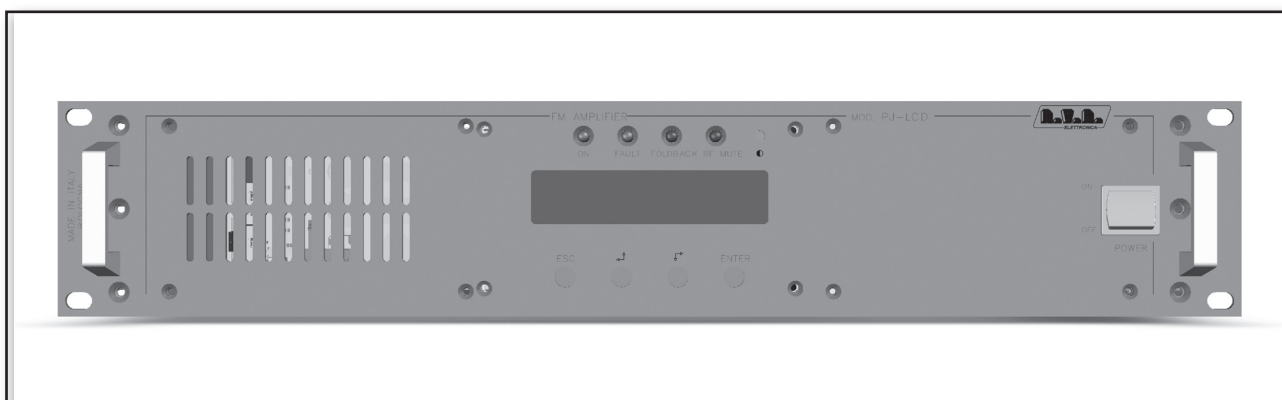

ATVCA



User Manual Volume 1

Manufactured by



Italy



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ATVCA - User Manual
Version 1.0

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R.V.R. Elettronica SpA
Via del Fonditore 2/2c - 40138 - Bologna (Italia)
Telephone: +39 051 6010506
Fax: +39 051 6011104
Email: info@rvr.it
Web: www.rvr.it

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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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IMPORTANT



The lightning flash with arrowhead, within a triangle, is intended to alert the user of the presence of dangerous voltage that may constitute a risk of electric shock.




The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the equipment.


1. Preliminary Instructions

• General Warnings


This equipment should only be operated, installed and maintained by "trained" or "qualified" personnel who are familiar with risks involved in working on electric and electronic circuits. "Trained" means personnel who have technical knowledge of equipment operation and who are responsible for their own safety and that of other unqualified personnel placed under their supervision when working on the equipment. "Qualified" means personnel who are trained in and experienced with equipment operation and who are responsible for their own safety and that of other unqualified personnel placed under their supervision when working on the equipment.

 **WARNING: Residual voltage may be present inside the equipment even when the ON/OFF switch is set to Off. Before servicing the equipment, disconnect the power cord or switch off the main power panel and make sure the safety earth connection is connected. Some service situations may require inspecting the equipment with live circuits. Only trained and qualified personnel may work on the equipment live and shall be assisted by a trained person who shall keep ready to disconnect power supply at need.**


R.V.R. Elettronica SpA shall not be liable for injury to persons or damage to property resulting from improper use or operation by trained/untrained and qualified/unqualified persons.

 **WARNING: The equipment is not water resistant. Any water entering the enclosure might impair proper operation. To prevent the risk of electrical shock or fire, do not expose this equipment to rain, dripping or moisture.**

Please observe local codes and fire prevention rules when installing and operating this equipment.

 **WARNING: This equipment contains exposed live parts involving an electrical shock hazard. Always disconnect power supply before removing any covers or other parts of the equipment.**

Ventilation slits and holes are provided to ensure reliable operation and prevent overheating; do not obstruct or cover these slits. Do not obstruct the ventilation slits under any circumstances. The product must not be incorporated in a rack unless adequate ventilation is provided or the manufacturer's instructions are followed closely.

 **WARNING: This equipment can radiate radiofrequency energy and, if not installed in compliance with manual instructions and applicable regulations, may cause interference with radio communications.**



WARNING: This equipment is fitted with earth connections both in the power cord and for the chassis. Make sure both are properly connected.

Operation of this equipment in a residential area may cause radio interference, in which case the user may be required to take adequate measures.

The specifications and data contained herein are provided for information only and are subject to changes without prior notice. R.V.R. Elettronica SpA disclaims all warranties, express or implied. While R.V.R. Elettronica SpA attempts to provide accurate information, it cannot accept responsibility or liability for any errors or inaccuracies in this manual, including the products and the software described herein. R.V.R. Elettronica SpA reserves the right to make changes to equipment design and/or specifications and to this manual at any time without prior notice.

• Notice concerning product intended purpose and use limitations.

This product is a radio transmitter suitable for frequency-modulation audio radio broadcasting. Its operating frequencies are not harmonised in designated user countries. Before operating this equipment, user must obtain a licence to use radio spectrum from the competent authority in the designated user country. Operating frequency, transmitter power and other characteristics of the transmission system are subject to restrictions as specified in the licence.

2. Warranty

La R.V.R. Elettronica S.P.A. warrants this product to be free from defects in workmanship and its proper operation subject to the limitations set forth in the supplied Terms and Conditions. Please read the Terms and Conditions carefully, as purchase of the product or acceptance of the order acknowledgement imply acceptance of the Terms and Conditions. For the latest updated terms and conditions, please visit our web site at WWW.RVR.IT. The web site may be modified, removed or updated for any reason whatsoever without prior notice. The warranty will become null and void in the event the product enclosure is opened, the product is physically damaged, is repaired by unauthorised persons or is used for purposes other than its intended use, as well as in the event of improper use, unauthorised changes or neglect. In the event a defect is found, follow this procedure:

- 1 Contact the seller or distributor who sold the equipment; provide a description of the problem or malfunction for the event a quick fix is available.

Sellers and Distributors can provide the necessary information to troubleshoot the most frequently encountered problems. Normally, Sellers and Distributors can offer a faster repair service than the Manufacturer would. Please note that Sellers can pinpoint problems due to wrong installation.

- 2 If your Seller cannot help you, contact R.V.R. Elettronica and describe the problem; if our staff deems it appropriate, you will receive an authorisation to return the equipment along with suitable instructions;
- 3 When you have received the authorisation, you may return the unit. Pack the unit carefully before shipment; use the original packaging whenever possible and seal the package perfectly. The customer bears all risks of loss (i.e., R.V.R. shall not be liable for loss or damage) until the package reaches the R.V.R. factory. For this

reason, we recommend insuring the goods for their full value. Returns must be sent on a C.I.F. basis (PREPAID) to the address stated on the authorisation as specified by the R.V.R. Service Manager.



Units returned without a return authorisation may be rejected and sent back to the sender.

- 4 Be sure to include a detailed report mentioning all problems you have found and copy of your original invoice (to show when the warranty period began) with the shipment.

Please send spare and warranty replacement parts orders to the address provided below. Make sure to specify equipment model and serial number, as well as part description and quantity.

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

3. First Aid

All personnel engaged in equipment installation, operation and maintenance must be familiar with first aid procedures and routines.

3.1 Electric shock treatment

3.1.1 If the victim is unconscious

Follow the first aid procedures outlined below.

- Lay the victim down on his/her back on a firm surface.
- the neck and tilt the head backwards to free the airway system (**Figure 1**).

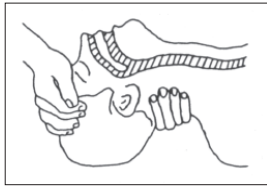


Figure 1

- If needed, open the victim's mouth and check for breathing.
- If there is no breathing, start artificial respiration without delay (**Figure 2**) as follows: tilt the head backwards, pinch the nostrils, seal your mouth around the victim's mouth and give four fast rescue breaths.



Figure 2

- Check for heartbeat (**Figure 3**); if there is no heartbeat, begin chest compressions immediately (**Figure 4**) placing your hands in the centre of the victim's chest (**Figure 5**).

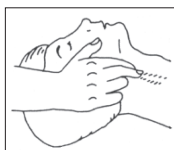


Figure 3

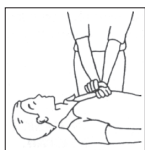


Figure 4

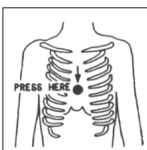


Figure 5

- One rescuer: give 2 quick rescue breaths after each 15 compressions.
- Two rescuers: one rescue breath after each 5 compressions.
- Do not stop chest compressions while giving artificial breathing.
- Call for medical help as soon as possible.

3.1.2 If the victim is conscious

- Cover victim with a blanket.
- Try to reassure the victim.
- Loosen the victim's clothing and have him/her lie down.
- Call for medical help as soon as possible.

3.2 Treatment of electric burns

3.2.1 Large burns and broken skin

- Cover affected area with a clean cloth or linen.
- Do not break any blisters that have formed; remove any clothing or fabric that is stuck to the skin; apply adequate ointment.
- Administer adequate treatment for the type of accident.
- Get the victim to a hospital as quickly as possible.
- Elevate arms and legs if injured.

If medical help is not available within an hour, the victim is conscious and is not retching, administer a solution of table salt and baking soda (one teaspoon of table salt to half teaspoon of baking soda every 250 ml of water).

Have the victim slowly drink half a glass of solution for four times during a period of 15 minutes.

Stop at the first sign of retching.

Do not administer alcoholic beverages.

3.2.2 Minor burns

- Apply cold (not ice cold) strips of gauze or dress wound with clean cloth.
- Do not break any blisters that have formed; remove any clothing or fabric that is stuck to the skin; apply adequate ointment.
- If needed, have the victim change into clean, dry clothing.
- Administer adequate treatment for the type of accident.
- Get the victim to a hospital as quickly as possible.
- Elevate arms and legs if injured.

4. Unpacking

The package contains:

- 1 **ATVCA**
- 1 User Manual
- 1 Mains power cable

The following accessories are also available from Your R.V.R. Dealer:

- **Accessories, spare parts and cables**

4.1 General Description

The **ATVCA** is an **analog TV broadcasting amplifier** manufactured by **R.V.R. Elettronica SpA** delivering up to 100 W_{PS} under 50 Ohm standard load and less than 10W drive power requirement.

The **ATVCA** has been designed for installation in a 19"x2HE box for rack.

The amplifier incorporates a low-pass filter to keep harmonics below the limits provided for by international standards (CCIR, FCC and ETSI).




Two major features of **ATVCA** are compact design and user-friendliness. Another key feature is its modular-concept design: the different functions are performed by modules with most connections achieved through male and female connectors or through flat cables terminated by connectors. This design facilitates maintenance and module replacement.

The RF power section uses one MOSFET modules able to withstand up to 400W.

An LCD on the front panel and a push-button panel provide for user interfacing with the microprocessor control system, which implements the following features:

- Power output enable/disable
- User-selectable threshold settings for output power alarm (Power Good feature)
- Measurement and display of amplifier's operating parameters
- Communication with external devices, as programming systems or telemetry systems through RS232 or I²C serial interface

Four LEDs on the front panel provide for machine status indication (ON, FAULT, FOLDBACK, RF MUTE).

The amplifier management software is based on a menu system. User has four navigation buttons available to browse submenus: **ESC**, , , , and **ENTER**.

The rear panel features the mains input connectors, RF power input and output connectors, remote connector, protection fuse, interlock input and interlock output connectors and a BNC connector that provides an RF test point with a level suitable to execute the measurement.

5. Quick guide for installation and use

This section provides a step-by-step description of the machine installation and configuration procedure. Follow these procedures closely upon first power-on and each time any change is made to general configuration, such as when a new transmission station is added or the exciter is replaced.

Once the desired configuration has been set up, no more settings are required for normal operation; at each power-up (even after an accidental shutdown), the amplifier defaults to the parameters set during the initial configuration procedure.

The topics covered in this section are discussed at greater length in the next sections, with detailed descriptions of all hardware and firmware features and capabilities. Please see the relevant sections for additional details.



IMPORTANT: When configuring and testing the transmitter in which the amplifier is integrated, be sure to have the Final Test Table supplied with the machine ready at hand throughout the whole procedure; the Final Test Table lists all operating parameters as set and tested at the factory.

5.1 Preparation

5.1.1 Preliminary checks

Unpack the amplifier and immediately inspect it for transport damage. Ensure that all connectors are in perfect condition.

Provide for the following (applicable to operating tests and putting into service):

- √ Single-phase 230 VAC or 115 VAC (-15% / +10%) mains power supply with adequate ground connection
- √ TV exciter with adjustable output power up to 10W (as a minimum), like RVR Elettronica BLUE VIDEO
- √ For operating tests only: dummy load with 50 Ohm impedance and adequate capacity (100 W as a minimum)
- √ Connection cable kit including:
 - Mains power cable
 - DB25 flat cable for interlock signal connection between exciter and amplifier
 - RF connection cable between exciter and amplifier (50 Ohm coaxial cable with “N”-type connectors)
 - RF cable for output to load / antenna (50 Ohm coaxial cable with N-type connectors as standard)

5.1.2 Mains power supply



WARNING: Disconnect mains power supply before beginning these procedures.

The supply unit (please see chapter 8.1 for a detailed description) is equipped with fuse.

The mains power supply protection fuse are conveniently located on the rear panel and are easily accessed (see figure 6.2): to check or replace a fuse, **disconnect machine from power mains**, unscrew fuse cover and pull fuse out of socket.

The following fuses are used:

	@ 230 Vac	@ 115 Vac
Mains Fuse <i>(fig. 6.2 - item [9])</i>	8A-T type 5x20	8A-T type 5x20

Table 5.1: Fuse

The mains power supply unit is the full-range type and requires no voltage setup.

5.1.3 Connections

Connect the output of a suitable TV exciter (for instance, BLUES VIDEO exciter available from R.V.R. Elettronica) to the RF input (see figure 6.2) using a 50-Ohm coaxial cable with “N”-type connectors. To begin with, set exciter to minimum output power and switch if off.

Connect the amplifier INTERLOCK OUT output (figure 6.2) to the matching INTERLOCK IN input fitted on all R.V.R. Elettronica exciters as standard; if your exciter is a different brand, identify an equivalent input.

Connect the RF output (see figure 6.2) to an adequately rated dummy load or to the antenna.



Note : *all TV amplifiers are connected to antenna never directly, but with an interposed RF filter. RF filter exhibits a near 50 Ohm like resistive load in the range of frequencies included in the TV channel where it has been adjusted but, with regard to all other frequencies, the impedance shown by the amplifier is completely unmatched. The lenght of the cable connecting amplifier and RF filter has an important effect so that the overall system can assume a favourable configuration for RF oscillations. This electrical phenomenon is noticed frequently when the internal circuit structure of the amplifier is absolutely simple, without items such as combiners, internal filters and so on, and so the electrical lenght parting RF active device (MOSFET) and external RF filter is at unseemly close range. Such a trouble is solvable with a suitable cut of the cable connecting the amplifier and the external RF filter. A very long cable is a misleading solution, only a critical lenght*

of the cable can fix the problem. User is cold to collaborate in order to prevent RF oscillation in the final plant, because antenna feature may cancel all setting lain in the factory where amplifier and RF filter have been adjusted on a pure resistive dummy load.



WARNING: Electric shock hazard. Never handle the RF output connector when the machine is powered on and no load is connected. Injury or death may result.

Ensure that the **POWER** switch in the front panel is set to “**OFF**”.

Connect the mains power cable to the MAINS connector on the rear panel (see figure 6.2).



Note : *The mains must be equipped with adequate ground connection properly connected to the machine. This is a pre-requisite for ensuring operator safety and correct operation.*

Please see figure 5.2 for a hook-up diagram showing RF connection between amplifier and exciter and load connection.

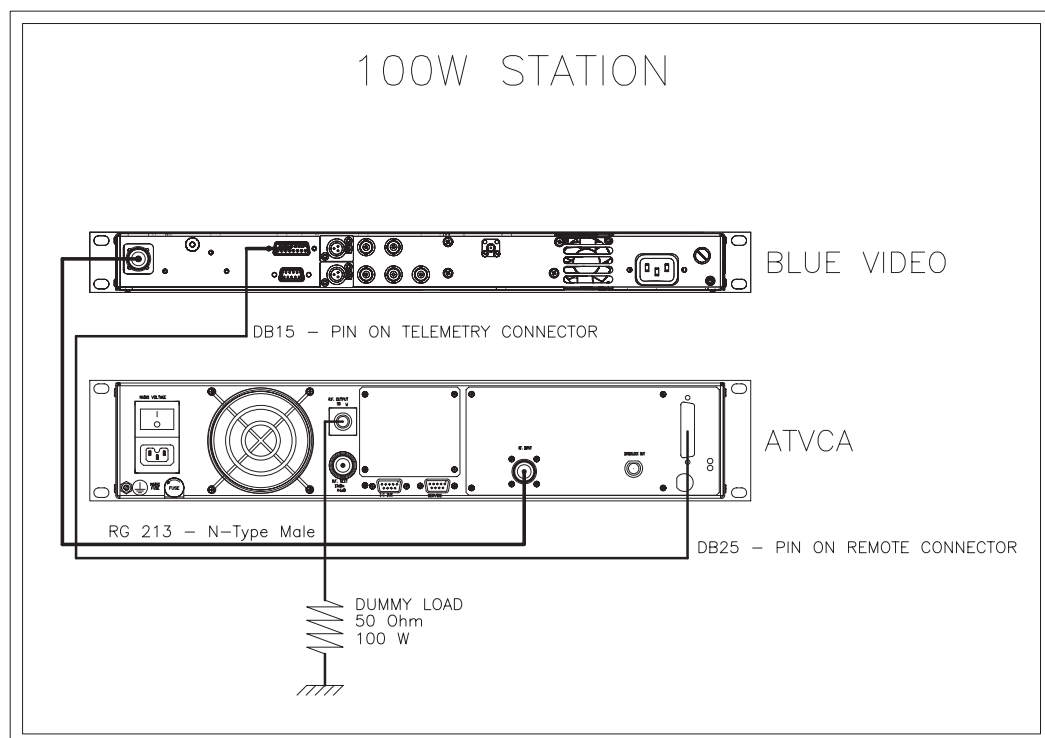


Figure 5.2: Connection to exciter

5.2 First power-on and setup

Follow this procedure upon first power-on and after making changes to the configuration of the transmitter in which the amplifier is integrated.



Note : Standard factory settings are RF power output Off (**Pwr OFF**) and output power set to upper limit (unless otherwise specified by customer).

5.1.2 Pilot exciter setup

Set up the pilot exciter so that the output power it delivers to a matched load equals the maximum input power indicated in the amplifier **final test table**, switch off the exciter and connect it to the amplifier.

5.2.2 Switch-on

When you have performed all connections described in the previous paragraph, switch-on the amplifier using the suitable power switch in the front panel (figure 6.1). Switch-on the pilot exciter.

5.2.3 Power check

Ensure that the **ON** light is turning on (see figure 6.1). The machine name should appear briefly on the display, quickly followed by forward and reflected power readings (figure 5.2 - menu 1). If RF output is disabled, these readings will be zero.

5.2.4 How to enable Local mode and RF output

Check current mode setting and enable **Local mode** (if not already enabled) following menu path **Fnc** ⇒ **Loc** ⇒ **Local** (figure 5.2): if left disabled, the machine will not accept the next command.

Now check if the **RF** output is enabled following menu path **Fnc** ⇒ **Pwr** ⇒ **ON** (figure 5.2 - menu 4).

5.2.5 Input power check and setup

Go to **Pwr** menu (figure 5.2 - menu 5) and look up forward output power **Fwd**, reflected power **Rfl** and input power **Inp** readings.

With drive power set as specified in the **Final Test Table**, the amplifier output power should be 100W.



Note : Normally, drive power should not exceed 13W (typically 10W): higher drive power requirements are a symptom of abnormal operation.



WARNING: Drive power levels above 15W, result in exceeding input power, which causes a temporary amplifier lock-out (see section 5.3.4.1 - Alarms and Faults for more details).

5.2.6 Changing the Power Good alarm threshold

Change Forward Power Good alarm setting **PgD** from the **Fnc** menu as required (factory setting is 50%).

Please read section 5.3.1 for more details.

5.2.7 Changing machine I²C address serial communication

Change the **IIC** address in the **Mix** menu as required (factory setting is 01).

Please read section 5.3.5 for more details.

5.2.8 How to enable Remote mode.

If you wish to use the telemetry control feature, enable Remote control in the **Fnc** menu (see section 5.3.1 for details).



Note : In the **Remote** mode, all local push-button controls except **Remote/Local** (for switching back to Local mode) are disabled . Operating parameter readings are available.



Note : the '**Remote**' is the preferred mode by factory.

5.3 Operation.

- 1) Switch-on the amplifier (chap. 6.1) and ensure that **ON** light is turning on (chap. 6.1). The machine name should appear briefly in the display, quickly followed by forward and reflected power reading (Menu 1), provided that the amplifier is delivering output power.

Fwd:	100	W
Rf1:	2	W

Menu 1

- 1b) Hold down the **ENTER** button until opening the **power setup menu**.



NOTE: The user should access the **power setup menu** by hold down the **ENTER** button but, this function in TV amplifier is not enabled.

The edit screen will look like this:



Menu 2

- 2) Ensure that machine is not in a locked-out state, so press the **ESC** key (chap. 6.1) in order to call up the selection screen (Menu 3). Highlight **Fnc** and press **ENTER** to confirm (chap. 6.1) and access the appropriate menu (menu 4).

If **Loc** row is set as **REMOTE** (this does mean that machine is in remote control), move cursor to **Loc** row and press **ENTER** (chap. 6.1); the label will toggle in **LOCAL**, (this does mean that machine is in local control operation mode).

In the same menu page, ensure that power inhibit is disabled: if **PWR** is set to **OFF**, (this does means that machine's power output is disabled), then move cursor to **PWR** and press **ENTER** (chap. 6.1 - [9]) so label will toggle in **ON**, (this does means that machine's power output is enabled).

Finally press **ESC** (chap. 6.1) twice to go back to the **default menu** (menu 1).

Afterwards, you can review all operating parameters of the machine through the management firmware.

Any alarm condition is handled automatically by the safety system and/or it is signalled by the LED indicator in the panel and/or by a display message.



NOTE: Standard factory's setting is: output power set to upper limit (unless otherwise specified by customer) and **OFF**.

5.4 Management Firmware

The machine features an LCD with two lines of 16 characters that displays a set of menus. Figure 5.2 (below) provides an overview of machine's menus.

Symbols listed below appear in the left portion of the display:

- (Cursor) - Blinks selected (i.e. accessible) menu.
- ▶ (Filled arrow) - Editable parameter marker. This symbol appears in menus that take up more than two lines to aid browsing.
- ▶▶▶ (Three empty arrows) - Parameter is being edited.
- ▶ (Empty arrow) - Current line marker; the parameter in this line cannot be edited. This symbol appears in menus that take up more than two lines to aid browsing.

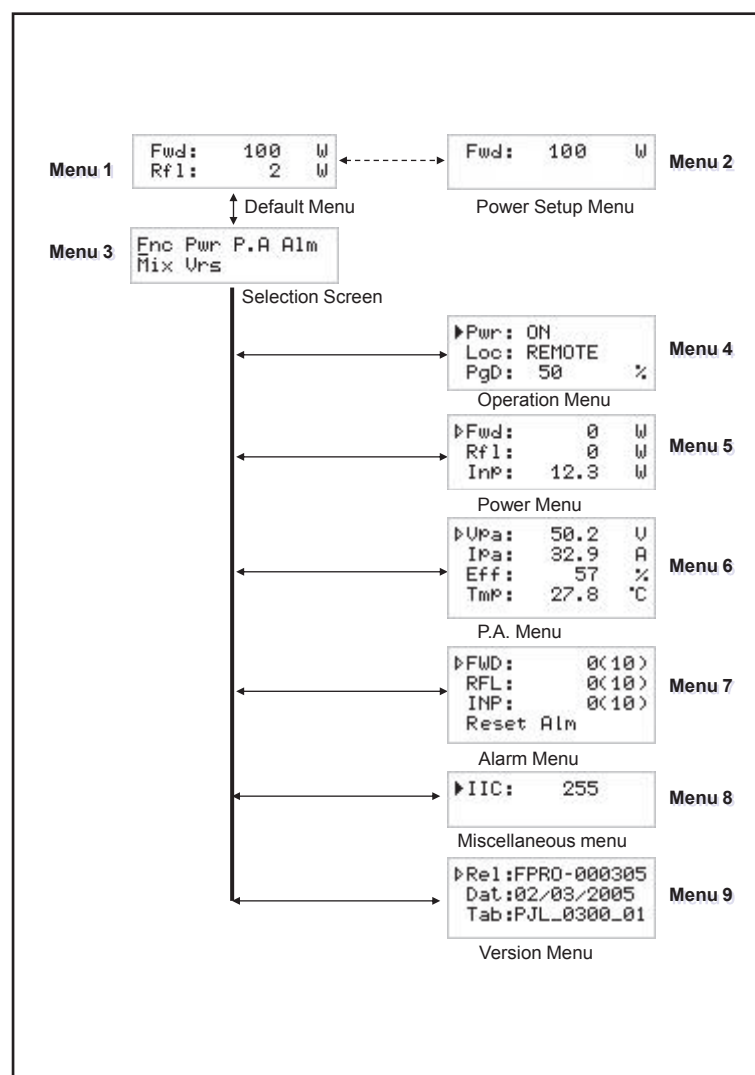



Figure 5.2

When the display is off, touching any key will turn on backlighting.

When the display is on, by pressing **ESC** button (chap. 6.1) from the **default menu** (menu 1) calls up the **selection screen** (menu 3), which gives access to all other menus:







Menu 3

To gain access to a submenu, select menu name (name is highlighted by cursor) using button  or  and press the **ENTER** button (chap. 6.1).

Press **ESC** again (chap. 6.1) to return to the **default menu** (menu 1).

5.4.1 Operation Menu (Fnc)

In this menu, you can set **RF output power** On/Off, toggle between “Local” or “Remote” control mode and set the **Forward Power Good (PgD)** threshold level.

In order to edit a row, highlight the appropriate row using the  or  buttons and then press and hold the **ENTER** button (chap. 6.1) until the command has been accepted. This way, **Pwr** setting is toggled between **ON** or **OFF** and **Loc** setting has been toggled between **LOCAL** or **REMOTE**. In order to edit Power Good threshold in **PgD** row, edit its value using buttons  and  ; finally, press **ENTER** to confirm (chap. 6.1).



Menu 4

Pwr	It enables (ON) or disables (OFF) the RF power output.
Loc	It modifies machine operation. In the LOCAL mode, the machine can read and modify its operating parameters through the navigation keys and the management firmware, whereas all other setting gates are locked out. In the REMOTE mode, the machine can only read its operating parameters; in this case parameters are modified based on the command received from other connected telemetry system.
Pgd	It modifies the Power Good (forward power) threshold. The Power Good level is a percentage of machine's rated power (100 W), not of forward output power expressed in Watt. This does mean that this threshold when set at 50% will give a warning at 50 W (=50% of 100W). When RF output power drops below the Power Good threshold setting, the machine changes the state of pin [7] of the DB15 labelled 'Remote' connector located in the rear panel (figure 6.3.2 - [6]).

5.4.2 Power Menu (Pwr)

This page holds all reading related to machine's RF power:




▶Fwd:	0	W
Rfl:	0	W
Inp:	12.3	W

Menu 5

Fwd	Forward power reading.
Rfl	Reflected power reading.
Inp	Input power reading.

Note that these are reading, rather than setting and cannot be edited (note the empty arrow).

5.4.3 Power Amplifier (P.A) Menu

This page is made up of four lines that can be scrolled using the buttons  and  and  , shows the reading relating to final power stage:

```

▶Vpa:    50.2    V
  Ipa:    32.9    A
  Eff:     57     %
  Tmp:    27.8    °C
    
```

Menu 6

Note that these are reading, rather than setting and cannot be edited (note the empty arrow).

- VPA Voltage supplied to amplifier’s module.
- IPA Current absorbed to amplifier’s module.
- Eff Efficiency based on ratio between RF forward power and power supply of amplifier module.
- Tmp Internal temperature of the machine.

5.4.4 Alarm Menu (Alm)

This menu shows any alarm condition occurring during machine’s operation. Alarm thresholds are preset by factory.

```

▶FWD:    0(10)
  RFL:    0(10)
  INP:    0(10)
  Reset Alm
    
```

Menu 7

FWD	Counter of alarm conditions triggered by forward power.
RFL	Counter of alarm conditions triggered by reflected power.
INP	Counter of alarm conditions triggered by input power.
Reset Alm	Alarm counter reset.

Alarm conditions are numbered from 1 to 10 and reflect the following situations: forward output power too high, reflected output power too high and input power too high.

Alarm monitoring cycle is as follows: when an alarm condition is detected, alarm counter increases by 1 unit, machine goes into lock-out state and the display shows the halt cause (chap. 5.3.4.1). After 15 seconds, the machine attempts to re-start; if a new alarm condition is detected, cycle is repeated over and over again up to 10 times maximum.

If machine re-starts successfully, all alarm counters are reset after 30 minutes of regular operation. After 10 alarm conditions triggered by the same cause, the machine goes into fault lock-out mode, a lock-out mode warning appears on the display and the 'FAULT' LED turns on (chap. 6.1).

After an alarm condition has been rectified, the counter may be reset by highlighting 'Reset Alm' and holding down the **ENTER** key a few time (chap. 6.1).

5.4.4.1 Alarms and Faults

There are three types of alarms that can cause a machine lock-out and trigger a "FAULT/LOCK" indication. **When any one of the three alarm thresholds is exceeding, the system will automatically switch to the warning screen (even if user is browsing another system menu) and the following messages are displayed:**

1. Over Forward Power

Forward power threshold exceeded.



```
!! ATTENTION !!  
OVER FWD Power
```

Alarm 1

2. Over Reflected Power

Reflected power threshold exceeded.

```
!! ATTENTION !!  
OVER RFL Power
```

Alarm 2

3. Over Input Power

Input power threshold exceeded.

```
!! ATTENTION !!  
OVER INP Power
```

Alarm 3

Monitoring cycle is as follows:

- An alarm condition occurs;
- Alarm is displayed and device is locked out for 15 sec.;
- Operating conditions are restored;
- Verification.

Upon reaching the 10 cycle limit, a “FAULT” indication is triggered and the device goes into lock-out mode, then an appropriate LED turns on (figure 6.1) and this screen is displayed:

I. Over Forward Power

Forward power alarm display.

```
!! HALTED FOR !!  
OVER FWD Power
```

Stop 1

II. Over Reflected Power

Reflected power alarm display.



```
!! HALTED FOR !!  
OVER RFL Power
```

Stop 2

III. Over Input Power

Input power alarm display.



```
!! HALTED FOR !!  
OVER INP Power
```

Stop 3

Once the machine goes into 'FAULT' mode, it will no longer attempt to re-start; user may choose the appropriate reset procedure according to current machine setting:

- Machine set to LOCAL control option - press 'Reset Alm' in the alarm menu (menu 7) or power off and back on again using the POWER switch (chap. 6.2).
- Machine set to REMOTE control option - power off and back on again sending the appropriate command via the DB15 connector (chap. 6.3.2 - item [14] and [15]).

Over temperature is a fourth alarm that does not trigger a permanent 'FAULT' condition, when it occurs the machine temporarily interrupts its working. It occurs if temperature exceeds 85°C (Celsius degrees), the following screen appears:

4. Over Temperature

Temperature power threshold exceeded.



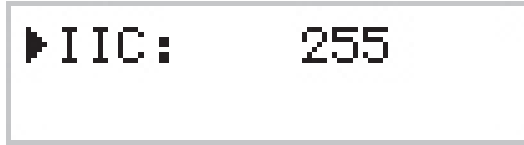
```
!! ATTENTION !!  
OVER TEMPERATURE
```

Alarm 4

Machine restores itself when temperature become regular and no protection counter is incremented.

5.4.5 Miscellaneous Menu (Mix)

This menu lets you set machine address in an I²C bus serial connection:

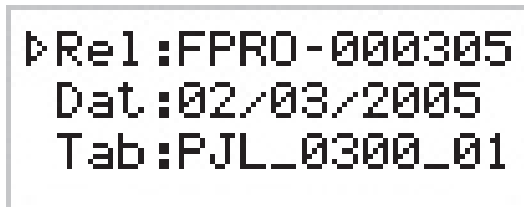


Menu 8

IIC I²C address setting. The I²C network address becomes significant when the exciter is connected in an RVR transmission system that uses this protocol. Do not change it unless strictly required.

5.4.6 Version Menu (Vrs)

This page holds machine's version/release information:



Menu 9

Note this is a reading, rather than a setting and cannot be edited (note empty arrow).

Rel Firmware release information.
Dat Release date.
Tab It shows table loaded in the memory.

6. Front and Rear Panel Description

This section describes the components found on the front and rear panel of **ATVCA**.

6.1 Front Panel

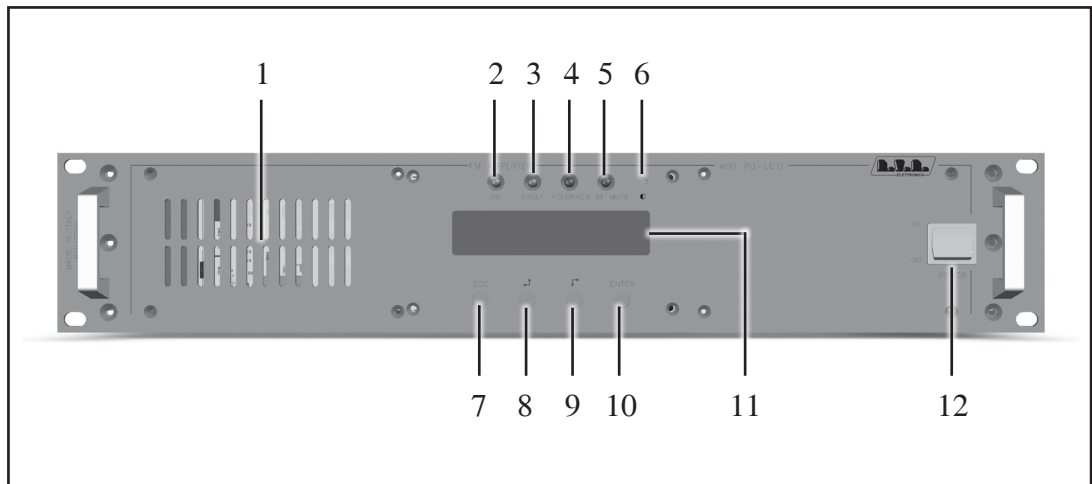




Figure 6.1

[1] AIR FLOW	Air flow for the forced ventilation.
[2] ON	Green LED - Turns on when amplifier is powered on.
[3] FAULT	Red LED - Turns on when machine is in permanent fault lock-out mode.
[4] FOLDBACK	Yellow LED - Turns on when foldback current limiting (Automatic Gain Control) is intervened.
[5] R.F. MUTE	Yellow LED - Turns on when exciter power output is inhibited by an external interlock signal.
[6] CONTRAST	Display contrast trimmer.
[7] ESC	Press this button to exit a menu.
[8] 	Navigation button used to browse menu system and edit parameters.
[9] 	Navigation button used to browse menu system and edit parameters.
[10] ENTER	Press this button to confirm a modified parameter and open a menu.
[10] DISPLAY	Liquid Crystal Display
[11] POWER	AC mains ON/OFF switch.

6.2 Rear Panel

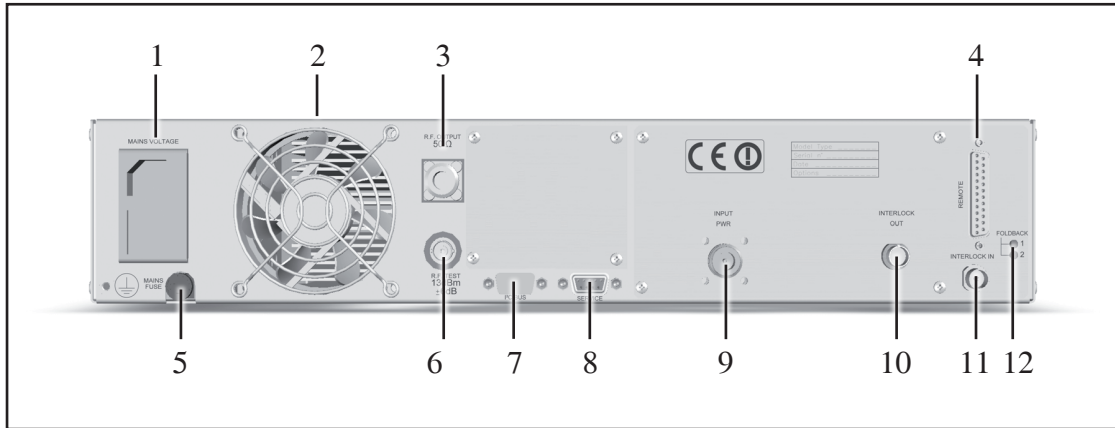


Figure 6.2

- | | |
|--|--|
| <p>[1] PLUG
 [2] FAN
 [3] R.F. OUTPUT
 [4] REMOTE

 [5] FUSE BLOCK

 [6] R.F. TEST

 [7] I²C BUS
 [8] SERVICE

 [9] INPUT PWR
 [10] INTERLOCK OUT

 [11] INTERLOCK IN
 [12] FOLDBACK 1-2</p> | <p>Mains supply plug, 90 - 260V 50-60 Hz.
 Fan for the forced ventilation of the amplifier.
 RF output connector, N-type, 50Ω.
 Reserved for Future Uses - DB25 connector for telemetry of the machine.
 Fuse carrier. Use a screwdriver to access the fuse. Contains the general protection fuse rated 8AT 5x20.
 RF test output, approx. 13 dBm wrt the RF output power level
 DB9 connector for I²C standard communication.
 DB9 connector for interconnection with other devices and factory parameters programming (only for factory programming).
 RF input connector, N-type, 50Ω.
 Interlock output BNC connector: when the transmitter goes into stand-by mode, the (normally floating) central connector is connected to ground.
 Reserved for Future Uses - Interlock input BNC connector:
 Reserved for Future Uses - Trimmer for the control of the delivered power in function of the foldback inputs</p> |
|--|--|

6.3 Connectors description

6.3.1 Service (for factory setting purposes only)

Type: Female DB9



1	NC
2	TX_D
3	RX_D
4	Internally connected to 6
5	GND
6	Internally connected to 4
7	Internally connected to 8
8	Internally connected to 7
9	NC

6.3.2 Remote

Type: Female DB15



Pin	Name	Type	Purpose
1	Interlock	IN	Inhibits power if closed to GND
2	Ext AGC FWD	IN	Ext. signal, 1-12V, for power limitation (AGC)
3	GND		Ground
4	SDA IIC	I/O	Serial for IIC communication
5	VPA TIm	ANL OUT	PA supply voltage: 3.9V F.S.
6	FWD TIm	ANL OUT	Forward power: 3.9V F.S.
7	Power Good	DIG OUT	Signalling of the activation by the grounding of the contact normally open (chap. 5.4.1)
8	GND		Ground
9	GND		Ground
10	Ext AGC RFL	IN	Ext. signal, 1-12V, for power limitation (AGC)
11	SCL IIC	I/O	Clock for IIC communication
12	IPA TIm	ANL OUT	PA power supply: 3.9V F.S.
13	RFL TIm	ANL OUT	Forward power: 3.9V F.S.
14	On cmd	DIG IN	A pulse towards ground (500 ms) triggers power output
15	OFF cmd	DIG IN	A pulse to ground (500 ms) inhibits power output

7. Technical Specifications

Parameters	Conditions	U.M.	ATVCA100LV1	ATVCA100LU1	
GENERALS					
Frequency range		MHz	170-230	470-862	
Rated output power		WPS	100	100	
Input power for rated output		W	2.5-3.5	2-3	
Power supply type			Mono phase	Mono phase	
AC Supply Voltage	Mains input voltage range	VAC	115 / 230 ±15%	115 / 230 ±15%	
DC Supply Voltage	CPU backup Input Voltage	VDC			
AC Apparent Power Consumption		VA			
Active Power Consumption		W			
RF Fan active Power consumption		W			
RF module efficiency		%	27-30 referred to ps with red field	36-37 referred to ps with red field	
Overall efficiency		%	58 referred to ps with red field	58 referred to ps with red field	
Input device			4 pushbutton	4 pushbutton	
Display			Alphanumerical LCD - 2 x 16	Alphanumerical LCD - 2 x 16	
Overall Physical Dimensions	Front panel width	mm	483	483	
	Front panel height	mm	2	2	
	Overall depth	mm	370	370	
Ambient working temperature		°C	0 to + 50 (operational -10)	0 to + 50 (operational -10)	
Spurious & harmonic suppression		dBc	In according to output filter	In according to output filter	Meets or exceeds all FCC and CCIR rules
RF INPUT					
RF Input	Connector		N type	N type	
	Impedance	Ohm	50	50	
Driver power for rated output		W	2.5-3.5	2-3	
RF OUTPUTS					
RF Output	Connector		N female type	N female type	
	Impedance	Ohm	50	50	
RF Monitor	Connector		BNC	BNC	
	Impedance	Ohm	50	50	
	Output Level	dBm	from -10 to +6	from -10 to +6	Referred to the RF output
AUXILIARY CONNECTIONS					
Interlock Input	Connector		BNC	BNC	For remote power inhibition (short is RF off)
Interlock Output	Connector		BNC	BNC	For remote power inhibition (short is RF off)
RS232 Serial Interface	Connector				
Service	Connector		DB9 F	DB9 F	Factory reserved for firmware program
I ² Cbus	Connector				
Modem	Connector				
RS485 Serial Interface	Connector				
Remote Interface	Connector		DB15F	DB15F	IIC + S analog / digital inputs, 5 analog / digital outputs
Telemetry Interface	Connector				
POWER REQUIREMENTS					
AC Power Input	AC Supply Voltage	VAC	115 / 230 ±15%	115 / 230 ±15%	
	AC Apparent Power Consumption	VA			
	Active Power Consumption	W			
	Power Factor				
DC Power Input	Connector		VDE male	VDE male	
	DC Supply Voltage	VDC			
	DC Current	ADC			
FUSES					
On Mains			1 External fuse F 8 T - 5x20 mm	1 External fuse F 8 T - 5x20 mm	
On services					
On PA Supply					
On Aux VDE socket					
MECHANICAL DIMENSIONS					
Physical Dimensions	Front panel width	mm	483 (19")	483 (19")	19" EIA rack
	Front panel height	mm	88(xxxx)	88(xxxx)	
	Overall depth	mm	390	390	
	Chassis depth	mm	370 (xxxx)	370 (xxxx)	
Weigh		kg	about 6	about 6	
OPTIONS					
Telemetry		code			
115 Vac		code			
TELEMETRY / TELECONTROL					
Remote connector inputs	Analogical level		FWD fold	FWD fold	For P.A. A.G.C. purpose, min 0,5 Vcc
	Analogical level		REF fold	REF fold	For P.A. A.G.C. purpose, min 0,5 Vcc
	pulse		RF ON	RF ON	
	pulse		RF OFF	RF OFF	
Remote connector outputs	ON/OFF level		Interlock	Interlock	for remote power inhibition (short is RF off)
	Analogical level		FWD	FWD	max 5 Vcc
	Analogical level		REF	REF	max 5 Vcc
	Analogical level		VPA	VPA	max 5 Vcc
	Analogical level		IPA	IPA	max 5 Vcc
	ON / OFF level		Power Good	Power Good	open collector
Remote connector others			I2Cbus		
TELEMETRY-TELECONTROL SW					
Telecon			Yes, via TLC300 or TLC2000	Yes, via TLC300 or TLC2000	
VARIOUS					
Cooling type			Forced, with internal fan	Forced, with internal fan	
Acoustic Noise		dBA			Leq 3 min @ 1 m
STANDARD COMPLIANCE					
Safety			EN60215:1989	EN60215:1989	
EMC			EN 301 489-11 V1, 2, 1	EN 301 489-11 V1, 2, 1	
Spectrum Optimization					

8. Working Principles

8.1 Power Supply

The **ATVCA** power supply unit is a switching-type unit whose +50 V main output powers the machine's RF amplifier. The power supply also features stabilizers for generating continuous +5 V and +18 V voltages for supplying the other equipment circuits. Note that the power supply is a "direct from mains" type, or rather it is without a transformer, and it can be connected to any voltage between 90 and 260 V without any adjustments or manual settings.

8.2 Panel board

The panel board accommodates the microcontroller that runs the machine control software and all user interface elements (display, LED's, keys, ...).

This board is interfaced with other machine modules via *flat cables* and provides for power supply, control signals and measurement distribution.

8.3 RF Power Amplifier

The RF power amplifier module is enclosed in a totally shielded metal container housed in the central part of the box.

The RF signal is coming from an external exciter via a 'N' type connector in the rear panel, it come into the amplifier and sent to the directional coupler in order to give RF power measurement. The amplified signal is delivered in an output 'N' type connector located in the rear panel. The gain of amplifier is around 10db.

In addition to the actual RF amplification, this circuit carries out the following functions:

- Measure of the RF input power.
- Measure of the RF forward and reflected power.
- Measure of the current of the power amplifier.
- Measure of the temperature of heat sink.

This board also features an RF sampling with respect to the output, which is available on a BNC connector below the transmitter output connector. This RF sample is useful to verify the characteristic of the carrier.

8.4 Control Board

The main function of this board is to give the bias to the MOSFET.

It also provides measurement interface to the front panel board and contains the protection circuit of the RF module. It is strictly linked, also physically, to RF amplifier module.

8.5 Telemetry board

This board is designed to inform the user of the equipment operation state. All input and output signals are available on the DB15 connector.

The same board also features the “INTERLOCK” BNC connector for disabling the device. By grounding the central pin, the output power is reduced to zero until the connection is removed.

When an R.V.R. amplifier is used, this connector is linked to the power amplifier REMOTE or INTERLOCK by means of a BNC-BNC connection. In case of amplifier faults, the central conductor is grounded thus forcing the machine to enter in stand-by mode.

8.6 Interlock Output Interface

The interlock output interface serves to generate the signal of INTERLOCK OUT, on the board is present one jumper which if set in opposite way reverses the working logic.

9. Identification and Access to the Modules

9.1 Identification of the Modules

The **ATVCA** is made up of various modules linked to each other through connectors so as to make maintenance and any required module replacement easier.

9.1.1 VHF Version Upper view (ATVCA100LV1)

The figure below shows the equipment upper view with the various components pointed out.

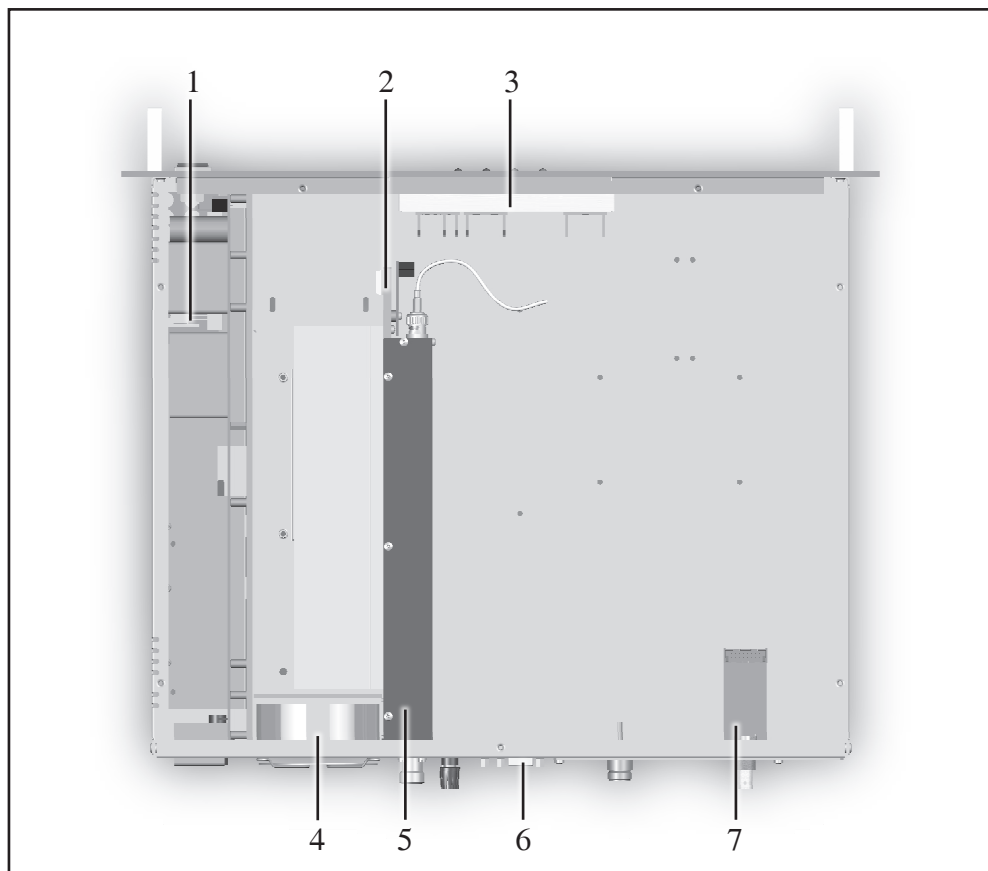


figure 9.1

- [1] Power Supply (*PSL600*)
- [2] Control Board (*SL216DR1001*)
- [3] Panel Board (*SL123PC1001*)
- [4] Cooling Fan (*VTL9G824G102*)
- [5] RF Module Board (*SL184RF2001*) + Directional Coupler Board (*SL216DC1001*)
- [6] Telemetry Board (*SLTLMTXLCH01*)
- [7] Interlock Output Interface (*SL123IN1001*)

9.1.2 UHF Version Upper view (ATVCA100LU1)

The figure below shows the equipment upper view with the various components pointed out.

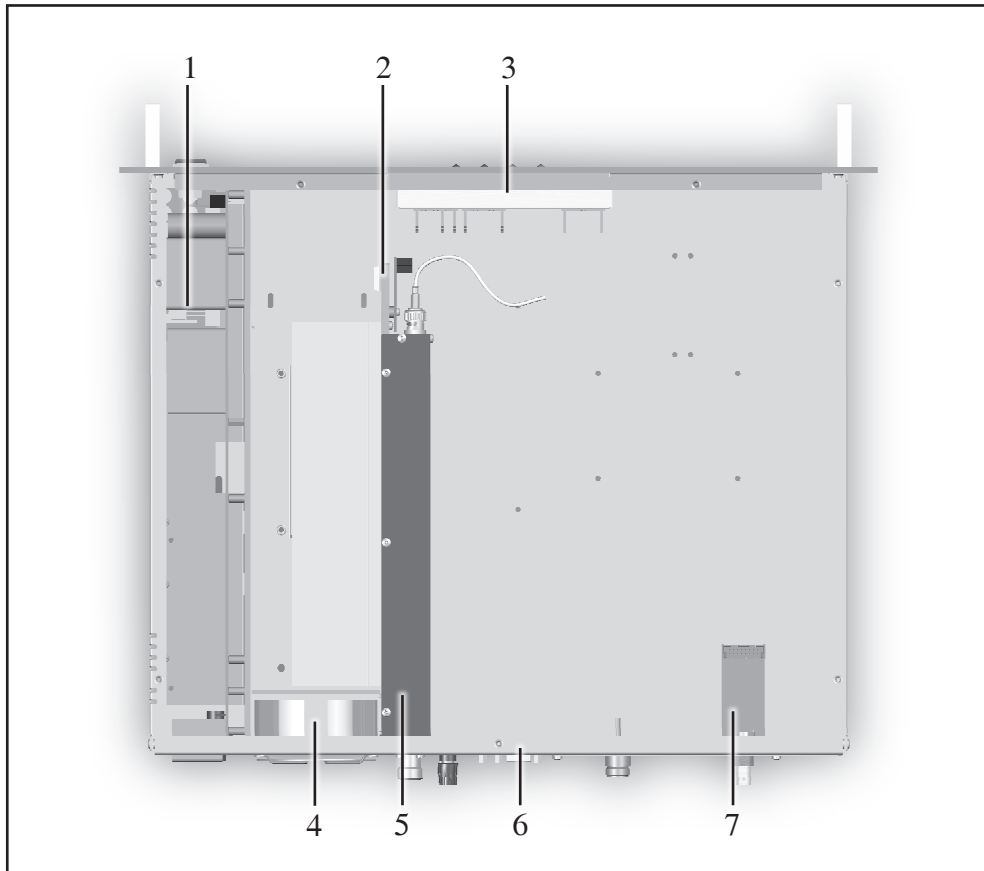


figure 9.2

- [1] Power Supply (*PSL600ATV*)
- [2] Control Board (*SL216DR1001*)
- [3] Panel Board (*SL123PC1001*)
- [4] Cooling Fan (*VTL9G824G102*)
- [5] RF Module Board (*SL230RF1001*) + Directional Coupler Board (*SL230DC1001*)
- [6] Telemetry Board (*SLTLMTXLCH01*)
- [7] Interlock Output Interface (*SL123IN1001*)