EXC-GT

FM super-compact transmitter series
User and maintenance manual

Version 1.9

CE ⓘ

Preliminary notes

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This label indicates the express declaration by SIEL that the product associated with this manual conforms to Directive 1999/05/EC.

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📄   *For further information about how SIEL ensures compliance with EC regulations, refer to Chap. 3.*

Contents

1   INTRODUCTION

Congratulations on your purchase! The **EXC-GT** transmitter series is equipped with the most modern technology available, to provide you with maximum performance at minimal performance cost, while fully conforming to technical regulations. Flexibility, quality, compactness, and low electrical consumption make the devices in the EXC-GT series the best offered on the market today. The transmitters in the EXC-GT series are available ranging from 30 W (for common uses, such as an exciter) to 4 KW, ideal for N+1 systems and as a spare transmitter. These are just a few of the advanced characteristics that make the EXC-GT series truly unique:

- **Super-compact size and reduced weight** – The most powerful model is so compact that it can be entirely contained within a standard 19" 4-unit rack.

- **Low performance costs.** The unique design reduces internal loss and allows the device to achieve an extremely high yield – typically greater than 80% - minimizing electrical consumption and thus decreasing performance costs.

- **Sturdy modular construction**. Reliable modular construction minimizes and facilitates maintenance operations. In addition, it ensures a greater average time between failures, as well as ease of maintenance.

- **Easy to use and to configure.** All the transceivers use the same control interface, which is equipped with a large LCD screen, a multifunction knob, and few other buttons. This allows the user to easily set functions on the device, and to view the operating parameters in the blink of an eye.

- **Nominal RF output power over the full FM range particularly stable against time.** The output power may be varied from a minimum level and the operating frequency includes the full FM range, without retouching other parameters.

- **Power section entirely modular and highly reliable.** In the high-power versions, the stage of RF amplification is composed of multiple internal subcompact modules produced from the latest advances in technology and working in perfect synergy. Thanks to internal balancing circuits, when a failure occurs in one of the modules, the others are automatically rebalanced, allowing for transmission at reduced power. Each module is easily identifiable, inspected, and removable without the assistance of a welder, thanks to the reduced number of interconnections achieved using multi-polar connectors.

- **RF output stage has a reverse intermodulation figure lower than the standard bipolar construction**. Low enough to approach that of tube equipment, due to the MOS-FET design.

- **Low level of dissipation.** The reduction in internal loss and overall elevated yield minimize the dissipation of heat; as a result, the devices in the EXC-GT Series perform well even in challenging environmental conditions.

- **Stable, reliable power supply.** The entire line of transmitters integrates the use of power sources with active power factor correction (PCF), as stipulated in recent regulations. As such, impact on the electrical power source is minimal, resulting in greater reliability over the entire device.

- **Easy diagnostics and easy-to-read parameters**, thanks to a comprehensive metering and alarms section on the LCD display. All parameters and alarms are easily accessible from remote posts via the remote control input, which allows the user to change from stand-by to "on air" in a fraction of a second. Upon request, an external controller can be provided for long-range use of the device from an office or from other service points.

- **Compliance with the strictest regulations.** This device was designed in full compliance with CCIR, FFC, and other strict international regulations, as well as the recent, strict EC anti-magnetic noise requirements. In addition, this device complies with EC and ETSI 302.018-2 v 1.1.2.1 (2006-03) standards.

And that's not all: Siel products provide greater value added and incomparable quality. For further details, refer to Chap. 3.

📄 *Please note that the manufacturer, in its continuous attempt to further improve the quality this product, reserves the right to change its technical features without prior notice.*

✋ **Warning! Before initiating operations, it is essential to read this entire manual – with particular reference to Chap. 2 – in order to avoid damage to objects or people.**

2 SAFETY FIRST!

2.1 Symbols used

For quick reference, we used symbols that attract immediate attention, and which simply and efficiently advise and inform the user.

✋ **The symbol of the open hand stresses a description of the highest importance concerning technical assistance, dangerous situations, safety warnings, advice, and/or information of the highest importance. Where such symbol is not heeded, serious problems/consequences may arise.**

📓 *The written notebook represents practical, important advice that we recommend be followed in order to obtain the best possible performance from the device.*

The display messages (menu, options, etc.) are written `in this font` (Courier New).

Important sentences and words are underlined.

For ease of reference, cross references to sections, chapters, page numbers, diagrams, etc. may be indicated using the 🖙 symbol. For example: "🖙 3.1" means "refer to section 3.1"

2.2 Warnings

✋ **Before connecting or using this device, carefully read all instructions contained in this manual, in the order in which they are written. Cross references to sections and chapters were created exclusively for ease of use. Keep this manual in a safe place for future reference.**

✋ **IMPORTANT: Improper use or installation of this device could cause serious damage to objects and people alike. Therefore, it is essential to rely on an installer who has been previously authorized or approved by Siel, or by our local representative, and that both the user and the installer read the entire manual before carrying out any operation.**

✋ **All warnings included in this manual must be strictly followed to avoid damages to both the device and the operator. Read and follow all instructions indicated on warning labels or affixed to the device and its accessories.**

✋ **The EXC-GT Series family of transmitters has characteristics common to all its models. However, each version is equipped with a different transmission power, and characteristics specific to the series or options that make it unique. For this reason, it is important to verify the exact model of your device, as explained in detail later in this manual.**

✋ **Depending on the model used, the device may be of a weight such as does not permit it to be moved by a single person and without the proper equipment. In this case, the transmitter should only be moved exclusively with the proper equipment and having taken the proper precautions. The same is true for various internal parts. In case of doubt, contact Siel.**

✋ **Do not turn on the device without having duly wired and connected it, as explained in Chap. 6.**

✋ **Always follow the laws and regulations stipulated regarding the use of broadcast transmitters, as in effect in the geographical area in which you are operating.**

📓 *This manual describes in detail the menus that appear on the LCD display: as the software is continually updated, some of the screens shown in the chapters below may be different than those that appear on your device. In case of doubt, contact Siel.*

3   SIEL PRODUCTS AND VALUE ADDED

In this section, you will discover why purchasing Siel products is a wise decision. Siel's extensive experience in broadcasting devices is in itself value added, and the company is unequalled in terms of safety, regulatory conformity, technical support, and a high level of return on your investment. These are not empty words, as you will see below.

3.1   Full conformity to EC regulations

As is well known, broadcast devices must conform to strict regulations in terms of quality, safety, and electromagnetic compatibility. The latter aspect is of particular importance, as it ensures that the transmitter does not interfere with other devices and that it is not interfered with. In ensuring electromagnetic compatibility, a number of extremely precise measurements are taken that are often performed by people using inappropriate or uncertified devices; therefore, any results obtained under such conditions are unreliable. For example, if a user is not equipped with an extremely expensive, large anechoic room duly certified by a competent body, measurements may be rendered entirely useless.

Siel is particularly careful about guaranteeing its clients conformity to regulations. To this end, after having taken measurements during the research phase, Siel uses a certified laboratory and an international certification body (Rasek) to certify the full conformity of its products based on measurements taken according to regulations.

3.2   Quality in series manufacturing

A famous ad running since the 1980's guarantees "reliable quality over time". In order to ensure that each device produced in series conforms to testing and validation regulations, Siel is ISO 9000 certified.

3.3   Overdesigning for performance

Siel understands that, in order to guarantee extended performance times without servicing, the parts most subject to stress must be overdesigned. To this end, we have paid particular attention to creating the stages of RF power and the device's power supplies, designing them so they can provide and manage power levels much higher than the nominal values indicated in the specifications. People with experience in this field will gain a full appreciation of this aspect after having read through the entire manual.

3.4   Savings on all fronts

Choosing a product merely because it costs less than another one doesn't make sense if its performance costs are high. For this reason, Siel has undertaken to ensure that its products provide maximum return on the investment made in purchasing them. In particular, the EXC-GT series transmitters are distinguished by the following features:

- **Savings in electrical consumption** – the high yield allows for significant savings in terms of electrical energy consumed. In terms of the RF power supplied, a smaller electrical bill "reimburses" the user a portion of the purchase cost – month after month. This may seem insignificant, but if you compare our 4 KW transmitter to the average comparable product available on the market, the savings in electricity consumption cover the full cost of the device within just over three years.
- **Economy of space** – the exceptional compactness of EXC-GT transmitters significantly reduces bulk, and therefore the rental on locations in which the transmitters are installed.
- **Lower transportation costs** – the light weight of EXC-GT transmitters also results in lower transportation costs – an aspect that considerably lowers the total "keys in hand" cost.
- **Less maintenance** – the high energy yield also means less heat dissipation and less wear on components, minimizing service calls and their associated expenses.

4   IDENTIFYING YOUR MODEL

The EXC-GT Series family of transmitters has characteristics common to all of the models (for example, the command menu, the primary controls, the primary connection inputs, etc.). However, the range of models is in continual evolution, and each model is distinguished by a different transmission power and by characteristics specific to the series, or by optional characteristics that make it unique. For this reason, it is important to verify the exact model of your device as follows.

4.1   Default screen

When the device is turned on, the screen that appears indicates your model number, as in the following example:

As you will note, the exact model number of the device appears immediately following `Model:` and is immediately identifiable as **EXC30GT**. For further details regarding the main screen, see 🔖 10.1.

✋ **In order to avoid misunderstandings when reading the user manual, it is important to confirm the exact model of your device, as indicated on the main screen, and to remember this model number.**

4.2   External cabinet

Each model, according to its power level and other factors, may be produced in a specific 19" cabinet rack, which may have different commands and inputs arranged differently than on other models. To avoid misunderstandings regarding the location of these parts, refer to the following chapter, which illustrates the commands and inputs for each version.

5 COMMANDS AND INPUTS

The primary commands and connections for the EXC-GT Series are common to all the models. However, each version has been created with a different unit rack and may be equipped with different functions and connections. This section allows you to identify your device and the locations of its available commands and inputs.

✋ **In order to avoid misunderstandings when reading the user manual, it is important to confirm the exact model number of your device, as indicated on the main screen, and to remember this model number (📖 Chap. 4).**

5.1 Location of parts

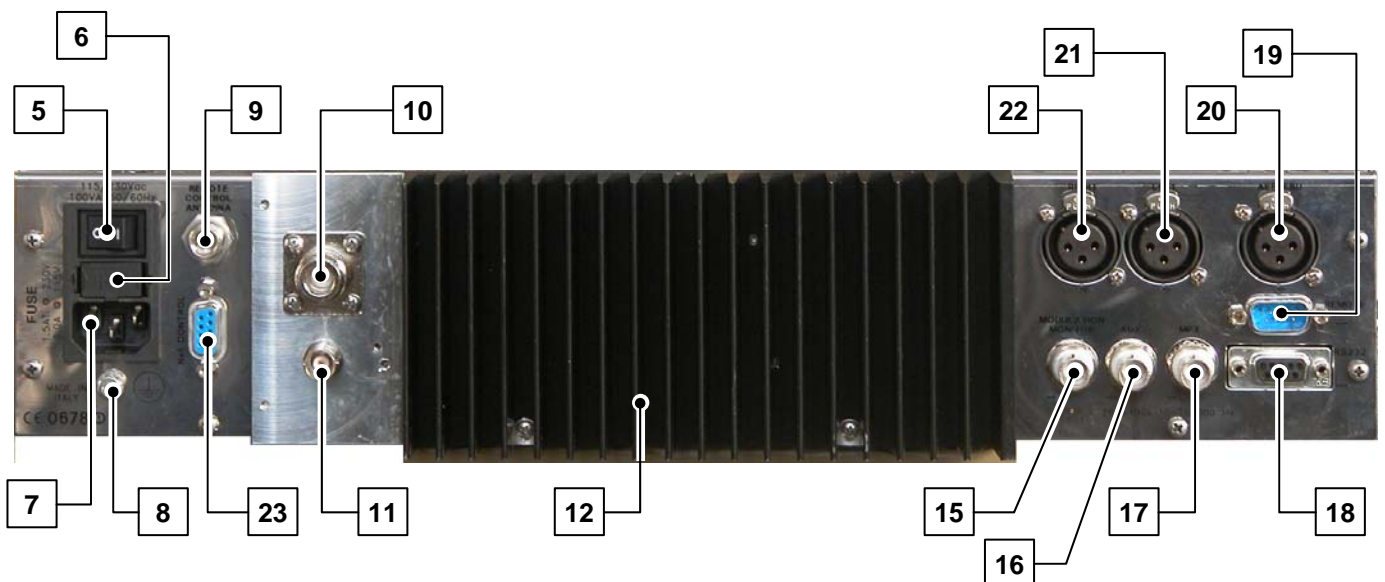To identify the various parts of the transmitters according to the cabinet (in a 19" rack) on which they are mounted, refer to the image corresponding to your device, and to the numbered list in section 5.2.
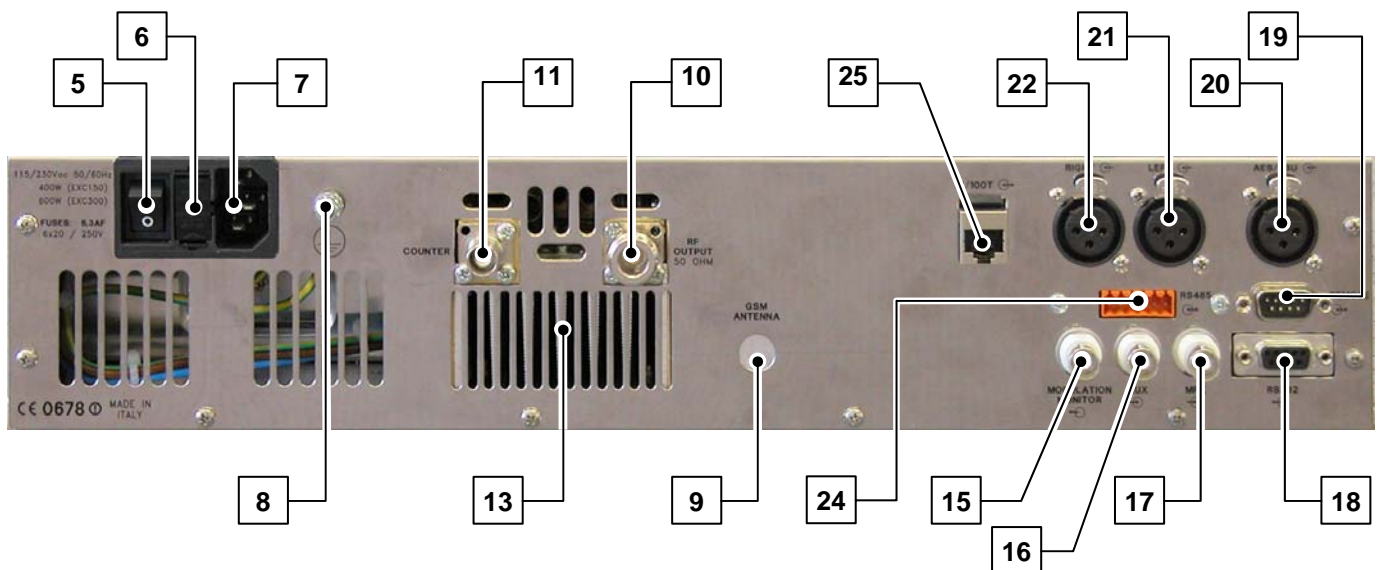
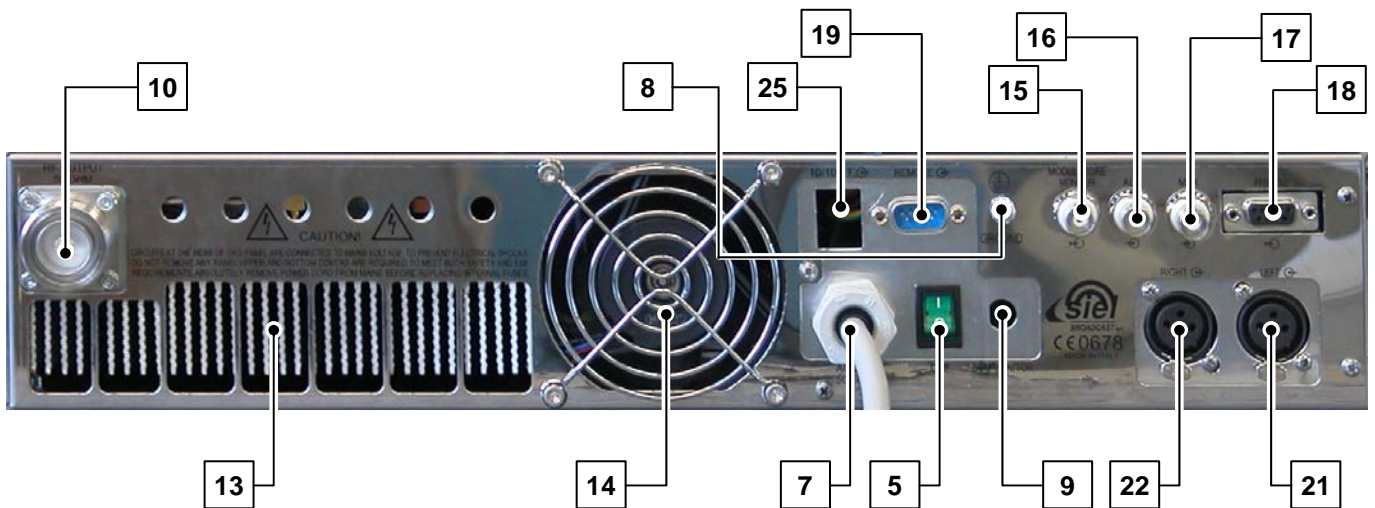### 5.1.a Model 1

Front

Rear

5.1.b   Model 2

Front

Rear

5.1.c   Model 3

Front

Rear

5.1.d   Model 4
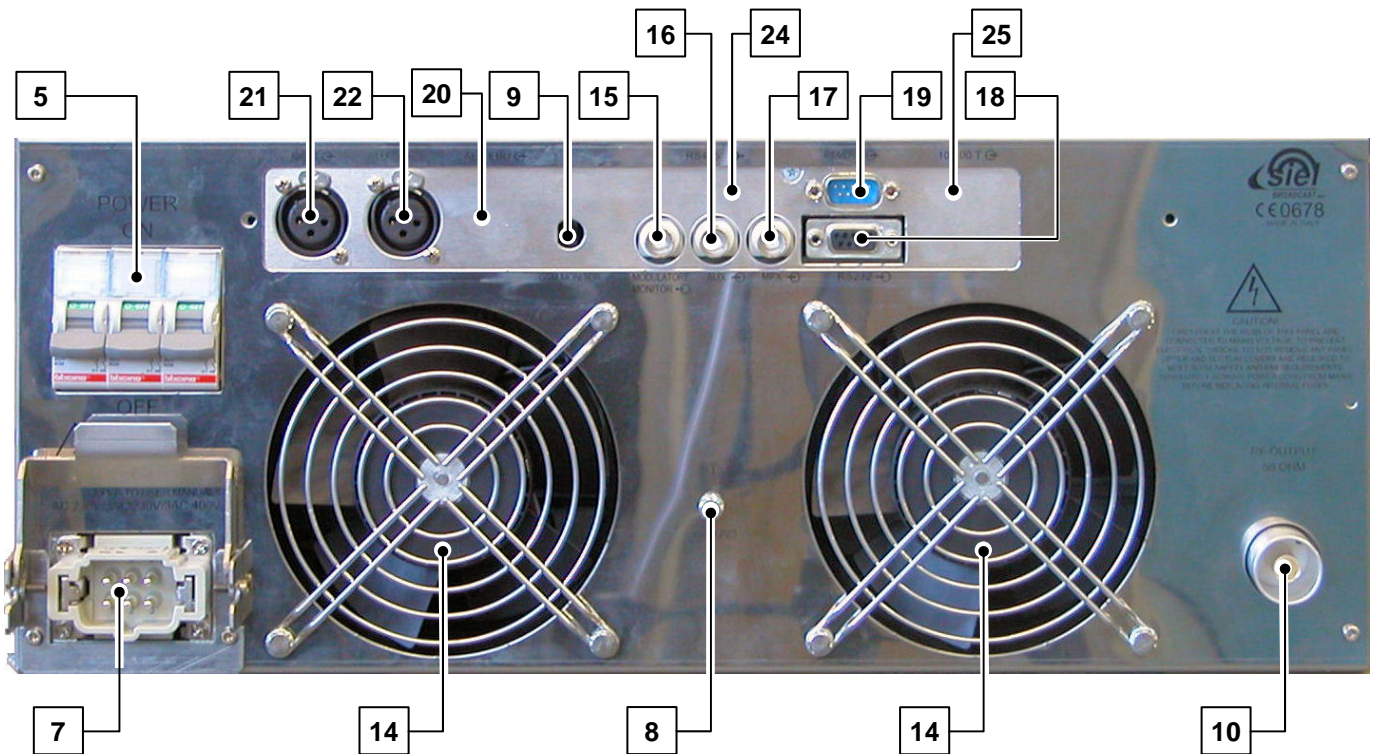
Front

Rear
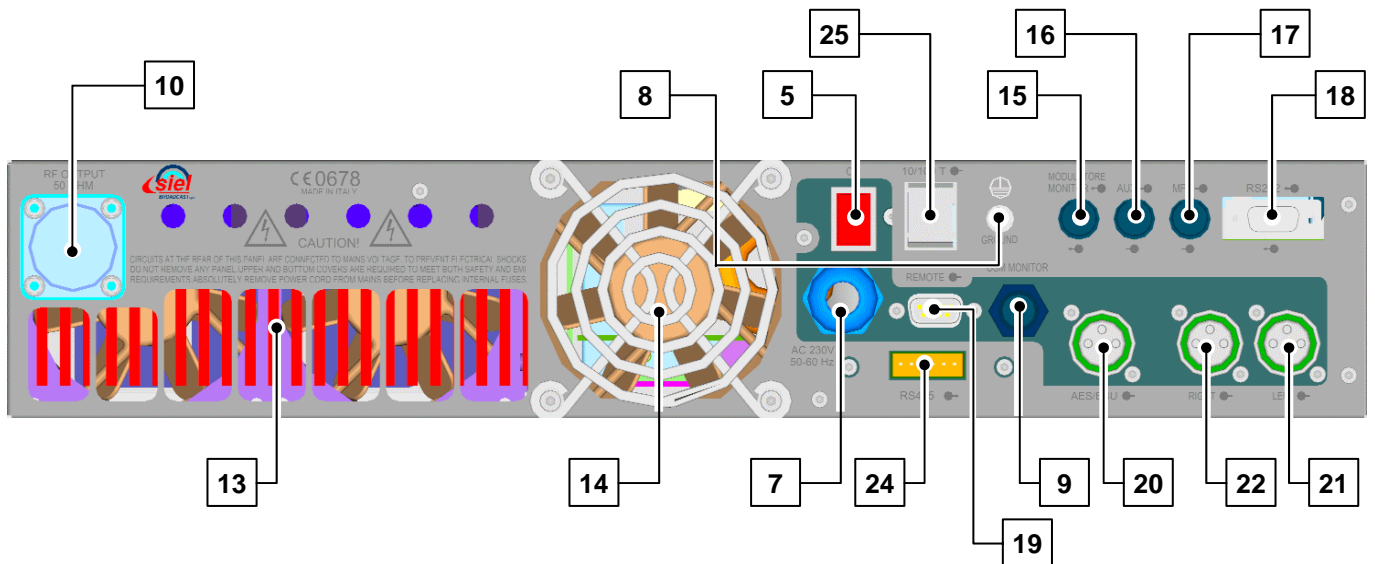
5.1.e   Model 5

Front
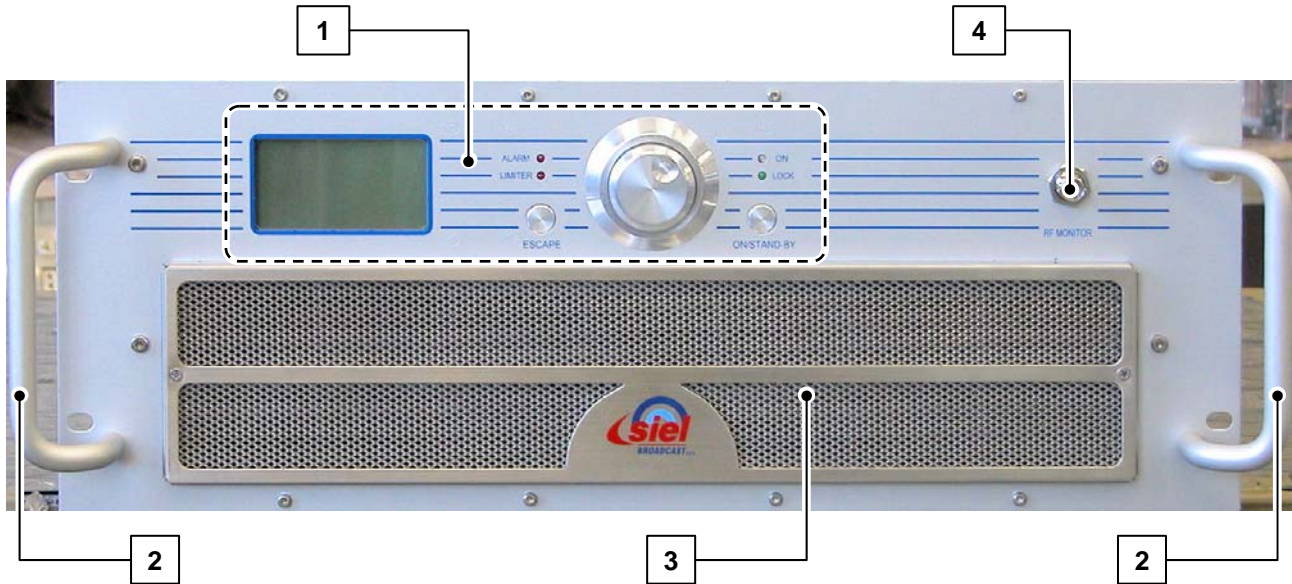
Rear

5.2   List of commands and inputs

The commands and inputs that, according to your model, may be available on the device are listed below:

[1]   **Control panel** – allows the user to set device functions, and to view and set operating parameters. It is composed of the following:

- **Liquid crystal display (LCD**) – a graphics display that shows the operating parameters and functions selected via the multi-function knob.
- **ALARM indicator light** (red) – this LED lights up in red if an alarm event occurs (e.g., output power or modulation too low).
- **LIMITER indicator light** (red) – this LED lights up in red to indicate that the maximum deviation limiter has activated due to an audio signal that is too high.
- **ON indicator light** (yellow/green) – this LED lights up two ways:
    - It lights up in <u>yellow</u> when the device is on <u>stand-by</u>
    - It lights up in <u>green</u> when the device is in <u>operation</u> (powered up).
- **LOCK indicator light** (green) – this LED lights up in green to indicate that the internal frequency synthesizer is locked on the set operating frequency.
- **Multifunction knob (encoder)** – allows the user to navigate the command menu in various ways:
    - If turned – selects the various functions/operations for the device, or the parameter values to be set.
    - If briefly pressed (like a button) when inside a menu – activates the option currently selected.
- **ESCAPE button** – while navigating through a menu, pressing this button will return the user to the previous level.
- **ON/STAND-BY button** – starts the device or puts it on stand-by.

📖 *For further information regarding the use of navigation commands in the menu, see ↗ 9.2.*

[2]   **Handles** – allow the user to easily pick up the device to remove it from or insert it into a mobile rack.

[3]   **Front ventilation grill** (only on some models) – allows the device to draw in cool air.

[4]   **Anterior RF MONITOR ouput** (only on some models) – BNC-type connector for sourcing the low level RF signal; this function is useful for connecting to external measurement units. The output level, depending on your model, ranges from 0 dBm to +15 dBm.

📖 *RF MONITOR output does not guarantee an output level that is perfectly constant as the frequency varies; as such, it cannot be used for precision spectrum measurements.*

[5]   **General power switch (POWER ON)** – allows the user to turn the general system power on and off.

[6]   **Fuse holder** (only on some models) – protective fuse holder for the power supply socket.

[7]   **Power socket or cable** – used to connect to a mains supply.

[8]   **Ground** – used to ground the device, to ensure safe operation.

[9]   **Remote control antenna** – input for an external GSM antenna (to be connected if the device is equipped with a remote control option via the cellular phone network).

[10] **Antenna output socket/flange (RF OUTPUT)** – this socket/flange is connected to an FM broadcasting antenna that can tolerate the transmitter's nominal power.

[11] **Posterior RF MONITOR input** (only on some models) – BNC-type connector for sourcing the low level RF signal. The signal attenuation is 57 dB.

[12] **Heatsink** (only on some models) – for dissipation of excess temperature during the transmitter power stages.

[13] **Ventilation grill** (only on some models) – for heat dissipation or, for models with forced air circulation, for expelling air brought in through the front ventilation grill to cool the device.

[14] **Cooling fan** (only on some models) – expels air sucked in through the front ventilation grill used to cool the device.

[15] **MODULATION MONITOR socket** – BF modulation output socket to be used as a monitor, for synchronization of the RDS encoder, or broadcast retransmission (BNC-type connector).

[16] **AUX** – auxiliary modulating channel input (RDS/SCA) at low frequency on a 20-100 KHz band (BNC-type unbalanced connector with grounding shield) for connection to an RDS encoder. For details, see 🕮 7.9.

[17] **MPX** – externally created broadband stereo composite modulating signal input (BNC-type unbalanced connector with grounding shield). For details, see 🕮 7.5.

[18] **RS232 serial programming port** – this female RS 232 Sub-D9 port with inverted cable allows the user to control the transmitter via a computer or an external point-to-point control device. For details, see 🕮 6.4.d.

[19] **REMOTE control input** – this 9-pin SUBD connector allows the user to remotely control the device or to perform other functions via a suitable interface. For connections to this input, see chapter 16. For details, see 🕮 6.4.e.

[20] **AES/EBU** (only on some models) – input for AES/EBU digital standard.

[21] **LEFT** – balanced input (female XLR) for modulation of the left audio channel. For details, see 🕮 7.5.

[22] **RIGHT** – balanced input (female XLR) for modulation of the right audio channel. This input can also accept a mono signal for monophonic transmissions, as explained in Chap. 7.

[23] **N 1 CONTROL** (only on some models) – 9-pin SUBD input for remote control. For connections to this input, see Chap. 16.

[24] **RS485 serial port** (only on some models) – this RS 485 serial port allows the user to connect multiple transmitters in series, each of which is identified via a previously assigned logical address.

[25] **10/100 T** (only on some models) – input for LAN connection using 10/100 Base-TX standard Ethernet.

📄 *The central BNC pin of the **MPX** input [17] is physically parallel to the + signal (pin 3) on the **RIGHT** XLR input for the right channel [22]. As such, the connectors cannot both be used at the same time.*

6   INSTALLATION

✋ **Warning! To ensure safe performance, it is absolutely essential that all the instructions outlined in this chapter be complied with.**

6.1   Check the supplied parts

Before using your transmitter, ensure that the following parts are included in the package:

- The transmitter
- The user manual
- A power cable supplied with a suitable connector

If any parts or missing or damaged, contact your supplier at once.

6.2   General safety rules

✋ **Warning! In order to prevent serious damage to objects or people, the following rules must be strictly followed.**

- Although no special instruments are required in most cases, the device should be installed by skilled personnel only. To make best use of the device and prevent damage to the unit, it is necessary to comply with the instructions outlined in this manual. Should doubts or technical problems arise during the installation procedure, it is strongly recommended that you contact SIEL or a local agent/dealer.
- Should technical problems or doubts of any kind arise during installation, SIEL would be happy to provide qualified technical assistance. Technical intervention by personnel not authorized by Siel should not be performed.
- As a rule, the user should not access the inside of the device. Tampering with the factory settings renders our warranty null and void, and may also affect the device's performance, causing costly damage.
- No adjustments or internal calibrations are required for normal operations. The device must be properly grounded and must be used with all the covers closed in order to prevent electrical shocks and to fully comply with EC, EMI, and other safety regulations.
- Never touch the inside of the device without first disconnecting it from the mains. AC, DC, and radiofrequency voltages are present inside the device and can be dangerous when the covers are removed.
- Do not operate the device without the covers properly screwed into place. Using an open transmitter may be dangerous to objects or people. In addition, if the top cover is removed, this may cause the device or other electronic measurement instrument to perform incorrectly due to the elevated RF fields.

6.3   Placement of the device

6.3.a   Choosing the proper room and placement

- Install the device in a dry, sheltered, well-ventilated room away from dust, moisture, insects, and rodents (mice).
- Room size should be such that the device can be placed in an upright position, and that technical personnel can easily perform routine or extraordinary maintenance. Evaluate the minimum size according to the power supplied by your model, taking into account that a volume of 2.5 x 2.2 m in height is required for a transmitter with 1 KW of power, and that no other transmission or auxiliary devices should be present in the vicinity.
- Place the apparatus as close as possible to the antenna, in order to prevent excessive power loss in the cables. If this is not feasible, use antenna cables with low loss and suitable cross-section.
- Vents in the walls and any other openings must be fitted with metal gratings to keep rodents and insects out, and must be equipped with a dust filter. Make absolutely sure that no water can seep through the vents, the air exhaust duct, or the antenna-cable grommet. Also confirm that the floor is not at risk of flooding during heavy rainfall.

6.3.b   Climatic conditions

- In order to achieve optimum performance in terms of power, life span, etc., the ideal room temperature should range between 5°C and +25°C. As a general rule, the useful life span of the device may be halved by a 10°C increase in room temperature, should the temperature exceed 30°C. The pre-set over-temperature alarm will activate when the limit of 45°C is exceeded. It is advisable to hang a minimum/maximum thermometer on the wall to indicate variations in temperature.
- The room must be ventilated to ensure that the temperature never exceeds 35°C. Such conditions can NOT generally be met when the exhaust cooling air is not pushed outside and is instead fed back into the room. This is also occur if more than one device is installed in the same location. An efficient ventilation system with air exchange is thus required in the room. For your

reference, the air flow rate required for proper functioning of a 1 KW transmitter must be at least 500 cubic meters per hour. Evaluate this element in proportion to the power supplied by the model you are installing.

- If the device is placed on a rack, the rear door of the rack can not usually be secured. If the system must be completely enclosed, a ventilation and air removal system must be created. To encourage air flow, a flange can be installed at the ventilation outflow, to which a hot air discharge conduit can be connected to the exterior. In this case, it is important to remember that the transmitter's internal fans are low pressure units and that it is fundamental for an exhaust fan to be installed on the air discharge conduit.

- The best solution is to keep the room at 20-25°C. Thermal insulation and effective ventilation via a fan controlled by a thermostat generally present the most advantageous solution.

- Excessive concentrations of moisture and/or dust in the air or in the room may cause a condensation build-up in the transmitter. If the system is periodically switched on and off, this can trigger destructive electric arcs and short circuits, and thus cause damage that is not covered by warranty.

6.3.c   Electrical conditions

- The mains capacity must be proportionately designed to adequately support the device's power consumption (including a sufficient safety margin).

- The power supply nominal range comes from 185 to 265 V_{AC} (nominal voltage single-phase 230 V_{AC}). Upon request, some power models are available with a 400 V_{AC} three-phase power supply.

- Mains fluctuations and electrical discharges due to weather or nearby industrial machinery may cause significant trouble, especially in mountain areas and in locations close to industrial areas.

- In such cases, it is advisable, if not indispensable, to install a protector, an insulating transformer, or possibly an electromechanical mains voltage regulator. Upon request, SIEL can provide all of these accessories.

- Even though the mains regulator allows for a wide incoming voltage range, it is important to avoid operating using high impedance mains lines in proximity to the lowest permitted AC limit: if the line falls below a given value while fully loaded, the control circuit for the lowest AC limit may trigger a very dangerous oscillating on/off cycle. In such cases, we recommend using a stabilizer on the external line.

📰 *Since the total cost of the system, inclusive of broadcasting equipment, antenna system, and installation, is rather high, a certain percentage of the budget should be set aside for purchasing and installing suitable protection and conditioning facilities. Depending on the location, the percentage of the total cost should be approximately 10-20% of the total amount. However, such additional costs will be amortized very quickly since the device operates under ideal conditions; as such, its useful life will increase and, in particular, the incidence of accidental breakdowns due to ambient or mains trouble will be reduced.*

6.4   Wiring the device

This section describes the minimum connections required to place the transmitter in operation.

6.4.a   Wiring into the antenna

Connect the **RF OUT** connector (📖 par. 5.2 ref. [10]) to the antenna or to the next RF amplifier via a high-quality 50 Ohm shielded coaxial cable equipped with the appropriate connectors.

It is indispensable that only low-loss cables be used when connecting directly to the antenna: in such cases, Celflex or another similar ½" cable is recommended. Larger cables must be connected using flexible terminal ends from the smallest section, in order to avoid mechanical stress on the output connector.

✋ **It is very important to ensure that the antenna, cables, and connectors have the correct impedance and are appropriate to the transmitter's nominal power level.**

✋ **The antenna must be suitable for FM broadcasting and able to resonate at the operating frequency with the minimum possible SWR.**

✋ **The antenna must be grounded via a copper braid of suitable cross-section to prevent lightening or static electricity from reaching the amplifier through the antenna cable.**

6.4.b   Connection to modulation signals

Connect the **LEFT** [21] and **RIGHT** [22] modulation inputs, or the **MPX** input [17] alternatively, based on your desired operating mode (monophonic or stereophonic) and the type of source being used (mono, stereo, or multiplex signal); refer to the information provided in Chap. 7.

👆 **The MPX connector is internally connected in parallel to the RIGHT connector. As such, if the MPX connector is in use, the simultaneous connection of signals to the LEFT and RIGHT connectors is not possible. Again in this case, the highest impedance position is 5 KOhm.**

📓 *Connection to the auxiliary RDS/SCA modulation signal is described further ahead, in section 6.4.d.*

6.4.c   Wiring into the mains

1) Verify that the rear power switch is turned off; if it is not off, do so now.
2) Ground the system.
3) According to your model, connect the power cable or the device's cable to a suitable single-phase input (230V_{AC} nominal voltage).

👆 **Before connecting the power, ensure that it is appropriate and is able to support the consumption required by the transmitter model you intend to use.**

👆 **The power supplied by the mains input must satisfy the requirements outlined in section 6.3.c.**

👆 **Your transmitter should not be used when near the lower voltage limit with high-impedance lines: if the line voltage falls below a certain limit at full load, the low voltage sensor circuit could trigger a continuous, extremely dangerous on/off cycle. In such case, install an external voltage stabilizer.**

👆 **In order to ensure proper operation and comply with safety regulations, proper grounding is required. Use the yellow/green lead in the power cable. The cable neutral lead is blue. Never connect the earth to the mains neutral lead.**

👆 **Use only the power supply cable supplied with the transmitter. For cable extensions, sections of sufficient and appropriate length are recommended.**
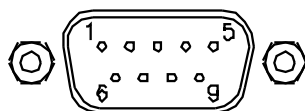
👆 **Never turn the device on without an antenna connection, even when in stand-by.**

6.4.d   Connection to the auxiliary modulation (optional)

Where necessary, an auxiliary RDS or SCA modulation source can be connected to the **AUX** input [16]; refer to the instructions outlined in Chap. 7.

6.4.e   Parallel port for remote control (optional)

Where necessary, connections can be made to the **REMOTE** parallel port [19]. Various lines are located in this port for simple, direct control of the transmitter via a male DB9 connector.

Connection of the pins is outlined in the following table:

N.	Connection	Notes
1, 5, and 8	ground	
2	"on the air" signal	+ 12V with 10 KOhm indicates that the transmitter provides considerable RF power, but not necessarily the correct level
3	direct power	A signal proportional to the direct power is present and is of a pseudo-quadratic type proportion. The variation field ranges between 0-5Vdc with an impedance of 1 KOhm. On the 1 KW 5V model, this equals 1500W
6	disable RF	This line's grounding deactivates the RF output. The maximum signal level is approximately + 10V/1mA
7	alarm	A low logic signal indicates an alarm. Normal function is indicated by the presence of + 12V on 10kohm. The maximum absorption capacity for the external current is limited to 10mA

6.4.f   Connection to the RS232 port (optional)

Where necessary, connections can be made to the **RS232** port [18]. This port manages Tx, Rx, and related return data signals via a RS232 standard without any "handshake" signal.

The above signals are inversely connected to the port; as such, a simple pin-to-pin type serial cable is sufficient, directly connected

to suitable connectors, usually a female DB9 or DB25 on the PC port and a male DB9 connector to the transmitter. The applicable communication software is also required.
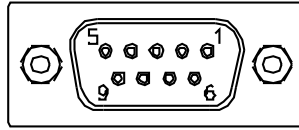
✋ **Never connect the cable if the PC or transmitter are turned on.**

7   AUDIO OPERATING MODES AND ASSOCIATED BF CONNECTIONS

This section describes how to select the various available operating modes, and how to make audio connections according to your requirements.

The transmitter is equipped with numerous characteristics specific to high-fidelity systems; as such, it should be connected to modulating signals with the same care as a Hi-Fi system, avoiding ground loops as much as possible. Under these conditions, you will obtain optimal performance.

According to the operating mode and type of modulation source available, you can connect to the modulation inputs in various ways:

- Monophonic transmission from an audio signal, via the main mono channel
- Monophonic transmission from a stereophonic audio signal, using the internal stereo encoder
- Stereophonic transmission from a stereophonic audio signal, using the internal stereo encoder
- Monophonic or stereophonic transmission from an external encoder or radio link receiver.

The device is also able to transmit an auxiliary signal (RDS or SCA), connected to the rear AUX input as described below.

7.1   Mono transmission from a mono signal

1) Connect the **RIGHT** connector [22] to the monophonic audio signal. Connection to the **LEFT** input is not necessary.
2) Using the **SETUP** menu, set the modulation mode to **Mono** (🗏 section 10.3.f).
3) Confirm or change preemphasis according to the local standard.

7.2   Mono transmission from a stereo signal

1) Connect the **RIGHT** connector [22] to the right audio channel.
2) Connect the **LEFT** connector [21] to the left audio channel.
3) Using the **SETUP** menu, set the modulation mode to **Mono L+R** (🗏 section 10.3.f).
4) Confirm or change preemphasis according to the local standard.

7.3   Stereo transmission from a stereo signal using the internal stereo encoder

Follow the steps outlined in section 6.5.b, ensuring that **Stereo** is selected at step 3.

7.4   Monophonic or stereophonic transmission from a multiplex signal

If you wish to use a multiplex signal (MPX) originating, for example, from an external encoder or a radio link receiver, follow the steps below:

1) Connect the multiplex signal to the **MPX** connector [17]. The multiplex signal is already preemphasized; as such, using the MPX input, the filtering and stereo encoding stages are skipped and the signal will not be further preemphasized.
2) Using the **SETUP** menu, set the modulation mode to **Mpx** (🗏section 10.3.f).

📄 *Selecting the preemphasis according to the local standard (50 microseconds in Italy) is not required, as it is irrelevant in this mode. However, it is recommended that this be done anyway.*

📄 *If the length of the cable delivering the signal to the MPX connector is only a few meters long, a 50 Ohm (RG58) cable can be used. If the distance is greater, a 75 Ohm (RG59) or 92 Ohm (RG62) cable should be used.*

7.5   Connection to LEFT, RIGHT, or MPX modulation connectors

The EXC-GT Series supports both balanced and unbalanced audio signals according to the connection that is made in the three **LEFT** and **RIGHT** XLR connector contacts. The input impedance for these contacts is pre-set at the factory at 10 KOhm resistivity (5 KOhm for unbalanced connections), which can be decreased to 600 Ohm if necessary, as explained further ahead.

Normally, an XLR audio input with balanced connection is used for connection to the balanced output of a professional mixer. Alternatively, an unbalanced connection can be used, and is useful for output connections on inexpensive devices, without a perceptible degradation in the audio signal.

Alternatively to connection to the **LEFT** e **RIGHT** connectors, an externally created multiplex signal can be connected to the **MPX** connector. In this case, connection should not be made to the **LEFT** and **RIGHT** connectors.

✋ **The MPX connector is internally connected in parallel to the RIGHT connector. As such, if the MPX connector is in use, the simultaneous connection of signals to the LEFT and RIGHT connectors is not possible. In such case, the highest impedance position is 5 KOhm.**

7.5.a   Balanced connection to the LEFT and RIGHT connectors

The output for a mixer or any other audio processor that drives a transmitter with a balanced coaxial cable should be connected at pin 3 (+) and pin 2 (-). The cable shield, connected to the ground of the audio driver device, must be connected to pin 1.
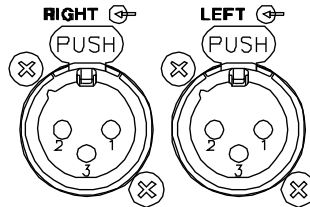

📄 *Balanced connection offers the greatest advantages. For example, cables connected to a source can greatly exceed 100 meters in length.*

7.5.b   Unbalanced connection to the LEFT and RIGHT connectors

For driving with an unbalanced signal, input pin 2 must be short-circuited with the ground and the shield to pin 1, while the signal must go to pin 3. In such case, the highest impedance selection will be 5 KOhm rather than 10 KOhm.

7.6   Connection to the MPX input

Connect an externally created multiplex signal to the MPX input using a suitable encoder.
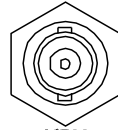
📄 *If the length of the cable delivering the signal to the MPX connector is only a few meters long, a 50 Ohm (RG58) cable can be used. If the distance is greater, a 75 Ohm (RG59) or 92 Ohm (RG62) cable should be used.*

7.6.a   Checking the **pilot tone in stereophonic transmission**

Where the internal stereo encoder is used, the level of the stereo driver tone, which is usually set internally at 9-10% of the modulation (from -21 to -20dB) corresponding to the standard established deviation of 7 – 7.5 kHz, cannot be changed externally.

Where the stereo modulation signal is externally generated by a separate stereo encoder, the driver tone must be measured in the absence of audio modulation and all other auxiliary signals, as described below:

1)   Disconnect all signals from the external stereo encoder input, and any RDS or SCA signals.
2)   Select the `VIEW` - `AUX` menu (section 10.2.c) and confirm that the driver tone is now the only available signal. The standard level is as indicated above, 9-10% (-21 to -20dB), and can be consequently adjusted on the external stereo encoder as required.
3)   Reconnect the previously disconnected signals.

7.7   Changing the input impedance

As previously explained, the input impedance on the modulation inputs can be changed. Selection of the input impedance is one of the very few settings that can only be changed internally, as follows:

1)   Disconnect the mains.
2)   Unscrew the screws that hold the top cover in place (16 or more cross-head screws will require removal, depending on the model).
3)   Remove the top cover and store it in a safe place.
4)   Identify the input card.

---
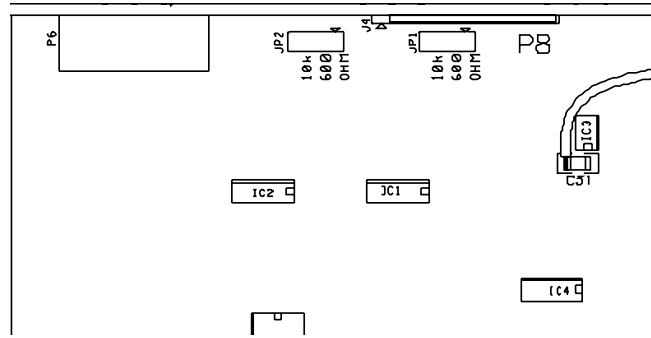
5) The input impedance is easily set using the **JP1** e **JP2** jumpers found on the input card, immediately after the input connectors as illustrated in the design. The selectable impedance values are serigraphed on the printed circuit board.

6) Place the top cover back on the transmitter, ensuring that all the screws are correctly screwed into place.

✋ **Do not forget to properly screw all the screws on the top cover into place; this is required to guarantee conformity to EMI/EMC regulations.**

7.8 Preemphasis

The low frequency audio signals of mono and stereo channels must be properly "preemphasized". The standard preemphasis is 50 or 75 µs, the first value usually being the one selected during manufacture. Confirm that this value is appropriate in your country: it is the standard value for all countries in Europe, most of the Pacific regions, and some countries in South America. However, the North American FCC standards require 75 µs.

To make changes to the preemphasis, use the **SETUP** menu as indicated in section 10.3.f.

7.9 Operating with the RDS and SCA encoders

In addition to the aforementioned operating modes, this device is able to transmit an auxiliary signal (RDS or SCA) connected to the rear **AUX** terminal as follows:

1) Connect the **AUX** terminal [16] to the RDS or SCA encoder output.
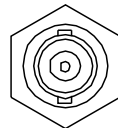
2) If the internal stereo encoder is used, connect the **MODULATION MONITOR** output [15] to the "driver tone" synchronization input on the RDS encoder (where available).

3) Using the **SETUP - AUX SENS** menu (🗐section 10.3.d), change the channel input sensitivity and, where necessary, the external generator level so as to obtain the required deviation. For RDS encoders, a reading of -11.5 dB or 2kHz is the standard modulation value.

4) Modulation and deviation can be viewed on the **STATUS** screen, 10.2.a, in addition to any other multiplex signals available at that time.

📄 *If the length of the cable delivering the signal to the AUX terminal is only a few meters long, a 50 Ohm (RG58) cable can be used. If the distance is greater, a 75 Ohm (RG59) or 92 Ohm (RG62) cable should be used. The same is valid for connection to the MODULATION MONITOR input.*

8 BASIC OPERATIONS

✋ **Immediately following installation, the first time the device is turned on, it is absolutely fundamental that the instructions outlined in this chapter be followed. Failure to perform the adjustments and controls explained in this section could cause serious damage to the device or interference with other broadcasters or services that operate via radio; any such damage will be the sole responsibility of the user.**

8.1.a Initial start-up and basic adjustments

The first time the device is turned on, it is important to perform basic adjustments (frequency, output power, modulation, etc.) and verify that they are functioning correctly (e.g., reflected power) via the commands menu. This section explains how to perform these adjustments.

✋ **The transmitter stores in its memory the operating mode in which it was working before the power supply was turned off or a mains failure took place. Therefore, before continuing, it is important to ensure that it is connected to a load that is able to support the maximum deliverable power.**

✋ **Operating the transmitter without an antenna, or when the antenna is improperly connected, may cause damage that is not covered by the warranty, particularly during the final stage of transmission.**

✋ **If turning the transmitter on places it directly in operation (rather than on stand-by), we recommend that the ON/STAND-BY button be pressed to place the transmitter on stand-by while making adjustments.**

✋ **Proper adjustment of the parameters should be made so as to conform to local regulations; such conformity is the full responsibility of the user.**

📄 *For questions regarding navigation of the commands menu, refer to Chap. 9.*

📄 *If the device is left on the **SETUP** menu without receiving a command, the display will automatically return to the **STATUS** screen under the **VIEW** menu (📖 section 10.2.a).*

1) Ensure that all installation conditions are met, as described in Chap. 6, and that all the connections described in sections 0, 6.4.b, and e 6.4.c have been made. You can connect a suitable dummy load to the transmitter's RF output instead of the antenna.

2) Turn on the device via the rear power switch (📖 section 5.2 ref. [5]). For a few seconds, the Siel logo will appear on the full screen; after this, the default screen will be displayed (📖 section 10.1); the bottom of the default screen will show the two main menus, **VIEW** and **SETUP**:

3) At this point, two conditions are possible:
   - **The transmitter begins to operate** (including possible powering up) – the display turns on, and the **ON** LED lights up in green. In such case, it is recommended that the basic settings be made, turning the transmitter on stand-by. To do so, press the ON/STAND-BY button. Ensure the **ON** LED lights up in yellow and skip directly to step 4).
   - **The transmitter goes to stand-by** – the display turns on, and the **ON** LED lights up in yellow. At this point, proceed to the next step.

4) Turn the knob to select the main **SETUP** menu, and press briefly to confirm. The first of the three pages comprising the **SETUP** menu (📖 section 10.3) will appear:

8.1.b Operating frequency

5) Ensure that the **FREQUENCY** sub-menu is selected; otherwise, turn the knob to select it.

6) Press the knob to access the sub-menu. The following screen will appear (🖫 section 10.3.a):

```
MILANO      14:53:24
SIEL ITALY     +31° C
Step     :    100KHz
Frequency:   98.00MHz

OK   ABORT  [ EDIT ]
```

7) Ensure that the **EDIT** option is selected; otherwise, turn the knob to select it, then press to confirm.

8) A value will be indicated after **Step** (frequency steps).

9) Turn the knob until you select the frequency step required to exactly set the required operating frequency, then press the knob to confirm.

📄 *Normally, it is sufficient to leave it at **100KHz** (e.g., operating frequency of 99.300 MHz). Otherwise, if the operating frequency is defined at a step lower than 100 KHz (e.g., operating frequency of 97.850 MHz), you will need to select the 10 KHz step.*

10) A value will be indicated after **Frequency**. Turn the knob until you reach the exact operating frequency desired, then press the knob to confirm.

11) **OK** will be highlighted. Three choices are now available:

   o If the parameters set are correct – skip directly to step 12) to confirm the settings.
   o If the parameters set are all incorrect – cancel all settings by turning the knob until **ABORT** is highlighted, then skip to step 12).
   o If a slight adjustment to the parameters is required – turn the knob until **EDIT** is highlighted, then return to step 8.

12) Press the knob to confirm. You will return to the page indicated in step 3).

8.1.c RF output power

13) Turn the knob until the **POWER** sub-menu is selected, then press to confirm. The power adjustment screen will appear (🖫 section 10.3.b):

```
MILANO      14:21:27
SIEL ITALY     +31° C
Pow. set :    25.0W
Pow. out :    25.0W

OK   ABORT  [ EDIT ]
```

14) Ensure that the **EDIT** option is selected; otherwise, turn the knob to select it, then press to confirm.

15) A value will be indicated after **Pow. Set:**.

16) Turn the knob until the desired power is set, then press the knob to confirm.

17) Okay will be highlighted **OK**. Three choices are now available:

   o If the parameters set are correct – skip directly to step 18) to confirm the settings.
   o If the parameters set are all incorrect – cancel all settings by turning the knob until **ABORT** is highlighted, then skip to step 18).
   o If a slight adjustment to the parameters is required – turn the knob until **EDIT** is highlighted, then return to step 15).

18) Press the knob to confirm. You will return to the page indicated in step 3).

📄 *If the device is currently in operation (green **ON** LED lit up), the **Pow. out:** indicator will show the power currently supplied. Otherwise, with the device on stand-by (yellow **ON** LED lit up), the indicator will remain at **0.0W**.*

8.1.d Modulation sensitivity

19) Turn the knob until the **MPX SENS.** sub-menu is selected, then press the knob to confirm.

20) The modulation sensitivity adjustment screen will appear (🖫 section 0):

21) Ensure that the **EDIT** option is selected; otherwise, turn the knob to select it, then press to confirm.

22) A value will be indicated after **Nom. Input**, normally pre-defined at **+6.0 dBm**.

23) Turn the knob to adjust the value based on the modulation level used. The peak deviation indicated by **Mpx**, expressed in KHz, will consequently be changed. Note that, to the right of the deviation, the value of the modulating signal will be indicated, as compared to the nominal value set.

24) Ensure that the measured peak deviation does not exceed local regulations, then press the knob to confirm the setting.

25) **OK** will be highlighted. Three choices are now available:
    o If the parameters set are correct – skip directly to step 26) to confirm the settings.
    o If the parameters set are all incorrect – cancel all settings by turning the knob until **ABORT** is highlighted, then skip to step 26).
    o If a slight adjustment to the parameters is required – turn the knob until **EDIT** is highlighted, then return to step 22).

26) Press the knob to confirm. You will return to the page indicated in step 3).

🖹 *For audio modulation, we recommend that users adopt a nominal peak level ranging between +6 and + 11.5 dBm.*

8.1.e   Modulation limiter

27) Turn the knob until the **LIMITER** sub-menu is selected, then press the knob to confirm.

28) The modulation limiter adjustment screen will appear (🖳 section 10.3.e):

29) Ensure that the **EDIT** option is selected; otherwise, turn the knob to select it, then press to confirm.

30) A value will be indicated after **Limiter**. This indicator is normally followed by **OFF** or by the limiter intervention value, expressed in dB, in reference to a deviation of 75 KHz.

31) Turn the knob to set the desired value (0 dB = limiter intervention of 75 KHz), then press the knob to confirm.

32) **OK** will be highlighted. Three choices are now available:
    o If the parameters set are correct – skip directly to step 33) to confirm the settings.
    o If the parameters set are all incorrect – cancel all settings by turning the knob until **ABORT** is highlighted, then skip to step 33).
    o If a slight adjustment to the parameters is required – turn the knob until **EDIT** is highlighted, then return to step 30).

33) Press the knob to confirm. You will return to the page indicated in step 3).

🖑 ***According to Italian law, the limiter must intervene above 75kHz. This transmitter fully complies with Italian regulations when the limiter is set at +0.5dB, equal to 80 kHz.***

🖹 *When the limiter begins to intervene, the modulation distortion increases. As such, the modulation sensitivity should be adjusted (🖳 section 10.3.c) so the limiter intervenes sporadically. Using this approach, its operation is generally imperceptible.*

🖹 *When the limiter activates, the **LIMITER** LED lights up in red.*

8.1.f   Transmission modes (mono/stereo) and preemphasis

34) Turn the knob until the **MODE** sub-menu is selected, then press the knob to confirm.

35) The transmission mode settings screen will appear (🖳 section 10.3.f):

36) Ensure that the **EDIT** option is selected; otherwise, turn the knob to select it, then press to confirm.

37) A value will be indicated after **Mode**. This indicator is normally followed by the operating mode (mono, stereo, mono L+R, or Mpx).

38) Turn the knob until the desired setting is selected, based on your needs, then press the knob to confirm.

39) A value will be indicated after **Preemphasis**. Turn the knob until the preemphasis value for your geographical region is selected (50 microseconds in Italy), then press the knob to confirm the value.

40) **OK** will be highlighted. Three choices are now available:
    o If the parameters set are correct – skip directly to step 41) to confirm the settings.
    o If the parameters set are all incorrect – cancel all settings by turning the knob until **ABORT** is highlighted, then skip to step 41).
    o If a slight adjustment to the parameters is required – turn the knob until **EDIT** is highlighted, then <u>return to step 37)</u>.

41) Press the knob to confirm. You will return to the page indicated in step 3).

8.1.g   System date and time

Setting the date and time is important because it allows the transmitter to keep track of events (alarms, etc.) that occur while the transmitter is operating. Set the date and time as follows:

42) Turn the knob until the **NEXT PAGE** sub-menu is selected, then press the knob to confirm. The display will indicate the second page of the **SETUP** menu (� section 10.3):

43) Turn the knob until the **DATE TIME** sub-menu is selected, then press the knob to confirm.

44) The date and time settings screen will appear:

45) Ensure that the **EDIT** option is selected; otherwise, turn the knob to select it, then press to confirm.

46) The hour will be indicated after **Time**. Turn the knob and adjust the current hour, then press the knob to confirm.

47) The minute will be indicated. Turn the knob to adjust the current minute, then press to confirm.

48) The second will be indicated. Turn the knob to adjust the current second, then press to confirm.

49) The day of the month will be indicated after **Date**. Turn the knob to set the current day, then press to confirm.

50) The month will be indicated. Turn the knob to set the current month, then press to confirm.

51) The year will be indicated. Turn the knob to set the current year, then press to confirm.

52) **OK** will be highlighted. Three choices are now available:
    o If the parameters set are correct – skip directly to step 53) to confirm the settings.
    o If the parameters set are all incorrect – cancel all settings by turning the knob until **ABORT** is highlighted, then skip to step 53).
    o If a slight adjustment to the parameters is required – turn the knob until **EDIT** is highlighted, then <u>return to step 46)</u>.

53) Press the knob to confirm. You will return to the **SETUP** menu screen indicated in step 42).

8.1.h   Changing from stand-by to full operation

The transmitter is thus programmed with the basic parameters. You can now return to the default screen by pressing the **ESCAPE** button. Of course, you may now need to adjust other parameters, according to your requirements (e.g., modulation of the auxiliary RDS/SCA signal (🖰 10.2.c). For further information regarding the parameters that can be set, refer to Chap. 10.

Once you are sure that you've correctly programmed all the parameters, you can place the transceiver in full operation by pressing the **ON/STAND-BY** button. Ensure that the **ON** LED is lit up in green.

✋ **If the red ALARM indicator light appears, this means that an alarm event has occurred. When this happens, check the type of alarm on the display, refer to the error table in section 12.1, and solve the problem.**

8.1.i   Checking parameters

We recommend that all the operating parameters be verified the first time that the transceiver is placed in full operation, via the **VIEW** menu. To access this menu from the default screen:

54)   Turn the knob to select the main **VIEW** menu, then press to confirm.
55)   The page composing the **VIEW** menu will appear:

56)   Refer to section 10.2 and verify that all parameters are correct, in particular:
   o   Direct and reflected power, via the STATUS sub-menu (🖰 10.2.a).
   o   Modulation, via the L/R and MPX GRAPH sub-menus (🖰 10.2.b).
   o   Operating frequency, mono/stereo mode, and preemphasis, via the SYSTEM sub-menu (🖰 10.2.e).
   o   Internal temperatures, via the TEMPERAT. sub-menu (🖰 10.2.g).

In addition, a spectrum analysis must be performed to ensure that no spurious emissions are generated due to internal or external reasons (e.g., inverse intermodulation in the final stage).

✋ **If the reflected power exceeds 10% of the direct power, you will not be able to increase the output power beyond a certain value due to an excessive SWR (standing wave ratio). Where this occurs, the antenna system must be checked with a view to minimizing the reflected power.**

✋ **If the red ALARM indicator light appears, this means that an alarm event has occurred. When this happens, check the type of alarm on the display, refer to the error table in section 12.1, and resolve the problem.**

📄 *While in normal operation, we recommend that you leave your device on the STATUS sub-menu, found under the main VIEW menu (🖰 10.2.e).*

📄 *If you leave the device in the main SETUP menu, after a period, the timer will automatically select the STATUS sub-menu under the main VIEW menu in order to avoid programming accidental settings.*

Siel hopes you enjoy working with your device, and would like to remind you that they are always available for further information or to resolve specific problems.

8.1.j   Changing from full operation to stand-by and vice-versa

During normal operation, you can place the transmitter in stand-by by pressing the **ON/STAND–BY** button. The device is on stand-by

when the **ON** LED changes from green to yellow.

To perform the reverse operation, press the **ON/STAND-BY** button again. The **ON** LED will light up in green.

8.1.k   Turning off the transmitter

To completely deactivate the device (for maintenance, etc.), we recommend that you first put it on stand-by, as described above, and then completely turn off the device via the general power switch (⇨ section 5.2 ref. [5]).

9   MENU AND NAVIGATION COMMANDS

To view the device's operating parameters, and to set parameters according to your requirements, you will need to navigate the commands menu shown on the LCD display. You can navigate the menu using:

- The multi-function knob.
- The **ESCAPE** button.

9.1   Multifunction knob

The multifunction knob is used to select the various menus that allow you to view or set the device's parameters and functions. It can be used in a variety of ways:

- **When turned clockwise** (Figure 1), it shows the next menu (or next option).
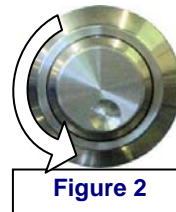
Figure 1   **Figure 2**

- **When turned anti-clockwise** (Figure 2), it shows the previous menu (or previous option).
- **When pressed briefly like a button** (Figure 3), it allows the user to access the menu currently highlighted (or option currently highlighted).

Figure 3
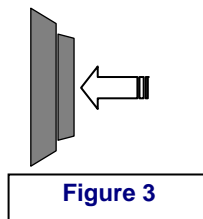
📄 *You can also turn the knob clockwise and anti-clockwise to select the various screens showing data that can be viewed within a menu. For example, alarm events in the view alarms menu (10.2.h).*

9.2   ESCAPE button

The **ESCAPE** button allows you to return to the previous menu level. As such, repeatedly pressing this button returns you to the main screen (you usually only need to press it twice), which appears when you turn the device on (see section 10.1).

9.3   Navigating the commands menu

Generally, you can navigate the commands menu as follows:

1) From the main screen (which appears when you turn the device on), turn the knob until one of the two main menus, **VIEW** or **SETUP**, are highlighted. In the example that follows, **SETUP** is highlighted.

2) Briefly press the knob to access the highlighted menu. The first page of the selected menu will appear (in the example below, the first page of the **SETUP** menu).

3) Turn the knob to select the desired sub-menu, then confirm by briefly pressing the knob. In the example below, the screen for the **FREQUENCY** sub-menu is shown.

4) At this point, depending on the main menu that you have accessed, various options may be available. Each option is explained in detail in the following chapter, and a brief overview is provided below:

    o   **VIEW menu** – used to check the device's operating parameters and alarms/events; as such, options are not usually available in its sub-menus. Once you have accessed a sub-menu, turning the knob has no effect, with the exception of the **MPX GRAPH** and **VIEW LOG** sub-menus. For further details regarding the use of these sub-menus, refer to sections 10.2.d and 10.2.h.

    o   **SETUP menu** – this was expressly designed to set the transmitter's parameters; as such, the options **EDIT**, **ABORT**, and **OK** are available in all the sub-menus. Refer to section 9.4 regarding the use of these options.

5) Where required, use the knob according to the instructions provided in each of the following descriptions of the individual sub-menus.

6) To go back to the previous level (and exit the current menu/sub-menu), press the **ESCAPE** button.

7) Where necessary, repeat the previous step multiple times until you return to the main screen, indicated in step 1.

📖 *Access to the VIEW and/or SETUP menus may be password protected. If so, you may need to enter a previously assigned password at step 2. For further details regarding passwords, refer to section 10.3.k.*

9.4   Additional commands in the SETUP menu

9.4.a   NEXT PAGE and PREV PAGE

The **SETUP** menu is composed of multiple pages; as such, you can access the next page by selecting the **NEXT PAGE** sub-menu, and the previous page by selecting **PREV. PAGE**.

9.4.b   EDIT, ABORT, and ESCAPE

Once you've entered one of the sub-menus in the **SETUP** menu, turning the knob allows you to select three commands that appear at the bottom of the screen:

- **EDIT** - used to access a setting and modify parameters.

- **ABORT** – used in the same manner as pressing the **ESCAPE** button, and thus to exit the screen and return to the previous navigation level without saving any settings made in that sub-menu.

- **OK** – confirms settings made in a sub-menu.

10 DESCRIPTION OF THE MENUS

📄 *The following menu descriptions refer to software version 1.2.3.*

📄 *Menus for higher-powered transmitters (approximately 1500 W or more) may include options for viewing additional parameters.*

10.1 Default screen

As soon as the device is turned on, the default screen will appear on the display, indicating the following information:

- **Model:** indicates the transmitter model (in this example, EXC30GT).
- **Version:** indicates the software version installed (in this example, 1.2.3).

The following main menus can be selected from the bottom part of the screen:

- **VIEW:** used to view the transmitter's operating parameters (📖 10.2).
- **SETUP:** used to set operating parameters and many of the device's functions/services (📖 10.3).

📄 *The main VIEW menu is normally the menu accessed; as such, pressing the knob will take you to that menu. For further details, refer to the next section.*

📄 *Access to the VIEW and SETUP menus may be password protected. If so, you will be asked for the previously assigned password. For details regarding passwords, see 📖 10.3.k.*

📄 *The menu and sub-menu screens described below all indicate the current time and temperature in the top right corner.*

✍ **In order to avoid misinterpreting the screens, it is important to verify the exact model number of your device on the main menu, and to safely store this model number (📖 Chap. 4).**

10.2 VIEW menu

This menu is used to view the transmitter's operating parameters; for example, direct power, reflected power, modulation, etc. It is in turn organized into eight sub-menus:

- **STATUS** – indicates the primary measurements, such as direct power, reflected power, etc. (📖 10.2.a).
- **L/R** – for measuring modulation (📖 10.2.b).
- **AUX** – for measuring modulation of the auxiliary RDS/SCA signal (📖 10.2.c).
- **MPX GRAPH** – graphically displays modulation in various modes (📖 10.2.d).
- **SYSTEM** – indicates the main system parameters, such as frequency, mono/stereo mode, preemphasis, etc. (📖 10.2.e).
- **VOLTAGE** – measures internal power voltages (📖 10.2.f).
- **TEMPERAT.** – measures internal temperatures (📖 10.2.g).
- **VIEW LOG** – indicates alarms/events that have occurred during operation (📖 10.2.h).

📄 *During normal use of the device, we recommend that the STATUS menu be selected.*

📄 *Each of the above sub-menus is used to view parameters; as such, options cannot be selected using the knob, with the exception of the MPX GRAPH and VIEW LOG sub-menus. Refer to 📖 10.2.d and 10.2.h.*

10.2.a STATUS sub-menu

The screen for this sub-menu contains the following items:

- **Dir. Power:** indicates the direct power currently delivered (in the example, 25.0 W).
- **Refl. Power:** indicates the reflected power currently measured (in the example, 0.0 W).
- **Mpx** (multiplex) – indicates the peak deviation, expressed in KHz (in the example, 69.1 KHz) and dB, in reference to a deviation of 75 KHz (0dB = 75 KHz). To change the deviation in function of the modulating signal, the modulation sensitivity must be set via the **MPX SENS** sub-menu, from the main **SETUP** menu (🖺 section 10.3.c).

In addition, the bar indicator graphically shows the last parameter indicated.

🖺 *This screen shows the most important parameters; as such, it is normally the one displayed during normal use of the transmitter.*

🖺 *In order to avoid saving accidental settings, when the SETUP has been accessed but no operation performed within a certain period of time, the device will automatically exit the SETUP menu and enter the VIEW menu, selecting the sub-menu STATUS.*

🖺 *To adjust the output power, go to the sub-menu POWER under the SETUP menu (🖺 10.3.b).*

10.2.b L/R sub-menu

The screen for this sub-menu is used to monitor total peak modulation. It shows the following items:

- **Left** (left channel) – the current level of the left modulating signal, expressed in dB, against the nominal level (in the example, +0.85 dB).
- **Right** (right channel) – the current level of the right modulating signal, expressed in dB, against the nominal level (in the example, +0.77 dB).

In addition, the bar indicators graphically show the two parameters indicated above (peak value).

Depending on the setting made in the **SETUP** menu, the modulation level can also be viewed via the following screen, which indicates a solo or a multiplex channel (which share the same channel).

In the example above, the **Right** channel is indicated.

🖺 *Adjustments can be made to the nominal modulation level via the SETUP menu (🖺 10.3).*

10.2.c AUX sub-menu

The screen for this sub-menu shows the modulation level for the **Aux** RDS/SCA signal:

The above example shows the standard level of the RDS signal (2 KHz), as well as the bar indicator, which shows the level graphically.

📄 *Adjustments can be made to modulation of the auxiliary signal via the **SETUP** menu (☞ 10.3).*

10.2.d   MPX GRAPH sub-menu

This sub-menu graphically shows the modulation trend over time in three different scales indicated on the right. <u>The different scales can be selected by simply turning the knob</u>.

The first (**LAST 2 Min.**) shows the modulation trend for the last two minutes:

The second (**LAST 2 Hr.**) shows the modulation trend for the last two hours:

The third (**LAST 24 Hr.**) shows the modulation trend for the last 24 hours:

Consequently, the graph shown on the third example screen approximately shows the modulation trend for the last two hours.

📄 *The screens are shown cyclically. As such, at the third screen, turning the knob clockwise will take you back to the first screen. Similarly, if you are at the first screen and you turn the knob anti-clockwise, the last screen will be selected.*

10.2.e   SYSTEM sub-menu

The screen for this sub-menu shows the key parameters (set frequency, mono/stereo mode, etc.) as follows:

- **Frequency:** indicates the operating frequency (in the example, 98.00 MHz).
- **Mode:** indicates **Mono**, **Stereo**, **Mono L+R**, or **Mpx** mode (in the example, **Stereo**).
- **Preemphasis:** indicates the modulation preemphasis value (in the example, 50 microseconds).
- **Elapsed hours:** indicates the time elapsed since the device was first turned on in the factory (in the example, 1 hour).

📖 *These adjustments are available via the **SETUP** menu (🖝 10.3.a and 10.3.f).*

10.2.f VOLTAGE sub-menu

The screen for this sub-menu indicates the device's power voltages as follows:

- **Vsupply+** (positive voltage supply) – indicates the positive voltage supply for the low power section (in the example, +12.27V)
- **Vsupply-** (negative voltage supply) – indicates the negative voltage supply for the low power section (in the example, -13.23V)
- **Vsupply2+** (positive voltage 2) – indicates the voltage supply for the power section (in the example, +29.62V)
- **GSM Batt** (GSM battery voltage supply) – indicates the voltage for the battery that powers the optional remote control unit via GSM cellular phone (in the example, **NP** indicates that the optional module is not present)

10.2.g TEMPERAT. sub-menu

The screen for this sub-menu indicates the current operating temperatures as follows:

- **CPU temp.** – indicates the current CPU temperature (in the example, +31 °C)
- **RF temp.** – indicates the RF temperature, if pertinent to the model in use (in the example, **n.a.**, not available)

📖 *The line **RF temp.** Is available only on the more powerful transmitters (EXC100GT and up), which are equipped with a heat probe on the RF power stage.*

10.2.h VIEW LOG sub-menu

This sub-menu provides a historical record of events (transmitter turned on, turned off, on stand-by, etc.) and alarms (insufficient modulation, excessive reflected power, etc.) that took place during operation. The transmitter's memory (non volatile) can record up to 100 alarms/events. As soon as you enter this menu, the transmitter takes a few seconds to update the data; during this time, the screen **waiting...** appears. Next, the following screen will appear:

📄 *If the device already has 100 events/alarms in its memory, a new event/alarm that occurs will cancel out the oldest recording so that the new event/alarm can be saved (FIFO).*

📄 *Via the `SETUP` menu, you can decide whether to activate/deactivate each alarm (e.g., low power, insufficient modulation, etc.), and set new detection thresholds (📄 section 10.3.l). Through this menu, you can also delete the alarm history.*

📄 *If an alarm event occurs when you are accessing the `VIEW LOG` menu, you must exit and re-enter the `VIEW LOG` menu in order to view the alarm on the event list.*

In the above example, an `Mpx Low` alarm is shown

- **`Alarm 002 of 034`**, meaning the second alarm of thirty-four recorded events
- **`Mpx Low`** indicates that the type of alarm refers to insufficient modulation
- **`Start:`** followed by the date and time, indicates when the alarm event started
- **`End:`** indicates the date and time at which the transmitter returned to normal operation.

As such, the duration of the alarm event can be calculated; in this example, 16 minutes. To select subsequent alarm events (less recent, with higher numbers), turn the knob anti-clockwise; turning the knob clockwise will take you to the most recent events.

10.3 SETUP **menu**

This menu allows you to program the device's operating parameters; for example, operating frequency, output power, modulation, passwords, etc. It is divided into the following three pages:

SETUP Page 1

SETUP Page 2

SETUP Page 3

To move from one page to another, select the commands **`NEXT PAGE`** or **`PREV PAGE`** using the knob, then press to confirm.

As you can see, the three pages allow you to access the following settings:

- **FREQUENCY** – frequency increment steps and operating frequency (🖭 10.3.a)
- **POWER** – output power level (🖭 10.3.b)
- **MPX SENS** – modulation sensitivity (🖭 10.3.c)
- **AUX SENS** – auxiliary modulation sensitivity, e.g., RDS (🖭 10.3.d)
- **LIMITER** – maximum deviation limiter (🖭 10.3.e)
- **MODE** – transmission mode, e.g., stereo/mono and preemphasis (🖭 10.3.f)
- **DISPLAY** – display backlighting and contrast (🖭 10.3.g)
- **SET IN** – logic levels for the ENABLE line and related activation mode (🖭 10.3.h)
- **SET OUT** – logic levels for remote control (🖭 10.3.i)
- **DATE TIME** – system date and time (🖭 10.3.j)
- **PASSWORD** – set passwords (🖭 10.3.k)
- **SET ALARM** – alarm identification mode (🖭 10.3.l)
- **ETHERNET** – Ethernet LAN interface settings (🖭 10.3.m)
- **POW TIMER** – set automatic power reduction during specific time periods (🖭 10.3.n)
- **MODEM** – modem modes (🖭 10.3.o)

10.3.a   FREQUENCY setting

Used to define the transmitter's operating frequency.

The following parameters can be set:

- **Step** – frequency increments can be selected (in the example, 100 KHz)
- **Frequency** – operating frequency

Use of this menu is described in section 8.1.b.

10.3.b   POWER setting

Used to adjust the transmitter's output power.

The display shows the following:

- **Pow. set** – set power
- **Pow. out** – measurement of the power supplied

Use of this menu is described in section 8.1.c.

10.3.c   MPX SENS setting

Used to adjust modulation input sensitivity according to the low frequency level available.

The display shows the following:

- **Mpx** – followed by the deviation value, expressed in KHz (in the example, 80.2 KHz) and in dB, in reference to a deviation of 75 KHz (0dB = 75 KHz)
- **Nom. input** – nominal value of low frequency input level (in the example, + 6.0 dBm)

Use of this menu is described in section 8.1.d.

10.3.d AUX SENS (RDS/SCA sensitivity modulation) setting

Used to adjust the present modulation result of the single auxiliary signal (RDS/SCA).

The display shows the following:

- **Aux** – followed by a deviation value expressed in KHz (in the example, 1.9 KHz) and in dB, in reference to a deviation of 75 KHz (0dB = 75 KHz)
- **Nom. input** – nominal value of auxiliary signal input level

To change the auxiliary modulation:

1) Ensure that the **EDIT** option is selected; otherwise, turn the knob to select it, then press to confirm.
2) A value will be indicated after **Nom. input**. This indicator is normally predefined at **+0.0 dBm**.
3) Turn the knob to change the value, based on the modulation level used. The peak deviation indicated by **Aux**, expressed in KHz, will consequently change. You will note that, to the right of the deviation, the value of the modulating signal will be indicated in dB, against the nominal value set.
4) Ensure that the deviation measured does not exceed local regulations, then press the knob to confirm the setting.
5) Using the knob, select **OK** to save the settings, **EDIT** to make further changes, or **ABORT** to exit without saving the new settings, then press to confirm (for further details regarding these commands, see 🕮 9.4.a).

10.3.e LIMITER setting

Used to limit the peak modulation at a maximum value.

The display shows the following:

- **Limiter** – followed by **OFF** if deactivated, or by a value expressed in dB, in reference to a deviation of 75 KHz (0dB = 75 KHz)
- **Mpx** – measurement of the current peak deviation value, expressed in KHz (in the example, 81.4 KHz) in dB, in reference to a deviation of 75 KHz (0dB = 75 KHz)

In addition, the bar indicator graphically shows the current peak deviation value.

By changing the **Limiter**, you can set a maximum modulation value beyond which the limiter will activate. Use of this menu is

described in section 8.1.e.

📄 *When the limiter begins to intervene, the modulation distortion increases. As such, the modulation sensitivity should be adjusted (🖎 section 10.3.c) so the limiter intervenes sporadically. Using this approach, its operation is generally imperceptible.*

10.3.f   MODE setting

Used to define whether the transmitter operates in mono or stereo, and its preemphasis value.

The display shows the following:

- **`Mode`** – followed by **`Mono`** (from the **RIGHT** input (🖎 ref. [22] section 5.2), **`Stereo`**, **`Mono L+R`** (monophony obtained through the sum of the stereo channels), or **`Mpx`** (external multiplex modulation signal originating from the **MPX** input (🖎 section 5.2 ref. [17]).
- **`Preemphasis`** – followed by the current preemphasis value, expressed in microseconds.

To change the auxiliary modulation:

1) Ensure that the **`EDIT`** option is selected; otherwise, turn the knob to select it, then press to confirm. A value will be indicated after **`Mode`**.
2) Turn the knob to change the setting to **`Mono`**, **`Stereo`**, **`Mono L+R`**, or **`Mpx`** according to your requirements, then press the knob. A value will be indicated after **`Preemphasis`**.
3) Turn the knob to change the setting to **`0`**, **`25`**, **`50`**, or **`75`** microseconds, according to your requirements (50 microseconds for Italy), then press the knob to set the value.
4) Using the knob, select **`OK`** to save the settings, **`EDIT`** to make further changes, or **`ABORT`** to exit without saving the new settings, then press to confirm (for further details regarding these commands, see 🖎 9.4.a).

10.3.g   DISPLAY setting

Used to optimize display legibility, based on ambient lighting conditions and the angle of the visual field.

This screen shows:

- **`Backlight`** – followed by the current backlighting value (in the example, 3)
- **`Contrast`** – followed by the current contrast value (in the example, 4)

To change these parameters:

1) Ensure that the **`EDIT`** option is selected; otherwise, turn the knob to select it, then press to confirm. A value will be indicated after **`Backlight`**.
2) Turn the knob to change the backlighting, which will immediately change based on the setting selected (three levels are available; 3 corresponds to maximum illumination), then press to confirm. A value will be indicated after **`Contrast`**.
3) Turn the knob to change the contrast, which will immediately change based on the setting selected (twenty levels are available; 1 corresponds to maximum contrast), then press the knob to set the value.
4) Using the knob, select **`OK`** to save the settings, **`EDIT`** to make further changes, or **`ABORT`** to exit without saving the new settings, then press to confirm (for further details regarding these commands, see 🖎 9.4.a).

10.3.h   SET IN (remote control input) setting

Used to set logic levels for the ENABLE line in the remote control input (🖎 section 5.2 ref. [19]):

The following parameters can be adjusted:

- **Type** – transmitter's activation/deactivation mode. You can define whether this takes place via the front ON/STAND-BY button only (the ENABLE line is therefore deactivated), the rear line only (the front ON/STAND-BY button is deactivated), or using both commands (either the front button or the ENABLE line). To this end, the settings **BOTH**, **LOCAL**, and **REMOTE** (only via the ENABLE line) are available.

- **Disable logic:** - defines whether activation of the command takes place using a LOW or HIGH logic level. The device is normally deactivated with a low level, meaning when this line is grounded.

To set these parameters:

1) Ensure that the **EDIT** option is selected; otherwise, turn the knob to select it, then press to confirm. A value will be indicated after **Type**.

2) Turn the knob to change the setting to **BOTH**, **LOCAL**, or **REMOTE** according to your requirements, then pres the knob to set the value. A value will be indicated after **Disable logic**.

3) Turn the knob to change the setting to **LOW** or **HIGH** according to your requirements, then press the knob to set the value.

4) Using the knob, select **OK** to save the settings, **EDIT** to make further changes, or **ABORT** to exit without saving the new settings, then press to confirm (for further details regarding these commands, see ⮧ 9.4.a).

📄 *The ENABLE line is equipped with an internal pull-up resistance that maintains the line on high status in the absence of a signal or connection.*

📄 *If **BOTH** is set under **Type** and the ENABLE line on the rear input is short-circuited, the ON/STAND-BY button won't work correct when this setting performs a logic function (OR) for the two commands.*

10.3.i   SET OUT (remote control output) setting

This screen allows you to define the logic levels (high/low) used for remote control:

You can define whether the status of the following lines normally has a HIGH or LOW logic level:

- **OnAIR logic** – ON THE AIR line, which signals when the device is powered up
- **Alarm logic** – ALARM line, which signals the presence of an alarm

To set these parameters:

1) Ensure that the **EDIT** option is selected; otherwise, turn the knob to select it, then press to confirm. A value will be indicated after **OnAIR logic**.

2) Turn the knob to change the setting to **LOW** or **HIGH** according to your requirements, then press the knob to set the value. A value will be indicated after **Alarm logic**.

3) Turn the knob to change the setting to **LOW** or **HIGH** according to your requirements, then press the knob to set the value.

4) Using the knob, select **OK** to save the settings, **EDIT** to make further changes, or **ABORT** to exit without saving the new settings, then press to confirm (for further details regarding these commands, see ⮧ 9.4.a).

📄 *The alarm activation threshold levels can also be defined via the alarm menu (⮧ par. 10.3.l).*

10.3.j   DATE TIME setting

Used to set the date and time used by the system to generate an alarm history, and for other functions.

The display shows the following:

- **Time** – followed by the currently set time
- **Date** – followed by the currently set date

Use of this menu is described in section 8.1.g

☝ **It is important to correctly set the time and date; otherwise, the alarm history and various other functions will not operate correctly.**

10.3.k   PASSWORD (menu protection) setting

Used to activate and set the passwords to protect access to the menus. Two passwords are available:

- **LEV 1** – this level is more restrictive, and protects access to both the **VIEW** and the **SETUP** main menus.
- **LEV 2** – protects access to the **SETUP** menu only.

Each password is composed of four alphanumeric characters (numbers **0-9** or letters **A-Z**).

📄 *Activate only one of the two passwords (LEV 1 or LEV 2) according to your requirements. Activating both passwords may cause problems when using the transmitter.*

☝ **If one of the two passwords is activated, remember to store it in a safe location. Losing a password requires that the level 3 password be used; this password should never normally be used (🕮 section 10.4).**

The display shows the following:

- **SET PASSWORD LEV 1**
- **SET PASSWORD LEV 2**
- In order to gain confidence with the password settings menu and with its operation, we recommend that the password be set as **0 0 0 0** (four zeros) the first time.

LEVEL 1 PASSWORD

To protect both main menus, activate/set the **LEV 1** password as follows:

1) Select **SET PASSWORD LEV 1** with the knob, then press to confirm. The following screen will appear:

2) Using the knob, select **EDIT** and press to confirm. **OFF** (password deactivated) will be selected. Turn the knob to select **ON**, then press to confirm. The first character in the password will be highlighted.
3) Turn the knob to select the first character, then press to confirm. The second character in the password will be highlighted.

4) Turn the knob to select the second character, then press to confirm. The third character in the password will be highlighted.

5) Turn the knob to select the third character, then press to confirm. The fourth character in the password will be highlighted.

6) Turn the knob to select the fourth character, then press to confirm. The first character in the <u>**Confirm**</u> line will be highlighted; <u>repeat the same password on this line</u> in order avoid errors in setting the password.

7) Set the four characters on the **Confirm** line as explained in steps 3) to 6).

8) Using the knob, select **OK** to save the settings, **EDIT** to make further changes, or **ABORT** to exit without saving the new settings, then press the knob to confirm (for further details regarding these commands, see 🗐 9.4.a).

9) Store the password in a safe place.

📄 *If the four characters in the* **CONFIRM** *line do not correspond to the ones entered in the first line, a* **Wrong password** *message will appear. Press the knob to delete the screen and return to step 2).*

Once a level 1 password is activated, each time someone attempts to access the **SETUP** menu, they will receive an **Insert PASSWORD** message asking for the password to be entered. Access to the **VIEW** menu is timed, and the password will only be requested if the **VIEW** menu is not used for a given period of time.

LEVEL 2 PASSWORD

If you wish to protect the **SETUP** menu only, activate/set the **LEV 2** password using the same procedure as outlined above, ensuring that **SET PASSWORD LEV 2** is selected at step 1).

Once a level 2 password is activated, each time someone attempts to access the **SETUP** menu, they will receive an **Insert PASSWORD** message asking for the level 2 password to be entered. The **VIEW** menu will remain accessible at all times.

10.3.l   SET ALARM setting

As previously explained, if a parameter falls outside a given value for a specific period of time (for example: modulation 6 dB lower than the nominal value for more than 10 minutes), the **ON** LED will light up in red and the bottom part of the display will indicate the associated alarm (e.g., **Mpx Low** = insufficient modulation). The last 100 alarm events can be accessed via the **VIEW LOG** alarm history menu, under the main **VIEW** menu, as explained in a.

This menu allows you to activate/deactivate each diagnostic alarm, and to set its sensitivity level and the time period beyond which the alarm is activated. In addition, the **RESET LOG** function is available, which allows you to delete the alarm history saved.

The following alarms can be set:

- **LOW RF POW** – an alarm is issued when the RF power is detected at below a certain percentage value.
- **HIGH VSWR** – an alarm is issued when an excessive SWR (standing wave ratio) is detected.
- **UNLOCK** – an alarm is issued when the internal PLL frequency synthesizer is unlocked.
- **MPX** – an alarm is issued when low (or no) modulation is detected for a given period of time.

In general, to set alarms:

1) Turn the knob to select the alarm that you wish to activate/configure (e.g., **LOW RF POW**), then press to confirm.

2) Ensure that the **EDIT** option is selected; otherwise, turn the knob to select it, then press to confirm. The first value to be set will be highlighted.

3) Turn the knob to change the setting according to your requirements, then press to set.

4) If the setting includes this option, the second alarm setting will be highlighted. Turn the knob to change the setting according to your requirements, then press to set.

5) Using the knob, select **OK** to save the settings, **EDIT** to make further changes, or **ABORT** to exit without saving the new settings, then press the knob to confirm (for further details regarding these commands, see 🗐 9.4.a).

LOW RF POW

Two parameters can be set from this screen:

- **PreAl. Low Power** – if the output power falls below the percentage set here (in reference to the nominal value set using the command outlined in section 10.3.b), a warning <u>pre-alarm</u> is issued by <u>flashing</u> the **ALARM** LED. The pre-alarm is <u>not</u> saved in the event history.
- **Alarm Low Power** – if the output power falls below the percentage set here (in reference to the nominal value set using the command outlined in section 10.3.b), an <u>alarm</u> is issued via a <u>steadily lit</u> **ALARM** LED. Obviously, this alarm is saved in the event history.

To set the low power pre-alarm and alarm:

1) Ensure that the **EDIT** option is selected; otherwise, turn the knob to select it, then press to confirm. A value will be indicated after **PreAl.Low Power**.
2) Turn the knob to change the percentage to meet your requirements, then press to confirm. A value will be indicated after **Alarm Low Power**.
3) Turn the knob to change the percentage to meet your requirements, then press to confirm.
4) Using the knob, select **OK** to save the settings, **EDIT** to make further changes, or **ABORT** to exit without saving the new settings, then press to confirm (for further details regarding these commands, see ◧ 9.4.a).

HIGH VSWR

From this screen, a value can be set for reflected power, beyond which a high SWR alarm will be issued.

In the above example, the **Refl. Power alarm** is issued when a reflected power of 2.8 W is exceeded.

To set the high reflected power alarm:

1) Ensure that the **EDIT** option is selected; otherwise, turn the knob to select it, then press to confirm. A value will be indicated after **Refl. Power alarm**.
2) Turn the knob to change the reflected power level according to your requirements, then press to confirm.
3) Using the knob, select **OK** to save the settings, **EDIT** to make further changes, or **ABORT** to exit without saving the new settings, then press to confirm (for further details regarding these commands, see ◧ 9.4.a).

UNLOCK

From this screen, a time can be set, beyond which an alarm will be issued if the transmitter's internal synthesizer continues to be unlocked.

In the above example, if the synthesizer is unlocked for a `Delay` of 31 seconds, an alarm will be issued.

To set the synthesizer unlock alarm:

1) Ensure that the `EDIT` option is selected; otherwise, turn the knob to select it, then press to confirm. A value will be indicated after `Delay`.
2) Turn the knob to change the time according to your requirements, then press to confirm.
3) Using the knob, select `OK` to save the settings, `EDIT` to make further changes, or `ABORT` to exit without saving the new settings, then press to confirm (for further details regarding these commands, see ⇲ 9.4.a).

MPX

From this screen, you can personalize the insufficient modulation alarm. Two parameters can be set:

- `Mpx Alarm` – the threshold below which modulation, expressed in dB in reference to a deviation of 75 KHz (0dB = 75 KHz), is considered insufficient.
- `Delay` – the time in seconds after which, if modulation remains insufficient, an alarm is issued.

In the above example, the alarm is issued only when modulation constantly remains at least 16 dB below 75 KHz for 60 seconds.

To set the insufficient modulation pre-alarm and alarm:

1) Ensure that the `EDIT` option is selected; otherwise, turn the knob to select it, then press to confirm. A value will be indicated after `Mpx Alarm`.
2) Turn the knob to change the modulation to a level that is considered insufficient for your requirements, then press to confirm. A value will be indicated after `Delay`.
3) Turn the knob to change the time interval according to your requirements, then press to confirm.
4) Using the knob, select `OK` to save the settings, `EDIT` to make further changes, or `ABORT` to exit without saving the new settings, then press to confirm (for further details regarding these commands, see ⇲ 9.4.a).

RESET LOG

As previously mentioned, this menu does not allow you to configure alarms, but rather to delete the alarm history.

When you access this menu, two simple commands are available by turning the knob:

- `YES` – the alarm history will be deleted. The message `waiting…` will appear while the history is being deleted.
- `NO` – the alarm history will not be deleted (in cases of accidental access to the sub-menu, where there is no actual need to delete the history).

After either command is selected, the display will return to the `SET ALARM` sub-menu.

☞ **The alarm/event history delete function does not request confirmation; as such, be careful not to accidentally delete the history.**

10.3.m ETHERNET (LAN) setting

Used to set parameters related to the Ethernet LAN interface.

The display will show the following parameters:

- **MAC** – physical Media Access Control address for the internal network card.
- **IP** – static IP address for the internal network card.

To set the IP address:

1) Ensure that the **EDIT** option is selected; otherwise, turn the knob to select it, then press to confirm. The first number after **IP** will be highlighted.
2) Turn the knob to change the first number of the IP address, then press to confirm. The second number will be highlighted.
3) Turn the knob to change the second number of the IP address, then press to confirm. The third number will be highlighted.
4) Turn the knob to change the third number of the IP address, then press to confirm. The fourth number will be highlighted.
5) Turn the knob to change the fourth number of the IP address, then press to confirm.
6) Using the knob, select **OK** to save the settings, **EDIT** to make further changes, or **ABORT** to exit without saving the new settings, then press to confirm(for further details regarding these commands, see 🖰 9.4.a).

10.3.n POW TIMER setting

Used to automatically decrease the transmitter's power by a given percentage during a specific time period (e.g., night time).

The display shows the following parameters:

- **OFF** or **ON** – power reduction deactivated (OFF) or activated (ON).
- **Reduce**: percentage of power reduction compared to the power set via the menu, as per section 10.3.b.
- **From** – followed by two sets of numbers (hour and minute). Indicates the time in which the transmitter will reduce power.
- **To** – followed by two sets of numbers (hour and minute). Indicates the time in which the transmitter will return to the normal power level set via the menu, as per section 10.3.b.

To set automatic power reduction:

1) Ensure that the **EDIT** option is selected; otherwise, turn the knob to select it, then press to confirm. A value will be displayed after **OFF** or **ON**.
2) Turn the knob to set **OFF** or **ON** according to your requirements, then press to confirm. A value will be indicated after **reduce**.
3) Turn the knob to change the power reduction percentage, then press to confirm. The first number (hour) will be highlighted after **from**.
4) Turn the knob to change the hour in which the power reduction will start (24-hour clock), then press to confirm. The second number (minutes) will be highlighted after **from**.
5) Turn the knob to change the minute in which the power reduction will start, then press to confirm. The first number (hour) will be indicated after **to**.
6) Repeat steps 4 and 5 to set the time in which the transmitter will return to normal power.
7) Using the knob, select **OK** to save the settings, **EDIT** to make further changes, or **ABORT** to exit without saving the new settings, then press to confirm (for further details regarding these commands, see 🖰 9.4.a).

10.3.o MODEM setting

If the transmitter is equipped with an optional modem, its parameters can be defined via this screen. For further details, refer to the documentation provided with this option.

📄 *If a modem has not been installed, the screen will indicate* `Modem not present.`

10.4 Hidden menus (under level 3 password)

Beside the two level 1 and level 2 passwords descrive in the par. 10.3.k, a third password, called "level 3 password" is available. It's preset during the production, it's always active and allows to access the `SETUP` sub menu and the one which allows the activation/change of the level 1 and level 2 passwords <u>even when the user has activated and forgotten them</u>.

There are two hidden menus which can be accessed only by entering the level 3 password. Briefly, accessing the `SETUP` menu by means of the level 3 password allows to:

- Access the `SETUP` sub menu and the one which allows the activation/change of the level 1 and level 2 passwords even when the user has activated and forgotten them.
- Change the level 3 password in order to change the one preset during the production of the equipment.

10.4.a Accessing the level 3 password

To access the `SETUP` submenu when you have forgotten the level 1 or level 2 password currently active:

1) Use the knob to select the `SETUP` menu and press it to confirm.
2) When the password is prompted, enter the level 3 password which was set during the production to `A B C D`.

3) Select the password change menu and change the level 1 or level 2 password which is currently active (📖 par. 10.3.k.)
4) Note down the new level 1 or level 2 password currently active and store it in a safety pace.

10.4.b Changing the level 3 password

Some unauthorized people who know the level 3 password preset in the production could alter the setting of the transmitter even when it's protected with either one or both the level 1 or two passwords. For this reason you can change the level 3 password preset in the production. <u>This operation must be done only if you are absolutely sure to note down the new level 3 password and stored it in a safety place</u>.

✋ **<u>IMPORTANT! Always note down the level 3 password and sore it in a safety place. Should you loose it, the total re-programming of the equipment or the CPU replacement at siel will be mandatory – with the related costs which this operation involves. This kind of service is not included in the warranty.</u>**

To change the level 3 password :

1) Use the knob to select the `SETUP` menu and press it to confirm.
2) When the password is prompted, enter the level 3 password which was set during the production to `A B C D`.

3) Select the `PASSWORD` submenu. As you can see, the command `SET PASSWORD LEV 3` (set level 3 password) also appears in it

4) Select **SET PASSWORD LEV 3** and change the password by following the procedure stated in par. 10.3.k.

📄 *You can change the level 3 password, but not disable it, because its setting is always fixed to* **ON**.

11 MAINTENANCE AND WARRANTY

11.1 Maintenance

🖐 **Strictly follow the instructions outlined in this section.**

11.1.a Clogging caused by dust

Since the transmitter is cooled by air, it is subject to clogging caused by dust. Because of the high-quality materials used in its manufacture, if it is installed as set forth according to the instructions in Chapter 6, it will not require special maintenance for quite some time.

A regular service routine, mainly to remove internal dust, is recommended every 6 months to one year at the most. Keep in mind that 90% of the air circulation is restricted to the main internal ventilation channel and does not affect the components.

11.1.b Ventilation fan

If the transmitter is equipped with forced air, we recommend changing the ventilation system regularly, especially in higher-temperature environments. As a precaution, substitution is recommended every 2 years; always use the same, high-quality, ball bearing type fan.

11.1.c Periodic overhaul

After a few years of continuous service, it is advisable to have the device overhauled in our factory or in a specialized Siel laboratory, where its characteristics can be checked against the initial parameters. If necessary, regular maintenance operations can also be carried out at this time.

It is especially important that the power supply be overhauled if the transmitter has been working at high temperatures, over 30 - 35°C.

Never modify the original settings without utilizing the proper testing equipment and standard procedures, and without having received authorization by Siel or an authorized representative.

11.2 Warranty

Like all Siel solid-state equipment, this transmitter series carries a one-year warranty on all its components, with the exception of the final RF power module, which may be damaged by faulty output connectors.

📄 *Notes:*

- This warranty will become null and void if the device is tampered with or if failure is due to improper use or maintenance, or external causes such as a mains over-voltage.
- This warranty covers work performed exclusively by our laboratories or those of our authorized representatives.
- Products shall be delivered to the laboratory carriage pre-paid, and shall be returned by freight forward.
- This warranty does not cover any indirect damage caused by non-operation or faulty operation

12 TROUBLESHOOTING

If all instructions set in this manual are followed, the EXC-GT series will guarantee several years of perfect service. However, should problems arise, refer to this chapter before contacting the local authorized assistance point.

12.1 Error messages

The following table explains the meaning of the main error messages and indicates the actions to be taken in order to solve the problem.

All alarms will be usually shown in any screen you are, and they will be overlapped on the upper screen section, where you normally see the company logo, system temperature and system time. In addition, the **ALARM** LED will light (🕮 5.2, point [1]).
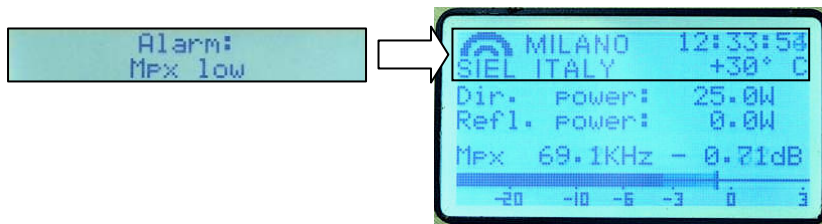
📖 *The messages below may appear during the amplifier normal operation as well as when the alarm data are displayed in the VIEW LOG sub-menu. For further details see the paragraph 10.2.h.*

12.1.a Mpx low (insufficient modulation)

The **Mpx low** alarm message appears when an insufficient modulation lasts for more than a given time. Both alarm delay and alarm threshold can be set in the alarms menu (🕮 10.3.l - **MPX**), respectively up to 180 seconds and < -16dB (as to 75 KHz frequency deviation, that is 0dB = 75 KHz).

12.1.b Refl Power High (excessive reflected power)
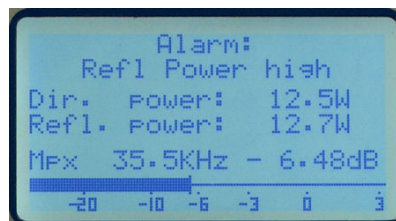
The **Refl Power high** alarm message appears when the reflected power level exceeds a threshold, usually set in the range from 5% to 7% of the maximum nominal power level. The threshold level can be adjusted via the alarms menu (🕮 10.3.l - **HIGH VSWR**).

If necessary, the maximum reflected power level can be automatically limited to the ~ 10% of the maximum output power level reducing the direct output power.

12.1.c   Over temperature
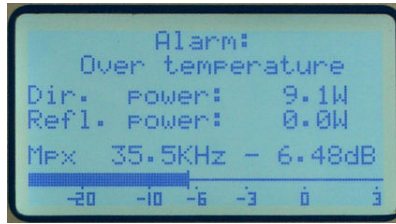
The `Over temperature` alarm may be referred to a system over temperature (CPU Temp.) or only to a RF power stage over temperature (RF temp.); each of the said temperatures is taken via a specific heat probe.

Before reaching the max allowed temperature, the alarm LED starts flashing, to signalize the approach to the limit condition. If the threshold is exceeded, the alarm LED stops flashing and starts steadily lighting. In this condition the output power level will be progressively reduced, to limit dissipation without completely blocking the transmitter operation.

To check whether the over temperature is due to whole system or to the RF power stage only, select the `Temperat.` sub-menu (🖈 10.2.g), in the `View` menu (🖈 10.2), which displays both the temperatures:
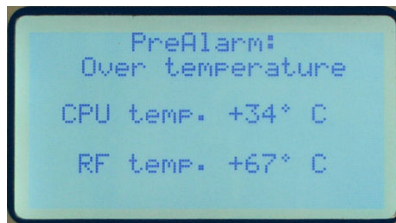
`CPU temp.` = system temperature

`RF temp.` = RF power stage temperature

12.1.d   Unlock (unlocked PLL synthesizer)

Unlock

Synthesizer unlock
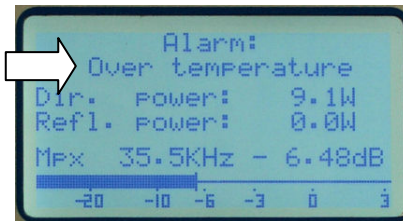
`Unlock` shows an unlock status of the built in synthesizer, generally meaning a real transmitter fault. When this failure happens it's quite important to contact the local authorized assistance point.

Depending on the software release of the control firmware, this alarm is often "masked" by the consequent low RF direct output power alarm, however the **LOCK** LED keeps off whereas the **ALARM** LED steadily lights.

With the most recent software releases the `Synthesizer unlock` priority alarm will be shown in the current screen, immediately signaling such condition.

13 CIRCUIT DESCRIPTION

✋ **This section's sole purpose is to provide general explanations about the device operation in order to simplify the maintenance by skilled personnel authorized by Siel. As already mentioned, no internal adjustments are required for normal operation. Tampering with the internal settings renders the warranty null and void and could seriously damage the equipment, compromising the guaranteed performance.**

✋ **Several modules are highly specialized and difficult to repair even by skilled technicians and must therefore be replaced with new modules, and, if possible, sent to the manufacturer in order to verify the possibility of a repair.**

✋ **Any inspection of the described modules must be carried out with the cover removed and, in many cases, with the equipment connected to the mains power supply. Although some energized parts are insulated and difficult to reach, this involves the risk of accidental contact with the mains voltage. In order to avoid this, use only insulated tools and never touch the power supply transformer, the main switch or the power sockets when the equipment is connected to the mains.**

✋ **Do not operate the equipment without the covers properly screwed on. If the top cover is removed, malfunctioning of the equipment may occur, as well as of any other electronic measuring instrument, owing to the strong R.F. fields involved.**

📄 *All modules can be accessed and easily replaced with little, if any, adjustment, usually with no soldering needed.*

Please make reference to the diagrams in Section 16. The equipment is composed of the following elements...

14 TECHNICAL FEATURES

Frequency range ....87,5 ÷ 108 MHz

FM modulation .... 75 KHz (adjustable) peak deviation

        Mono..180kF3E

        Stereo 256kF3E

Audio/MPX input level .... -3,5 ÷ +12,5 dBm @ 75 KHz deviation

Audio input connectors.. XLR female

Aux channel input level (RDS/SCA)

        7,5 KHz deviation .... -12,5 ÷ +3,5 dBm

        2 KHz deviation ....-24 ÷ -8 dBm

Aux channel input impedance...10 KOhm

Modulation distortion

        7,5 KHz deviation .... <0,05 %, 0,02% typical

        2 KHz deviation .... <0,2 %, 0,05% typical

Mono S/N ratio

        30 ÷ 20000 Hz ....>76 dB, 86 dB typical

        CCIR ....>75 dB, 81 dB typical

Stereo S/N ratio

        30 ÷ 20000 Hz ....>72 dB, 77 dB typical

        CCIR ....>68 dB, 72 dB typical

Audio channels band width .... 30 ÷ 15.000 Hz ±0,1 dB

Preemphasis time constant.. selectable, 25/50/75 microseconds

Nominal RF output power ....25 ÷ 4.000 W depending on the model

Transmitter tuning steps... 10/100 KHz

Output power ALC stability...± 3%

Harmonics and spurious emissions ....< 80 dBc

RF output impedance... 50 Ohm

RF input connector..N type

RF antenna output connector... depending on the model

RF sampler connector...BNC type

Power supply

        Single phase...230 V$_{AC}$ (185÷265 V$_{AC}$)

        Three phase (only some models and on demand)... 400 V$_{AC}$ (320÷460 V$_{AC}$)

Total consumption.. depending on the model

Operating temperature range...recomm. 0 ÷ 35 °C; extreme: – 10 ÷ + 55 °C max

Relative umidity.. up to 95% not condensed

Dimensions .... depending on the model

Weight .... depending on the model

📄   *The above details may undergo changes without prior notice*

15 INDEX

16 ELECTRICAL, MECHANICAL DIAGRAMS AND PARTS LOCATION

Figure 1 – EXC30 Top view (open)

Figure 1 – EXC30 Top view (open)

Figure 2 – EXC30 General Wiring Diagram – E1161

COMPONENTS MARKED WITH "*" ARE OPTIONAL

Figure 3 – Control Mainboard/1 (LF and Mainboard section) – E0837CS (CS30111B)

Figure 4 – Control Mainboard/2 (LF Process Section) – E0837CS (CS30111B)
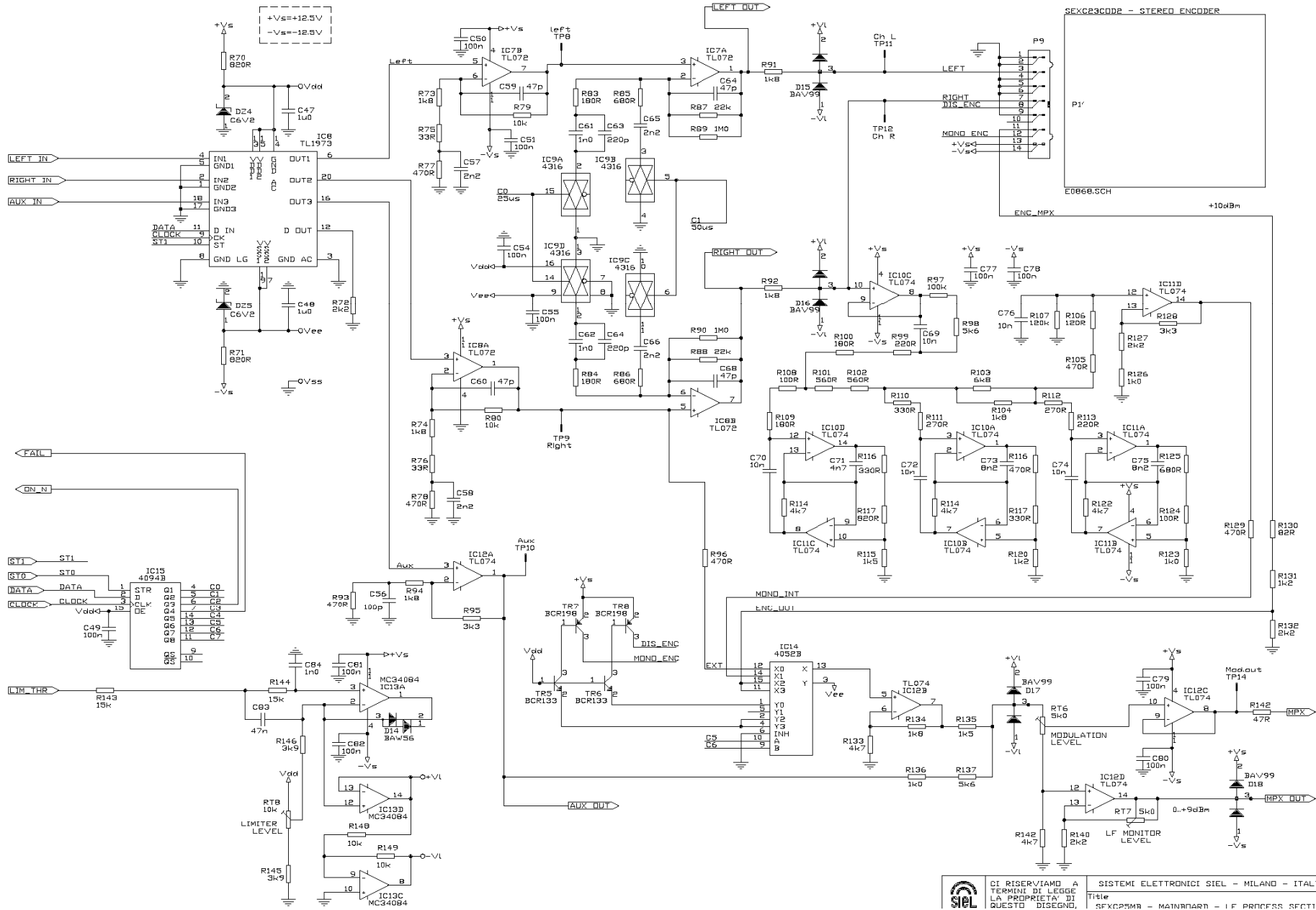
Figure 5 – LF and Mainboard – CS30111B (E0837CS)
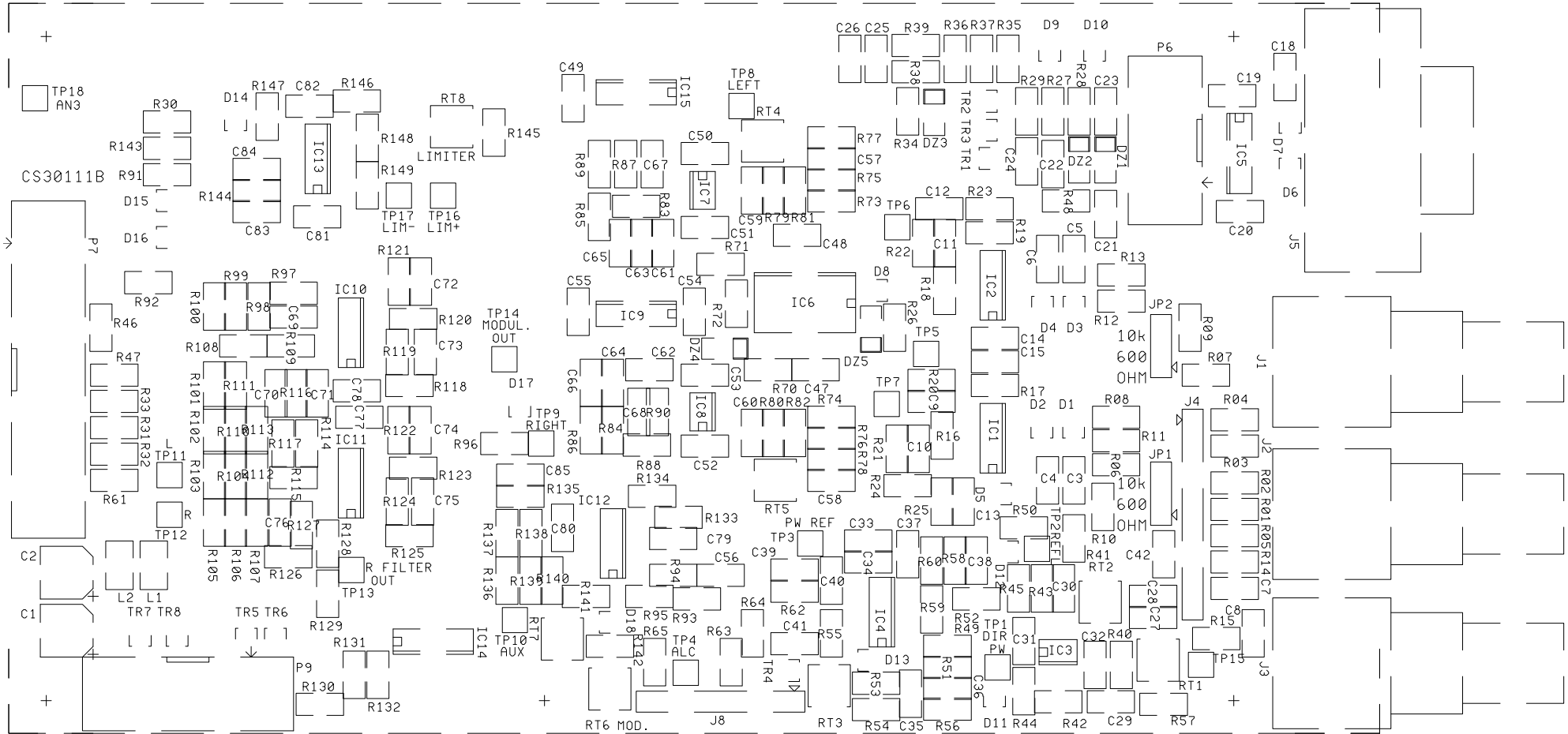
Figure 6 – CPU Controller Board 1/3 – E1148 (CS36121A)
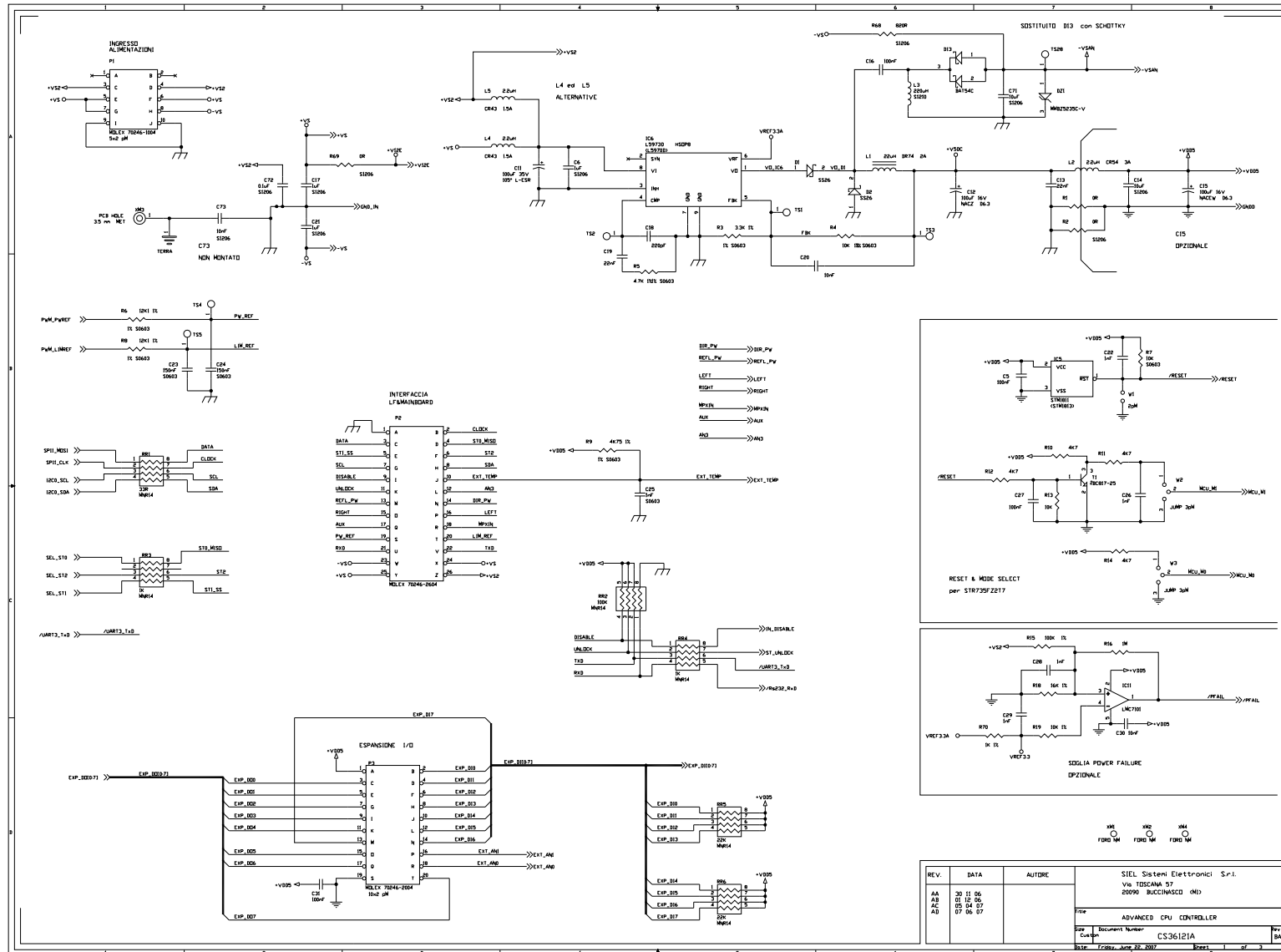
Figure 7 – CPU Controller Board 2/3 – E1148 (CS36121A)
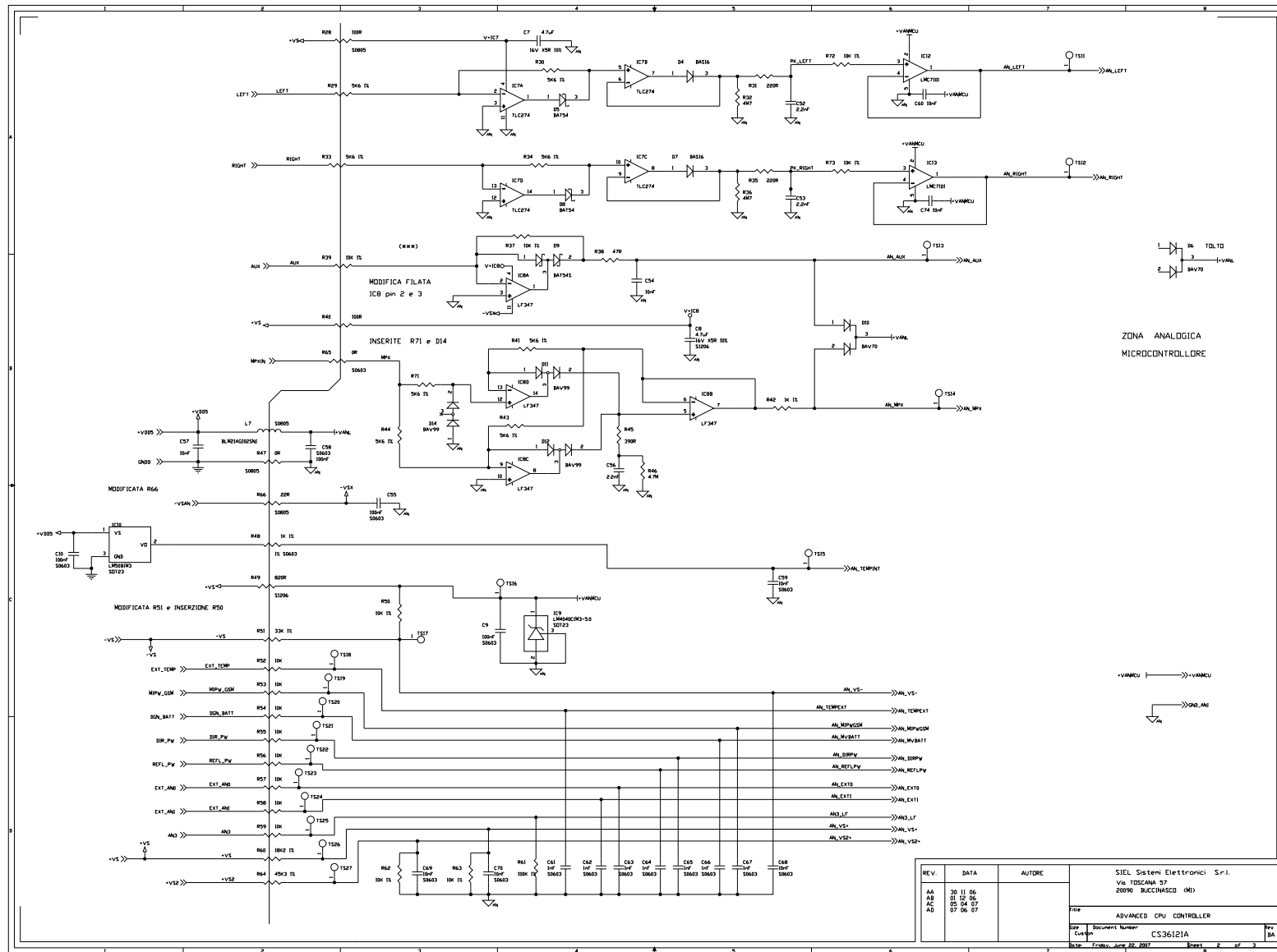
Figure 8 – CPU Controller Board 3/3 – E1148 (CS36121A)

Figure 9 – CPU Controller Board – CS36121A (E1148)
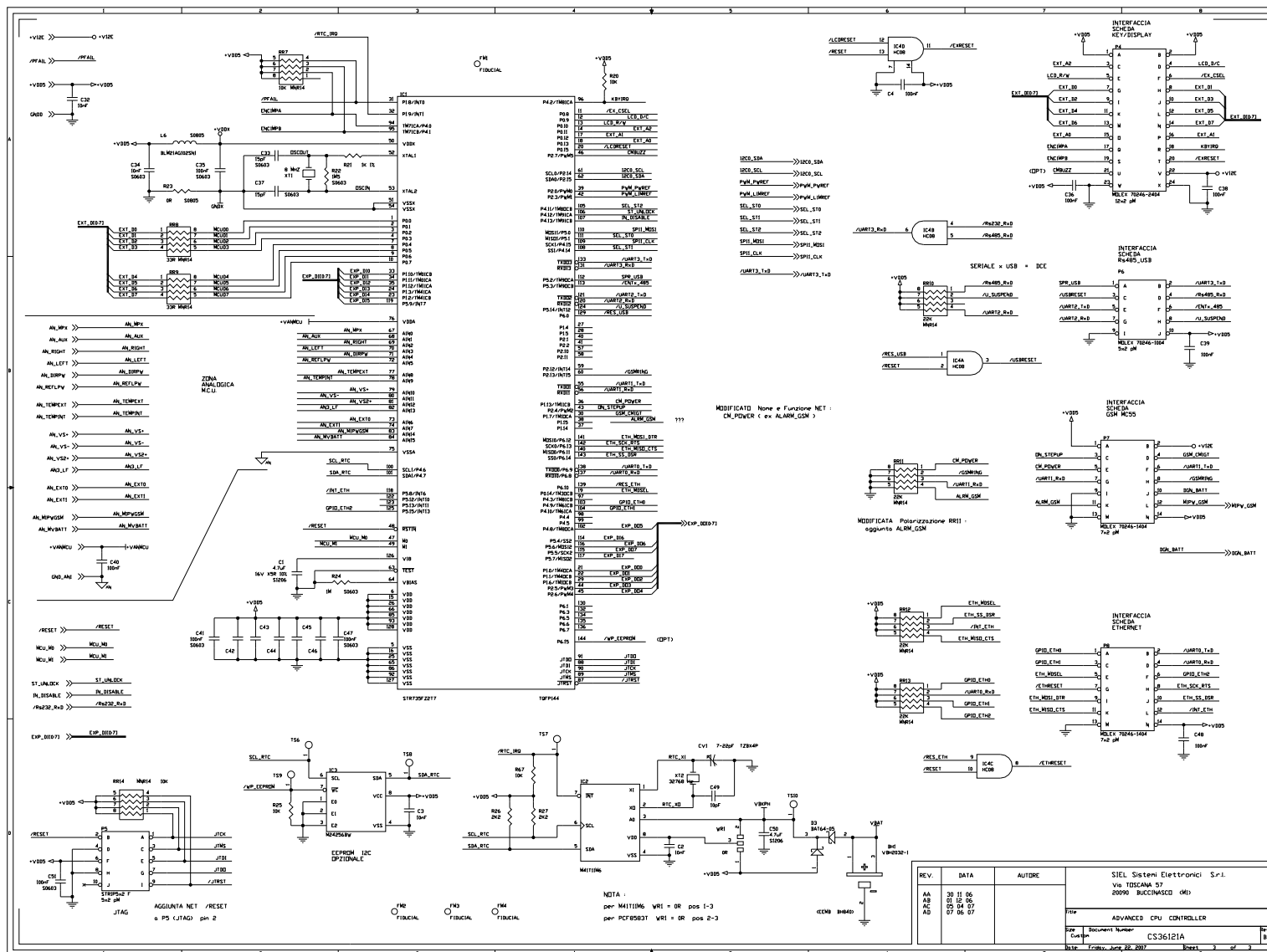
Figure 9 – CPU Controller Board – CS36121A (E1148)

Figure 10 – Keyboard and Display Board – E1157 (CS36072)
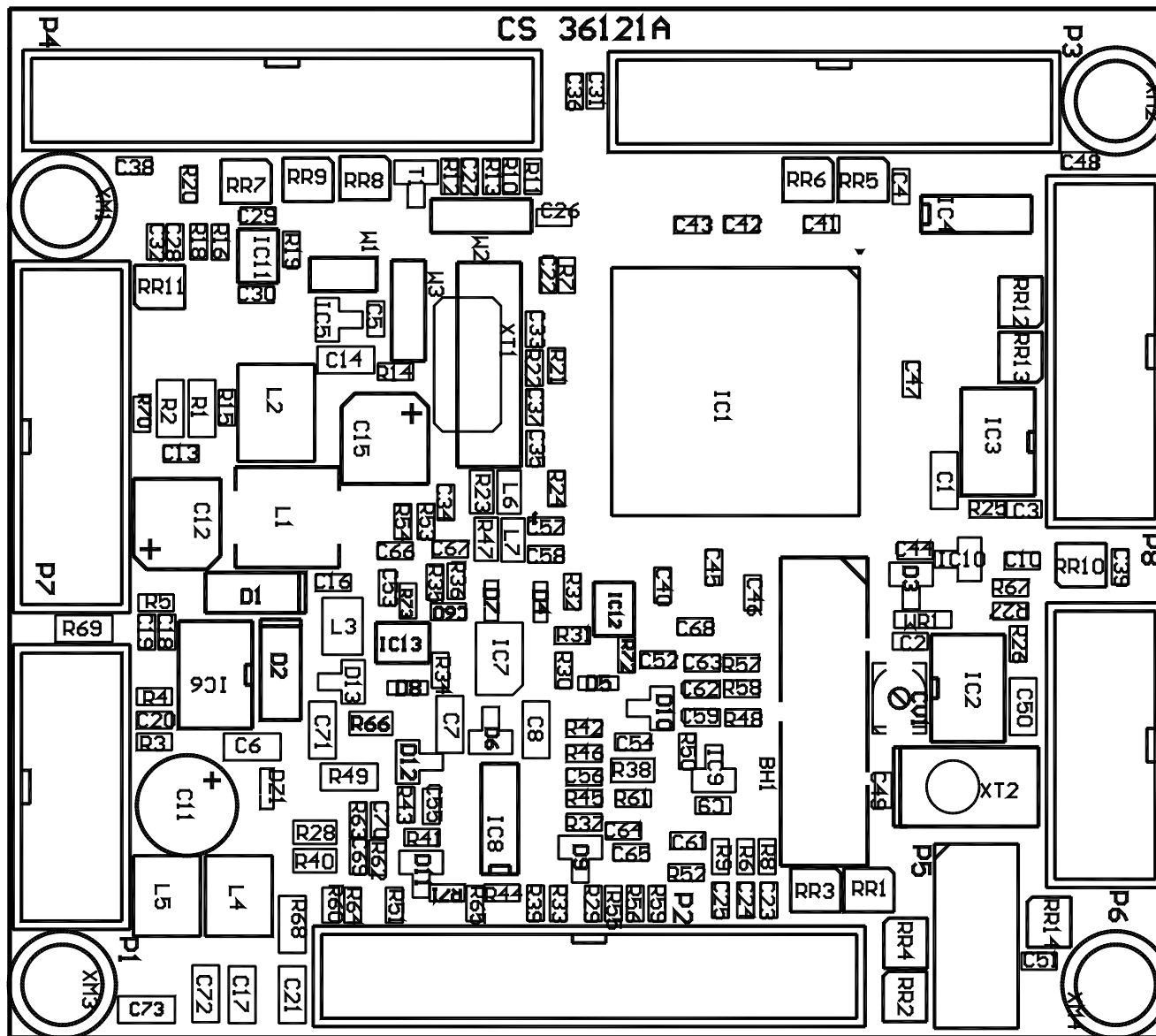
Figure 10 – Keyboard and Display Board – E1157 (CS36072)
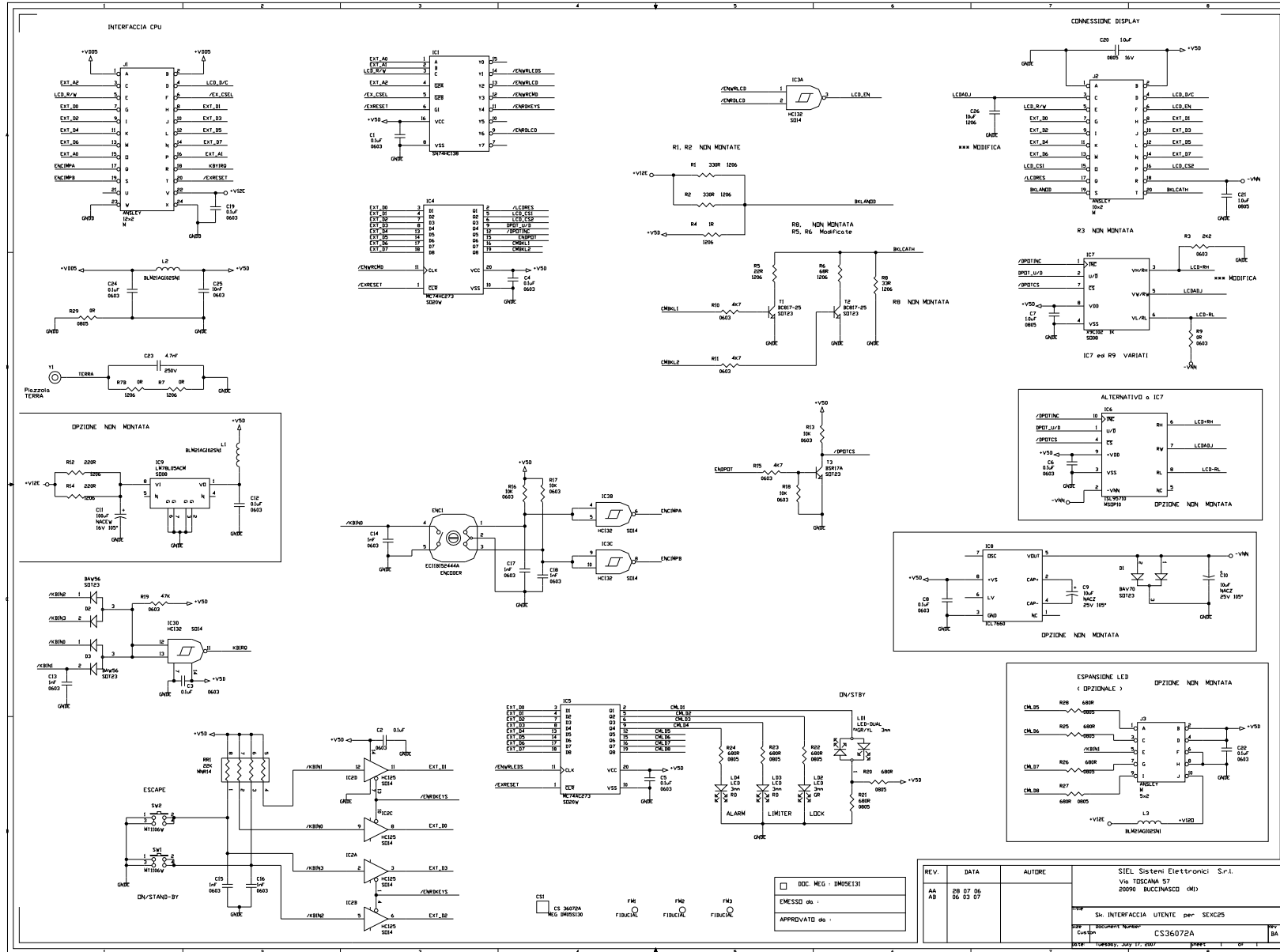
Figure 11 – Keyboard and display Board – CS36072 (E1157)
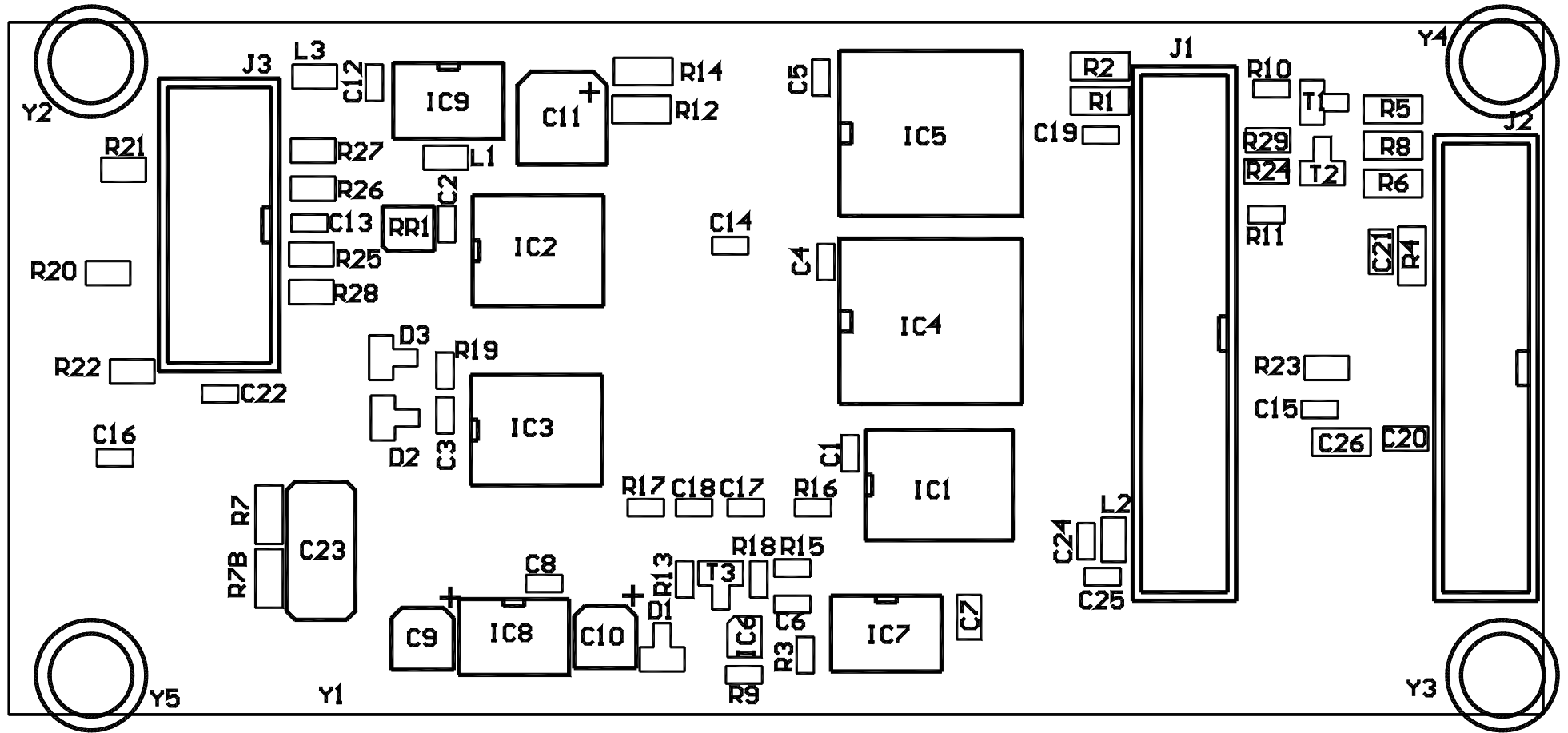
Figure 12 – FM Exciter Board – E0839m (CS29041)

Figure 13 – FM Exciter Board – CS29041 (E0839m)
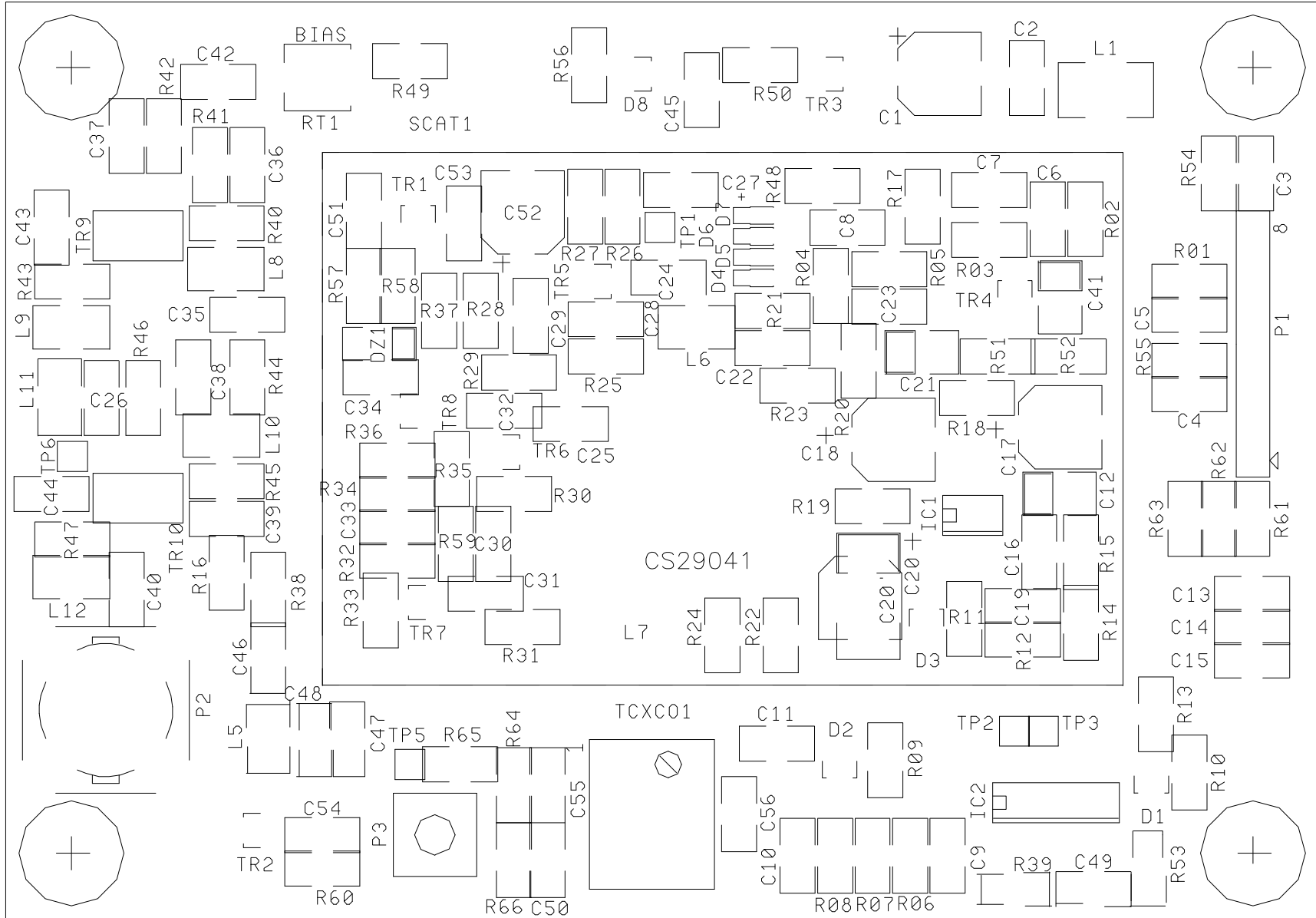
Figure 14 – Power Amplifier Board – E1137 (CS36092C)
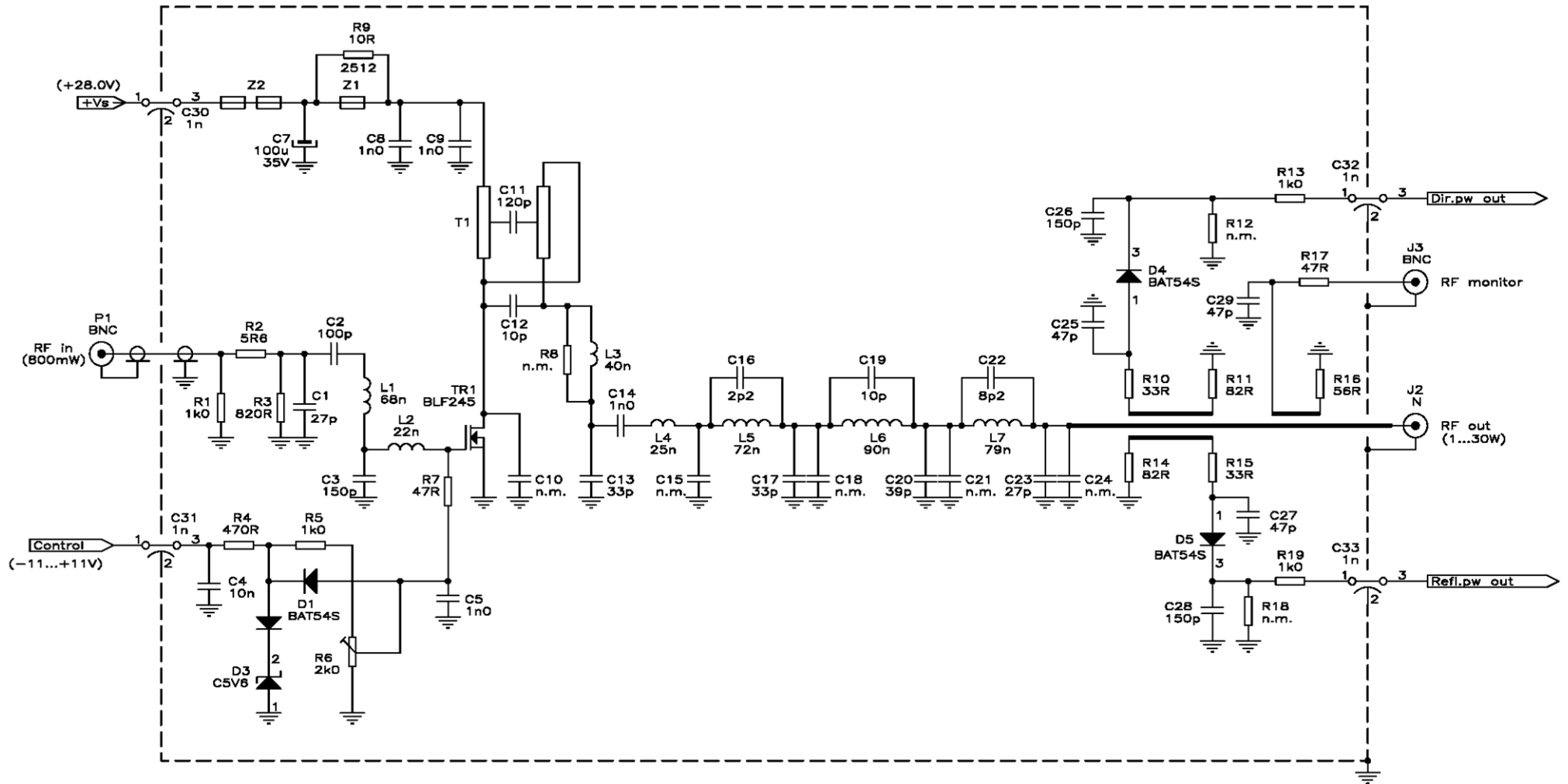
ATT.	R2	R3	R4
3dB	18	330	270
2dB	12	470	390
1dB	5.6	1k0	820

VALUE SHOWN ARE ONLY TYPICAL AND MAY VARY
DUE TO PRODUCTION ADJUSTMENTS

° CS 36092C

SIEL

CI RISERVIAMO A TERMINI DI LEGGE LA PROPRIETA' DI QUESTO DISEGNO, CON IL DIVIETO DI RIPRODURLO O DI RENDERLO NOTO A DITTE CON—

SISTEMI ELETTRONICI SIEL — MILANO — ITALY

Title SEXC25AMP2 — 30W FM POWER AMPLIFIER

Size B | Document Number E1137/2 — File E1137.sch

Figure 15 – Power Amplifier Board – CS36092C (E1137)
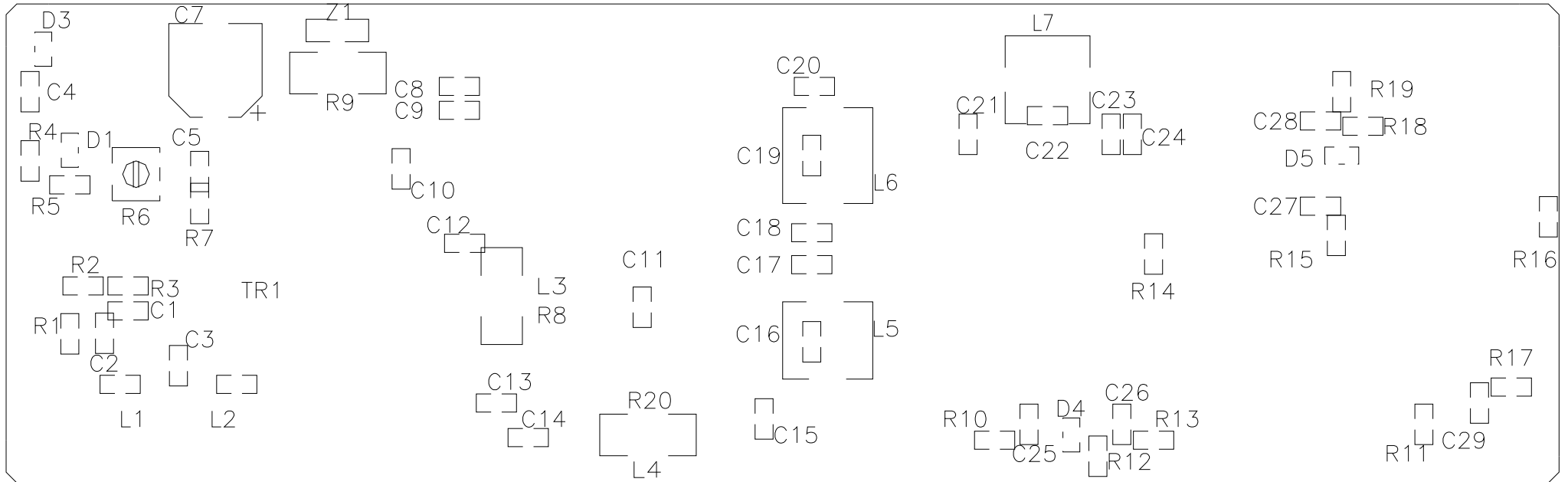
Figure 16 – Mains Input SMPS Board – E0840CS (CS29052A)
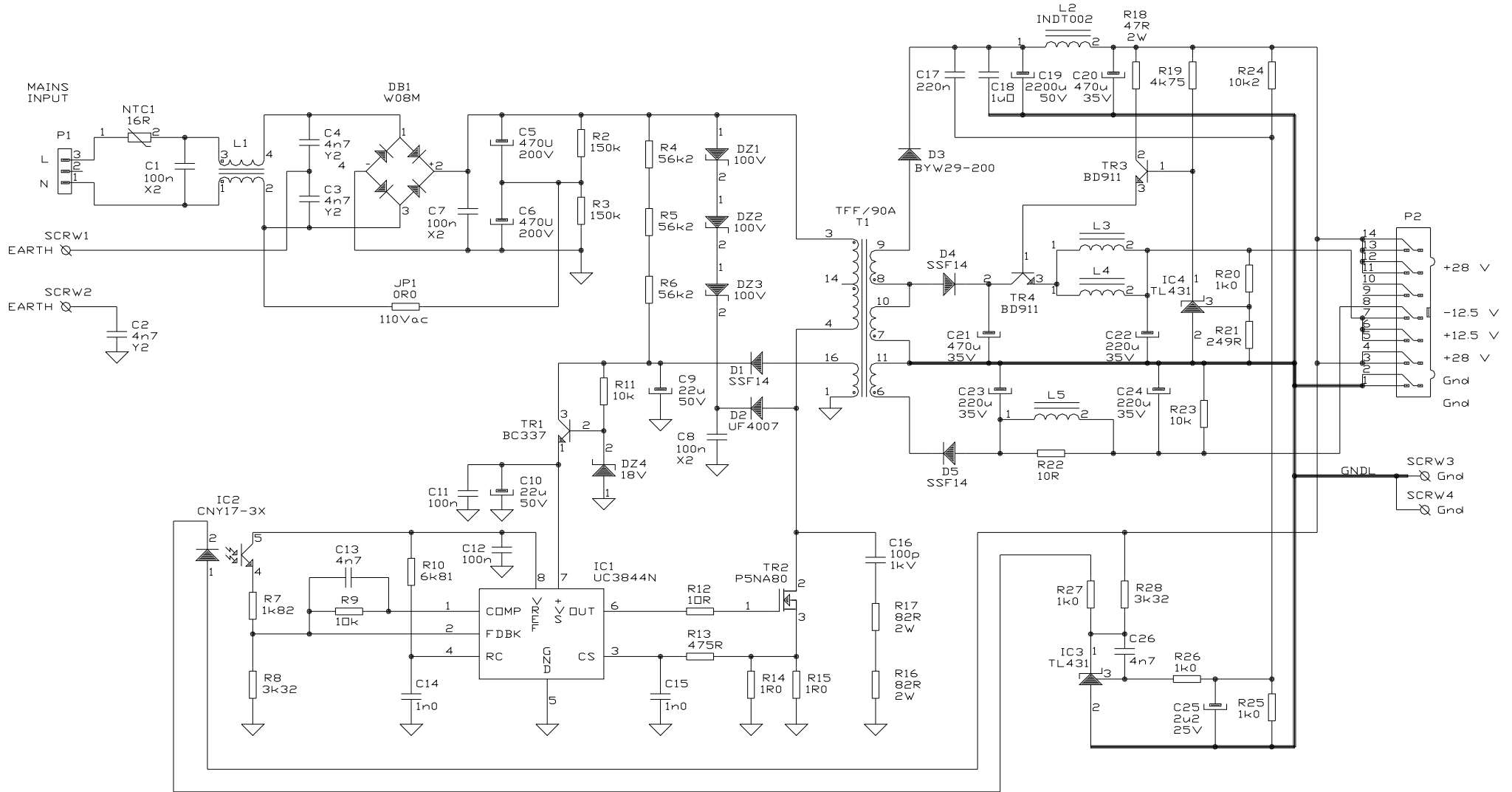
COMPONENTS SHOWN ARE TYPICAL

AND MAY VARY IN PRODUCTION

CI RISERVIAMO A
TERMINI DI LEGGE
LA PROPRIETA' DI
QUESTO DISEGNO,
CON IL DIVIETO
DI RIPRODURLO O DI REN-
DERLO NOTO A DITTE CON-

SISTEMI ELETTRONICI SIEL – MILANO – ITALY

Title
SEXC25AL2 – SMPS 80W, 28V/2.5A +-12.5V

Size	Document Number	RE
B	E0840 – file E0840.SCH	A

CS29052
SIEL

Figure 17 – Mains Input SMPS Board – CS29052A (E0840CS)

Figure 18 – Analog Input Board – E1124m
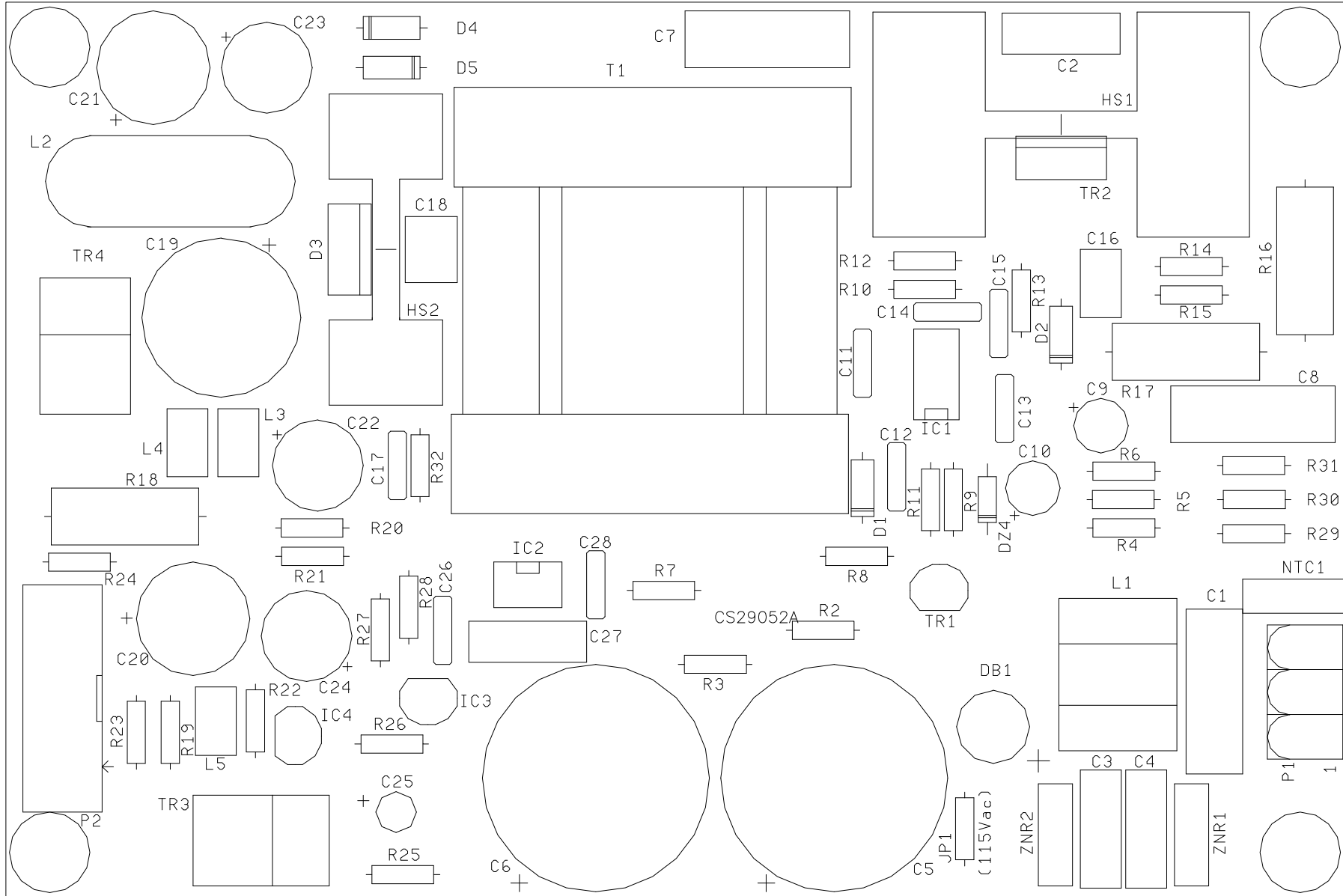
Figure 18 – Analog Input Board – E1124m
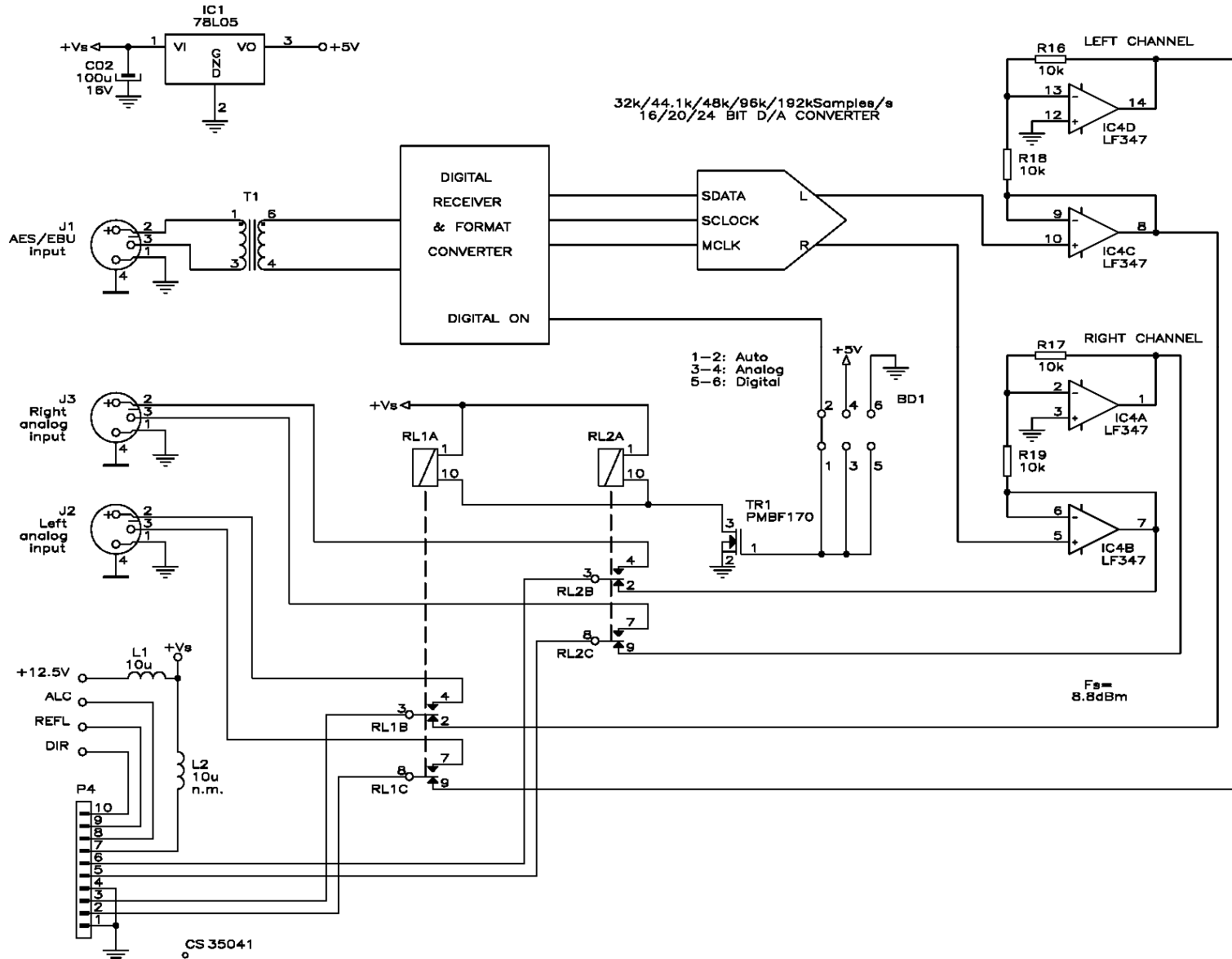
VALUE AND DIAGRAMS SHOWN ARE ONLY EXEMPLIFICATIVE
AND DO NOT REFLECTS REAL COMPONENTS

Figure 19 – AES/EBU Digital Input Board – CS35041A (E1124m)

Figure 20 – Stereo Encoder Board – E0868 (CS29121A)

Figure 20 – Stereo Encoder Board – E0868 (CS29121A)

Figure 21 – Stereo Encoder Board – CS29121A (E0868)
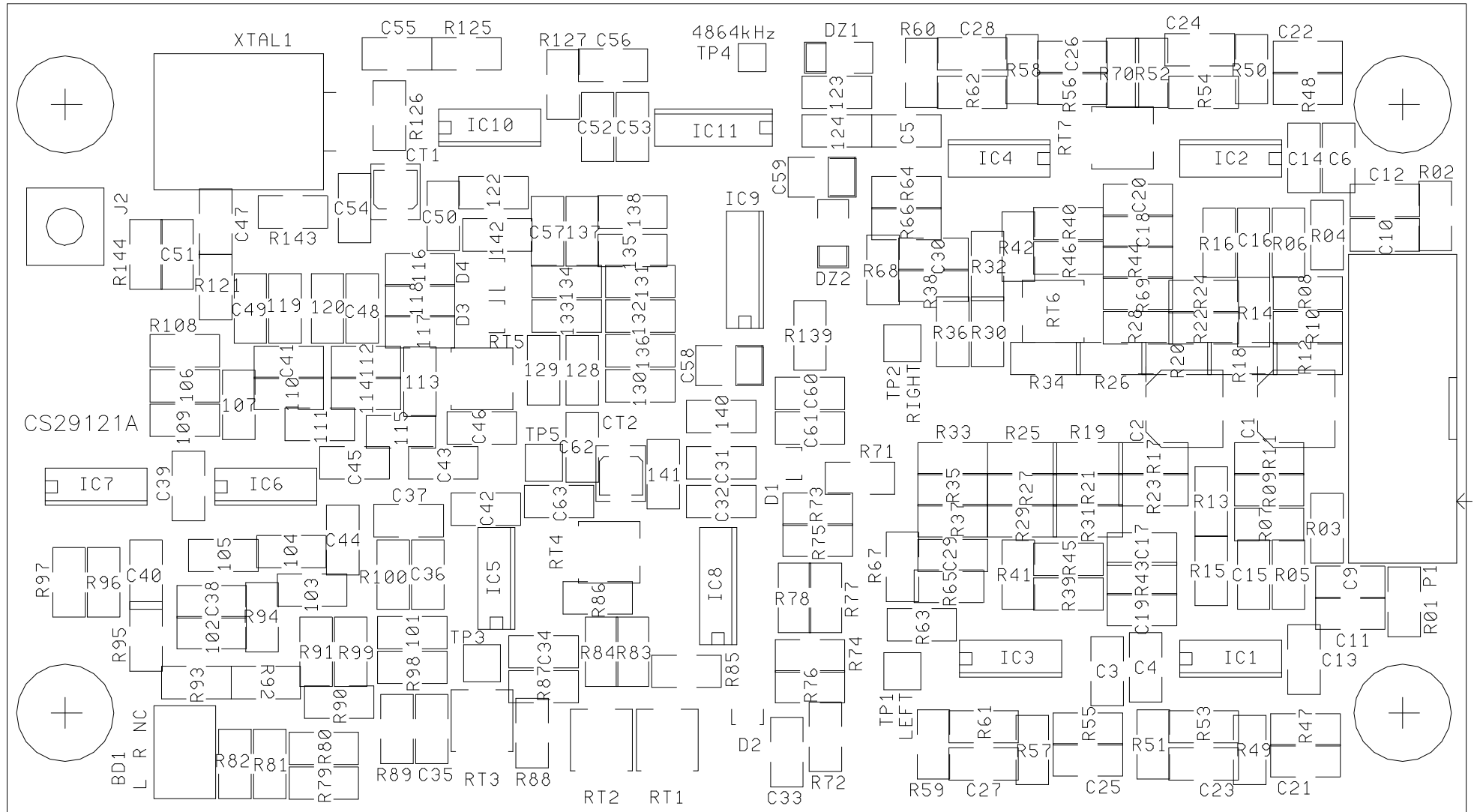
Figure 22 – GSM Modem Board – E1160
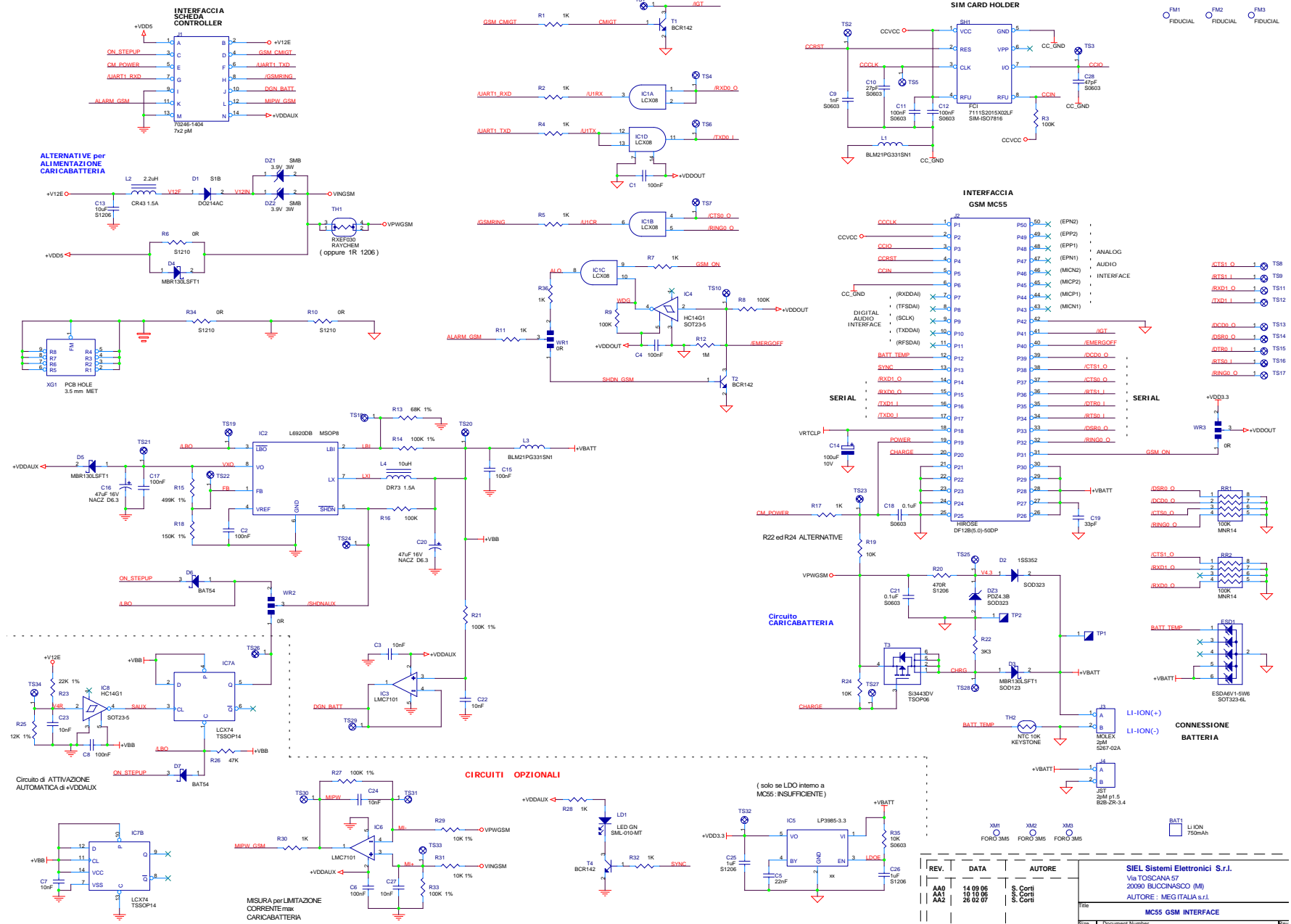
Figure 23 – RS 485 Interface Board – E1171 (CS37111)
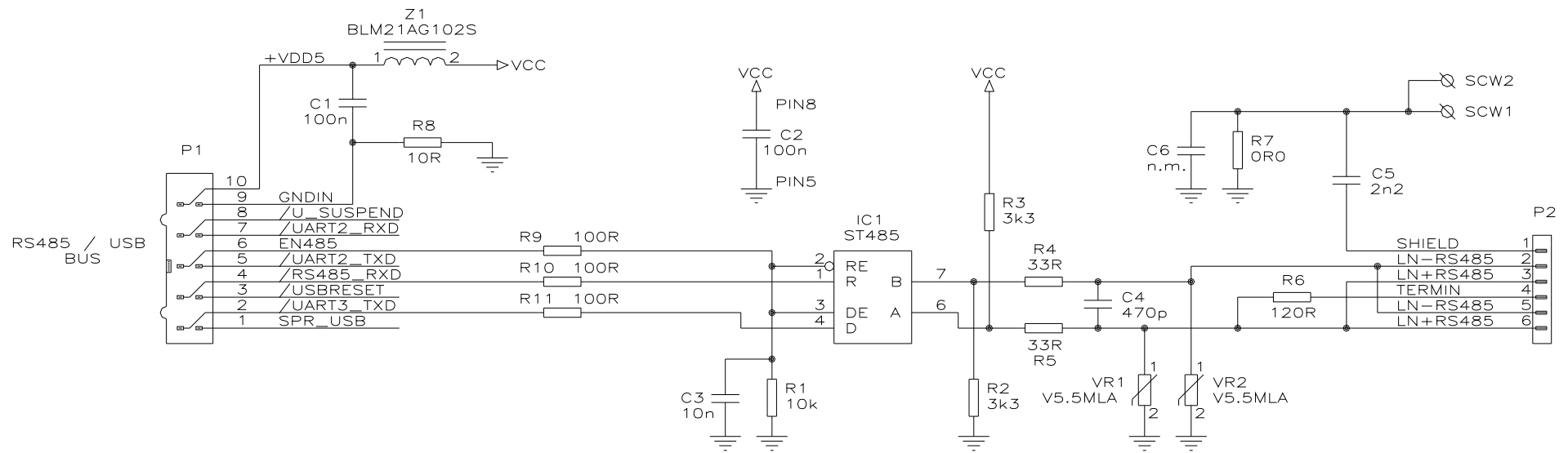
Figure 24 – RS 485 Interface Board layout – CS37111 (E1171)
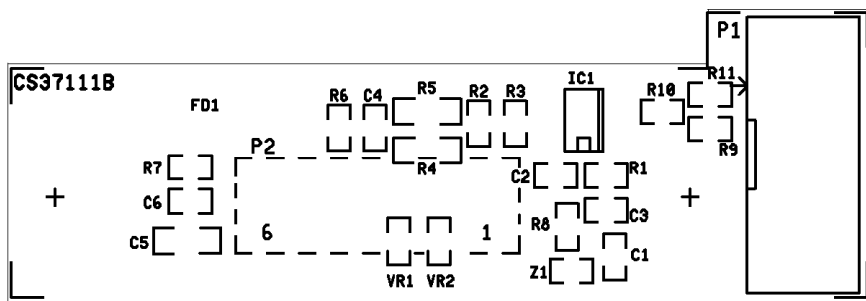
Component side
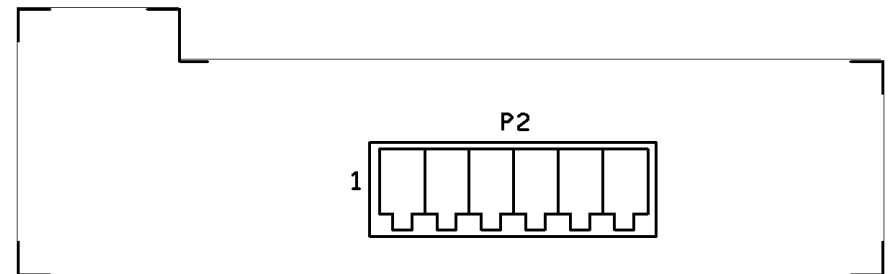
Rear side

Figure 25 – EXC 120 – Vista dall'alto (aperto)
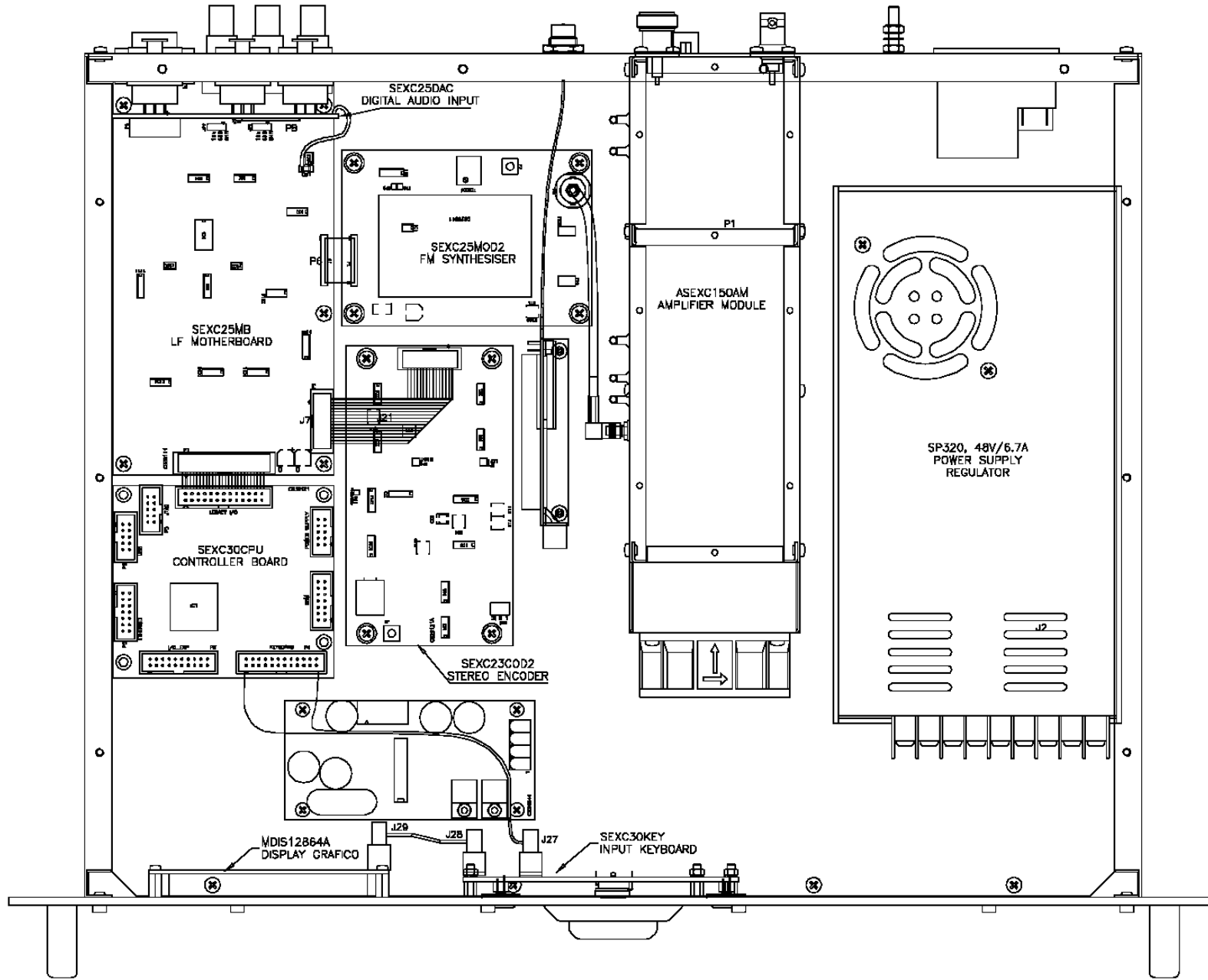
Figure 26 – EXC 120 – General Wiring Diagram E1170
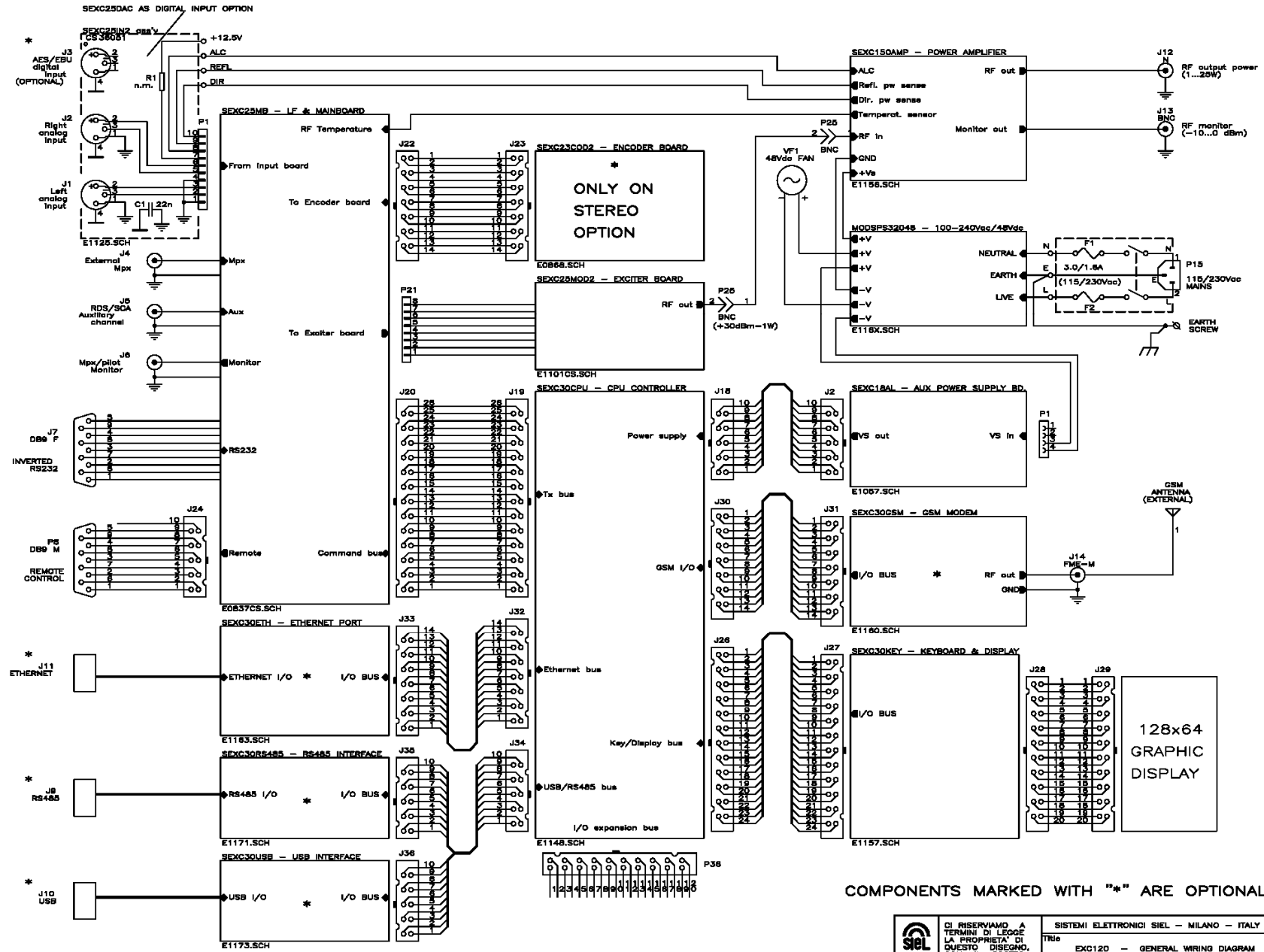
Figure 26 – EXC 120 – General Wiring Diagram E1170

Figure 27 – Power Amplifier Board – E1156 (CS37051)

VALUE SHOWN ARE ONLY TYPICAL AND MAY VARY
DUE TO PRODUCTION ADJUSTMENTS

SISTEMI ELETTRONICI SIEL – MILANO – ITALY

Title
ASEXC150AMP – 150W FM POWER AMPLIFI

Size | Document Number

Figure 28 – Power Amplifier Board – CS37051 (E1156)
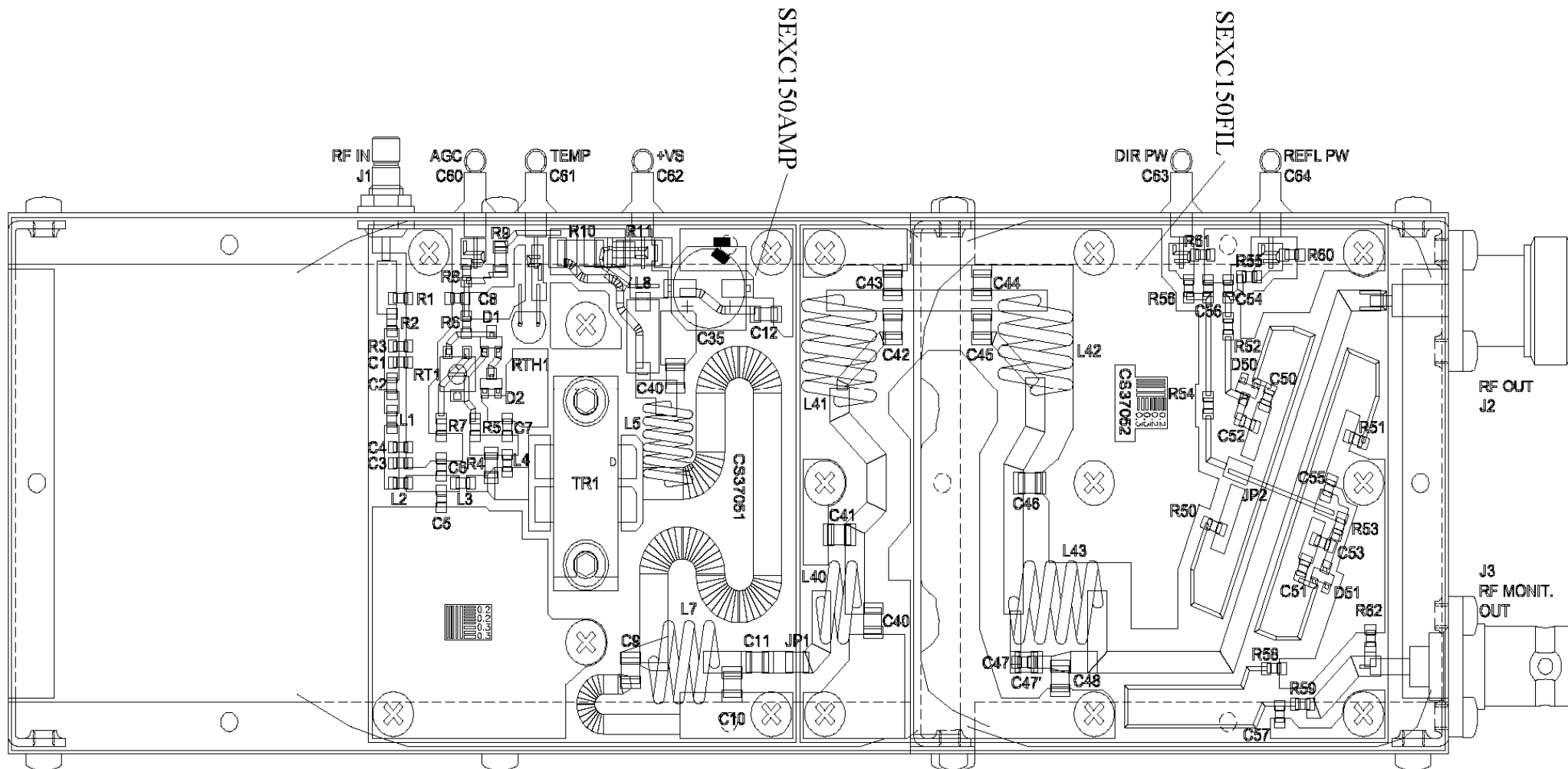
Figure 29 – Aux Power Supply Board – E1057 (CS34044)
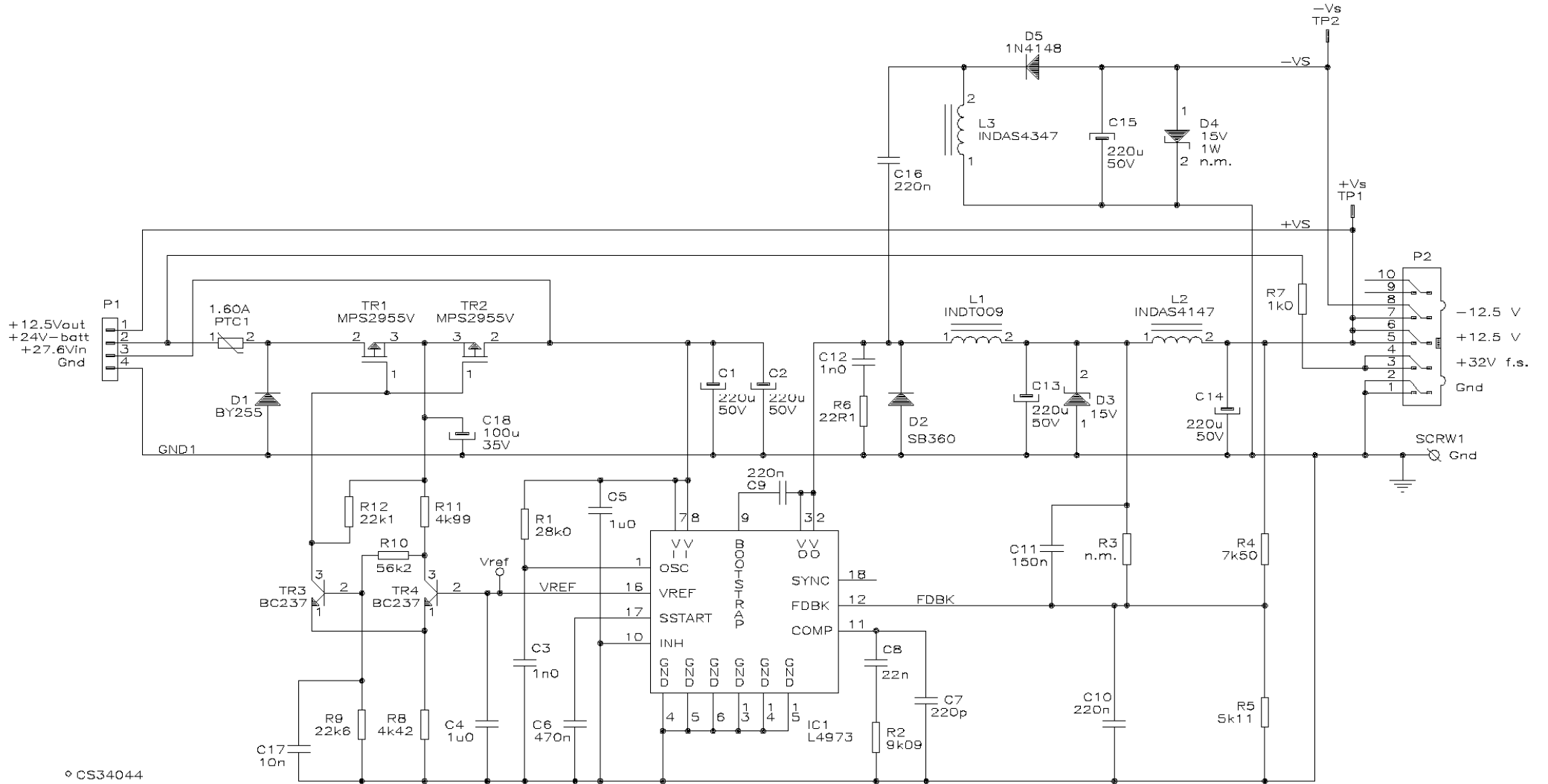
Figure 30 – Aux Power Supply Board – CS34044 (E1057)
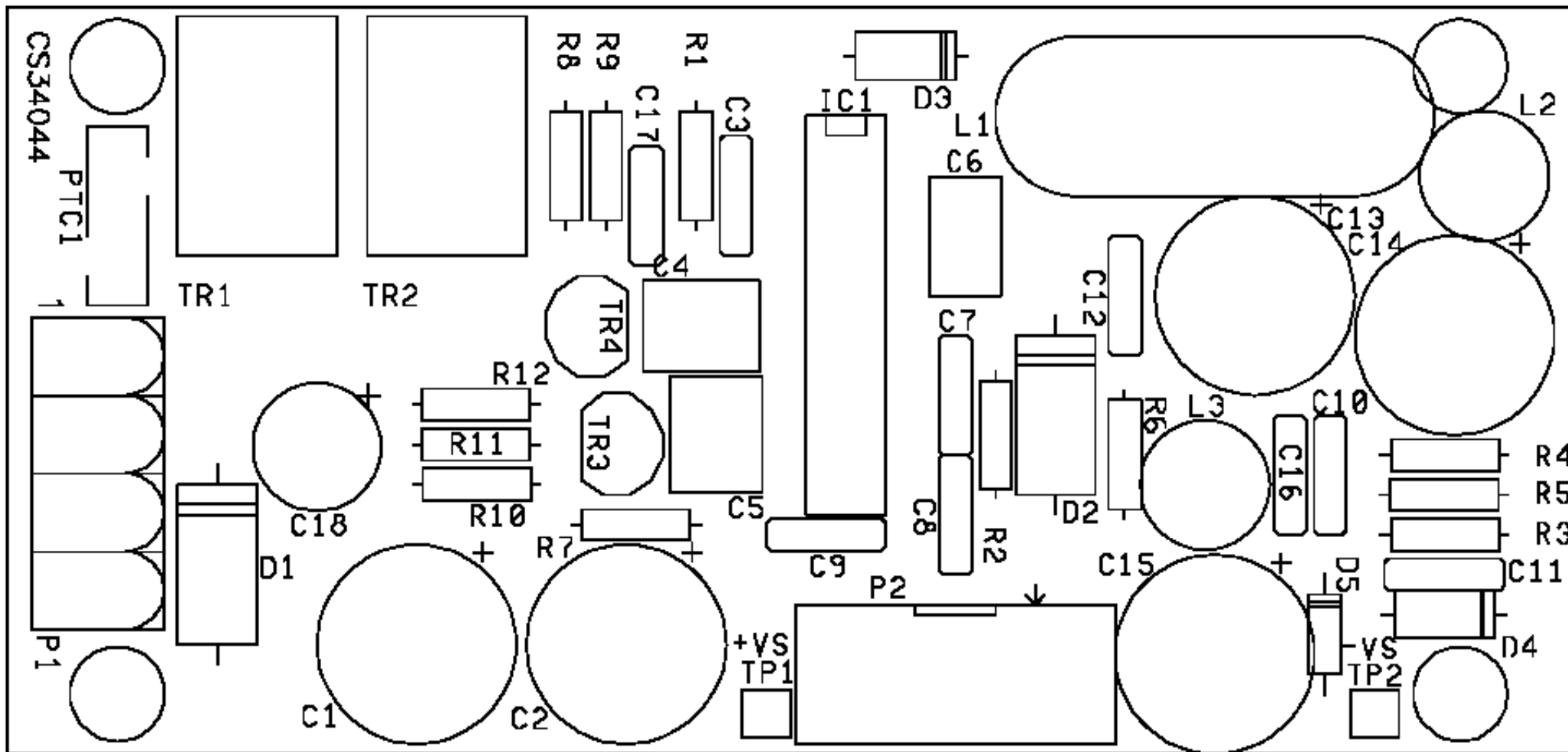
Figure 31 – EXC 705-1505 Power System – E1191
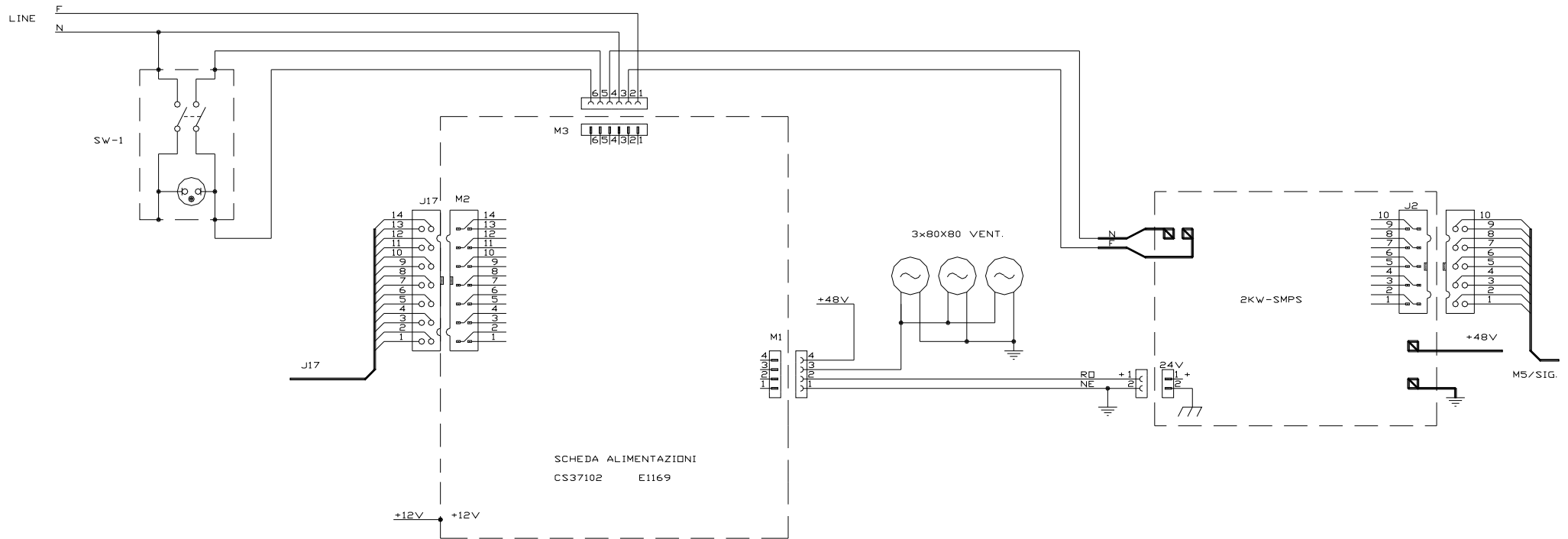
Figure 32 – EXC 705-1505 Low Level Wiring Diagram – E1192
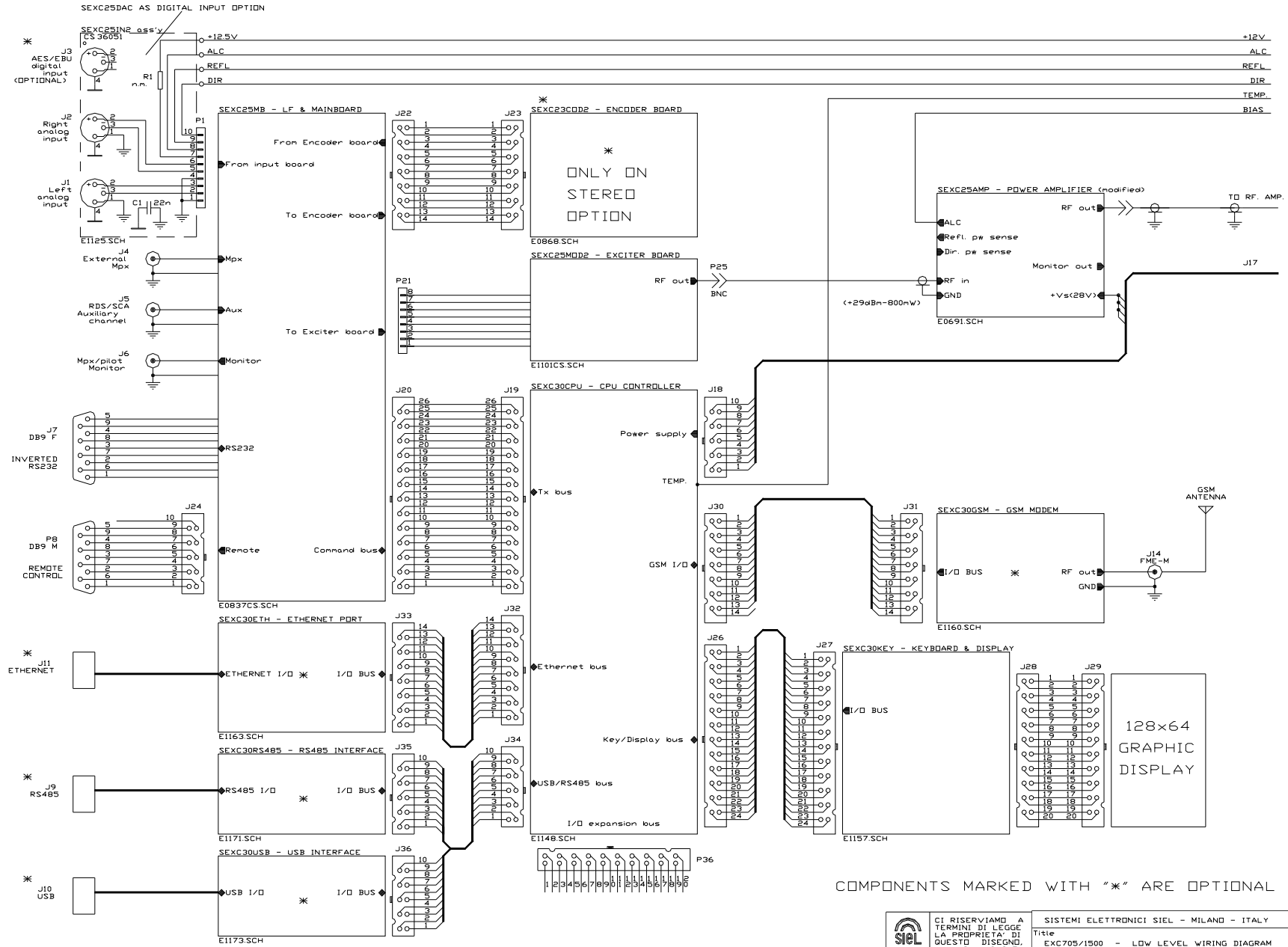
Figure 33 – EXC 705-1505 RF Power Amplifier – E1193
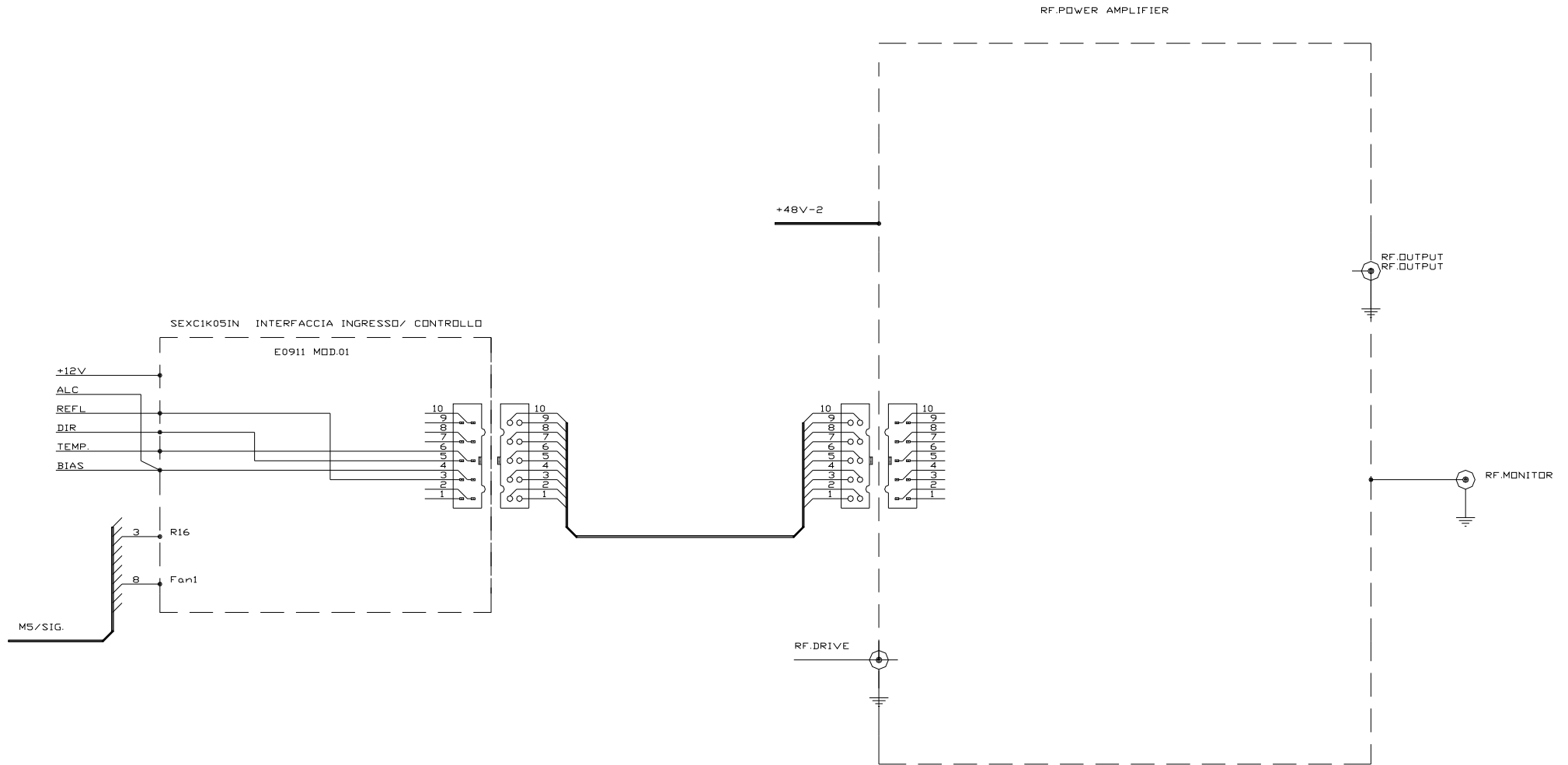
Figure 34 – Power Supply Control – E1169 (CS37102)
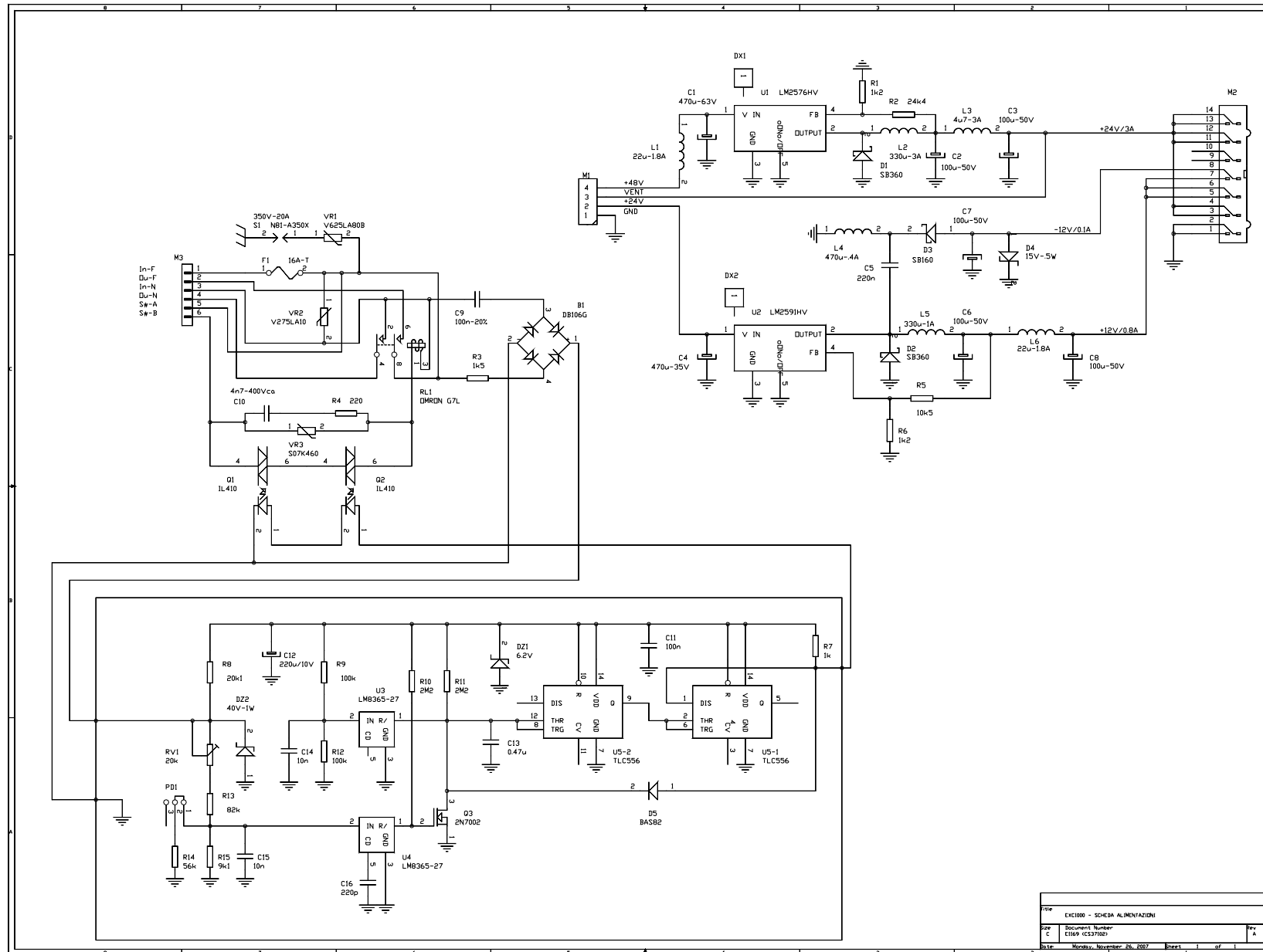
Figure 34 – Power Supply Control – E1169 (CS37102)

Figure 35 – Power Supply Control – CS37102 (E1169)
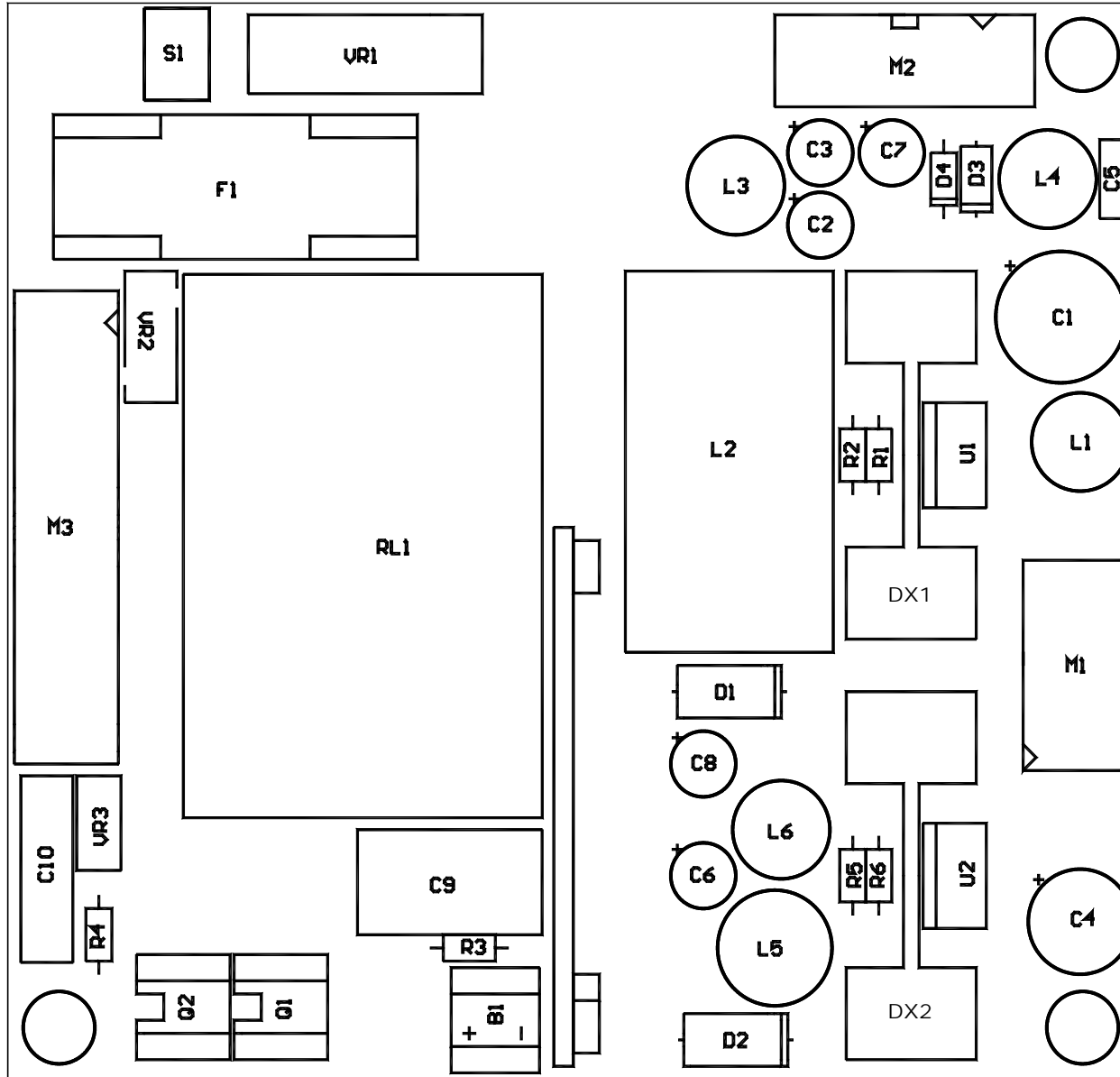
Figure 36 – Driver Amplifier Board – E0927 (CS32049)

VALUE SHOWN ARE ONLY TYPICAL AND MAY VARY
DUE TO PRODUCTION ADJUSTMENTS

ATT.	R61	R60	R62
3dB	18	330	270
2dB	12	470	390
1dB	5.6	1k0	820

SISTEMI ELETTRONICI SIEL – MILANO – ITALY

Title: ASEXC305AM – 300W FM AMPLIFIER WITH DRIVER

Size: C Document Number: DIS. E0927 – File E0927.SCH REV: C

Date: July 16, 2004 Sheet 1 of 1

CI RISERVIAMO A TERMINI DI LEGGE LA PROPRIETA' DI QUESTO DISEGNO. CON IL DIVIETO DI RIPRODURLO O DI REN-DERLO NOTO A DITTE CON-CORRENTI O A TERZI

Figure 37 – Driver Amplifier Board – CS32049 (E0927)
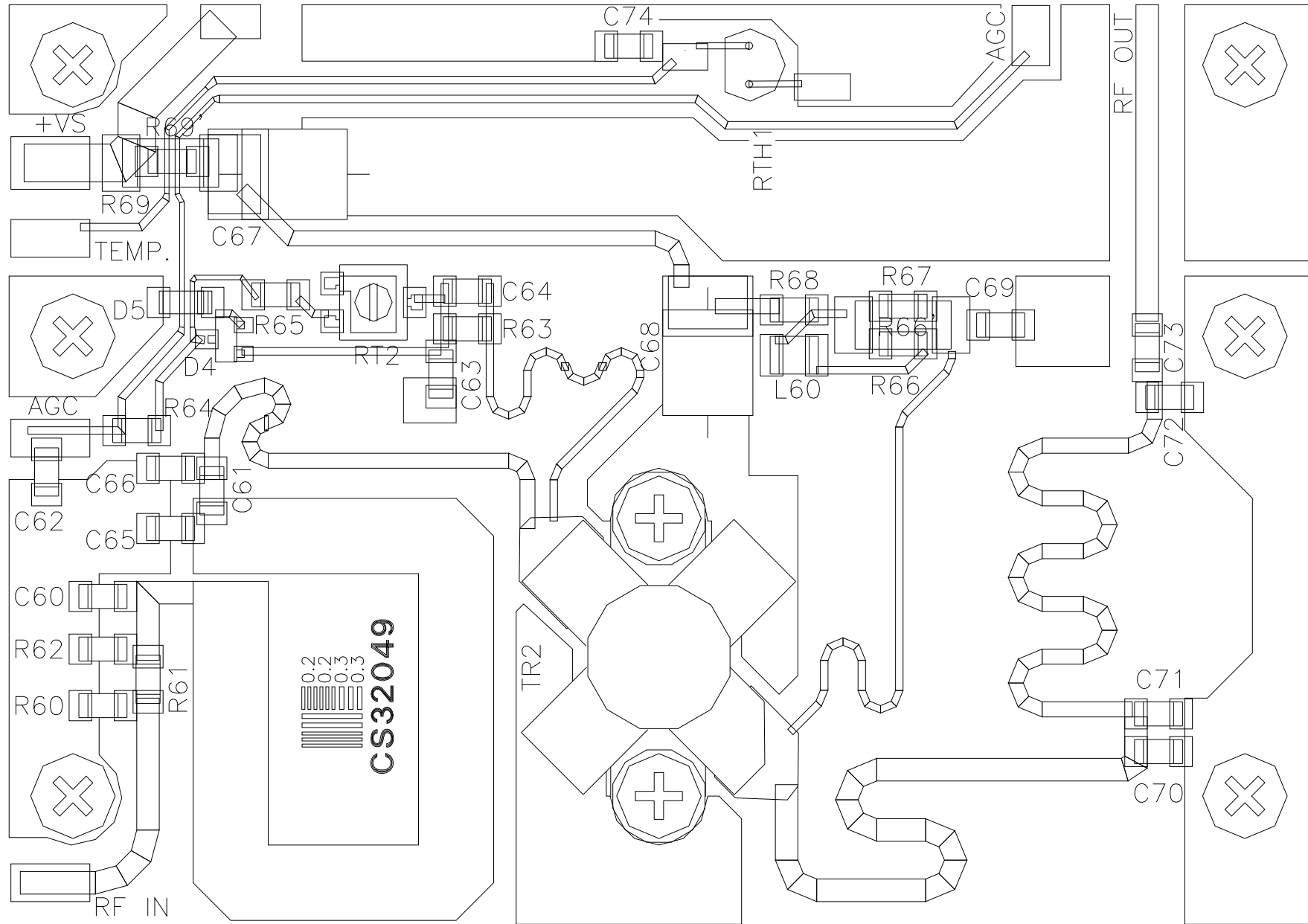
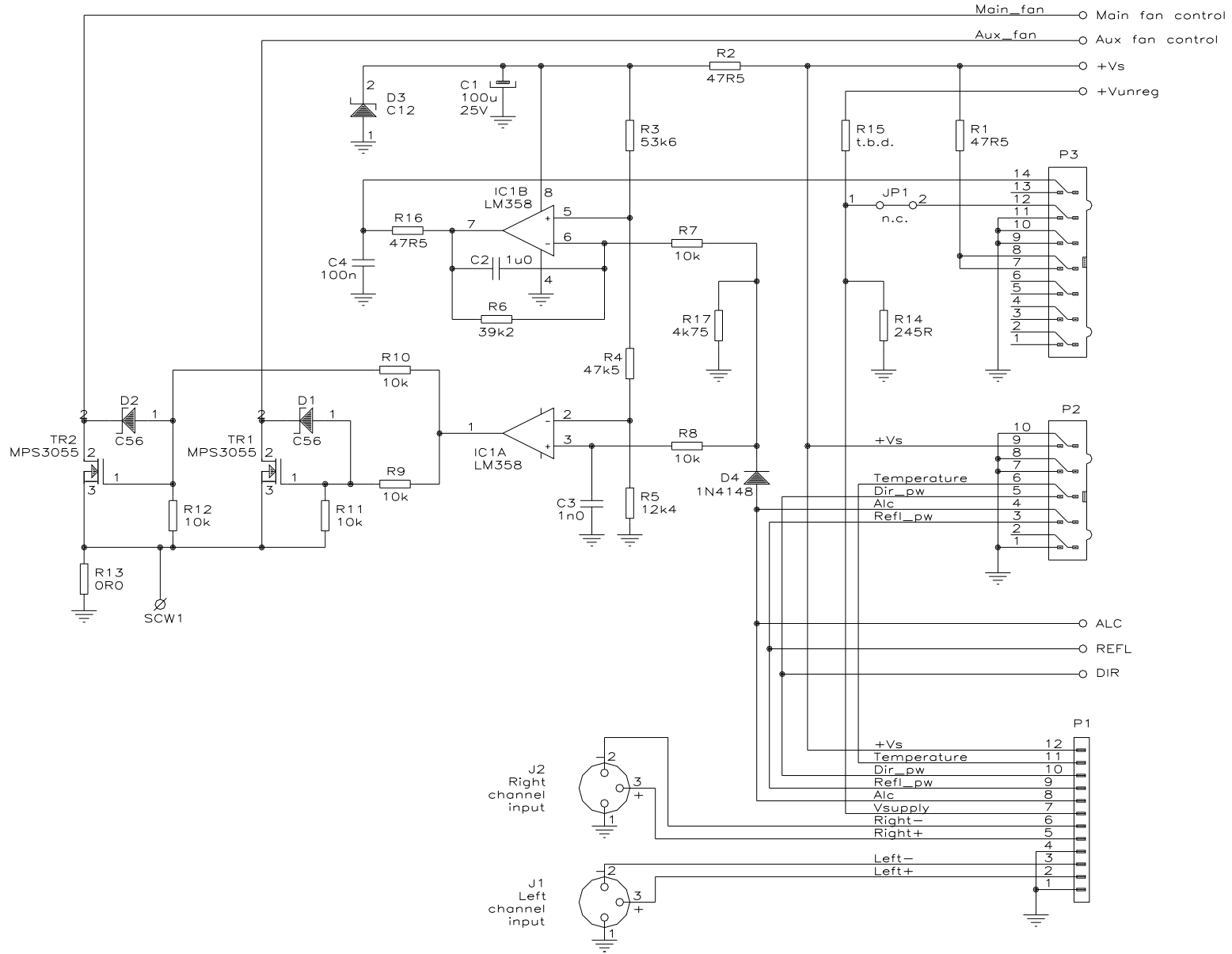# Figure 38 – I/O Interface Board – E0911 (CS31111A)
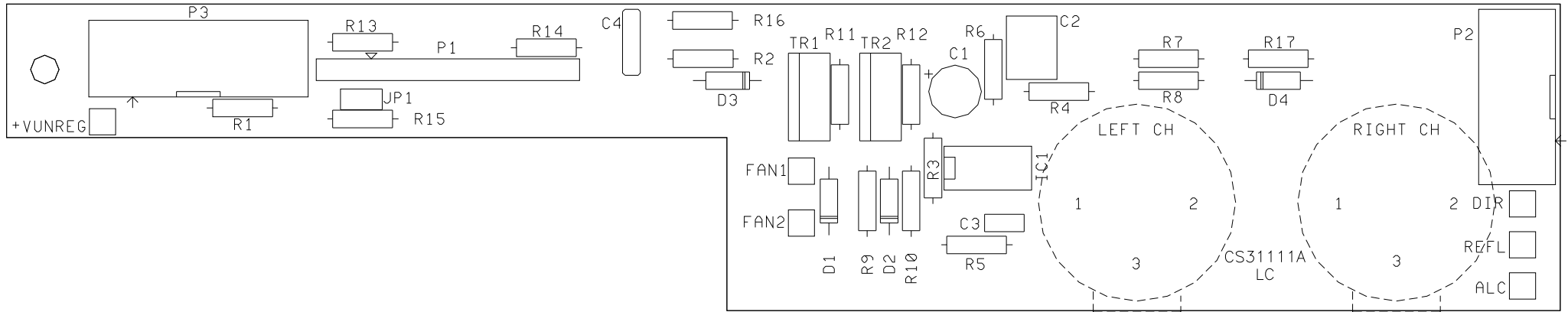
Figure 39 – I/O Interface Board – CS31111A (E0911)

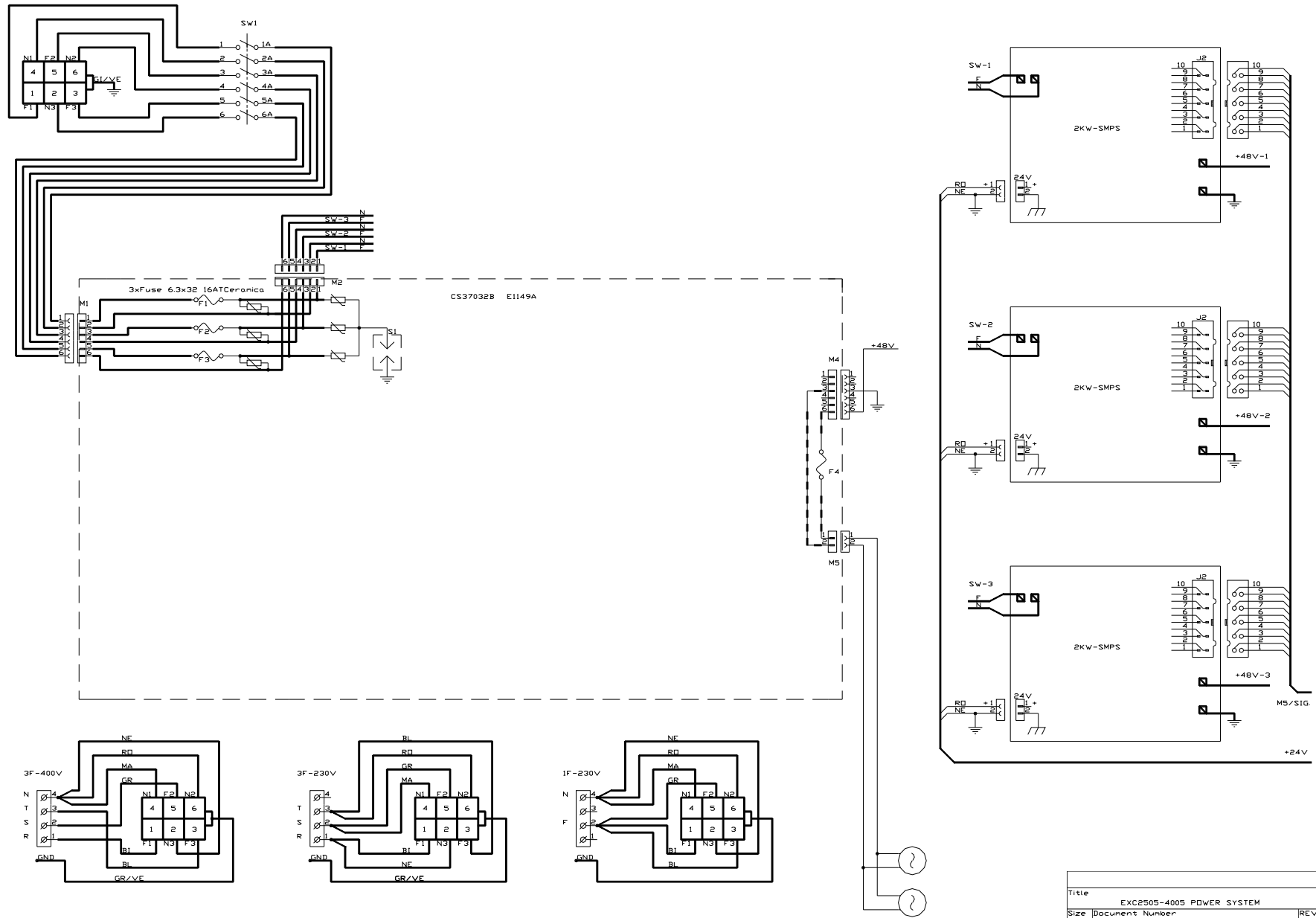**Figure 40 – EXC2505-4005 Power System – E1188**

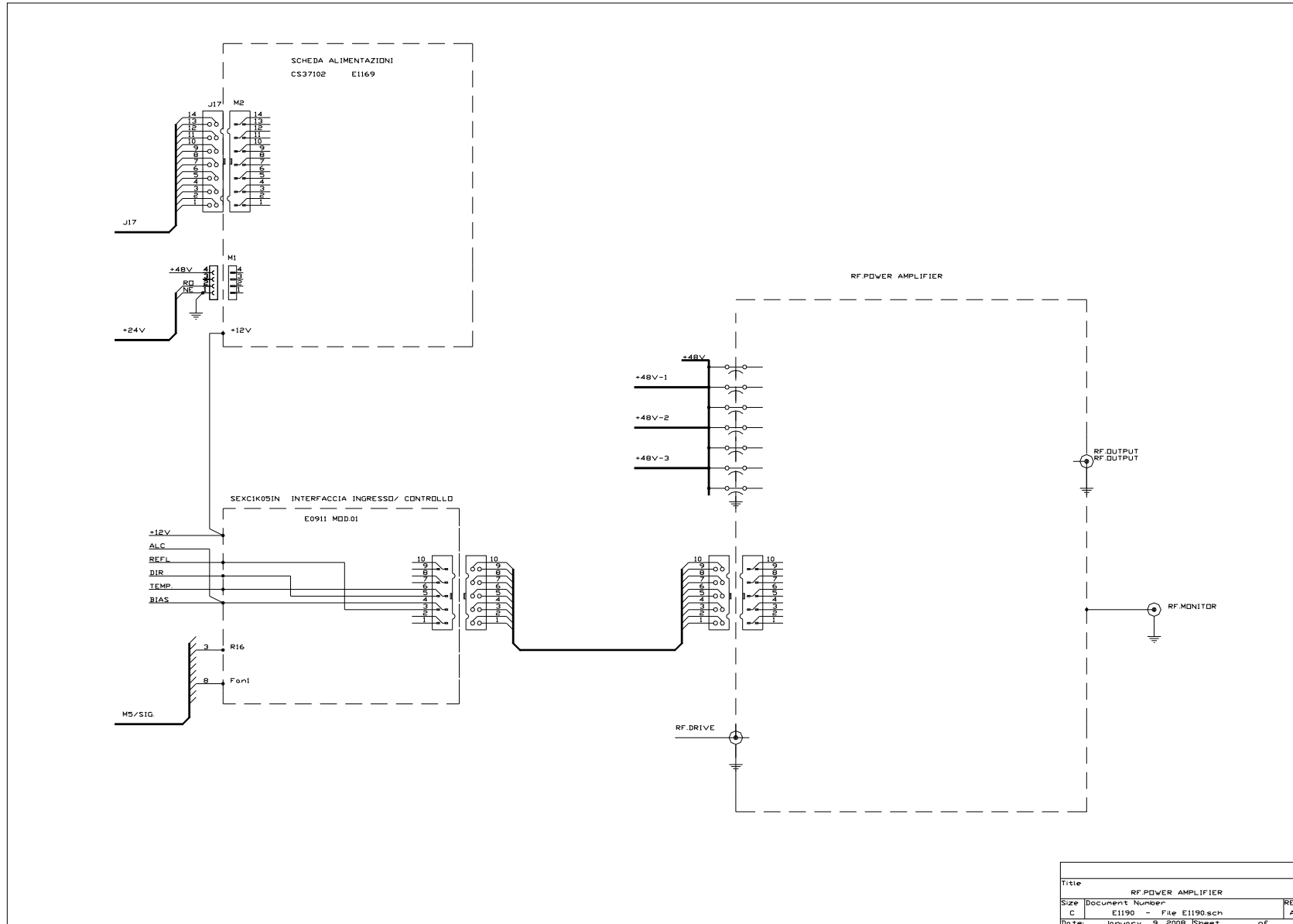**Figure 41 – EXC 2505-4005GT Low Level Wiring Diagram – E1189**
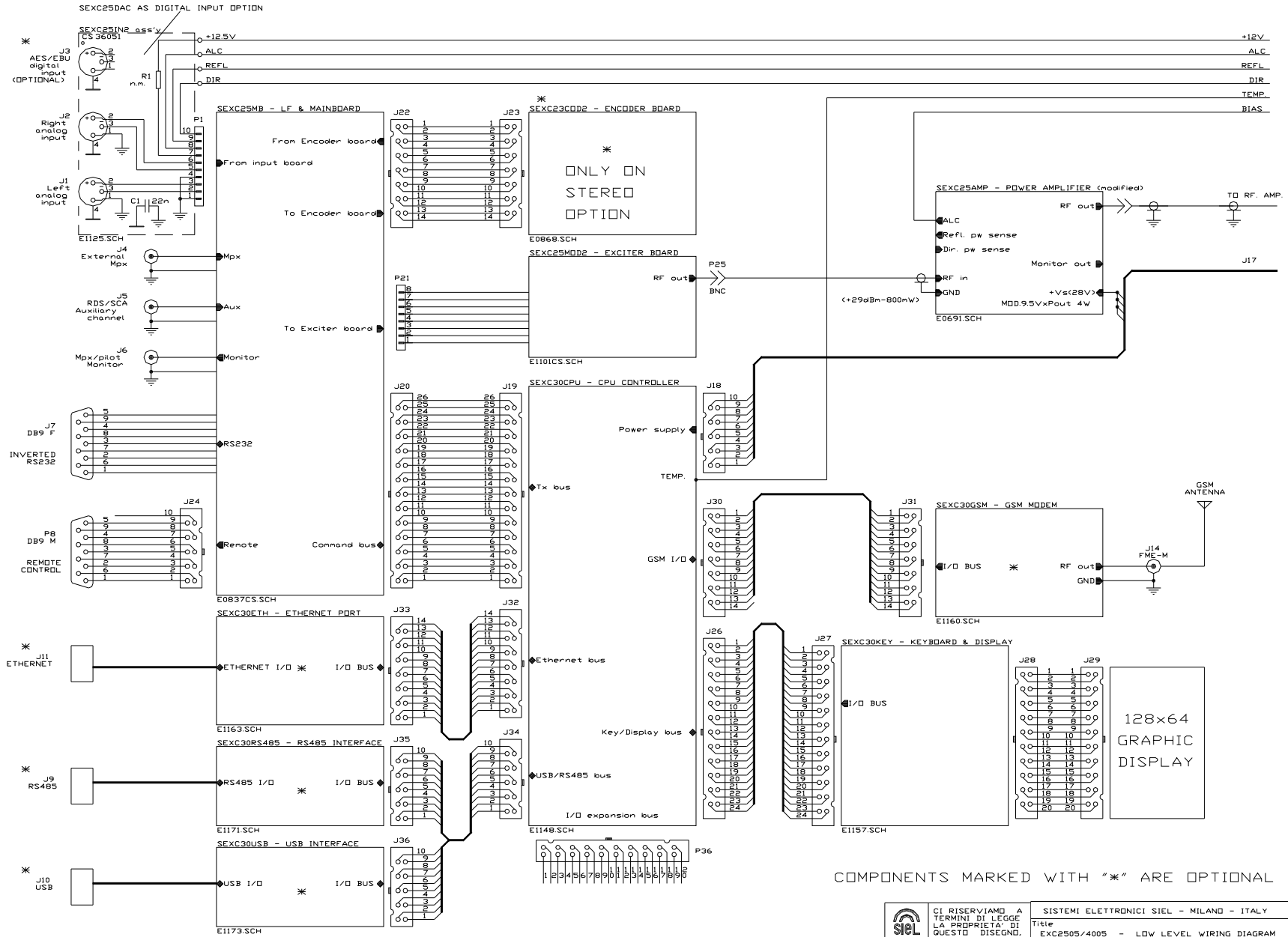
Figure 42 – EXC 2505-4005GT RF Power Amplifier – E1190

Figure 43 – RFB 4005 Line Interface Board – E1149A (CS37032)
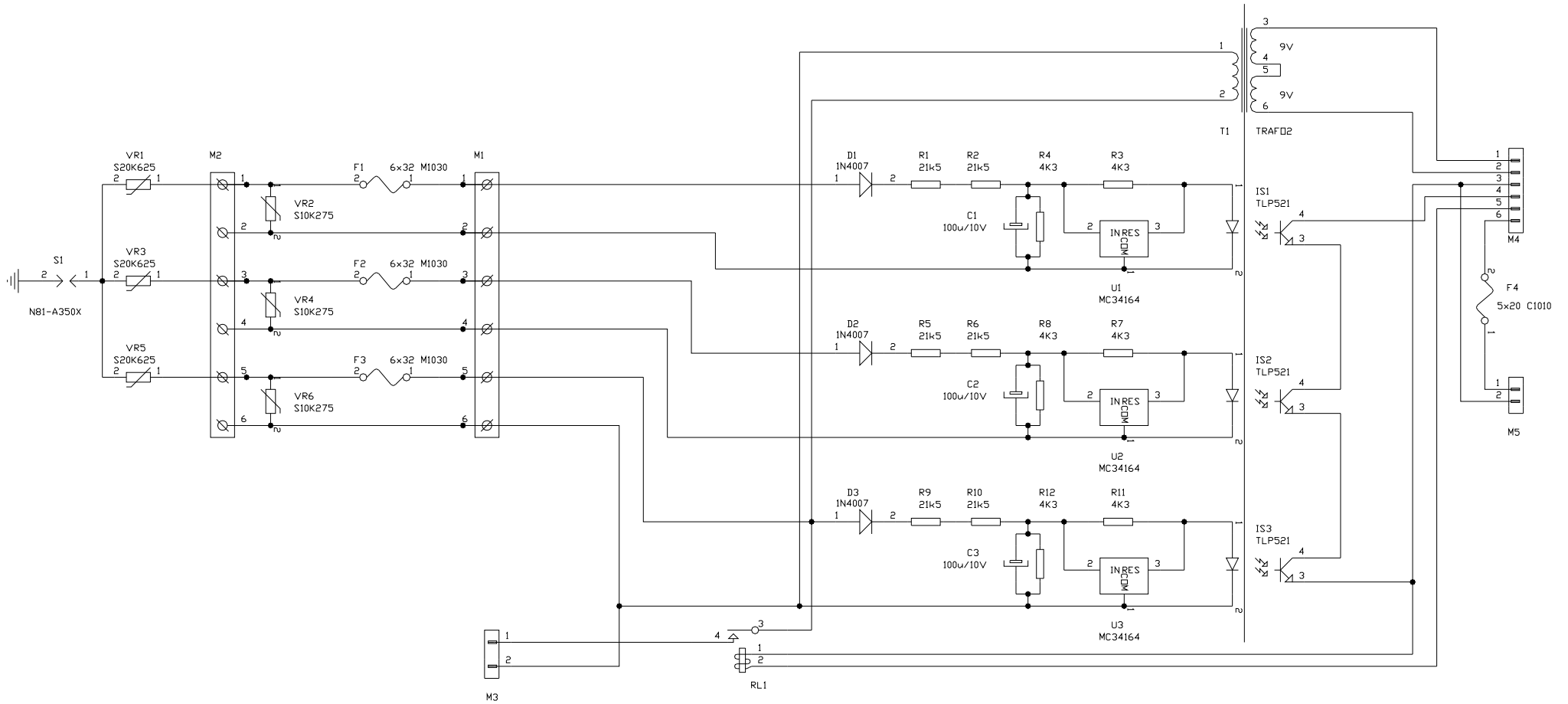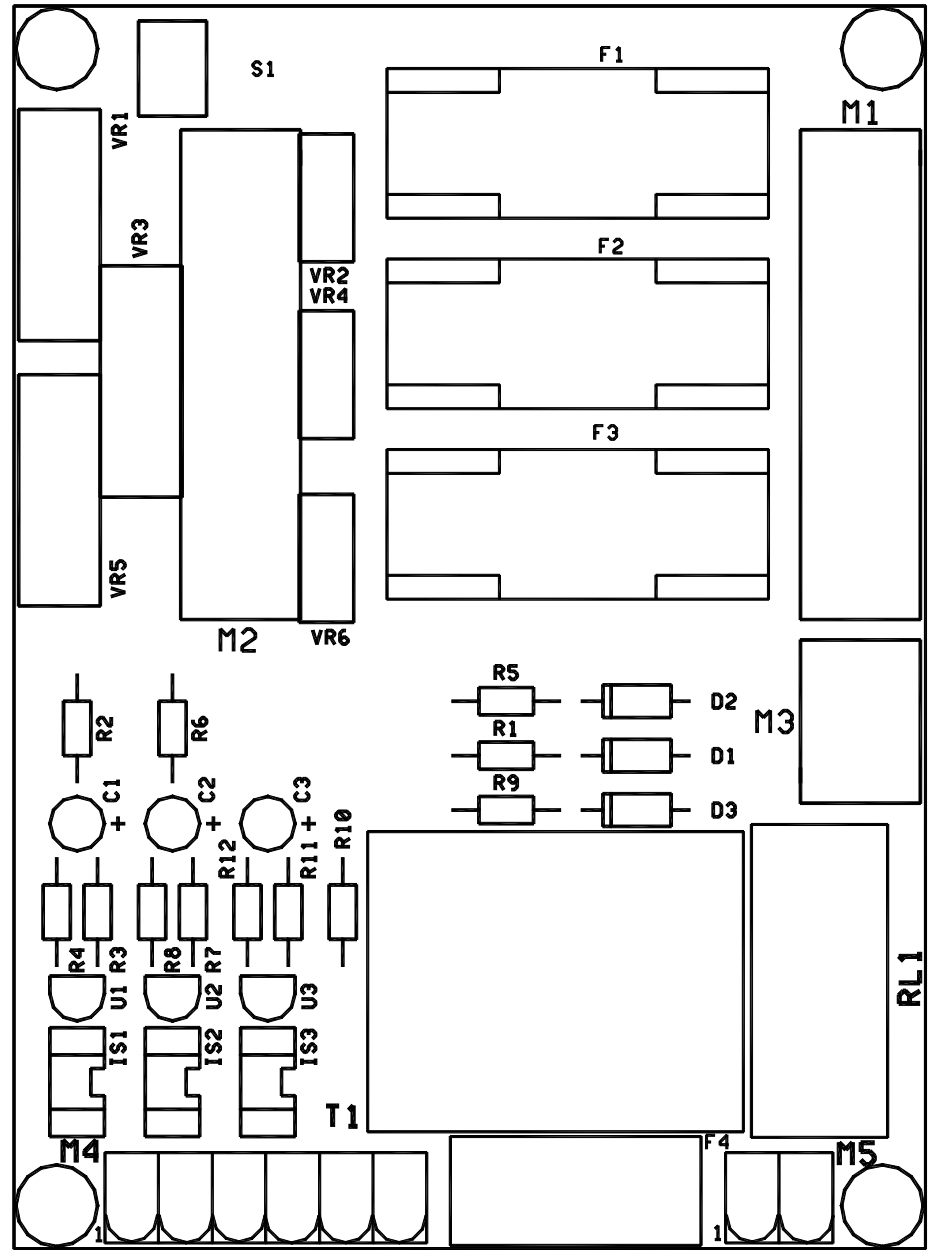
Figure 44 – RFB 4005 Line Interface Board – CS37032 (E1149A)

MOD. C1

Ministero delle Comunicazioni

Direzione Generale per la Pianificazione e la Gestione dello Spettro Radioelettrico
Ufficio II – Unità Funzionale 3

ALLEGATI ....

RISP. AL N. ....

DEL ....

00100 ROMA

PROT. N. **DGPGSR / II / 3 / 350061 / FOR /**

Citare nella risposta tutti i dati contenuti nel riquadro

Soc. **SIEL BROADCAST S.P.A.**
(Att. Sig. Antonio ORIZZONTE)
Via Toscana, 57/59 -
20090 Buccinasco (MI)

p.c. D.G.S.C.E.R.
Ufficio III
SEDE

p.c. **ISPETTORATI TERRITORIALI**
LORO SEDI

OGGETTO : Notifica di immissione sul mercato, ai sensi dell'art. 6.4 della Direttiva 99/5/CE, recepita con decreto legislativo 9.5.2001 n. 269, degli apparati eccitatori di di radiodiffusione sonora in FM marca SIEL BROADCAST SPA, mod. **EXC5GT**, mod. EXC10GT, mod. EXC20GT, mod. EXC25GT, mod. EXC30GT, mod. EXC 50GT, mod. EXC100GT, mod. EXC120GT, mod. EXC150GT, **mod. EXC250 GT**, mod. EXC300GT, mod. EXC400GT, mod. ECX500GT, mod. EXC600GT, mod. EXC700GT, mod. EXC1000GT, mod. EXC1500GT, mod. EXC1700GT, mod. EXC2000GT, mod. EXC2500GT, mod. EXC3000GT, mod. EXC4000GT.

     Si prende atto delle notifiche di immissione sul mercato inviate da codesta Società e pervenute a questa Direzione Generale in data 31/01/2008, relative agli apparati indicati in Allegato. Al riguardo si comunica che i medesimi apparati, **se conformi** a tutti i requisiti ed obblighi derivanti dall'applicazione del decreto lgs citato in oggetto, possono essere immessi sul mercato e utilizzati sul territorio nazionale, limitatamente nella banda di frequenze 87,5 ÷ 108 MHz attribuita al servizio di radiodiffusione sonora in FM dal vigente Piano Nazionale Ripartizione Frequenze, emanato con D.M. 8 luglio 2002.

Le caratteristiche tecniche principali dichiarate sono le seguenti :

- Banda di frequenze : 87,5 ÷ 108 MHz
- Potenze RF : 5 W e.r.p. (mod. EXC5GT); 10 W e.r.p.(mod. EXC10GT); 20 W e.r.p. (mod. EXC20GT); 25 W e.r.p. (mod. EXC25GT); 30 W e.r.p. (mod. EXC30GT); 50 W e.r.p. (mod. EXC50GT); 100 W e.r.p. (mod. EXC100GT); 120 W e.r.p. (mod. EXC120GT); 150 W e.r.p. (mod. EXC250GT); 300 W e.r.p. (mod. EXC300GT); 400 W e.r.p. (mod. EXC400GT); 500 W e.r.p. (mod. EXC500GT); 600 W e.r.p. (mod. EXC600GT); 700 W e.r.p. (mod. ECX 700GT); 1000 W e.r.p. (mod. EXC1000GT); 1500 W e.r.p. (mod. EXC1500GT); 1700 W e.r.p. (mod. EXC1700GT); 2000 W e.r.p. (mod.EXC2000GT); 2500 W e.r.p. (mod. EXC2500 GT), 3000 W e.r.p. (mod. EXC3000GT); 4000 W e.r.p. (mod. EXC4000GT);
- Spaziatura tra i canali : programmabile a passi di 100 kHz
- Tipo di modulazione : FM
- Organismo notificato consultato : **EMCC DR. RASEK**; Numero id.: **0678**

     Si rende noto che, ai sensi dell'art. 38, comma 4 del Codice delle comunicazioni elettroniche, emanato con decreto legislativo 1° agosto 2003, l'uso degli apparati in questione è soggetto a "concessione". Pertanto, **il costruttore o la persona responsabile dell'immissione sul mercato dei medesimi, deve fornire all'utente, ai sensi dell'art. 6.3 del decreto lgs citato in oggetto, le informazioni necessarie sul predetto uso cui gli stessi sono destinati.**
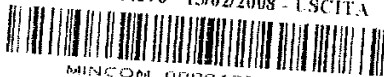
IL DIRETTORE GENERALE
(Ing. F. Troisi)

Subject: **Statement of Compliance with CE rules - Homologation of Machines**

We hereby inform you that the transmitter systems of our production meet the requirements under the European Directive **1999/5/CE**

We declare, therefore, that these transmitter systems are approved and notified by the competent offices, referring to the protocol identifier:

CE 0678

We hereby declare as well, in compliance with the said directive, that the equipments conform to EC regulations in force, and in particular to the following norms:

ETS 300447	Electro magnetic Compatibility (EMC) standards
EN 300384	Very High Frequency (VHF) Frequency Modulated, sound broadcasting Transmitters
EN 60065	Electrical safety requirements for Radio Transmitting Equipments
EN 60215	Safety requirements for Radio Transmitting Equipments

These devices are fitted with **CE** marking stating the above homologation. We hereby declare, also, that the transmitter systems by us produced are supplied together with a manual of use and maintenance.

We underline that the correct identification symbol for the scope of the homologation is reported in the head of the present "manual of use and maintenance" and in the document "Notification of placing in the market" of the Ministry of Communication, as well attached.

Any acronyms and / or suffixes other or integrative reported on the manual and / or on the machine define batches of production internally, without prejudice to the validity of same.

Buccinasco, 20 gennaio 2008

Siel Broadcast S.p.A. / Sole Administrator
Antonio Orizzonte