



Cte broadcast

Service and Operating Manual

1000 W VHF FM amplifier

VL1000 PLUS

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Annex

Circuit diagrams, parts lists and components Layout^[AA1]

PCB Unit	Attached file name			
	Reference	Electric diagram	Component layout	Part list
Input Power splitter	AA			
RF Amplifier module	AB			
Output Power Combiner	AC			
RF Low pass filter	AE			
RF Control circuit	AD			
Power supply				
Main AC supply filter				
General control				
LCD display unit				
Keyboard				

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1. Features

1.1 Uses

VL1000 PLUS is a modern 1000W FM amplifier which integrates the solid state reliability with the digital technology which makes it safe and easy to use.

High gain MOSFETs transistors and systematic use of state of the art manufacturing methods, have helped us to find effective solutions for the design this new equipment. The amplifier, of simple and rugged construction, is able to satisfy the requests of all those end-users looking for top-quality equipment at reasonable prices.

1.2 Main features

- Weights only 32 Kg, for easy moving and maintenance.
- Better operation temperature of the equipment, thanks to the air filter placed on the front panel and to the optional air convey to be placed in the rear part of unit.
- Impressive number of utilities, controls and data, with local or remote record facility.
- Hi quality/price ratio.

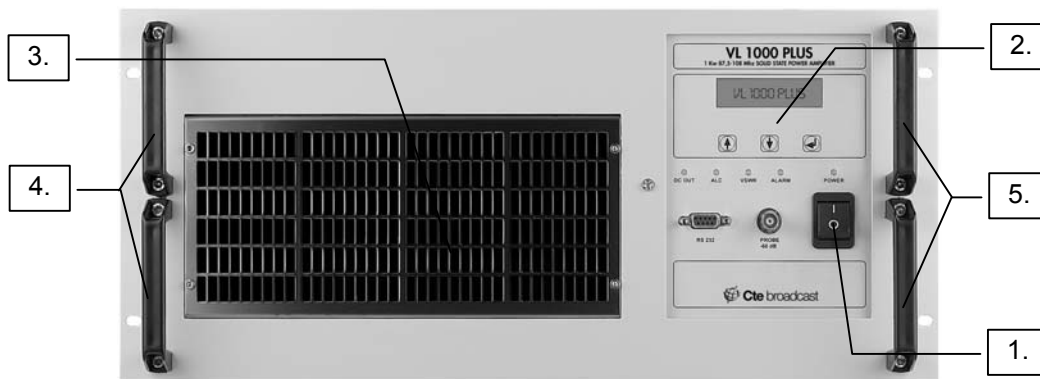
1.3 Locating main parts and connectors

Please make reference of the following pictures in order to locate the main parts of the VHF amplifier.

1.3.1 Front

Mains part and connectors (front)

1. AC Mains power switch. Allows to switch on/off the whole amplifier
2. Control panel - It's composed by an alpha LCD display, 5 status LEDs as well as a keypad. The LCD display normally shows the amplifier's status and another parameter (e.g. power, time, date etc.). The combination between the keypad and the LCD makes easy to provide settings, check measurements etc.
3. Vent grid – from this grid the cooling air is taken in order to keep the proper working temperature.
4. Left front handles – use it in combination to the right handle to move the amplifier
5. Right front handles

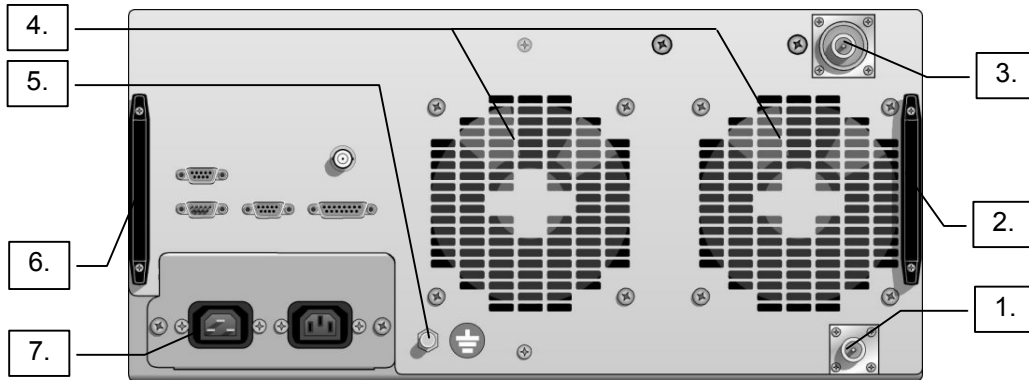


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1.3.2 Rear



Mains part and connectors (rear)

1. RF input connector – connect to this input the output of the exciter (as per the following directions)
2. Right rear handle - use it in combination to the left handle to move the amplifier (it also fixes the rear panel)
3. RF output connector – connect this output to the antenna (as per the following directions)
4. Fans – they provide the air flow necessary to the RF amplifier cooling
5. Ground terminal – general ground terminal
6. Left rear handle
7. AC power input plug – connect the AC mains supply voltage as per the following directions

1.4 Description of additional connectors

A total of 8 connectors are available in the VHF amplifier. 2 of them are located in the front panel and the other 6 ones located in the rear panel.

1.4.1 Front panel



Additional connectors (front)

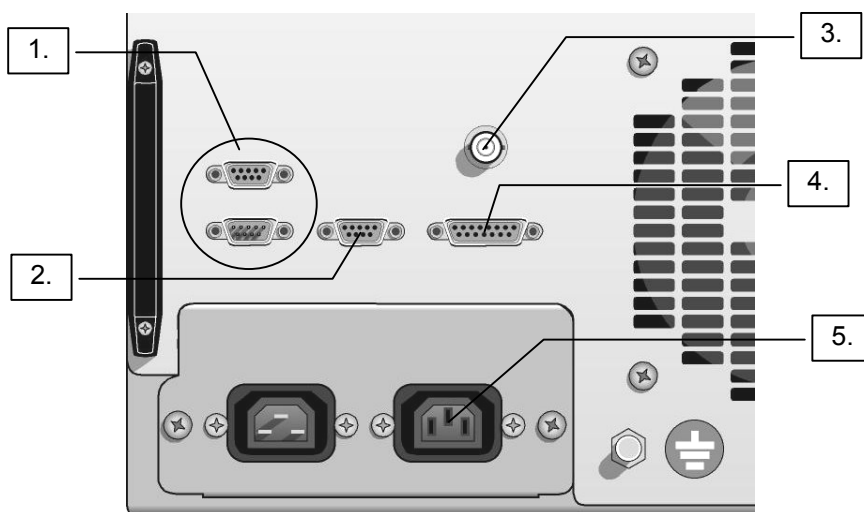
1. The **RS232**-type connector is an auxiliary RS232 front connection (to be activated via the menu as described in paragraph 4.6.4)
2. The connector marked with **PROBE -60dB** is a -60dB output coming from the RF Filter Unit suitable for linear RF measurements in the 87,5 to 108 MHz frequency range

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1.4.2 Rear panel



Additional connectors (rear)

1. The twin (male and female) RS485-type connectors is designed for the eventual parallel connection of more amplifiers
2. The RS232-type connector is designed for the connection to the exciter (if the exciter supports such this connection).
3. The BNC connector is for the carrier enable
4. The 15 pin DB15-type connector is designed for several remote controls and services as described in paragraph 1.4.3
5. AUX is a general purpose auxiliary switched AC output (2A max)

1.4.3 DB15 PIN Description

The wiring connections of the DB15-type connector is the following:

1. GND
2. Signal which is proportional to the power supply module output voltage (1V = 10V)
3. Signal which is proportional to the square root of the direct power (5V = 500W)
4. For factory use only
5. GND
6. STAND-BY command line (activated by short circuiting this line with GND)
7. Reserved
8. RESET command line (activated by short circuiting this line with GND)
9. Signal which is proportional to the power supply module output current (1V = 10A)
10. Signal which is proportional to the square root of the reflected power (4V = 50W)
11. For factory use only
12. STAND-BY signal (the contact is NC in normal operation, connected to GND in STAND-BY alarm)
13. NO alarm contact (the contact is NC in normal operation, connected to PIN 15 in ALARM mode)
14. NC alarm contact (the contact is NO in normal operation)
15. Common alarm contact (see 13 and 14)

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1.4.4 Description of indicators

Five indication LEDs are available in the front of the unit as per the following description and figure:



LED indicators

- **DCOUT** – shows the availability of the power supply output voltage
- **ALC** – when glowing, shows that the ALC (Automatic Level Control) is engaged, so the output RF power can be kept constant
- **VSWR** – glows when the VSWR is excessive
- **ALARM** – indicates that an alarm has been occurred
- **POWER** – indicates that the AC mains power is available

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2. Operation






2.1 Putting in operation

2.1.1 Unpacking

After unpacking the VHF amplifier and choosing a suitable place to put it, check that all the necessary parts are available to continue:

1. VHF amplifier (already mounted in a standard 11 units rack, five of each are already occupied by the VHF amplifier)
2. Spare fuses
3. AC power plug (inside its package)
4. Documentation

2.1.2 Connections

1. Make sure that the AC power switch  is in **O** (Off) position
2. Connect all the earth wires coming from the other devices fitted in the rack to the earth terminal  provided in the rear of the equipment and marked with the appropriate symbol.
3. Connect the AC power cable to the provided AC power plug following the instructions printed on its package, particularly taking care to the earth connection
4. Ensure that the AC mains supply voltage is $230V_{CA} (\pm 15\%)$ and insert the AC power input plug in the AC connector  located in the rear of the VHF amplifier
5. Ensure that the antenna is suitable for the FM broadcasting frequency range (from 87.5 to 108 MHz) with a continuous power capability of 500W and connect it to the 7/16-type RF Output connector  available in the rear of the VHF amplifier
6. Switch the exciter on and adjust it to the minimum output power
7. Connect the exciter's RF output to the N-type RF input connector  located in the rear panel.
8. Now the equipment is ready to work at the minimum configuration. For further connections, please make reference on the connector description on paragraph 1.4





CAUTION: Maximum input power must not exceed 10W!

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2.2 Switching the system on

1. Switch the VHF amplifier on by pressing the AC Power switch **I O**  in **I** position
2. Switch the exciter on
3. Carefully and slowly raise the exciter's output power and stop at the point in which the **ALC** LED  will steadily glow.
4. Now the system is operating. If all is properly working, the following LEDs should glow: **DC OUT**  (meaning that the power supply voltage is available) and **POWER**  (AC mains power is available).
5. Moreover the upper line of the LCD display should show the output power and the lower should visualize **Normal** (normal working condition). The LCD Display should stay backlighted for 30 minutes after the last button pressed.
6. Check the forward and reflected RF power according to the instructions stated in paragraph 4.4

2.3 Cares and maintenance^[AA2]

As many other electronic equipment, this amplifier need some cares which are mandatory to guarantee years of perfect operation. On the other side, if maintenance operation won't be regularly made, faults can occur, particularly in hard environments.

Air cooling fans must be regularly inspected and replaced every 10,000 hours according to the instructions stated at 5.3.3

Vent air filter must be regularly replaced or cleaned according to the environment conditions. To replace the filter, please follow the paragraph 5.3.4

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3. Circuit Description

3.1 General

3.2 Power Splitter

The input power from the exciter is applied to a 2 WAYS splitter 3 Db 90°; the signals on the outputs are out of phase by 90°.

The resistive termination resistor R1 absorb the unbalanced power when one of the BLF278 stages fail.

3.3 RF Amplifier

The amplifier circuit is composed two identical base modules. The input matching of the active device BLF278 composed of two FET is done by means of the transformation ratio 4:1 of transformer T1, by the capacitor C1, C2 and by the inductor L1.

The resistors R1 and R2 connected between the two gates of BL278 serve to increase the margin of stability of the amplifier and at the same time to get a SWR that is acceptable over the whole operating frequency band.

The two FET composing the BLF278 operate in push pull mode.

The line connected between the two drains serves to compensate for the capacitate component of the output impedance. The ensuing impedance is raised by the transformation ratio 1:4 of the transformer T2, and so taken to the value of 50Ω by the adapter circuit composed of C7, L2 and L3.

The parallel resonating circuit composed of C6 and L2 is calculated so as to lower the value of the 2nd harmonic component generated by the amplifier.

The gates of the two FET are connected, by means R8, R41 and L6, to a polarization circuit(BIAS=2,3v). The direct voltage on the gates regulated by means the trimmer RV1.

The NTC physically located on the case of the active device serves to compensate the variation of the polarization on the basis of the operating temperature. Through point 9 connected to the control circuit is possible, by means of an appropriate negative voltage, to zero the level of output power in the event of operating trouble detected by the RF Control Circuit itself

The toroid ferrite cores the output transformer is wound on may be damaged by strong magnetic fields created by current.

This situation may arise in the event of a FET failure.

3.4 Output Combiner

The power coming from the two BL278 stages are sent to the input of one 3dB couplers .

In output line is placed a directional coupler that detects the reflected power. The resistive termination R3 absorb all unbalanced power. At the ends of the termination there is a unbalanced detector. Both signal are connected the control circuit.

3.5 Low Pass Filter

The output signal coming from the power amplifier module is connected to the input of a low pass filter.

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This filter is a constant coupling type and it is composed by two π network section including two second harmonic traps.

The filter's capacitors consist in microstrips printed on a Teflon substrate. The inductances are made in silver-laminated copper wire wound in air.

The directional coupler is obtained with microstrips technology; it offers two voltages depending by the forward and reflected power. In this module is placed a probe RF -60db connected by a coaxial cable to the front panel.

3.6 Control Circuit

The protection function of the four BLF278 stages is obtained by the Control Circuit.

The amplifier is protected of the excessive SWR, excessive unbalanced powers and overheating. The signal WR coming from the "reflected power detector" of the RF module, it's amplified by U2A and will reach the comparator U2D.

If the reflected power will excess the pre-set value, set by the resistive trimmer RV1, the comparator U2D its output representing an excessive reflected power level.

The signal of unbalanced UMB2 previously processed, is offered to the diode D12 to the input of buffer U2B.

The output of U1B is connected to the comparator U2C which output represents excessive internal unbalanced power error. The intervention protection level of UMB2 can be adjusting with the resistive trimmers RV3.

When the temperature level of the heatsink reaches the intervention level (80°C), the temperature chip sensor at the center of the same heatsink transmits a signal to the microprocessor that switch of the Amplifier.

The constant current generator formed by transistor Q3 and surrounding, components, is feeding the diodes D4 and DZ1 and between their terminals always offers a voltage of 10V.

This is the polarization and the control voltage of the basic module.

The previous described are lead through D7 coming into the basis of the Darlington pair Q1 and Q2, in case of intervention, can regulate the control voltage to al level of about -12V which totally cutoff the output power of the module. If the control voltage (-15V auxiliary supply) fail the general control by means the microprocessor switch off the amplifier.

3.7 Power Supply

The Power Supply is composed by four principal stages:

3.7.1 Main Filter

It consists in a board which is separate from the Power Supply and located in the internal side of the rear panel, The main filter has the purpose to limit the emission creates by the switching Power Supply and rejected to the main cable and it protects the equipment from overvoltages and noise coming from the main line.

3.7.2 Starting Point Limitation Circuit

A starting point limitation circuit provide to limit the spike current when the equipment is switched on. At the beginning of this stage there is the general protection fuse F1, which protects all the power supply board. The resistor which limits the initial current is R103, this resistor is further short circuited by the relay RL1

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for the normal operation; the short circuit becomes operating in less than 1 second (the time necessary to charge the capacitors); this time is defined by an RC circuit.

3.7.3 Power Supply Stage

The Power supply stage is a switching type double conversion mains direct. The first stage conversion is AC/DC, it transform the 230V alternate signal into a 400V direct signal. The switching frequency is 40KHz. The circuit which provides the first conversion regulates the power coefficient of the 230V main line current absorption, the power coefficient at full charge isn't less than 99%. The power factor control (PFC) is obtained by the dedicated IC UC3854 (U5) and related circuitry: P1 e P2, the IGBT transistor Q4, the inductor L1, diodes from D1 to D4 and capacitors from C8 to C11. This configuration offers a very effective protection against input overvoltages which are absorbed by the inductor L1 as well as the capacitors from C8 to C11, additionally increasing the reliability of the mains direct switching regulator.

The second conversion stage has a DC/DC half-bridge structure, it transforms the direct voltage from 400V to 48V insulated from the mains line. The switching frequency is 40KHz. The Power Supply is protected of an over charge, short-circuit of the output voltage and by means the General Control it is protected of the overheating.

The IC which provides the regulation of the half bridge stage is U4 SG3525. The half bridge is obtained by means of the IGBT transistors Q1 and Q7, by the capacitors C1 and C12, as well as the transformer T3 which offers galvanic insulation from the mains supply. The rectifying diodes are D9, D10, D17 and D22. The first filter cell is made by the inductors L4 and L7 as well as the capacitors C15 and C17, while the second filter cell is obtained with L5 and C19.

The second DC/DC conversion stage is intrinsically protected against overloads and short circuits and provides a variety of signals to the General Control board, e.g. the output current (obtained by the shunts from SH1 to SH4), the output voltage (obtained by the output), a signal which is proportional to the operating temperature (IC LM335 RK1 which is fixed to one heatsink nearby the diode D38). The second DC/DC conversion stage also receives the ALC feedback signal coming from the control board by means of L9 and R57 to the IC U2 changing the power supply voltage in order to keep constant the RF output power.

In case of overheating, the board acts on the opto-insulator U6 with a ST-BY hi level signal which locks the two stages U5 e U4 (SG3525) and highlights unwanted events. Therefore, any signal which is not referred to the ground or the accidental removal of the EC2 connector forces the power supply in stand-by mode.

The output voltage 100 Hz ripple is less than 20 mV_{PP} at full load in order to minimize the residual AM modulation.

The total efficiency of the two conversion stages is 0.88.

3.7.4 Auxiliary Voltage Supply (+15;-15)(+15-fans dedicated)

A voltage supply main direct with three-output voltage + 15 and -15, additional +15 for the fans composes this circuit. The +15 and -15 voltages are necessary to feed all the chip of the equipment and the additional +15 is dedicated for the fans. On the output of the fans supply are plaecd two fuse to save the fans against short circuitThe circuit is protected of an over charge, short-circuit of the output voltage.

At the beginning of this stage the fuse F4 protects the whole auxiliary stage. The stage is obtained by a flyback-type stage made by the MosFET Q11, the transformer T4, diodes D16 and D18 as well as capacitors C78, C96 and C79. The regulation IC is UC3844 (U7). The transformer T4 offers a galvanic insulation between the generated auxiliary voltages and the source (the output coming from the bridge).

3.8 General Control

The General Control Board is obtained with a microprocessor PIC17C756A with following characteristics:

- Clock 16MHz
- 12 input A/D 10bit

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- 2 Universal asynchronous receiver transmit
- The microprocessor is connected at the memory EEPROM 93C86 that has an 1K word capacity, at the data/time chip, at an interface for two COM port RS232 and an interface for one COM port RS485

The microprocessor control all the protection of the power amplifier:

- Excessive SWR
- Power Supply Overheating
- Power Amplifier Overheating
- Supply Auxiliary Voltage-15V Failure
- Unbalanced Power

Moreover it manage the navigation on the display of the functions:

- Measure
- Display Failures
- Language
- Reset Mode
- Warning Temperature
- Power Output -3 dB
- Failure Counter
- Time and Data Set

3.8.1 Excessive SWR Protection

The amplifier has two protections by the SWR. The first detector is located in the power amplifier module and the second is located in the Low Pass Filter. The first protection has an intervention time more quickly than the second.

In case of not correct antenna's impedance the General Control gives a signal at the power supply, it reduce the output voltage and so the RF output power will be reduced to have the maximum level of the SWR 1.8.

If there is a momentary spike of the reflected wave ratio (SWR) the detector on the power amplifier module gives a signal at the control circuit (located in same module) and it reduce the voltage of the BLF278's gate.

3.8.2 Power Supply and Power Amplifier Overheating

When the heatsink temperature of the power amplifier module and power supply module reaches about 80°C, the general Control switches the Power Supply off. In this case the equipment is in Stand by mode. During this process the fans will work, when the temperature will reach less than 70°C (approx.) the general control restores the normal Power Supply operation.

3.8.3 Supply Auxiliary Voltage -15V Failure

This supply voltage is important to control the voltage on the BLF278's gate. If it shall be broken The equipment will go in stand-by.

3.8.4 Measure

The measurement available via the menu (see 4.4)are forward a direct power, voltage and current of the Power Amplifier, temperature regarding heatsink power supply and power amplifier; date and time.

3.8.5 Display Failures

The failures display indicates the alarm type that the equipment has (SWR, etc).

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3.8.6 Warning Temperature

If this option is ON, when the heatsink temperature of the power amplifier module and power supply module reaches about 70°C (near to the level of overheating alarm) the General Control adjusts the equipment in order to output the half of the rated full power only (-3 dB/250W).

3.8.7 Function -3dB

This function allows to set the equipment's output power at -3 dB (the half of the rated full power).

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4. Menu Commands

4.1 Start Up Condition

At the start up the name, the version and the serial number of the equipment appear on the LCD display. Simultaneously all the LEDs will be tested.



At the end of the start up, the **Main Menu** will be visualized. It is composed by two lines:



- **The upper line** shows the default measurement **Dir. Pow.** Which is the RF Output Power and is followed by its value. This measurement can be changed by the menu according to your need.
- **The second line** is the status of the equipment (**Normal** if all is going well).



4.2 Menu Description






By entering the menu, it's possible to change the default measurement displayed in the upper line of the LCD and to access to a range of visualizations (e.g. the event log) and settings (half output power, switching between front and rear RS232 connectors etc.)

4.3 Navigation

4.3.1 Navigation commands

- At the right of the LCD display there is an asterisk ***** which indicates the selected menu item.
- The two keys  and  allow, respectively, to scroll the menu up and down in order to select the various menu items.

 *Note: the menu scroll function is not cyclic. Therefore after selecting the last menu item it's necessary to press the  key in order to scroll the items back.*

- To access a menu item in order to change/set it, move the position of the asterisk ***** on that item by pressing the  and  keys and then press the  key.
- By pressing **at the same time** the two keys  and , the Main Menu is recalled and the selected menu item won't be changed.

4.4 Flow chart

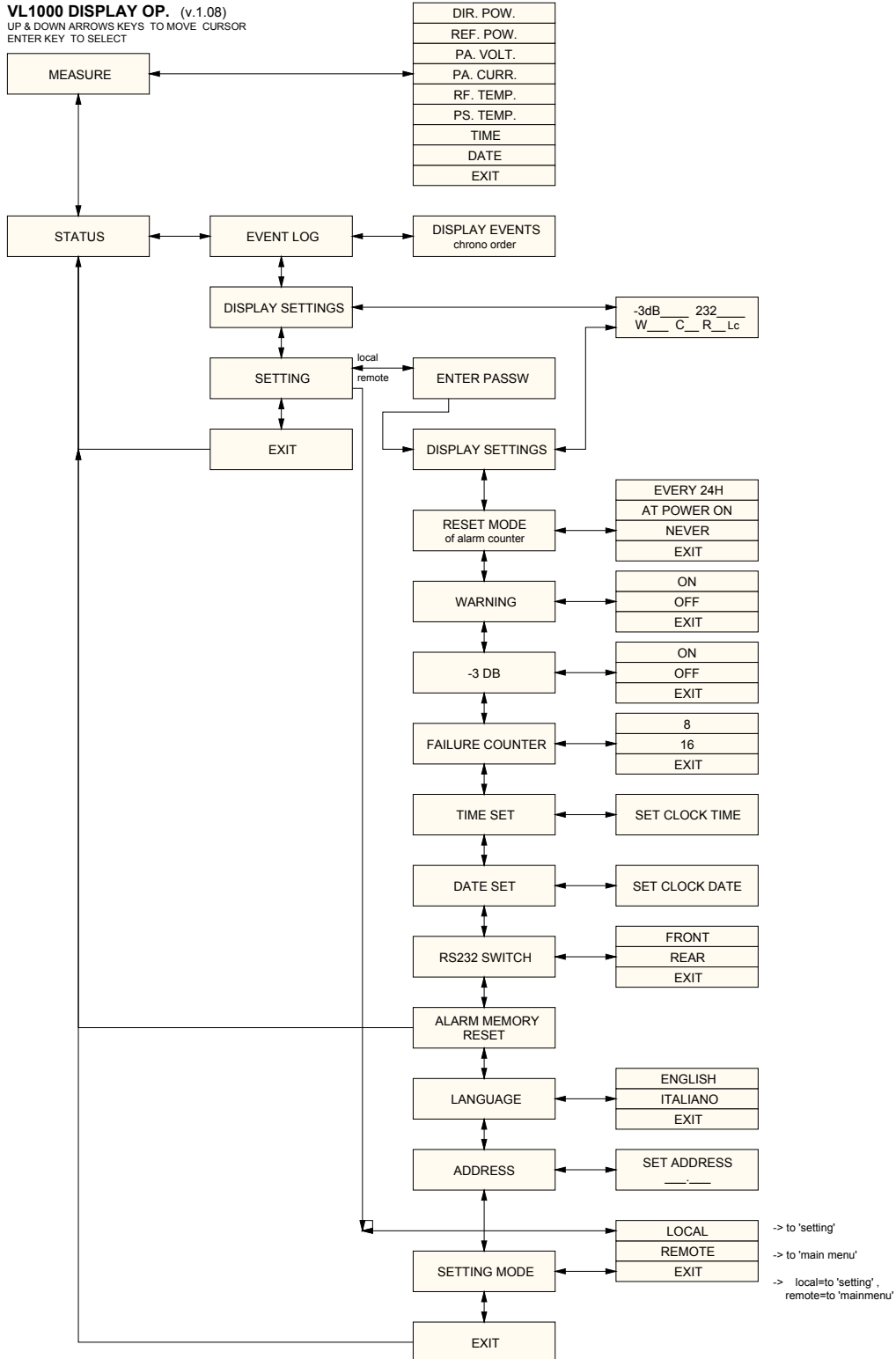
The flow chart of the menu is organized as follows.

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MENU FLOW CHART



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4.5 Upper line Menu (parameter selection)

As over stated, the upper line normally shows the RF Output Power. To show another parameter:

1. Make sure that the asterisk * is on the **upper** line (or move it with the and keys)
2. Press the key in order to access the parameter list.
3. With the and keys, scroll the available parameters as per the following table:

Parameter	Description
Dir. Pow.	RF output power (in W)
Ref. Pow.	Reflected power (in W)
PA.Volt.	RF power amplifier supply voltage (in V)
PA.Curr.	RF power amplifier drained current (in A)
RF.Temp	RF power amplifier temperature (in °C)
PS.Temp	Power Supply temperature (in °C)
Time	Current time (hours, minutes and seconds)
Date	Current date (in MM/DD/YY format)
Exit	It's obviously not a parameter, but a command to exit the menu without changing the current parameter.

4. Press the and keys in order to move the asterisk * to the line which shows the new parameter to be selected (or to **Exit** in case you want to keep the current parameter).
5. Press the key in order to select the new needed measurement (or escape the list in case you selected **Exit**)

4.6 Lower line Menu (seeing event log and settings)

As over stated, the lower line shows the amplifier status and can't be changed, however this selects a Menu which allows to read the **Event log** as well as to read/change some settings. To access to this menu:

1. Make sure that the asterisk * is on the **lower** line (or move it with the and keys)
2. Press the key to access the menu.
3. With the and keys, you can select three submenus:

Submenu	Description
Event Log	Allows to see the event log
Display	Allow to see in one screen shot all the settings described at 4.6.3
Setting	Allow to change each of the various available settings (access protected by a 3igits password)

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Local/Remote	Setting of the operational mode
Exit	It's obviously not a submenu, but a command to come back to the main menu.

4. Press the key in order to select the new needed submenu (or escape the submenus in case you selected **Exit**)

4.6.2 “Event Log” submenu

1. After entering in this submenu you will see the last event as per the following example

	Display	Description
First line	Normal 67	Event name followed by its order number
Second line	12:56 09/06/00	Time and date in which the event happened

2. The and keys you can scroll the various events. The key moves to the lower order numbers, while the key moves to the higher ones. The following list states the various events you could see and their description

Event	Description
Normal	Normal working condition
Vaux Fail	Auxiliary supply voltage failure
PA Overheat	RF power amplifier temperature was too high
PA Unbalance	The four stages of the RF power amplifier were unbalanced
PS Overheat	Power supply temperature was too high
PS Overload	The current required to the power supply was too high
Exc. SWR	Reflected power (SWR) was too high
Power-On	Start up condition
Stand-By Al	Automatic stand-by caused by an alarm
Stand-By Rem	Manual stand-by was performed
-3dB Warning ON	The amplifier automatically reduced its RF output power down to the half (-3dB) because the temperature was too high
-3dB Cmd ON	-3dB manual command was enabled
-3dB Off	-3dB manual command was disabled

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- You can see up to 99 events which are stored in FIFO (First in First Out) and divided into two 50-events blocks. As soon as the event 100 happens, the older 50-event bloc is automatically canceled in order to make room for other future 49 events.
- The key pressed from any event allows to escape the event list and come back to the Event Log screen shot. If there aren't stored events (or the reset has just been performed), the key has no effect.

4.6.3 “Display” submenu

The submenu Display allows to see in one screen shot all the settings which will be described in the next paragraph. After entering in this submenu you will simply see them in short format as per the following example:

Display	
First line	-3dB Off 232Rear
Second line	Warn On C 8 R24

This is a brief description of the related meanings:

- The caption **-3dB Off** means that the amplifier is working at the full rated power (1KW).
- 232Rear** means that the rear RS232 connector is enabled (the front connector is therefore disabled)
- Warn On** means that in case of RF power unit overheating the power will be automatically reduced to the half (250W)
- The caption **C 8** inside the machine there is a counter which counts the eventual failures (e.g. overheating, excessive SWR etc.). After 8 failures the amplifier will be switched in stand-by mode
- R24** means that the counting of the failure counter is reset each 24 hours

The detailed description of all these setting is stated in the next paragraph, in which is explained how to change such these settings and other ones.

4.6.4 “Setting” submenu

The submenu Setting allows to change each of the various available settings. Part of them can be seen in one screen shot as described in the previous paragraph. This submenu is protected by a 3-digits password which is stated in the red **Code Card** label attached to the amplifier. The password can be uninhabited by an internal jumper (placed on the general control board).[AA3]

- After entering in this submenu you will be prompted to enter the password

Display	
First line	Password:
Second line	00.00.00









- The cursor will be already positioned on the 1st digit and set to 1. By means of the and keys you can increase or decrease that figure
- Press the key to enter the 1st digit
- Repeat steps b) and c) for the other two digits of the password
- If the password will be correct, the display screenshot will be recalled, however, by repeatedly pressing the and keys, the settings will be available as well according to the following table:

Setting	Description	Available settings/Notes
---------	-------------	--------------------------

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Display	Same submenu explained in the dedicated paragraph	A quick visualization of the settings which is automatically recalled after a setting has been changed
Reset Mode	Defines if the failure counter should be regularly reset and the reset time.	R24 - every 24hours Ron - At Power on Rne - never Exit - exit without affecting the preset value
Warning	If this warning feature is set to on, the amplifier automatically reduces its power down to 500W (-3dB) in case of overheating (10 °C below the critical temperature)	Warn on - warning feature is on Warn off - warning feature is off Exit - exit without affecting the preset value
-3dB	Manual reduction of the RF output power to the half (-3dB)	-3dB on - half power (500W) -3dB off - full power (250W) Exit - exit without affecting the preset value
Failure Counter	Defines the number of faults which the failure counter must count before switching the amplifier into stand-by condition	C_8 - stand-by after 8 faults C_16 - stand-by after 16 faults Exit - exit without affecting the preset value
Time Set	Allows to set the internal clock	Use the  and  keys to increase/decrease each figure and press the  key to enter. In the minutes/time setting, figures can be increased/decreased at 10 digits steps by keeping either the  and  keys held pressed
Date Set	Allows to set the internal calendar (in MM/DD/YY format)	Use the  and  keys to increase/decrease each figure and press the  key to enter.
RS232 Switch	Switches the RS232 connection between the rear and the front connector	232Rear - rear RS232 connector 232Front - front RS232 connector Exit - exit without affecting the preset value
Al.Mem Reset	Manual reset of the event log and failure counter. It also escape the Setting menu leading back to the	

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	Main menu	
Language	Selects the needed language for the LCD messages among the available languages	English is the default. The number of the available languages depend on the version
Address	Allows to set up the address of the RS485 connector	Leads to Set Address screen shot
Exit	Escapes the setting menu and restore the Main menu	

“

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5. Service

5.1 General information and warnings

CAUTION: Only qualified and authorized engineers are allowed to perform the following service operations

CAUTION: The amplifier may only be removed from the rack (rackmount) or opened and module disassembled and assembled while no voltage has been applied. Before performing any operation be sure that the AC plug is disconnected, the power switch is in OFF position and wait few minutes in order to allow the internal capacitor to discharge

CAUTION: After any disassembling/removing/replacing operation, is meant that to restore the original conditions the described operations must be carried out in the opposite order unless otherwise specified

CAUTION: The normal operation of the amplifier can restored only if all the parts are assembled and connected

5.2 Adjustments^[AA4]

This a description related of each adjustment trimmer available in the amplifier ordered per unit

5.2.1 PCB S3110A .02 RF Power Amplifier Unit

1.

Adjustment	Test point/function	Value
RV1	adjusts the gate voltage of Q1	2.3V
RV2	adjusts the gate voltage of Q2	2.3V
RV3	adjusts the gate voltage of Q3	2.3V
RV4	adjusts the gate voltage of Q4	2.3V

Adjustments of PCB S3110A.02 RF Power Amplifier Unit

5.2.2 PCB K3123A02 RF module control

Adjustment	Test point/function	Value
RV1	adjusts the protection against excessive SWR	200W
RV2	adjusts the unbalance protection of the power FETs BLF278 Q1-Q2	400W
RV3	adjusts the unbalance protection of the power FETs BLF278 Q3-Q4	400W
RV4	adjusts the unbalance protection of the power FETs BLF278 Q1-Q4	200W
RV5	adjusts the measurement of temperature "RF TEMP" read on the LCD display	

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Adjustments of PCB K3123A02 RF module control

5.2.3 PCB S3115D02– General controller

Adjustment	Test point/function	Value
RV1	RV1 adjusts the measurement of voltage PA.Volt. read on the LCD display (see 4.4)	
RV2	adjusts the total protection against excessive SWR	100W
RV3	adjusts the measurement against excessive current PA.Curr. read on the LCD display (see 4.4)	
RV4	adjusts the measurement of reflected RF power Ref. Pow. read on the LCD display (see 4.4)	
RV5	adjusts the RF output power in ALC condition	1000W
RV6	adjusts the measurement of direct RF power Dir. Pow. read on the LCD display (see 4.4)	
RV7	adjusts the -3dB output power	500W

Adjustments of PCB S3115D02 – General controller

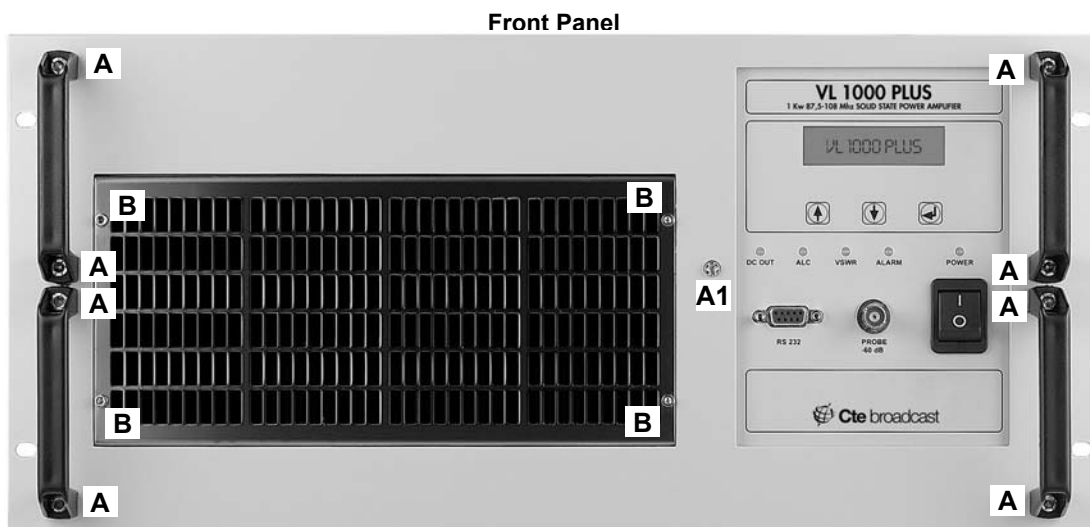
5.2.4 PCB K3113C.01 - Power Supply Unit

Adjustment	Test point/function	Value
RV1	adjusts the power supply voltage	48V
RV2	adjusts the maximum current for the protection	50A @ 48V
RV3	adjusts the protection against over load	40A @ 48V
RV4	adjusts the temperature measurement PS.Temp. read on the LCD display (see 4.4)	

Adjustments of PCB K3113C.01 - Power Supply Unit

5.3 Opening the VHF amplifier

Make reference to the following pictures:

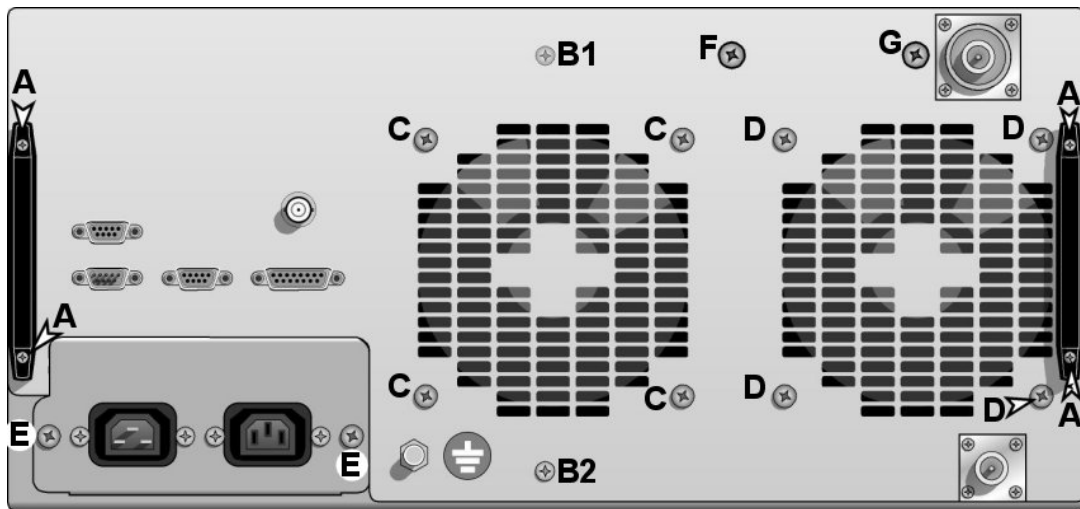


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Rear Panel



5.3.1 Removing the top cover

Unscrew the nine screws which fix the top cover in place

5.3.2 Removing the bottom cover

Unscrew the ten screws which fix the bottom cover in place

5.3.3 Dismounting fans

1. Use an allen key to remove the four exagonal screws which hold the handles (2 screws each handle, marked **A**) to the rear panel.
2. Use an allen key to remove the hexagonal securing screws (marked **B1** and **B2**) placed over and below the left fan (marked on the rear external panel with a circle): the rear external panel will be free to be tilted.
3. Remove fan cables from the Power Supply board.
4. Remove the rear panel together with the two fans
5. Unscrew the four cross-head screws which lock the fan(s) on the panel (marked **C** and/or **D**)
6. Replace the fan(s) and the related vent filter(s) as described in chapter 2.3

CAUTION: At step 2, the rear external panel can just be tilted, not removed. Take care about all the internal wires.

CAUTION: The missing regular filter replacement or cleaning will activate the thermal protection.

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5.3.4 Dismounting vent filter(s)

1. Use an allen key to remove the four exagonal screws which hold the vent grid located on the front panel (marked with **B**)
2. Replace the filter or clean it by means of a air compressor.

5.3.5 Replacing mains AC fuses

1. Remove the two cross-head screws marked with **E** which hold the AC Mains Filter Unit to the rear panel (don't remove the four screws which hold the two AC connectors to the filter)
2. Slightly extract the AC Main Filter Unit from the rear panel (it's not necessary to remove it) in order to access the two fuses
3. Replace the fuse F1 (mains AC power) and/or the fuse F2 (auxiliary 2A switched output) according to their condition.

5.3.6 Removing the AC Mains Filter Unit

1. Remove the two cross-head screws marked with **E** which hold the AC Mains Filter Unit to the rear panel (don't remove the four screws which hold the two AC connectors to the filter)
2. Carefully extract the AC Main Filter Unit from the rear panel in order to access the two connectors
3. Carefully unplug the two connectors
4. Remove the AC Mains Filter Unit

5.3.7 Removing the Controller Unit

1. Remove the top cover as over stated
2. Locate the Controller Unit and carefully unplug all its connectors
3. Unscrew the four screws which seats the PCB to the chassis
4. Remove the Controller Unit board

5.3.8 Dismounting the front LCD Display Unit

1. Remove the top cover as over stated
2. Carefully unplug the two flat cables
3. Unscrew the two exagonal nuts which hold the two LCD display PCBs to the panel
4. Remove the two PCBs together

5.3.9 Dismounting the AC Mains Power Switch

1. Remove the top cover as over stated
2. Take down note the connection of the four colored wires (brown, blue + 2 gray wires) and unplug their Faston-type connectors from the switch
3. Press the two tabs inward which fix the switch to the front panel and keep them pressed
4. Press the switch toward the front panel and remove it

CAUTION: When restoring/replacing the new switch take care to observe the wiring connections as noted at step 2.

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5.3.10 Removing the RF Board Unit

1. Remove the top and the bottom covers as over stated
2. Before going on, please remove the cover of the RF Board Unit (accessible from the top) by unscrewing all its screws (this operation is mandatory, otherwise the RF Unit can't be extracted).
3. Remove the nine screws near the front handles marked with **A**
4. Remove the screw located in the center of the front panel between the vent grid and the control panel (marked with **A1**): the front panel will be free
5. Remove the front panel: only the main chassis with Display Unit and Keyboard will be left in the front of the VHF amplifier
6. Remove the internal N-type male connector from the female-to-female pass-through transition fixed on the rear panel which makes the RF IN connector.
7. Remove the side power supply connector (the one with four red wires), the side flat cable coming from the Control Unit as well as the 4 wires connector coming from the RF Filter Unit.
8. Unscrew the six exagonal side screws which hold the RF Unit in place. Please note that the central inner screw fixes the power supply voltage negative wire.
9. Loose the only the upper screw located on the rear panel marked with **B1** (it's not necessary to loose the lower screw marked with **B2**).
10. Loose the two big pass-through screws located on the rear panel (marked **F** and **G**). Just loose them (not remove), otherwise the RF filter can fall down.
11. Unscrew the N-type connector between the RF Unit and the RF Filter Unit
12. Carefully extract the RF Unit toward the front taking care not to damage the RF input cable.

CAUTION: To restore the RF Board Unit in place, strictly follow the dedicated paragraph. Do not carry on the over stated steps in the opposite order

5.3.11 Removing the RF Filter Unit

1. Perform the over stated steps to remove the RF Board Unit, apart the last step.
2. Slightly extract the RF unit toward the front just for 10 centimeters approx. in order to access the RF filter unit
3. Completely remove the hexagonal screw **B1** and two big pass-through screws **F** and **G** described at steps 9. and 10. in the previous paragraph
4. Remove the RF angle connector which feeds the -60dB measure signal from the RF filter unit to the front panel
5. Remove the RF Filter Unit
6. To open the RF Filter Unit, simply unscrew the twelve screws which fix its cover

Should you just need to perform a control of the RF Filter board, you can just unscrew the screws stated at step 6. without removing the filter

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5.3.12 Restoring the RF Board Unit

1. Insert the RF Board unit in the slot of the front panel and locate it at the middle position (approx.)
2. Track the RF input cable inside in a path between the two fans and carefully move it to the left toward the female-to-female N-type pass-through transition fixed on the rear panel to which it should be connected
3. Carefully slide the module toward the RF Filter Unit and slightly start to screw its N connector just to "hook" it on the RF Filter's one
4. Push the RF Board Unit completely onto the RF Filter Unit
5. Screw completely the three screws which fix the filter to the rear panel and check that the RF Filter is perfectly and steadily fixed
6. Screw perfectly the N connector in order to ensure the perfect RF connection between RF Board Unit and the RF Filter
7. Screw the six side hexagonal screws described at step 8. of 5.3.10 ensuring that the central inner screw perfectly fixes the power supply voltage negative wire
8. Perform in reverse order the steps from 2. to 7. described in 5.3.10

5.3.13 Removing the Power Supply board

1. Remove the bottom cover as over stated
2. Unplug the connectors which connects the two fans, the negative and positive power supply voltage, the Control Unit (flat cable) and the AC mains supply (six connectors in total)
3. Unscrew the nine screws which seat the Power Supply board in the VHF amplifier

5.3.14 Replacing the Lexan Keypad/LED Unit

1. Unscrew the eight screws near the front handles
2. Unscrew the screw located in the center of the front panel between the air vent and the control panel
3. Remove the front panel (only the main chassis with display and control panel will be left in the front of the VHF amplifier)
4. Unplug the flat connector which connects the Lexan Keypad/LED Unit with the LCD Display Unit
5. Remove the AC Mains Power Switch as described in 5.3.9
6. Remove the BNC connector from the front panel (it feeds the -60dB measure signal from the RF filter unit to the front panel)
7. Remove the female-to-female pass-through BNC transition from the front panel by unscrewing the related nut
8. Carefully remove the Lexan Keypad/LED Unit (it is jammed onto the front panel by means of its adhesive tape)
9. Perfectly clean the surface where the old Lexan Keypad/LED Unit was jammed in order to ensure a perfect adherence of the new one
10. Peel off the protection film from the new Lexan Keypad/LED Unit
11. Stick the new Lexan Keypad/LED Unit onto the front panel making reference on the three holes for the BNC transition, the RS232 connector as well as the AC Mains Power Switch

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DEVIATIONS FOR FM BROADCASTING

MODEL: **VL1000 PLUS**

COUNTRY	FM Broadcasting introduced	Deviations from ERC Decisions and other comments
AUSTRIA	Yes	Individual licence is required
BELGIUM	Yes	Individual licence is required
DENMARK	Yes	Individual licence is required
FINLAND	Yes	Individual licence is required
FRANCE	Yes	Individual licence is required
GERMANY	Yes	Individual licence is required
GREECE	Yes	Individual licence is required
IRELAND	Yes	Individual licence is required
ITALY	Yes	Individual licence is required
LUXEMBOURG	Yes	Individual licence is required
NETHERLANDS	Yes	Individual licence is required
NORWAY	Yes	Individual licence is required
PORTUGAL	Yes	Individual licence is required
SPAIN	Yes	Individual licence is required
SWEDEN	Yes	Individual licence is required
SWITZERLAND	Yes	Individual licence is required
UNITED KINGDOM	Yes	Individual licence is required

RESTRIZIONI ALL'USO PER APPARATI FM BROADCASTING

MODELLO: **VL1000 PLUS**

STATO	Introduzione FM Broadcasting	Restrizioni all'uso
AUSTRIA	Sì	Richiesta la licenza individuale
BELGIO	Sì	Richiesta la licenza individuale
DANIMARCA	Sì	Richiesta la licenza individuale
FINLANDIA	Sì	Richiesta la licenza individuale

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FRANCIA	Sì	Richiesta la licenza individuale
GERMANIA	Sì	Richiesta la licenza individuale
GRECIA	Sì	Richiesta la licenza individuale
IRLANDA	Sì	Richiesta la licenza individuale
ITALIA	Sì	Richiesta la licenza individuale
LUSSEMBURGO	Sì	Richiesta la licenza individuale
NORVEGIA	Sì	Richiesta la licenza individuale
OLANDA	Sì	Richiesta la licenza individuale
PORTOGALLO	Sì	Richiesta la licenza individuale
REGNO UNITO	Sì	Richiesta la licenza individuale
SPAGNA	Sì	Richiesta la licenza individuale
SVEZIA	Sì	Richiesta la licenza individuale
SVIZZERA	Sì	Richiesta la licenza individuale

Restrictions à l'usage pour FM Broadcasting

Modèle: **VL1000 PLUS**

PAYS	FM Broadcasting présenté	Correction de la directive ERC et autre commentaires
ALLEMAGNE	Oui	Licence individuelle demandée
ANGLETERRE	Oui	Licence individuelle demandée
AUTRICHE	Oui	Licence individuelle demandée
BELGIQUE	Oui	Licence individuelle demandée
DANEMARK	Oui	Licence individuelle demandée
ESPAGNE	Oui	Licence individuelle demandée
FINLANDE	Oui	Licence individuelle demandée
FRANCE	Oui	Licence individuelle demandée
GRECE	Oui	Licence individuelle demandée
IRLANDE	Oui	Licence individuelle demandée
ITALIE	Oui	Licence individuelle demandée
LUXEMBOURG	Oui	Licence individuelle demandée
NORVEGE	Oui	Licence individuelle demandée
PAY-BAS	Oui	Licence individuelle demandée
PORTUGAL	Oui	Licence individuelle demandée
SUEDE	Oui	Licence individuelle demandée
SUISSE	Oui	Licence individuelle demandée

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RESTRICCIONES AL USO DE FM BROADCASTING

MODELO: **VL1000 PLUS**

PAIS	FM Broadcasting introducida	Restricciones al uso y otros comentarios
ALEMANIA	Si	Requiere licencia individual
AUSTRIA	Si	Requiere licencia individual
BÉLGICA	Si	Requiere licencia individual
DINAMARCA	Si	Requiere licencia individual
ESPAÑA	Si	Requiere licencia individual
FINLANDIA	Si	Requiere licencia individual
FRANCIA	Si	Requiere licencia individual
GRAN BRETAÑA	Si	Requiere licencia individual
GRECIA	Si	Requiere licencia individual
HOLANDA	Si	Requiere licencia individual
IRLANDA	Si	Requiere licencia individual
ITALIA	Si	Requiere licencia individual
LUXEMBURGO	Si	Requiere licencia individual
NORUEGA	Si	Requiere licencia individual
PORTUGAL	Si	Requiere licencia individual
SUECIA	Si	Requiere licencia individual
SUIZA	Si	Requiere licencia individual

Nutzungshinweis zu FM BROADCASTING

MODELL: **VL1000 PLUS**

LAND	FM Broadcasting eingeführt	Abweichungen von ERC Vorschriften und Kommentare
BELGIEN	Ja	Individuelle Lizenz erforderlich
DÄNEMARK	Ja	Individuelle Lizenz erforderlich
DEUTSCHLAND	Ja	Individuelle Lizenz erforderlich

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FINNLAND	Ja	Individuelle Lizenz erforderlich
FRANKREICH	Ja	Individuelle Lizenz erforderlich
GRIECHENLAND	Ja	Individuelle Lizenz erforderlich
GROßBRITANNIEN	Ja	Individuelle Lizenz erforderlich
IRLAND	Ja	Individuelle Lizenz erforderlich
ITALIEN	Ja	Individuelle Lizenz erforderlich
LUXEMBURG	Ja	Individuelle Lizenz erforderlich
NIEDERLANDE	Ja	Individuelle Lizenz erforderlich
NORWEGEN	Ja	Individuelle Lizenz erforderlich
ÖSTERREICH	Ja	Individuelle Lizenz erforderlich
PORTUGAL	Ja	Individuelle Lizenz erforderlich
SPANIEN	Ja	Individuelle Lizenz erforderlich
SCHWEDEN	Ja	Individuelle Lizenz erforderlich
SCHWEIZ	Ja	Individuelle Lizenz erforderlich

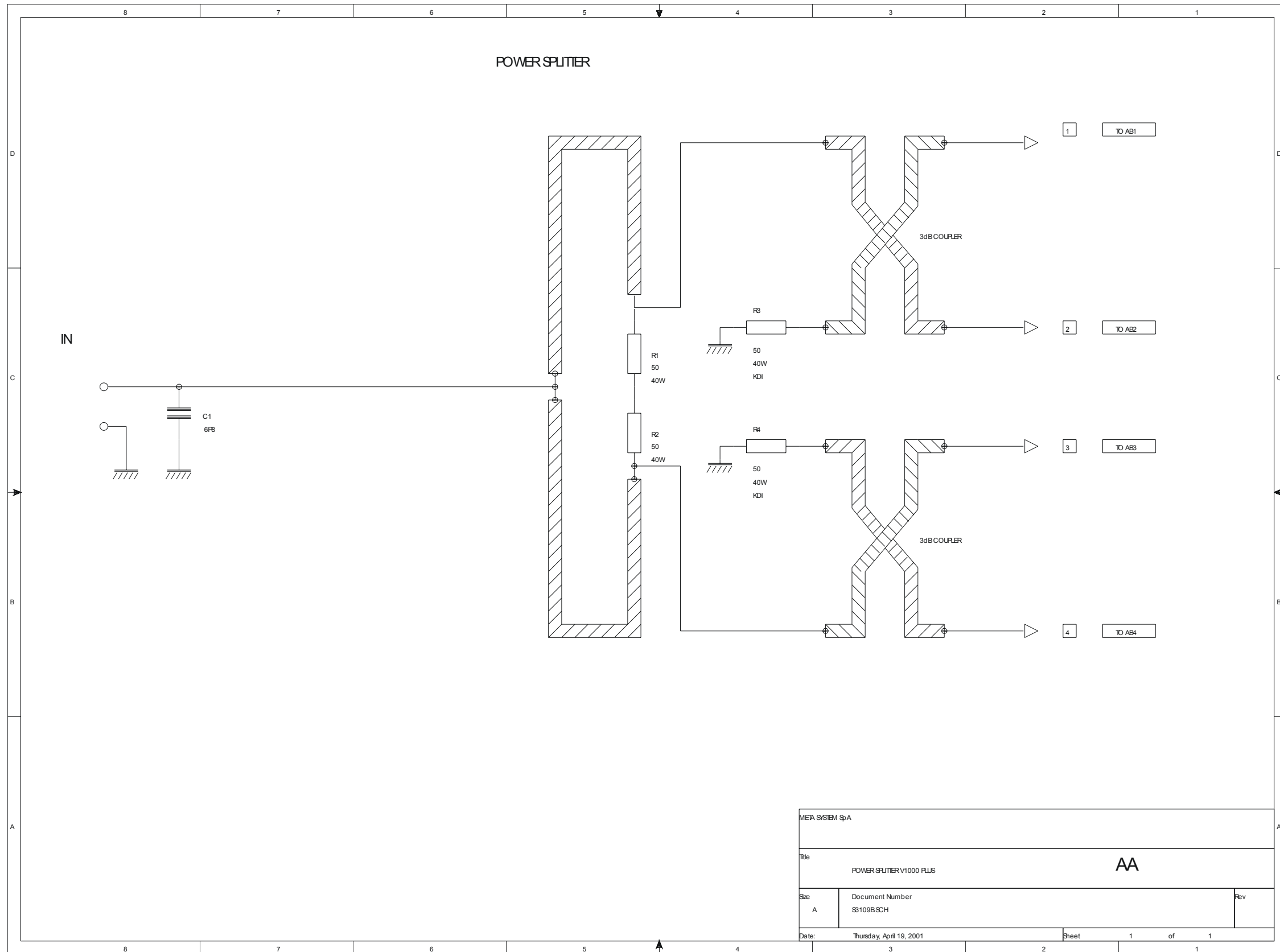
DESVIOS PARA FM BROADCASTING

MODELO: **VL1000 PLUS**

PAÍS	FM Broadcasting introduzido	Desvios estabelecidos pelo ERC e outras notas
ALEMANHA	Sim	Exigida licença individual
AUSTRIA	Sim	Exigida licença individual
BÉLGICA	Sim	Exigida licença individual
DINAMARCA	Sim	Exigida licença individual
ESPAÑA	Sim	Exigida licença individual
FINLÂNDIA	Sim	Exigida licença individual
FRANÇA	Sim	Exigida licença individual
GRÉCIA	Sim	Exigida licença individual
HOLANDA	Sim	Exigida licença individual
IRLANDA	Sim	Exigida licença individual
ITALIA	Sim	Exigida licença individual
LUXEMBURGO	Sim	Exigida licença individual
NORUEGA	Sim	Exigida licença individual
PORTUGAL	Sim	Exigida licença individual
REINO UNIDO	Sim	Exigida licença individual
SUÉCIA	Sim	Exigida licença individual
SUIÇA	Sim	Exigida licença individual


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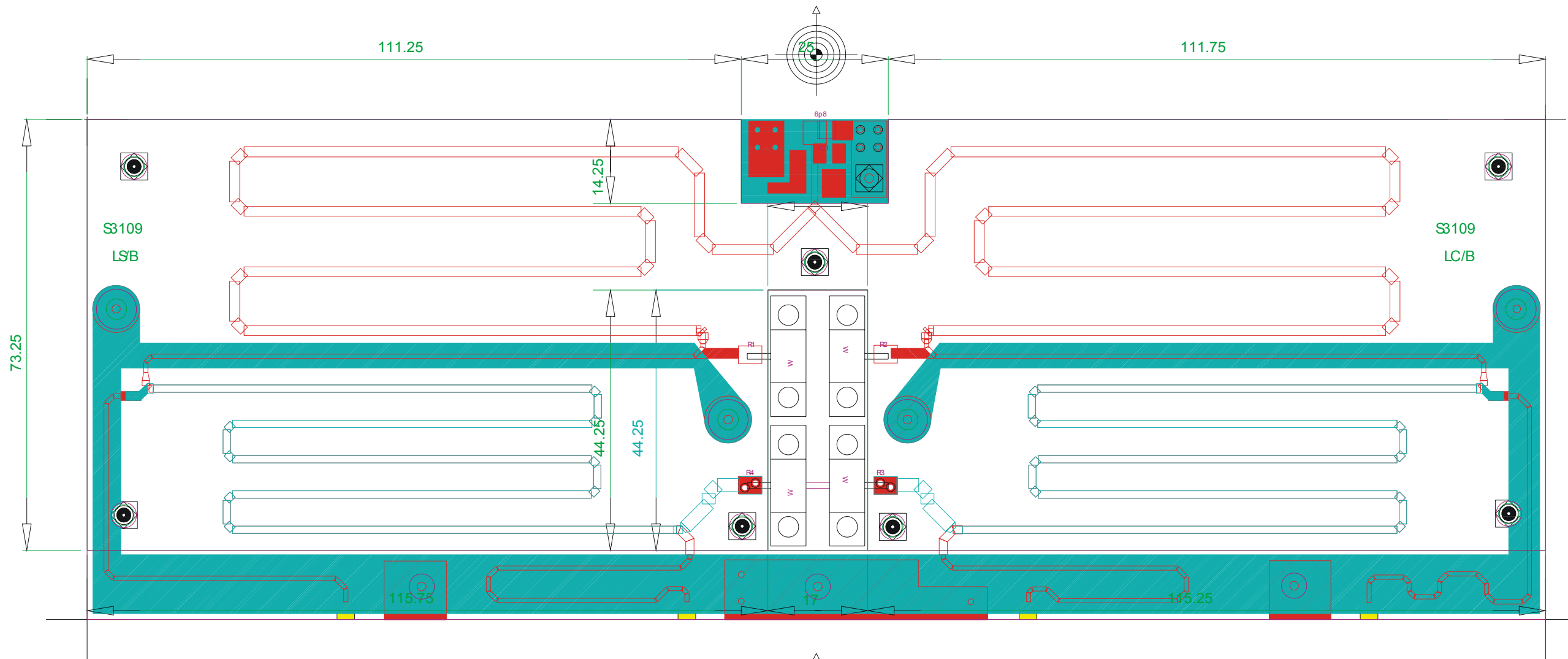


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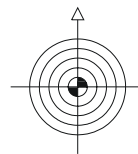
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POWER SPLITTER



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FORATURA C.S S3109A - VISTA LATO COMPONENTI

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POWER SPLITTER VL1000 PLUS Revised: Thursday, April 19, 2001

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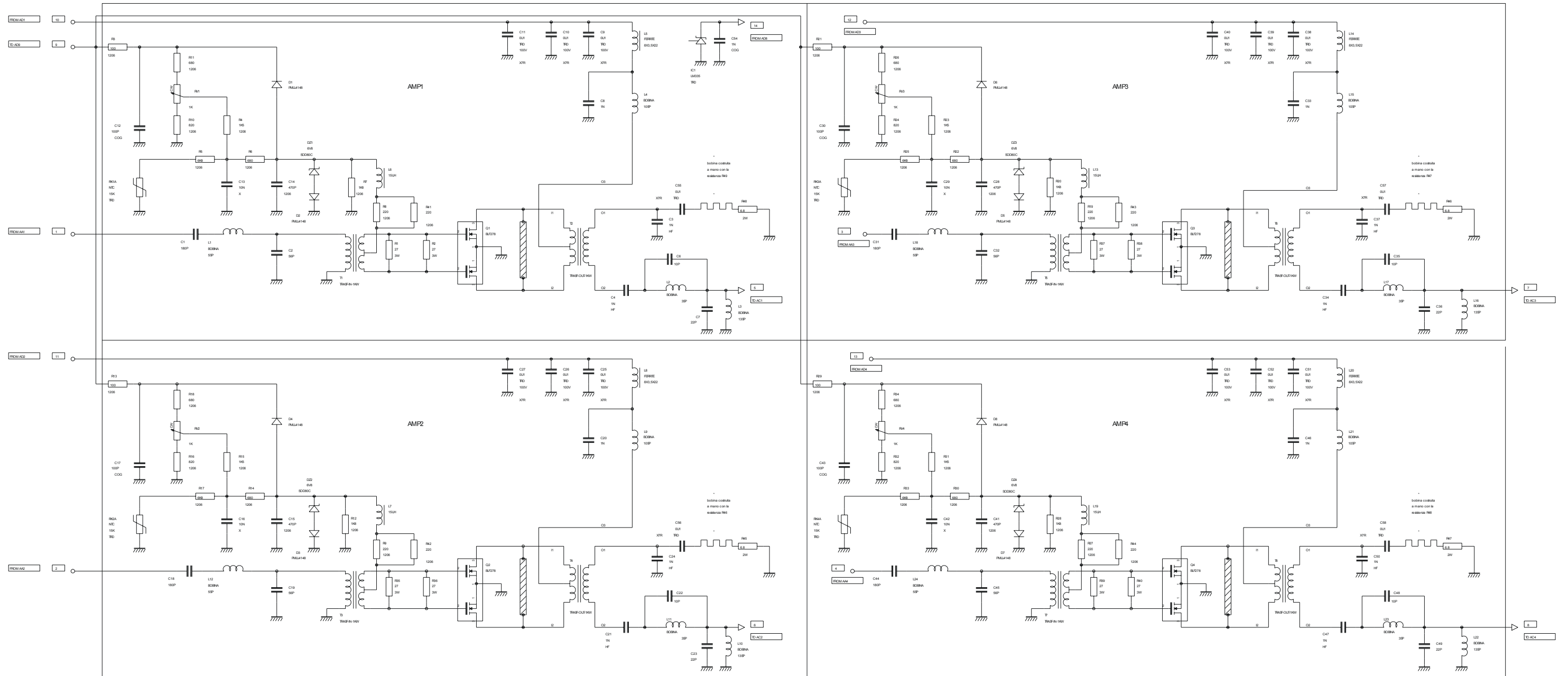
Comp. No.	Stock No.	Designation		Manufacturer	Designation
C1	C02056	6P8	HF	MURATA	ERE22X5C2H6R8CD13L
R1	R09616	50	40W ISO	KDI	PPR800-40-3-50-5
R2	R09616	50	40W ISO	KDI	PPR800-40-3-50-5
R3	R09615	50	40W TER	KDI	PPT800-40-3-50-5
R4	R09615	50	40W TER	KDI	PPT800-40-3-50-5

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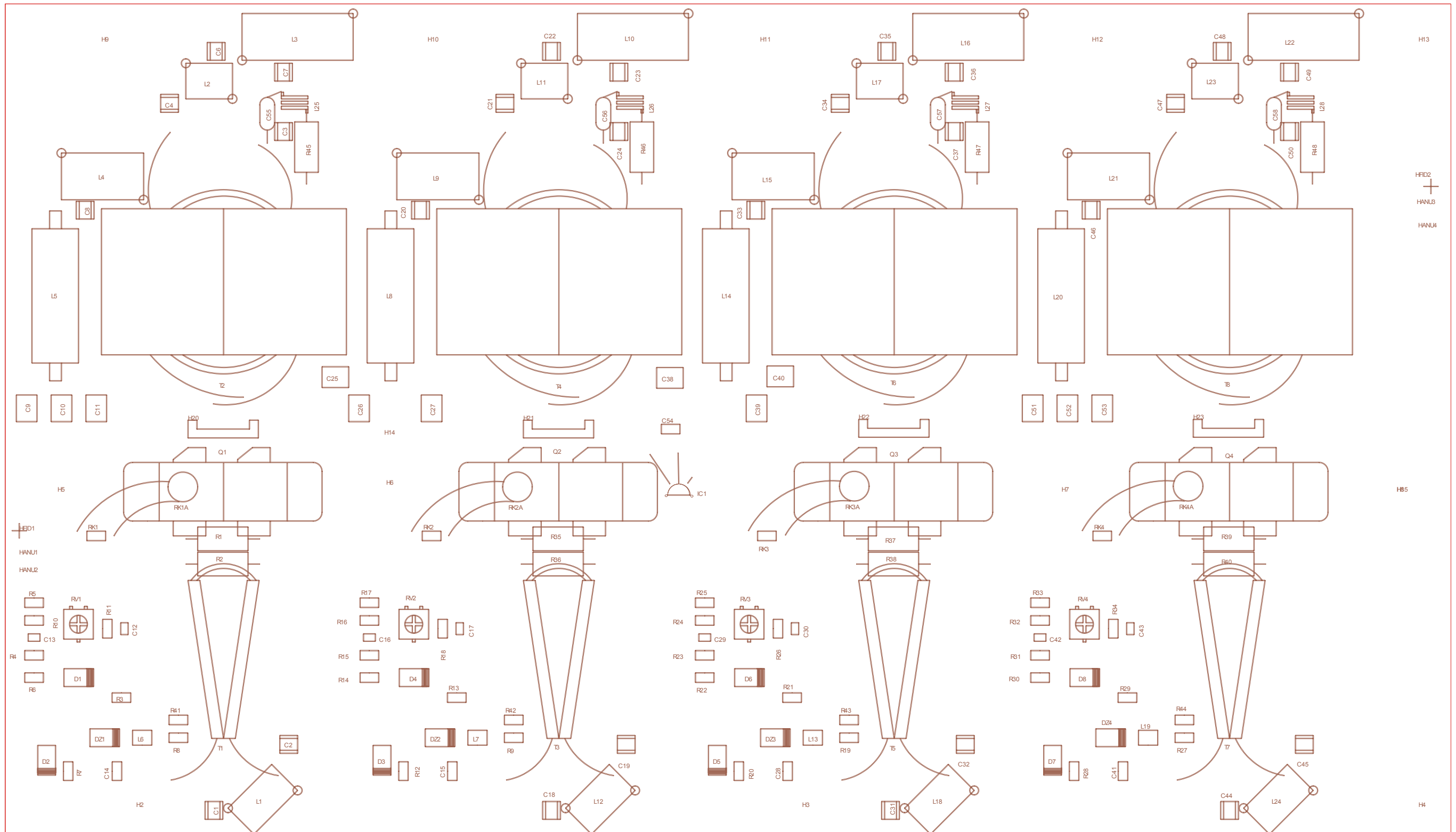


1KW POWER MODULE AMPLIFIER



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	CODICE	S3110A01	DATA	28-02-01	REFER. X	R	IL TECNICO DISEGNATORE	CAVALCABRE	_____
	TITOLO	CIRCUITO AMPLIFICATORE VL1000 PLUS			IL TECNICO PROGETTISTA	MOTTI	_____	_____	_____

SCALA 1:1

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AMPLIFICATORE VL1000 PLUS Revised: Thursday, April 19, 2001

S3110A01.SCH Revision: ?

META SYSTEM S.p.A.

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Il tecnico progettista: Allegri M.

Il tecnico disegnatore: Scorticati S.

Bill Of
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Comp. No.	Stock No.	Designation			Manufacturer	Designation
C1	C02124	180P	HF		MURATA	ERE22X5C1D181JD13B
C2	C02100	56P	HF		MURATA	ERE22X5C2H560JD13L
C3	C02160	1N	HF		MURATA	ERE22X5C1H102JD13L
C4	C02160	1N	HF		MURATA	ERE22X5C1H102JD13L
C6	C02064	10P	HF		MURATA	ERE22X5C2H100JD13L
C7	C02080	22P	HF		MURATA	ERE22X5C2H220JD13L
C8	C02160	1N	HF		MURATA	ERE22X5C1H102JD13L
C9	C01765	0U1	TRD	100V X	SIEMENS	B37987F1104K100
C10	C01765	0U1	TRD	100V X	SIEMENS	B37987F1104K100
C11	C01765	0U1	TRD	100V X	SIEMENS	B37987F1104K100
C12	C3310B	100P	0805	COG	MURATA	GRM40COG101J50
C13	C3510F	10N	0805	X	MURATA	GRM40X7R103K50
C14	C3347S	470P	1206	X	MURATA	GRM42X7R471K50
C15	C3347S	470P	1206	X	MURATA	GRM42X7R471K50
C16	C3510F	10N	0805	X	MURATA	GRM40X7R103K50
C17	C3310B	100P	0805	COG	MURATA	GRM40COG101J50
C18	C02124	180P	HF		MURATA	ERE22X5C1D181JD13B
C19	C02100	56P	HF		MURATA	ERE22X5C2H560JD13L
C20	C02160	1N	HF		MURATA	ERE22X5C1H102JD13L
C21	C02160	1N	HF		MURATA	ERE22X5C1H102JD13L
C22	C02064	10P	HF		MURATA	ERE22X5C2H100JD13L
C23	C02080	22P	HF		MURATA	ERE22X5C2H220JD13L
C24	C02160	1N	HF		MURATA	ERE22X5C1H102JD13L
C25	C01765	0U1	TRD	100V X	SIEMENS	B37987F1104K100
C26	C01765	0U1	TRD	100V X	SIEMENS	B37987F1104K100
C27	C01765	0U1	TRD	100V X	SIEMENS	B37987F1104K100
C28	C3347S	470P	1206	X	MURATA	GRM42X7R471K50
C29	C3510F	10N	0805	X	MURATA	GRM40X7R103K50
C30	C3310B	100P	0805	COG	MURATA	GRM40COG101J50
C31	C02124	180P	HF		MURATA	ERE22X5C1D181JD13B
C32	C02100	56P	HF		MURATA	ERE22X5C2H560JD13L
C33	C02160	1N	HF		MURATA	ERE22X5C1H102JD13L

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C34	C02160	1N	HF		MURATA	ERE22X5C1H102JD13L
C35	C02064	10P	HF		MURATA	ERE22X5C2H100JD13L
C36	C02080	22P	HF		MURATA	ERE22X5C2H220JD13L
C37	C02160	1N	HF		MURATA	ERE22X5C1H102JD13L
C38	C01765	0U1	TRD	100V X	SIEMENS	B37987F1104K100
C39	C01765	0U1	TRD	100V X	SIEMENS	B37987F1104K100
C40	C01765	0U1	TRD	100V X	SIEMENS	B37987F1104K100
C41	C3347S	470P	1206	X	MURATA	GRM42X7R471K50
C42	C3510F	10N	0805	X	MURATA	GRM40X7R103K50
C43	C3310B	100P	0805	COG	MURATA	GRM40COG101J50
C44	C02124	180P	HF		MURATA	ERE22X5C1D181JD13B
C45	C02100	56P	HF		MURATA	ERE22X5C2H560JD13L
C46	C02160	1N	HF		MURATA	ERE22X5C1H102JD13L
C47	C02160	1N	HF		MURATA	ERE22X5C1H102JD13L
C48	C02064	10P	HF		MURATA	ERE22X5C2H100JD13L
C49	C02080	22P	HF		MURATA	ERE22X5C2H220JD13L
C50	C02160	1N	HF		MURATA	ERE22X5C1H102JD13L
C51	C01765	0U1	TRD	100V X	SIEMENS	B37987F1104K100
C52	C01765	0U1	TRD	100V X	SIEMENS	B37987F1104K100
C53	C01765	0U1	TRD	100V X	SIEMENS	B37987F1104K100
C54	C3410B	1N	0805	COG	MURATA	GRM40COG102J50
C55	C01765	0U1	TRD	100V X	SIEMENS	B37987F1104K100
C56	C01765	0U1	TRD	100V X	SIEMENS	B37987F1104K100
C57	C01765	0U1	TRD	100V X	SIEMENS	B37987F1104K100
C58	C01765	0U1	TRD	100V X	SIEMENS	B37987F1104K100
D1	D05106	PMLL4148			PHILIPS	PMLL4148
D2	D05106	PMLL4148			PHILIPS	PMLL4148
D3	D05106	PMLL4148			PHILIPS	PMLL4148
D4	D05106	PMLL4148			PHILIPS	PMLL4148
D5	D05106	PMLL4148			PHILIPS	PMLL4148
D6	D05106	PMLL4148			PHILIPS	PMLL4148
D7	D05106	PMLL4148			PHILIPS	PMLL4148
D8	D05106	PMLL4148			PHILIPS	PMLL4148
DZ1	D01685	6V8	SOD80C		PHILIPS	BZV55C6V8
DZ2	D01685	6V8	SOD80C		PHILIPS	BZV55C6V8
DZ3	D01685	6V8	SOD80C		PHILIPS	BZV55C6V8
DZ4	D01685	6V8	SOD80C		PHILIPS	BZV55C6V8
IC1	I00318	LM335	TRD		NATIONAL	LM335AZ
L1	M03084	BOBINA	TRD	5SP	METASYSTEM	M03084
L2	M03047	BOBINA	TRD	3SP	METASYSTEM	M03047
L3	M03254	BOBINA	TRD	13SP	METASYSTEM	M03254
L4	M03186	BOBINA	TRD	10SP	METASYSTEM	M03186
L5	M01035	FERRITE	TRD	8X3,5X22	NEOSID GMBH	F2A8X3.5X22
L6	M12150	15UH			SIEMENS	B82422-A1153-K100
L7	M12150	15UH			SIEMENS	B82422-A1153-K100
L8	M01035	FERRITE	TRD	8X3,5X22	NEOSID GMBH	F2A8X3.5X22
L9	M03186	BOBINA	TRD	10SP	METASYSTEM	M03186
L10	M03254	BOBINA	TRD	13SP	METASYSTEM	M03254
L11	M03047	BOBINA	TRD	3SP	METASYSTEM	M03047

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L12	M03084	BOBINA	TRD	5SP	METASYSTEM	M03084
L13	M12150	15UH			SIEMENS	B82422-A1153-K100
L14	M01035	FERRITE	TRD	8X3,5X22	NEOSID GMBH	F2A8X3.5X22
L15	M03186	BOBINA	TRD	10SP	METASYSTEM	M03186
L16	M03254	BOBINA	TRD	13SP	METASYSTEM	M03254
L17	M03047	BOBINA	TRD	3SP	METASYSTEM	M03047
L18	M03084	BOBINA	TRD	5SP	METASYSTEM	M03084
L19	M12150	15UH			SIEMENS	B82422-A1153-K100
L20	M01035	FERRITE	TRD	8X3,5X22	NEOSID GMBH	F2A8X3.5X22
L21	M03186	BOBINA	TRD	10SP	METASYSTEM	M03186
L22	M03254	BOBINA	TRD	13SP	METASYSTEM	M03254
L23	M03047	BOBINA	TRD	3SP	METASYSTEM	M03047
L24	M03084	BOBINA	TRD	5SP	METASYSTEM	M03084
Q1	T01040	BLF278	TRD		PHILIPS	BLF278
Q2	T01040	BLF278	TRD		PHILIPS	BLF278
Q3	T01040	BLF278	TRD		PHILIPS	BLF278
Q4	T01040	BLF278	TRD		PHILIPS	BLF278
R1	R04104	27	TRD	3W	PHILIPS	2322 195 13279
R2	R04104	27	TRD	3W	PHILIPS	2322 195 13279
R3	R23100	100	1206		SIEMENS	B54103A1 101J60
R4	R24150	1K5	1206		SIEMENS	B54103A1 152J60
R40	R04104	27	TRD	3W	PHILIPS	2322 195 13279
R41	R23220	220	1206		SIEMENS	B54103A1 221J60
R42	R23220	220	1206		SIEMENS	B54103A1 221J60
R43	R23220	220	1206		SIEMENS	B54103A1 221J60
R44	R23220	220	1206		SIEMENS	B54103A1 221J60
R45	R04061	6R8	TRD	2W	PIHER	EO-02 6,8 OHM
R46	R04061	6R8	TRD	2W	PIHER	EO-02 6,8 OHM
R47	R04061	6R8	TRD	2W	PIHER	EO-02 6,8 OHM
R48	R04061	6R8	TRD	2W	PIHER	EO-02 6,8 OHM
R5	R24680	6K8	1206		SIEMENS	B54103A1 682J60
R6	R23680	680	1206		SIEMENS	B54103A1 681J60
R7	R24180	1K8	1206		SIEMENS	B50103A1 182J60
R8	R23220	220	1206		SIEMENS	B54103A1 221J60
R9	R23220	220	1206		SIEMENS	B54103A1 221J60
R10	R23820	820	1206		SIEMENS	B54103A1 821J60
R11	R23680	680	1206		SIEMENS	B54103A1 681J60
R12	R24180	1K8	1206		SIEMENS	B50103A1 182J60
R13	R23100	100	1206		SIEMENS	B54103A1 101J60
R14	R23680	680	1206		SIEMENS	B54103A1 681J60
R15	R24150	1K5	1206		SIEMENS	B54103A1 152J60
R16	R23820	820	1206		SIEMENS	B54103A1 821J60
R17	R24680	6K8	1206		SIEMENS	B54103A1 682J60
R18	R23680	680	1206		SIEMENS	B54103A1 681J60
R19	R23220	220	1206		SIEMENS	B54103A1 221J60
R20	R24180	1K8	1206		SIEMENS	B50103A1 182J60
R21	R23100	100	1206		SIEMENS	B54103A1 101J60
R22	R23680	680	1206		SIEMENS	B54103A1 681J60
R23	R24150	1K5	1206		SIEMENS	B54103A1 152J60

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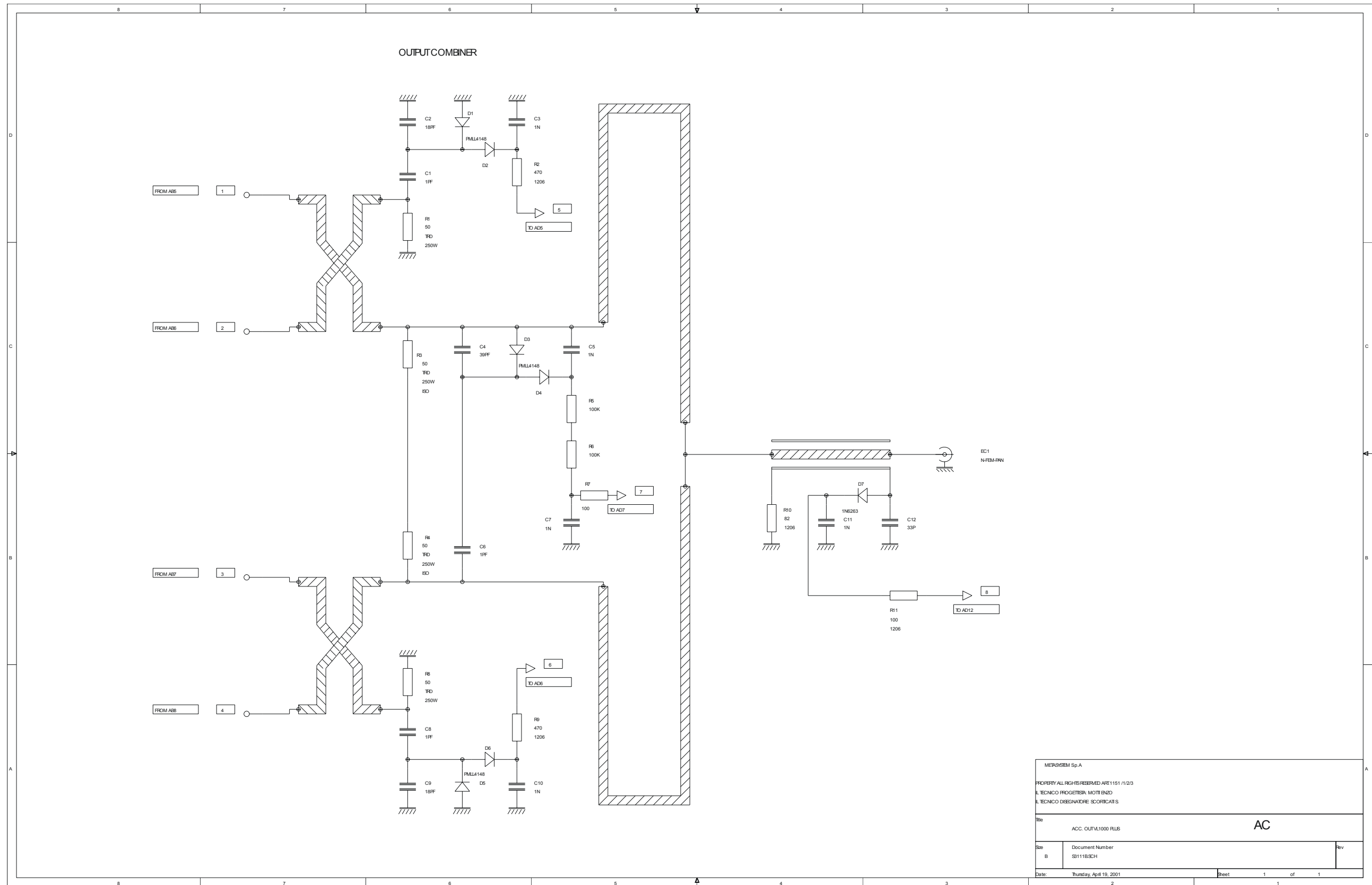
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R24	R23820	820	1206		SIEMENS	B54103A1 821J60
R25	R24680	6K8	1206		SIEMENS	B54103A1 682J60
R26	R23680	680	1206		SIEMENS	B54103A1 681J60
R27	R23220	220	1206		SIEMENS	B54103A1 221J60
R28	R24180	1K8	1206		SIEMENS	B54103A1 182J60
R29	R23100	100	1206		SIEMENS	B54103A1 101J60
R30	R23680	680	1206		SIEMENS	B54103A1 681J60
R31	R24150	1K5	1206		SIEMENS	B54103A1 152J60
R32	R23820	820	1206		SIEMENS	B54103A1 821J60
R33	R24680	6K8	1206		SIEMENS	B54103A1 682J60
R34	R23680	680	1206		SIEMENS	B54103A1 681J60
R35	R04104	27	TRD	3W	PHILIPS	2322 195 13279
R36	R04104	27	TRD	3W	PHILIPS	2322 195 13279
R37	R04104	27	TRD	3W	PHILIPS	2322 195 13279
R38	R04104	27	TRD	3W	PHILIPS	2322 195 13279
R39	R04104	27	TRD	3W	PHILIPS	2322 195 13279
RK1A	R05910	NTC	TRD	15K	MURATA	NTH5D153KA
RK2A	R05910	NTC	TRD	15K	MURATA	NTH5D153KA
RK3A	R05910	NTC	TRD	15K	MURATA	NTH5D153KA
RK4A	R05910	NTC	TRD	15K	MURATA	NTH5D153KA
RV1	R14100	1K	1G		TOCOS	G4BT1KOHM
RV2	R14100	1K	1G		TOCOS	G4BT1KOHM
RV3	R14100	1K	1G		TOCOS	G4BT1KOHM
RV4	R14100	1K	1G		TOCOS	G4BT1KOHM
T1	XF7L24	TRASF-IN-1KW	TRD		METASYSTEM	XF7L24
T2	XF7L61	TRASF-OUT-1KW	TRD		METASYSTEM	XF7L61
T3	XF7L24	TRASF-IN-1KW	TRD		METASYSTEM	XF7L24
T4	XF7L61	TRASF-OUT-1KW	TRD		METASYSTEM	XF7L61
T5	XF7L24	TRASF-IN-1KW	TRD		METASYSTEM	XF7L24
T6	XF7L61	TRASF-OUT-1KW	TRD		METASYSTEM	XF7L61
T7	XF7L24	TRASF-IN-1KW	TRD		METASYSTEM	XF7L24
T8	XF7L61	TRASF-OUT-1KW	TRD		METASYSTEM	XF7L61

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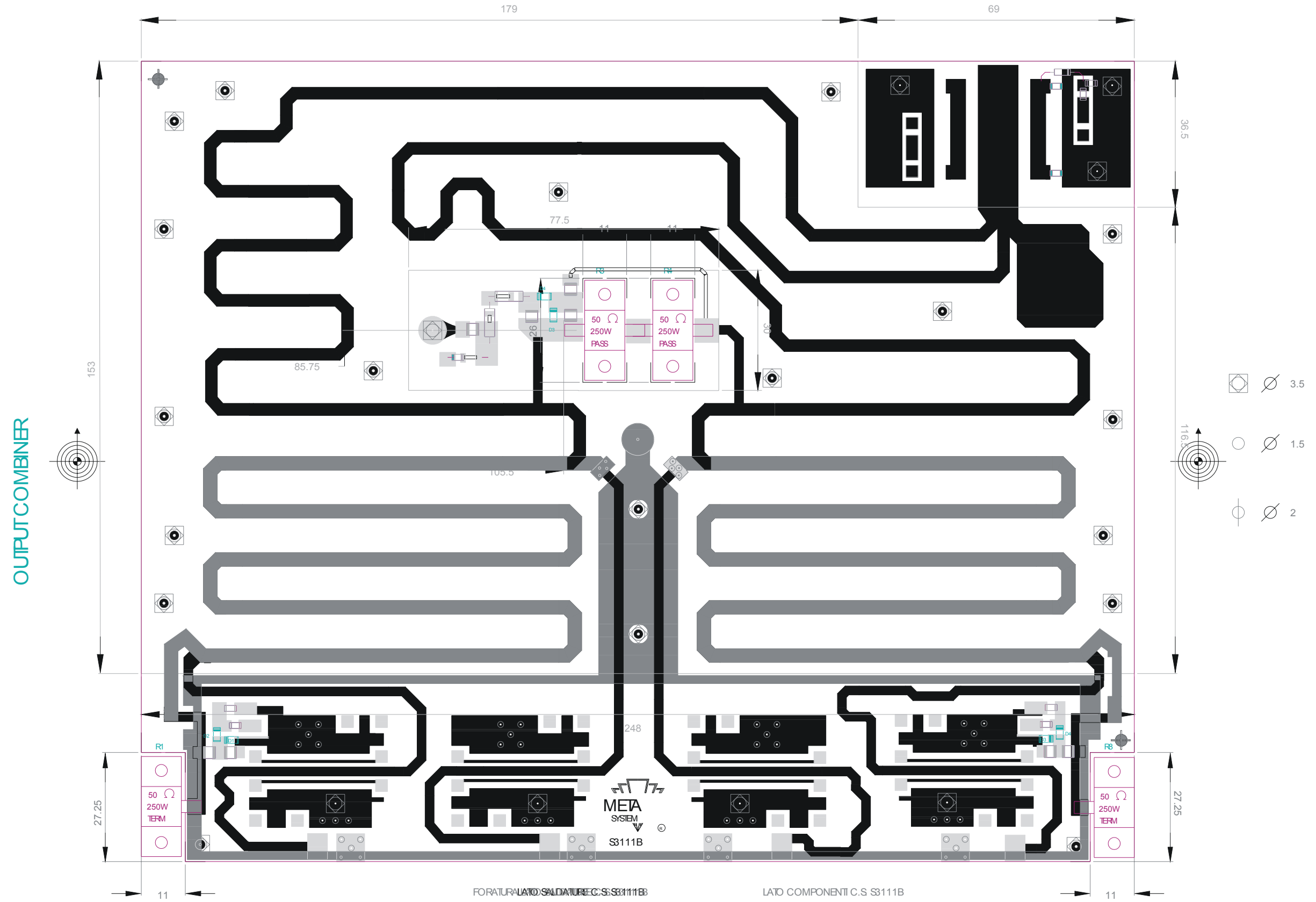
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MEPAGSEM Sp.A	
PROPERTY ALL RIGHTS RESERVED ART.1151 /1/2/3	
IL TECNICO PROGETTISTA: MOTI ENZO	
IL TECNICO DESEGNAIORE: SCORRICATI S.	
File: ACC: OUTVL1000 PLUS AC	
Size: B	Document Number: SB111BSCH
Date: Thursday, April 19, 2001	Sheet: 1 of 1

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ACC. OUT VL1000 PLUS Revised: Thursday, April 19, 2001

S3111B.SCH Revision:

METASYSTEM S.p.A

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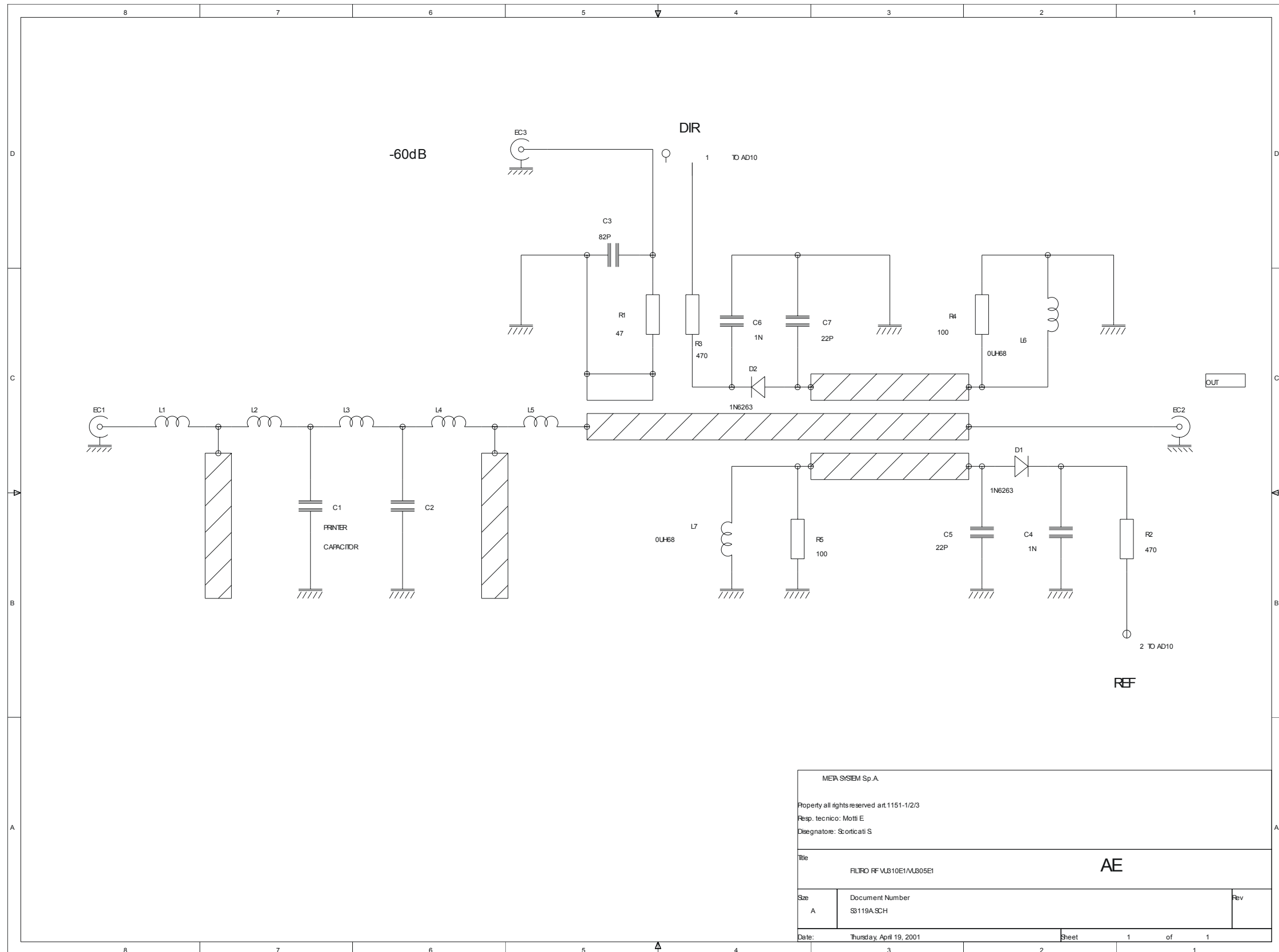
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Bill Of
Materials
October
9,2001
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Comp. No.	Stock No.	Designation		Manufacturer	Designation
C1	C02016	1PF	HF	MURATA	ERE22X5C2H1R0CD13L
C2	C02076	18PF	HF	MURATA	ERE22X5C2H180JD13L
C3	C3410P	1N	1206 COG	MURATA	GRM42COG102K50
C4	C02092	39PF	HF	MURATA	ERE22X5C2H390JD13L
C5	C02160	1N	HF	MURATA	ERE22X5C1H102JD13L
C6	C02016	1PF	HF	MURATA	ERE22X5C2H1R0CD13L
C7	C02160	1N	HF	MURATA	ERE22X5C1H102JD13L
C8	C02016	1PF	HF	MURATA	ERE22X5C2H1R0CD13L
C9	C02076	18PF	HF	MURATA	ERE22X5C2H180JD13L
C10	C3410P	1N	1206 COG	MURATA	GRM42COG102K50
C11	C3410P	1N	1206 COG	MURATA	GRM42COG102K50
C12	C3233P	33P	1206 COG	MURATA	GRM42COG330J50
D1	D05106	PMLL4148		PHILIPS	PMLL4148
D2	D05106	PMLL4148		PHILIPS	PMLL4148
D3	D05106	PMLL4148		PHILIPS	PMLL4148
D4	D05106	PMLL4148		PHILIPS	PMLL4148
D5	D05106	PMLL4148		PHILIPS	PMLL4148
D6	D05106	PMLL4148		PHILIPS	PMLL4148
D7	D00807	1N6263	TRD HOT-CAR.	ST	1N6263
EC1	E04520	N-FEM-PAN	TRD UG-58-A/U	BELCO	UG-58-A/U
R1	R09617	50	TRD 250W	KDI	PTT975-250-3-50-5
R2	R23470	470	1206	SIEMENS	B54103A1 471J60
R3	R09618	50	TRD 250W	KDI	PPR975-250-3-50-5
R4	R09618	50	TRD 250W	KDI	PPR975-250-3-50-5
R5	R01510	100K	TRD 1%	ROY	MF25 100KOHM F
R6	R01510	100K	TRD 1%	ROY	MF25 100KOHM F
R7	R23101	100		SIEMENS	B54103A1 101J60
R8	R09617	50	TRD 250W	KDI	PTT975-250-3-50-5
R9	R23470	470	1206	SIEMENS	B54103A1 471J60
R10	R22820	82	1206	SIEMENS	B54103A1 820J60
R11	R23100	100	1206	SIEMENS	B54103A1 101J60

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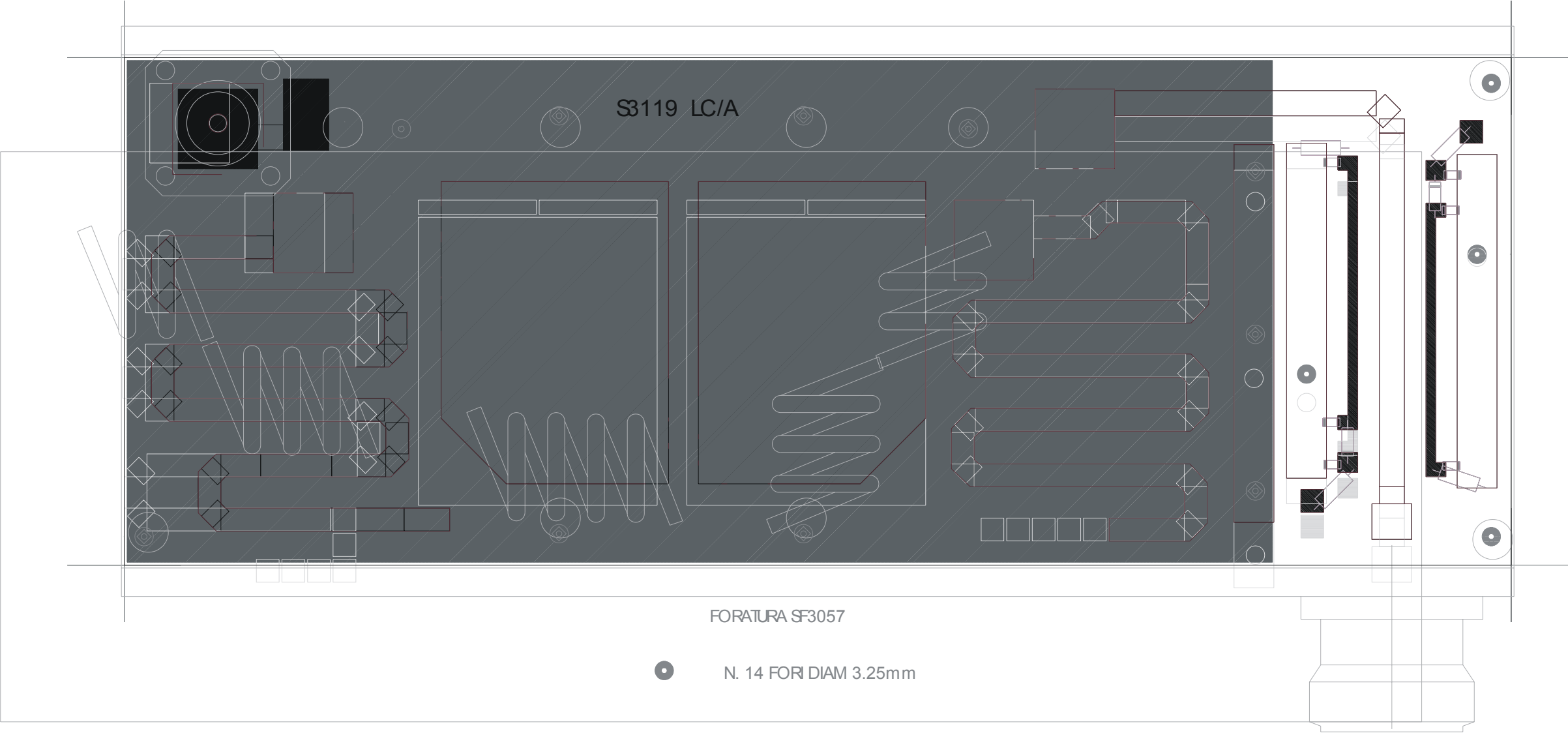
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FILTER AND DIRECTIONAL COUPLER CIRCUIT



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FILTRO RF VL1000 PLUS Revised: Thursday, April 19, 2001

S3119A.SCH Revision: ?

META SYSTEM S.p.A.

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Resp. tecnico: Motti E.

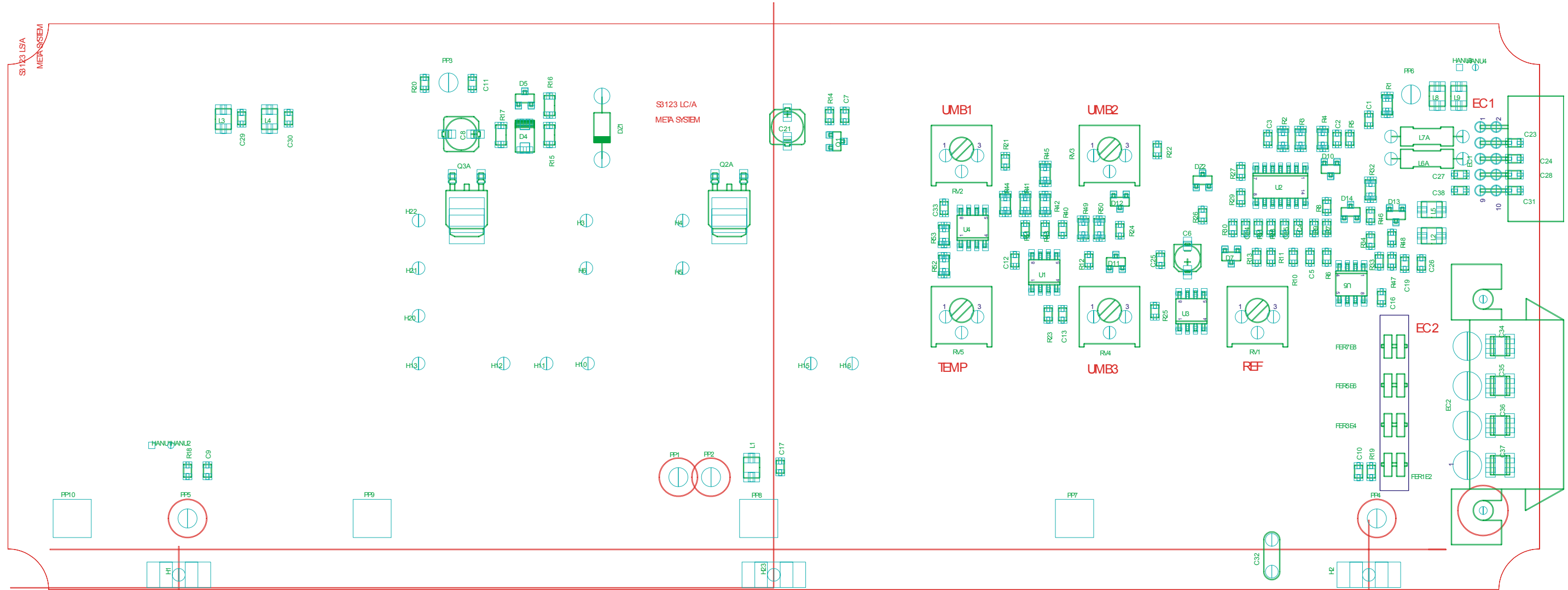
Disegnatore: Scorticati S.

Bill Of Materials
October 9,2001
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Page1

Comp. No.	Stock No.	Designation		Manufacturer	Designation
C1	PDEL	HH			
C2	PDEL	HH			
C3	C1282C	82P	TRD 63V	PHILIPS	222264 210 829
C4	C02160	1N	HF	MURATA	ERE22X5C1H102JD13L
C5	C02080	22P	HF	MURATA	ERE22X5C2H220JD13L
C6	C02160	1N	HF	MURATA	ERE22X5C1H102JD13L
C7	C02080	22P	HF	MURATA	ERE22X5C2H220JD13L
D1	D00807	1N6263	TRD HOT-CAR.	ST	1N6263
D2	D00807	1N6263	TRD HOT-CAR.	ST	1N6263
EC1	E04519	N-MAS-PAN	TRD	KAIJAK	B0900-N2A5
EC2	E04572	7/16FEM-PAN	TRD	CPE	SP12.000
EC3	E04541	BNC-FEM-PAN	TRD	NL INDUS.	14277
L1	XF7L44	BOB-2SP-DIAM-14	TRD	METASYSTEM	XF7L44
L2	XF7L45	BOB-4SP-DIAM-14	TRD	METASYSTEM	XF7L45
L3	XF7L46	BOB-5SP-DIAM-14	TRD	METASYSTEM	XF7L46
L4	XF7L45	BOB-4SP-DIAM-14	TRD	METASYSTEM	XF7L45
L5	XF7L44	BOB-2SP-DIAM-14	TRD	METASYSTEM	XF7L44
L6	M00010	0UH68	TRD 0W25	SIEMENS	B78108T3681K
L7	M00010	0UH68	TRD 0W25	SIEMENS	B78108T3681K
R1	R00201	47	TRD	ROY	CR25PS 47OHMJ
R2	R00321	470	TRD	ROY	CR25PS 470OHMJ
R3	R00321	470	TRD	ROY	CR25PS 470OHMJ
R4	R23100	100	1206	SIEMENS	B54103A1 101J60
R5	R23100	100	1206	SIEMENS	B54103A1 101J60

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	CODICE	K3123A01	DATA	09/04/01	REFER. X	R	IL TECNICO DISEGNATORE:	SCORICAR	_____
	TITOLO:	CONTROLLER MODULO RF V1.1000/1.500 PLUS		IL TECNICO PROGETTISTA:		MOTI	_____		

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RF CONTROL MOD. RF VL1000 PLUS ReS Revised: Tuesday, April 10, 2001

K3123A01.SCH Revision: ?

META SYSTEM SpA

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IL TECNICO PROGETTISTA:MOTTI ENZO

IL TECNICO DISEGNATORE:SCORTICATI STEFANO

Bill Of Materials
October
9,2001
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Comp.No.	Stock No.	Designation	Manufacturer	Designation
C1	C3315B	150P	COG 0805 MURATA	GRM40 COG 151 J50
C2	C3410F	1N	X 0805 MURATA	GRM40 X7R 102 J50
C3	C3610F	0U1	X 0805 MURATA	GRM40 X7R 104 J25
C4	C3610F	0U1	X 0805 MURATA	GRM40 X7R 104 J25
C5	C3315B	150P	X 0805 MURATA	GRM40 COG 151 J50
C6	C42101	10U	16V ELNA	RV2-16V100M-D55R
C7	C3510F	10N	X 0805 MURATA	GRM40 X7R 103 J50
C8	C42103	10U	35V D5 NIC	NACE10M35V5X5.5TR13
C9	C3510F	10N	X 0805 MURATA	GRM40 X7R 103 J50
C10	C3510F	10N	X 0805 MURATA	GRM40 X7R 103 J50
C11	C3510F	10N	X 0805 MURATA	GRM40 X7R 103 J50
C12	C3610F	0U1	X 0805 MURATA	GRM40 X7R 104 J25
C13	C3610F	0U1	X 0805 MURATA	GRM40 X7R 104 J25
C14	C3610F	0U1	X 0805 MURATA	GRM40 X7R 104 J25
C15	C3610F	0U1	X 0805 MURATA	GRM40 X7R 104 J25
C16	C3610F	0U1	X 0805 MURATA	GRM40 X7R 104 J25
C17	C3510F	10N	X 0805 MURATA	GRM40 X7R 103 J50
C19	C3510F	10N	X 0805 MURATA	GRM40 X7R 103 J50
C21	C42103	10U	35V D5 NIC	NACE10M35V5X5.5TR13
C23	C3410B	1N	TRD 0805 MURATA	GRM40 COG 102 J50
C24	C3410B	1N	TRD 0805 MURATA	GRM40 COG 102 J50
C25	C3610F	0U1	X 0805 MURATA	GRM40 X7R 104 J25
C26	C3510F	10N	X 0805 MURATA	GRM40 X7R 103 J50
C27	C3410B	1N	COG 0805 MURATA	GRM40 X7R 103 J50
C28	C3410B	1N	TRD 0805 MURATA	GRM40 X7R 103 J50
C29	C3410B	1N	COG 0805 MURATA	GRM40 X7R 103 J50
C30	C3410B	1N	COG 0805 MURATA	GRM40 X7R 103 J50
C31	C3410B	1N	TRD 0805 MURATA	GRM40 X7R 103 J50
C32	C01765	0U1	TRD 100V SIEMENS	B37987 F1104 K100
C33	C3610F	0U1	X 0805 MURATA	GRM40 X7R 104 J25

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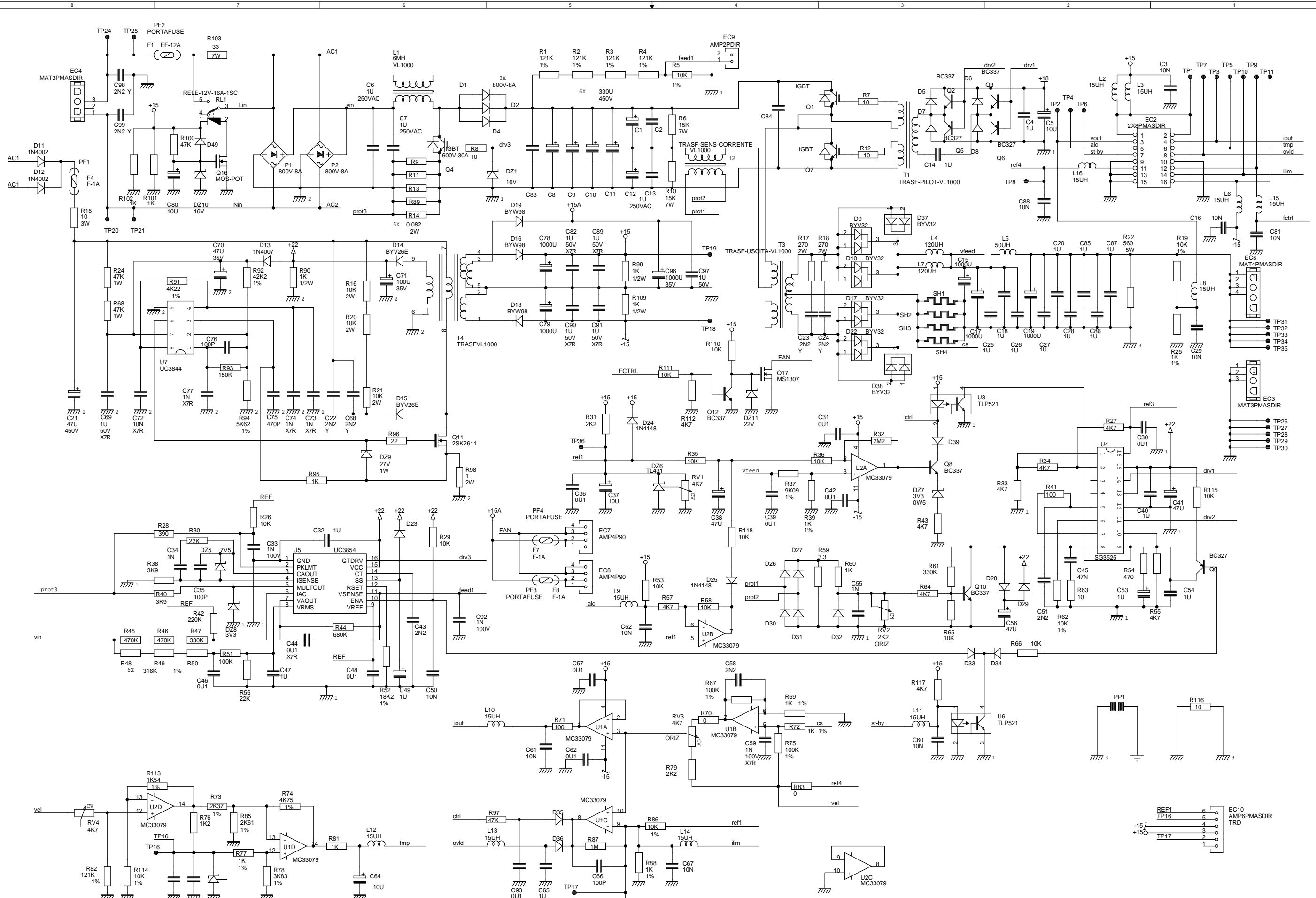
C34	C02160	1N	TRD		MURATA	ERE22X5C1H102JD13L
C35	C02160	1N	TRD		MURATA	ERE22X5C1H102JD13L
C36	C02160	1N	TRD		MURATA	ERE22X5C1H102JD13L
C37	C02160	1N	TRD		MURATA	ERE22X5C1H102JD13L
C38	C3410B	1N	COG	0805	MURATA	GRM40 COG 102 J50
D4	D05021	SM4004			PHILIPS	S1G
D5	D05006	BAV99			PHILIPS	BAV99
D7	D05011	BAW56			PHILIPS	BAW56
D10	D05006	BAV99			PHILIPS	BAV99
D11	D05006	BAV99			PHILIPS	BAV99
D12	D05002	BAV70			PHILIPS	BAV70
D13	D05006	BAV99			PHILIPS	BAV99
D14	D05011	BAW56			PHILIPS	BAW56
DZ1	D00117	9V1	TRD	1W	PHILIPS	BZV85-C9V1
DZ2	D02152	BZX84-15V			PHILIPS	BZX84-C15V
EC1	E05610	2X5PMAS90	TRD		NL INDUSTRIES	MFCA10W
EC2	E04709	MAT4PMAS90	TRD		AMP	1-350944-0
FER1	M01090	FERRITE-TOROID-T20-12	TRD		AMIDON	T20-12
FER2	M01090	FERRITE-TOROID-T20-12	TRD		AMIDON	T20-12
FER3	M01090	FERRITE-TOROID-T20-12	TRD		AMIDON	T20-12
FER4	M01090	FERRITE-TOROID-T20-12	TRD		AMIDON	T20-12
FER5	M01090	FERRITE-TOROID-T20-12	TRD		AMIDON	T20-12
FER6	M01090	FERRITE-TOROID-T20-12	TRD		AMIDON	T20-12
FER7	M01090	FERRITE-TOROID-T20-12	TRD		AMIDON	T20-12
FER8	M01090	FERRITE-TOROID-T20-12	TRD		AMIDON	T20-12
L1	M12150	15UH			SIEMENS	B82422-A1153-K100
L2	M12150	15UH			SIEMENS	B82422-A1153-K100
L3	M12150	15UH			SIEMENS	B82422-A1153-K100
L4	M12150	15UH			SIEMENS	B82422-A1153-K100
L5	M12150	15UH			SIEMENS	B82422-A1153-K100
L6A	M00086	15UH	TRD		SIEMENS	B78108-S1153-K
L7A	M00086	15UH	TRD		SIEMENS	B78108-S1153-K
L8	M12150	15UH			SIEMENS	B82422-A1153-K100
L9	M12150	15UH			SIEMENS	B82422-A1153-K100
Q1	T05003	BC807			PHILIPS	BC807/25
Q2A	T05012	MJD42			MOTOROLA	MJD45H11-T4
Q3A	T05012	MJD42			MOTOROLA	MJD45H11-T4
R1	R54422 R34422	4K22	1%	0805	SIEMENS	B54102A2 422F260
R2	R55100 R35100	10K	1%	0805	SIEMENS	B54102A2 103F060
R3	R54680	6K8	1%	0805	SIEMENS	B54102A2 682F060
R4	R55100 R35100	10K	1%	0805	SIEMENS	B54102A2 103F060
R5	R24471	4K7		0805	SIEMENS	B54102A1 472J60
R6	R25101	10K		0805	SIEMENS	B54102A1 103J60
R7	R25101	10K		0805	SIEMENS	B54102A1 103J60
R8	R27101	1M		0805	SIEMENS	B54102A1 105J60
R9	R26101	100K		0805	SIEMENS	B54102A1 104J60
R10	R24271	2K7		0805	SIEMENS	B54102A1 272J60
R11	R24821	8K2		0805	SIEMENS	B54102A1 822J60
R12	R24221	2K2		0805	SIEMENS	B54102A1 222J60

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R13	R23101	100		0805 SIEMENS	B54102A1 101J60
R14	R27221	2M2		0805 SIEMENS	B54102A1 225J60
R15	R22220	22		1206 SIEMENS	B54103A1 220 J60
R16	R24100	1K		1206 SIEMENS	B54103A1 102 J60
R17	R22100	10		1206 SIEMENS	B54103A1 100 J60
R18	R25101	10K		0805 SIEMENS	B54102A1 103J60
R19	R25101	10K		0805 SIEMENS	B54102A1 103J60
R20	R25101	10K		0805 SIEMENS	B54102A1 103J60
R21	R24471	4K7		0805 SIEMENS	B54102A1 472J60
R22	R24471	4K7		0805 SIEMENS	B54102A1 472J60
R23	R26331	330K		0805 SIEMENS	B54102A1 334J60
R24	R24471	4K7		0805 SIEMENS	B54102A1 472J60
R25	R24221	2K2		0805 SIEMENS	B54102A1 222J60
R26	R26101	100K		0805 SIEMENS	B54102A1 104J60
R27	R25101	10K		0805 SIEMENS	B54102A1 103J60
R28	R25101	10K		0805 SIEMENS	B54102A1 103J60
R29	R26471	470K		0805 SIEMENS	B54102A1 474J60
R30	R23471	470		0805 SIEMENS	B54102A1 471J60
R31	R25101	10K		0805 SIEMENS	B54102A1 103J60
R32	R25100	10K		1206 SIEMENS	B54103A1 103 J60
R33	R25151	15K		0805 SIEMENS	B54102A1 153J60
R34	R25101	10K		0805 SIEMENS	B54102A1 103J60
R40	R24121	1K2		0805 SIEMENS	B54102A1 122J60
R41	R54130	1K3	1%	0805 SIEMENS	B54102A2 132F060
R42	R54130	1K3	1%	0805 SIEMENS	B54102A2 132F060
R43	R54470 R34470	4K7	1%	0805 SIEMENS	B54102A2 472F060
R44	R54100	1K	1%	0805 SIEMENS	B54102A2 102F060
R45	R54130	1K3	1%	0805 SIEMENS	B54102A2 132F060
R46	R25221	22K		0805 SIEMENS	B54102A1 223J60
R47	R25101	10K		0805 SIEMENS	B54102A1 103J60
R48	R24101	1K		0805 SIEMENS	B54102A1 102J60
R49	R54100 R34100	1K	1%	0805 SIEMENS	B54102A2 102F060
R50	R54383	3K83	1%	0805 SIEMENS	B54102A2 382F360
R51	R24151	1K5		0805 SIEMENS	B54102A1 152J60
R52	R55100	10K	1%	0805 SIEMENS	B54102A2 103F060
R53	R35124	12K4	1%	1206 SIEMENS	B54103A2 123F460
RV1	R0518	10K		TRD ORIZ BOURNS	3386P-1-103
RV2	R0520	22K		TRD ORIZ BOURNS	3386P-1-223
RV3	R0520	22K		TRD ORIZ BOURNS	3386P-1-223
RV4	R0518	10K		TRD ORIZ BOURNS	3386P-1-103
RV5	R0518	10K		TRD ORIZ BOURNS	3386P-1-103
U1	I01401	LM358		SAMSUNG	KA358D
U2	I01418	MC33079D		MOTOROLA	MC33079D
U3	I01806	LM336		NATIONAL	LM336M5
U4	I01806	LM336		NATIONAL	LM336M5
U5	I01403	LM393		SAMSUNG	KA393DTF



META SYSTEM S.p.A
 PROPERTY ALL RIGHTS RESERVED ART.1151 2/3/4
 IL TECNICO PROGETTISTA:INCERTI ERNESTO
 IL TECNICO DISEGNATORE:SCORTICATI STEFANO

Title: ALIMENTATORE VL1000

Size: C Document Number: K3113C01.SCH Rev: 00

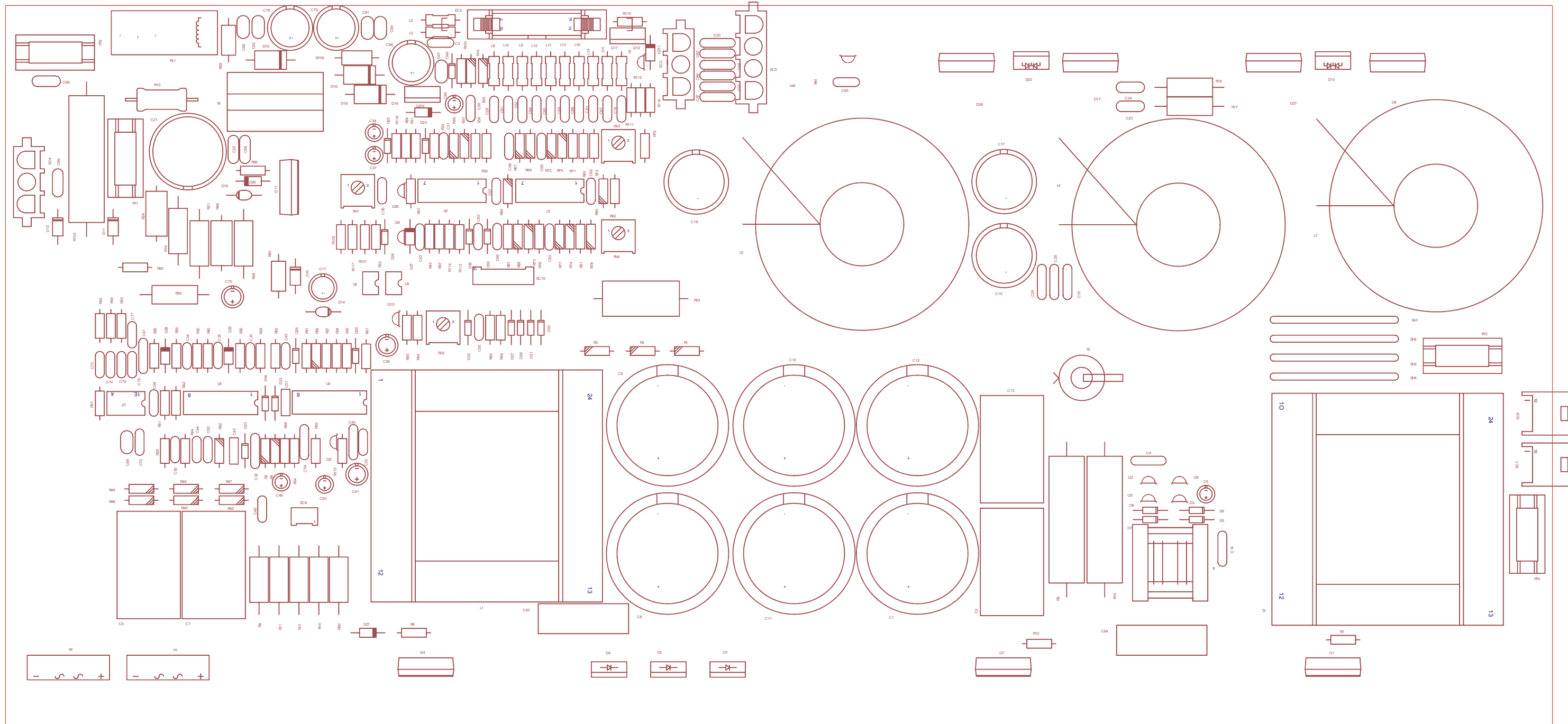
Date: Monday, April 15, 2002 Sheet: 1 of 1

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TECAR 7.8		
CODICE: 08113021	DATA: 09-01-01	REVISIONE: X
DESCRIZIONE: 1000W VHF FM AMPLIFICATORE VL1000 PLUS		
IL TECNICO DESENHADOR: CARVALHO		
IL TECNICO PROJETISTA: INZISI		
MEX. IMBEM PROPRIETARY ALL RIGHTS RESERVED. APT 1151-1-023		



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ALIMENTATORE VL1000 Revised: Wednesday, April 04, 2001

K3113C01.SCH Revision: 00

META SYSTEM

S.p.A

PROPERTY ALL RIGHTS RESERVED ART.1151 2/3/4

IL TECNICO PROGETTISTA:INCERTI ERNESTO

IL TECNICO DISEGNATORE:SCORTICATI

STEFANO

STAMPATO C.S.

S3113B

Bill Of
Materials
October
9,2001
12:07:08

Comp. No.	Stock No.	Designation		Manufacturer	Designation
C1	C2333Y	330U	TRD 450V	DAEWOO	FHS2W331MLSAS2
C2	C01553	1U	TRD 250VAC MKP	ICEL	MAB A254 100 KHS
C3	C1510W	10N	TRD Y5V	PHILIPS	2222629 19103
C4	C01788	1U	TRD 50V X7R	MURATA	RPER71H105K3M1
C5	C2210J	10U	TRD 50V	ELNA	RE2-063V100M
C6	C00188	1U	TRD 250VAC MKP-X OKAJA		CO-RE105
C7	C00188	1U	TRD 250VAC MKP-X OKAJA		CO-RE105
C8	C2333Y	330U	TRD 450V	DAEWOO	FHS2W331MLSAS2
C9	C2333Y	330U	TRD 450V	DAEWOO	FHS2W331MLSAS2
C10	C2333Y	330U	TRD 450V	DAEWOO	FHS2W331MLSAS2
C11	C2333Y	330U	TRD 450V	DAEWOO	FHS2W331MLSAS2
C12	C2333Y	330U	TRD 450V	DAEWOO	FHS2W331MLSAS2
C13	C01553	1U	TRD 250VAC MKP	ICEL	MAB A254 100 KHS
C14	C01788	1U	TRD 50V	MURATA	RPER71H105K3M1
C15	C2410M	1000U	TRD 63V	ELNA	RE3-063V102M
C16	C1510W	10N	TRD Y5V	PHILIPS	2222629 19103
C17	C2410M	1000U	TRD 63V	ELNA	RE3-063V102M
C18	C01788	1U	TRD 50V X7R	MURATA	RPER71H105K3M1
C19	C2410M	1000U	TRD 63V	ELNA	RE3-063V102M
C20	C01788	1U	TRD 50V X7R	MURATA	RPER71H105K3M1
C21	C2247Y	47U	TRD 450V	DAEWOO	FHS47450 22X25
C22	C00187	2N2	TRD 250VAC Y	MURATA	DE2E3KY222MN2A
C23	C00187	2N2	TRD 250VAC Y	MURATA	DE2E3KY222MN2A
C24	C00187	2N2	TRD 250VAC Y	MURATA	DE2E3KY222MN2A
C25	C01788	1U	TRD 50V X7R	MURATA	RPER71H105K3M1
C26	C01788	1U	TRD 50V X7R	MURATA	RPER71H105K3M1
C27	C01788	1U	TRD 50V X7R	MURATA	RPER71H105K3M1
C28	C01788	1U	TRD 50V X7R	MURATA	RPER71H105K3M1
C29	C1510W	10N	TRD Y5V	PHILIPS	2222629 19103
C30	C01764	0U1	TRD 63V X7R	SIEMENS	B37987F5104-K51

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C31	C01764	0U1	TRD	63V X7R	SIEMENS	B37987F5104-K51
C32	C01788	1U	TRD	50V X7R	MURATA	RPER71H105K3M1
C33	C01717	1N	TRD	100V X7R	SIEMENS	B37981F1102K51
C34	C01717	1N	TRD	100V X7R	SIEMENS	B37981F1102K51
C35	C1310D	100P	TRD	100V X7R	PHILIPS	2222642 10101
C36	C01764	0U1	TRD	63V X7R	SIEMENS	B37987F5104-K51
C37	C2210J	10U	TRD	50V	ELNA	RE2-063V100M
C38	C2247J	47U	TRD	50V	PANASONIC	ECA1JM470BJ
C39	C01764	0U1	TRD	63V X7R	SIEMENS	B37987F5104-K51
C40	C01788	1U	TRD	50V X7R	MURATA	RPER71H105K3M1
C41	C2247J	47U	TRD	50V	PANASONIC	ECA1JM470BJ
C42	C01764	0U1	TRD	63V X7R	SIEMENS	B37987F5104-K51
C43	C00919	2N2	TRD	63V MKT	SIEMENS	B32529C1222K
C44	C01764	0U1	TRD	63V X7R	SIEMENS	B37987F5104-K51
C45	C1547W	47N	TRD	Y5V	MURATA	DD306-63F473Z50
C46	C01764	0U1	TRD	63V X7R	SIEMENS	B37987F5104-K51
C47	C01788	1U	TRD	50V X7R	MURATA	RPER71H105K3M1
C48	C01764	0U1	TRD	63V X7R	SIEMENS	B37987F5104-K51
C49	C2110J	1U	TRD	50V	ELNA	RE2-100V010M
C50	C1510W	10N	TRD	Y5V	PHILIPS	2222629 19103
C51	C00919	2N2	TRD	63V MKT	SIEMENS	B32529C1222K
C52	C1510W	10N	TRD	Y5V	PHILIPS	2222629 19103
C53	C2110J	1U	TRD	50V	ELNA	RE2-100V010M
C54	C01788	1U	TRD	50V X7R	MURATA	RPER71H105K3M1
C55	C01717	1N	TRD	100V X7R	SIEMENS	B37981F1102K51
C56	C2247J	47U	TRD	50V	PANASONIC	ECA1JM470BJ
C57	C01764	0U1	TRD	63V X7R	SIEMENS	B37987F5104-K51
C58	C01724	2N2	TRD	50V X7R	MURATA	RPER71H222K3M1
C59	C01717	1N	TRD	100V X7R	SIEMENS	B37981F1102K51
C60	C1510W	10N	TRD	Y5V	PHILIPS	2222629 19103
C61	C1510W	10N	TRD	Y5V	PHILIPS	2222629 19103
C62	C01764	0U1	TRD	63V X7R	SIEMENS	B37987F5104-K51
C63	C01764	0U1	TRD	63V X7R	SIEMENS	B37987F5104-K51
C64	C2210J	10U	TRD	50V	ELNA	RE2-063V100M
C65	C01788	1U	TRD	50V X7R	MURATA	RPER71H105K3M1
C66	C1310D	100P	TRD	100V	PHILIPS	2222642 10101
C67	C1510W	10N	TRD	Y5V	PHILIPS	2222629 19103
C68	C00187	2N2	TRD	250VAC Y	MURATA	DE2E3KY222MN2A
C69	C01788	1U	TRD	50V X7R	MURATA	RPER71H105K3M1
C70	C2247F	47U	TRD	35V	DAEWOO	RS35V47UF
C71	C2310H	100U	TRD	35V	ELNA	RE2035V101
C72	C01740	10N	TRD	100V X7R	MURATA	RPE132-901X7R103K100M
C73	C01717	1N	TRD	100V X7R	SIEMENS	B37981F1102K51
C74	C01717	1N	TRD	100V X7R	SIEMENS	B37981F1102K51
C75	C1347N	470P	TRD	63V	MURATA	RD876-2N750 471J
C76	C1310D	100P	TRD	100V	PHILIPS	2222642 10101
C77	C01717	1N	TRD	100V X7R	SIEMENS	B37981F1102K51
C78	C2410F	1000U	TRD	35V	DAEWOO	RM35V1000UF
C79	C2410F	1000U	TRD	35V	DAEWOO	RM35V1000UF

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C80	C2210J	10U	TRD	50V	ELNA	RE2-063V100M
C81	C1510W	10N	TRD	Y5V	PHILIPS	2222629 19103
C82	C01788	1U	TRD	50V X7R	MURATA	RPER71H105K3M1
C83	C01538	0U1	TRD	250VAC MKP-X	SIEMENS	B81121CB125
C84	C01538	0U1	TRD	250VAC MKP-X	SIEMENS	B81121CB125
C85	C01788	1U	TRD	50V X7R	MURATA	RPER71H105K3M1
C86	C01788	1U	TRD	50V X7R	MURATA	RPER71H105K3M1
C87	C01788	1U	TRD	50V X7R	MURATA	RPER71H105K3M1
C88	C1510W	10N	TRD	Y5V	PHILIPS	2222629 19103
C89	C01788	1U	TRD	50V X7R	MURATA	RPER71H105K3M1
C90	C01788	1U	TRD	50V X7R	MURATA	RPER71H105K3M1
C91	C01788	1U	TRD	50V X7R	MURATA	RPER71H105K3M1
C92	C01717	1N	TRD	100V X7R	SIEMENS	B37981F1102K51
C93	C01764	0U1	TRD	63V X7R	SIEMENS	B37987F5104-K51
C95	C01764	0U1	TRD	63V X7R	SIEMENS	B37987F5104-K51
C96	C2410F	1000U	TRD	35V	DAEWOO	RM35V1000UF
C97	C01788	1U	TRD	50V X7R	MURATA	RPER71H105K3M1
C98	C00187	2N2	TRD	250VAC Y	MURATA	DE2E3KY222MN2A
C99	C00187	2N2	TRD	250VAC Y	MURATA	DE2E3KY222MN2A
D1	D00724	800V-8A	TRD	VELOCE	PHILIPS	BYR29F-800
D2	D00724	800V-8A	TRD	VELOCE	PHILIPS	BYR29F-800
D4	D00724	800V-8A	TRD	VELOCE	PHILIPS	BYR29F-800
D5	D00504	1N4148	TRD		PHILIPS	1N4148
D6	D00504	1N4148	TRD		PHILIPS	1N4148
D7	D00504	1N4148	TRD		PHILIPS	1N4148
D8	D00504	1N4148	TRD		PHILIPS	1N4148
D9	D00723	BYV32	TRD		PHILIPS	BYV32F-200/B
D10	D00723	BYV32	TRD		PHILIPS	BYV32F-200/B
D11	D00511	1N4002	TRD		MIC	1N4002
D12	D00511	1N4002	TRD		MIC	1N4002
D13	D00516	1N4007	TRD		MIC	1N4007
D14	D00719	BYV26E	TRD		PHILIPS	BYV26E/A52R
D15	D00719	BYV26E	TRD		PHILIPS	BYV26E/A52R
D16	D00700	BYW98	TRD		ST	BYW98-200
D17	D00723	BYV32	TRD		PHILIPS	BYV32F-200/B
D18	D00700	BYW98	TRD		ST	BYW98-200
D19	D00700	BYW98	TRD		ST	BYW98-200
D22	D00723	BYV32	TRD		PHILIPS	BYV32F-200/B
D23	D00504	1N4148	TRD		PHILIPS	1N4148
D24	D00504	1N4148	TRD		PHILIPS	1N4148
D25	D00504	1N4148	TRD		PHILIPS	1N4148
D26	D00504	1N4148	TRD		PHILIPS	1N4148
D27	D00504	1N4148	TRD		PHILIPS	1N4148
D28	D00504	1N4148	TRD		PHILIPS	1N4148
D29	D00504	1N4148	TRD		PHILIPS	1N4148
D30	D00504	1N4148	TRD		PHILIPS	1N4148
D31	D00504	1N4148	TRD		PHILIPS	1N4148
D32	D00504	1N4148	TRD		PHILIPS	1N4148
D33	D00504	1N4148	TRD		PHILIPS	1N4148

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D34	D00504	1N4148	TRD	PHILIPS	1N4148
D35	D00504	1N4148	TRD	PHILIPS	1N4148
D36	D00504	1N4148	TRD	PHILIPS	1N4148
D37	D00723	BYV32	TRD	PHILIPS	BYV32F-200/B
D38	D00723	BYV32	TRD	PHILIPS	BYV32F-200/B
D39	D00504	1N4148	TRD	PHILIPS	1N4148
D49	D00504	1N4148	TRD	PHILIPS	1N4148
DZ1	D00147	16V	TRD 1W	PHILIPS	BZX85C16
DZ5	D00107	7V5	TRD 1W	PHILIPS	BZX85C7V5
DZ6	I00320	TL431	TRD	ST	TL431ACZ
DZ7	D00060	3V3	TRD 0W5	PHILIPS	BZX79C3V3
DZ8	D00062	3V3	TRD 1W	PHILIPS	BZX85C3V3
DZ9	D00172	27V	TRD 1W	PHILIPS	BZX85C27
DZ10	D00147	16V	TRD 1W	PHILIPS	BZX85C16
DZ11	D00162	22V	TRD 1W	PHILIPS	BZX85C22
EC2	E05603	2X8PMASDIR	TRD	NL INDUSTRIES	MFCB16Y
EC3	E04704	MAT3PMASDIR	TRD	AMP	0.0350429-1
EC4	E04704	MAT3PMASDIR	TRD	AMP	0.0350429-1
EC5	E04708	MAT4PMASDIR	TRD	AMP	0-0350430-1
EC7	E04328	AMP4P90	TRD	AMP	0-0280378-1
EC8	E04328	AMP4P90	TRD	AMP	0-0280378-1
EC9	E04320	AMP2PDIR	TRD	AMP	0-0280370-1
EC10	E04340	AMP6PMASDIR	TRD	AMP	O-O280372-2
F1	V0763E	EF-12A	TRD 5X20 SABBIA	FUSIT	520HF12
F4	V0741A	F-1A	TRD 5X20	OMEGA FUSIBILI	CF520210
F7	V0741A	F-1A	TRD 5X20	OMEGA FUSIBILI	CF520210
F8	V0741A	F-1A	TRD 5X20	OMEGA FUSIBILI	CF520210
L1	M00179	6MH	TRD VL1000	METASYSTEM	M00179
L2	M00086	15UH	TRD	SIEMENS	B78108S1153K
L3	M00086	15UH	TRD	SIEMENS	B78108S1153K
L4	XF7L25	120UH	TRD 30A	METASYSTEM	XF7L25
L5	XF7L26	50UH	TRD 60A	METASYSTEM	XF7L26
L6	M00086	15UH	TRD	SIEMENS	B78108S1153K
L7	XF7L25	120UH	TRD 30A	METASYSTEM	XF7L25
L8	M00086	15UH	TRD	SIEMENS	B78108S1153K
L9	M00086	15UH	TRD	SIEMENS	B78108S1153K
L10	M00086	15UH	TRD	SIEMENS	B78108S1153K
L11	M00086	15UH	TRD	SIEMENS	B78108S1153K
L12	M00086	15UH	TRD	SIEMENS	B78108S1153K
L13	M00086	15UH	TRD	SIEMENS	B78108S1153K
L14	M00086	15UH	TRD	SIEMENS	B78108S1153K
L15	M00086	15UH	TRD	SIEMENS	B78108S1153K
L16	M00086	15UH	TRD	SIEMENS	B78108S1153K
P1	D0098H	800V-8A	TRD PONTE	GENERAL SEMIC.	KBU8K
P2	D0098H	800V-8A	TRD PONTE	GENERAL SEMIC.	KBU8K
PF1	V0000A	PORTAFUSE	TRD	OMEGA FUSIBILI	C1010
PF2	V0000A	PORTAFUSE	TRD	OMEGA FUSIBILI	C1010
PF3	V0000A	PORTAFUSE	TRD	OMEGA FUSIBILI	C1010
PF4	V0000A	PORTAFUSE	TRD	OMEGA FUSIBILI	C1010

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Q1	T01144	IGBT	TRD 600V-30A	HARRIS	HGTG30N60B3D
Q2	T00550	BC337	TRD	PHILIPS	BC337-25
Q3	T00550	BC337	TRD	PHILIPS	BC337-25
Q4	T01144	IGBT	TRD 600V-30A	HARRIS	HGTG30N60B3D
Q5	T00540	BC327	TRD	PHILIPS	BC327-25
Q6	T00540	BC327	TRD	PHILIPS	BC327-25
Q7	T01144	IGBT	TRD 600V-30A	HARRIS	HGTG30N60B3D
Q8	T00550	BC337	TRD	PHILIPS	BC337-25
Q9	T00540	BC327	TRD	PHILIPS	BC327-25
Q10	T00550	BC337	TRD	PHILIPS	BC337-25
Q11	T01136	2SK2611	TRD	TOSHIBA	2SK2611
Q12	T00550	BC337	TRD	PHILIPS	BC337-25
Q16	T01119	MOS-POT	TRD TO220	SAMSUNG	IRFZ14A
Q17	T02000	MS1307	TRD	IR	94-2293
R1	R01526	121K	TRD 1%	ROY	MF25 121KOHM F
R2	R01526	121K	TRD 1%	ROY	MF25 121KOHM F
R3	R01526	121K	TRD 1%	ROY	MF25 121KOHM F
R4	R01526	121K	TRD 1%	ROY	MF25 121KOHM F
R5	R01318	10K	TRD 1%	ROY	MF25 10KOHM F
R6	R03665	15K	TRD FILO 7W	ATE	7CS0225
R7	R00121	10	TRD	ROY	CR25PS10OHM J
R8	R00121	10	TRD	ROY	CR25PS10OHM J
R9	R02994	0.082	TRD 2W	ATE	2CS0664
R10	R03665	15K	TRD FILO 7W	ATE	7CS0225
R11	R02994	0.082	TRD 2W	ATE	2CS0664
R12	R00121	10	TRD	ROY	CR25PS10OHM J
R13	R02994	0.082	TRD 2W	ATE	2CS0664
R14	R02994	0.082	TRD 2W	ATE	2CS0664
R15	R03209	10	TRD FILO 3W	ATE	3CSS0001
R16	R04289	10K	TRD 2W	PIHER	EO-02-10KOHM
R17	R04175	270	TRD 2W	PIHER	EO-02-270OHM
R18	R04175	270	TRD 2W	PIHER	EO-02-270OHM
R19	R01318	10K	TRD 1%	ROY	MF25 10KOHM F
R20	R04289	10K	TRD 2W	PIHER	EO-02-10KOHM
R21	R04289	10K	TRD 2W	PIHER	EO-02-10KOHM
R22	R03462	560	TRD FILO 5W	FAREM	RFA5-560J5W
R24	R04336	47K	TRD 1W	PIHER	EO-01-47KOHM
R25	R01126	1K	TRD 1%	ROY	MF25 1KOHM F
R26	R00481	10K	TRD	ROY	CR25PS10KOHM J
R27	R00441	4K7	TRD	ROY	CR25PS4.7KOHM J
R28	R00311	390	TRD	ROY	CR25PS390 OHM J
R29	R00481	10K	TRD	ROY	CR25PS10KOHM J
R30	R00521	22K	TRD	ROY	CR25PS22KOHM J
R31	R00401	2K2	TRD	ROY	CR25PS2.2KOHM J
R32	R00761	2M2	TRD	ROY	CR25PS2.2MOHM J
R33	R00441	4K7	TRD	ROY	CR25PS4.7KOHM J
R34	R00441	4K7	TRD	ROY	CR25PS4.7KOHM J
R35	R00481	10K	TRD	ROY	CR25PS10KOHM J
R36	R00481	10K	TRD	ROY	CR25PS10KOHM J

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R37	R01310	9K09	TRD 1%	ROY	MF25 9.09KOHM
R38	R00431	3K9	TRD	ROY	CR25PS3.9KOHM J
R39	R01126	1K	TRD 1%	ROY	MF25 1KOHM F
R40	R00431	3K9	TRD	ROY	CR25PS3.9KOHM J
R41	R00241	100	TRD	ROY	CR25PS100 OHM J
R42	R00641	220K	TRD	ROY	CR25PS220KOHM J
R43	R00441	4K7	TRD	ROY	CR25PS4.7KOHM J
R44	R00701	680K	TRD	ROY	CR25PS680KOHM J
R45	R00681	470K	TRD	ROY	CR25PS470KOHM J
R46	R00681	470K	TRD	ROY	CR25PS470KOHM J
R47	R00661	330K	TRD	ROY	CR25PS330KOHM J
R48	R01606	316K	TRD 1%	ROY	MF25 316KOHM F
R49	R01606	316K	TRD 1%	ROY	MF25 316KOHM F
R50	R01606	316K	TRD 1%	ROY	MF25 316KOHM F
R51	R00601	100K	TRD	ROY	CR25PS100KOHM J
R52	R01368	18K2	TRD 1%	ROY	MF25 18.2KOHM F
R53	R00481	10K	TRD	ROY	CR25PS10KOHM J
R54	R00321	470	TRD	ROY	CR25PS470 OHM J
R55	R00441	4K7	TRD	ROY	CR25PS4.7KOHM J
R56	R00521	22K	TRD	ROY	CR25PS22KOHM J
R57	R00441	4K7	TRD	ROY	CR25PS4.7KOHM J
R58	R00481	10K	TRD	ROY	CR25PS10KOHM J
R59	R00061	3.03	TRD	ROY	CR25PS3.3 OHM J
R60	R00361	1K	TRD	ROY	CR25PS1KOHM J
R61	R00661	330K	TRD	ROY	CR25PS330KOHM J
R62	R01318	10K	TRD 1%	ROY	MF25 10KOHM F
R63	R00121	10	TRD	ROY	CR25PS10OHM J
R64	R00441	4K7	TRD	ROY	CR25PS4.7KOHM J
R65	R00481	10K	TRD	ROY	CR25PS10KOHM J
R66	R00481	10K	TRD	ROY	CR25PS10KOHM J
R67	R01510	100K	TRD 1%	ROY	MF25 100KOHM F
R68	R04336	47K	TRD 1W	PIHER	EO-01-47KOHM
R69	R01126	1K	TRD 1%	ROY	MF25 1KOHM F
R70	R09000	0	TRD	SUN ELECTRONIC	RC1000
R71	R00241	100	TRD	ROY	CR25PS100 OHM J
R72	R01126	1K	TRD 1%	ROY	MF25 1KOHM F
R73	R01198	2K37	TRD 1%	ROY	MF25 2.37KOHM F
R74	R01256	4K75	TRD 1%	ROY	MF25 4.75KOHM F
R75	R01510	100K	TRD 1%	ROY	MF25 100KOHM F
R76	R00371	1K2	TRD	ROY	CR25PS1.2KOHM J
R77	R01126	1K	TRD 1%	ROY	MF25 1KOHM F
R78	R01238	3K83	TRD 1%	ROY	MF25 3.83KOHM F
R79	R00401	2K2	TRD	ROY	CR25PS2.2KOHM J
R81	R00361	1K	TRD	ROY	CR25PS1KOHM J
R82	R01526	121K	TRD 1%	ROY	MF25 121KOHM F
R83	R09000	0	TRD	SUN ELECTRONIC	RC1000
R85	R01206	2K61	TRD 1%	ROY	MF25 2.61KOHM F
R86	R01318	10K	TRD 1%	ROY	MF25 10KOHM F
R87	R00721	1M	TRD	ROY	CR25PS1MOHM J

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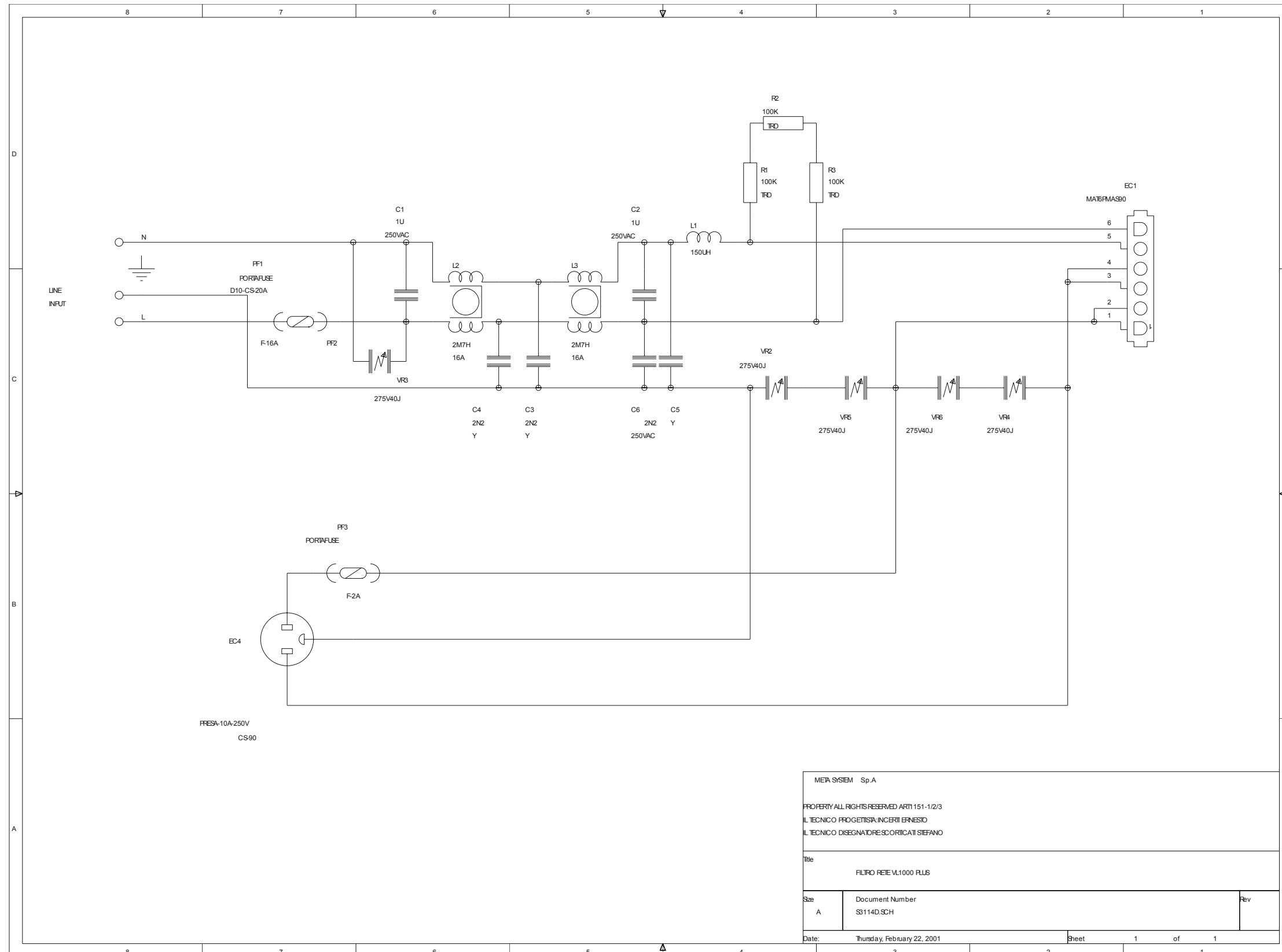
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R88	R01126	1K	TRD 1%	ROY	MF25 1KOHM F
R89	R02994	0.082	TRD 2W	ATE	2CS0664
R90	R00362	1K	TRD 1/2W	ROY	CR50PS 1KOHM J
R91	R01246	4K22	TRD 1%	ROY	MF25 4.22KOHM F
R92	R01438	42K2	TRD 1%	ROY	MF25 42.2KOHM F
R93	R00621	150K	TRD	ROY	CR25PS150KOHM J
R94	R01270	5K62	TRD 1%	ROY	MF25 5.62KOHM F
R95	R00361	1K	TRD	ROY	CR25PS1KOHM J
R96	R00161	22	TRD	ROY	CR25PS 22OHM J
R97	R00561	47K	TRD	ROY	CR25PS47KOHM J
R98	R04001	1	TRD 2W	PIHER	EO-02 1 OHM
R99	R00362	1K	TRD 1/2W	ROY	CR50PS 1KOHM J
R100	R00561	47K	TRD	ROY	CR25PS47KOHM J
R101	R00361	1K	TRD	ROY	CR25PS1KOHM J
R102	R00361	1K	TRD	ROY	CR25PS1KOHM J
R103	R03283	33	TRD FILO 7W	ATE	7CS33R-5%
R109	R00362	1K	TRD 1/2W	ROY	CR50PS 1KOHM J
R110	R00481	10K	TRD	ROY	CR25PS10KOHM J
R111	R00481	10K	TRD	ROY	CR25PS10KOHM J
R112	R00441	4K7	TRD	ROY	CR25PS4.7KOHM J
R113	R01162	1K54	TRD 1%	ROY	MF25 1.54KOHM F
R114	R01318	10K	TRD 1%	ROY	MF25 10KOHM F
R115	R00481	10K	TRD	ROY	CR25PS10KOHM J
R116	R00121	10	TRD	ROY	CR25PS10OHM J
R117	R00441	4K7	TRD	ROY	CR25PS4.7KOHM J
R118	R00481	10K	TRD	ROY	CR25PS10KOHM J
RK1	I00318	LM335	TRD	NATIONAL	LM335AZ
RL1	E02004	RELE-12V-16A-1SC	TRD	SCHRACK	RP71001
RV1	R0516	4K7	TRD ORIZ	BOURNS	3386P-1-502
RV2	R0514	2K2	TRD ORIZ	BOURNS	3386P-1-202
RV3	R0516	4K7	TRD ORIZ	BOURNS	3386P-1-502
RV4	R0516	4K7	TRD ORIZ	BOURNS	3386P-1-502
SH1	R09007	SHUNT	TRD D2-35MM-H8	METASYSTEM	R09007
SH2	R09007	SHUNT	TRD D2-35MM-H8	METASYSTEM	R09007
SH3	R09007	SHUNT	TRD D2-35MM-H8	METASYSTEM	R09007
SH4	R09007	SHUNT	TRD D2-35MM-H8	METASYSTEM	R09007
T1	M02197	TRASF-PILOT-VL1000	TRD	METASYSTEM	M02197
T2	XF7L60	TRASF-SENS-CORRENTE	TRD VL1000	METASYSTEM	XF7L60
T3	M02196	TRASF-USCITA-VL1000	TRD	METASYSTEM	M02196
T4	M02198	TRASFVL1000	TRD	METASYSTEM	M02198
U1	I00315	MC33079	TRD	MOTOROLA	MC33079P
U2	I00315	MC33079	TRD	MOTOROLA	MC33079P
U3	A03012	TLP521	TRD	SIEMENS	SFH615A-3
U4	I00422	SG3525	TRD	ST	SG3525AN
U5	I00420	UC3854	TRD	UNITRODE	UC3854N
U6	A03012	TLP521	TRD	SIEMENS	SFH615A-3
U7	I00423	UC3844	TRD	ST	UC3844N


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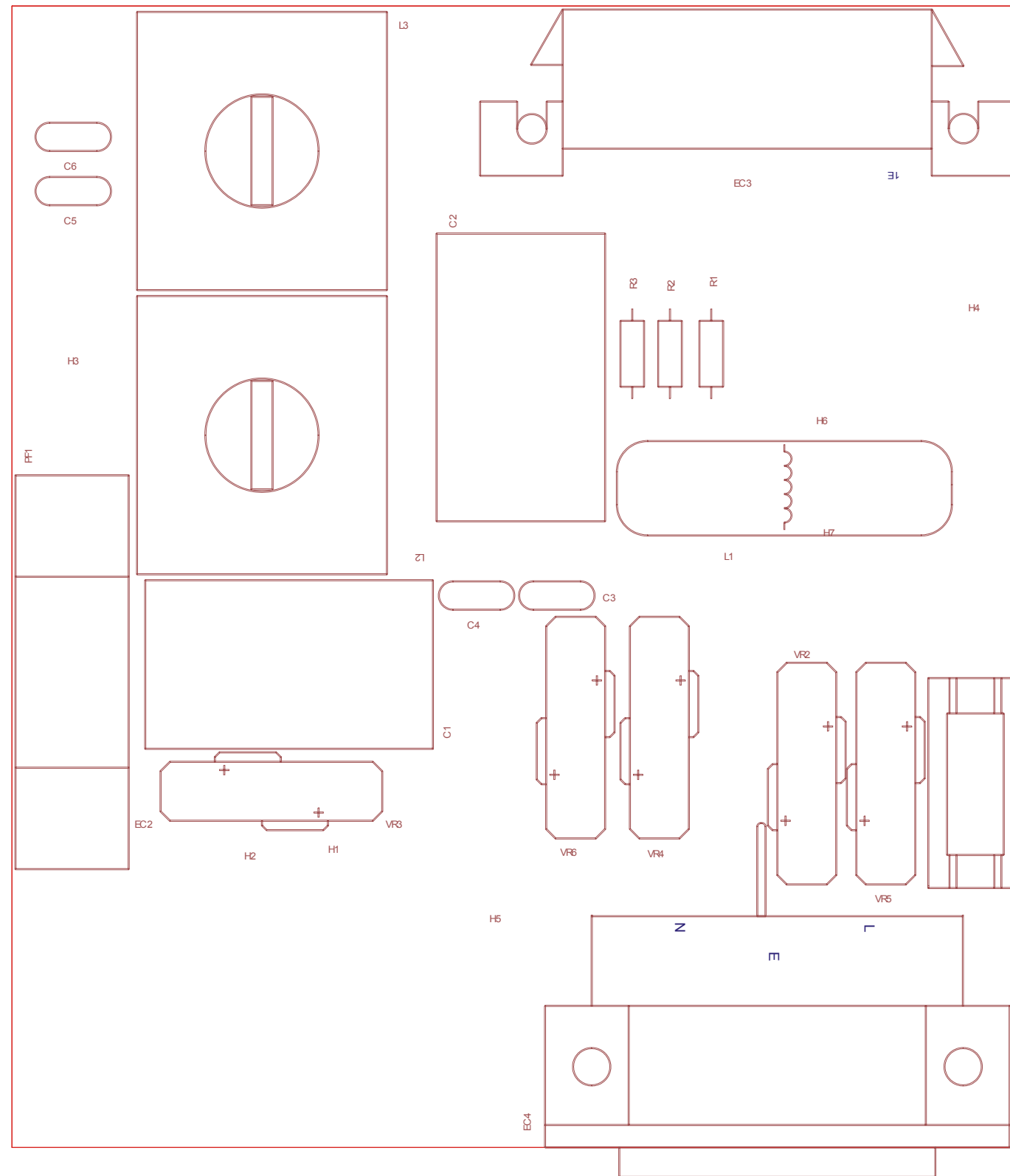
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IL TECNICO PROGETTISTA: ING. ERNESTO		
IL TECNICO DISEGNATORE: SCORICATI SIEFANO		
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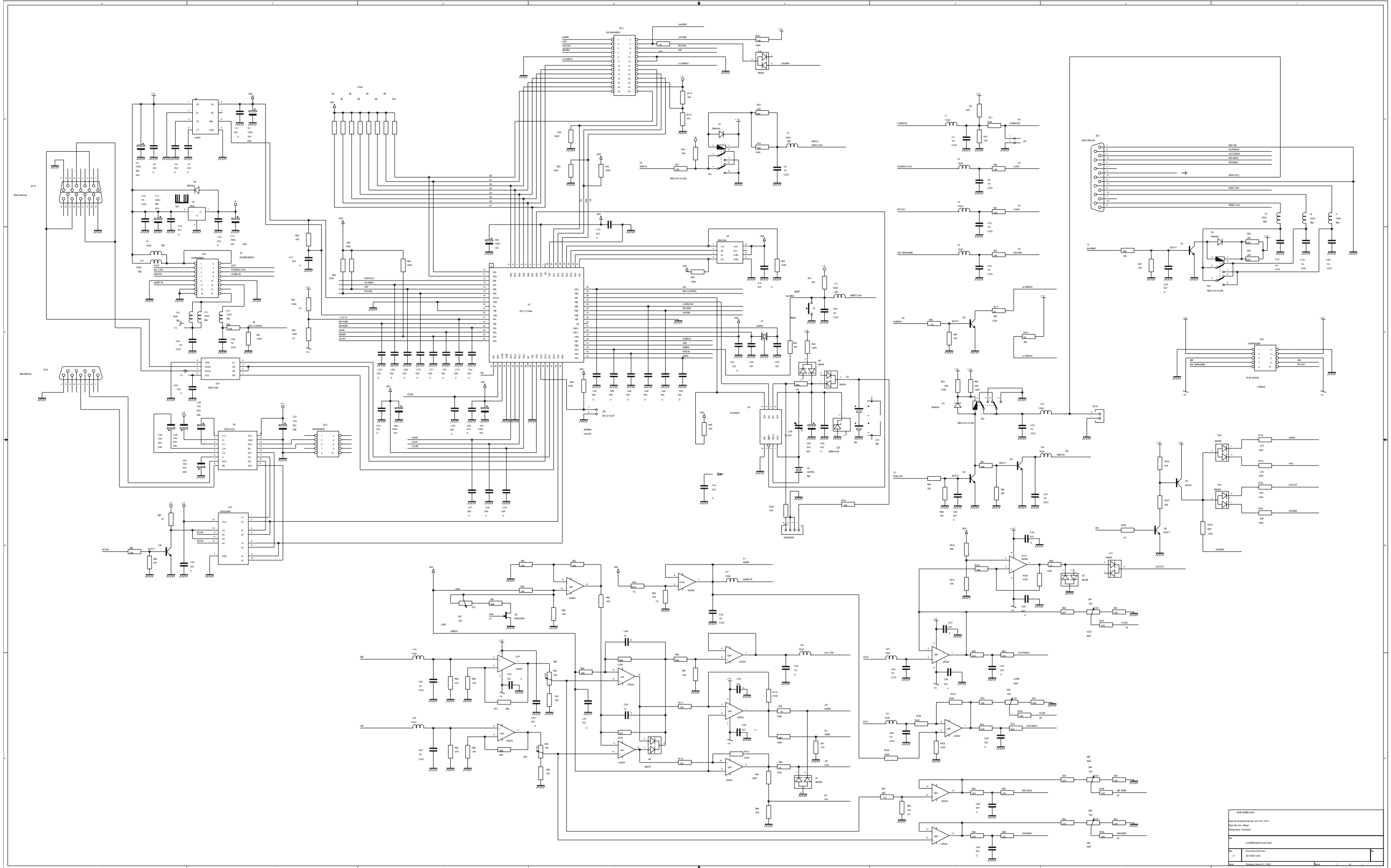
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Comp. No.	Stock No.	Designation		Manufacturer	Designation
C1	C00188	1U	TRD 250VAC MKP-X	OKAYA	CO-RE105
C2	C00188	1U	TRD 250VAC MKP-X	OKAYA	CO-RE105
C3	C00187	2N2	TRD 250VAC Y	MURATA	DE2E3KY222MN2A
C4	C00187	2N2	TRD 250VAC Y	MURATA	DE2E3KY222MN2A
C5	C00187	2N2	TRD 250VAC Y	MURATA	DE2E3KY222MN2A
C6	C00187	2N2	TRD 250VAC Y	MURATA	DE2E3KY222MN2A
EC1	E04718	MAT6PMAS90	TRD	AMP	0-640583-1
EC4	E04815	PRESA-10A-250V	TRD CS-90	K&B	43R65.1111
F1	V0765F	F-16A	TRD 10X38 GI	OMEGA FUSIBILI	GI 138-316
F2	V0747A	F-2A	TRD 5X20	OMEGA FUSIBILI	CF 520-220
L1	M00166	150UH	TRD 8A	TISCI	1X150 UH
L2	M00174	2M7H	TRD 16A	TISCI	2X2.5 MH
L3	M00174	2M7H	TRD 16A	TISCI	2X2.5 MH
PF1	V0000	PORTAFUSE	TRD D10-CS-20A	BUSS	1A-3400-09
PF2	V0000	PORTAFUSE	TRD D10-CS-20A	BUSS	1A-3400-09
PF3	V0000A	PORTAFUSE	TRD	OMEGA FUSIBILI	C1010
R1	R00601	100K	TRD	ROY	CR25PS 100KOHM J
R2	R00601	100K	TRD	ROY	CR25PS 100KOHM J
R3	R00601	100K	TRD	ROY	CR25PS 100KOHM J
VR2	R06150	275V40J	TRD	SIEMENS	SIOVS20K275
VR3	R06150	275V40J	TRD	SIEMENS	SIOVS20K275
VR4	R06150	275V40J	TRD	SIEMENS	SIOVS20K275
VR5	R06150	275V40J	TRD	SIEMENS	SIOVS20K275
VR6	R06150	275V40J	TRD	SIEMENS	SIOVS20K275

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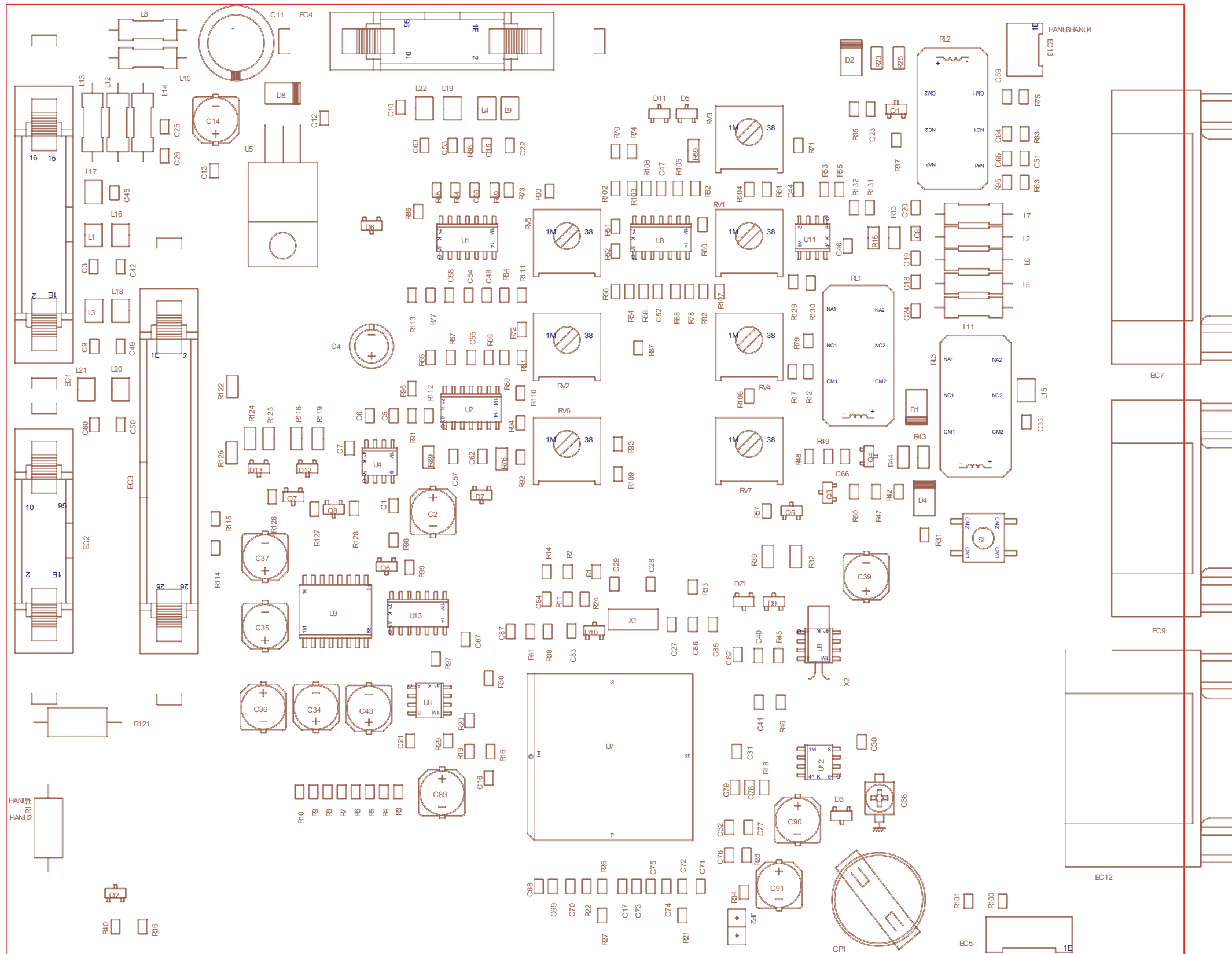
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	TITOLO: SCHEDA CONTROLLER VL1000 PLUS			IL TECNICO PROGETTISTA: _____	ALLEGRI: _____

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Resp.Tecnico: Allegri

Disegnatore: Scorticati

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Comp. No.	Stock No.	designation		Manufacturer	designation
A1	I01978	PIC17C756A	TRD	MICROCHIP	PIC17C756AT
C1	C3610F	0U1	X	MURATA	GRM40X7R104K25
C2	C43101	100U	16V 6X6	NIC	NACE101M16VTR
C3	C3410B	1N	COG	MURATA	GRM40COG102J50
C4	C2310C	100U	TRD 25V	ELNA	RE2-025V101M
C5	C3610F	0U1	X	MURATA	GRM40X7R104K25
C6	C3610F	0U1	X	MURATA	GRM40X7R104K25
C7	C3610F	0U1	X	MURATA	GRM40X7R104K25
C8	C3410B	1N	COG	MURATA	GRM40COG102J50
C9	C3410B	1N	COG	MURATA	GRM40COG102J50
C10	C3410B	1N	COG	MURATA	GRM40COG102J50
C11	C2322F	220U	TRD 35V	ELNA	RE2-035V221M
C12	C3610F	0U1	X	MURATA	GRM40X7R104K25
C13	C3610F	0U1	X	MURATA	GRM40X7R104K25
C14	C43101	100U	16V 6X6	NIC	NACE101M16VTR
C15	C3410B	1N	COG	MURATA	GRM40COG102J50
C16	C3610F	0U1	X	MURATA	GRM40X7R104K25
C17	C3610F	0U1	X	MURATA	GRM40X7R104K25
C18	C3410B	1N	COG	MURATA	GRM40COG102J50
C19	C3410B	1N	COG	MURATA	GRM40COG102J50
C20	C3410B	1N	COG	MURATA	GRM40COG102J50
C21	C3610F	0U1	X	MURATA	GRM40X7R104K25
C22	C3410B	1N	COG	MURATA	GRM40COG102J50
C23	C3610F	0U1	X	MURATA	GRM40X7R104K25
C24	C3410B	1N	COG	MURATA	GRM40COG102J50
C25	C3410B	1N	COG	MURATA	GRM40COG102J50
C26	C3410B	1N	COG	MURATA	GRM40COG102J50
C27	C3610F	0U1	X	MURATA	GRM40X7R104K25
C28	C3215B	15P	COG	MURATA	GRM40COG150J50
C29	C3215B	15P	COG	MURATA	GRM40COG150J50
C30	C3610F	0U1	X	MURATA	GRM40X7R104K25

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C31	C3610F	0U1	X	MURATA	GRM40X7R104K25
C32	C3610F	0U1	X	MURATA	GRM40X7R104K25
C33	C3410B	1N	COG	MURATA	GRM40COG102J50
C34	C42106	10U	50V 6X6	ELNA	RV2-50V100M-R
C35	C42106	10U	50V 6X6	ELNA	RV2-50V100M-R
C36	C42106	10U	50V 6X6	ELNA	RV2-50V100M-R
C37	C42106	10U	50V 6X6	ELNA	RV2-50V100M-R
C38	C05067	10-40P		MURATA	TZBX4P400BB110T00
C39	C42106	10U	50V 6X6	ELNA	RV2-50V100M-R
C40	C3610F	0U1	X	MURATA	GRM40X7R104K25
C41	C3610F	0U1	X	MURATA	GRM40X7R104K25
C42	C3410B	1N	COG	MURATA	GRM40COG102J50
C43	C42106	10U	50V 6X6	ELNA	RV2-50V100M-R
C44	C3610F	0U1	X	MURATA	GRM40X7R104K25
C45	C3410B	1N	COG	MURATA	GRM40COG102J50
C46	C3610F	0U1	X	MURATA	GRM40X7R104K25
C47	C3610F	0U1	X	MURATA	GRM40X7R104K25
C48	C3710F	1U	X	MURATA	GRM21BR71A105K
C49	C3410F	1N	X	MURATA	GRM40X7R102K50
C50	C3410B	1N	COG	MURATA	GRM40COG102J50
C51	C3610F	0U1	X	MURATA	GRM40X7R104K25
C52	C3610F	0U1	X	MURATA	GRM40X7R104K25
C53	C3410B	1N	COG	MURATA	GRM40COG102J50
C54	C3610F	0U1	X	MURATA	GRM40X7R104K25
C55	C3610F	0U1	X	MURATA	GRM40X7R104K25
C56	C3610F	0U1	X	MURATA	GRM40X7R104K25
C57	C3610F	0U1	X	MURATA	GRM40X7R104K25
C58	C3710F	1U	X	MURATA	GRM21BR71A105K
C59	C3610F	0U1	X	MURATA	GRM40X7R104K25
C60	C3410B	1N	COG	MURATA	GRM40COG102J50
C62	C3610F	0U1	X	MURATA	GRM40X7R104K25
C63	C3410B	1N	COG	MURATA	GRM40COG102J50
C64	C3610F	0U1	X	MURATA	GRM40X7R104K25
C65	C3610F	0U1	X	MURATA	GRM40X7R104K25
C66	C3610F	0U1	X	MURATA	GRM40X7R104K25
C67	C3610F	0U1	X	MURATA	GRM40X7R104K25
C68	C3510F	10N	X	MURATA	GRM40X7R103K50
C69	C3510F	10N	X	MURATA	GRM40X7R103K50
C70	C3510F	10N	X	MURATA	GRM40X7R103K50
C71	C3510F	10N	X	MURATA	GRM40X7R103K50
C72	C3510F	10N	X	MURATA	GRM40X7R103K50
C73	C3510F	10N	X	MURATA	GRM40X7R103K50
C74	C3510F	10N	X	MURATA	GRM40X7R103K50
C75	C3510F	10N	X	MURATA	GRM40X7R103K50
C76	C3510F	10N	X	MURATA	GRM40X7R103K50
C77	C3510F	10N	X	MURATA	GRM40X7R103K50
C78	C3510F	10N	X	MURATA	GRM40X7R103K50
C79	C3510F	10N	X	MURATA	GRM40X7R103K50
C82	C3510F	10N	X	MURATA	GRM40X7R103K50

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C83	C3510F	10N	X	MURATA	GRM40X7R103K50
C84	C3510F	10N	X	MURATA	GRM40X7R103K50
C85	C3510F	10N	X	MURATA	GRM40X7R103K50
C86	C3510F	10N	X	MURATA	GRM40X7R103K50
C87	C3510F	10N	X	MURATA	GRM40X7R103K50
C89	C43101	100U	16V 6X6	NIC	NACE101M16VTR
C90	C43101	100U	16V 6X6	NIC	NACE101M16VTR
C91	C43101	100U	16V 6X6	NIC	NACE101M16VTR
CP1	E10000	CONT-PILE-SMD	TRD	METASYSTEM	E10000
D1	D05021	SM4004		PHILIPS	S1G
D2	D05021	SM4004		PHILIPS	S1G
D3	D05006	BAV99		PHILIPS	BAV99
D4	D05021	SM4004		PHILIPS	S1G
D5	D05006	BAV99		PHILIPS	BAV99
D6	D05002	BAV70		PHILIPS	BAV70
D7	D05011	BAW56		PHILIPS	BAW56
D8	D05021	SM4004		PHILIPS	S1G
D9	D05006	BAV99		PHILIPS	BAV99
D10	D05006	BAV99		PHILIPS	BAV99
D11	D05006	BAV99		PHILIPS	BAV99
D12	D05011	BAW56		PHILIPS	BAW56
D13	D05011	BAW56		PHILIPS	BAW56
DS1	G00003	DISSIP	TRD TO220	PADA ENG.	8100/25/N
DZ1	D01682	BZX84-6V8		PHILIPS	BZX84-C-6V8
EC1	E05603	2X8PMASDIR	TRD	NL INDUSTRIES	MFCB16Y
EC2	E05601	2X5PMASDIR	TRD	NL INDUSTRIES	MFCB10Y
EC3	E05604	2X13PMASDIR	TRD	BREDI ELET.	H311-026P
EC4	E05601	2X5PMASDIR	TRD	NL INDUSTRIES	MFCB10Y
EC5	E04330	AMP4PDIR	TRD	AMP	0-0280371-1
EC7	E0405S	DB15-FEM-90	TRD CS	NL INDUSTRIES	F15MWC06
EC9	E04043	DB9-FEM-90	TRD	NL INDUSTRIES	F9MWC06
EC12	E0405B	DB18-MAS-90	TRD	NL INDUSTRIES	FM9TW1AU30
EC13	E04320	AMP2PDIR	TRD	AMP	0-0280370-1
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JP7	E04300	HE-13/14-2P	TRD	LUMBERG	2.5 MS02
L1	M12150	15UH		SIEMENS	B8242A1153K100
L2	M00086	15UH	TRD	SIEMENS	B78108S1153K
L3	M12150	15UH		SIEMENS	B8242A1153K100
L4	M12150	15UH		SIEMENS	B8242A1153K100
L5	M00086	15UH	TRD	SIEMENS	B78108S1153K
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L8	M00086	15UH	TRD	SIEMENS	B78108S1153K
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L15	M12150	15UH		SIEMENS	B8242A1153K100
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L20	M12150	15UH		SIEMENS	B8242A1153K100
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Q1	T05001	BC817		PHILIPS	BC817-25
Q2	T05001	BC817		PHILIPS	BC817-25
Q3	T05001	BC817		PHILIPS	BC817-25
Q4	T05001	BC817		PHILIPS	BC817-25
Q5	T05421	IRLML2803		IR	IRLML2803
Q6	T05001	BC817		PHILIPS	BC817-25
Q7	T05003	BC807		PHILIPS	BC807-25
Q8	T05001	BC817		PHILIPS	BC817-25
R1	R23271	270	0805	SIEMENS	B54102A1 271J60
R2	R25221	22K	0805	SIEMENS	B54102A1 223J60
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R31	R25101	10K	0805	SIEMENS	B54102A1 103J60
R32	R56100 R36100	100K	0805 1%	SIEMENS	B54102A2 104F060
R33	R25101	10K	0805	SIEMENS	B54102A1 103J60

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R34	R26101	100K	0805	SIEMENS	B54102A1 104J60
R35	R24151	1K5	0805	SIEMENS	B54102A1 152J60
R36	R24101	1K	0805	SIEMENS	B54102A1 102J60
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R46	R25101	10K	0805	SIEMENS	B54102A1 103J60
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R49	R25101	10K	0805	SIEMENS	B54102A1 103J60
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R51	R25101	10K	0805	SIEMENS	B54102A1 103J60
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R83	R23471	470	0805	SIEMENS	B54102A1 471J60
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R85	R25151	15K	0805	SIEMENS	B54102A1 153J60
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R87	R54560	5K6	0805 1%	SIEMENS	B54102A2 562F060
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R116	R23470	470	1206	SIEMENS	B54103A1 471J60
R117	R00212	56	TRD 1/2W	ROY	CR50PS 56 OHMJ
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R121	R00222	68	TRD 1/2W	ROY	CR50PS 56 OHMJ
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R123	R23680	680	1206	SIEMENS	B54103A1 681J60
R124	R23680	680	1206	SIEMENS	B54103A1 681J60
R125	R23680	680	1206	SIEMENS	B54103A1 681J60
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R129	R26471	470K	0805	SIEMENS	B54102A1 474J60
R130	R25101	10K	0805	SIEMENS	B54102A1 103J60
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R132	R25391	39K	0805	SIEMENS	B54102A1 393J60
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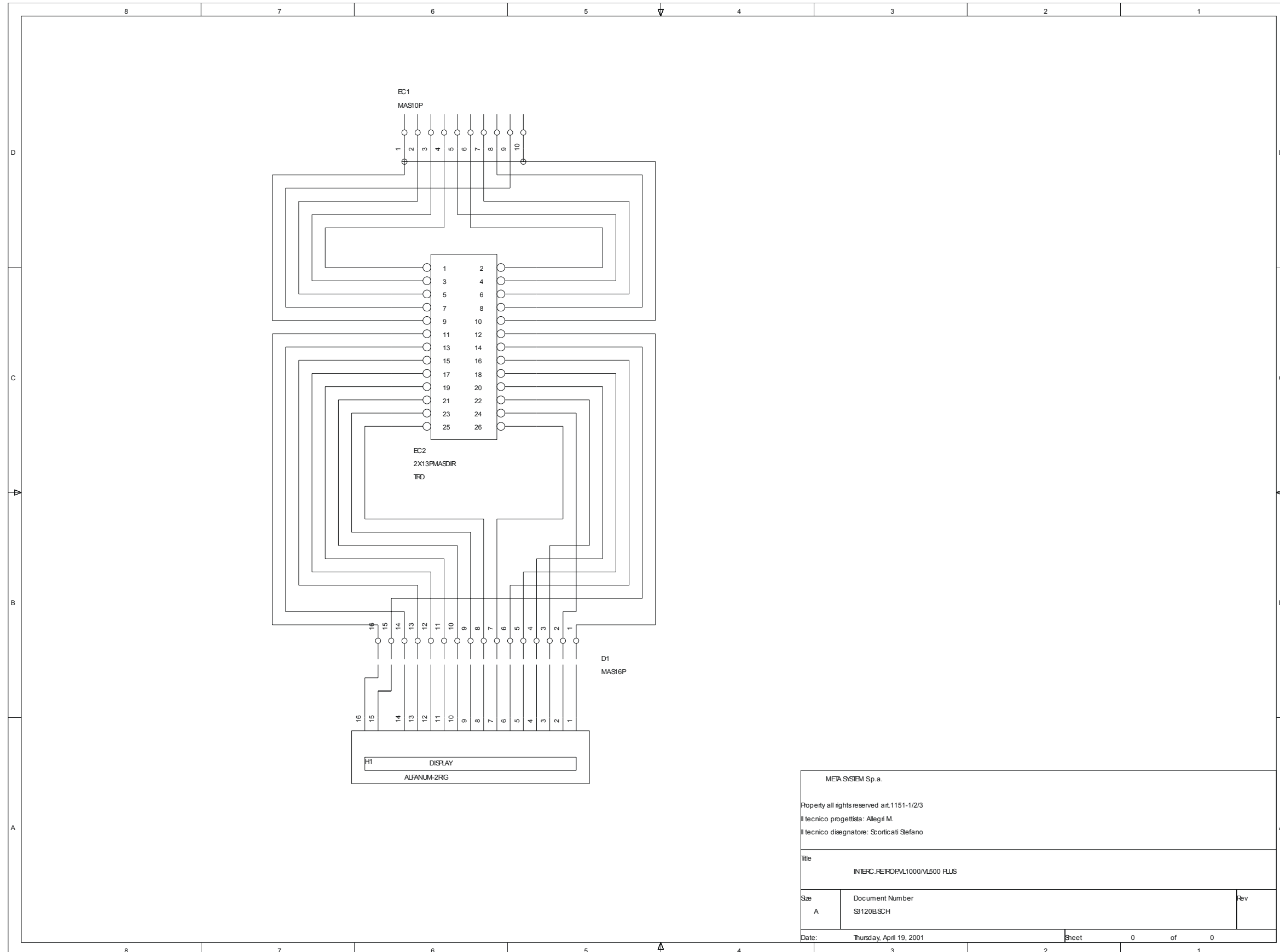
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RL3	E02056	RELE-12V-1A-2SC	TRD	OMRON	G5V-2-H1 12VCC
RV1	R0518	10K	TRD ORIZ	BOURNS	3386P-1-103
RV2	R0518	10K	TRD ORIZ	BOURNS	3386P-1-103
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RV5	R0518	10K	TRD ORIZ	BOURNS	3386P-1-103
RV6	R0518	10K	TRD ORIZ	BOURNS	3386P-1-103
RV7	R0518	10K	TRD ORIZ	BOURNS	3386P-1-103
S1	E00055	PULS		OMRON	B3S1002P
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U3	I01400	LM324		SAMSUNG	KA324DTF
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U5	I00403	7805	TRD	ST	L7805CV
U6	I01957	ST93C86		ST	M93C86
U7	E10900	ZOCCOLO	SMD	CONNEX	D0368TBA2
U8	I01937	PCF8593T		PHILIPS	PCF8593T
U9	I01958	DS14C232		HARRIS	ICL232CBE
U11	I01401	LM358		SAMSUNG	KA358D
U12	I01979	DS75176B		NATIONAL	DS75176BM
U13	I01241	74HC4066		PHILIPS	74HC4066D
VB1	VO114 V0114 G11062	KIT-2PILE-LITIO	TRD	PANASONIC	CR1220
X1	A05519	16MHZ	3PIN	MURATA	CSTCS16.00MXA040Q-TC
X2	A05019	32K768	TRD	KYOCERA	KF-38G-12P0200


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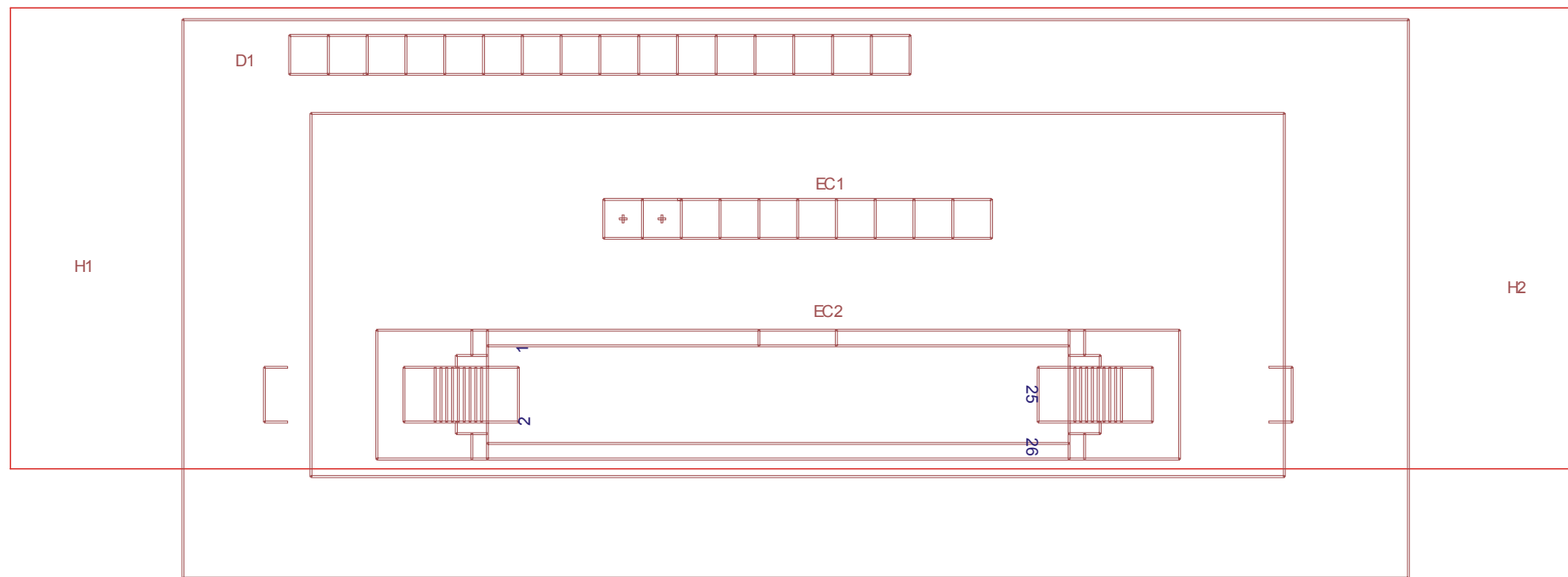
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Il tecnico disegnatore: Scorticati Stefano		
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CODICE	S3120B	DATA:	11-09-00	RIFERIM. X:	IL TECNICO DISEGNATORE	CAVALCABLE	_____
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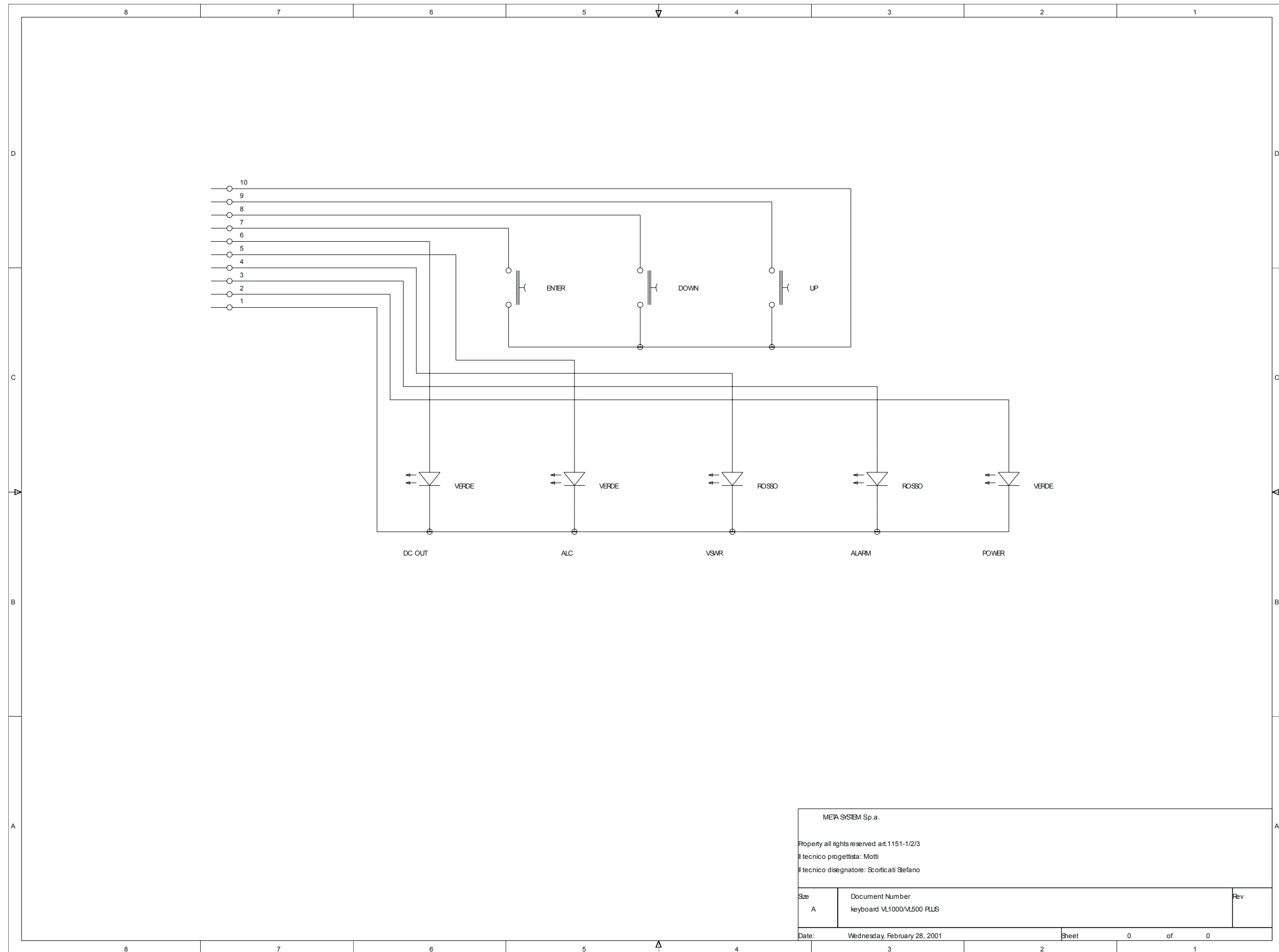
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Comp.No.	Stock No.	Designation			Manufacturer	Designation
D1	E04302	HE-13/14-40P	TRD	MAS16P	LUMBERG	2.5 MS 40
EC1	E04302	HE-13/14-40P	TRD	MAS10P	LUMBERG	2.5 MS 40
EC2	E05604	2X13PMASDIR	TRD		BREDI E.	H311-026P
H1	A01006	DISPLAY	TRD	2RIGHE	POWERTIP	PC1602LRU-CSO-E-Y4

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