CHAPTER 7 SETTING INTO SERVICE - OPERATION

7.1 FRONT PANEL OPERATING ELEMENTS

7.1.1 Definitions

Before describing the meaning and the operating condition of the different front panel indicators, it is necessary to explain the meaning of the transmission inhibition information.

Transmission inhibition: *This signal prevents the transmitter from changing to transmission and therefore disables the PTT. It is enabled on one of the following conditions:*

a) External transmission inhibition:

It corresponds to an external condition of the transmitter by a software command (with the JBUS supervision link).

b) System transmission inhibition:

It corresponds to an internal condition of the transmitter displaying an operation failure. This inhibition can be **hardware**: in this case the inhibition sources are:

- "REAL transmission inhibition", signal R, triggered by the REAL16061 or REAL16069 PCB as soon as the mains voltage falls below 19V.
- "PLL transmission inhibition", INHIB_PLL_F signal, triggered by the frequency synthesizer as soon as the PLL is unlocked.
- "3 second time delay at the starting", TEMPO_DEM signal, triggered at the power up of the transmitter for inhibiting any transitory states showing up in this phase.

REMARK: *The PD4 input port provides the "OR-wired" of the operating transmission inhibition and the hardware system transmission inhibition to the microcontroller.*

The inhibition can be **software**: in this case the inhibition sources are:

- " DSP operating failure" given by the DSP+CODEC watchdog status.
- "VHF module temperature default" given by the temperature sensor reading of the VHF module.
- "mains module temperature default", read only in version A, and given by the temperature sensor reading of the mains module.
- "PLL transmission inhibition", INHIB_PLL_F signal (PD7 input port), triggered by the frequency synthesizer as soon as the PLL is unlocked.

c) Frequency change:

This pertains to a 200 ms software time-delay enabled during a frequency change by the user.

7.1.2 Front panel of EM 9009

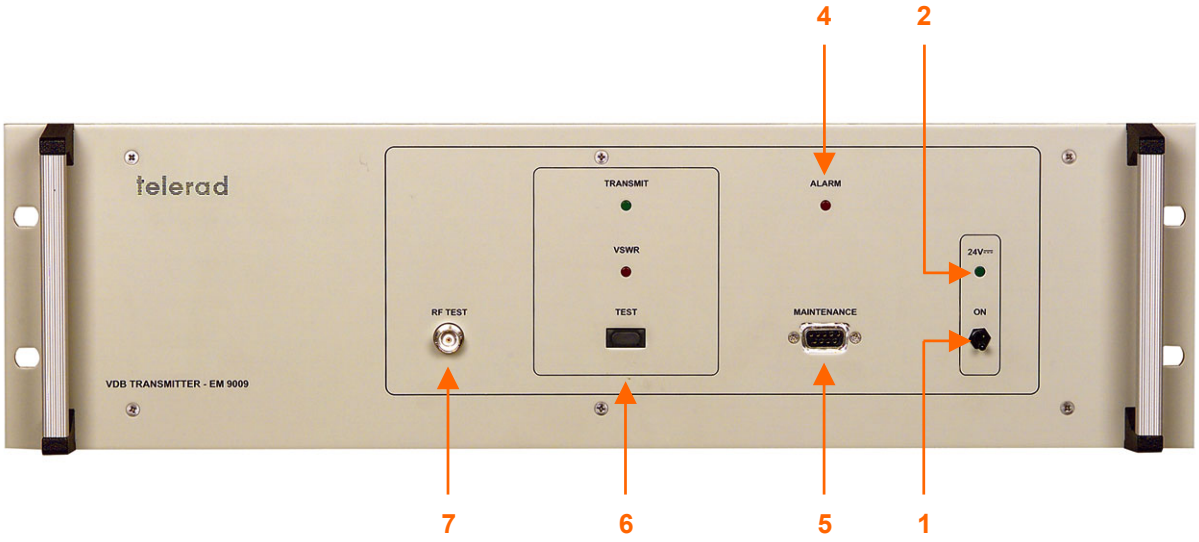


FIGURE 13 - EM 9009 FRONT PANEL

7.1.3 Front panel of EM 9009 A

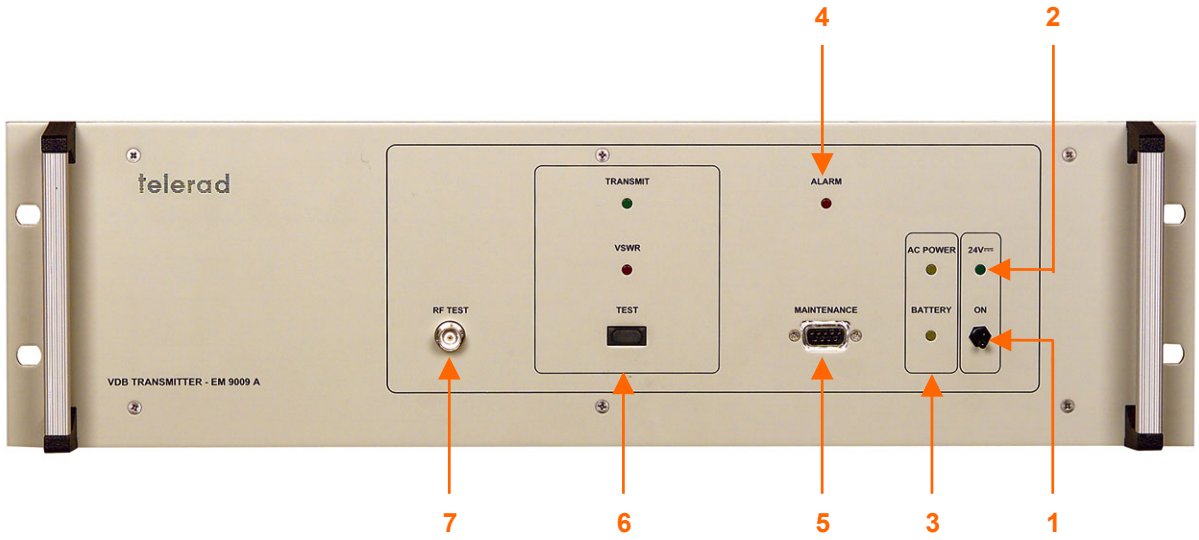


FIGURE 14 - EM 9009 A FRONT PANEL

7.1.4 Description of light indicators and switches

① **ON/OFF Switch:**
It switches on the transmitter.

② **V= indicator:**
It signals that the transmitter is switched on (dc voltage in mains output).

③ **MAINS and BATTERY indicators: (version A only)**
These indicators signal the presence of sources, which supply the power to the unit.

④ **ALARM indicator:**
It signals an operating default of the transmitter.

The Alarm indicator is illuminated if:

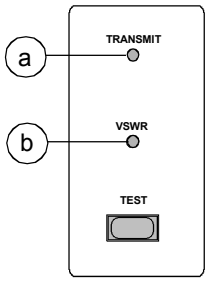
- the **"software system transmission inhibition"** signal is enabled (see previous definitions),
- the **"RF information"** signal, valid in all the modes, signals "No RF" without SWR detection. In case of SWR detection this information is not read due to the power reduction, which follows,
- the **"Microcontroller alarm"** is enabled,
- the **"DSP Alarm"** is enabled,
- the **"SWR"** signal indicating an infinite SWR is enabled,
- the result from the **software test command** signals a defect,
- the transmitter is **loading a software release.**

REMARK: *When the On/Off switch changes from Off to On, the test result and the test memory are positioned at: OK.*

⑤ **MAINTENANCE Socket (liaison RS232):**
SUB-D 9 pins socket for connection to the Telerad programmer PGM 9000 (see specific guide), or an ASCIL terminal, or a PC in a terminal emulation.

⑥ **TEST push-button and indicators:**
It permits the transmitter to operate in CW transmission. At the same time the main parameters of operation are analyzed and the result is provided by RF, SWR and ALARM indicators.

The indicators are active, apart from the TEST push-button.



a) *Transmit indicator:*
It is illuminated during transmission when the power is higher than -3dB of nominal power. In test, the level is -2dB of nominal power.

b) *SWR indicator:*
It is illuminated when the SWR detected is higher than 2.

⑦ **RF TEST socket (BNC):**
On this socket, a sample of the ANTENNA signal is available to measure directly the frequency on transmission (drift control of the master oscillator). Output level: about 0dBm/50 ohms.

7.2 SETTING THE TRANSMITTER INTO SERVICE

Before starting the EM 9009 or EM 9009 A transmitter, check the following:

For version A only, the mains switch on the rear panel of the unit should be at "0". The mains cord on J1 is to be connected with the mains.

On EM 9009 or EM 9009 A, J6 socket is linked to a dc voltage source.

The On/Off switch on the front panel of the unit should be positioned downward.

The RF output on the rear panel should be connected to an antenna or a 50 ohms load.

To start the EM 9009 transmitter proceed as follows:

Keep the On/Off switch at upward position.

Check that the "24 V" and "ALARM" indicators illuminate. After a few seconds the "ALARM" indicator switches off.

If the transmitter is connected to 50 ohms load, press the "TEST" key and check that "TRANSMIT" indicator illuminates.

Release "TEST" button and connect the transmitter to an antenna: EM 9009 is then ready to transmit.

Before starting the EM 9009 A or EM 9000 transmitter, check the following:

Keep the mains switch in the back of the unit at position “I” and check if the “MAINS” indicator is illuminated.

If the transmitter is linked to a dc voltage source, check that the “BATTERY” indicator is illuminated.

Keep the On/Off switch at the upward position.

Check that the "24 V" and "ALARM" indicators illuminate. After a few seconds the "ALARM" indicator switches off.

If the transmitter is connected to 50 ohms load, press "TEST" key and check that "TRANSMIT" indicator illuminates. Release "TEST" button and connect the transmitter to an antenna: EM 9009 is then ready to transmit.

7.3 OPERATING SETTINGS

7.3.1 Introduction

This chapter deals with the operating settings required for preventive maintenance.

Recommended measuring devices:

Precision Frequency meter < 0.1 p.p.m.
For instance, 53181 A H.P model (option 010 – High stability)

7.3.2 Operation verification

Connect and switch on the transmitter (see CHAPTER 6).

Enable the internal test using a PGM 9000 programmer (see specific guide) or an ASCII terminal (see CHAPTER 5, § 5.2.25 – TEST Command).

Analyze the test results.

7.3.3 Frequency verification

Connect and switch on the transmitter (see CHAPTER 6).

Connect a frequency meter on the RF TEST socket (BNC type) of the front panel (see § 7.1).

Enable the "remote On/Off command" on the operating connector (contact to ground), next switch the transmitter to transmission with the "remote PTT command" which is also on the Operating connector (contact to ground).

Verify that the frequency read matches the transmitter operating frequency ±1 p.p.m.

If frequency is out-of-tolerance, see next paragraph (Frequency adjustment).

7.3.4 Frequency adjustment

The unit is switched off. Remove the top cover and switch on the transmitter.

Adjust the frequency with R586 potentiometer in synthesizer block (see PLATE 5h). The hole in the shield cover of this block is there for this use.

Switch off the transmitter. Put the top cover of the transmitter back.