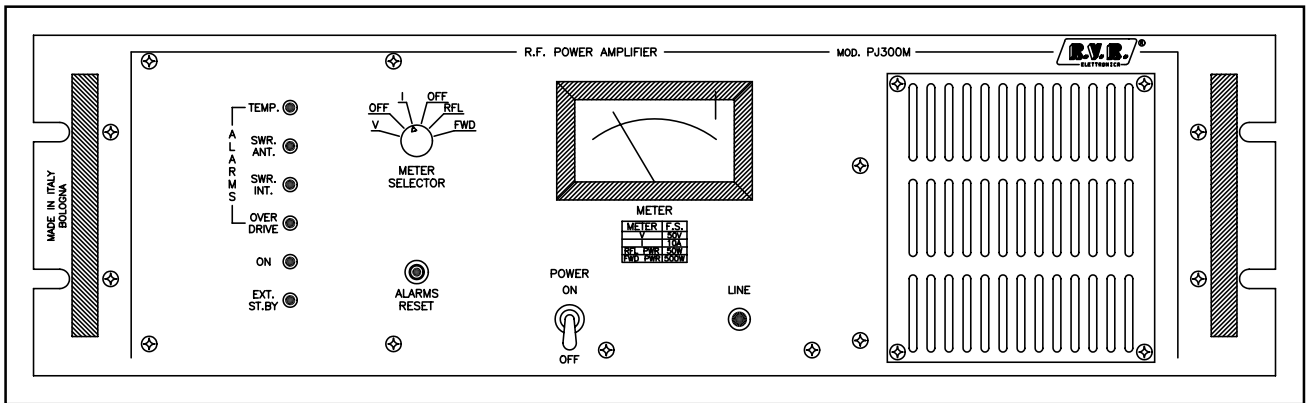


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# PJ300M



## User Manual

### Volume 1

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Manufactured by  Italy



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PJ300M - User Manual  
Versione 7.0

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**Notification of intended purpose and limitations of product use**

This product is a FM transmitter intended for FM audio broadcasting. It utilises operating frequencies not harmonised in the intended countries of use.

The user must obtain a license before using the product in intended country of use. Ensure respective country licensing requirements are complied with.

Limitations of use can apply in respect of operating frequency, transmitter power and/or channel spacing.

**Declaration of Conformity**

Hereby, R.V.R. Elettronica SpA, declares that this FM transmitter is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.



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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-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.

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

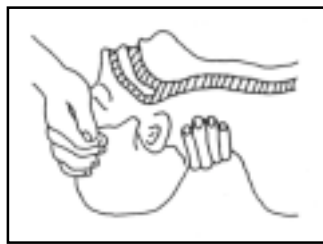


Figure 1



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**).



Figure 3

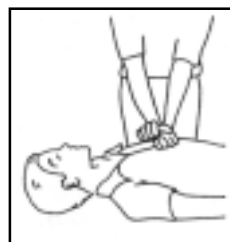


Figure 4

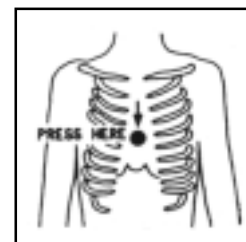


Figure 5

- 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

RVR Elettronica's PJ300M is a 19" rack-mountable, 3 HE high, solid-state broadband power amplifier for FM audio broadcasting. It works without adjustment on the whole 87.5 - 108 MHz FM band and its power output is 300 W nominal with a drive level of about 10W.

The RF power section employs one high power MOSFET module, able to deliver more than 300 W.

The power supply is a switching mode one, and a "soft-start" circuit is included to minimize the transformer's current spikes when the device is switched on.

The amplifier features a built-in protection system against situations than can be dangerous for the device like exceeding output power or reflected power, overdrive or overtemperature. The protection system is conceived to return the machine in its normal status if the conditions that generated the warnings were temporary.

The front panel includes an analog display to measure the main working parameters. The different parameters are selected with a rotating selector.

A series of LEDs on the front panel give to the user immediate signalling of conditions that have to be noticed. The group includes four red alarm LEDs (temperature, external SWR, internal SWR, overdrive), a green LED that indicates the ON status of the amplifier and a yellow LED that indicates if the machine is forced to stand-by status by an external signal through the telemetry connector.

On the telemetry connector the main parameters are available for the user as dc voltage levels that are proportional to the value of the parameter under consideration.

A built-in low pass filter keeps the harmonic emission level below the CCIR and FCC permitted thresholds.

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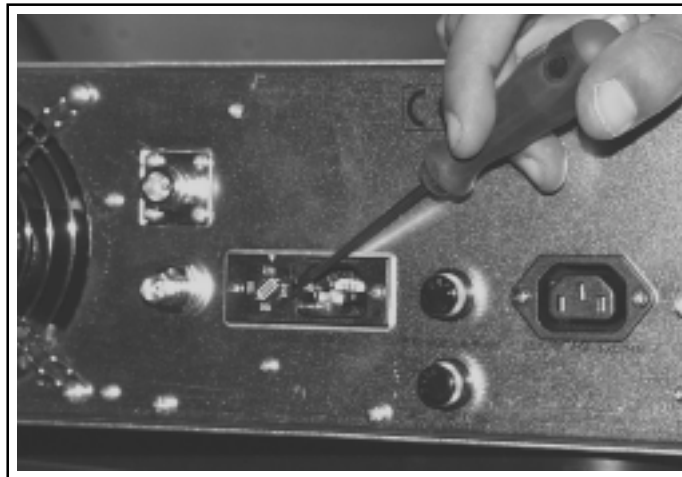
## 5. Installation and Use

This chapter is intended to summarize the necessary points for the installation of the device. In case any of the topics herein are unclear, for example when you use the amplifier for the first time, please read carefully the whole manual.

### 5.1 Preparation

Unpack the amplifier and before any other operation check that the amplifier didn't suffer any damage during the transport, and specifically check whether all the controls and connectors on the front and rear panels are in good conditions.

Check the mains voltage selector on the rear panel: the selected value is indicated by an arrow. If required, extract the selector block levering with a screwdriver (Fig. 5.1). Rotate the block until the correct printed value corresponds with the arrow, and then reinsert the fuse block.



*Figure 5.1*

If it is necessary for you to change the voltage, check the value of the fuse inside the voltage changer block. The required values are the following:

- Supply = 220 - 240 V    6,3A 5x20
- Supply = 100 - 120 V    10A 5x20

The other fuses in the amplifier, accesible from the rear panel, are:

- RF Module                    10A 6,3X32
- AC Line for Exciter        2A 6,3X32

Verify that the mains switch is in the OFF positon.

Connect to the RF input of the amplifier the RF Output of suitable exciter, able to deliver an adjustable power between 2 and 20W (for example the RVR Elettronica's PTX30) using a coax cable terminated with N-type connectors; the exciter shall be set for minimum power and OFF.

Link one of the Alarms/Interlock connectors to the Interlock connector of the exciter, if available (as it is in RVR Elettronica’s exciters). If the exciter you are going to use has no suitable interlock connector, it is advisable to use for its supply the plug called “AC Line for exciter” on the rear panel of the amplifier. This plug is protected by a relay that is opened under the same conditions that trigger the “interlock” circuit.

Connect the RF output to the antenna cable or to a dummy load with suitable power rating.

Finally, connect a proper cable to the amplifier’s mains input plug.



**ATTENTION:** It is essential that the unit is properly earthed to ensure both the safety of operaton as well as the correct working of the equipment.

## 5.2 Operation

Switch ON the amplifier and verify the green “ON” LED being it.

The analog instrument, joined with the rotating selector, is used to visualize the working parameters of the unit (Fig. 5.2):

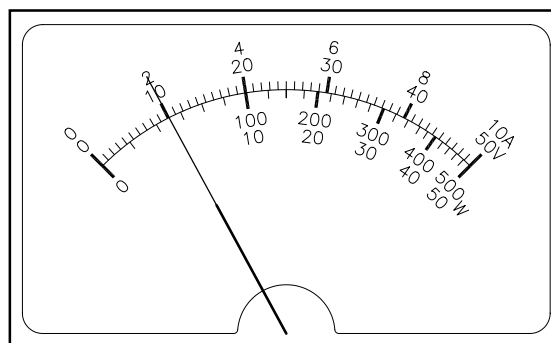


Figure 5.2

Rotating Selector Position	Full Scale Value	Visualization Line
I	10 A	1
V	50 V	2
FWD	500 W	3
RFL	50 W	4

Check on the analog instrument using the rotating selector if the internal supply voltage (parameter “V”) is 50V. Check that the standby current (I) is approx 200 mA. These values confirm that the power supply is correctly operating and that the quiescent setting of the RF power module is all right.

Swith ON the exciter (set for minimum power) and wait for it to lock on the working frequency. When the PLL locked, progressively increase the exciter’s ouput power, while checking on the amplifier’s instrument its emitted power (FWD). Along with the increase in the emitted power, one can notice a proportional increase in the drawn current (I). Keep increasing the exciter output power until the amplifier reaches the desired level, that is at most 300 W. At this point, the normal working values for the



PJ300M are:

- $V \cong 50\text{ V}$
- $I \cong 8 \div 9,5\text{ A}$

It is possible to verify the precision of the built-in wattmeter using an external measurement instrument like a through wattmeter. An accuracy of 10% should be considered normal.

To check the functionality of the “alarms reset” button, push it while the amplifier is transmitting.



**ATTENTION:** While the button is pushed, **the power** output of the amplifier **is cut**.

With the button pushed, verify that “FWD”, “V” and “I” are all reduced to 0. If the connection of the interlock has been done correctly, the exciter power is also cut while the button is pressed.

Releasing the button, all the parameters will return to their former value.

To test the amplifier protection system, you can increase the drive level until the red LED “overdrive” lights up. The protection system is triggered by this condition, and the amplifier is disabled for about 10 seconds. The exciter is also disabled via the interlock connector. After the delay introduced by the protection system, the amplifier and the exciter will be enabled again.

The device doesn’t require any human supervision for its normal operation. If any alarm condition arise, these are automatically managed by the embedded protection system; if the protection system doesn’t succeed in re-establishing the normal conditions, it will be necessary to remove the causes of the malfunctioning and to manually reset the system (using the button “alarms reset”, or via the telemetry connector).

### 5.3 Protection System

Basically, the protection system of the amplifier forces it in standby mode in case a situation that is considered “dangerous” for the machine takes place.

After approx 10 seconds, the amplifier will be reenabled. If in the meantime the blocking condition has not been removed, the amplifier will be disabled again. After four attempts the device will be disabled for approx 90 seconds.

After this longer interval is expired, the amplifier starts a new cycle of disabling/reenabling, analogous to the previous one. If at the end of this cycle the fault condition is still present, the amplifier will be definitely disabled. As already said, at this point it will be necessary to manually reset the amplifier using the button “alarms reset”, or via the telemetry connector.

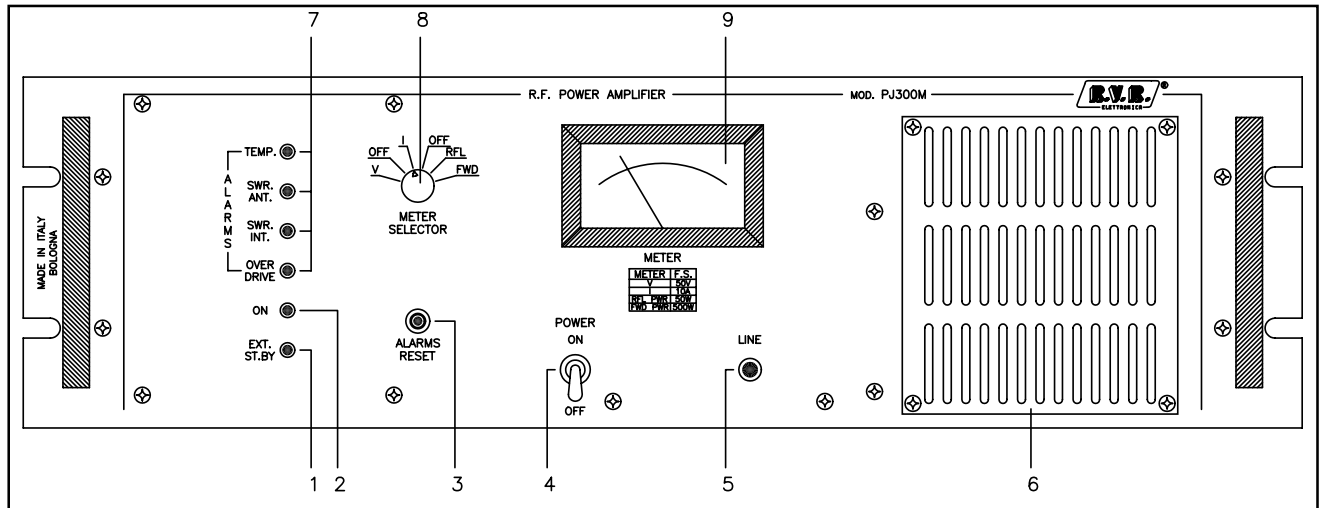
If, during the cycles of the protection, the amplifier works regularly for at least 90 seconds, the counters of the protection system are reset.

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## 6. External Description

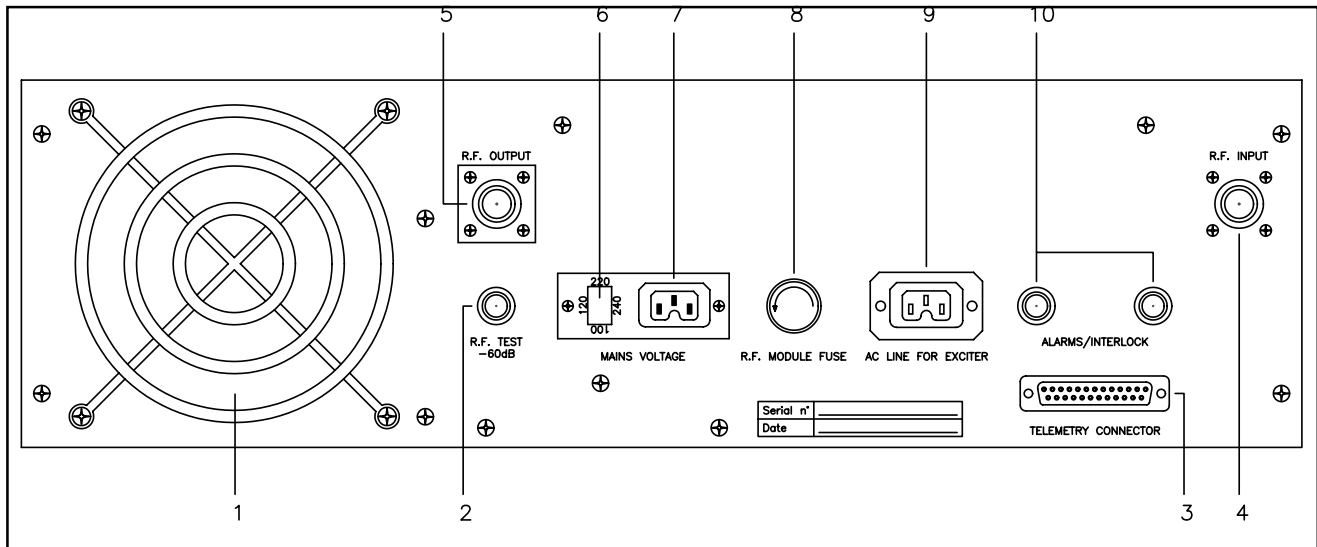
This chapter describes the front and rear panels of the PJ300M, with a brief indication of all the different components.

### 6.1 Front Panel



- |                    |   |
|--------------------|---|
| [1] Ext. St. By    | External Standby LED indicator                        |
| [2] On             | Indicates when the amplifier is switched ON           |
| [3] Alarms Reset   | Push the button to reset the alarm status             |
| [4] On / Off       | Mains switch  |
| [5] Line           | AC line indicator                                     |
| [6] Air Filter     | Air filter of the power amplifier                     |
| [7] Alarms         | Alarms indication LEDs:                               |
|                    | TEMP                      Overheating                 |
|                    | SWR ANT                  Antenna SWR                  |
|                    | SWR INT                  Internal SWR                 |
|                    | OVERDRIVE              Excessive input power          |
| [8] Meter Selector | Working parameters visualization selector:            |
|                    | V                          Voltage of the RF module   |
|                    | OFF                        The indicator is OFF       |
|                    | I                            Current of the RF module |
|                    | OFF                        The indicator is OFF       |
|                    | REF                        Reflected power            |
|                    | FWD                        Forward power              |
| [9] Meter          | Analog display to show the working parameters         |

## 6.2 Rear Panel

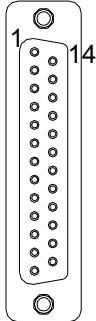


- |                                      |  |
|--------------------------------------|--|
| [1] Fan                              | Fan for forced ventilation   |
| [2] R.F. Test -60 dB                 | RF sample, -60 dB with respect to the output level   |
| [3] Telemetry Connector              | Connector for remote measurement of working parameters   |
| [4] R.F. Input                       | RF input connector ("N" type)  |
| [5] R.F. Output                      | RF output connector ("N" type)   |
| [6] Voltage Charger & A.C. Line Fuse | Fuse block and voltage changer. Use a screwdriver to change the fuse or the mains voltage. Rotate the block to select the desired voltage  |
| [7] Mains Voltage Socket             | Mains voltage socket   |
| [8] RF Module Fuse                   | RF module protection fuse  |
| [9] A.C. Line for Exciter            | Auxiliary plug to supply an external exciter. This plug should be used if the exciter doesn't include an interlock connector   |
| [10] Alarms/Interlock                | BNC connector to put the connected devices (normally an exciter) in stand-by mode when the amplifier is disabled. This operation is performed putting the inner conductor to ground. |

## 6.3 Connectors Description

### 6.3.1 Telemetry Connector

Type: DB25 Female



1	R.F. Module's Voltage	2.0V X 50V
2	R.F. Module's Voltage	2.0V X 10A
3	GND	0 V
4	Reflected power	1.6 V X 40 W
5	Inhibitor TX	12 V
6	Internal SWR	15 V -> fault
7	GND	0 V
8	Operate	15V
9	Internally connected	
10	Internally connected	
11	Internally connected	
12	Internally connected	
13	Internally connected	
14	Internally connected	
15	Internally connected	
16	Forward power	1.4 V X 300 W
17	Temperature	15 V -> fault
18	SWR antenna	15 V -> fault
19	Over drive	15 V -> fault
20	Stand-by command	15V
21	GND	0 V
22	Internally connected	
23	Internally connected	
24	Internally connected	
25	Internally connected	

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## 7. Technical Specifications

### 7.1 Dimensional and Environmental Specifications

Cabinet Dimensions	340.0 mm (13,39") x 126.0 mm (04,96") x 437.0 mm (17,20")
Panel dimensions	483 mm (19") x 132,5 mm (05,22")
Weight	20 Kg
Operating temperature range	-10 °C ÷ 50 °C
Umidity	95% Maximum, without condensation

### 7.2 Electrical Specifications

A.C. power supply	selectable 100,120, 220, 240 V ±10% 50-60 Hz
Cooling	Forced ventilation
Frequency range	87.5 MHz ÷ 108 MHz
Output power	300 W
Drive power	Approx 10 W for Pout = 300 W
Input connector	"N" type standard connector
Input impedance	50 Ohm
Output connector	"N" type standard connector
Output impedance	50 Ohm
Harmonic and spurious suppression	Meets or exceeds all FCC and CCIR requirments

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## 8. Theory of Operation

The figure 8.1 shows the block diagram of PJ300M. The blocks are described in the present chapter:

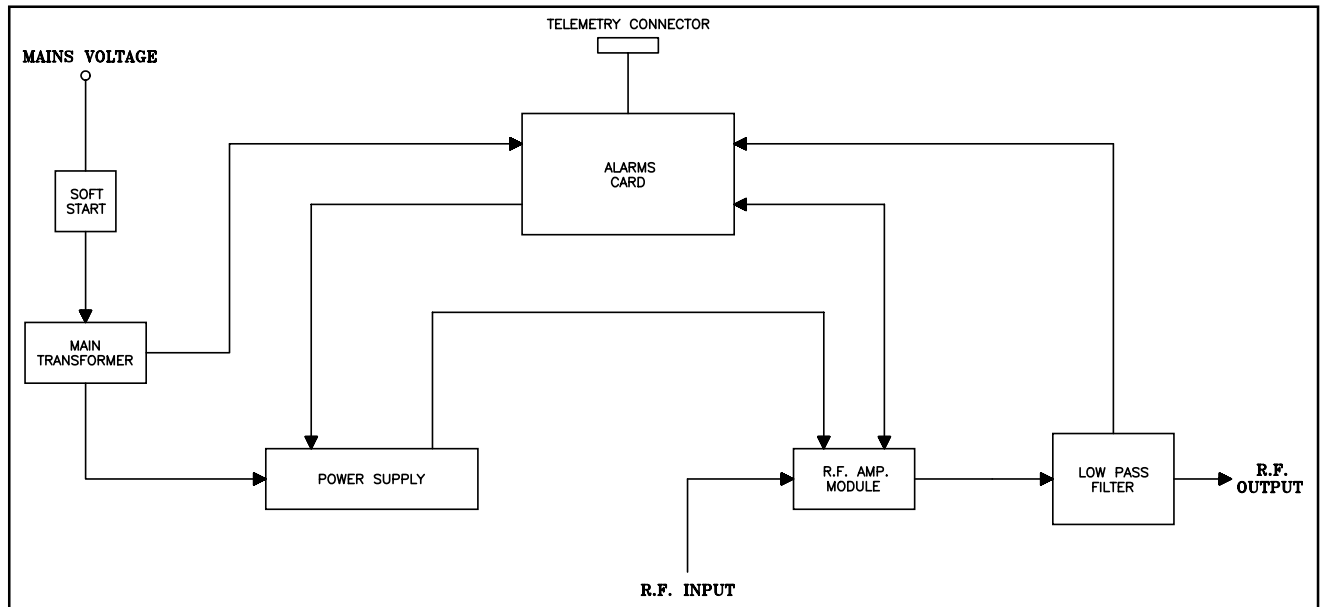


Figure 8.1

### 8.1 Power supply section

The power supply section of the PJ300M is composed by the mains transformer, the soft start card and the switching mode power supply.

The mains transformer includes a primary winding with selectable input for 100,120,220 or 240 V ac supply and three secondary windings: A) 30-0-30 V, B) 16-0-16 V and C) 0-36V. The A) output is used to drive the switching mode power supply, B) is connected to the alarms card, and the output C) supplies the soft-start circuit.

The soft start board is intended to eliminate the current spikes that could be drained by the transformer when when the amplifier is switched on. This is achieved using a high power resistor that is momentarily included by a relay to load the secondary circuit of the transformer.

The RF module is supplied at 50 V by the switching mode power supply.

The alarms card includes a rectifying and stabilizing circuit to provide the  $\pm 15V$  needed by the electronics.

## **8.2 R.F. Power Amplifier**

The RF power amplifier section is composed of a single power module hosted in a shielded enclosure of the amplifier. The module is mounted on a heat sink that allows its cooling through forced ventilation.

The module is supplied separately by the switching mode power supply, and delivers 300 W of RF power with approx. 8 W of input.

The quiescent parameters of the module are:

$V_{dc} = 50V$ ,  $V_{gs} = 3.5 V$ ,  $I_{dq} = 200 mA$

The active device employed is a power MOSFET (BLF278).

## **8.3 Low Pass Filter**

The filter attenuates the spurious emissions of the amplifier under the levels allowed by the international standards, so that the amplifier can normally be directly connected to the transmission antenna.

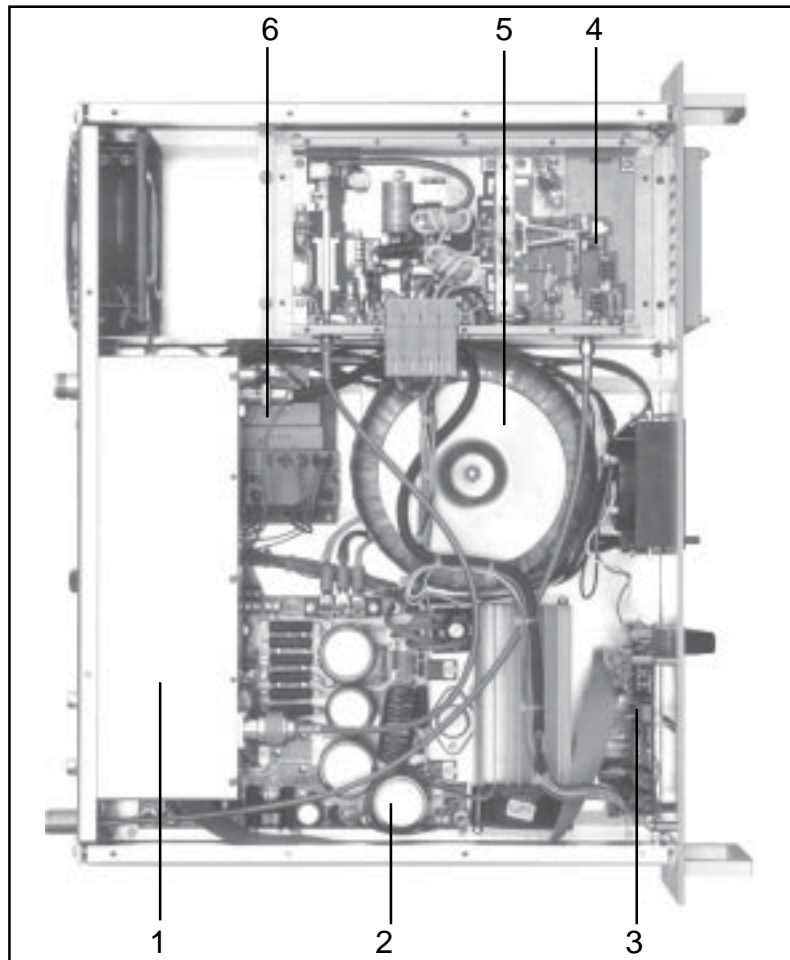
Thanks to this low pass filter the amplifier features a harmonic suppression of more than 75 dB.

## **8.4 Alarms Card**

This card detects any system anomaly such as excessive internal SWR external SWR, overheating, etc. This module will also, whenever possible, reset the system to its original condition, after a fault happened, as described in the previous chapters.

## 9. Identification and Access to Modules

### 9.1 Modules Identification (top view)



- [1] Low pass filter
- [2] Switching mode power supply (PSSW5010)
- [3] Alarms card
- [4] RF power amplifier module
- [5] Transformer
- [6] Soft start card

## 9.2 Ordinary Maintenance

The only regular maintenance needed by the PJ300M, is the periodic substitution of the blowers, and the cleaning of dust filters (if installed) and any dust accumulated inside the amplifier.

The time between overhauling of the blowers depends upon the environmental factors like temperature, humidity, dust pollution etc. It's advisable to check the unit every 6 months, and to substitute noisy blowers.

Blowers should be changed as a matter of course at least every 18 months.

## 9.3 Substitution of modules



**ATTENTION:** When the amplifier is operated with the cover removed, hazardous voltages and heavy current are accessible. Make shure that all primary power is disconnected from the amplifier before performing any maintenance of the device.

To reinstall a module, just execute the operations described in the following in the opposite sequence.

Remove all the screws that are located on the top cover of the machine. After the cover has been removed, it is possible to extract and replace the modules, that you may identify with the help of chapter 9.1.

These operations must be done only by specialized technicians, equipped with appropriate tools. Wrong operations can cause serious damages to the machine and and will void your warranty.

### 9.3.1 Power Supply Replacement

- With the help of the wiring diagram shown in appendix, take the note of the cables connected to J1, J2, J3, J4 and J5 of the low pass filter and disconnect them.
- Unscrew the two screws securing the low pass filter to the rear panel.
- Carefully remove the low pass filter.
- Take note of the wiring of JP2, JP3 and JP4 power supply's connectors and disconnect them.
- Unscrew the screws securing the power supply to the hex standoffs.
- Carefully remove the power supply.

### 9.3.2 Low Pass Filter Replacement

Proceed as described in the first three steps of the previous paragraph.

### 9.3.3 R.F. Power Amplifier Module Replacement

- With the help of the wiring diagram shown in Appendix, take the note of the cable position.

- Disconnect the RF module connectors CN1, J1 and J2
- Remove the air filter of the RF module from the front panel
- Unscrew two screws securing the heat sink of the RF module to the front panel
- Release the metal bar that holds the heatsink on the other end removing its screws
- Carefully remove the amplifier module

#### 9.3.4 Soft Start Card Replacement

- With the help of the wiring diagram shown in Appendix, take the note of the cable position.
- Disconnect M1 and M2 connectors.
- Disconnect M3.
- Dismount the four securing screws and remove the board.

#### 9.3.5 Alarms Card Replacement

- Remove the knob of the meter selector loosening the screw inside the knob.
- Dismount the nut of the alarms reset push-button.
- Disconnect CN1 and CN3 alarms card's connectors.
- Disconnect CN2 telemetry card's connector.
- Remove the screws securing the board to the front panel.
- Carefully extract the card.

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## 10. Internal Adjustment

### 10.1 Power Supply Adjustment (PSSW5010)

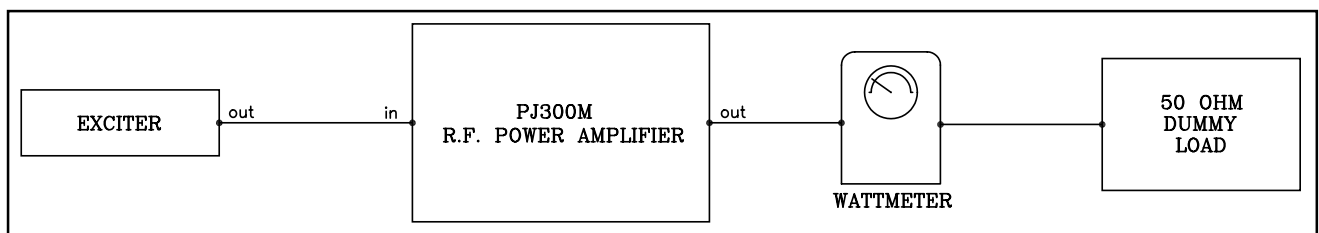
The power supply module is a factory adjusted device, and doesn't need normally any adjustment. If it has been necessary to substitute or repair the module, it is useful to do the following tests and adjustments:

- Disconnect CN1 from the RF power module.
- For safety, connect a suitable dummy load ( $P > 300W$  on 50 Ohm) to the amplifier output and switch the amplifier on.
- Verify that the output voltage of the power supply is 50V using a digital multimeter connected to pins 1-2 and 3-4 of connector JP3 and, if necessary, adjust the value using the trimmer R15 of the power supply.
- Put the rotating selector of the analog meter on the position "V" and verify that the voltage shown is 50V. You can adjust the voltage reading operating on trimmer R14 placed of the alarms card.
- Verify that test point TP2 is present a voltage of 5.0V; if this value is different, adjust R59 to obtain the correct voltage.
- Switch off the amplifier and reconnect the power supply to the RF module.

### 10.2 R.F. Power Amplifier Module Adjustment

After you have changed the power amplifier module perform the following operations:

- Connect CN1 (coming from power supply) to the RF module.
- Connect the input connector J1 to PJ300M RF input connector and the output J2 to the input connector J1 of low pass filter.



- See setup shown in figure, that comprises a dummy load ( $P > 300W$  at 50 Ohm) with a wattmeter in series, to verify the delivered power of the amplifier.
- Connect to the RF input connector of the amplifier an exciter able to deliver a variable power of 20 W max.
- Connect the alarms/interlock connector to the appropriate connector on the exciter.
- Set the output power of the exciter to its minimum value.
- Switch on the PJ300M, keeping off the exciter and measure the quiescent current of the module. At working temperature, an RF module has to drain approx 200 mA. If the current is different from this value, use trimmer R20 on the module to compensate the difference.

At this point, it is possible verify how the module works at nominal power:

- Enable the power output from the exciter (switching it on and waiting for the PLL to lock, or exiting from the stand-by mode).
- Gradually rise the power of the exciter and monitor the power output of the amplifier, until it reaches its nominal value of 300W.

A correctly adjusted amplifier has :

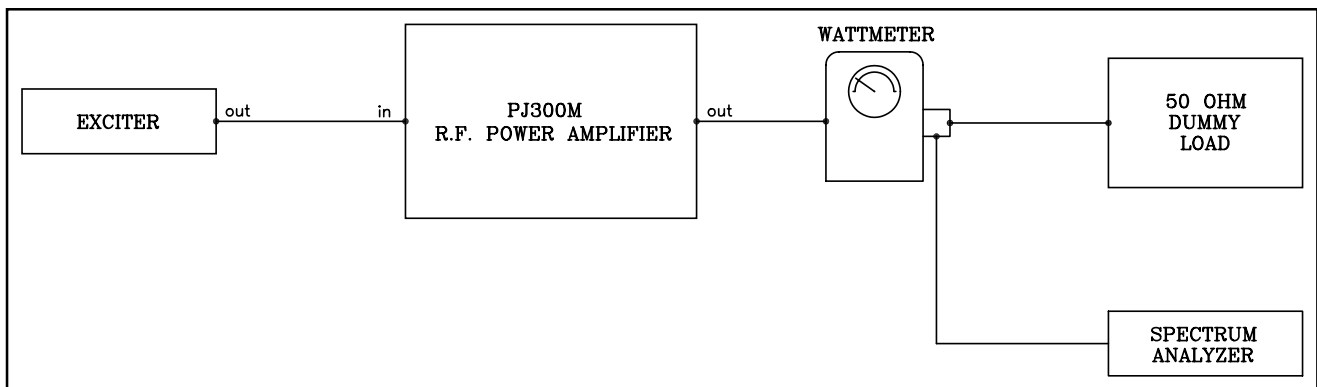
$$P_{out} = 300W, 8W < P_{in} < 12W \text{ and } 8A < I_{pa} < 9.5A$$

Little differences in the current drawn by different modules are due to the different gains of the MOS-FET devices (BLF 278).

### 10.3 Alarms Card Adjustment

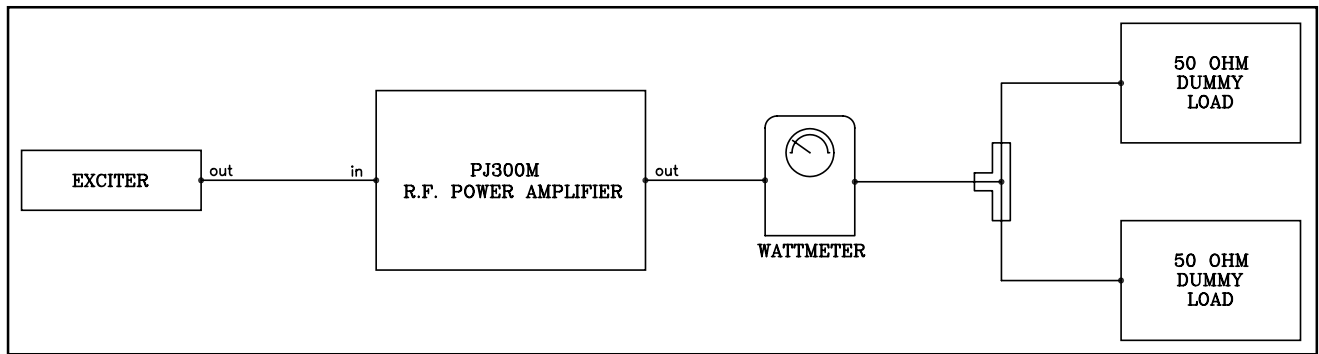
**NOTE: Make sure that this replacement is really necessary.**

- After changing the board, connect the amplifier as shown in the figure.



- Switch on the PJ300M
- Pot the measurement selector on position “V”
- Adjust the trimmer R14 on the alarms card to have a reading of 50V (make shure the voltage of the power supply is really 50V)
- Switch on the exciter and wait for the PLL lock
- Increase the ouput power to a level of 300W measured on the external wattmeter
- Adjust the FWD reading with trimmer R11
- Now increase again the drive power up to approx. 15 W, so that an output power of 325 W is reached. Adjust R26 on the alarms card to trigger the lock condition of the amplifier due to the overdrive protection. These valus may slightly vary at the different frequencies.
- Reduce the drive power to the minimum value, switch off the amplifier and the exciter.





- To calibrate the SWR reading and alarm and the INT SWR alarm, connect two paralleled dummy loads to the RF output connector of the amplifier as it's shown in the figure. It is also possible to use a cavity filter slightly misadjusted with respect to the working frequency.
- Switch on the amplifier and the exciter and wait for the PLL to lock.
- Select "RFL" with the meter selector, and set the external wattmeter for reflected power reading.
- Increase the output power to obtain a reading of 40W of reflected power on the external wattmeter. Now adjust the trimmer R13 on the alarms card to obtain the same reading on the PJ300M meter.
- Move R40 on the alarms card and check the LED SWR INT is lit. Now measure the voltage on pin 13 of U1 and adjust R40 to have 1.6V.
- With 40W of reflected power, adjust the trimmer R56 on the alarms card until the protection "SWR ANT" is triggered

**NOTE: This setting may vary with the working frequency, it is preferable to make this adjustment at the operating frequency.**

- Overtemperature alarm check (temp.)
- Check the overtemperature protection by short circuiting the terminals of the temperature sensor placed on the RF power amplifier module; the appropriate led will light, and the amplifier will stop.
- External stand-by check (EXT. ST. BY)
- Check the EXT. ST. BY protection by short circuiting the pin 8 and 22 of the telemetry connector and verify that the EXT. ST. BY led lights and the amplifier will stop.
- Short circuiting the pin 21 and 22 of the telemetry connector will regularly restart.

**NOTE: The operation performed in the last two steps will reset all the alarm memories returning the amplifier to the conditions of the first power on.**

## 10.4 Soft-Start Adjustment

No adjustment are needed after this board has been changed.

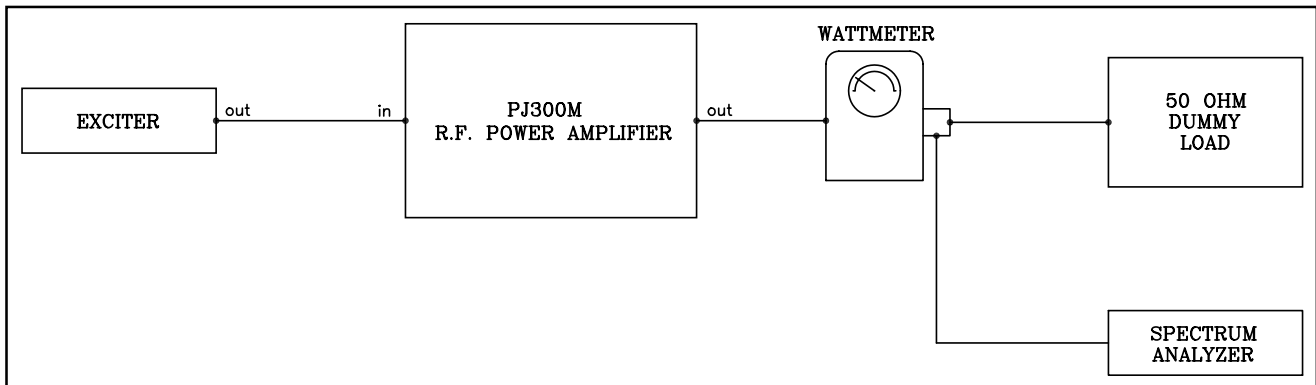
**NOTE: Pay attention to the correct insertion of the connectors.**

## 10.5 Low Pass Filter adjustment

No adjustments are required inside the low pass filter module since it is a factory adjusted device.

In case of replacement of a unit, perform the following operations:

- Reconnect all the modules and turn the trimmer TR1 of the filter completely clockwise.



- Follow the setup shown in the figure, that comprises a dummy load ( $P > 300\text{W}$  at 50 Ohm) with a trough wattmeter in series, to verify the power delivered by the amplifier.
- Connect to the RF input connector of the amplifier a suitable exciter able to deliver a variable power of 20 W max.
- Connect one of the two connectors alarms/interlock of the amplifier to the appropriate connector of the exciter.
- Switch on the amplifier PJ300M and the exciter and wait for the exciter to lock on the working frequency.
- Slowly increase the drive power to obtain 325W of output power.
- Check with a spectrum analyzer connected to a suitable directional coupler that the harmonics level is below -75 dBc.
- Adjust the trimpot TR1 in the low pass filter until the protection system is triggered.
- It is advisable to repeat the regulation of FWD and RFL power measurement on the alarm card as described before.