

# ***TAJFUN 1000***

## **INSTRUCTION MANUAL**



[www.vhelectronics.sk](http://www.vhelectronics.sk)  
[www.kenwood.sk](http://www.kenwood.sk)

## Acknowledgment

Thank you for purchasing Power linear amplifier **TAJFUN 1000 432** from VH Electronics. During its production, we used the latest knowledge in the field of VHF Power amplifiers and the most advanced technology in the management, communication and display systems. We believe that our product will exceed your expectations and will be working properly to your satisfaction. Please take a few moments to read this manual and get acquainted with this device.

## I. GENERAL INFORMATION

### I.1 Description

TAJFUN 1000 432 is a small, lightweight but robust LDMOS VHF Power Amplifier (hereafter PA) working in amateur 70cm band with output power up to 900W.

### I.2 Technical parameters

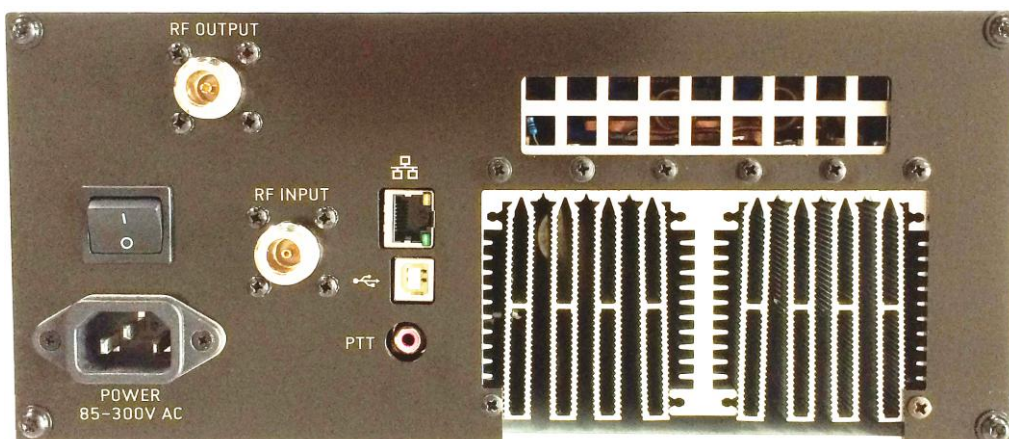
- Frequency Coverage            430 - 434 MHz Amateur band
- Operating Mode                FM, SSB, CW, DIGI
- Output Power                    900W CW  
    700W SSB, 600W @ 21°C FM and DIGI 50% duty cycle
- Input Power                      18 - 22W ( Inside 3dB hybrid attenuator )
- Power Gain                      Typically 18dB
- LDMOS MRFE6VP61K25 ( 1200W ) PUSH PULL Configuration
- Class Operating                AB
- Input / Output Impedance 50  $\Omega$  Connector 2 x N-female
- Suppression of harmonics  $\leq 70$  dBc (Low Pass Filter)
- Intermodulation distortion -32 dBc
- Cooling                          Robust heatsinks, 3 fans PA + 1 fan Power Supply
- Coaxial Relay                    CX600NC – CX140D
- Communication ports        USB, LAN
- Power Supply Inside        Input: 195 - 277VAC, 45 - 66Hz  
    Output: 53VDC / 1800W
- Working temperature        0 - 45°C, Max. Humidity 90%
- Dimension                      266 x 105 x 294mm ( width x height x depth )
- Weight                            6,2kg

### I.3 Protection, measurements and display

- Protection PWR, REF, Temperature, I<sub>max</sub>, U<sub>max</sub>/U<sub>min</sub>
- Control / Display Colour TFT display
- Measurements and display:
  - Drain Current
  - DC Voltage
  - Output Power PWR
  - Reflected Power REF
  - Peak Power PEP
  - Temperature

### I.4 Put into operation

If your device was transported or stored in a cool or cold environment, it is necessary to unzip it first and let it dry in a warm environment (by doing this you will protect your device against a possible water condensation). Then you should connect the connecting coaxial cable to the RF INPUT and RF OUTPUT jacks on the rear panel (N-female connector) and attach the PTT RCA (CINCH) connector. Broadcasting (Tx) is active when connected to GND.



Back panel

Insert a supplied power cord into the POWER. Then turn on the power switch. Initializing and control equipment starts. After a short time the fans will start, initialize the TFT touch screen and display:

**Basic menu - “Home QSO“ , “Contest QSO“**



By pressing an icon on the screen we select:

#### I.4.1 Mode **Home QSO**

This mode is suitable for the standard operation of the Home for the occasional QSO with less demand for cooling of the PA. Speed cooling fans are continuously controlled (PWM) according to the temperature of the LDMOS transistor independently of the control of the PTT (Rx/Tx mode). Advantage – quiet operation.

#### I.4.2 Mode **Contest QSO**

This mode is suitable for the Contest, eventually for DIGI operation with high demands on cooling of the PA. After switching of the PTT (Tx mode) it switches the maximum speed of the cooling fans. After switching off the PTT (mode Rx) the speed is continuously controlled (PWM) according to the temperature of the LDMOS transistor. Advantage - powerful cooling for demanding operations.

After selecting the operating mode we will get to the menu for **Display operation**.



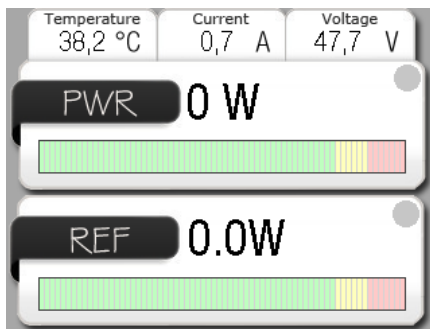
**In this menu, the PA does not respond to control PTT. Coaxial relays RF INPUT linking directly to the RF OUTPUT connector (bypass the amplifier). This mode ideal for local QSOs at low power without having to disconnect the PA.**

By pressing on the Icon, you can choose from the following views:

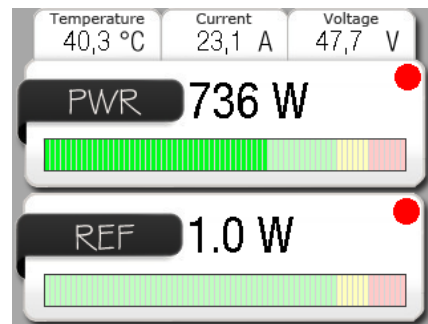
- **Standard**
- **Bargraph**
- **Peak**
- **All values**

#### I.4.3 **Standard**

It shows the performance of the Output Power - PWR, Reflected Power – REF, both appears in a bargraph and their values are represented in a numerical form + it shows the values of the Temperature, Current and Voltage



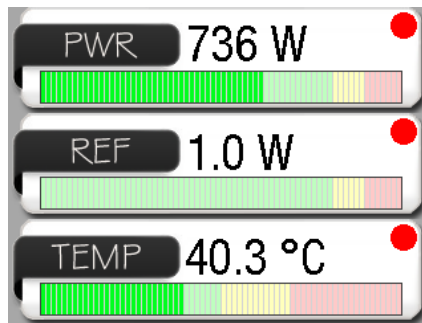
Mode Rx



Mode Tx

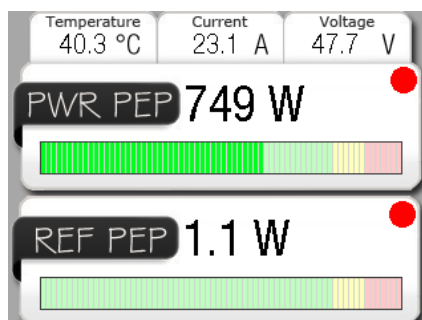
#### I.4.4 **Bargraph**

It shows the performance of the Output Power - PWR, Reflected Power - REF and the Temperature – TEMP; they are all shown in a bargraph and their values appear in numerical form



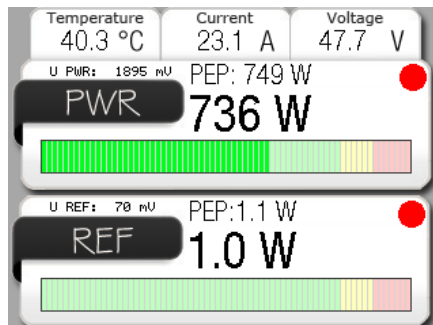
#### I.4.5 **Peak**

It displays values as Standard, but PWR PEP and REF PEP are displayed in the peak values and the maximum values are represented during the hold of the PTT (Tx mode)



### I.4.6 All values

It displays values as Standard. PWR PEP and REF PEP are displayed in the peak value and the maximum value are represented during the hold of the PTT (Tx mode) + it shows the values of the Coupler U PWR and U REF [mV] for servicing.



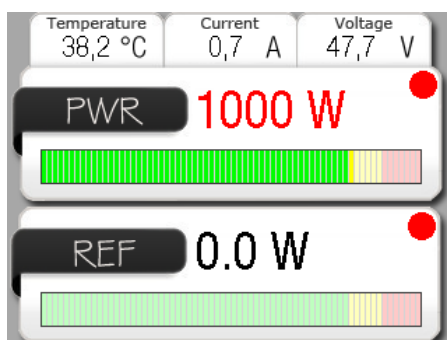
## I.5 Responding in excessing the parameters Alert / Block-Warning

### I.5.1 Output Power PWR

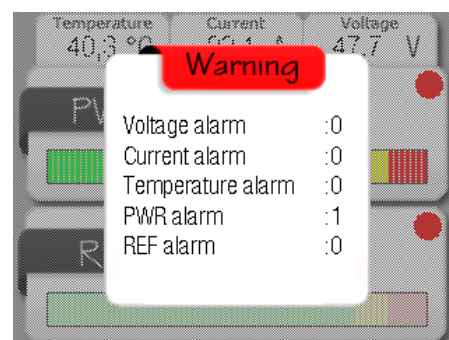
**Alert** - when crossing PWR above the set value ( $\geq 1000W$ ) it gets into a red bargraph, the numeric value turns red and the buzzer beeps

**Block** - when crossing PWR above critical value ( $\geq 1100W$ ) it declares "**Warning**" on the display and it blocks the LD MOS (Inhibit -5V), it turns the coax relay off and it blocks the PTT.

In order to restore operation it is necessary to "**Restart**" – confirm "**Warning**" and return to the **Display operation**



*Alert*



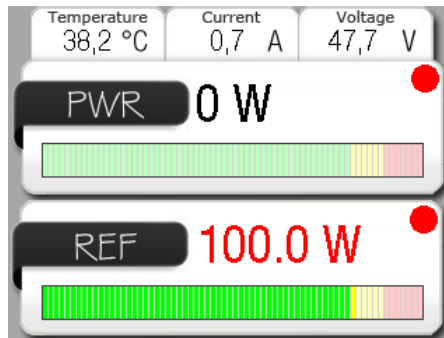
*Block - Warning*

### 1.5.2 Reflected Power REF

*Alert* - when crossing PWR above the set value ( $\geq 100\text{W}$ ) it gets into a red bargraph, the numeric value turns red and the buzzer beeps

*Block* - when crossing REF above critical value ( $\geq 110\text{W}$ ) it declares "**Warning**" on the display and it blocks the LDMOS (Inhibit -5V), it turns the coax relay off and it blocks the PTT.

In order to restore operation it is necessary to "**Restart**" – confirm "**Warning**" and return to the **Display operation**



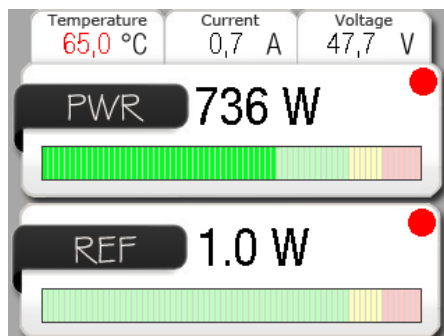
*Alert*

### 1.5.3 Temperature

*Alert* - when crossing the temperature above the set value ( $\geq 65^\circ\text{C}$ ) it gets into a red bargraph, the numeric value turns red and the buzzer beeps

*Block* - when crossing PWR above critical value ( $\geq 70^\circ\text{C}$ ) it declares "**Warning**" on the display and it blocks the LDMOS (Inhibit -5V), it turns the coax relay off and it blocks the PTT.

In order to restore operation it is necessary to "**Restart**" – confirm "**Warning**" and return to the **Display operation**



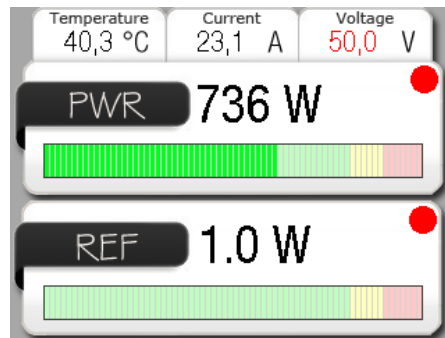
*Alert*

#### I.5.4 DC Voltage

*Alert* - when crossing DC Voltage above the set value ( $\geq 50V$ ) the numeric value turns red and the buzzer beeps

*Block* - when crossing DC Voltage above critical value ( $\geq 55V$ ) it declares "**Warning**" on the display and it blocks the LDMOS (Inhibit -5V), it turns the coax relay off and it blocks the PTT.

In order to restore operation it is necessary to "**Restart**" – confirm "**Warning**" and return to the **Display operation**



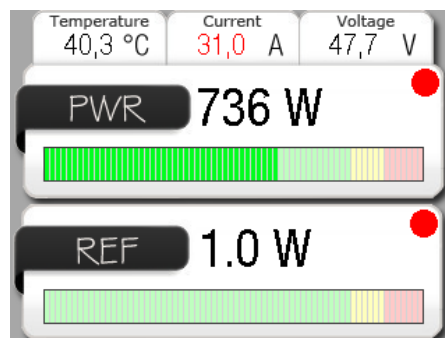
*Alert*

#### I.5.5 Drain Current

*Alert* - when crossing Current above the set value ( $\geq 31A$ ) the numeric value appears red and the buzzer beeps

*Block* - when crossing Current above the critical value ( $\geq 35A$ ) it declares "**Warning**" on the display and it blocks the LDMOS (Inhibit -5V), it turns the coax relay off and it blocks the PTT.

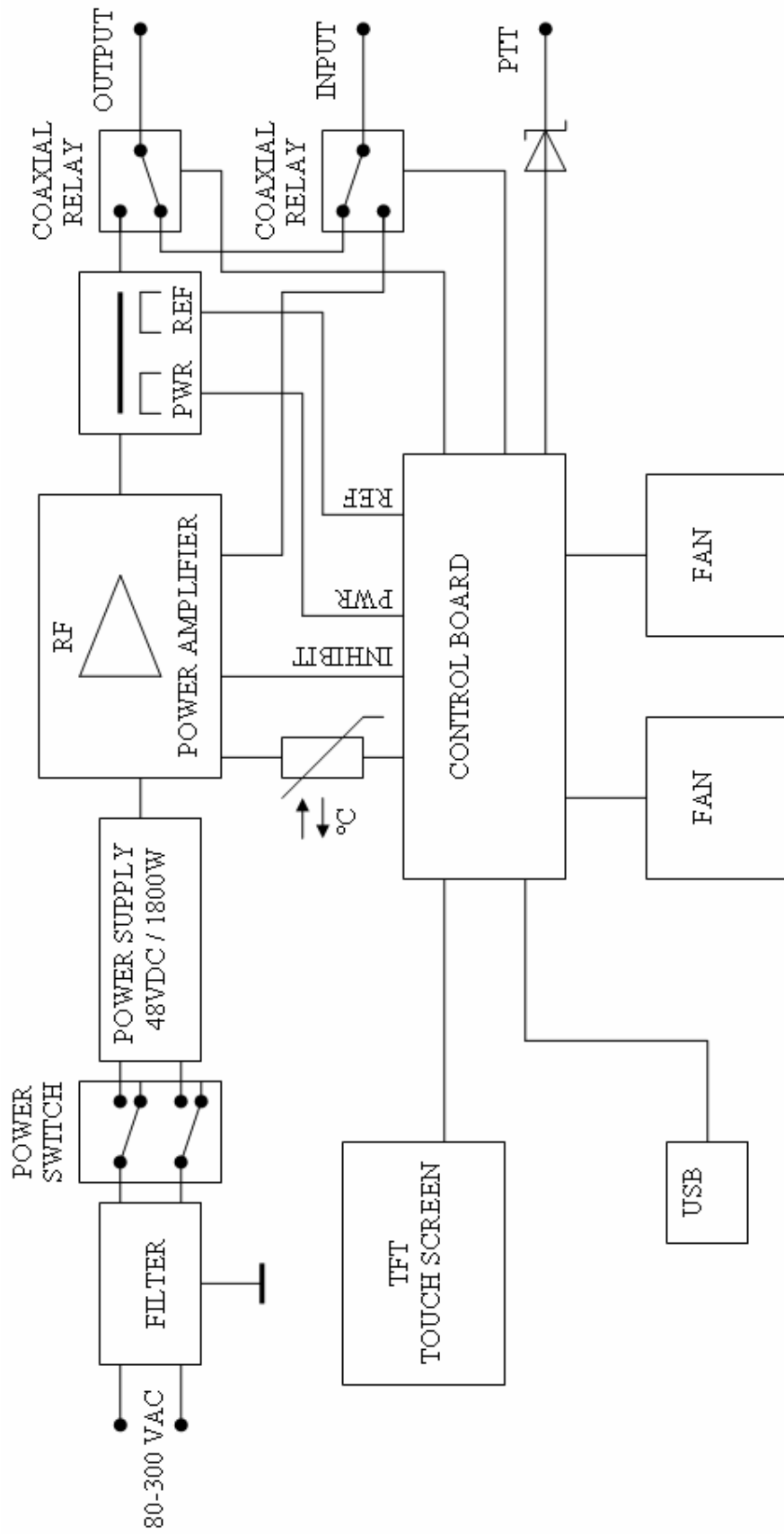
In order to restore the operation it is necessary to "**Restart**" – confirm "**Warning**" and return to the **Display operation**



*Alert*



# BLOCK DIAGRAM



## I.6 Sequencer

### I.6.1 Time control coaxial relay

Control unit „Control Board“ switch input and output coaxial relays in the correct time sequence according to the PTT signal. Time T1 and T2 can be changed using the software Service Tajfun 1000 via USB port PA.

<http://vhelectronics.sk/index.php/en/ham-radio-vhf-uhf/big-tajfun-1000-144-mhz-detail>

Normally set times:

T1 (Relay IN) ..... 20ms

T2 (Relay OUT)... 25ms

**ATTENTION !!! Carefully consider any change in these times not to cause destruction LDMOS or accident PA.**

