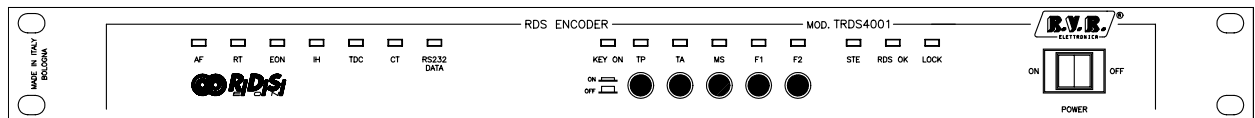

TRDS 4001



User Manual

Manufactured by  Italy



TRDS 4001 - User Manual
Version 4.0

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1. Preliminary instructions

This manual is written as a general guide for those having previous knowledge and experience with this kind of equipment.

It is not intended to contain a complete statement of all safety rules which should be observed by personnel in using this or other electronic equipment.

The installation, use and maintenance of this piece of equipment involve risks both for the personnel performing them and for the device itself, that shall be used only by trained personnel.

R.V.R. doesn't assume responsibility for injury or damage resulting from improper procedures or practices by untrained/unqualified personnel in the handling of this unit.

Please observe all local codes and fire protection standards in the operations of this unit.



WARNING: always disconnect power before opening covers or removing any part of this unit.

Use appropriate grounding procedures to short out capacitors and high voltage points before servicing.



WARNING: This is a "CLASS A" equipment. In a residential place this equipment can cause hash. In this case can be requested to user to take the necessary measures.

R.V.R. Elettronica SpA reserves the right to modify the design and/or the technical specifications of the product and this manual without notice.

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2. Warranty

Any product of **R.V.R. Elettronica** is covered by a 12 (twelve) month warranty.

For components like tubes for power amplifiers, the original manufacturer's warranty applies.

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

R.V.R.'s warranty shall not include:

- 1) Re-shipment of the unit to R.V.R. for repair purposes
- 2) Any unauthorized repair/modification
- 3) Incidental/consequential damages as a result of any defect
- 4) Nominal non-incidental defects
- 5) Re-shipment costs or insurance of the unit or replacement units/parts

Warranty shall come into force from invoice date and for the period of the manufactures warranty.

Any damage to the goods must be reported to the carrier in writing on the shipment receipt.

Any discrepancy or damage discovered subsequent to delivery, shall be reported to R.V.R. within five (5) days from its receipt.

To claim your rights under this warranty:

- a. Contact the dealer or distributor where you purchased the unit. Describe the problem and ask if he has an easy solution. Dealers and Distributors are supplied with all the information about problems that may occur and usually they can repair the unit quicker than what the manufacturer could do. Very often installing errors are discovered by dealers.
- b. If your dealer cannot help you, contact R.V.R. in Bologna and explain the problem. If it is decided to return the unit to the factory, R.V.R. will mail you a regular authorization with all the necessary instructions to send back the goods.
- c. When you receive the authorization, you can return the unit. Pack it carefully for the shipment, preferably using the original packing and seal the package perfectly. The customer always assumes the risks of loss (i.e., R.V.R. is never responsible for damage or loss), until the package reaches R.V.R. premises. For this reason, we suggest you to insure the goods for the whole value. Shipment must be effected C.I.F. (PREPAID) to the address specified by R.V.R.'s service manager on the authorization.



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

- a Be sure to enclose a written technical report where mention all the problems found and a copy of your original invoice establishing the starting date of the warranty.

Replacement and warranty parts may be order from the following address. Be sure to include the equipment model and serial number as well as part description and part number.



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

3. First Aid

The personnel employed in the installation, use and maintenance of the device, shall be familiar with theory and practice of first aid.

3.1 Treatment of electrical shocks

3.1.1 If victim is not responsive

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

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

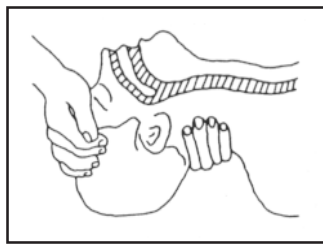


Figure 1

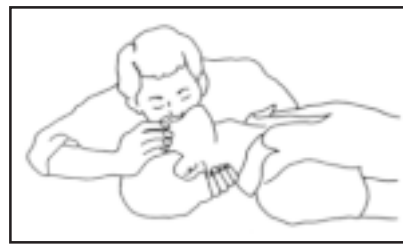


Figure 2

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

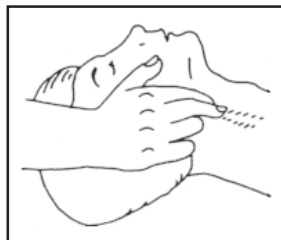


Figura 3



Figura 4

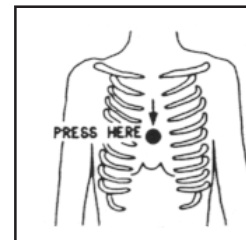


Figura 5

- APPROX. 80 SEC. : ONE RESCUER, 15 COMPRESSIONS
- APPROX. 60 SEC.: TWO RESCUERS, 5 COMPRESSIONS, 1 BREATH
- DO NOT INTERRUPT RHYTHM OF COMPRESSIONS WHEN SECOND PERSON IS GIVING BREATH
- Call for medical assistance as soon as possible.

3.1.2 If victim is responsive

- Keep them warm
- Keep them as quiet as possible
- Loosen their clothing (a reclining position is recommended)
- Call for medical help as soon as possible

3.2 Treatment of electrical Burns

3.2.1 Extensive burned and broken skin

- Cover area with clean sheet or cloth (Cleansed available cloth article).
- Do not break blisters, remove tissue, remove adhered particles of clothing, or apply any salve or ointment.
- Treat victim for shock as required.
- Arrange transportation to a hospital as quickly as possible.
- If arms or legs are affected keep them elevated

If medical help will not be available within an hour and the victim is conscious and not vomiting, give him a weak solution of salt and soda: 1 level teaspoonful of salt and 1/2 level teaspoonful of baking soda to each quart of water (neither hot or cold). Allow victim to sip slowly about 4 ounces (half a glass) over a period of 15 minutes. Discontinue fluid if vomiting occurs



Do not give alcohol

3.2.2 Less severe burns (1st and 2nd degree)

- Apply cool (not ice cold) compresses using the cleansed available cloth article.
- Do not break blisters, remove tissue, remove adhered particles of clothing, or apply salve or ointment.
- Apply clean dry dressing if necessary.
- Treat victim for shock as required.
- Arrange transportation to a hospital as quickly as possible
- If arms or legs are affected keep them elevated.

4. General Description

4.1 Introduction

The necessity to immediately know the working parameters of several device in a system or to transmit with all the several units which have to manage a firm, is a more and more greater need in all circles.

The cordless broadcasting , for its simple installation and its great pliability, appears as the more suitable solution in many circles.

In the broadcasting field too, the need to transmit not only the radio signals, but also data package of different kinds, is already strongly felt for many years, because it allows to better the quality and the reliability of the available services and at the end to implement the new ones.

This necessity is also felt in the international field, so much that a proper research team has constituted itself to identify the different necessities and to determine a broadcasting standard which would appear more proper for the sector.

The team has reached the "RADIO-DATA-SYSTEM (RDS)", which appears todays the data broadcasting system more used in the radio field.

The TRDS4001 system allows to transmit, with the radio signal (mono or stereo), a data channel as specified in the paper "Specification of the radio data system (RDS)", which is issued by the European Committee for Electrotechnical Standardization (CENELEC) Ref. N° EN 50067.

4.2 RDS System Description

The RADIO-DATA-SYSTEM is proper for the transmission of information in mono/ stereo programs of VHF/MF (87.5-108 Mhz).

It satisfies the requested requirements to the transmission of supplementary data on radio programs:

- 1) Compatibility with the current mono/stereo transmissions;
- 2) Absence of interferences towards the adjacent programs;
- 3) Compatibility with other identification systems which are already working.

The system, selected by an international specialistic team, allows the data transmission at a speed of 1187.5 bit/sec with phase modulation at two levels , carrier wave 57 Mhz and range ± 2 Khz.

The broadcasted binary signal is in advance put out on a differential codification.

The registry of transmission is at packages of length 104 bits (87.6 ms) named GROUPS, each of them composed of 4 blocks of 26 bits.

Every block is composed of 16 bits of information and of 10 bits of protection, which are properly studied to allow the recovery of an erroneous word with a maximum of 5 wrong bits.

They are provided with 16 separate blocks of which 6 are still not defined; every group begins with a PI identification code (Program Identification) which has the double intent to synchronize the receiver and to identify the channel which transmits the signal.

The purpose of the encoder TRDS4001 is to manage the principal services defined by the standard CENELEC EN 50067 as: PI, PS, PTY, TP, AF, TA, DI, M/S, PIN, RT, EON, TDC, IH, CT.

As follows, we'll mention a short description about the function of each of these services.

PI - PROGRAM IDENTIFICATION: it's the identification code of the radio. Its more important application is to allow the receiver, in case of bad reception, to implement the "Automatic Frequency Change"; this happens when there is a signal with the same PI and of better level than the synchronized one.

PS - PROGRAM SERVICE: it's the visualized text on the receiver display, which has to be of maximum 8 characters, as this is the standard dimension of receivers displays. The TRDS4001 characteristic is to store up to 8 messages and the time of transmission of each of them. Every message can be composed from 1 to 16 words of 8 characters, and it's possible to select the permanence time on the display of each of the 16 separate words.

PTY - PROGRAM TYPE: it's the identification of the "Program Type" which is on air (example News, Sport, Rock, etc.) It's used to qualify on the receiver the automatical research of the program type desired.

TP - TRAFFIC PROGRAM IDENTIFICATION: this service indicates with a signal on the receiver display that the program we're receiving includes traffic news.

AF - ALTERNATIVE FREQUENCIES: it's the frequencies list of different transmitters which transmit the same program in the adjacent receiving areas. The list is memorized by the receiver and used to reduce the commutation time between the different transmitters of the same program.

TA - TRAFFIC-ANNOUNCEMENT IDENTIFICATION: it' used to indicate to the car-driver that the traffic news are on air. The receiver could use the signal in one of the following modes:

- a) To switch automatically from the Tape (or from the Compact Disk) to the radio;
- b) To automatically switch on the radio when the traffic news begin;

c) To automatically change over from a station which doesn't transmit traffic news;

M/S - MUSIC/SPEECH SWITCH: it's used to modify the music and the spoken volume one by one.

PIN - PROGRAM- ITEM NUMBER: it's used to plan the receiver to receive certain programs at preselected date and hour.

RT - RADIOTEXT: it's used to transmit the text trasmission; this function is mainly for the domestic application (house receivers).

EON - ENHANCED OTHER NETWORKS: it's used to transmit the PI,PS,AF,PTY to the PIN of other radios.

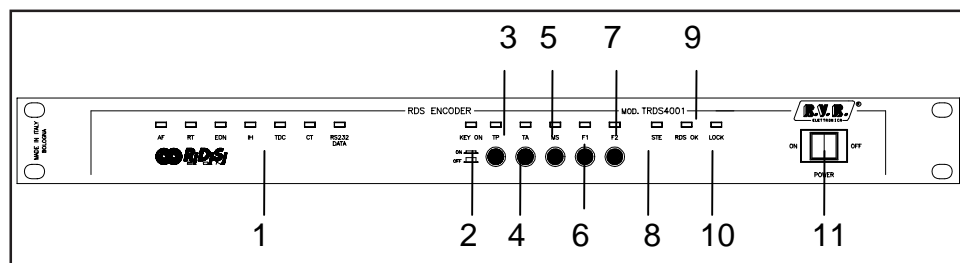
TDC - TRANSPARENTE DATA CHANNEL: it's used for the data transmission and it could be free used, for example, to send messages on a brightly sign.

IH - IN HOUSE APPLICATION: it's used to transmit data of exclusive use of the broadcaster and it can be utilized , for example, to send telemetry data, software, etc.

4.3 Encoder External Description

The coder TRDS4001 is composed of a 19", 1HE and 250 mm depth rack.

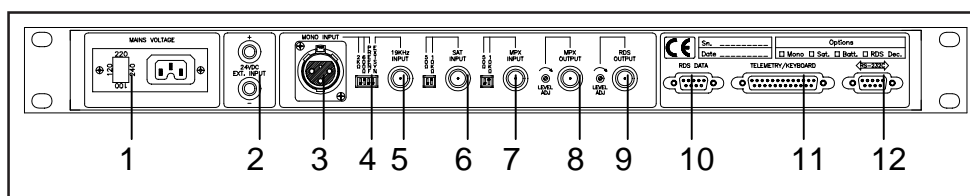
4.3.1 Front Panel



- 1 LEDS 7 green leds indicating some functions of the RDS encoder (for future use)
- 2 KEY ON
Led indicating that one of the keys is pressed
- 3 TP Switch and led to insert/remove and see the status of the TP bit
- 4 TA Switch and led to insert/remove and see the status of the TA bit
- 5 M/S Switch and led to insert/remove and see the status of the M/S bit
- 6 F1 Switch and led to insert/remove and see the status of the F1 bit (reserved for future use)
- 7 F2 Switch and led to insert/remove and see the status of the F2 bit (reserved for future use)
- 8 STE green LED, when lit it indicates the detection of the 19 kHz tone in the MPX input

- 9 RDS OK
green LED, when lit it indicates the correct generation of the RDS signal
- 10 LOCK green LED, when lit it indicates that the encoder is locked on the supplied pilot tone
- 11 ON mains switch

4.3.2 Rear panel



- 1 Mains Mains plug and valtage changer
- 2 Vdc 24 V dc in
- 3 Mono Mono XLR input
- 4 Dip Sw Switch to select external synchronization (19 kHz in) or internal (MPX in or internal oscillator for mono in)
- 5 19kHz Pilot tone input
- 6 SAT optional auxiliary input
- 7 MPX IN
BNC connector for MPX input
- 8 MPX OUT
BNC connector for MPX+RDS output
- 9 RDS BNC connector for RDS output
- 10 RDS DB9 connector for RDS data (not implemented)
- 11 TELEMETRY
DB25 connector for auxiliary I/O
- 12 RS232 DB9 connector for serial programming of the encoder

4.4 Software

The software in kit in italian and english language, on a DOS disk supplied, allows actually to set eight different RDS messages, each of 16 words and a maximum of 25 alternative frequencies; every message automatically starts at the hour of the day specificately preselected from the user. Moreover, it allows to manage all the services, which are listed in the foregoing section.

All the ENCODER management applications are configurable with a IBM-compatible personal computer, which has to be connected with a serial cable to the encoder.

After having configured the encoder, the PC can be disconnected.

4.5 Technical Specifications

Electrical Specifications

RDS Signal	as in CENELEC EN 50067 specs
Codification	Differential at two levels
Modulation	DSB with suppressed carrier
Frequency	57 KHz
Range	±2.4 KHz
MPX INPUT	0/+12 dBm on 600 Ohm
OUTPUT	MPX + RDS
MPX output level	Inp MPX
RDS output level	20-1000 mVpp
Output impedance	100 Ohm
RDS user messages	16 words of 8 characters, whose 2 with data and transmission time
Alternative frequencies	25
Message change	with IMB-compatible PC
CONNECTION	RS232-C standard
COMUNICATION	Full Duplex
RAPIDITY	1200 baud
RS232-C CONNECTOR	9 Pin Cannon Female
MESSAGE MANAGEMENT	checked with a microchecker
DATA PRESERVATION	10 years (in absence of power supply)
A.C. SUPPLY	100-130 V, 50-60 Hz 198-250 V, 50-60 Hz
D.C. SUPPLY	24V
POWER CONSUMPTION	15 VA

Physical Specifications

RACK DIMENSIONS	44.0mm (1.7") H
	360.0mm (14.15")W
	245.0mm (9.7")D
PANEL DIMENSIONS	483.0mm (19") W
	44.0mm (1.7") H
OPERATING TEMPERATURE	- 10°C to 50°C
HUMIDITY	90% max, non condensing
WEIGHT	3.5 Kg

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5. Electrical Description

5.1 Introduction

This chapter describes the TRDS4001 ENCODER function . For utility, the device is divided in subassemblies which will be deeply discussed in the following paragraph.

5.2 Power Supply

The power supply section is composed from a 220 V transformer (double primary 110-110 V) which supplies a +12 V voltage for the analogical part and a +5 V voltage for the digital logical one. In 24 V version (actually current model), in case of range absence, the apparate automatical commutes the power supply on the external battery, on guaranting the continuity of service.

5.3 RDS Circuit

It presents a microchecker which manages the production of RDS message. The setted RDS message is preserved also in absence of primary power supply. The RDS carrier wave at 57 Khz is produced on locking at the 19 Khz one of MPX signal in input for the stereo transmission systems, or with an internal quartz oscillator for the mono transmission systems. In the stereo systems the stereo led lights. The into codifier microchecker could immediatly modifythe transmitted message; that guarantees the system very much flexibile and adattable at the different customers necessities.

5.4 Audio Exchanger Circuit (Only For TRDS4001/SAT Version)

This circuit, which is present only in sat version, has the function, after pointing out the audio signal absence which comes from the earth connection, to change over the apparate on the sign which comes from the sat.

The commutation time is changeable from 20 to 45 seconds and it could be regulated between the R6 trimmer.

We could have the audio signal threshold level regulation on setting the R9 trimmer on the circuit.

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6. Installation Procedures

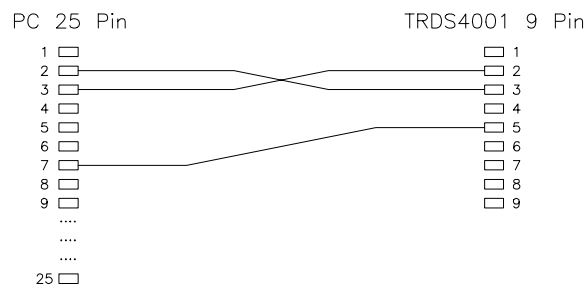
6.1 Introduction

This chapter contains the useful information for the TRDS4001 installation and preliminary check-in.

The R.V.R. ELETTRONICA S.p.A. supplies the following equipment:

1. N. 1 19" 1U rack, which contains the TRDS4001 RDS codifier;
2. N. 1 VDE cable for the A.C. supply of the system;
3. N. 1 3.5" DOS disk with relative software;
4. N. 1 Reverse DB9 serial connection cable, male and female;
5. Manual.

In case of the personal computer is not equipped of a DB9 type serial gate, but of a DB25 type one, the cable has to be realized as showed in the following screen:



6.2 Unpacking

Unpack the equipment and, before any other operation, check the unity for any shipping damage and check that all controls placed on the front and the rear panel are useable.

6.3 Installation Instructions

For the installation and the use of the system are necessary the following not supplied accessories:

1. Cables for the mono and stereo signals entrance to the TRDS4001 (BNC side TRDS4001);
2. Cables for the connection between codifier and transmitter (BNC side TRDS4001);

For a right TRDS4001 codifier working, it's important to observe with attention as follows:

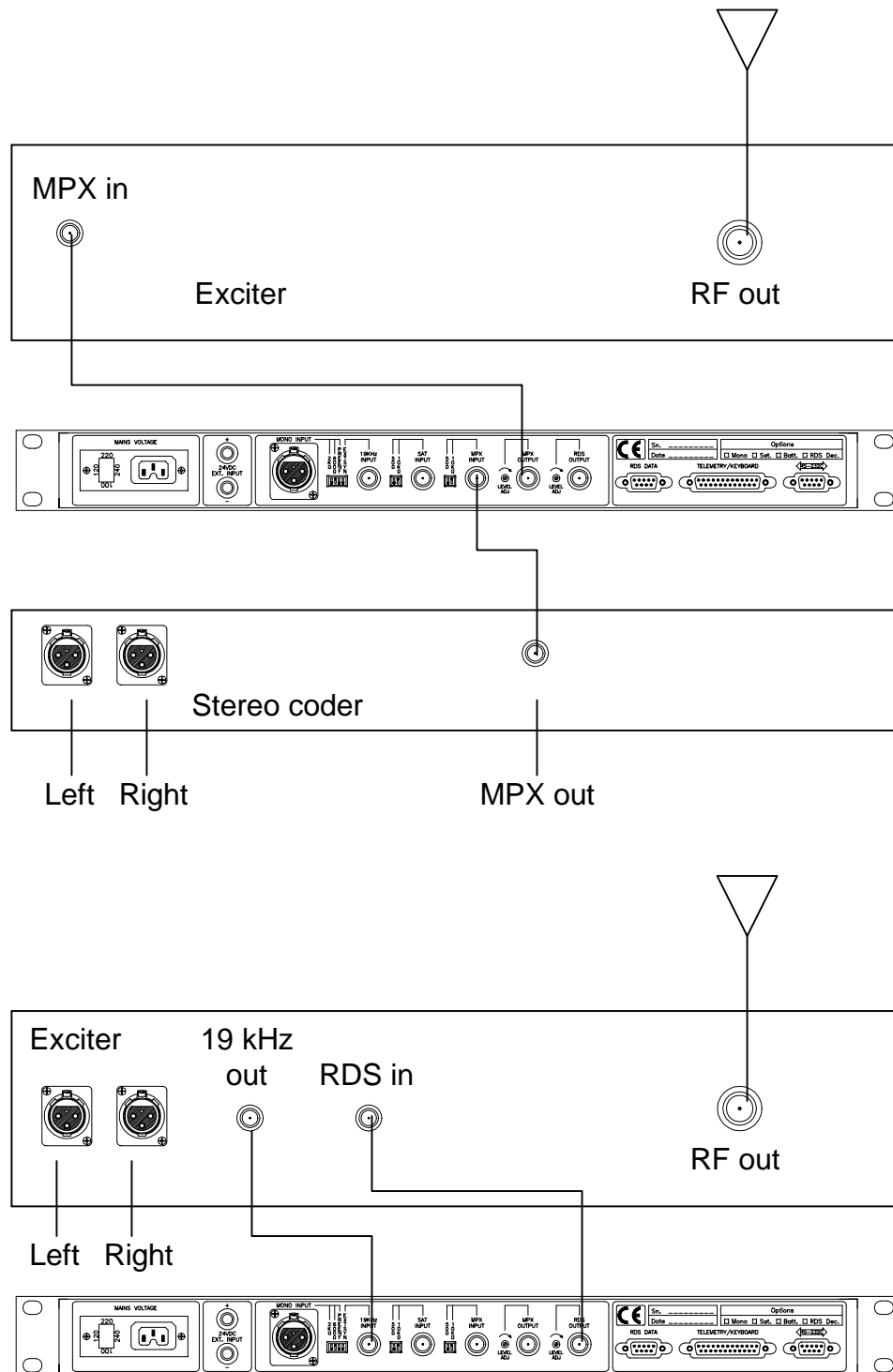
- 1) The TRDS4001 coder has to be installed immediately before the transmitter, either for stereo transmissions or the mono ones.
- 2) The connections has to be realized with most possible short screened cables. We recommend cables not longer than 3 meters.
- 3) Realize with care the input and output connections in order to reduce drones and background noises.
- 4) Place the codifier far from heat sources and in not directly sun radiations facing areas.
- 5) Check that the range voltage which will supply the system is as desired.
- 6) Realize a supplied DOS disk copy before using. For that it's enough to use the DOS "COPY" command.
- 7) Do not open the rack containing the system.
- 8) Clean the system only with a dry and soft cloth in order to avoid finishings damages.
- 9) In case of damages, switch off the system and contact directly the firm R.V.R. ELETTRONICA s.p.a.

6.4 Hardware Installation

The TRDS4001 RDS encoder can be connected to an exciter basically in two ways:

- it can add the RDS signal to a MPX input signal and then supply the resulting baseband signal to an exciter accepting MPX input or,
- it can just generate the RDS signal synchronized with an external 19 kHz pilot tone

The following figure gives a schematic example of the two ways of installing the encoder.



If all the connections have been right realized, the coder will be working in 2-3 seconds and sending the RDS messages.

It doesn't need any adjustment because it's already set before the ship; the MONO or MPX signal is 0dBm on 600 Ohm (about 2.2 Vpp.).

In different case, it's necessary be equipped of a spectrum tester in order to set the undercarrier wave level at -30 dB compared to the not modulated FM carrier wave.

6.5 Software Installation

The supplied software has been planned in wise to simplify the use also by unpractised user; every performance is complete with a different available options list in order to reduce the difficult on setting.

In case of, for any reason, on the screen are nonsense indications or the PC jams, we recommend to reset it and to repeat the procedure from the beginning.

The supplied software forecasts either the alphanumerical commands use or the following ones:

TAB [] to go from a window to another one of the same screen;

UP/DOWN DIRECTIONAL ARROWS to run the different voices of an internal list at one frequency or to go from a word to another one of a message or to change place on the screen commands (ex. ABORT, CONFIRMATION, MODIFY);

<ENTER> to select the desired function;

DEL to cancel some message characters and/or cody;

LEFT/RIGHT DIRECTIONAL ARROWS to change place into a message word.

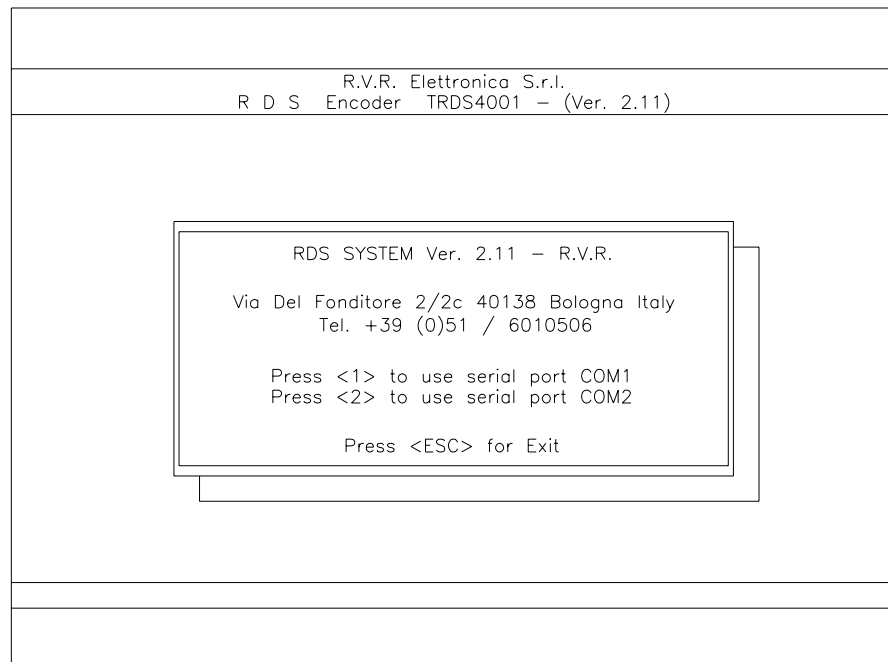
The firm R.V.R ELETTRONICA Spa supplies in kit a 3.5" DOS disk containing the program which allows the total management of messages and ENCODER services.

For that it's necessary an IBM compatible Personal Computer with RS232 serial line and a 3.5" disk drive.

The management could be realized also during the TRDS4001 working on following this procedure:

- 1) Connect the serial cable between the PC and the 9 pins connector placed on the front panel (REMOTE);
- 2) Connect the PC to the power supply net;
- 3) Switch on the PC and the RDS ENCODER;
- 4) When the prompt appears on the screen (normally C:\), insert the supplied disk (after made a copy) in the proper drive;
- 5) Finger A: or B: (it depends from the disk drive type);
- 6) Entry in the program directory on operating as follows:

- a) finger CD ENGLISH <INVIO> (program in italian language);
 - b) finger RDS <INVIO> (to start the management program);
- 7) On the screen you can see the followings presentation window:



- 8) In this window we recommend to finger:

1 to use serial port COM1

2 to use serial poert COM2

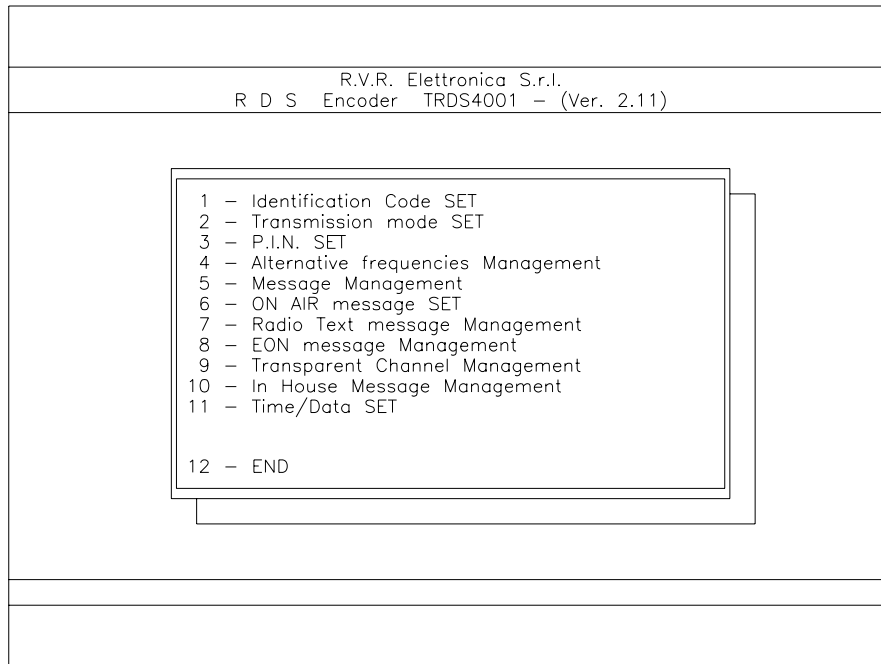
ESC for EXIT

It's necessary to finger the serial line number used for the ENCODER connection, 1 for COM1 and 2 for COM2.

After indicating the serial line the program trys to connect with the system.

If the connection does not working within 5 seconds, the help instructions appear on the screen.

If all is right, the chief menu appears, which shows as follows:



N.B. In the up-link sat encoders, before the chief menu, select the place (or the encoder) you desire to connect to.

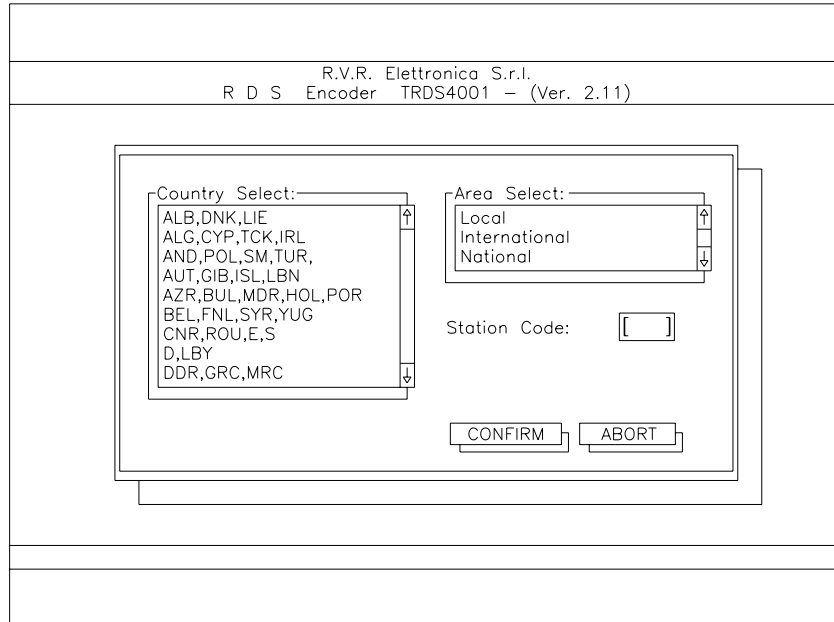
A) MAIN MENU

The main menu allows the following functions:

- 1) Identification code SET
- 2) Transmission mode SET
- 3) P.I.N. SET
- 4) Alternative frequencies Management
- 5) Messages Management
- 6) ON AIR message SET
- 7) Radio Text message Management
- 8) EON messages Management
- 9) Transparent Channel Management
- 10) In House Message Management
- 11) Time/Data SET
- 12) End

B) IDENTIFICATION CODE SETTING

It's used to set or change the identification code of a broadcaster (PROGRAM IDENTIFICATION CODE - PI) which has to be univocal into the broadcaster covering area. It's depends from the country of the braodcaster and from the same broadcaster covering areas. The menu shows as follows:



R.V.R. Elettronica S.r.l.
R D S Encoder TRDS4001 - (Ver. 2.11)

Country Select:

- ALB, DNK, LIE
- ALG, CYP, TCK, IRL
- AND, POL, SM, TUR,
- AUT, GIB, ISL, LBN
- AZR, BUL, MDR, HOL, POR
- BEL, FNL, SYR, YUG
- CNR, ROU, E, S
- D, LBY
- DDR, GRC, MRC

Area Select:

- Local
- International
- National

Station Code:

For the planning it's necessary to select the country in the COUNTRY SELECT window (ex. ENTER command on I, JOR), to select the covering area on the window AREA SELCET (ex. RETURN command on LOCAL or NATIONAL) and the code (number from 1 to 255).

The on the encoder values and/or selected are pointed out on the screen in a different color strip.

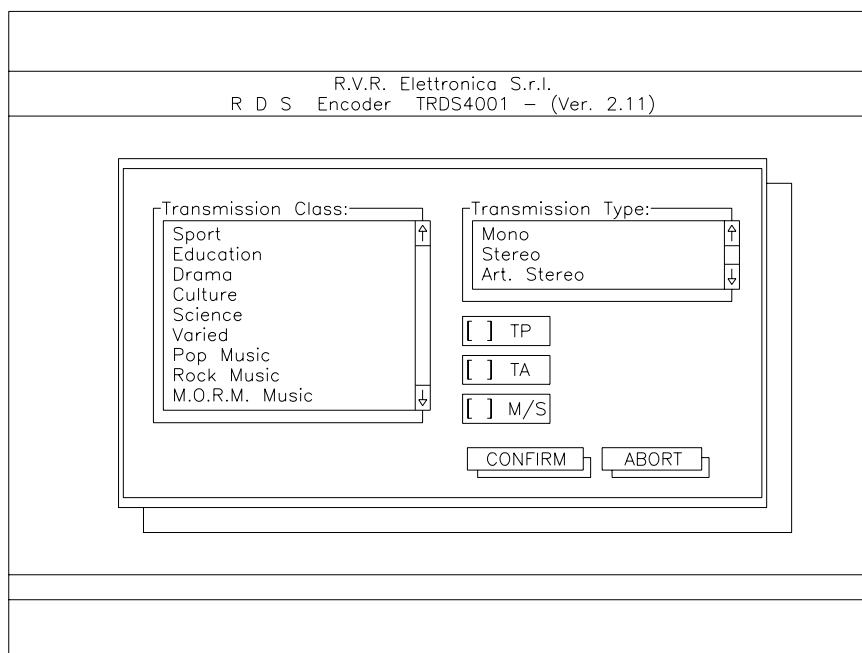
The preselected data are revised on the encoder only pressing ENTER when the cursor is placed on the screen-command (lighted one) CONFIRM; they are neglected on pressing the screen-command ABORT.

Normally, these data are setted only for the first time.

C) TRANSMISSION MODE SET

It's used to set or change the by the broadcaster sended programmes type, the used transmission type and to allow the TP services (Traffic-Programmes Identification), TA (Traffic-Announcement Identification), M/S (Music/Speech Switch).

The setting menu shows as follows:



For the planning it's necessary to select the sended programmes type, in the TRANSMISSION CLASS window (ex. command ENTER on VARIOUS or NOTICES) and to select the transmission type used in the TRANSMISSION TYPE window (ex. command ENTER on STEREO).

The on the encoder values, and/or selected, appear on the screen in a different colour strip.

To allow the TA; TP; or M/S services, take place on the proper window and make them working on pressing the cursor: if a "X" lights in this window, the procedure is right.

The preselected data are revised on the encoder only on pressing the command ENTER when is lighting the CONFIRM screen-command; they are neglected on pressing the screen-commander ABORT.

Normally, these data are setted only for the first time.

D) P.I.N. SET - PIN

It's used to planning the receiver to receive specificated programmes in a preselected date and hour.

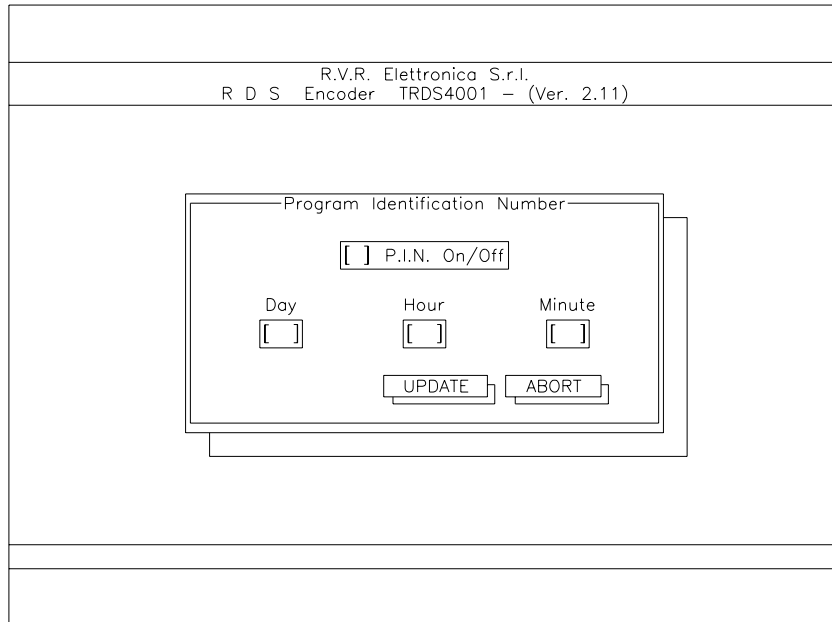
In oder to right operate, it's necessary to ability the service; for that, take place on the "P.I.N. On/Off" window and press the cursor; if a "X" lights in the window, the procedure is right.

Now, it' necessary to set the date, the hour and the minute of the service starting.

The preselected data are revised on the encoder only on pressin the command

ENTER when is lighting the screen-command UPDATE; they are neglected on pressing the ABORT screen-command.

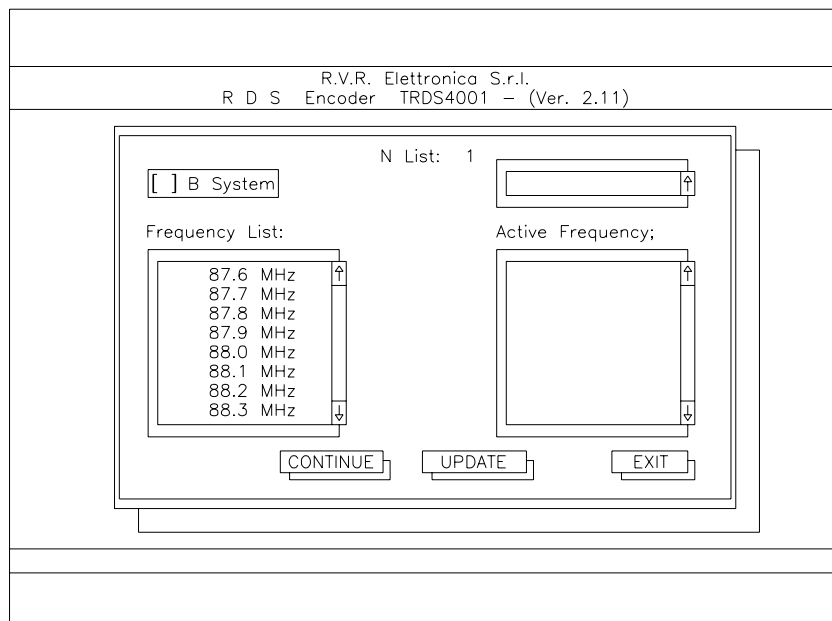
The "P.I.N. SET" shows as follows:



E) ALTERNATIVE FREQUENCIES MANAGEMENT - AF -

It's used to set or change the broadcaster sinthony frequencies lists in its diffusion areas.

The menu shows as follows:



For the alternative frequencies transmission, the program uses two methods: A (default selected) and B.

The two methods use the following size:

A METHOD: every station send a nearly frequencies list, after the contained frequencies number (max. 25);

B METHOD: every station send a frequencies list for every transmitters which it gets.

The list begins with the chief frequency and it follows with the by transmitters used ones (max. 12 and nearby at the current user areas).

The method B is recommended when the frequencies list is long, as allows at autotuning the system to check a smaller frequencies number in order to more quickly search the new syntony frequency. At the contrary, if the frequencies number is small, the method A is recommended, as it allows a smaller data number transmission.

In order to set the method B, it's necessary to place the cursor on the window showing "METHOD B" and to press the spacebar; if a "X" appears, the procedure is right.

In addition to the "METHOD B", on the screen appear other two windows: FREQUENCY LIST and ACTIVE FREQUENCY, both of them containing a frequencies list. The submultiples of 100 khz are not admitted by the standard. On pressing ENTER on a into a FREQUENCY LIST frequency you select the one which is showed on the ACTIVE FREQUENCY window. If the setted frequency is already in the ACTIVE FREQUENCY list, the PC utters indicating the error.

On pressing ENTER on a frequency of the ACTIVE FREQUENCY list you cancel the same frequency.

The setted data are revised on the encoder only on pressing ENTER when the screen-command UPDATE is pointed out on the screen; they are neglected on pressing the screen-command EXIT.

Normally, these data are setted only for the first time.

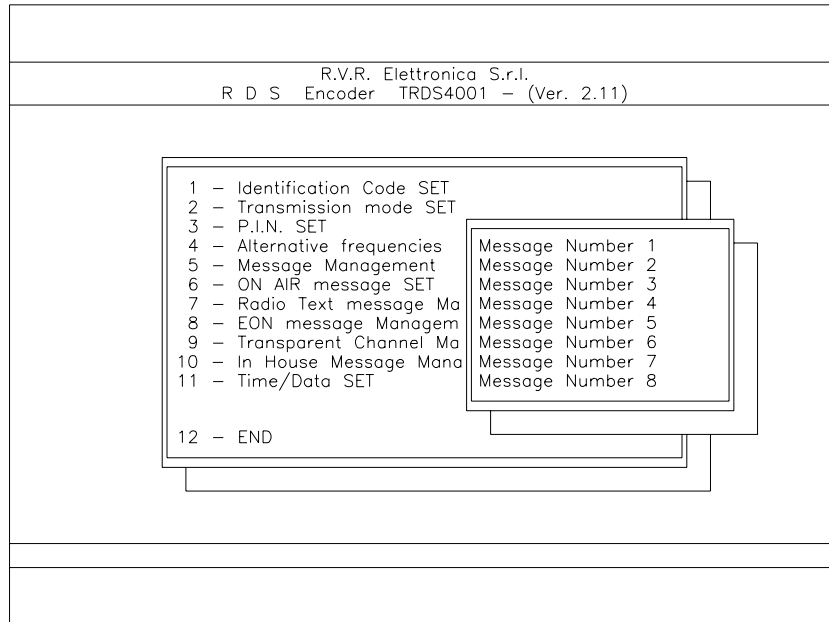
F) MESSAGE MANAGEMENT

It's used to set or modify the user messages contains (max. 8) which are visualized on receivers equipped of RDS syntonized with the broadcaster.

Every message contains max 16 words of 8 characters and every words could be send and visualized on the receiver display for a time changing from 2 to 60 seconds.

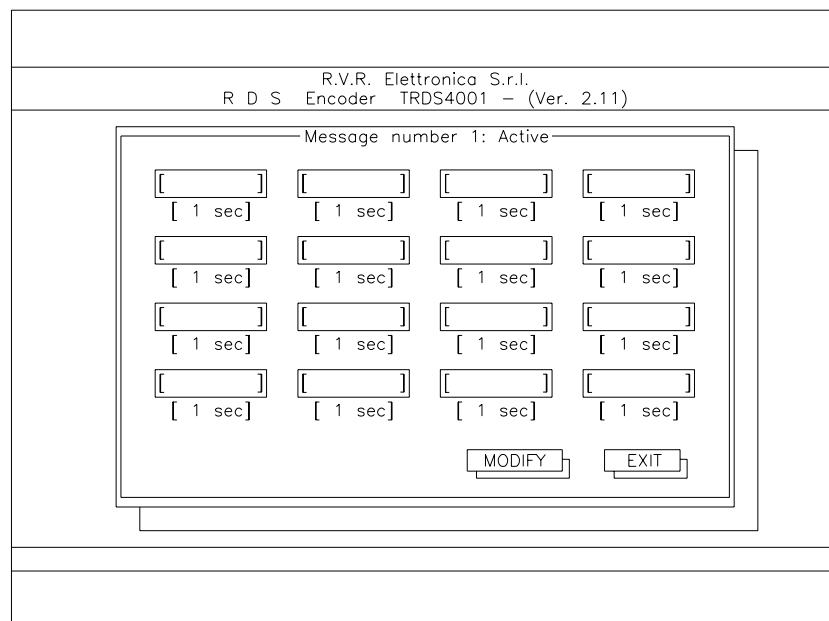
On selecting the voice "MESSAGE MANAGEMENT" from the chief menu, it appears

a submenu: the user has to choose which messages he wants to modify (or to simply visualize); the new menu shows as follows:



At this point, the user selects one of the 8 messages (ex. message number 1) and the current message contain appears.

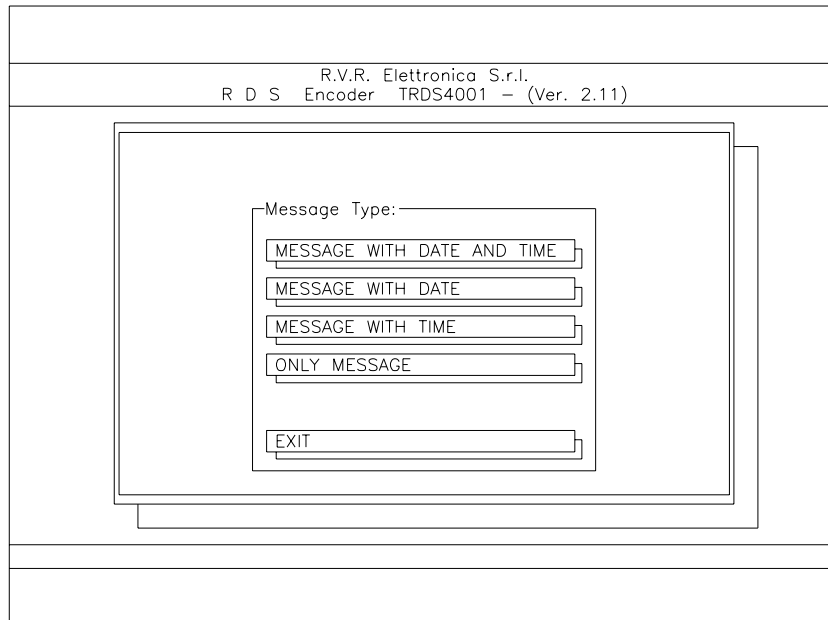
The new menu is the following:



If the user desires to modify the text, than press ENTER on the screen command

MODIFY or press RETURN on the screen command EXIT.

On selecting the window "MODIFY", the new menu appears, which are listed the selectable message types in; the new menu is the following:



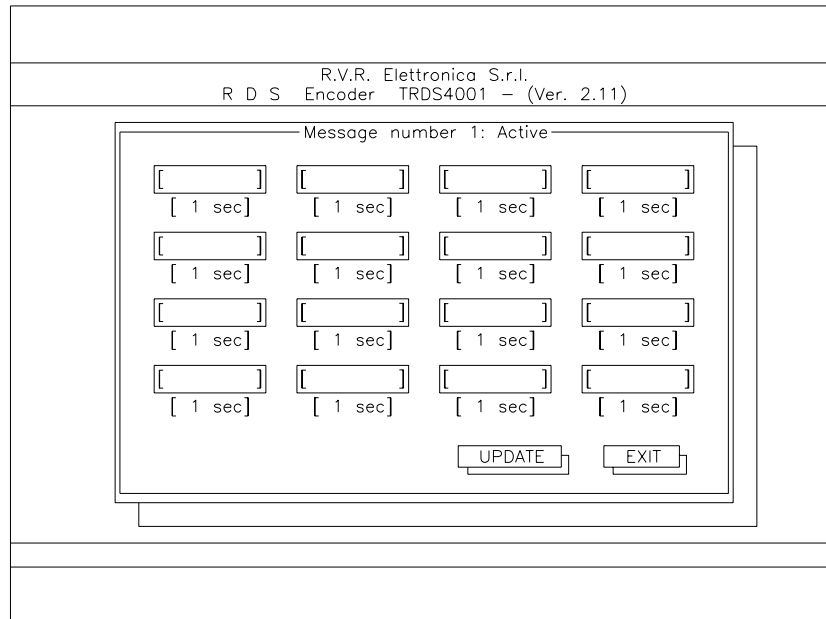
The possible type are four:

- a) Message with Date and Time;
- b) Message with Date;
- c) Message with Time;
- d) Only Message.

At this point it's possible to select the desired message type, or in case of the user does not desire any modifies, it's possible to go out from the menu on selecting the voice EXIT; the program returns at the chief menu.

The choices are possible on placing the cursor with the directional arrows "UP/DOWN" and on confirming with the command ENTER.

In case of the user has selected such a program, the new menu shows as follows:



In case of "MESSAGE with DATE and TIME", the message will contain as first 2 words, of the 16 ones, the date and the hour.

In case of "MESSAGE with DATE", the message will contain as first word, of the 16 ones, the data.

In case of "MESSAGE with TIME", the message will contain as first word, of the 16 ones, the HOUR.

In case of "ONLY MESSAGE", the 16 words are all reserved for the text message.

In order to take place into the message from a word to another one, it's sufficient to press the command TAB.

In order to take place into a word, it's sufficient to use the directional arrows "RIGHT" and "LEFT".

In order to modify the time, it's necessary to use the directional arrow "DOWN" to go into the time window and to press the new one.

The setted data are revised on the encoder only on pressing RETURN on the screen command UPDATE; they are neglected on pressing the screen command EXIT.

G) ON AIR MESSAGES SET

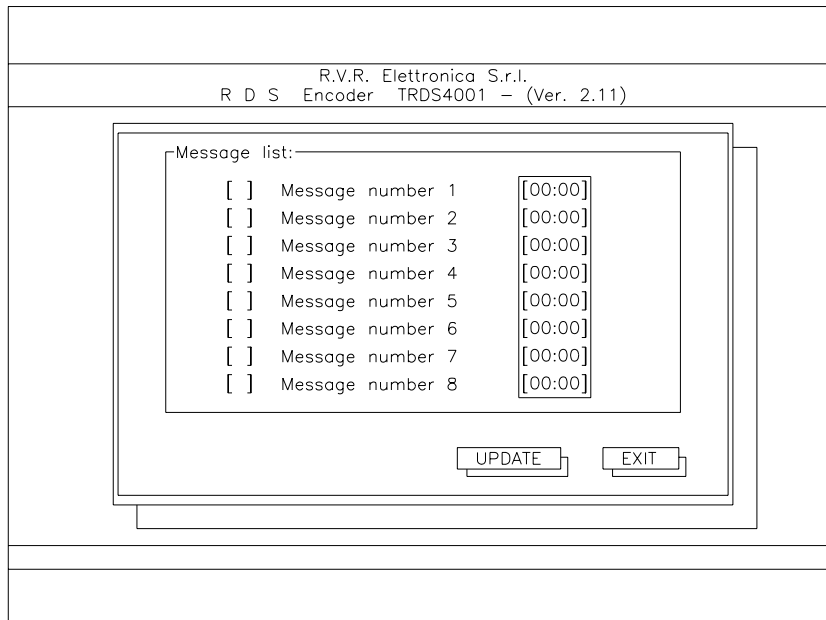
It's used to set/defuse each of the 8 messages and to select the hour and day of the on air putting.

To set/defuse a message it's necessary to press the command SPACE on the keyboard when the cursor is connected with the message. The active messages are where appears a "X".

To change place from the column ACTIVATION to the HOUR one, it's necessary to press the command TAB. It's not realized any check of the hours congruity; it's duty of the user to select different hours for the several messages and time distances between two consecutive messages of at least some minutes. The system automatical provides to put on air the active messages at the preselected hour.

The setted data are revised on the encoder only on pressing ENTER when appears the command REVISE; they are neglected on pressing the command EXIT.

The menu presents as follows:



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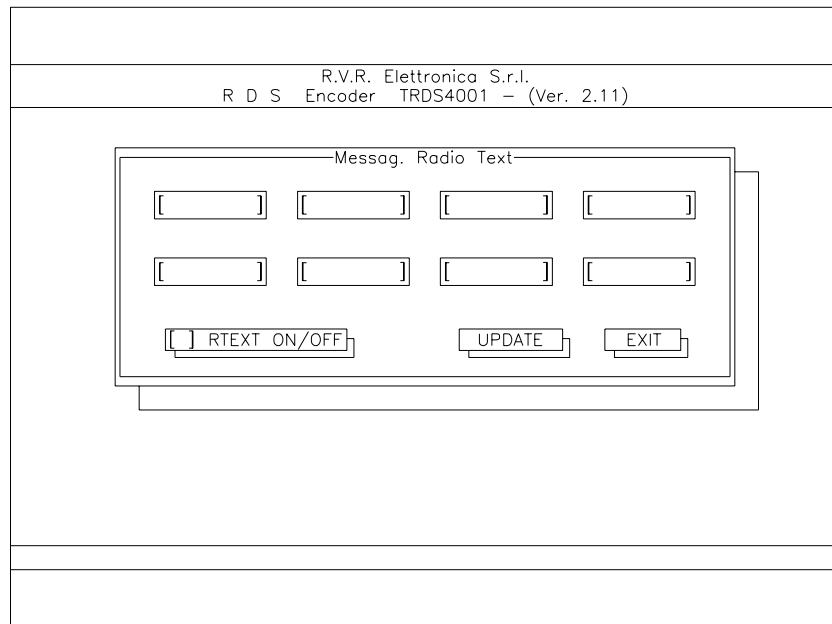
Message list:

<input type="checkbox"/>	Message number 1	[00:00]
<input type="checkbox"/>	Message number 2	[00:00]
<input type="checkbox"/>	Message number 3	[00:00]
<input type="checkbox"/>	Message number 4	[00:00]
<input type="checkbox"/>	Message number 5	[00:00]
<input type="checkbox"/>	Message number 6	[00:00]
<input type="checkbox"/>	Message number 7	[00:00]
<input type="checkbox"/>	Message number 8	[00:00]

H) RADIO TEXT MESSAGE MANAGEMENT - RT -

This option allows to send messages type TEXT and it's mainly indicated for home RDS receivers.

The text could be composed at most of 8 words, each of no more than 8 characters; the relative menu is the following:



To ability the service "Radio Text" it's necessary to place the cursor on the window "RTEXT ON/OFF" and to press the spacebar; if a "X" appears, the procedure is right.

In order to take place into the text from a word to another one, it's sufficient to use the command TAB; to take place into a word, it's necessary to use the directional arrows "RIGHT" and "LEFT".

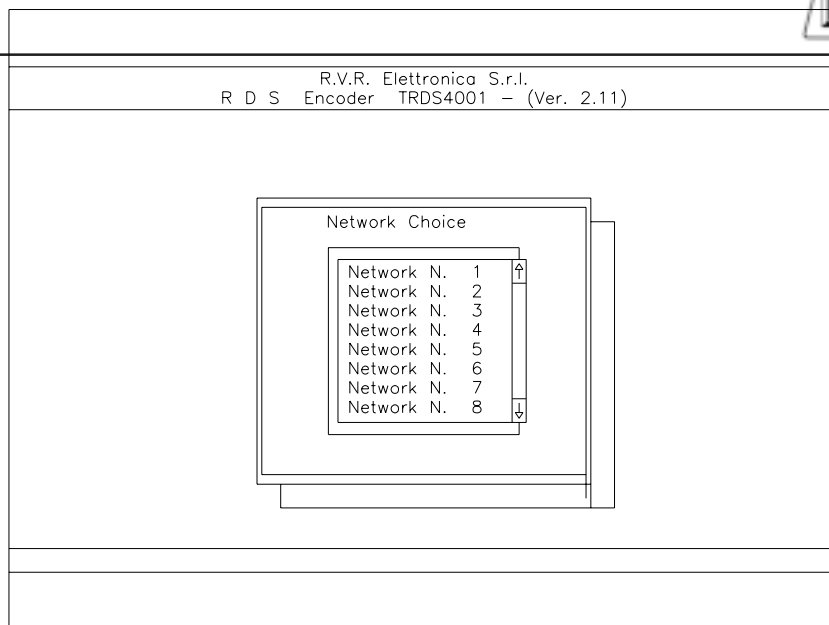
The setted data are revised on the encoder only on pressing RETURN on the screen command UPDATE; they are neglected on pressing the screen-command EXIT.

I) EON MESSAGE MANAGEMENT - EON -

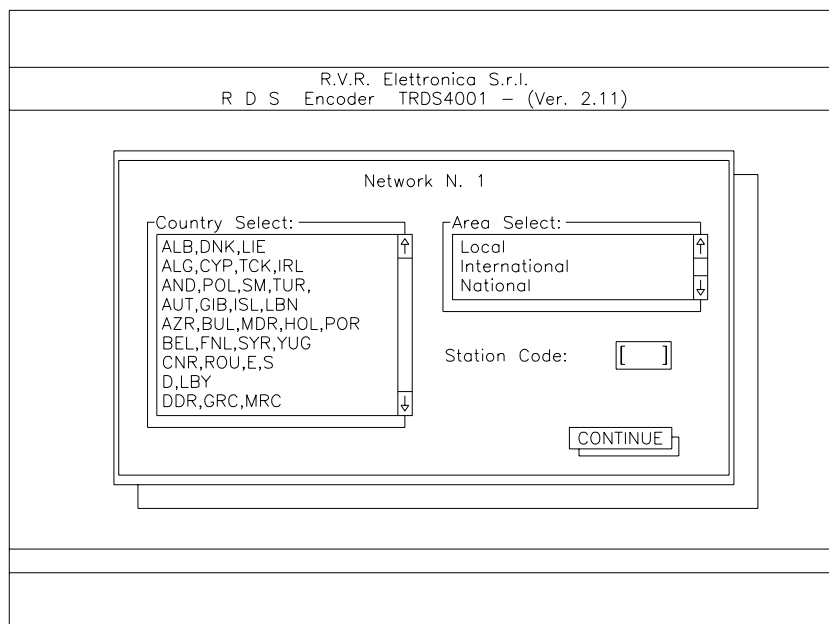
This service is used to transmit the PI (Program Identification), il PS (Program service), l'AF (Alternative Frequencies), il PTY (Program Type) and the PIN (Program-item Number) relative at other networks (radio).

This service allows to manage at most 16 networks.

On pressing the voice "EON MESSAGES MANAGEMENT" from the chief menu, a new one will appear: the user has to choose which of the 16 items of the network he wants to set; the new menu shows as follows:



At this point, the user selects one of the 16 items (ex. Network N. 1) and the new menu is the follows:



In this menu the system asks the information about Network Program Identification.

To plan, it's necessary to select the country in the window COUNTRY SELECT (ex. command ENTER on I, JOR), to select the covering area on the window AREA SELECT (ex. command ENTER on LOCAL or NATIONAL) and the code (number from 1 to 255).

When all the choices are made, on continuing to realize the further ones, take place on screen-command "CONTINUE" and press ENTER; at this point a new menu appears as follows:

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Network N. 1

Transmission Class:

- News
- Affairs
- Informations
- Sport
- Education
- Drama
- Culture
- Science
- Varied

P.I.N.
[]

PS name
[]

[] TP

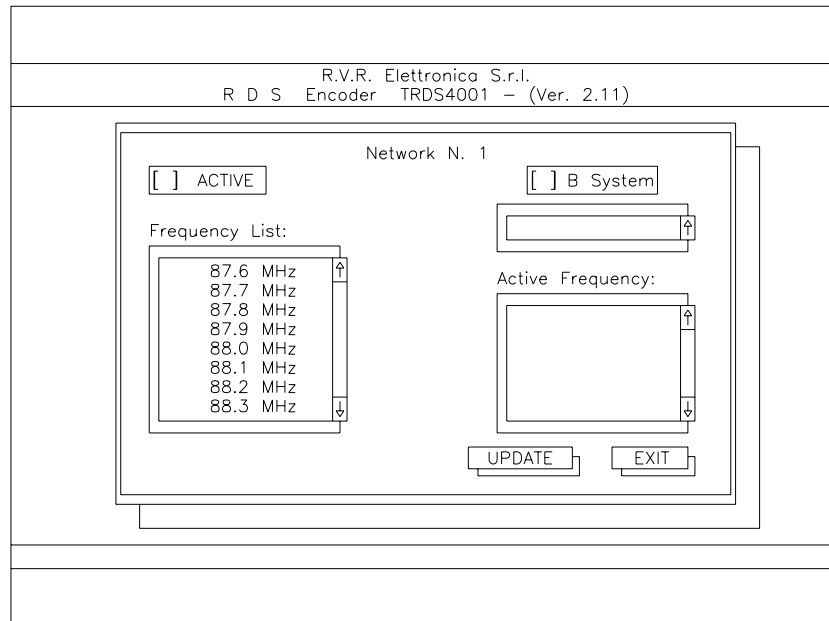
[] TA

[] CONTINUE

In this menu it's possible realize the following settings:

- 1) Program types sended;
- 2) Program-item number (P.I.N.);
- 3) Program service (PS), at most of 8 characters;
- 4) Abilitation of TP services (Traffic-Program Identification), and TA (Traffic-Announcement Identification).

When all the choices are made, on continuing to realize the further ones, take place on the screen command "CONTINUE" and press <ENTER>; at this point a new menu appears as follows:



In this menu the user could set the syntony frequencies list of the broadcaster in its diffusion areas.

Also in this case, as in the "Alternative Frequencies Management" one, the program is provided with two methods for the management of the frequencies list, the A, in default setted, and the B one, indicated for very long frequencies lists.

To set the method B, it's necessary to place the cursor on the window "METHOD B" and than press the spacebar; if a "X" appears, the procedure is right.

In addition to this window, on the screen appear other three windows: FREQUENCY LIST, ACTIVE FREQUENCY and ACTIVE.

The windows "FREQUENCY LIST" and "ACTIVE FREQUENCY" contain a frequencies list.

the submultiples of 100 Khz are not admitted by the standard.

On pressing <ENTER> on a frequency into the FREQUENCY LIST, the user selects the frequency which is visualized on the window ACTIVE FREQUENCY.

If the setted frequency is already into the ACTIVE FREQUENCY, the PC utters on indicating the error.

On pressing <ENTER> on a frequency of the ACTIVE FREQUENCY list, the user cancels the same frequency.

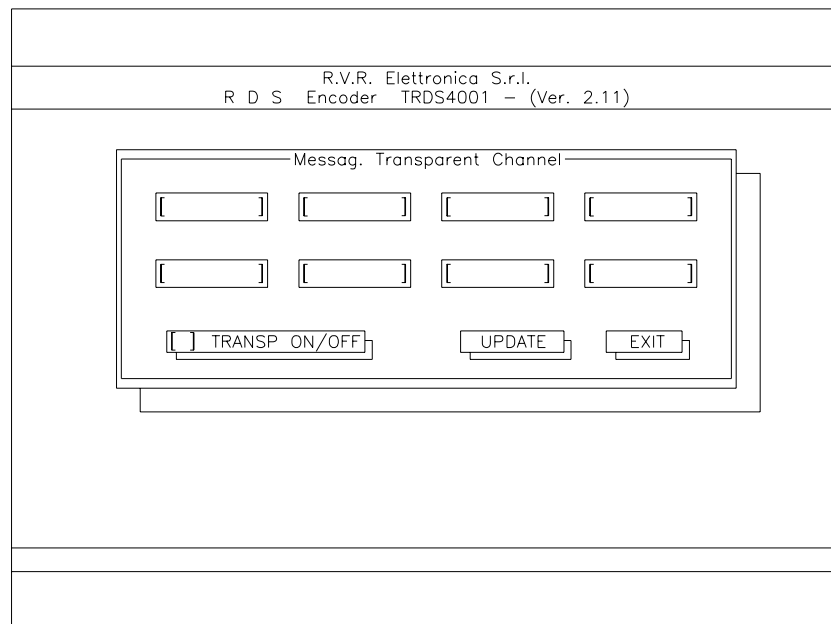
The window ACTIVE allows to set or to defuse the EON message; to ability it, place the cursor on the window "ACTIVE" and press the spacebar; if a "X" appears, the procedure is right.

The setted data within this moment are revised on the encoder only on pressing <ENTER> when appears the screen command UPDATE; they are neglected on pressing the screen command EXIT.

L) TRANSPARENT CHANNEL MANAGEMENT - TDC -

This option is used for the transmission of any type of data.

The text could be composed at most from 8 words, each of 8 characters; the menu shows as follows:



To ability the service "Transparent Data Channel", it's necessary to place the cursor on the window "TRANSP. ON/OFF" and to press the spacebar; if a "X" appears, the procedure is right.

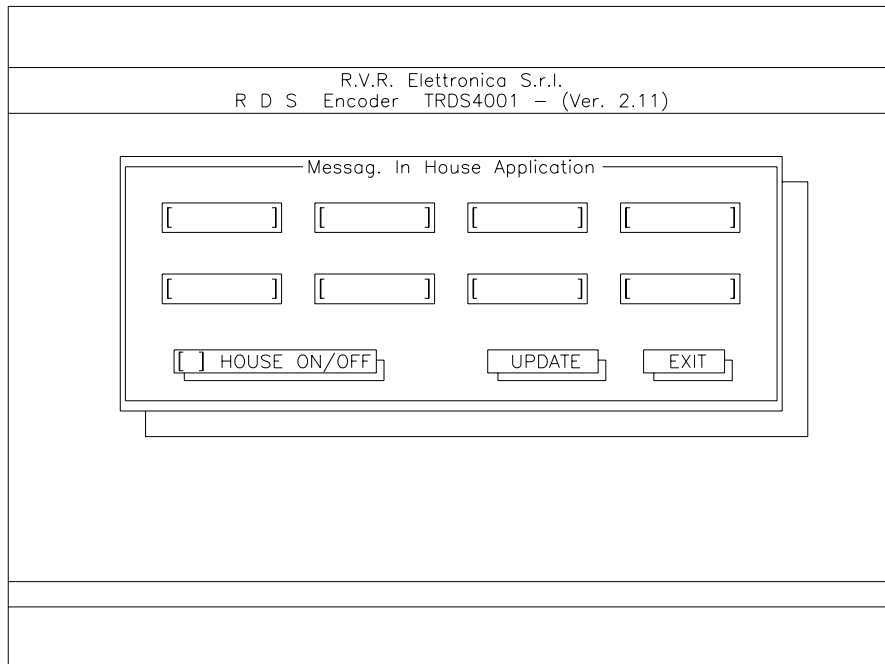
To take place into a text from a word to another one, it's sufficient to use the command "TAB"; to take place into a word, on utilizing the directional arrows "RIGHT" and "LEFT".

The setted data are revised on the encoder on pressing <ENTER> on the screen-command UPDATE; they are neglected on pressing the screen-command EXIT.

M) MESSAGE MANAGEMENT IN HOUSE - IH -

This option is used for the trasmission of the data of exclusiv use of the radio broadcaster and it could be used, for ex., for the transmission of telemetry data, software, etc.

The text could be composed at most of 8 words, each of at most 8 characters; the new menu is the following:



To ability the service "IN House Application", it's necessary to place the cursor on the window "HOUSE ON/OFF" and press the spacebar; if a "X" appears, the procedure is right.

To take place into a text from a word to another one, use the command "TAB"; to take place into a word, use the directional arrows "RIGHT" and "LEFT".

The setted data are revised on the encoder on pressing <ENTER> on the screen-command "UPDATE"; they are neglected on pressing the screen-command "EXIT".

N) TIMDE/DATE SET

This option allows the reading and the setting of the into clock /calendar date and hour, whose the program is provided with.

Date and hour, as so read by the encoder, appear on the screen on the left side; on the right side, the user could see the PC date and hour, at the moment in which is read the encoder clock.

The date and hour setted on the window on the left are transfered on the encoder at the moment of pressing the screen-command UPDATE.

No revising are realized on pressing the screen command EXIT.

The menu shows as follows:

R.V.R. Elettronica S.r.l. R D S Encoder TRDS4001 - (Ver. 2.11)								
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Target Time/Date</td> </tr> <tr> <td style="text-align: center;">[22:28:02]</td> </tr> <tr> <td style="text-align: center;">[11/01/97]</td> </tr> <tr> <td style="text-align: center;">22:34:50</td> </tr> </table>	Target Time/Date	[22:28:02]	[11/01/97]	22:34:50	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">PC Time/Date</td> </tr> <tr> <td style="text-align: center;">22:24:26</td> </tr> <tr> <td style="text-align: center;">11/07/97</td> </tr> </table>	PC Time/Date	22:24:26	11/07/97
Target Time/Date								
[22:28:02]								
[11/01/97]								
22:34:50								
PC Time/Date								
22:24:26								
11/07/97								
<input type="button" value="UPDATE"/> <input type="button" value="EXIT"/>								

The TRDS4001/SAT Encoder version, in the chief menu, is provided with a further option, as follows:

O) STATION SELECTION

The RDS SAT version codifier provides the messages planning with a directly connected Pc and with a remote connection of the PC to the UP-LINK transmitter.

In this case, the several codifiers are identified by an internal 8 bits code (from 1 to 255) in EPROM memorized; when the user wants to modify a codifier message, he has to know the relative code.

The several codes are listed into the record "STATION.DAT", which is realized and modified by a standard EDITOR. The record provides 4 useful fields to the encoder identification which are separated by commas:

- 1) Code, 3 numerals number (from 1 to 255). The codes more shortly than 3 numerals have to be preceded by spaces;
- 2) Address, alphanumeral field at most of 30 characters;
- 3) Place, alphanumeral field at most of 25 characters;
- 4) District, 2 characters field.

The supplied management program uses only the field 1 for the encoder addressing; the other ones could contain the informations that the user considers more proper. The only bond to respect is NOT EXCEED the presettet characters limit. Into the record STATION.DOC, two encoder could not have the same code.

This option allows to select 1,2,.....N, all the encoders (identified by the station where they are placed in) to send the message to; if no encoder is selected, none of the other voices into the chief menu are settable.

SAT CONNECTION VERSION

The RDS codifier in UP-LINK version for SAT presents some peculiarities compared with the other codifiers which are specified in this chapter.

A) The software in kit provides two programs: RDSSATTX and RDSSATPC.

The RDSSATTX program is useable with the connection of the Pc to the SAT transmitter.

This program takes and memorizes the several messages information from the file on disk /directorate where the program is placed in, in absence of confirmation by the selected codifier. Therefore, we recommend to make files copies whenever the user modifies a message.

The revised files by RDSSATTX are `FREQ.BIN`, `ID.BIN`, `MSG.BIN`, `PROG.BIN`, `TYPE.BIN`.

The RDSSATPC program is useable with the connection of the PC to the RDS codifier. This program receives the information on directly asking to the preselected codifier, on setting the voice into the chief menu `POST.SELECT`.

This program is working for one station at a time.

P) EXIT

On setting this option the program ends and returns the cheking to the PC DOS operative system. The PC could be disconnected by the codifier.

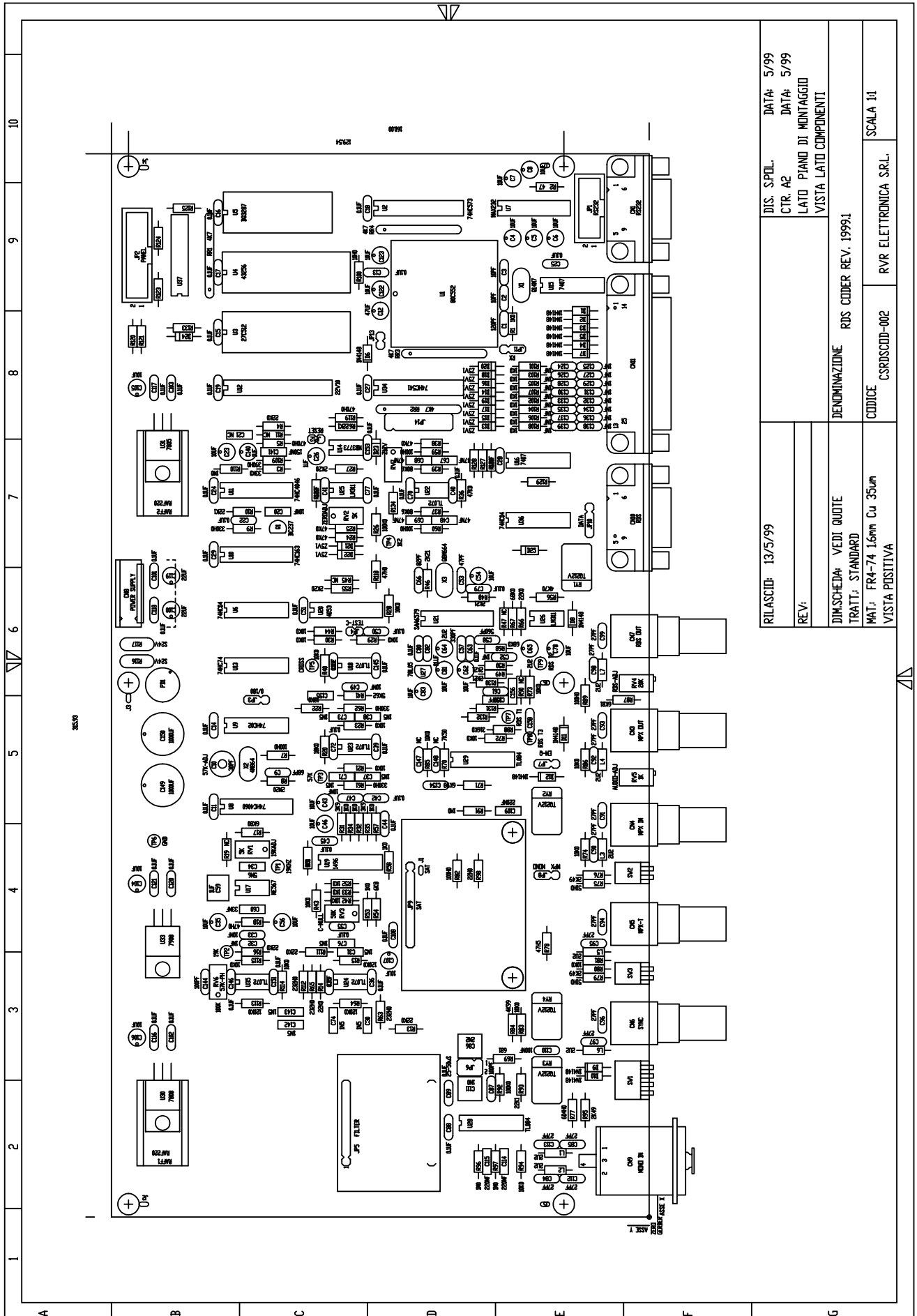
Appendix A Piani di montaggio, schemi elettrici, liste componenti / *Component layouts, schematics, bills of material*

Questa parte del manuale contiene i dettagli tecnici riguardanti la costruzione delle singole schede componenti il TRDS 4001. L'appendice è composta dalle seguenti sezioni:

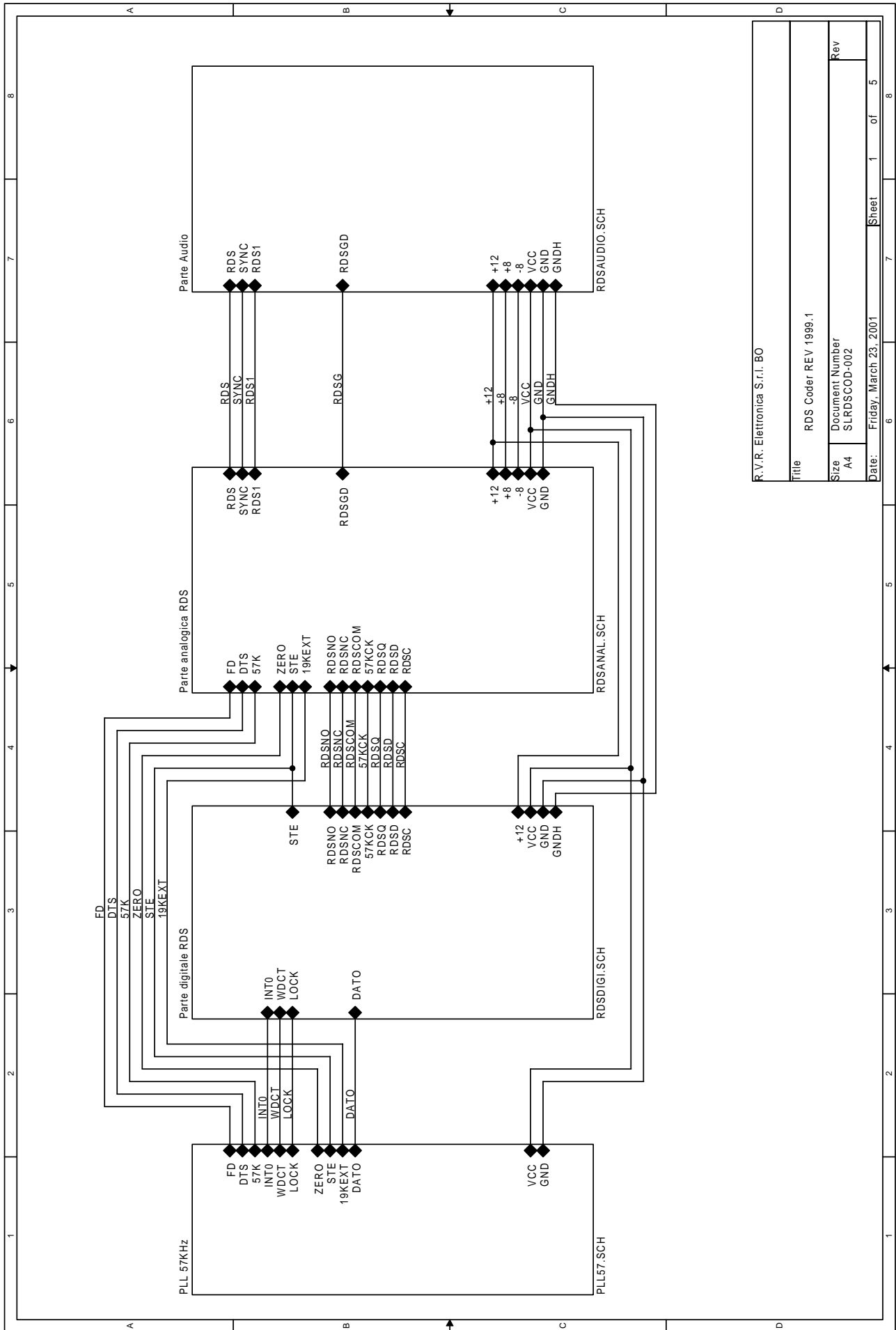
This part of the manual contains the technical details about the different boards of the TRDS 4001. This appendix is composed of the following sections:

Description	RVR Code	Vers.	Pages
RDS Coder	SLRDSCOD-002	1.0	10
RDS Panel	SLRDSPAN9901	1.1	6
Power Supply	SLPSUP003	1.0	4

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RILASCIATO: 13/5/99	DIS. SPOL. DATA: 5/99
REV:	CTR. A2 DATA: 5/99
DIMENSIONI: VEDI QUOTE	LATO PIANO DI MONTAGGIO
TRATT.: STANDARD	VISTA LATO COMPONENTI
MAT.: FR4-74 1.6mm Cu 35um	DENOMINAZIONE RDS CODER REV. 1999.1
VISTA POSITIVA	CODICE CSPOSCOD-002
	SCALA 1:1



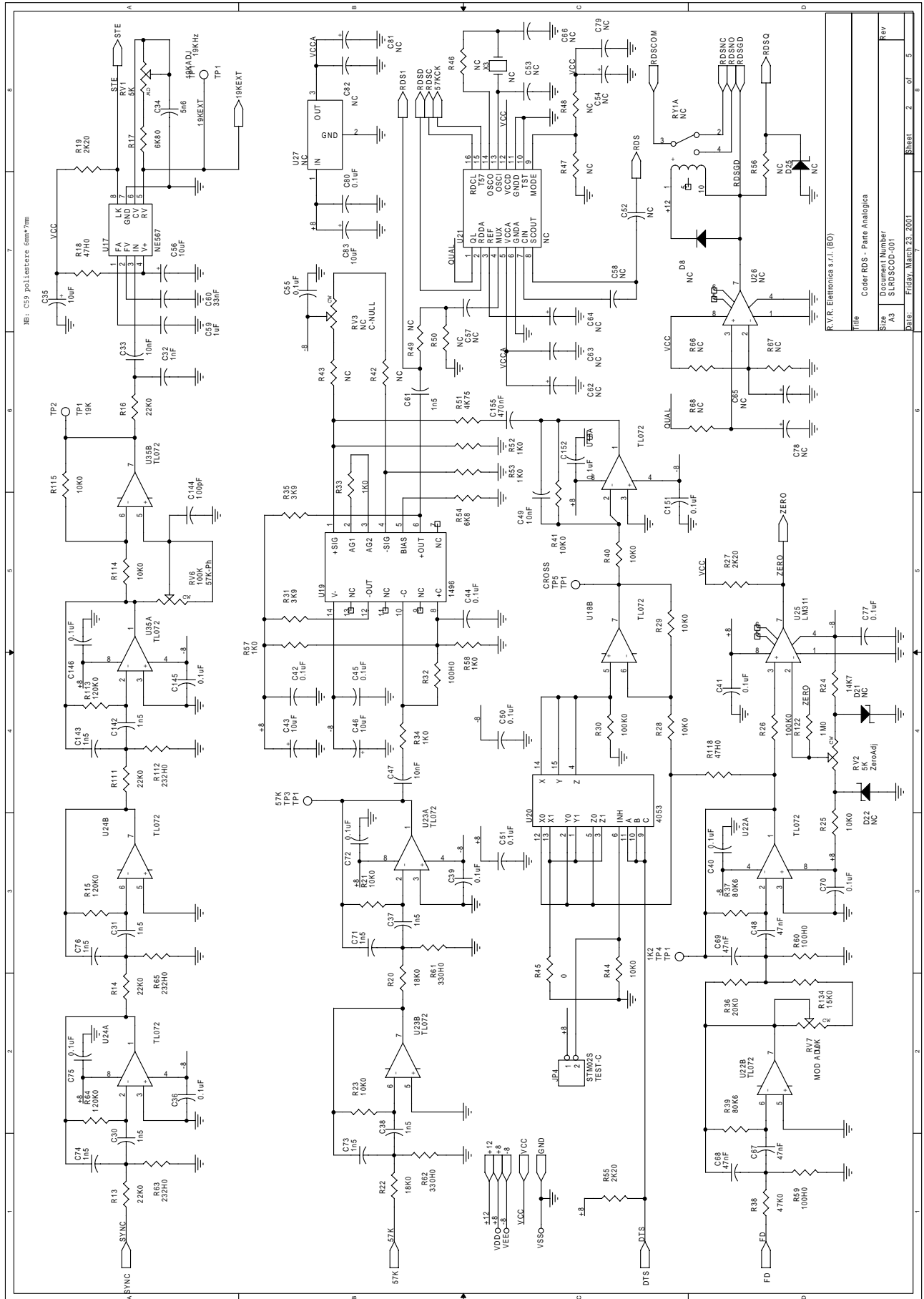
R.V.R. - Elettronica S.r.l. BO

Title RDS Coder REV 1999.1

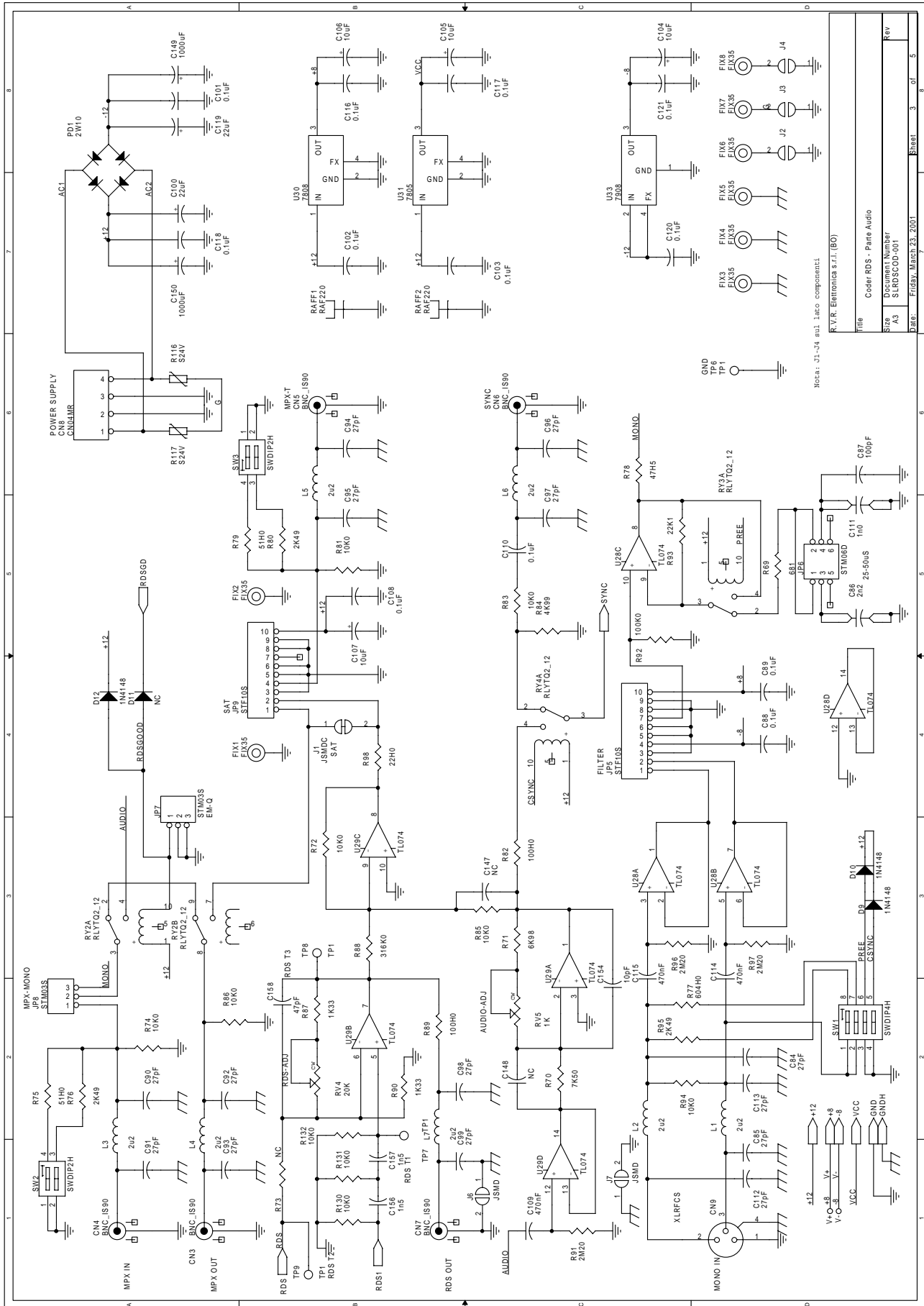
Size A4 Document Number SLRDSCOD-002

Date: Friday, March 23, 2001

Sheet 1 of 5

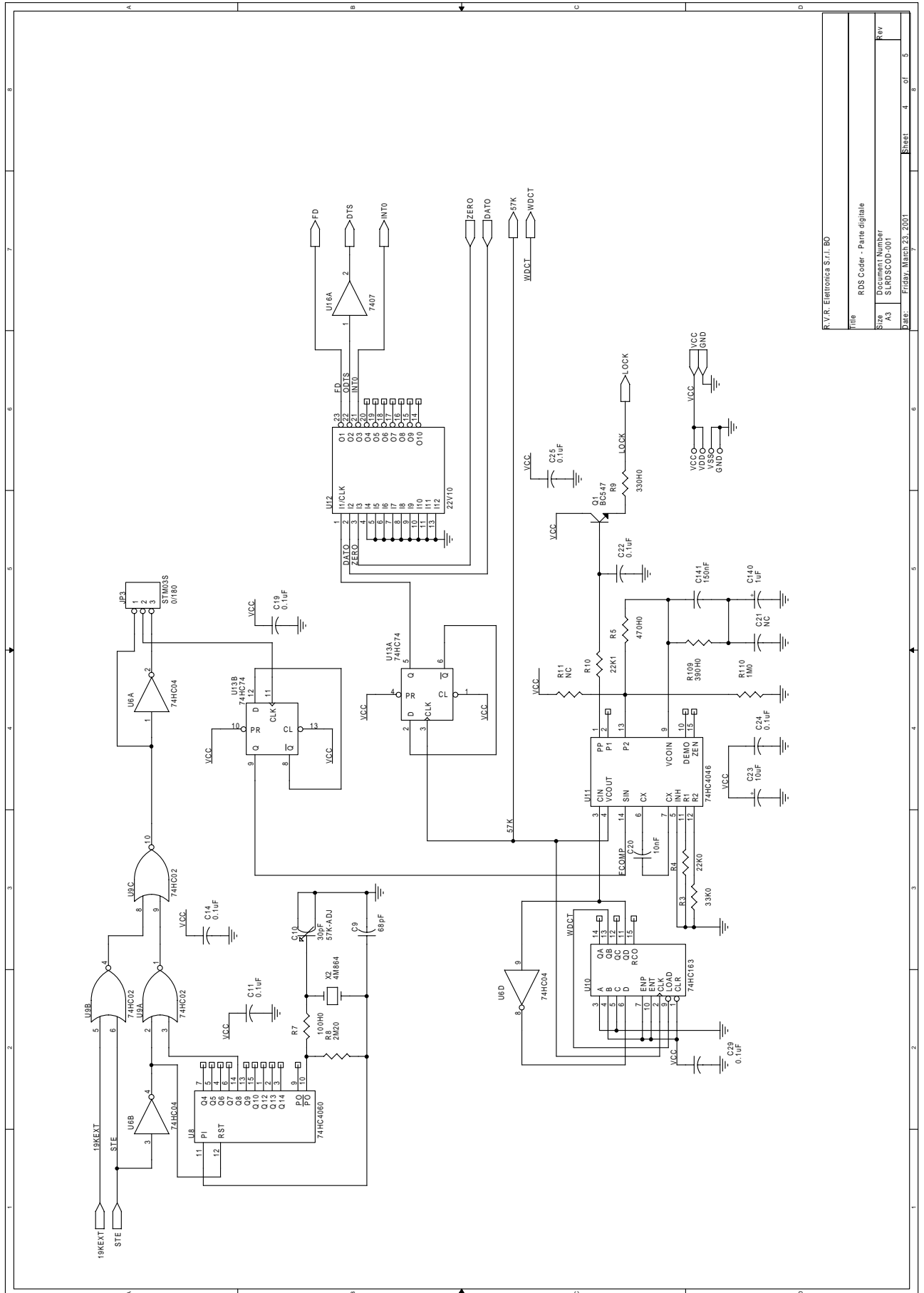


File	Coder RDS - Parte Analogica
Size	Document Number
A3	SLRDSCOD-001
Date:	Friday, March 23, 2001
Sheet	2 of 5

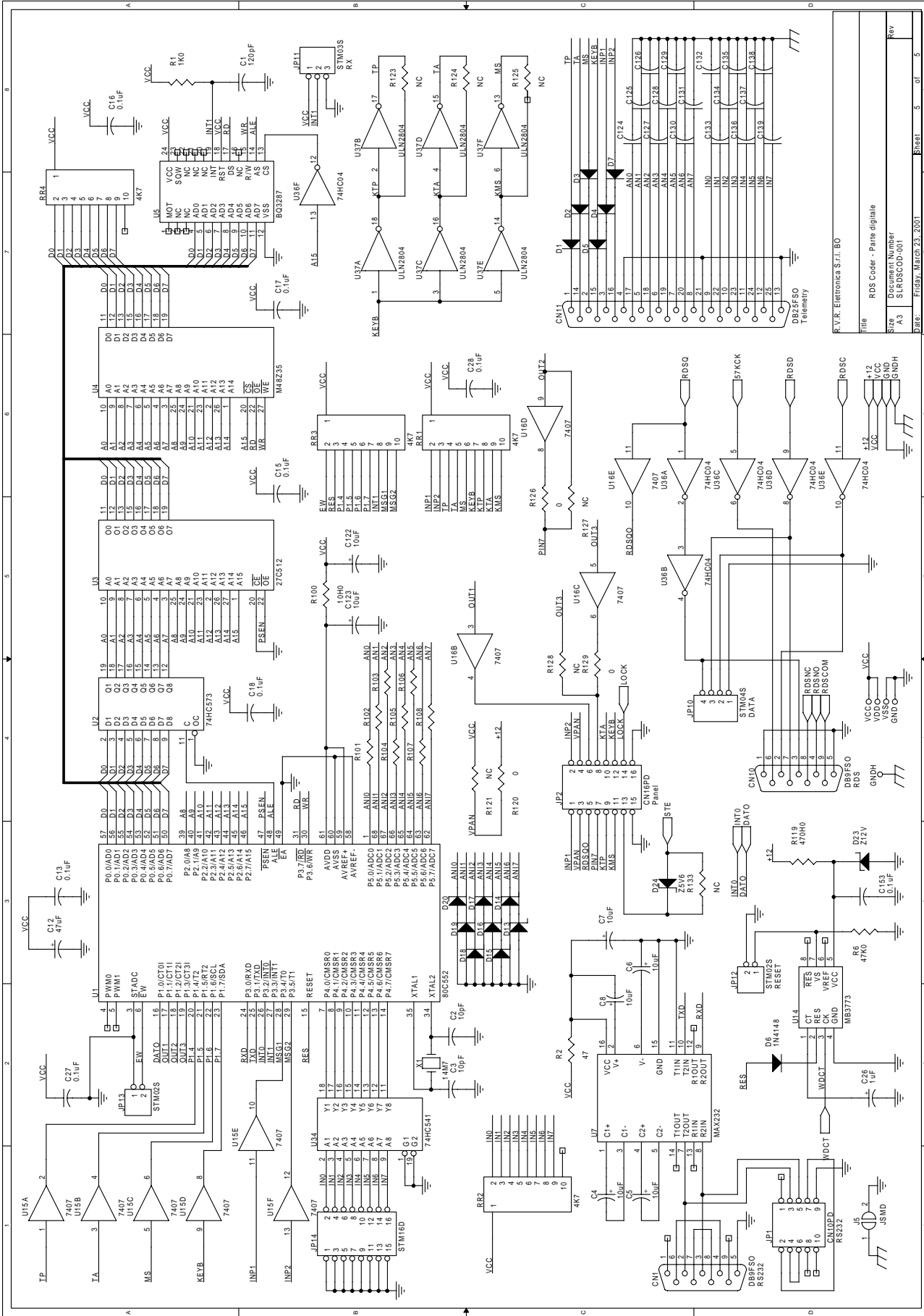


Nota: J1-J4 au. laco componenti

R.V.R. ELETTRONICA S.r.l. (BO)	
Title	Coder RDS - Parte Audio
Size	Document Number
A3	SLRDSCOD-001
DATE:	FILESY: MARCO-23-2001
Sheet	3 of 5



R.V.R. Elettronica S.r.l. BO				
Title	RDS Coder - Parte digitale			
Size	Document Number SLRDSCOD-001			
A3	Date: Friday, March 23, 2001			
Rev	Sheet	4	of	5

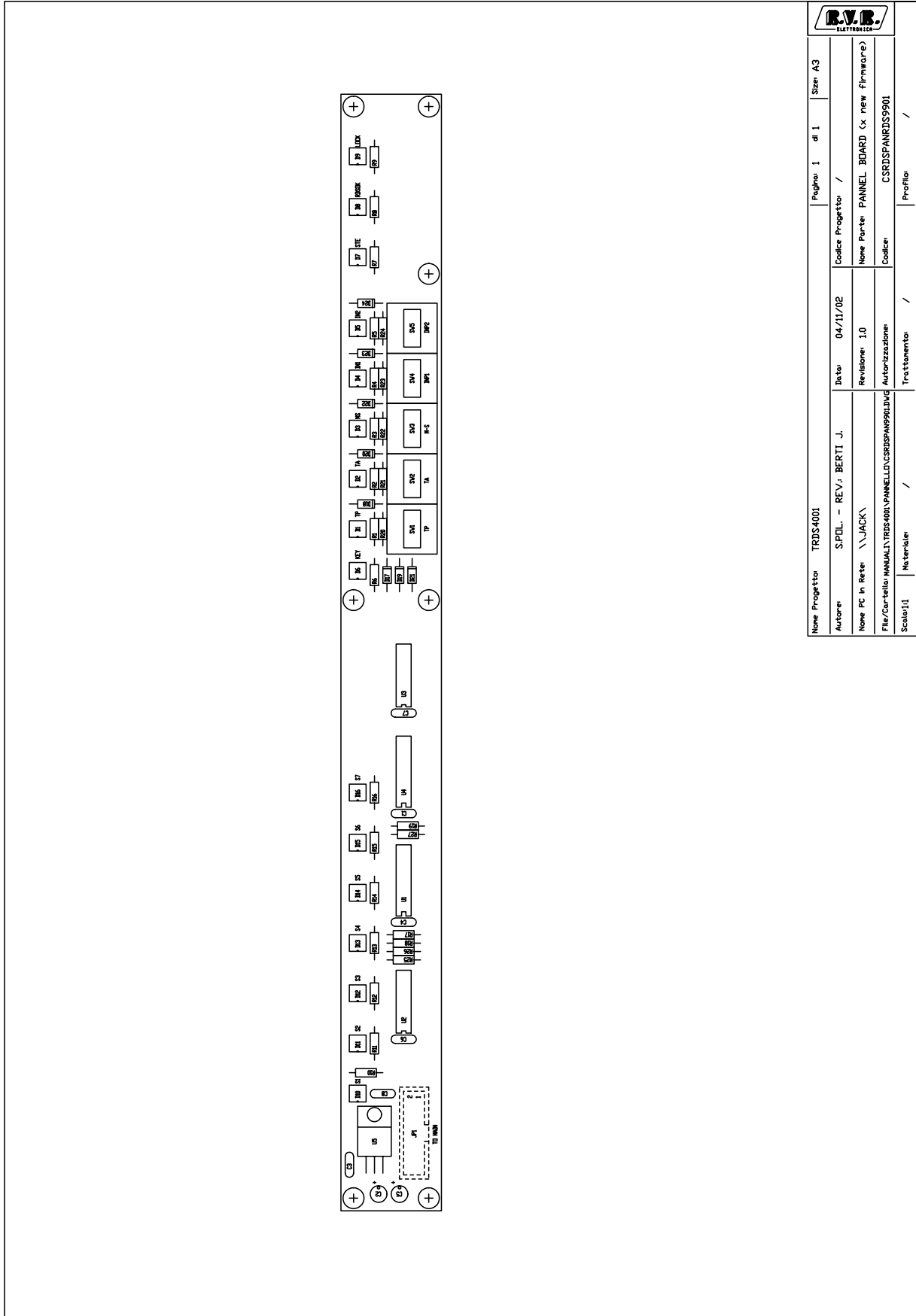


Item	Qty	Reference	Part
1	2	CN1, CN10	DB9FSO
2	5	CN3, CN4, CN5, CN6, CN7	BNC_IS90
3	1	CN8	CN04MR
4	1	CN9	XLRFCS
5	1	CN11	DB25FSO
6	1	C1	120pF
7	3	C2, C3, C154	10pF
8	17	C4, C5, C6, C7, C8, C23, C35, C43, C46, C56, C83, C104, C105, C106, C107, C122, C123	10uF
9	1	C9	68pF
10	1	C10	30pF
11	46	C11, C13, C14, C15, C16, C17, C18, C19, C22, C24, C25, C27, C28, C29, C36, C39, C40, C41, C42, C44, C45, C50, C51, C55, C70, C72, C75, C77, C80, C88, C89, C101, C102, C103, C108, C110, C116, C117, C118, C120, C121, C145, C146, C151, C152, C153	0.1uF
12	1	C12	47uF
13	4	C20, C33, C47, C49	10nF
14	48	RY1, X3, RV3, D8, R11, D11, U21, D21, C21, D22, D25, U26, U27, R42, R43, R46, R47, R48, R49, R50, C52, C53, C54, R56, C57, C58, C62, C63, C64, C65, R66, C66, R67, R68, R73, C78, C79, C81, C82, R121, R123, R124, R125, R127, R128, R133, C147, C148	NC
15	3	C26, C59, C140	1uF
16	13	C30, C31, C37, C38, C61, C71, C73, C74, C76, C142, C143, C156, C157	1n5
17	17	C32, C124, C125, C126, C127, C128, C129, C130, C131, C132, C133, C134, C135, C136, C137, C138, C139	1nF
18	1	C34	5n6
19	4	C48, C67, C68, C69	47nF
20	1	C60	33nF
21	14	C84, C85, C90, C91, C92, C93, C94, C95, C96, C97, C98, C99, C112, C113	27pF
22	1	C86	2n2
23	2	C144, C87	100pF
24	2	C100, C119	22uF
25	4	C109, C114, C115, C155	470nF
26	1	C111	1n0
27	1	C141	150nF
28	2	C149, C150	1000uF
29	1	C158	47pF
30	10	D1, D2, D3, D4, D5, D6, D7, D9,	1N4148

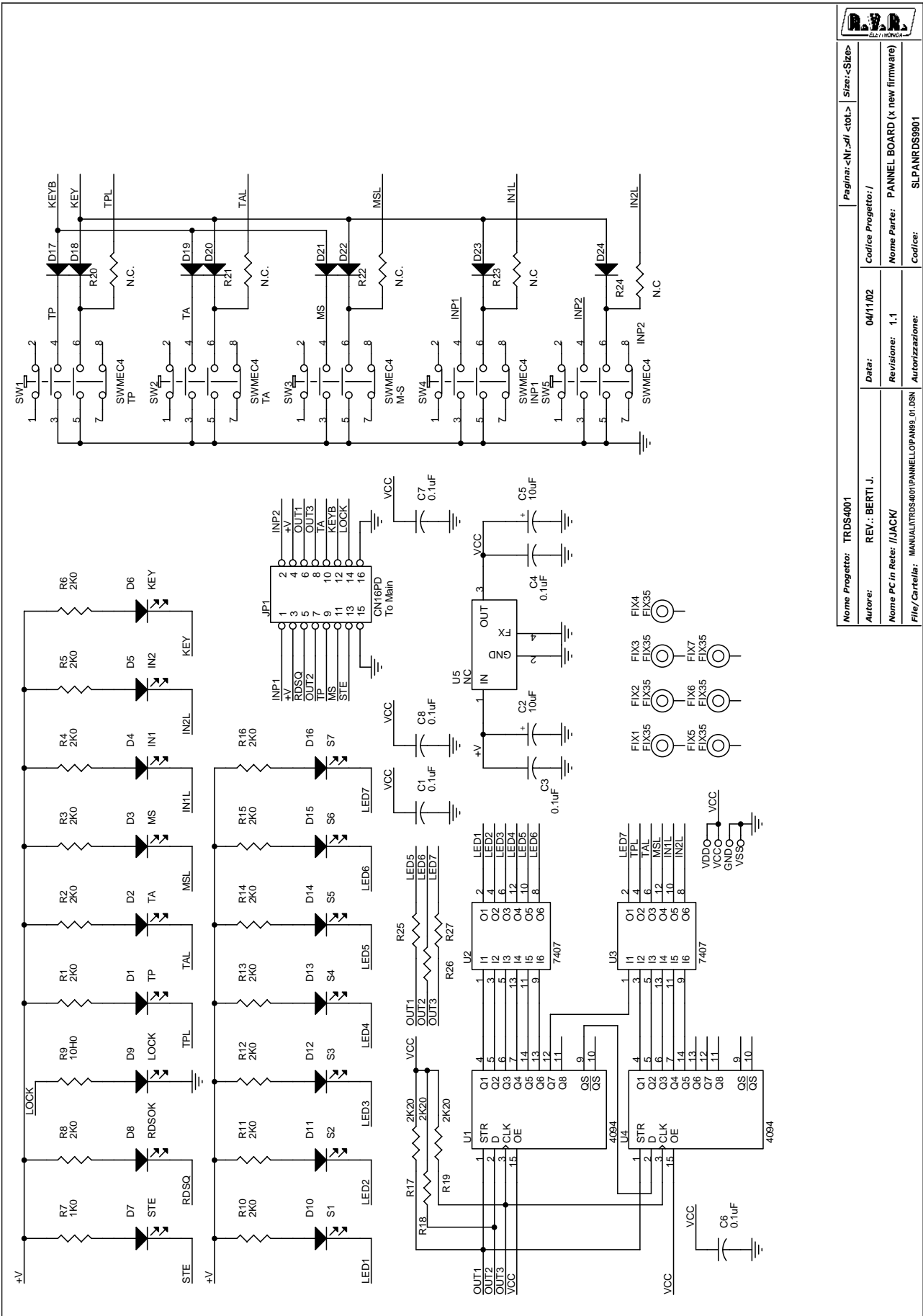
31	8	D10, D12 D13, D14, D15, D16, D17, D18, D19, D20	Z5V1
32	1	D23	Z12V
33	1	D24	Z5V6
34	8	FIX1, FIX2, FIX3, FIX4, FIX5, FIX6, FIX7, FIX8	FIX35
35	1	JP1	CN10PD
36	1	JP2	CN16PD
37	4	JP3, JP7, JP8, JP11	STM03S
38	3	JP4, JP12, JP13	STM02S
39	2	JP5, JP9	STF10S
40	1	JP6	STM06D
41	1	JP10	STM04S
42	1	JP14	STM16D
43	1	J1	JSMDC
44	6	J2, J3, J4, J5, J6, J7	JSMDC
45	7	L1, L2, L3, L4, L5, L6, L7	2u2
46	1	PD1	2W10
47	1	Q1	BC547
48	2	RAFF1, RAFF2	RAF220
49	4	RR1, RR2, RR3, RR4	4K7
50	2	RV1, RV2	5K
51	1	RV4	20K
52	1	RV5	1K
53	1	RV6	100K
54	1	RV7	10K
55	3	RY2, RY3, RY4	RLYTQ2_12
56	15	R1, R33, R34, R52, R53, R57, R58, R101, R102, R103, R104, R105, R106, R107, R108	1K0
57	1	R2	47
58	1	R3	33K0
59	5	R4, R13, R14, R16, R111	22K0
60	2	R5, R119	470H0
61	2	R38, R6	47K0
62	6	R7, R32, R59, R60, R82, R89	100H0
63	4	R8, R91, R96, R97	2M20
64	3	R9, R61, R62	330H0
65	2	R10, R93	22K1
66	3	R15, R64, R113	120K0
67	1	R17	6K80
68	2	R18, R118	47H0
69	3	R19, R27, R55	2K20
70	2	R20, R22	18K0
71	20	R21, R23, R25, R28, R29, R40, R41, R44, R72, R74, R81, R83, R85, R86, R94, R114, R115, R130, R131, R132	10K0
72	1	R24	14K7
73	3	R26, R30, R92	100K0
74	2	R31, R35	3K9
75	1	R36	20K0
76	2	R37, R39	80K6
77	4	R45, R120, R126, R129	0
78	1	R51	4K75
79	1	R54	6K8
80	3	R63, R65, R112	232H0
81	1	R69	681
82	1	R70	7K50

83	1	R71	6K98
84	2	R75, R79	51H0
85	3	R76, R80, R95	2K49
86	1	R77	604H0
87	1	R78	47H5
88	1	R84	4K99
89	2	R87, R90	1K33
90	1	R88	316K0
91	1	R98	22H0
92	1	R100	10H0
93	1	R109	390H0
94	2	R110, R122	1M0
95	2	R116, R117	S24V
96	1	R134	15K0
97	1	SW1	SWDIP4H
98	2	SW2, SW3	SWDIP2H
99	9	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9	TP1
100	1	U1	80C552
101	1	U2	74HC573
102	1	U3	27C512
103	1	U4	M48Z35
104	1	U5	BQ3287
105	2	U6, U36	74HC04
106	1	U7	MAX232
107	1	U8	74HC4060
108	1	U9	74HC02
109	1	U10	74HC163
110	1	U11	74HC4046
111	1	U12	22V10
112	1	U13	74HC74
113	1	U14	MB3773
114	2	U16, U15	7407
115	1	U17	NE567
116	5	U18, U22, U23, U24, U35	TL072
117	1	U19	1496
118	1	U20	4053
119	1	U25	LM311
120	2	U29, U28	TL074
121	1	U30	7808
122	1	U31	7805
123	1	U33	7908
124	1	U34	74HC541
125	1	U37	ULN2804
126	1	X1	14M7
127	1	X2	4M864

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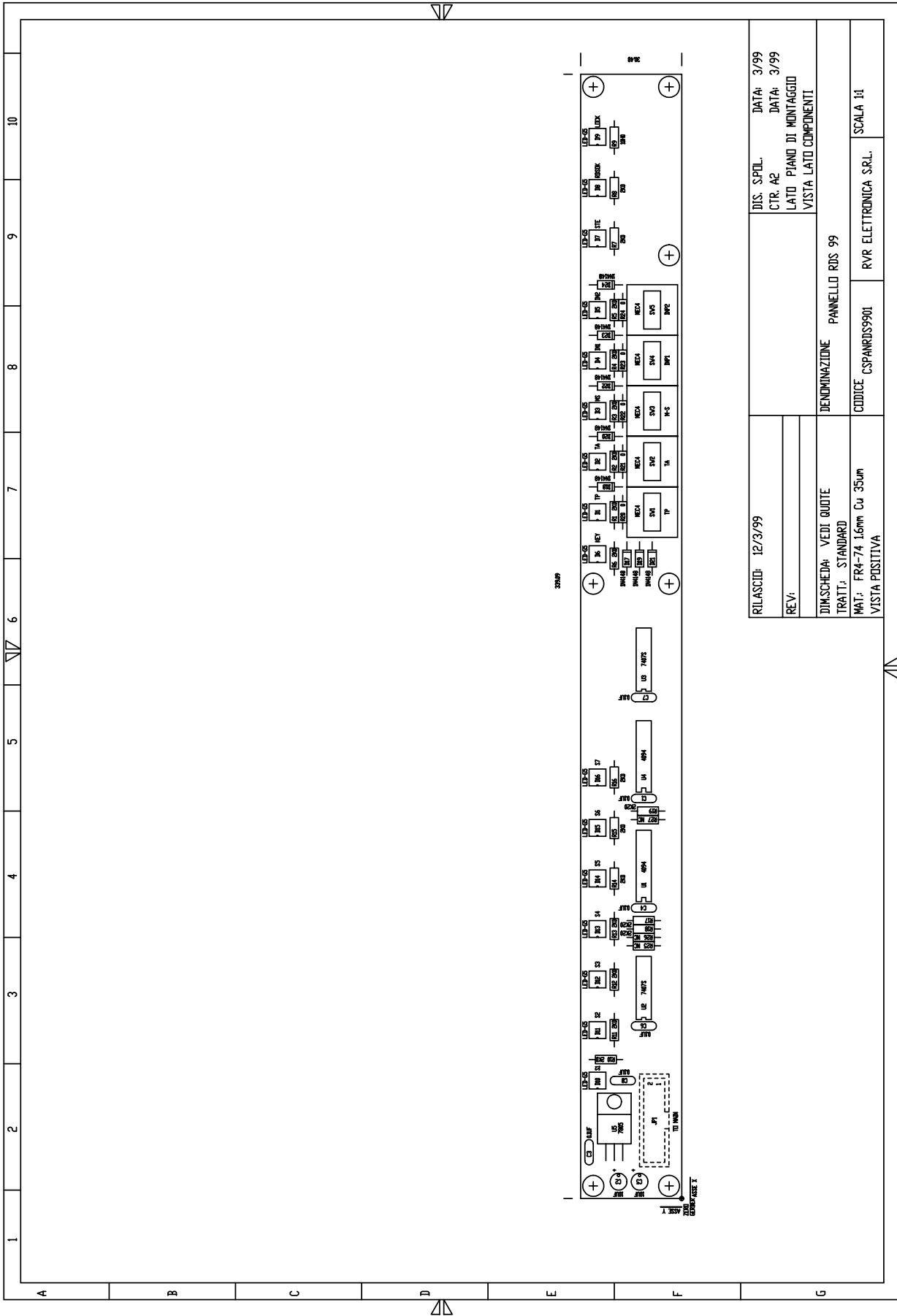
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		Autorizzazione:			

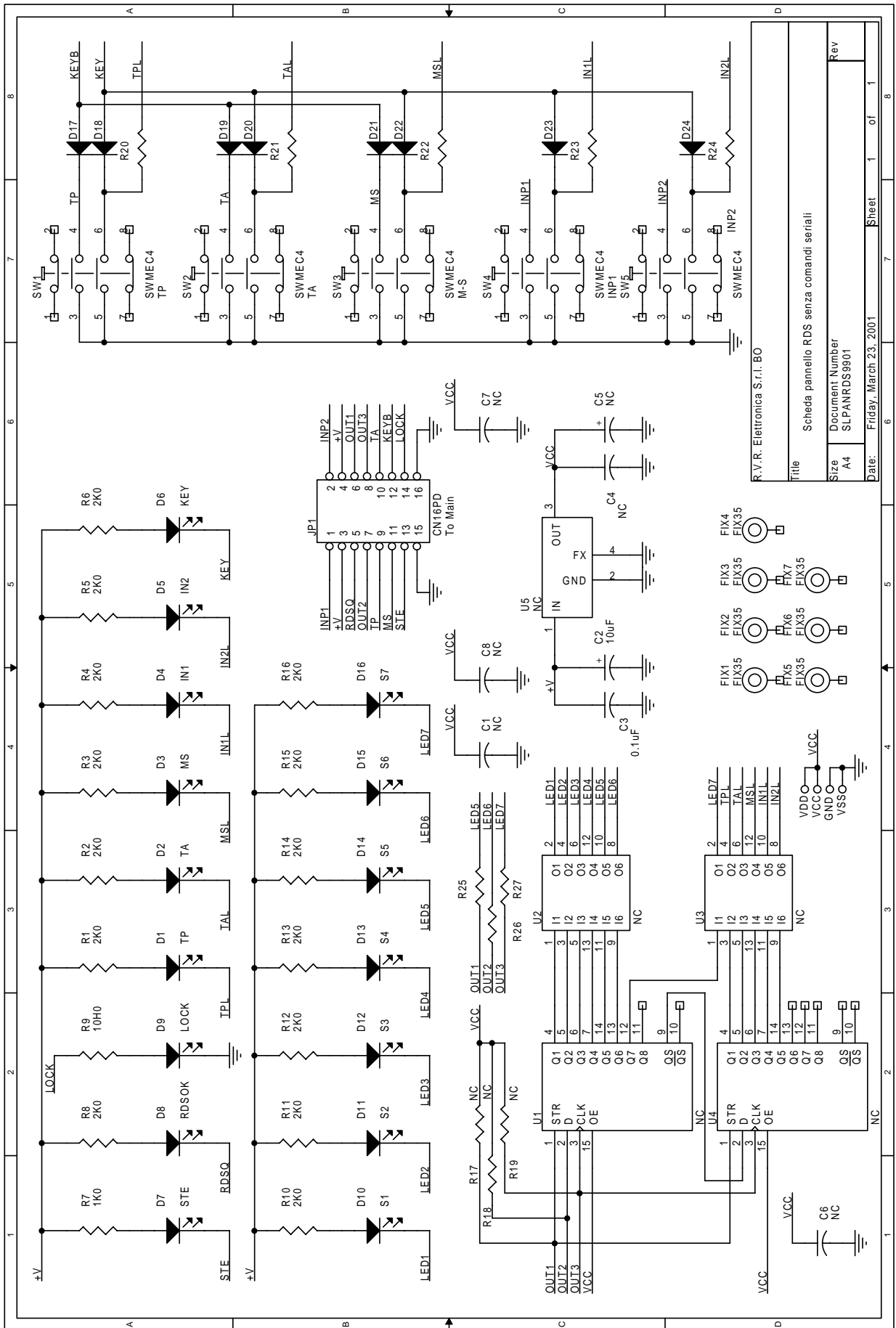
SLPANRDS9901 Bill Of Materials Page1

Item	Q.ty	Reference	Part
1	6	C1, C3, C4, C6, C7, C8	0.1uF
2	2	C2, C5	10uF
3	16	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, D16	LED-G5
4	8	D17, D18, D19, D20, D21, D22, D23, D24	1N4148
5	7	FIX1, FIX2, FIX3, FIX4, FIX5, FIX6, FIX7	FIX35
6	1	JP1	CN16PD
7	14	R1, R2, R3, R4, R5, R6, R8, R10, R11, R12, R13, R14, R15, R16	2K0
8	1	R7	1K0
9	1	R9	10H0
10	3	R17, R18, R19	2K20
11	3	R20, R21, R22	N.C.
12	2	R23, R24	N.C.
13	4	U5, R25, R26, R27	NC
14	5	SW1, SW2, SW3, SW4, SW5	SWMEC4
15	2	U1, U4	4094
16	2	U2, U3	7407



Versione precedente, solo per riferimento

Former version, for reference only



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Title	Scheda pannello RDS senza comandi seriali
Size	Document Number
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Date:	Friday, March 23, 2001
Sheet	1 of 1
Rev	

Versione precedente, solo per riferimento

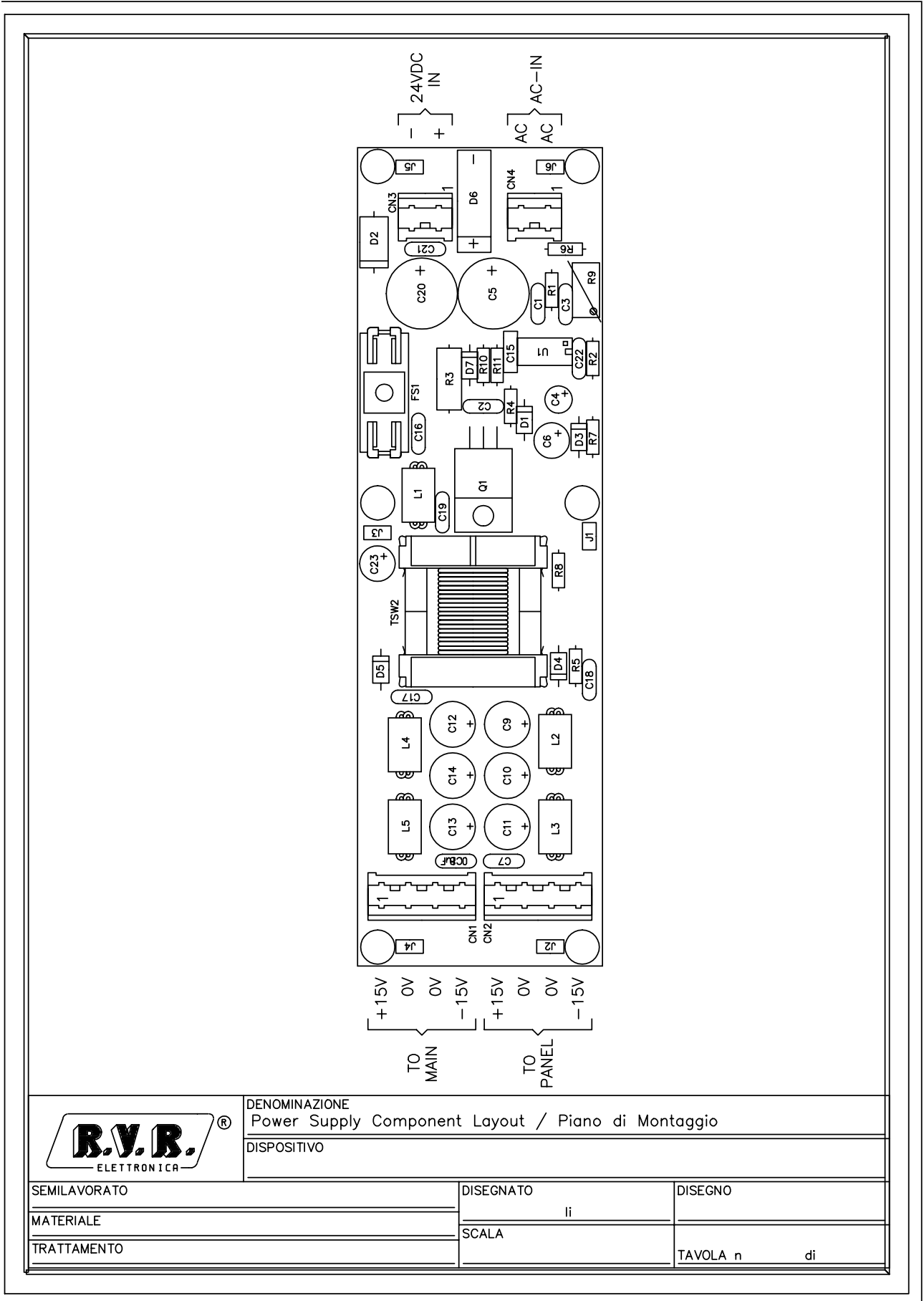
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Bill of Materials

Page1

Item	Qty	Reference	Part
1	17	U1, C1, U2, U3, U4, C4, U5, C5, C6, C7, C8, R17, R18, R19, R25, R26, R27	NC
2	1	C2	10uF
3	1	C3	0.1uF
4	16	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, D16	LED-G5
5	8	D17, D18, D19, D20, D21, D22, D23, D24	1N4148
6	7	FIX1, FIX2, FIX3, FIX4, FIX5, FIX6, FIX7	FIX35
7	1	JP1	CN16PD
8	14	R1, R2, R3, R4, R5, R6, R8, R10, R11, R12, R13, R14, R15, R16	2K0
9	1	R7	1K0
10	1	R9	10H0
11	5	R20, R21, R22, R23, R24	0
12	5	SW1, SW2, SW3, SW4, SW5	SWMEC4



DENOMINAZIONE
Power Supply Component Layout / Piano di Montaggio

DISPOSITIVO

SEMILAVORATO

DISEGNATO

DISEGNO

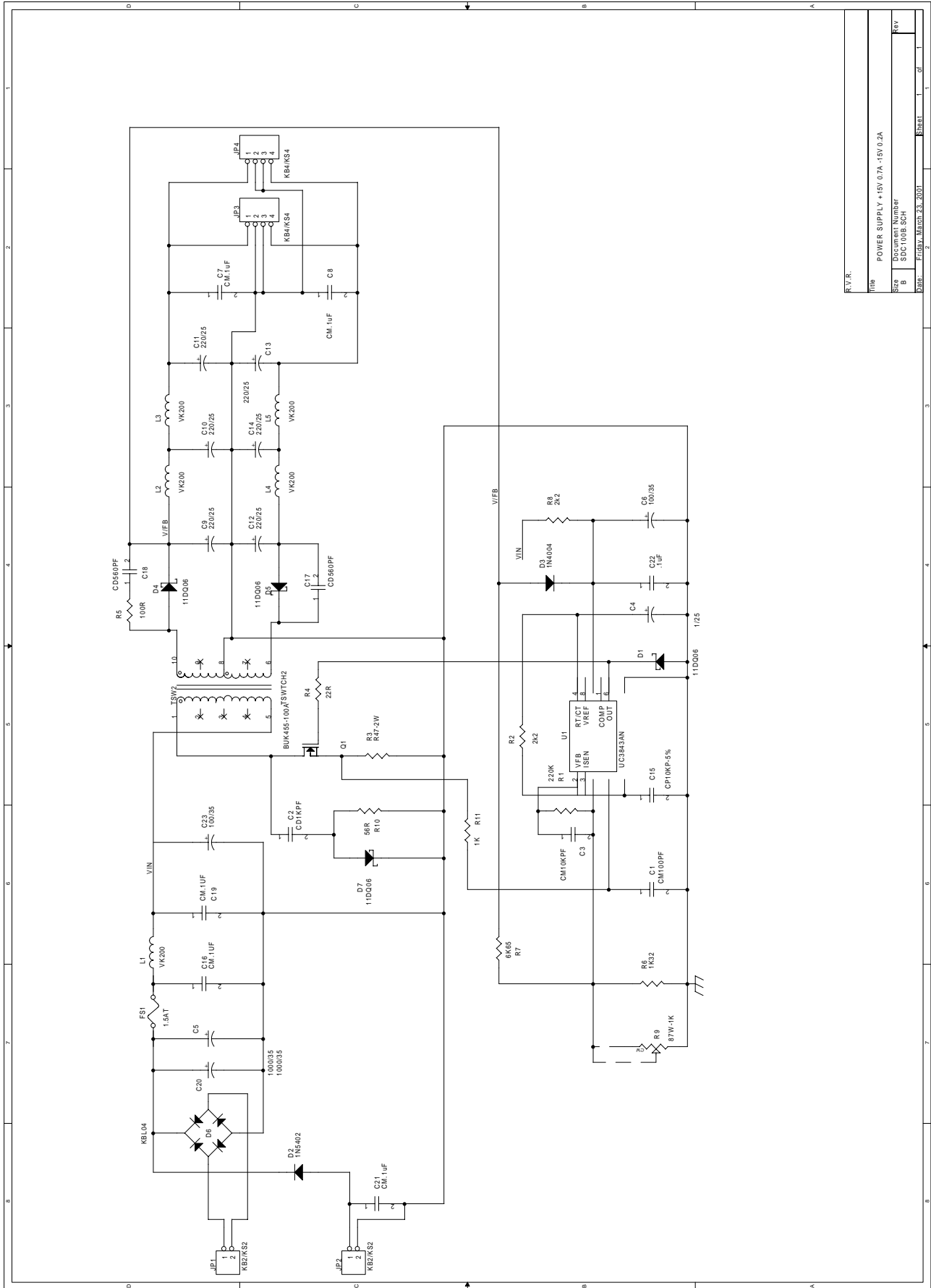
MATERIALE

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TRATTAMENTO

SCALA

TAVOLA n di



R.V.R.	
TIPO	POWER SUPPLY + 15V 0.7A - 15V 0.2A
SIZE	DOCUMENT NUMBER
B	SDC100B SCH
REV.	1
DATE	19/03/2001

Item	Qty	Reference	Part
1	1	C1	CM100PF
2	1	C2	CD1KPF
3	1	C3	CM10KPF
4	1	C4	1/25
5	2	C5, C20	1000/35
6	2	C6, C23	100/35
7	5	C7, C8, C16, C19, C21	CM.1uF
8	6	C9, C10, C11, C12, C13, C14	220/25
9	1	C15	CP10KP-5%
10	2	C17, C18	CD560PF
11	1	C22	.1uF
12	4	D1, D4, D5, D7	11DQ06
13	1	D2	1N5402
14	1	D3	1N4004
15	1	D6	KBL04
16	1	FS1	1.5AT
17	2	JP1, JP2	KB2/KS2
18	2	JP3, JP4	KB4/KS4
19	5	L1, L2, L3, L4, L5	VK200
20	1	Q1	BUK455-100A
21	1	R1	220K
22	2	R2, R8	2k2
23	1	R3	R47-2W
24	1	R4	22R
25	1	R5	100R
26	1	R6	1K32
27	1	R7	6K65
28	1	R9	87W-1K
29	1	R10	56R
30	1	R11	1K
31	1	TSW2	TSWTCH2
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