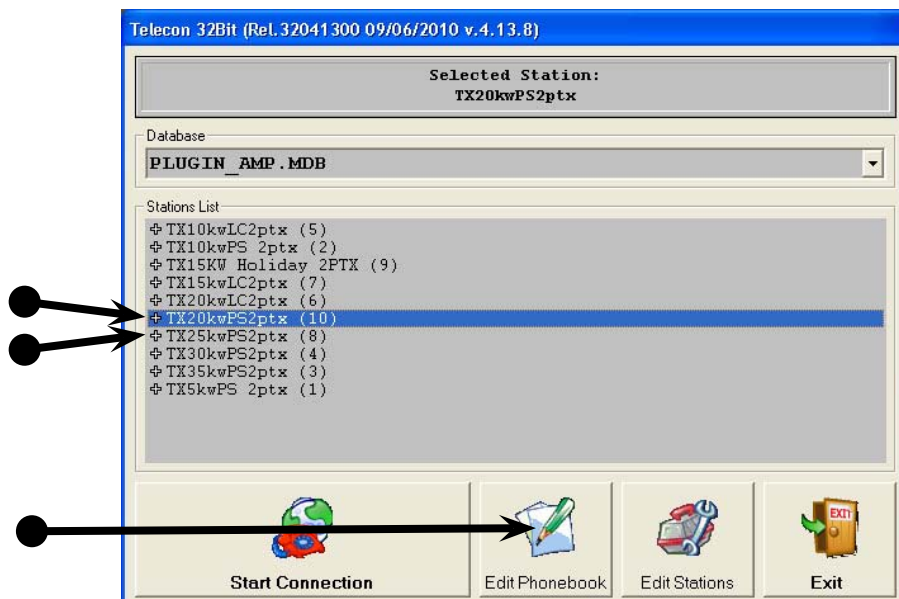
This will open the following screen
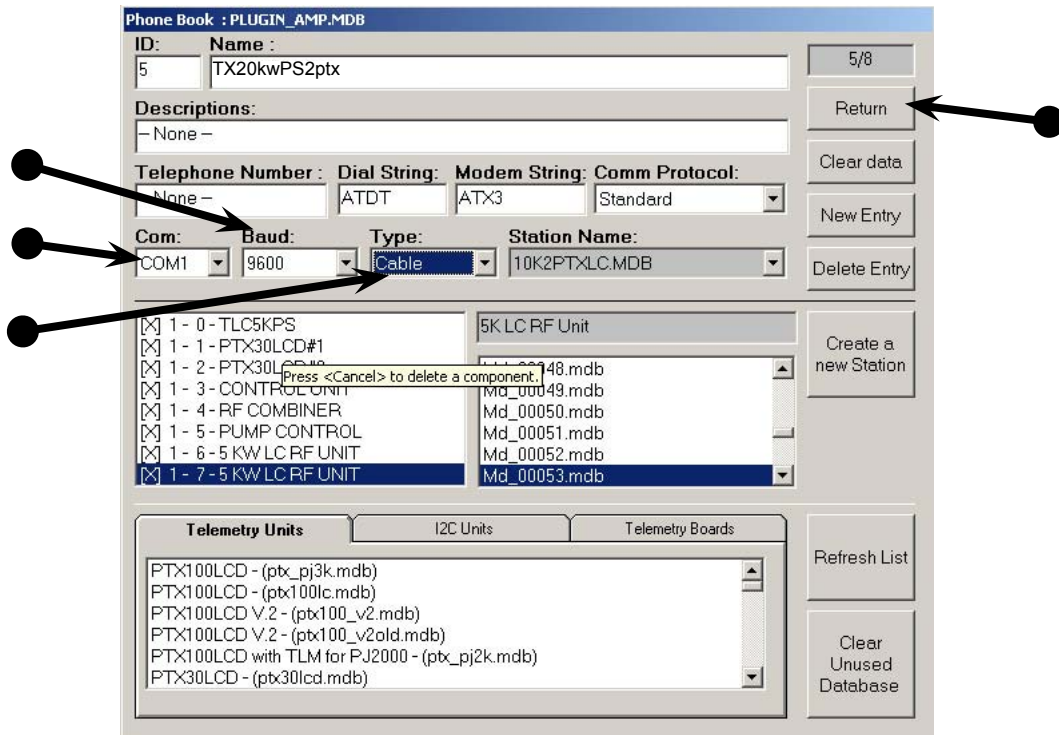
The first time will need access to the telemetry via the DB9 cable, so you can set the details of the station and telephone numbers to which messages will be sent.

Plug the cable into a PC serial port (for those who no longer have the serial port you can use a USB - RS-232 converter, not supplied), and the other end is connected to the RS232 port of the telemetry (if it has already been added to the bridge between the modem and RS-232 remove)

Set the following parameters:

Com: select the serial port in use on the PC (COM1,COM2,ecc...)

Baud: is the speed of the serial port, should always be 9600 otherwise it will you communicate

Type: is the type of connection between PC and telemetry, in this case, select "Cable"

Press the button "Return" at the top right and return to the main screen.
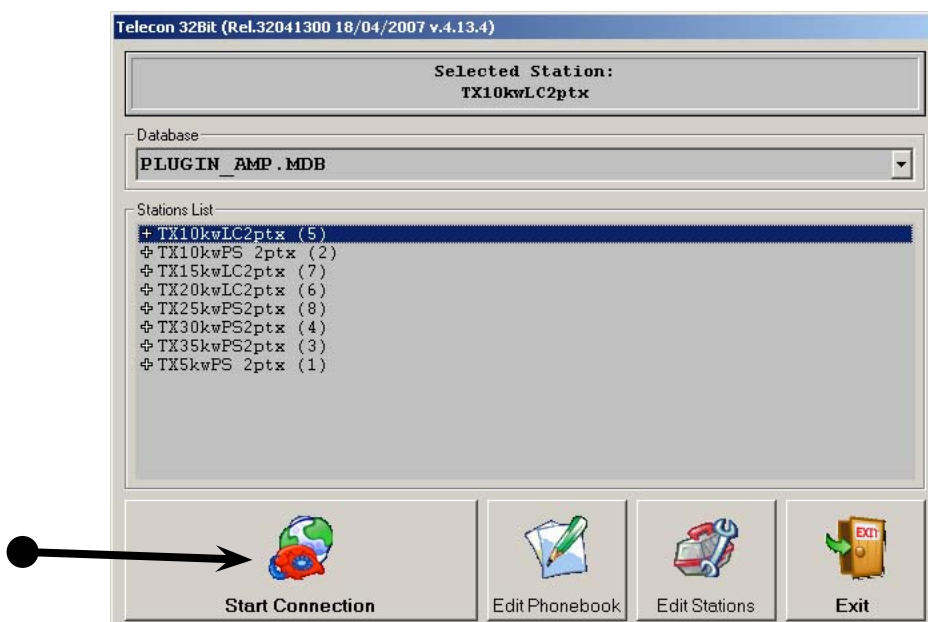
Press the "Start Connection" and at this point will be the link.
This will display the following screen.
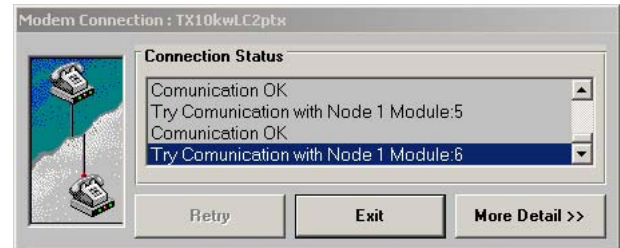
If everything is done correctly it will open the following screen.
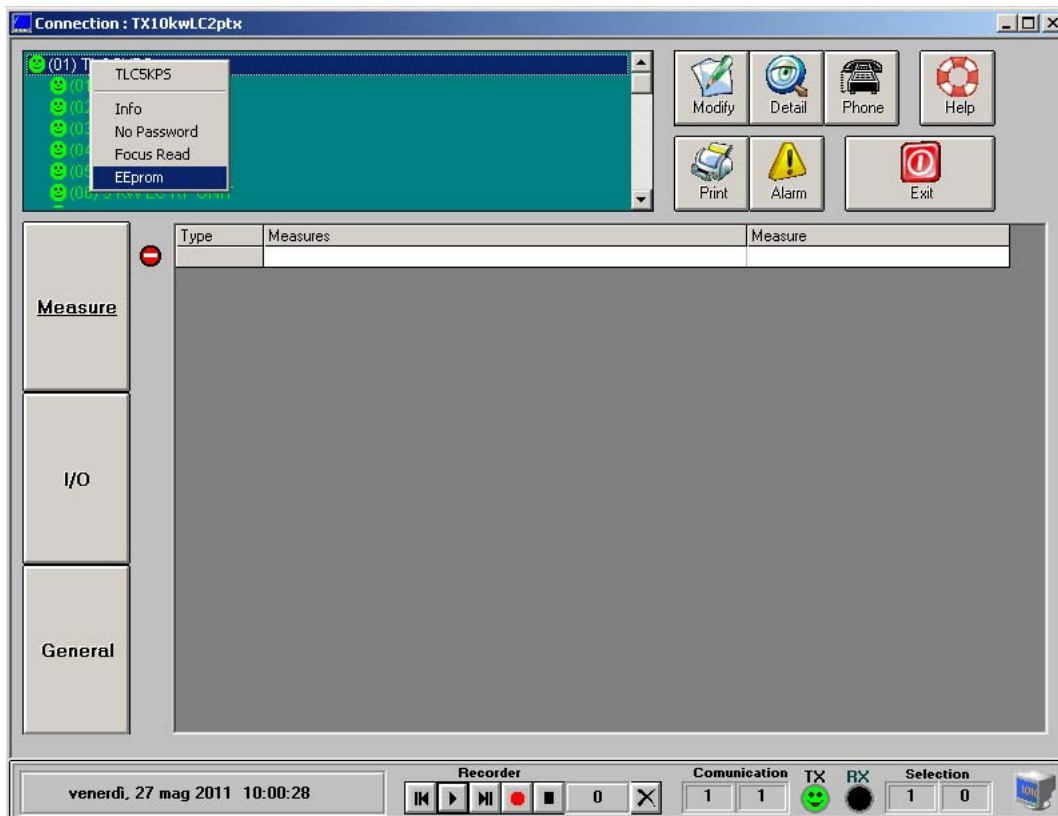
Click 2 times on the top item on the left "(01) TLC5KPS" (in this box are listed all the devices connected to the machine via I2C BUS, in this case we are querying the telemetry) with the left mouse button, opens a drop down menu and click the last entry "EEprom".
A screen will open, click on button "Read EEPROM" and the question "Are you sure?" press OK.
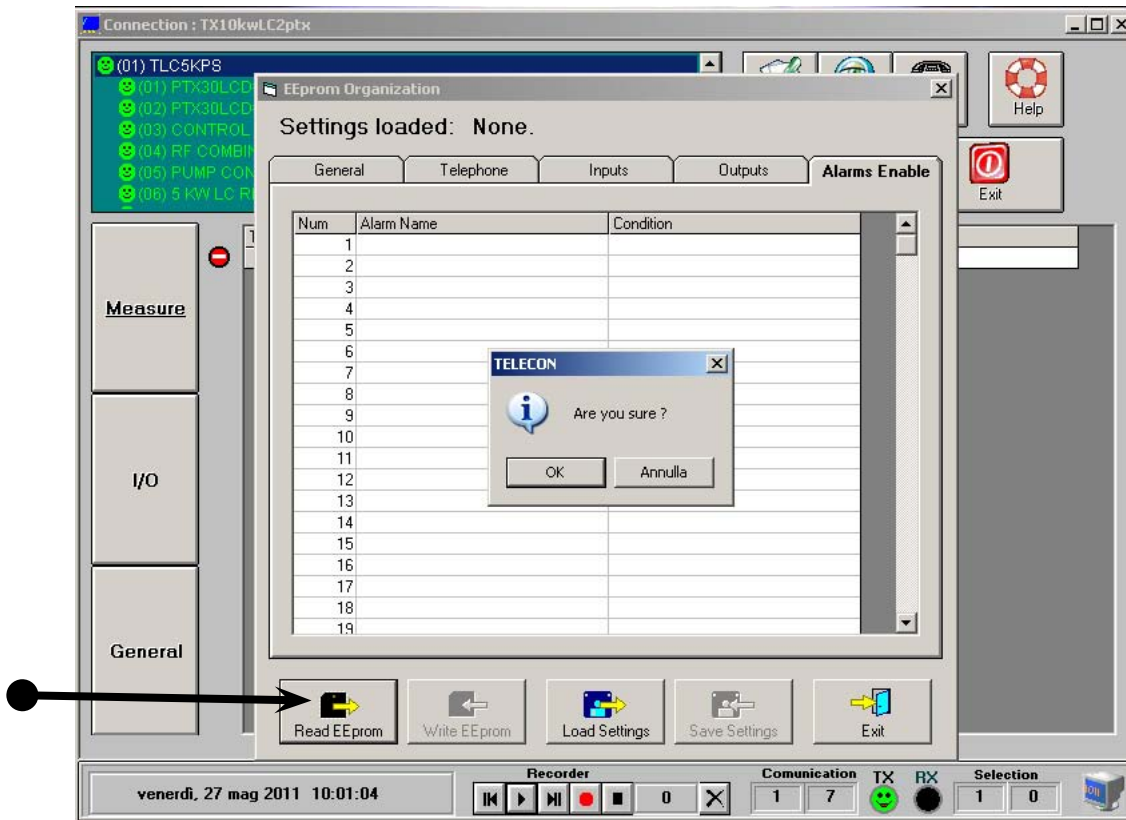
Begin reading the data in the EEPROM. The blue squares at the bottom, showing what progress has been reached, the reading of the EEPROM.
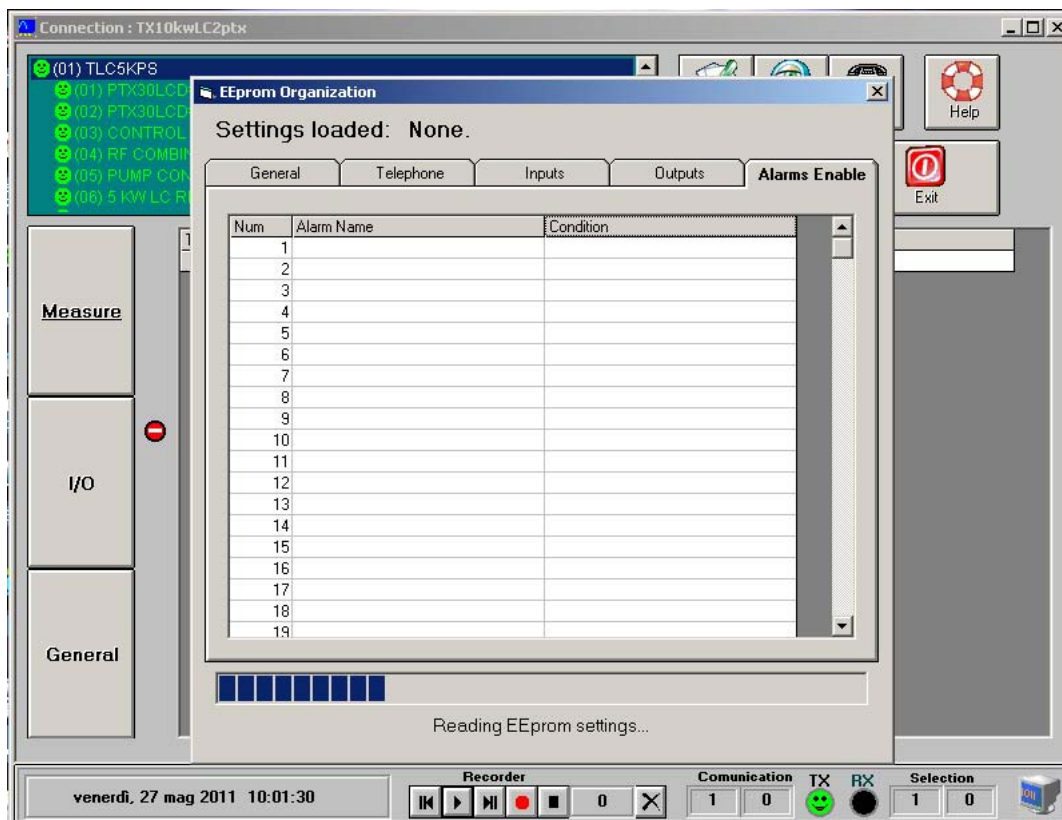
When the blue bar is full, you will see the following screen.
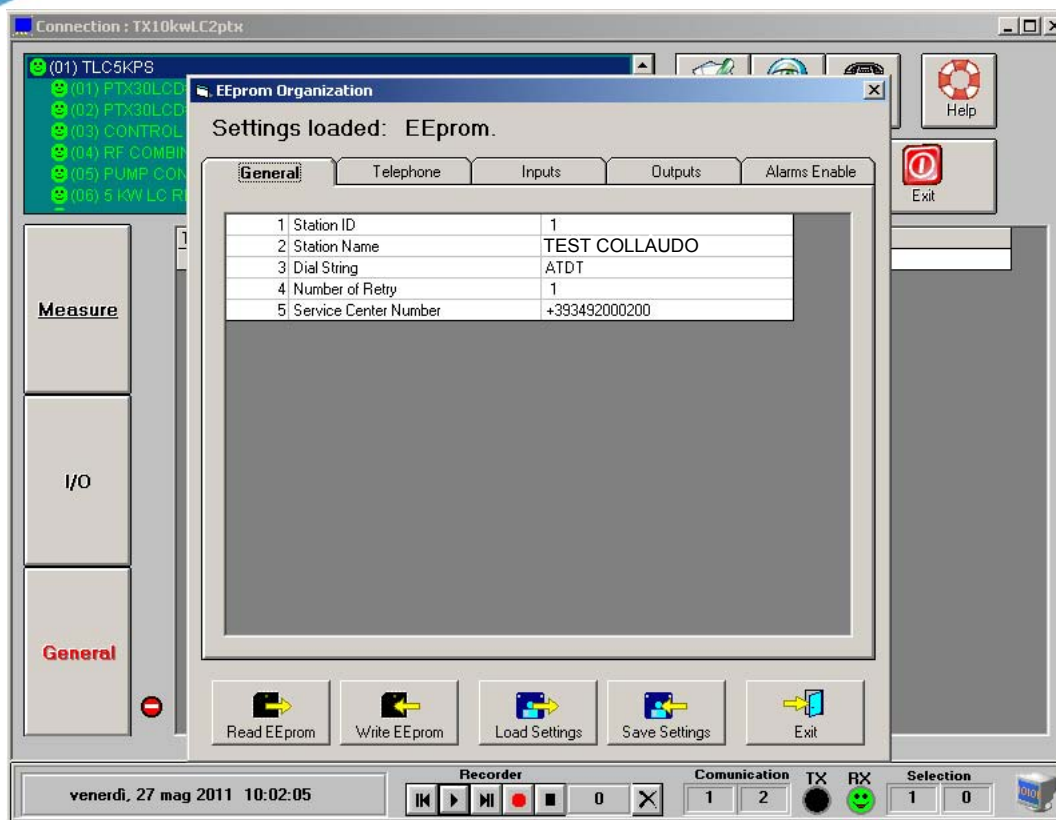
The screen that opens shows the inside pages of different settings, but those that we have to compile us, are the first two, "General" and "Telephone".

GENERAL

Station ID	Identification of the address of the transmitter, usually 1
Station Name	Mnemonic name of the station, like place or frequency, this name will be displayed in the SMS message you will arrive
Dial String	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 Centre.
Service Center Number	Service center number of your mobile operator **Note: before the number, there must always be the international prefix of the state where you are eg. +39 For Italy**

Clicking on the various fields you can change their values.
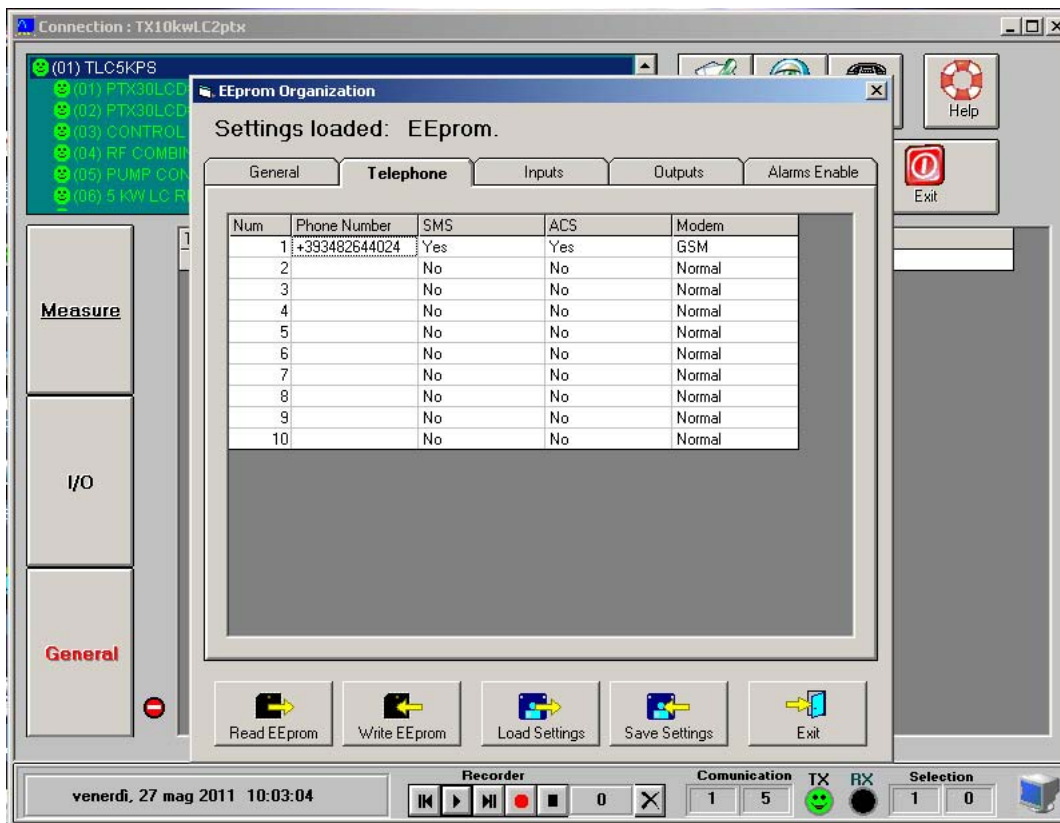
TELEPHONE

1.....10	Memory location where you save the phone number
Phone Number	Telephone number to which messages are sent **Note: before the number, there must always be the international prefix of the state where you are eg. +39 For Italy**
SMS	Yes: the SMS message in case of alarm, is sent to the number set No: the SMS message in case of alarm, will not be sent to the number set
ACS	Yes: the number set, can be sent to telemetry, via SMS requests for information or modify parameters No: the number set, can not send telemetry, via SMS requests for information or modify parameters
Modem	Select the type of modem used, in this case GSM

Clicking on the various fields you can change their values.
The possible combinations of parameters SMS and ACS are:

SMS	ACS	
Yes	Yes	OK
Yes	No	OK
No	Yes	Condition not possible
No	No	OK, but the number set will be ignored

Once completed these settings, click on "Write EEPROM" to write in the memory, when asked answer OK
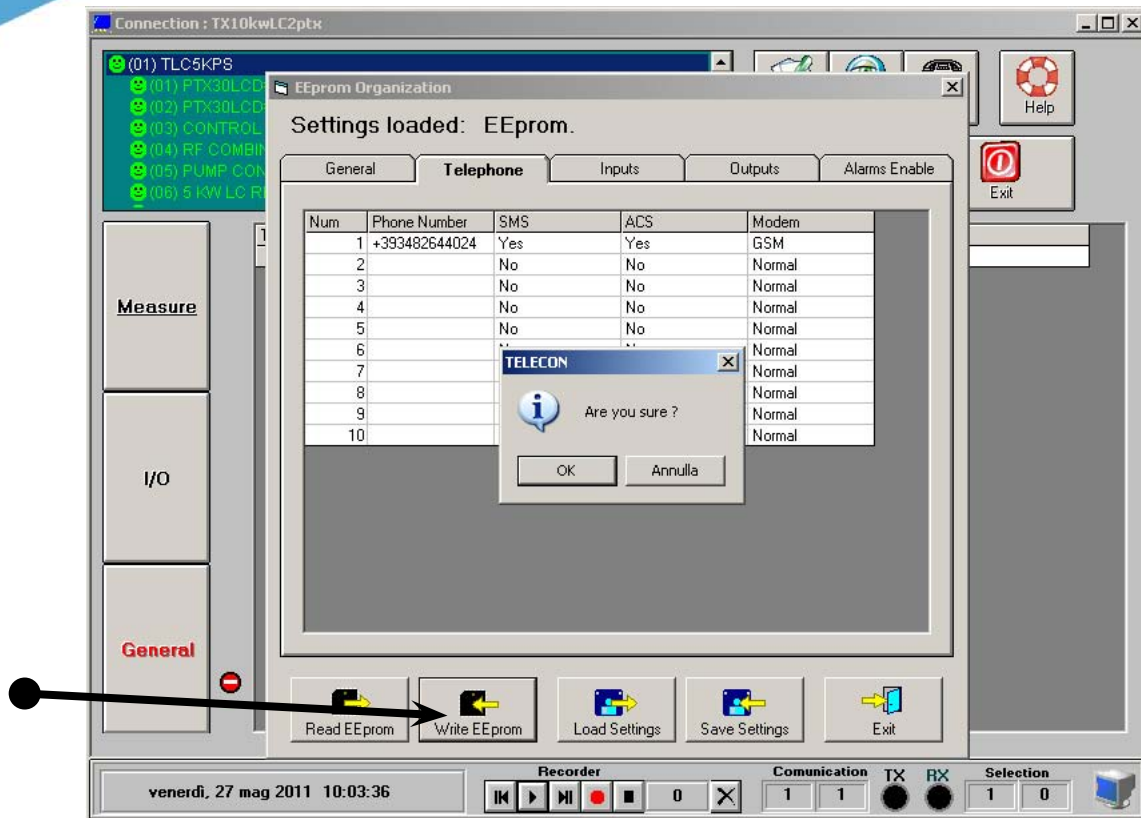
Start writing data into the EEPROM. The blue squares at the bottom, showing what progress has been reached, the writing of the EEPROM.
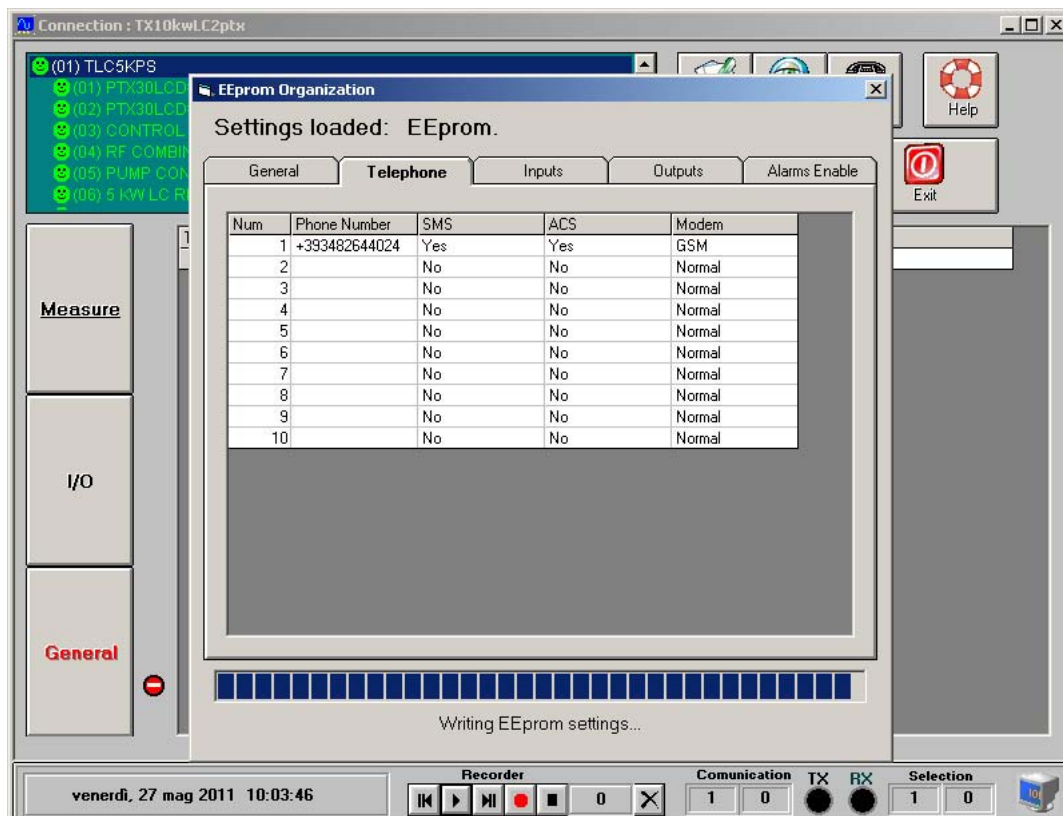
Once you have finished writing, press the button "Exit" to return to the main screen as well.
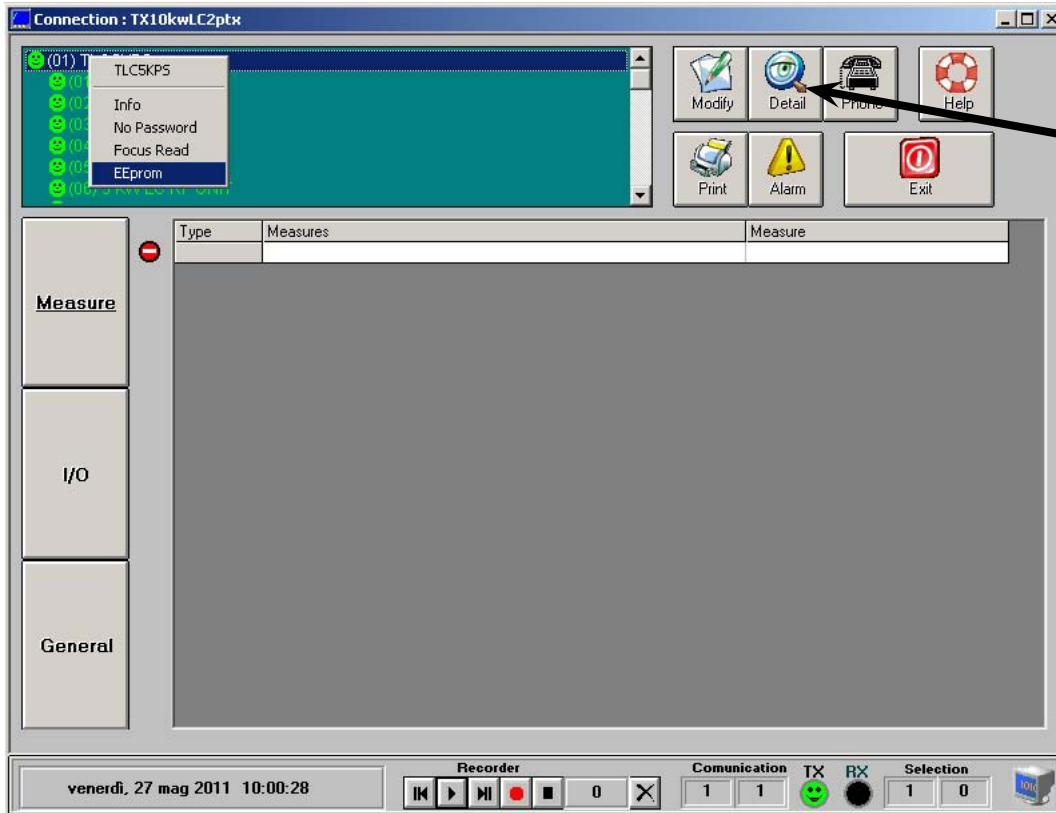
Now press "Details" in the upper right and will open the following screen.
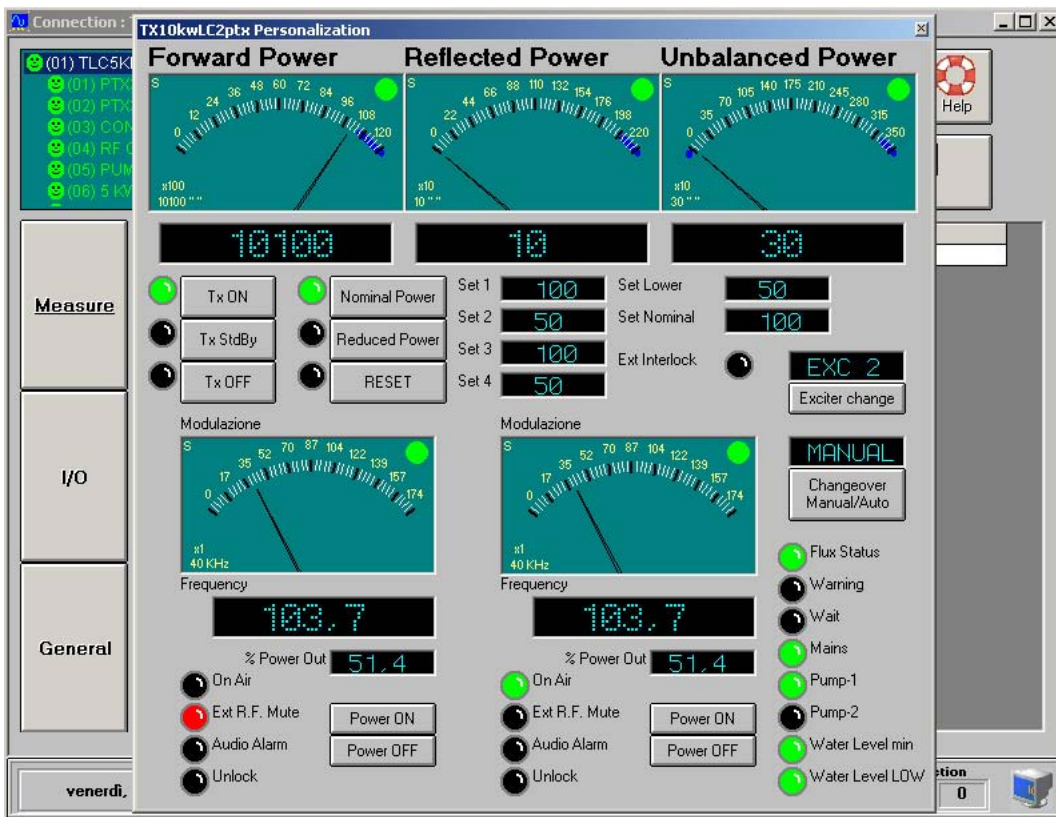
Through this screen and possible see all the parameters of trsmettitore as if you were in front of the machine: forward power, reflected, unbalanced, frequency, see the status of the LEDs, you can turn it off, turn it on, reset alarms and exchange the exciters.
To exit this screen press the X in the upper right.

Back to the main screen, select the entries in the top left, you can view the parameters of the devices inserted in the machine: eccitatore 1 e 2, control unit, RF combiner, ecc..
On the left side there are 3 buttons: Measure, I / O and General. Each displays different information (not always all 3 are available for all devices).
"Measure" contains all the measures questioned apparatus (eg, measurements of currents, voltages, temperatures, etc. ...).
"I / O" indicates the status of its internal relay system questioned.
"General" contains general information about interrogated apparatus (frequency, forward and reflected power and so on ...).
In the "Measure" and "General", by moving the mouse cursor over the various lines of information, appears Simble prohibition red, this indicates that you can not change that value.
The only screen where you can change the values, is that "I / O," in which, positioned over several lines, a blue arrow appears, this indicates that you can change that value. Is possible, always on the "Measure" and "General", which appears a yellow exclamation mark, this indicates that the relevant measure is outside the range of accepted values.
Example: tab "Measure" PTX

Example: tab "I/O" PTX

Example: tab "General" PTX

Clicking on the date on the bottom left is possible, write in the telemetry time and date (the sameset on computer), so that if there are alarms can be known with precision time and date on which the event occurred.

Once you click on the confirmation date is asked to do this, answer "Yes".
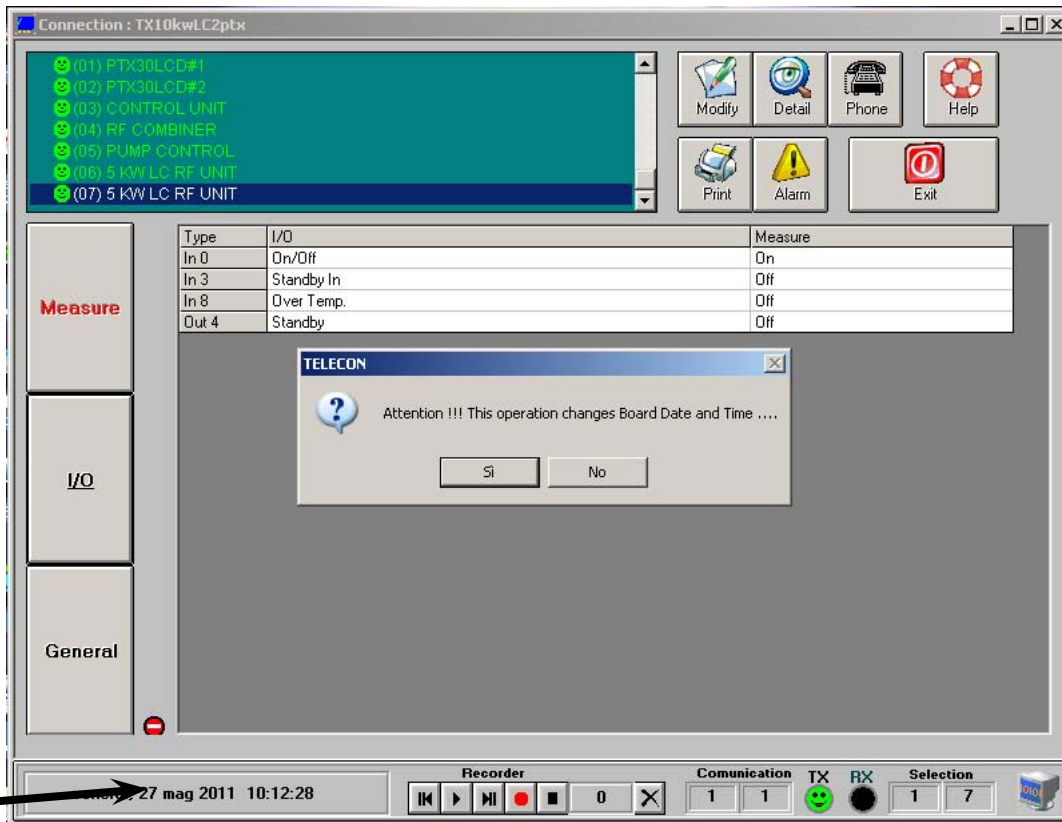

Also from the main screen, clicking on the "Alarms", a screen opens where you can view the alarms (to display the list, click on the "+" next to TLC5KPS)
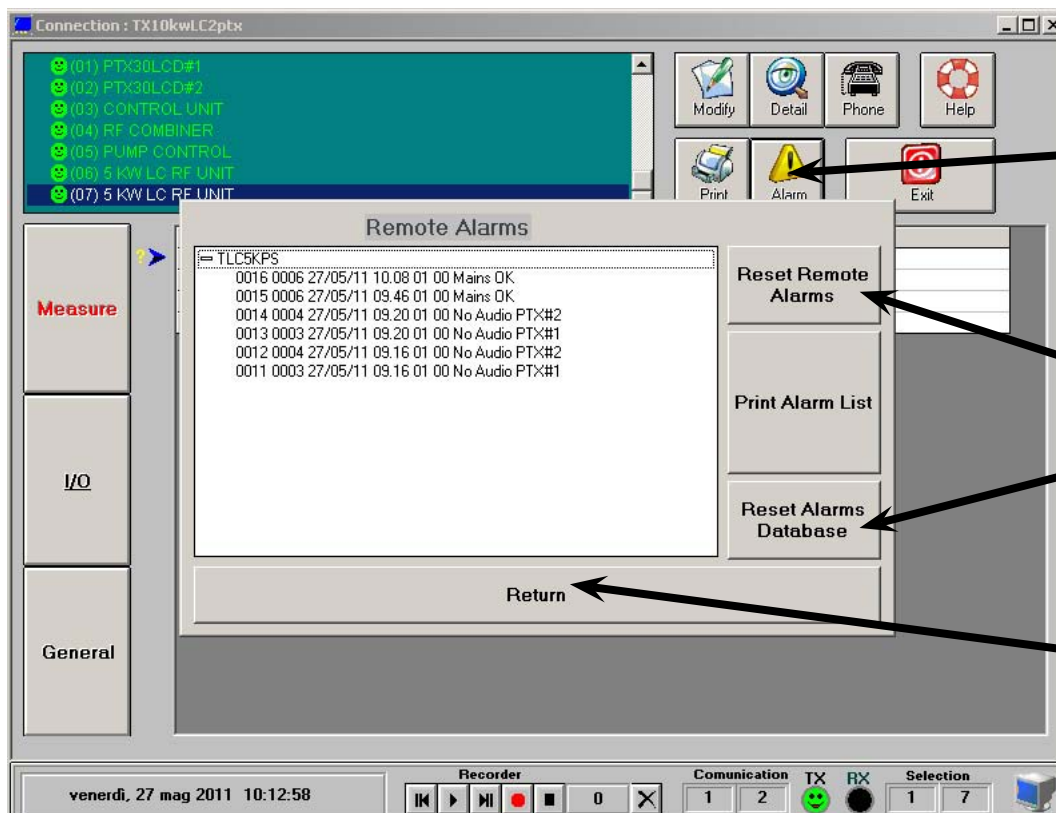
From this screen you can also reset the alarms.
Clicking on the "Remote Reset Alarms" resets the alarms stored in the telemetry.
You will be asked the following question, answer "Yes".
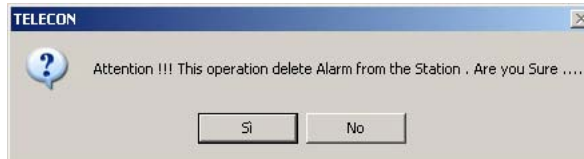
Clicking on the "Reset Alarms Database" deletes the alarm list on this screen the program.
You will be asked the following question, answer "Yes".
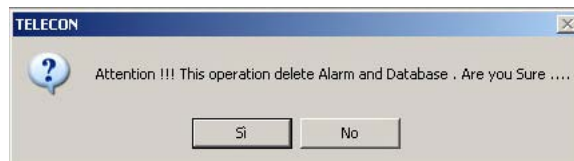
Click on the "Return" at the bottom to return to the main screen.
Press the "Exit" to return to the selection of the type of transmitter.
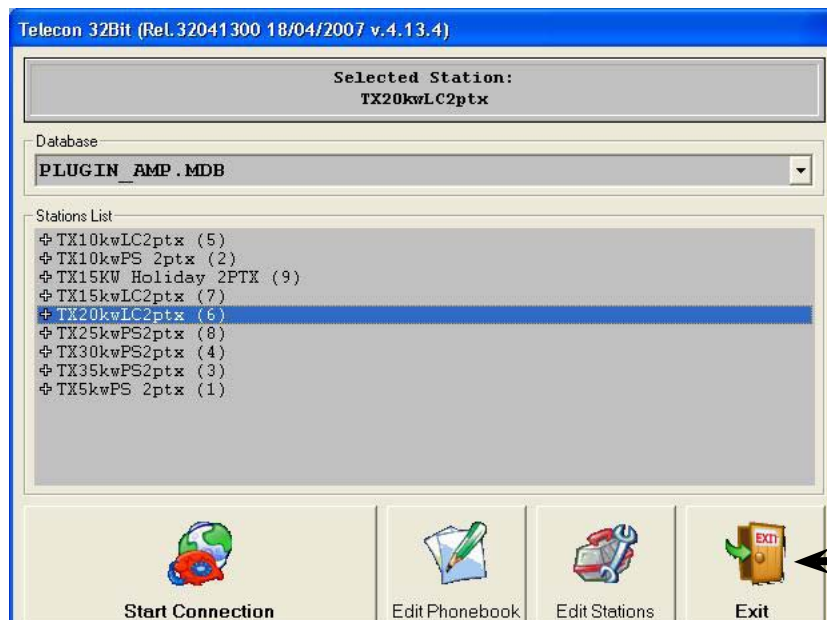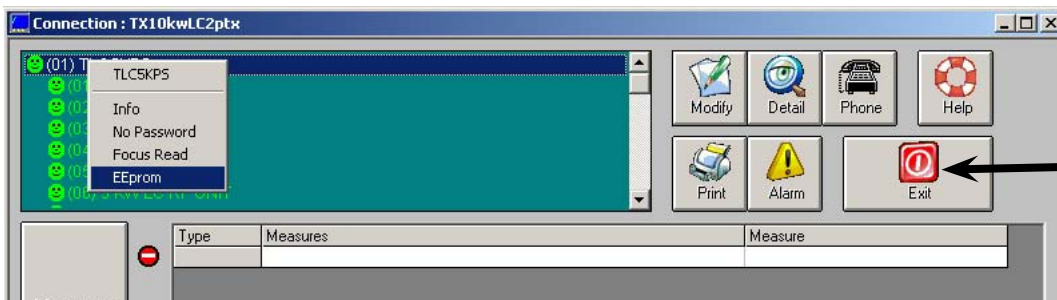
Then disconnect the RS-232 cable by the telemetry, and reconnect the bridge MODEM - RS-232. Now you can connect remotely to the transmitter, using a GSM modem connected to your PC, or via phone to verify that everything works correctly.
Press the "Exit" to exit permanently from the program.
Leave the transmitter in "REMOTE" if you do get warning messages or be able to connect remotely via PC or mobile phone

Checked in the "Modem" menu of the CCU, if where they have been properly stored the data entered (see chap. 5.1.13)
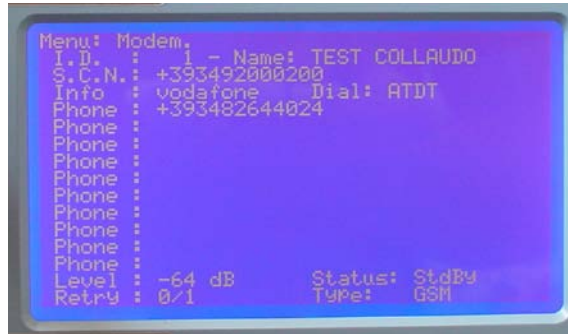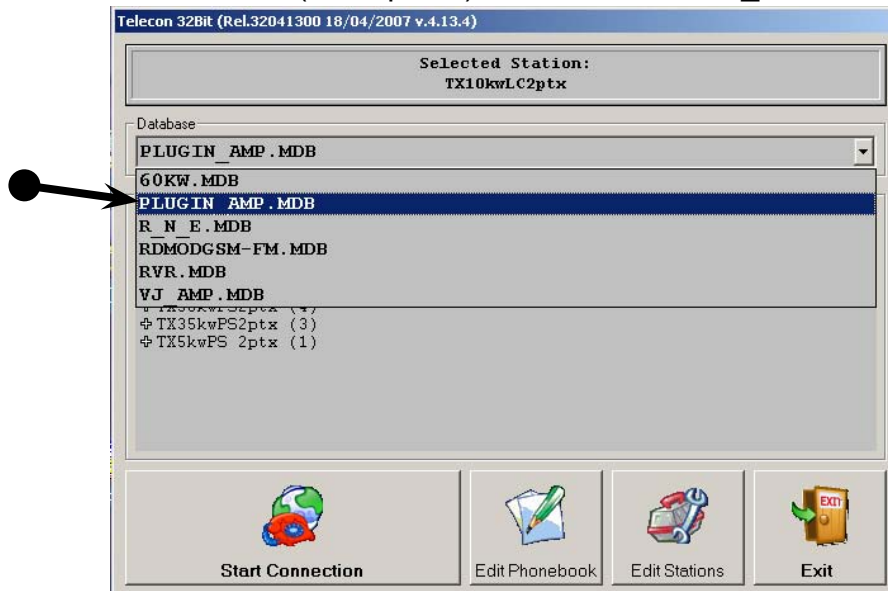

7.8.2   Dial-up via PC

WARNING: The transmitter must be in REMOTE otherwise there can be connected to the telemetry.
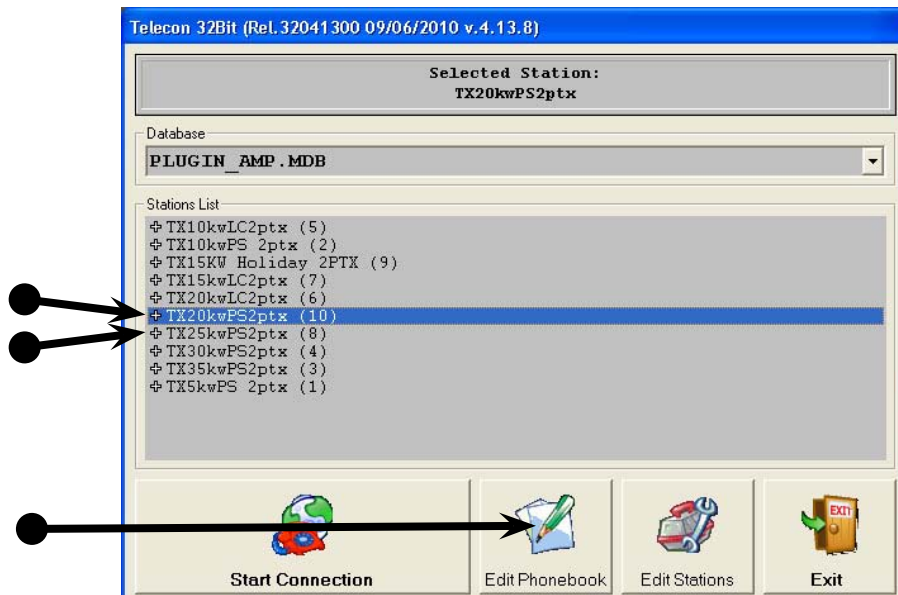
Launch the Telecon program: Start -> Programs -> Telecon 32bit

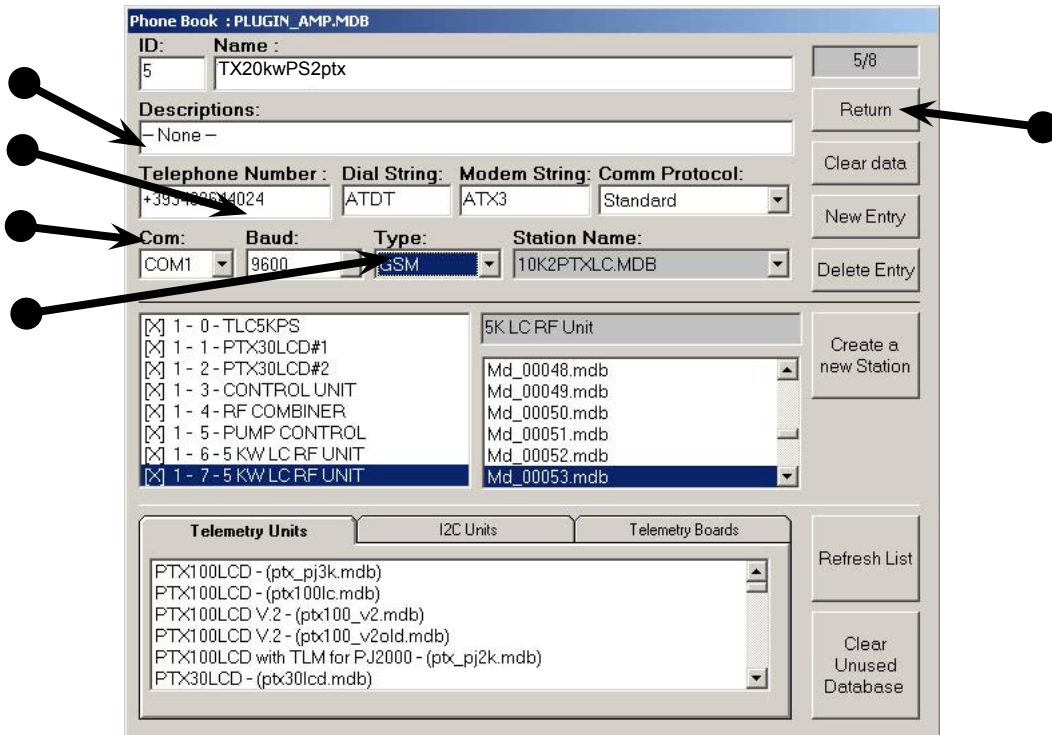You will be presented with the database selection screen.

On the Database combobox (the top line), selet the PLUGIN_AMP.MDB database.

Then select the station "TX20kwPS2ptx" per il PJ20KPS-C o "TX25kwPS2ptx" per il PL25KPS-C and click on "Edit Phonebook".

This will open the following screen

Connect the GSM modem to a PC serial port (for those who no longer have the serial port you can use a USB converter - RS-232, not supplied).

Set the following parameters:

Telephone Number: set the phone number of the SIM present in the GSM telemetry, of transmitter, we want to control **(Note: there is always the number in front of the international prefix of the state where you are eg. +39 for Italy).**

Com: select the serial port in use on the PC (COM1,COM2,ecc...)

Baud: is the speed of the serial port, should always be 9600 otherwise it will you communicate

Type: is the type of connection between PC and telemetry, in this case, select "GSM"

Press the button "Return" at the top right and return to the main screen.
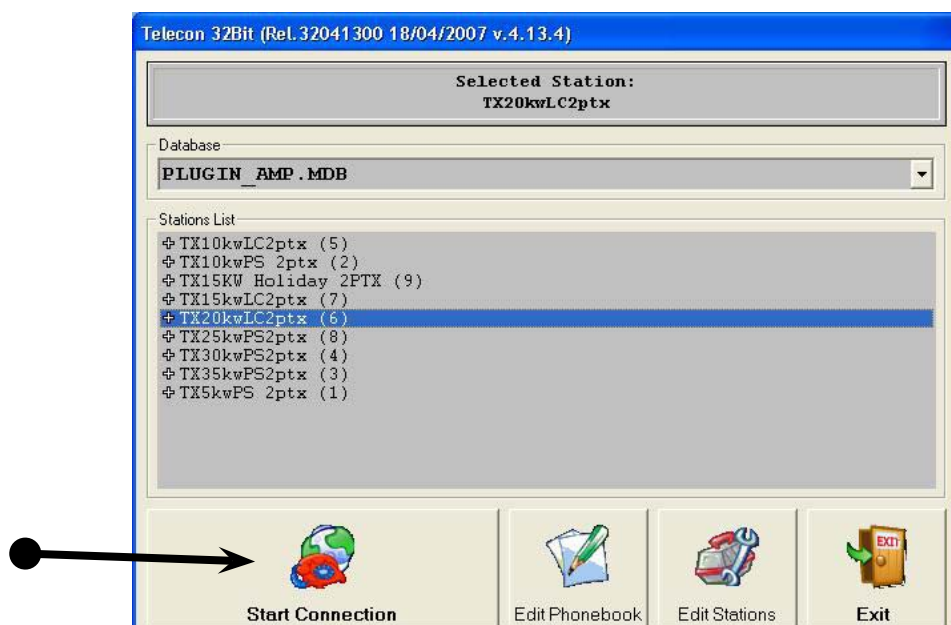
Press the "Start Connection" and at this point will be the link.
Now follow the steps previously listed.

7.8.3 Dial-up via mobile

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

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 transmitters
TXOFF	Station: "station name"- ID: "ID number"- TX is Off -	Switching off the transmitters
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

Every time you send a command must always return back a reply message, to confirm that the command was received and executed.

The reply message may arrive within a maximum time of 5 min. After this time the command is void.

These commands can be sent only if the telephone number used is in memory of the telemetry and the parameter "ACS" is set to "Yes".

WARNING: The transmitter must be in REMOTE otherwise not receive any command.

7.8.4 Alarms

These are the alarms that the transmitter can send:

1	Foward Power	The power has dropped below the value set in PWG2 (menu settings of the CCU)
2	Reflected Power	The power has risen above the value set in PWG4 (menu settings of the CCU)
3	Unbalanced Power	The power on the dummy load has exceeded the 3500 W
4	No Audio PTX1	No audio input to PTX1
5	No Audio PTX2	No audio input to PTX2
6	Mains Fault (solo se è presente l' UPS)	Is no longer the power supply, the transmitter is turned off, the UPS takes on the logic control, modulators and telemetry
7	Mains OK	It is not an alarm, is sent the first time you turned on the telemetry or when the mains voltage returns

File Name: Manuale PJ20KPS-C rev. 1.2 eng

Version: 1.2

Date: 23/07/2012

Revision History

Date	Version	Reason	Editor
06/06/2012	1.0	First version	Nicolini D.
21/06/2012	1.1	Adding information	Nicolini D.
23/07/2012	1.2	Adding information	Nicolini D.

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