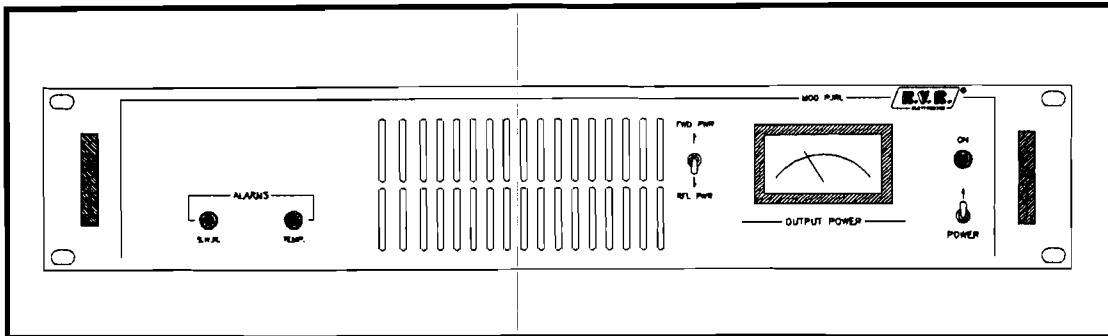


# PJRL20



TECHNICAL AND MAINTENANCE MANUAL



Manufactured by R.V.R. Elettronica - Italy



**Avviso riguardante l'uso designato e le limitazioni d'uso del prodotto**

Questo prodotto è un trasmettitore radio indicato per il servizio di radiodiffusione audio in modulazione di frequenza. Utilizza frequenze operative che non sono armonizzate negli stati di utenza designati.

L'utilizzatore di questo prodotto deve ottenere dall'Autorità di gestione dello spettro dello stato di utenza designato apposita autorizzazione all'uso dello spettro radio, prima di mettere in esercizio questo apparato.

La frequenza operativa, la potenza del trasmettitore, nonché altre caratteristiche dell'impianto di trasmissione sono soggette a limitazione e stabilite nell'autorizzazione ottenuta.

**Dichiarazione di Conformità**

Con la presente R.V.R. Elettronica SpA dichiara che questo trasmettitore è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE



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**PJRL20 20W RADIO LINK AMPLIFIER**

**Technical and Maintenance Manual**

English

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## PRELIMINARY INSTRUCTIONS AND WARRANTY INFORMATION

Please observe safety precautions when handling this unit. This equipment contains dangerous currents and high voltages.

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 warnings which should be observed by personnel in using this or other electronic equipment.

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.

**CAUTION:** 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.

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.

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.

All manufacturers warranties will be supported by R.V.R. to ensure precise and speedy service where possible.

R.V.R. shall not be liable for any damage of whatsoever nature, arising out of or in connection with the product or its use thereof.

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-incidentals 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 manufacturer's warranty.

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.**

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 S.r.l.  
Via del Fonditore, 2/2c  
40138 Bologna - Italy**

**- Broadcasting Equipment -**

R.V.R. reserves the right to modify the design and specifications of the equipment in this manual without previous notice.



**WARNING!**

The currents and voltages in this equipment are dangerous!  
Personnel must at all times observe safety regulation!

This manual is intended as a general guide for trained and qualified personnel who are aware of the dangers inherent in handling potentially hazardous electrical and electronic circuits.

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

The installation, operation, maintenance and service of this equipment involves risks both to personnel and equipment, and must be performed only by qualified personnel exercising due care.

R.V.R. ELETTRONICA S.r.l. shall not be responsible for injury or damage resulting from improper procedures or from the use of improperly trained or inexperienced personnel performing such tasks.

During installation and operation of this equipment, local building codes and fire protection standards must be observed.

**WARNING!**

Always disconnect power before opening covers, doors, enclosures, gates, panels or shields.  
Always use grounding sticks and short out high voltage points before servicing. Never make internal adjustments, perform maintenance or service when alone or when fatigued.

Do not remove, short-circuit or tamper with interlock switches on access covers, doors, enclosures, gates, panels or shields.

Keep away from live circuits, know your equipment and don't take chances.

**WARNING!**

In case of emergency ensure that power has been disconnected

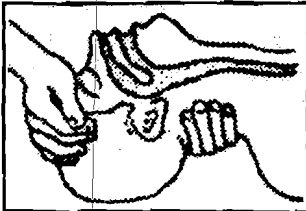
### Treatment of electrical Shock

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

#### A AIRWAY

IF UNCONSCIOUS,  
OPEN AIRWAY



LIFT UP NECK,  
PUSH FOREHEAD BACK,  
CLEAR OUT MOUTH IF NECESSARY,  
OBSERVE FOR BREATHING

#### B BREATHING

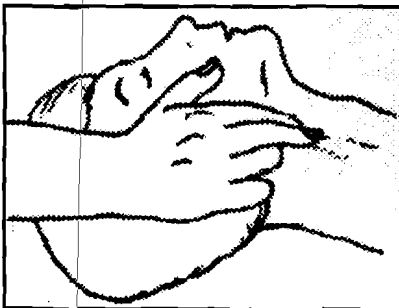
IF NOT BREATHING,  
BEGIN ARTIFICIAL  
BREATHING.



TILT HEAD,  
PINCH NOSTRILS,  
MAKE AIRTIGHT SEAL,  
4 QUICK FULL BREATHS.  
REMEMBER MOUTH TO MOUTH  
RESUSCITATION MUST BE  
COMMENCED AS SOON AS  
POSSIBLE.

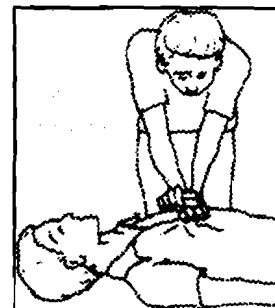
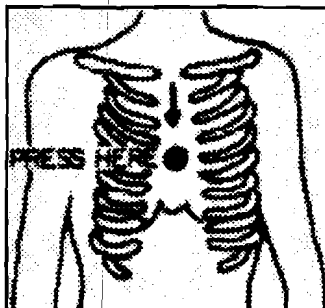
#### C CIRCULATION

CHECK CAROTID PULSE



IF PULSE ABSENT,  
BEGIN ARTIFICIAL  
CIRCULATION

DEPRESS STERNUM 1 1/2" TO 2"



APPROX. 80 SEC. : ONE RESCUER, 15 COMPRESSIONS,  
2 QUICK BREATHS.

APPROX. 60 SEC. : TWO RESCUERS, 5 COMPRESSIONS,  
1 BREATH

NOTE: DO NOT INTERRUPT RHYTHM OF COMPRESSIONS  
WHEN SECOND PERSON IS GIVING BREATH.

Call for medical assistance as soon as possible.

2) If victim is responsive:

- a. Keep them warm.
- b. Keep them as quiet as possible.
- c. Loosen their clothing (a reclining position is recommended).

## FIRST-AID

Personnel engaged in the installation, operation, maintenance or servicing of this equipment are urged to become familiar with first-aid theory and practices. The following information is not intended to be a complete first-aid procedure, it is brief and is only to be used as a reference. It is the duty of all personnel using the equipment to be prepared to give adequate Emergency First Aid and thereby prevent avoidable loss of life.

### Treatment of electrical Burns

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

### NOTE

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).

- 2) Less severe burns - (1st & 2nd degree)
  - a. Apply cool (not ice cold) compresses using the cleansed available cloth article.
  - b. Do not break blisters, remove tissue, remove adhered particles of clothing, or apply salve or ointment.
  - c. Apply clean dry dressing if necessary.
  - d. Treat victim for shock as required.
  - e. Arrange transportation to a hospital as quickly as possible.
  - f. If arms or legs are affected keep them elevated.

## CHAPTER 1

### DESCRIPTION OF THE PJRL20

#### 1.1 GENERAL DESCRIPTION

The PJRL20 is housed in a 2U, 19" rack-mounting container comprising a number of interconnected modules mounted internally on the bottom of the equipment, facilitating removal and substitution.

On the front panel there are: the FWD-PWR/REF-PWR selector to select the forward or reflected power measuring on the analog meter, the switch on selector with its relative led and the analog meter for the measuring of main operating parameters.

On the rear panel there are: the VDE socket for mains voltage input, the REMOTE BNC connector to block R.F. power output from external equipment, the R.F. Output N-type connector.

#### 1.2 ELECTRICAL DESCRIPTION

The PJRL20 is a very high efficiency Radio Link Amplifier working in three different frequency range : 200-780MHz, 780-890MHz, 890-970 MHz. This equipment is a high gain Radio Link Amplifier with relatively low input; infact, it's typically capable of more than 20 W output power with only 300 mW.

A voltage selector on the transformer primary allows a variety of supply voltages to be used.

#### 1.3 METERS AND INDICATORS

The forward and reflected power of the amplifier can be monitored using the analog multimeter (5 Fig.1) situated on the front panel.

The power to be measured is selected by the selector (4 Fig.1).

Two red led indicators advise in case of S.W.R. alarm (1 Fig.1) and TEMP. alarm (2 Fig.1).

The green led ON indicates the presence of the mains voltage line inside the amplifier.

#### 1.4 R.F. AMPLIFIER

The RF amplifier is a wide-band design and guarantees an adjustable power output of 2 to 20 watts across the entire band.

A low-pass filter enables the PJRL20 to be used as a low power transmitter, connected directly to an antenna.

#### 1.5 SPECIFICATIONS

Please refer to Table A for the electrical specifications and Table B for the mechanical specifications.

TABLE A**ELECTRICAL SPECIFICATIONS**

Power Supply	110-130 V / 50-60 Hz single phase 220-240 V / 50-60 Hz single phase
Frequency Range	Mod. PJRL20/1      200-780MHz Mod. PJRL20/2      780-890MHz Mod. PJRL20/3      890-970 MHz
Cooling	Forced Ventilation
Output power	20 W continuously
R.F. Drive Power	approx. 300 mW
R.F. Input Connector	N-type, 50 Ohm
R.F. Output Connector	N-type, 50 Ohm
Power Consumption	approx. 140W at full power
Spurious and Harmonic Suppression	meets or exceeds all FCC and CCIR requirements

TABLE B**DIMENSIONAL AND ENVIROMENTAL SPECIFICATIONS**

Chassis dimensions	82 mm (3.22") H 326 mm (12.83") W 445 mm (17.51") D
Panel Dimensions	483 mm (19") W 88 mm (3.47") H
Operating temperature	-10°C to 50°C
Humidity	95% max. non-condensing
Weight	9.5Kg

CHAPTER 2**ELECTRICAL DESCRIPTION****2.1 INTRODUCTION**

This section describes, in detail, the operating theory behind the PJRL20 amplifier. To aid understanding, the unit has been subdivided into blocks, each of which is fully described below.

**2.2 POWER SUPPLY**

This circuit comprises two boards, mounted on a heat sinks, in turn mounted at right-angles to each other on the chassis base (7 Fig.3). The power supply generates the stabilized voltages necessary for each of the various modules that make up the PJRL20.

After having undergone filtering for mains-borne interference, the supply is transformed into lower voltages, rectified, smoothed and stabilized to the following values: +12V and 2 to 15V variable.

These voltages supply the RF power amplifier. A power limiting circuit intervenes in the event of excess SWR on the output, thus protecting the final stage. A temperature probe, mounted on the R.F. Power Amplifier heat-sink intervenes in the event of excess Temperature.

**2.3 R.F. POWER AMPLIFIER**

The final power stage is mounted on a heat sink to dissipate waste heat and is enclosed in a totally screened, metal container, fixed to the upper-middle part of the central section of the unit (9 Fig.3).

The R.F. signal coming from the R.F. input connector at a power level of about 300 mW, reaches the power stage (MHW820) and is amplified to a level of 20 W. The resultant signal is then filtered by a low-pass filter which removes any harmonic content. A directional coupler allows the direct and reflected power levels to be measured and displayed on the analog voltmeter and also feedback to the power supply to check the VSWR level.

**2.4 "PJRL CONN1" CARD**

This card is situated centrally on the chassis base of the equipment (1 Fig.3). The CON-1 card receives signals coming from power supply and send them to the front panel.

The meaning of CN2 connector's pins is the following:

Pin 1	FWD PWR SW.	Pin 5	SWR LED (+)
Pin 2	INTERLOCK	Pin 6	TEMP. LED (+)
Pin 3	TEMP. LED (-)	Pin 7	REF PWR SW.
Pin 4	TEMP. PROBE	Pin 8	SWR LED (-)

On this card is present too R1 trimmer for the adjustment of the reflected power on the analog meter.



## FRONT PANEL VIEW DESCRIPTION (FIG.1)

1	SWR	Indicates that reflected power exceeds presetted level
2	TEMP	Indicates that temperature exceeds presetted level of 70°C
3	GRID	Air cooling grid
4	FWD/REF	Selector for forward or reflected power measurement
5	METER	Analog meter used to display the following operating parameters of the amplifier: Forward power Reflected power
6	ON	Led indicator of the mains voltage presence
7	POWER	ON/OFF switch

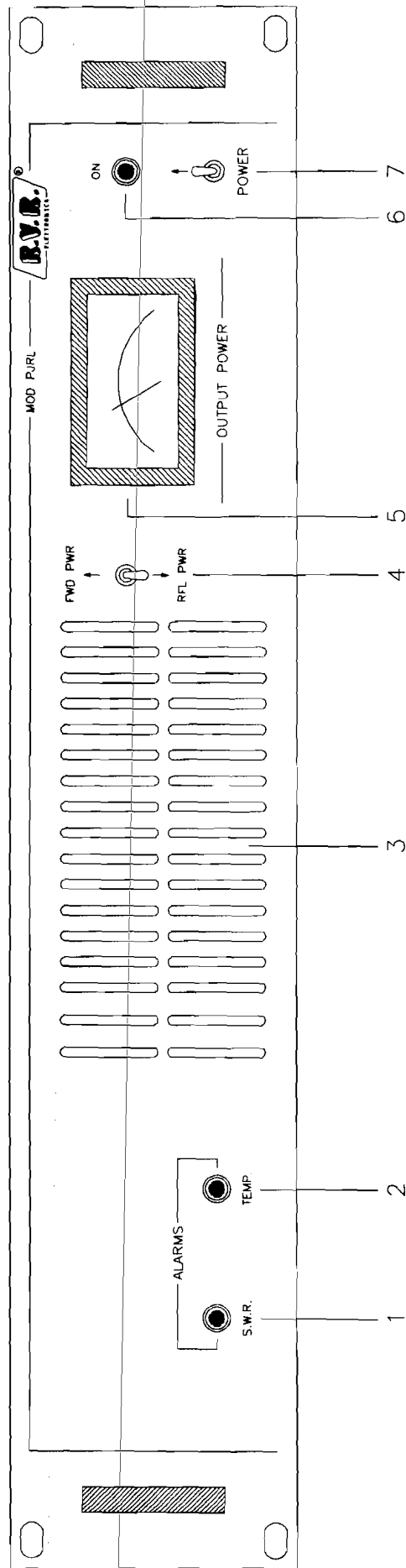


FIG. 1

## REAR PANEL VIEW DESCRIPTION (FIG.2)

1	PLUG	Line power connector
2	FUSE BLOCK	Fuse block and line voltage selector. Use a small screwdriver to change the fuse or the line voltage. Rotate the block and position it for the desired voltage.
3	INTERLOCK	BNC connector. Connecting the central conductor to ground will cause the RF output power level to drop to zero and to stay there until the short is removed.
4	FAN	Air cooling Fan
5	R.F. OUTPUT	N-type connector, 50 Ohm
6	R.F. INPUT	N-type connector, 50 Ohm

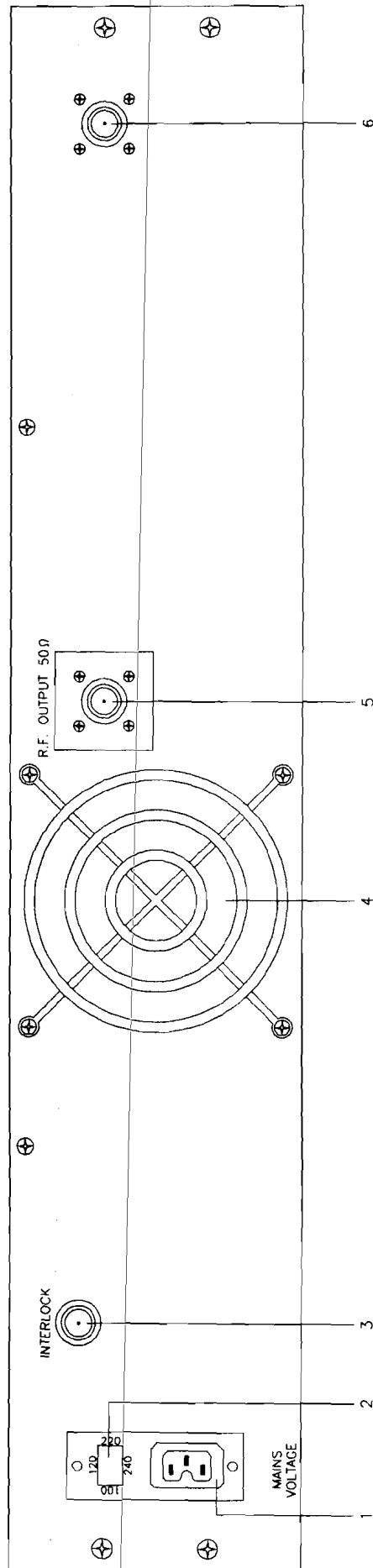


FIG. 2

TOP VIEW DESCRIPTION (FIG.2)

- 1 ..... "PJRL CONN1" Card
- 2 ..... "CON-PA1" Card
- 3 ..... R.F. Power Amplifier Module
- 4 ..... Meter
- 5 ..... Transformer
- 6 ..... Supply Socket
- 7 ..... Power Supply Module
- 8 ..... Fan
- 9 ..... R.F. Output Connector
- 10 ..... R.F. Input Connector

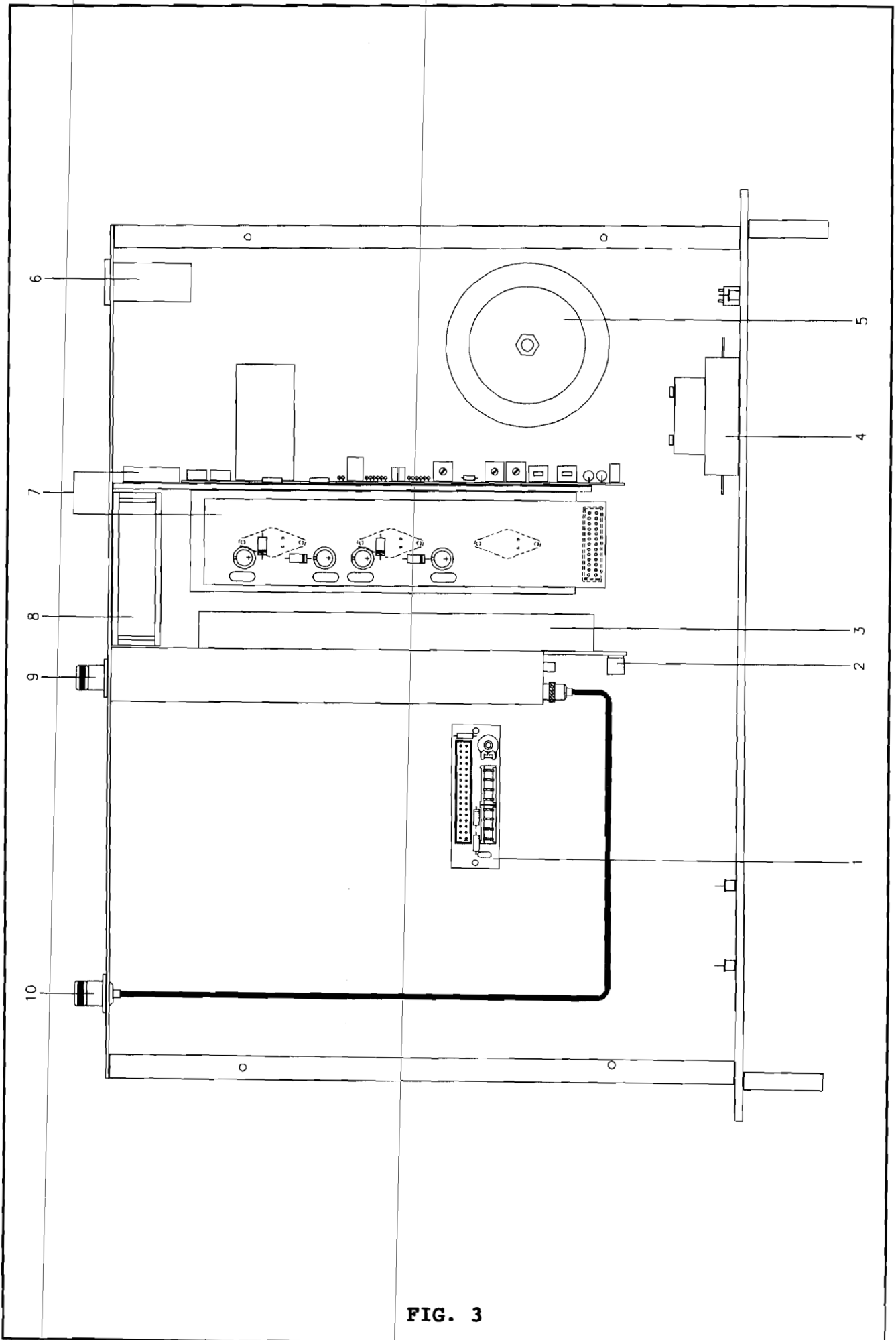


FIG. 3

TABLE C**RECOMMEND TEST EQUIPMENT**

<b>INSTRUMENT TYPE</b>	<b>SUGGESTED MODEL</b>	<b>SPECIFICATIONS</b>
Non Inductive Dummy Load	Bird Mod. 8085	50 Ohm, 50W cont.
Calibrated in-line Wattmeter with Sample	Bird Mod. 43	50 Ohm
Power Supply	Hewlett Packard Mod. 6002A	0-50V, 0-10A
Multimeter	Fluke Mod. 73	DC Voltage : max 1000V AC Volatge : max 750V DC Current : max 10A AC Current : max 10A Resistance : 32MOhm

CHAPTER 3

**INSTALLATION**

**3.1 INTRODUCTION**

This chapter contains the information required for installation of the PJRL20 amplifier and for preliminary checks.

**3.2 UNPACKING**

Remove the unit from its packaging and before any other operation, check for any damage that the unit may have suffered in transit and that all front and rear panel controls are functioning.

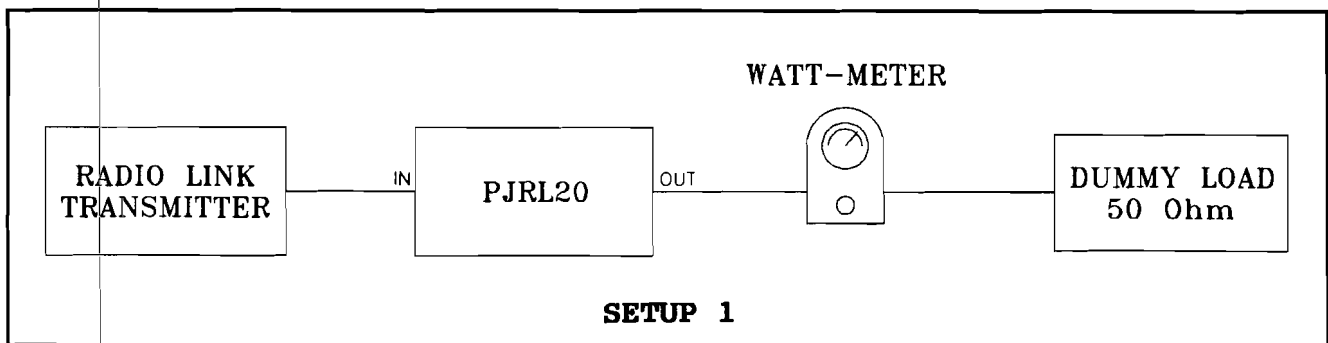
**3.3 INSTALLATION**

- 1) Check that the line voltage selector is correctly set for the local supply. If not, remove the cover on which the voltages are printed and rotate it until the required value corresponds to the arrow, and reinsert it.  
Check also that the fuse mounted inside the cover is present and in order.

The current capacity of the fuse are as follows:

220-240 V - 3.15 A  
100-120 V - 4 A

- 2) Connect R.F. Output connector of a radio link transmitter (PTRLNV or other) with the same frequency range (max. output power 1-2 W), to R.F. Input connector of the PJRL20 (SETUP 1).



- 3) Connect a dummy load with a power rating of at least 20 W continuous to the R.F. output of the amplifier, situated on the rear panel of the unit.  
It is advisable to connect a bypass wattmeter in series with this load in order to verify the accuracy of the unit's own internal wattmeter.



- 4) Connect a switch, via a cable, to the INTERLOCK connector on the rear panel so that the switch is able to short the central conductor to its screen. Leave the switch in the short-circuit position.
- 5) Verify that POWER switch of the two equipment is on the OFF position.
- 6) Connect line power to the unit via the VDE socket.

N.B. It is essential that the unit be properly earthed to ensure both the safety of the operator as well as the correct functioning of the equipment.

- 7) Switch on both the transmitter and the amplifier and check that the green ON led is on.  
Select the desired operating frequency on the transmitter.
- 8) After having verified that the UNLOCK led on the transmitter is switched off and that the unit is therefore locked to the selected operating frequency, open the switch connected to the INTERLOCK connector so as to remove the short circuit between the central conductor and ground. The RF output is now enabled and should correspond to a power level of about 20W.  
To check this reading, select FWD on the meter selector and read the power from the 50W FSD scale.
- 9) If this power is not about 20W, using a small screwdriver, rotate the ATT1 attenuator until the output power is of 20W.  
Check the value with the bypass wattmeter which should be within  $\pm 10\%$ .
- 10) With the power output at 20W, select a new transmitter's operating frequency well away from the current value.  
The UNLOCK led should switch on and the power output on the amplifier should fall to zero at the same time. Only when the UNLOCK led switches off on the transmitter (unit locked to new frequency) should the power output of the amplifier resume its previous level.
- 11) SWR alarm check.  
Disconnect the output load and check that the S.W.R. led switches on.  
Re-connect the output load and check that REF falls to zero, the SWR led switches off and that PWR FWD jumps to 20W.
- 12) Now short circuit the central conductor of the INTERLOCK input to ground and the output power should drop instantly to zero.  
Removing the short should cause the power output to return, gradually, to its previous level.

## CHAPTER 4

### **MAINTENANCE**

#### **4.1 SAFETY REQUIREMENTS**

WARNING WARNING WARNING WARNING WARNING WARNING WARNING

When the amplifier is operational, removing the top cover will expose lethal voltages on the line voltage selector and heavy currents on the power supply filter terminals and power transistors. Use insulated tools for any type of maintenance work and do not touch any internal components when the amplifier is switched on.

Ensure that the amplifier is disconnected from the line supply before carrying out any maintenance work.

#### **MAINTENANCE LEVEL 1**

#### **4.2 ROUTINE MAINTENANCE**

The only routine maintenance required by the PJRL20 is the periodic replacement of the cooling fan and the removal of accumulated dust. The period between such action will depend on ambient operating conditions such as temperature, air-borne dust levels and humidity. It is advisable to check the unit every 6 months and to replace noisy or worn fans. Fans should be replaced as a matter of course after no more than 18 months of operation.

#### **MAINTENANCE LEVEL 2**

#### **4.3 R.F. POWER AMPLIFIER MODULE REPLACEMENT**

- 1) Open the top cover of the unit.
- 2) Disconnect connector CN1 on the CON-PA1 card connecting R.F. Power Amplifier to Power Supply.
- 3) Unscrew the three fixing screws situated on the lower part of the bottom of the equipment.
- 4) Disconnect the screened cable connecting the RF Power Amplifier module to the R.F. Input connector.
- 5) Slide out the RF Power Amplifier.

#### **4.4 POWER SUPPLY MODULE REPLACEMENT**

- 1) Open the top cover of the unit.
- 2) Unscrew the three fixing screws situated on the lower part of the bottom of the equipment.
- 3) Disconnect connector CN3 from the Power Supply.
- 4) Take careful note of the position of the various colored connecting wires.
- 5) Disconnect the INTERLOCK faston connector situated on the power supply.
- 6) Take careful note of the positions of the fastons connected to the bridge rectifier.
- 7) Disconnect fastons JP1 and JP2 situated on the bridge rectifier.
- 8) Carefully lift out the power supply.

#### **4.5 PJRL CONN1 CARD REPLACEMENT**

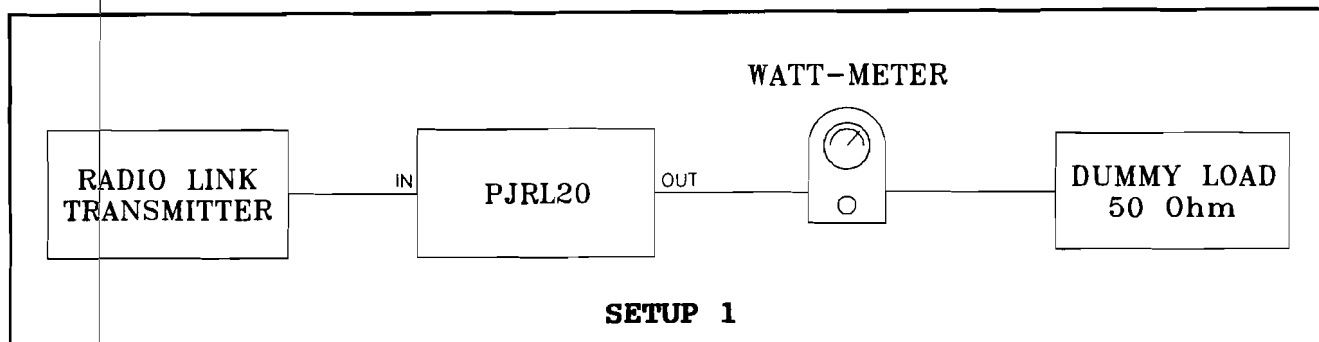
- 1) Open the top cover of the unit.
- 2) Disconnect connector CN1 and CN2 situated on the PJRL CONN-1 card.
- 3) Unscrew the two fixing nuts on the bottom of the equipment.
- 4) Remove the PJRL CONN1 card.

CHAPTER 5

**CALIBRATION PROCEDURE**

**5.1 R.F. POWER AMPLIFIER MODULE CALIBRATION**

After having replaced the amplifier, carry out the following procedure (see SETUP 1):



- 1) Connect a bypass wattmeter between the RF output and a 50 Ohm, >20W dummy load to verify the correct reading of the analog meter.
- 2) Switch on the amplifier. Verify with voltmeter that the voltage between the pin VPA and ground is a value from +12V to +13V; if not adjust R23 trimmer on the power supply card.
- 3) Take a reading of the output power. If this is not 20 W, adjust AT1 attenuator on the R.F. Power Amplifier module accordingly.
- 4) Disconnect the dummy load from the amplifier output, check for the lighting of the SWR indicator.
- 5) Select the PWR REF reading. Adjust R1 on the PJRL CONN1 for a correct reading (max. 2W).
- 6) Reconnect the dummy load and check the output power is once more 20W.

**5.2 POWER SUPPLY CALIBRATION**

The only calibration procedure required in the event of Power Supply replacement is that of the RF Power Amplifier from step (1) to step (6).

MEASUREMENT	VALUE	FSD	TRIMMER	NOTE
FWD PWR	20W	50W	R3	
REF PWR	2W	50W	R8	1

NOTE:

1. Disconnect the load only for this measurement.

### 5.3 PJRL CONN1 CARD CALIBRATION

The only calibration procedure required in the event of PJRL CONN1 replacement is that to re-adjust the reflected power reading on the analog meter through R1 trimmer.

APPENDIX A

**CIRCUIT DIAGRAMS, LAYOUTS AND BILLS OF MATERIAL**

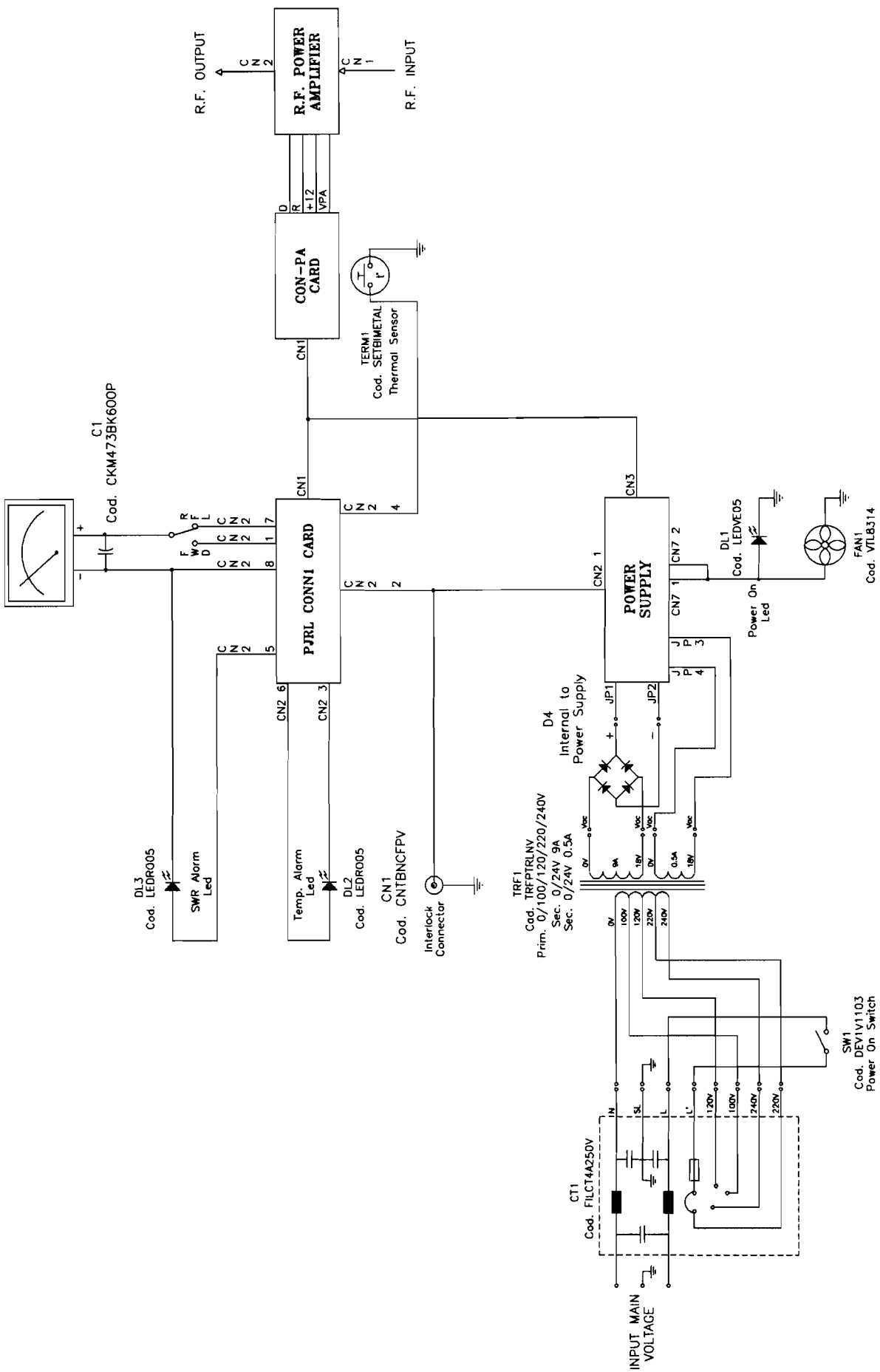
This section contains circuit diagrams, layouts and bills of material of the modules which composing the equipment.  
For more information about each module see as reference Section 2.

**WIRING DIAGRAM**

1 Radio Link Amplifier Wiring Diagram

Pag. 30

MET1  
Cod. SMABM42R251  
Meter

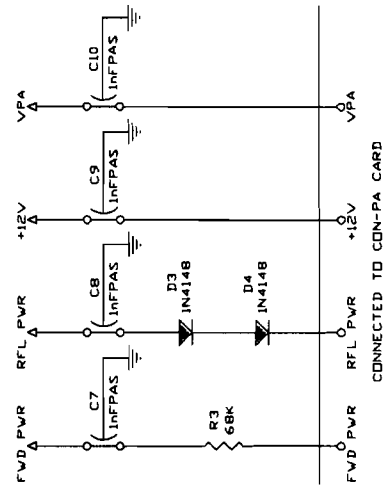
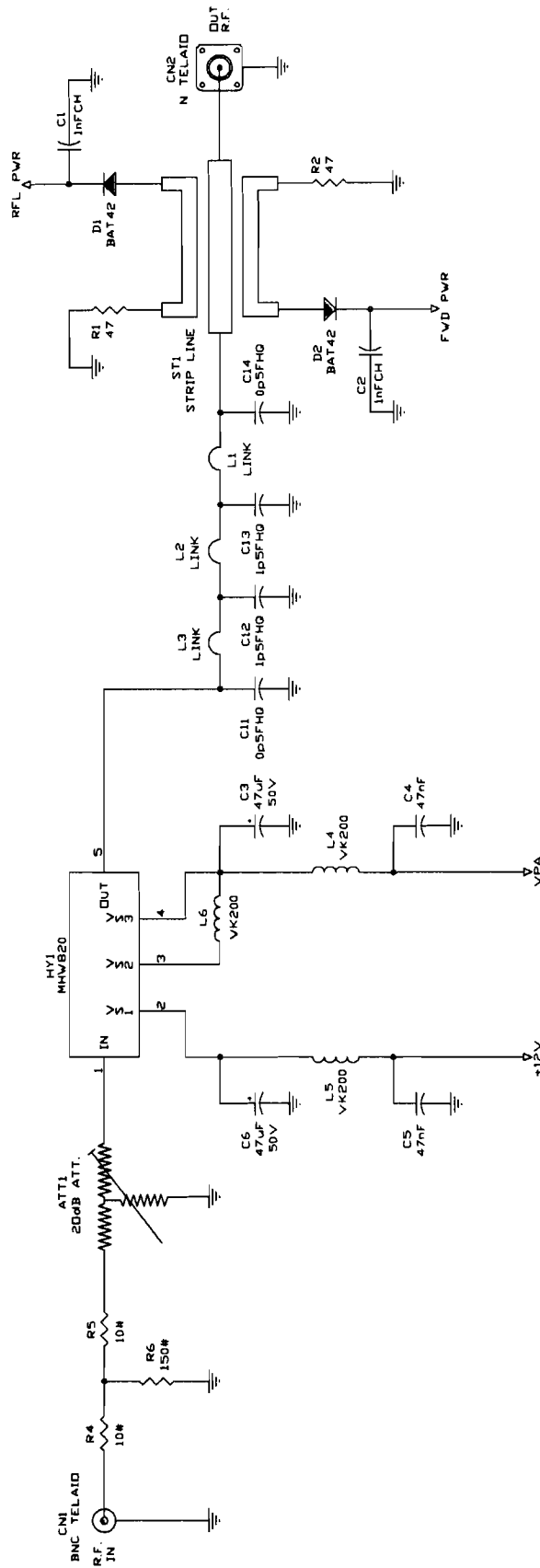


RADIO LINK AMPLIFIER WIRING DIAGRAM



**R.F. POWER AMPLIFIER**

<u>1</u>	<u>Circuit Diagram</u>	<u>Pag. 32</u>
<u>2</u>	<u>Bill of Materials</u>	<u>Pag. 33</u>
<u>3</u>	<u>Layout</u>	<u>Pag. 34</u>

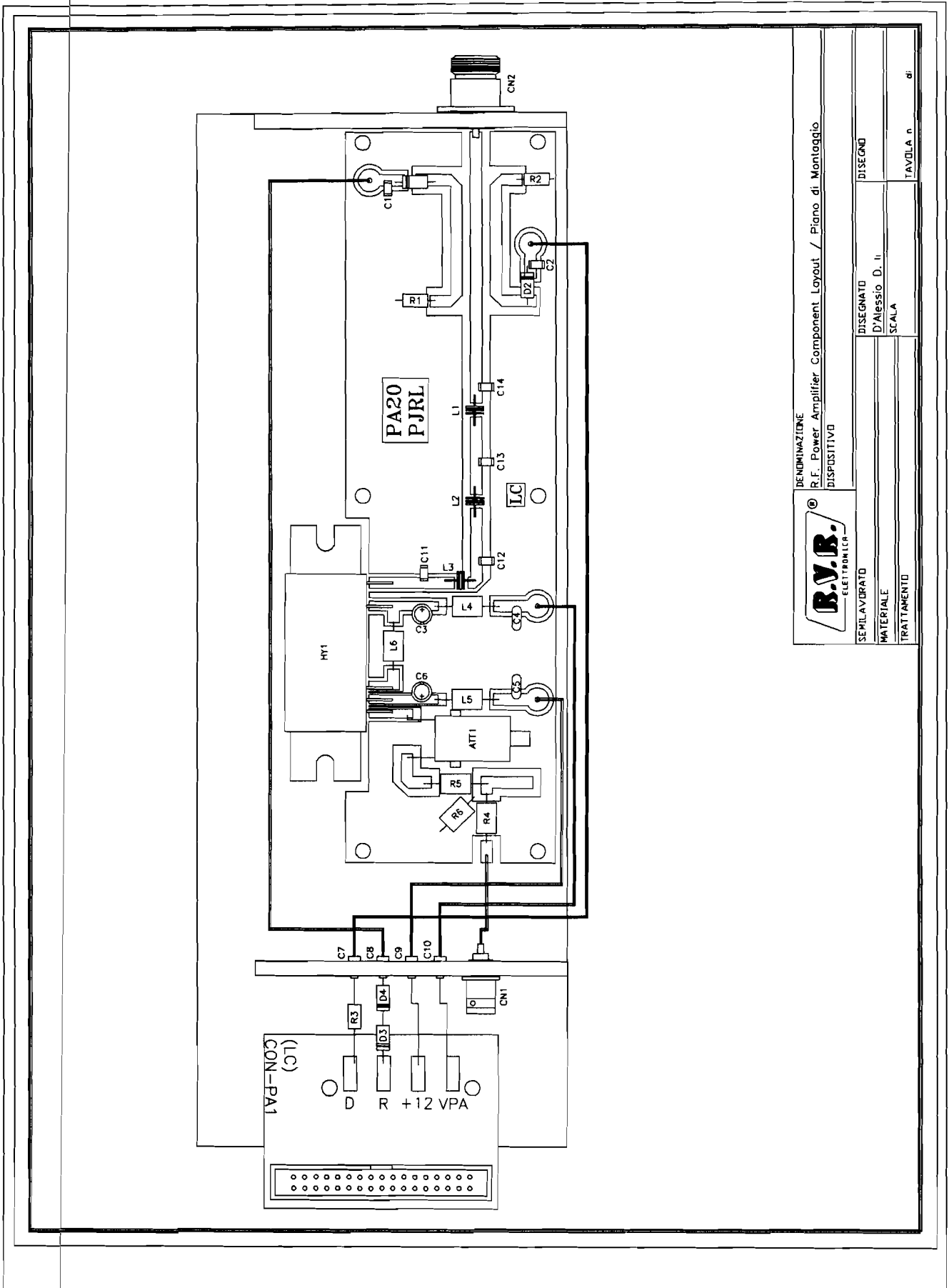



HY1 -> 806 < F < 890 -> MHWB20-2  
 HY1 -> 870 < F < 950 -> MHWB20-3

R.V.R. Elettronica S.r.l. (Bo)

Title		20W R.F. Power Amplifier Circuit Diagram
Size	Document Number	REV
A3		
Date:	November 24, 1994	Sheet 1 of 1

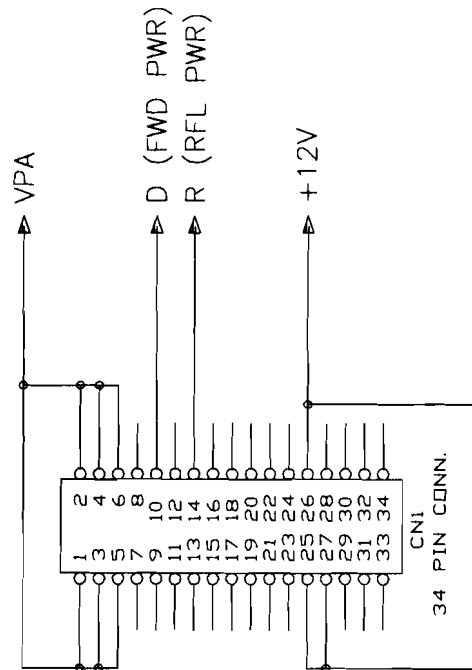
R.F.	Power Amplifier	Bill of Materials/Lista Componenti			Pag. 1
Item	Quantity	Reference	Part	Description	Part Order Code
1	2	R4,R5	10#	RESISTOR 2W	RSC002JH0010
2	2	R1,R2	47	RESISTOR 1/4W 5%	RSC1/4JH0047
3	1	R6	150#	RESISTOR 2W	RSC002JH0150
4	1	R3	68K	RESISTOR 1/4W 5%	RSC1/4JK0068
5	2	C11,C14	0p5FHQ	HIGHT Q CAPACITOR	CKM0,5AJ500
6	2	C12,C13	1p5FHQ	HIGHT Q CAPACITOR	CKM1,5AJ500
7	2	C1,C2	1nFCH	CERAMIC CHIP CAPACITOR	CCC102AJ500
8	4	C7,C8,C9, C10	1nFPAS	CERAMIC THROUGH CAPAC.	CDP102XK500
9	2	C4,C5	47nF	CERAMIC CAPACITOR	CKM473BK600P
10	2	C3,C6	47µF	ELECTROLYTIC CAPACITOR	CEA476BM630
11	3	L4,L5,L6	VK200	RF CHOKE	IMPVK200
12	3	L1,L2,L3	LINK	LINK FILO ARG. 1mm	CAVARG1000
13	1	CN1	BNC TELAIO	CONN. BNC A TELAIO	CNTBNCFPV
14	1	CN2	N TELAIO	CONN. N A TELAIO	CNTNFPFL
15	2	D3,D4	1N4148	SILICON DIODE	DIS1N4148
16	2	D1,D2	BAT42	HOT CARRIER DIODE	DHCBAT42
17	1	HY1	MHW820	HYBRID POW AMP MHW820	MIBMHW820-2/
18	1	ST1	STRIP LINE	STRIP LINE	
19	1	ATT1	20dB ATT.	20dB VARIABLE ATTENUATOR	



		DENOMINAZIONE R.F. Power Amplifier Component Layout / Piano di Montaggio	
SEMILAVORATO		DISPOSITIVO	
MATERIALE		DISEGNATO D'Alessio D. II	
TRATTAMENTO		SCALA	
		TAVOLA n. di	

CON-PA CARD

<u>1</u>	<u>Circuit Diagram</u>	<u>Pag. 35</u>
<u>2</u>	<u>Bill of Materials</u>	<u>Pag. 37</u>
<u>3</u>	<u>Layout</u>	<u>Pag. 38</u>



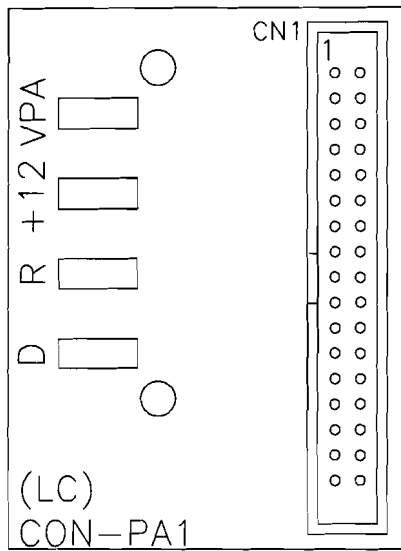
R.V.R. Elettronica S.r.l. (Bo)


Title		CON-PA Card Circuit Diagram	
Size	Document Number	REV	
A4			
Date:	Sheet	of	

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CON-PA Card	Bill of Materials/Lista Componenti			Pag. 1	
Item	Quantity	Reference	Part	Description	Part Order Code
1	1	CN1	34 P CONN.	CONN. M 2*17 P 2.54	CNTMCSFC34P

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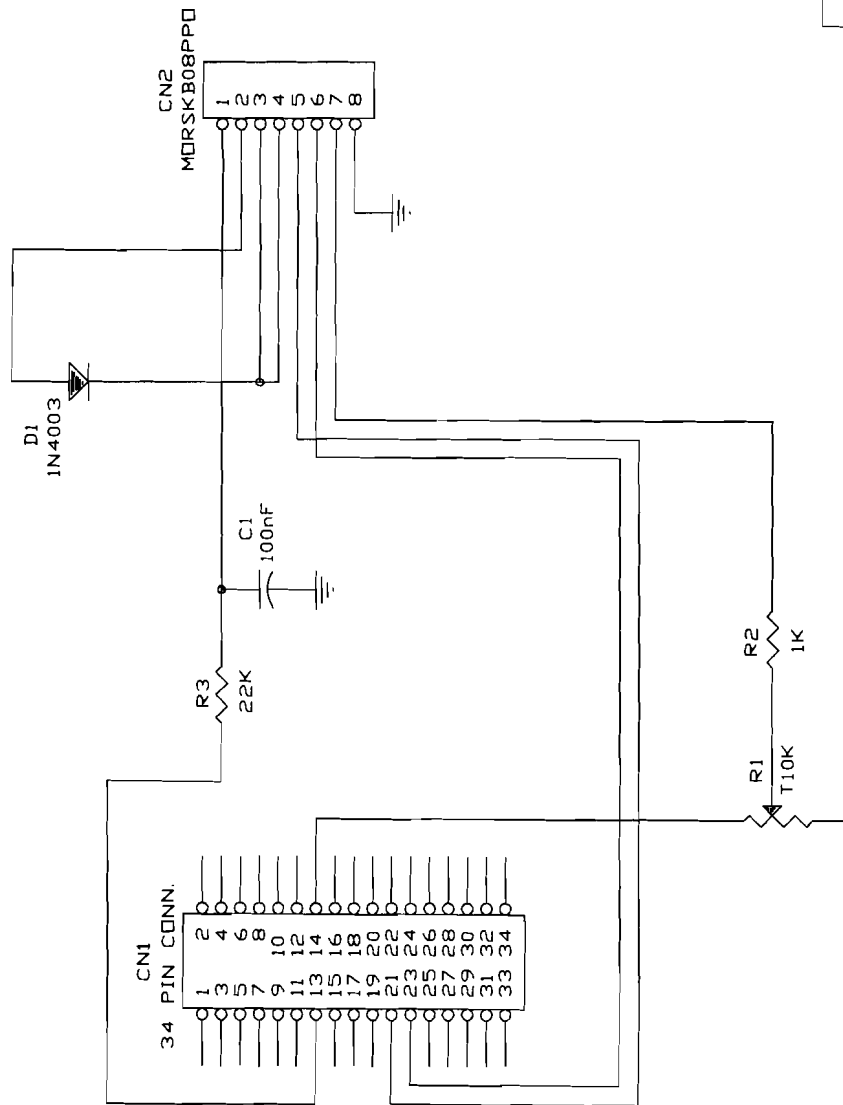
	DENOMINAZIONE	
	CON-PA Card Component Layout / Piano di Montaggio	
	DISPOSITIVO	
SEMILAVORATO	DISEGNATO	DISEGNO
MATERIALE	D'Alessio D. U	
TRATTAMENTO	SCALA	TAVOLA n di



"PJRL CONN1" CARD

<u>1</u>	<u>Circuit Diagram</u>	<u>Pag. 40</u>
<u>2</u>	<u>Bill of Materials</u>	<u>Pag. 41</u>
<u>3</u>	<u>Layout</u>	<u>Pag. 42</u>

- 1 -> FWD PWR
- 2 -> REMOTE
- 3 -> NEG. LED TEMP. ALARM
- 4 -> THERMAL SENSOR
- 5 -> POS. LED SWR ALARM
- 6 -> POS. LED TEMP ALARM
- 7 -> RFL PWR
- 8 -> GROUND

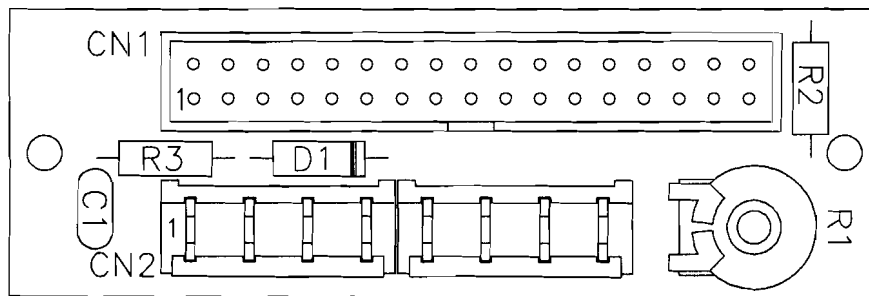



R.V.R. Elettronica S.r.l. (Bo)	
Title "PJRL CONN1" Card Circuit Diagram	
Size	Document Number
A4	REV
Date: November 24, 1994	Sheet 1 of 1

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PJRL CONN1 Card		Bill of Materials/Lista Componenti			Pag. 1
Item	Quantity	Reference	Part	Description	Part Order Code
1	1	R2	1K	RESISTOR 1/4W 5%	RSC1/4JK0001
2	1	R3	22K	RESISTOR 1/4W 5%	RSC1/4JK0022
3	1	R1	T10K	TRIMMER REG. VERT. 10mm	RVTD10VK0010
4	1	C1	100nF	CERAMIC CAPACITOR	CKM104BK600P
5	1	CN2	MORSKB08PPO	MORS. LUMB. FEMM. CS 8P	MORSKB08PPO
6	1	CN1	34 P CONN.	CONN. M 2*13 P 2.54	CNTMCSFC34P
7	1	D1	1N4003	SILICON DIODE 200V	DIS1N4003

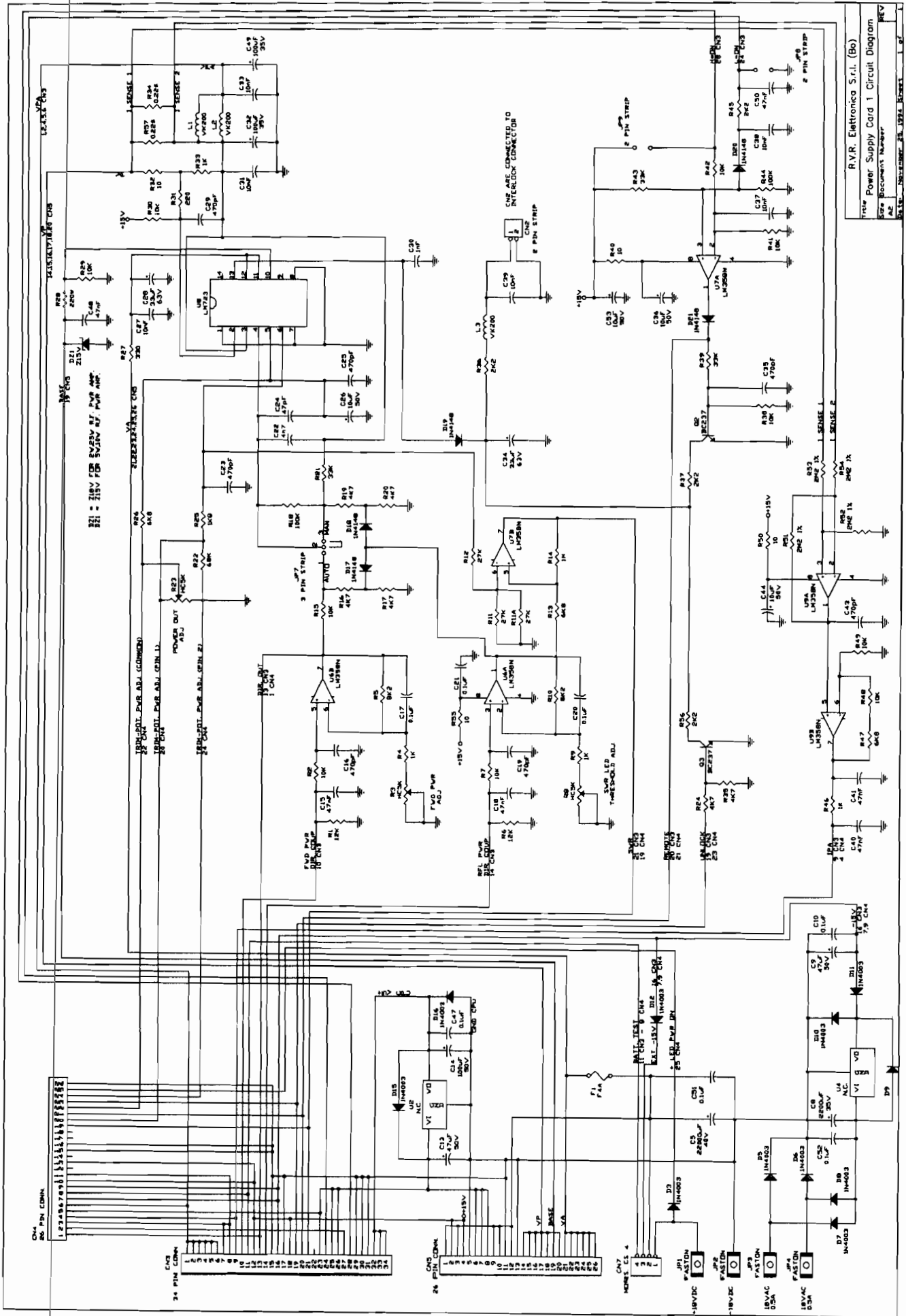
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	DENOMINAZIONE	
	"PJRL CONN1" Card Component Layout / Piano di Montaggio	
DISPOSITIVO		
SEMILAVORATO	DISEGNATO	DISEGNO
MATERIALE	D'Alessio D. II	
TRATTAMENTO	SCALA	TAVOLA n di

**POWER SUPPLY**

<u>1</u>	<u>Power Supply Card 1 Circuit Diagram</u>	<u>Pag. 44</u>
<u>2</u>	<u>Power Supply Card 1 Bill of Materials</u>	<u>Pag. 45</u>
<u>3</u>	<u>Power Supply Card 1 Component Layout</u>	<u>Pag. 48</u>
<u>4</u>	<u>Power Supply Card 2 Circuit Diagram</u>	<u>Pag. 49</u>
<u>5</u>	<u>Power Supply Card 2 Bill of Materials</u>	<u>Pag. 50</u>
<u>6</u>	<u>Power Supply Card 2 Component Layout</u>	<u>Pag. 51</u>



Power Supply Card 1			Bill of Materials/Lista Componenti		Pag. 1
Item	Quantity	Reference	Part	Description	Part Order Code
1	2	R34,R57	0.22\$	RESISTOR 5W	RAFO05JH0,22
2	4	R32,R40, R50,R55	10	RESISTOR 1/4W 5%	RSC1/4JH0010
3	1	R31	220	RESISTOR 1/4W 5%	RSC1/4JH0220
4	1	R28	220*	RESISTOR 1/2W 5%	RSC1/2JH0220
5	1	R27	330	RESISTOR 1/4W 5%	RSC1/4JH0330
6	4	R4,R9,R33, R46	1K	RESISTOR 1/4W 5%	RSC1/4JK0001
7	1	R25	1K8	RESISTOR 1/4W 5%	RSC1/4JK01,8
8	4	R36,R37, R45,R56	2K2	RESISTOR 1/4W 5%	RSC1/4JK02,2
9	6	R16,R17, R19,R20, R24,R35	4K7	RESISTOR 1/4W 5%	RSC1/4JK04,7
10	3	R13,R26,R47	6K8	RESISTOR 1/4W 5%	RSC1/4JK06,8
11	2	R5,R10	8K2	RESISTOR 1/4W 5%	RSC1/4JK08,2
12	10	R2,R7,R15, R29,R30, R38,R41, R42,R48,R49	10K	RESISTOR 1/4W 5%	RSC1/4JK0010
13	2	R1,R6	12K	RESISTOR 1/4W 5%	RSC1/4JK0012
14	3	R11A,R11, R12	27K	RESISTOR 1/4W 5%	RSC1/4JK0027
15	3	R21,R39,R43	33K	RESISTOR 1/4W 5%	RSC1/4JK0033
16	1	R22	68K	RESISTOR 1/4W 5%	RSC1/4JK0068
17	2	R18,R44	100K	RESISTOR 1/4W 5%	RSC1/4JK0100
18	1	R14	1M	RESISTOR 1/4W 5%	RSC1/4JM0001
19	4	R51,R52, R53,R54	2M2 1%	RESISTOR 1/4W 1%	RSM1/4FM02,2
20	3	R3,R8,R23	HC5K	TRIM. REG. ORIZ. CERMET	RVTCEROK0005
21	1	C24	47pF	CERAMIC CAPACITOR NPO	CKM470BJ600C
22	7	C16,C19, C23,C25, C29,C35,C43	470pF	CERAMIC CAPACITOR	CKM471BK600P
23	1	C30	1nF	CERAMIC CAPACITOR	CKM102BK600P

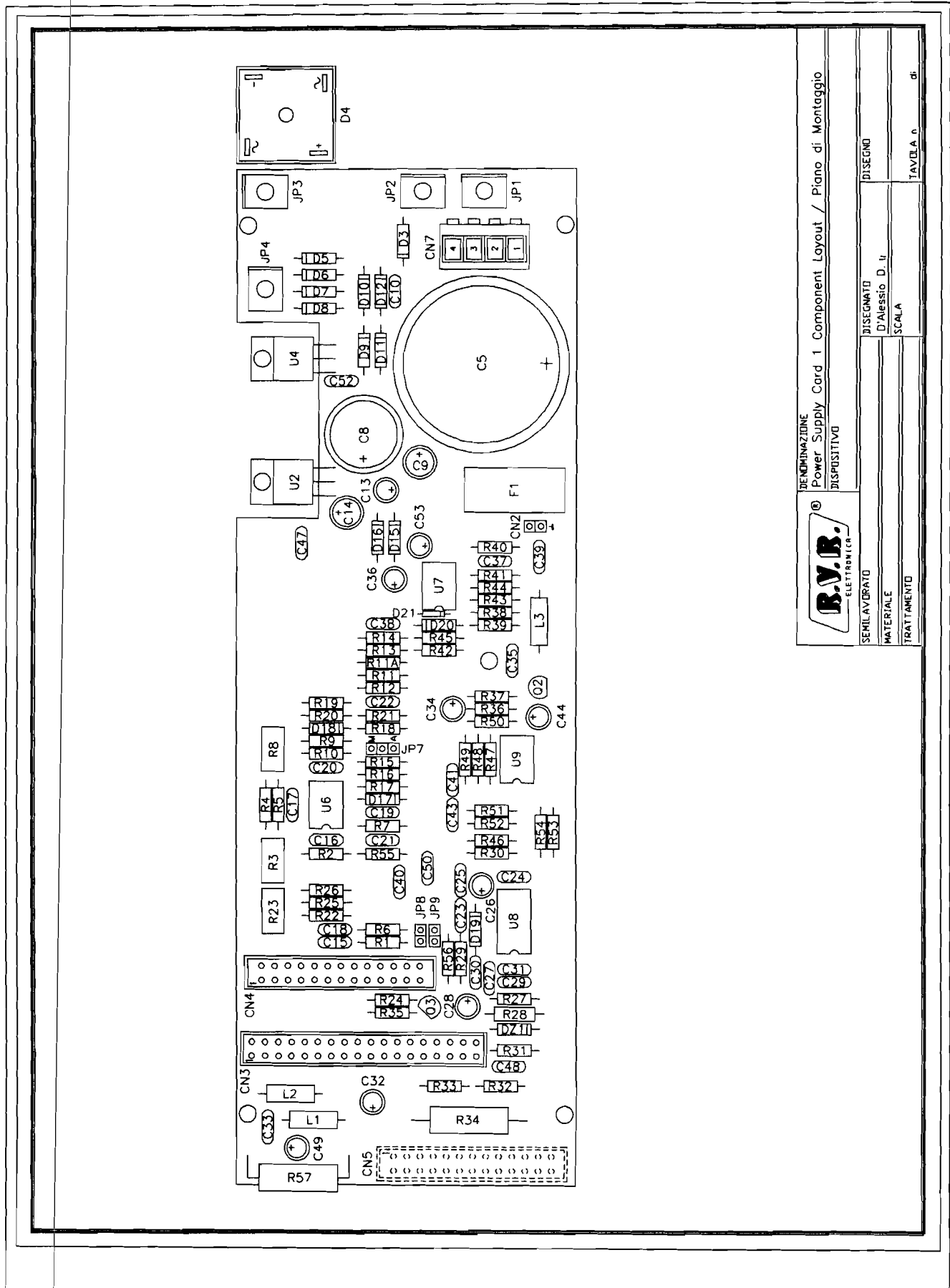
Power Supply Card 1			Bill of Materials/Lista Componenti		Pag. 2
Item	Quantity	Reference	Part	Description	Part Order Code
24	1	C22	4n7	CERAMIC CAPACITOR	CKM472BK600P
25	6	C27,C31, C33,C37, C38,C39	10nF	CERAMIC CAPACITOR	CKM103BK600P
26	6	C15,C18, C40,C41, C48,C50	47nF	CERAMIC CAPACITOR	CKM473BK600P
27	7	C10,C17, C20,C21, C47,C51,C52	0.1 $\mu$ F	CERAMIC CAPACITOR	CKM104BK600P
28	4	C26,C36, C44,C53	10 $\mu$ F	ELECTROLYTIC CAPACITOR	CEA106AM350
29	2	C28,C34	33 $\mu$ F	ELECTROLYTIC CAPACITOR	CEA336BM350
30	2	C9,C13	47 $\mu$ F	ELECTROLYTIC CAPACITOR	CEA476BM630
31	3	C14,C32,C49	100 $\mu$ F	ELECTROLYTIC CAPACITOR	CEA107BM350
32	1	C8	2200 $\mu$ F	ELECTROLYTIC CAPACITOR	CEA228CM350
33	1	C5	22000 $\mu$ F	ELECTROLYTIC CAPACITOR	CEA229PM630
34	3	L1,L2,L3	VK200	RF CHOKE	IMPVK200
35	1	F1	F4A	FAST FUSIBLE	FUS5X20RP4
36	3	CN2,JP8,JP9	2 PIN STRIP	STRIP M P 2.54 2 PIN	CNTSTRIPMCS
37	1	JP7	3 PIN STRIP	STRIP M P 2.54 3 PIN	CNTSTRIPMCS
38	4	JP1,JP2, JP3,JP4	FASTON	CON. FASTON M CIRC. ST.	CNTFSTMCSGR
39	1	CN7	MORS. CS 4	MORS. C. S. 4 CONT.	MORSKB04PPO
40	2	CN4,CN5	26P CONN.	CONN. M 2*13 P 2.54	CNTMCSFC26P
41	1	CN3	34P CONN.	CONN. M 2*17 P 2.54	CNTMCSFC34P
42	5	D17,D18, D19,D20,D21	1N4148	SILICON DIODE	DIS1N4148
43	11	D3,D5,D6, D7,D8,D9, D10,D11, D12,D15,D16	1N4003	SILICON DIODE 200V	DIS1N4003
44	1	DZ1	Z15V	ZENER DIODE 15V 0.4W	DIZ15VOW4
45	1	U8	LM723	VAR. STABILIZER 100mA	CILLM723
46	2	Q2,Q3	BC237	NPN TRANSISTOR	TRNBC237




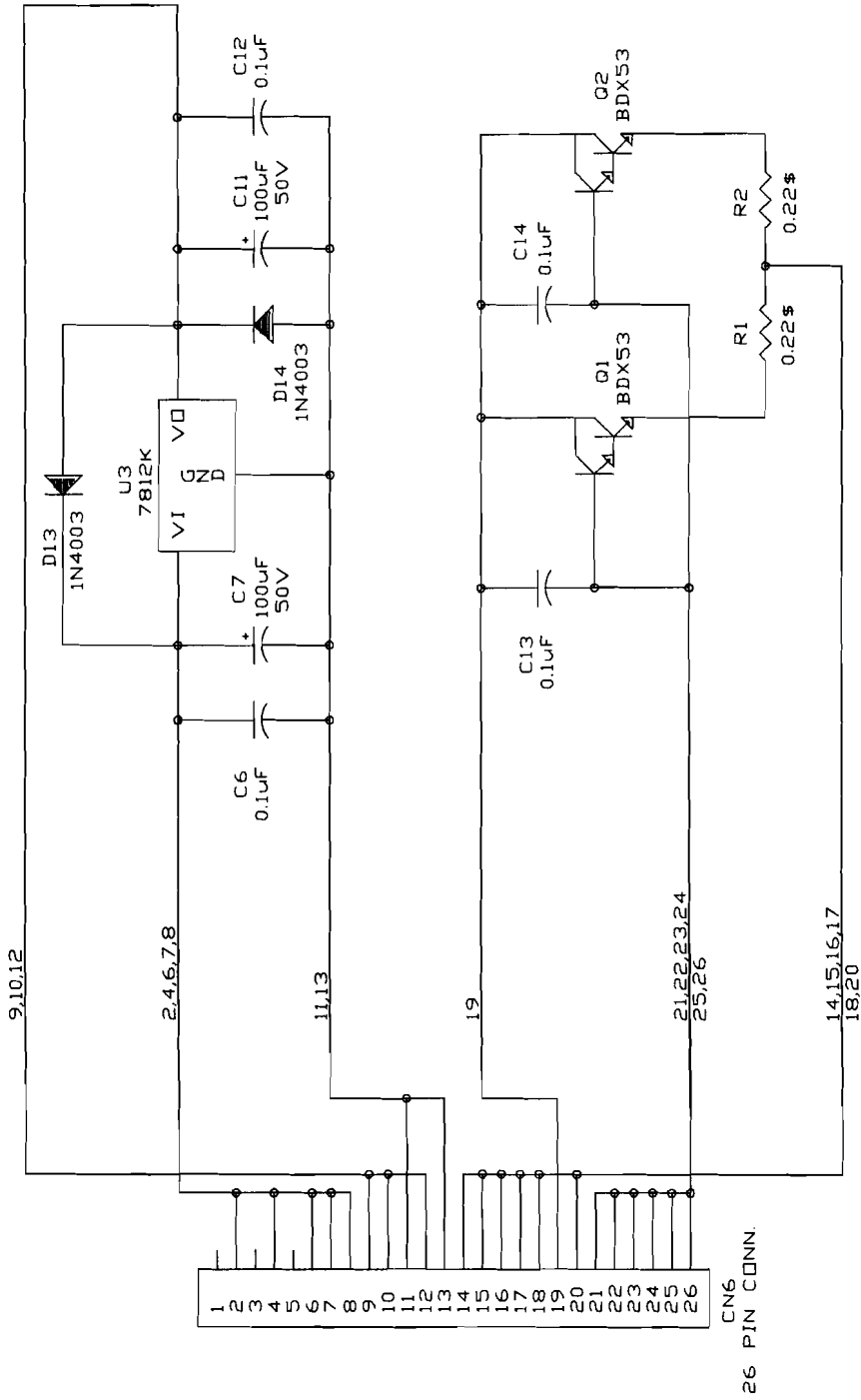
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Power Supply Card 1		Bill of Materials/Lista Componenti			Pag. 3
Item	Quantity	Reference	Part	Description	Part Order Code
47	3	U6,U7,U9	LM358N	DOUBLE OP. AMP.	CILLM358N
48	2	U2,U4	N.C.	NOT CONNECTED	

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 ELETTRONICA	DENOMINAZIONE Power Supply Card 1 Component Layout / Piano di Montaggio	
	DISPOSITIVI	
SEMILAVORATO	DISEGNATO D'ALESSIO D. I.	DISEGNO
MATERIALE	SCALA	TAVOLA n. di
TRATTAMENTO		



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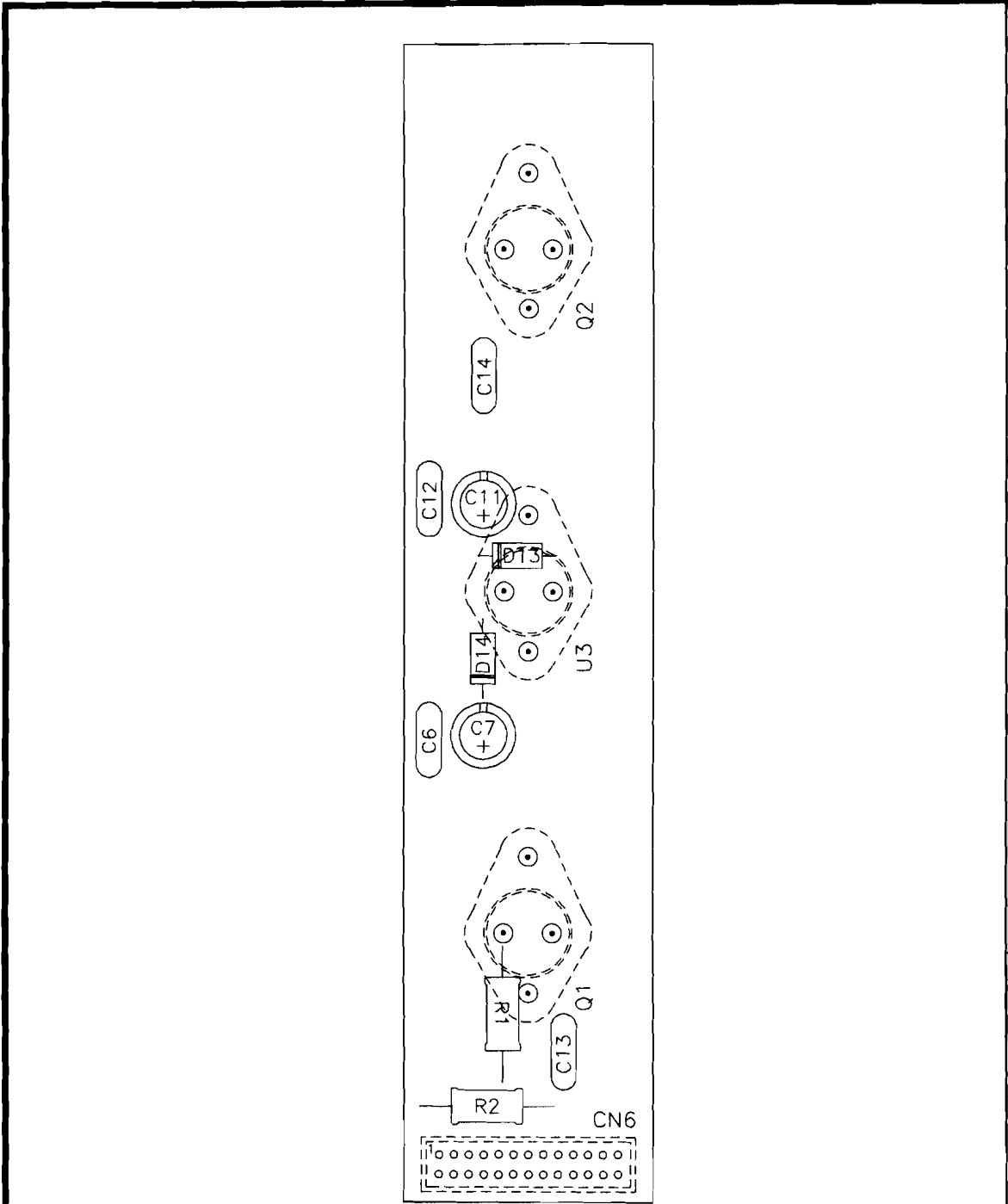
Title Power Supply Card 2 Circuit Diagram


Size Document Number

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Date: November 25, 1994 Sheet of

Power Supply Card 2		Bill of Materials/Lista Componenti			Pag. 1
Item	Quantity	Reference	Part	Description	Part Order Code
1	2	R1,R2	0.22 $\Omega$	RESISTOR 5W	RAF005JH0,22
2	4	C6,C12, C13,C14	0.1 $\mu$ F	CERAMIC CAPACITOR	CKM104BK600P
3	2	C7,C11	100 $\mu$ F	ELECTROLYTIC CAPACITOR	CEA107BM350
4	1	CN6	26P CONN.	CONN. M 2*13 P 2.54	CNTMCSFC26P
5	2	D13,D14	1N4003	SILICON DIODE 200V	DIS1N4003
6	1	U3	7812K	POS. STABILIZER 1.5A	CIL7812K
7	2	Q1,Q2	BDX53	NPN TRANSISTOR	TRNBDX53



	DENOMINAZIONE Power Supply Card 2 Component Layout / Piano di Montaggio	
	DISPOSITIVO	
SEMILAVORATO	DISEGNATO D'Alessio D. II	DISEGNO
MATERIALE	SCALA	TAVOLA n. di
TRATTAMENTO		

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Created By D'Alessio D. & Morotti M.

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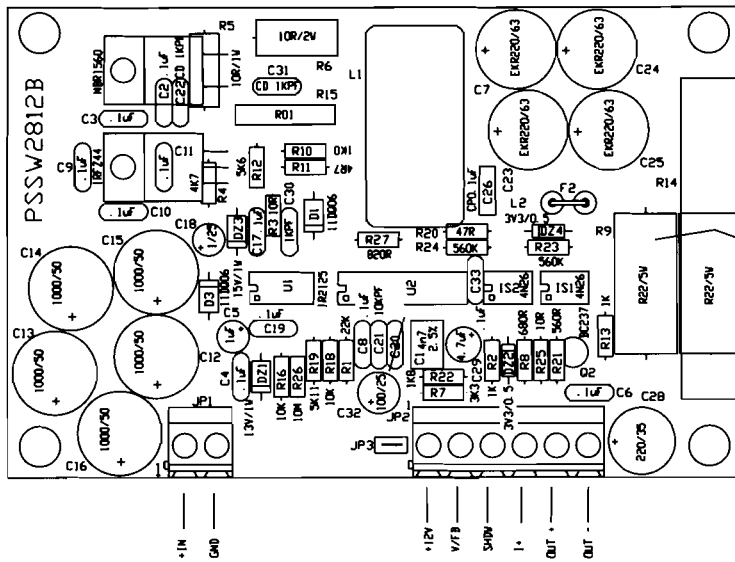
# APPENDIX

Description	RVR Code	Vers.	Page
Power Supply	PSSW2812B	0.2	4

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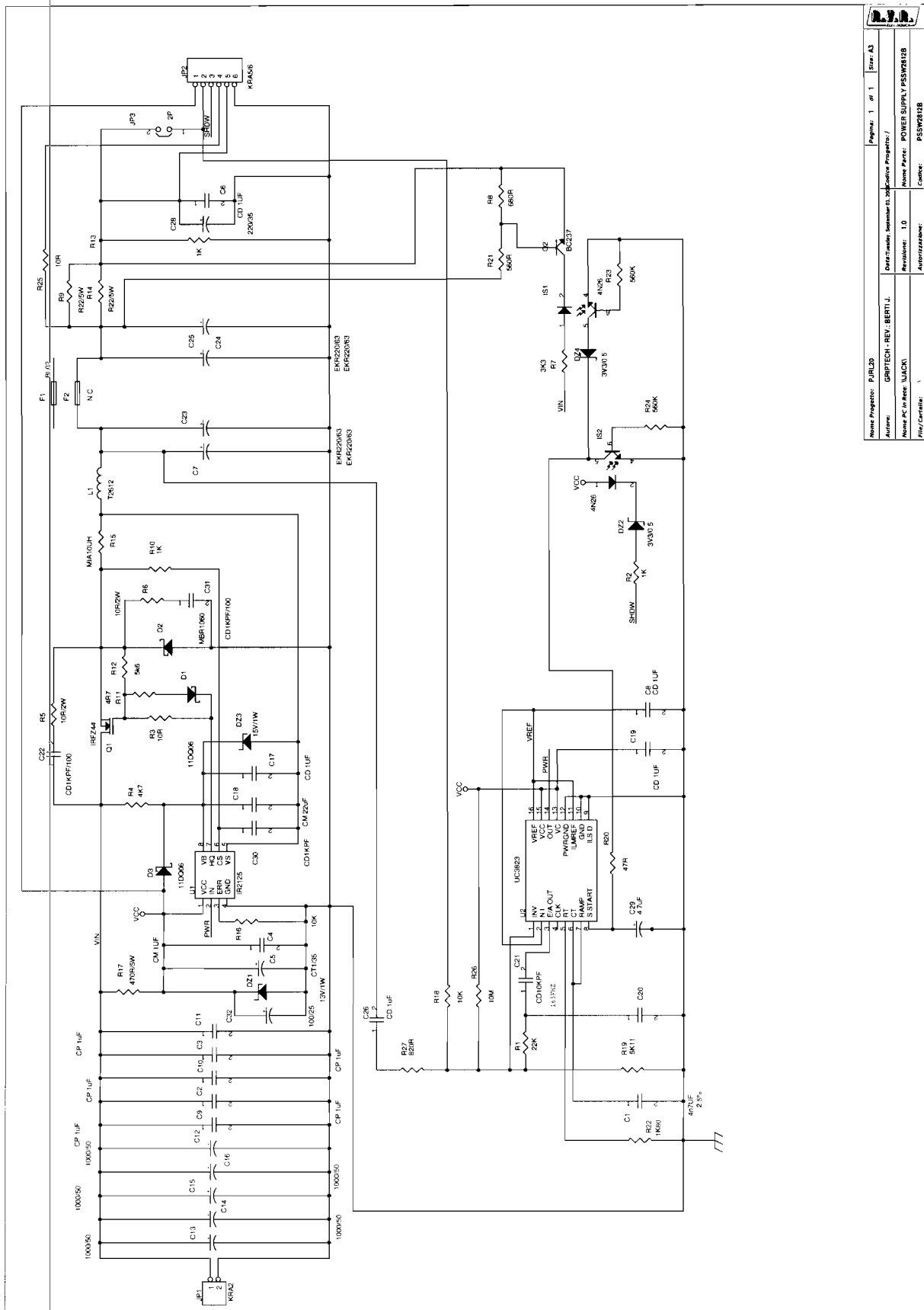
PJRL20 2G



+1N  
GND  
+12V  
VFB  
SDW  
I+  
OUT +  
OUT -

MONTARE SOLLEVATE  
COMME CAMPIONE

Nome Progetto	P_JRL20	Pagina	1 di 1	Size	A4
Autore	GRIPTECH - REV: BERTI J.	Codice Progetto	/		
Nome PC in Rete	\\JACK	Revisione	1.0	Nome Parte	SWITCHING POWER SUPPLY
File/Cartella	MANUAL\APPENDIX\PJRL20\PSSW2812B.DWG	Autonizzazione	/		
Scale	/	Trattamento	/		
Ma. scale	/	Profilo	/		
		Codice	PSSW2812B		



Nome Progetto: PJRL20	Dimensione Foglio: A3
Autore: GRPTECH - REV. BERTI L.	Data Revisione: 03/09/02
Nome PC in Rete: MACK	Revisione: 1.0
Nome File: PSSW2812B	Autore: PSSW2812B

POWER SUPPLY      Bill Of Materials      Page1

Item	Q.ty	Reference	Part
1	1	C1	4n7UF
2	5	C2,C3,C9,C10,C11	CP.1uF
3	1	C4	CM.1UF
4	1	C5	CT1/35
5	5	C6,C8,C17,C19,C26	CD.1uF
6	4	C7,C23,C24,C25	EKR220/63
7	5	C12,C13,C14,C15,C16	1000/50
8	1	C18	CM.22uF
9	1	C20	CAP NP
10	1	C21	CD10KPF
11	2	C31,C22	CD1KPF/100
12	1	C28	220/35
13	1	C29	4.7uF
14	1	C30	CD1KPF
15	1	C32	100/25
16	1	DZ1	13V/1W
17	2	DZ2,DZ4	3V3/0.5
18	1	DZ3	15V/1W
19	2	D3,D1	11DQ06
20	1	D2	MBR1060
21	1	F1	BL02
22	1	F2	N.C.
23	2	IS1,IS2	4N26
24	1	JP1	KRA2
25	1	JP2	KRA5/6
26	1	JP3	2P
27	1	L1	T2812
28	1	Q1	IRFZ44
29	1	Q2	BC237
30	1	R1	22K
31	3	R2,R10,R13	1K
32	2	R3,R25	10R
33	1	R4	4K7
34	2	R6,R5	10R/2W
35	1	R7	3K3
36	1	R8	680R
37	2	R14,R9	R22/5W
38	1	R11	4R7
39	1	R12	5k6
40	1	R15	MIA10UH
41	2	R16,R18	10K
42	1	R17	470R/5W
43	1	R19	5K11
44	1	R20	47R
45	1	R21	560R
46	1	R22	1K80
47	2	R24,R23	560K
48	1	R26	10M
49	1	R27	820R
50	1	U1	IR2125
51	1	U2	UC3823

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