

Operation instructions

USER'S MANUAL



Professional wireless intercom

PROFESSIONAL FM TRANSCEIVER

UHF Amplifier Manual

Mode	Color	Type	Blink	Function
Power measurement	Green	Bar-graph	No	Measurement output power, 10W increments
Power setting display	Green	Bar-graph	Yes	Indicates actual power limit (10,20.....70, 80Watt)
SWR measurement	Green	Dot	No*	Shows VSWR
Error indicator	Red	Dot(s)	No	Indicate error condition

*Blinks on under/over range

Push buttons function

Name	Function
RX LNA	Toggles operation of receiver pre-amplifier (LNA)
TX PA	Toggles operation of transmit power amplifier
SSB ON	Toggles SSB mode
SET POWER	Displays/changes transmit power limit
SHOW SWR	Enables SWR display

Turning amplifier on and off

Transmit power of amplifier and receiver preamplifier functions are independent on each other . They can be toggled on/off by pressing respective push buttons : RX LNA and TX PA . When function is enabled , LED associated with push button is lit .

Amplifier is completely off , when both LEDs are dark .

Changing power level

Transmit power amplifier is equipped with Automatic Level Control loop (ALC).Preset power is adjustable is 8 steps: 10W, 20W 30W,40W,50W,60W,70W,80W. First press of SET POWER button enters power setting mode. Multi-function display bar blinks, showing preset power level. First press of SET POWER button, doesn't change the level, but displays actual setting. Subsequent pressing of SET POWER button change power setting. Amplifier exits power setting mode if SET POWER button is not pressed again within 2 seconds.

Automatic Level Control is of saturated nonlinear type, only suitable for FM modulation. While using amplifier with AM/SSB modulations, set ALC threshold to maximum power (50W), then adjust transceiver power to yield appropriate power displayed on bar-graph. For AM modulation, carrier power should not exceed 10-15w,to accommodate modulation peaks without distortion.

In case of SSB modulation, observe bar-graph which is of PEP type, keeping 50WLED lit only occasionally.

Turning SSB mode on/off

The SSB ON button toggles SSB mode on/off, actual state indicated by associated LED. When SSB mode is enabled, carrier sensing algorithm, time delays, power meter bar behaviour are changed to address modulation properties. There is no difference in power amplifier biasing itself, since this modern design is inherently linear, unlike elder bipolar transistor based designs.

Using external PTT input

The external PTT ("external keying") mini jack socket is located on the rear panel. It allows the TX mode to be enabled by shorting the center conductor of the plug to the outer conductor (to ground). First, enable the TX PA function, by pressing the TX PA button. The associated LED will light up. Upon the first shorting of the external PTT, the amplifier enters external PTT mode of operation. The associated LED will start blinking.

In external PTT mode, the amplifier no longer reacts to the RF input signal from the transceiver. Instead, it goes into TX mode every time the external PTT signal has been applied. Once the SSB mode is enabled, the TX/RX transition delays remain short. Power meter operates in the PEP mode.

The amplifier remains in the external PTT mode, until the TX PA button is pressed or the DC power is removed.

Measuring VSWR

This useful function allows to accurately measure amplifier load VSWR. To enable VSWR measurement, press SHOW SWR button while transmitting. This mode will persist as long as amplifier is in transmit mode. Display returns to normal operation (power measurement) after releasing transceiver PTT button.

Actual VSWR is represented as single "moving dot". Lowest reading is 1.20, below this value respective LED starts blinking, indicating under range. Highest reading is 1.90, crossing 2.00 will cause respective LED blinking, indicating over range.

Built in VSWR meter is of good quality, compensating for detector nonlinearities, what makes measurement result fairly independent on output power. It also offers exceptional directivity, with residual VSWR reading in order of 1.10.

Error Signal

To signal error in amplifier operation, multi-function display bar LEDs change color to red. Appearance of any error denies power amplifier transmit operation.

Error LED	Meaning	Amplifier reaction
High SWR	Excessive VSWR (over 2.1) detected. Typically caused by faulty antenna.	Deny transmitting, resume after PTT release
OVER DRIVE	Excessive input power(>7Watt)	Deny transmitting, resume after PTT release
DC VOLTAGE	DC supply voltage out of permissible range (10.5V to 14.8V)	Deny transmitting, resume after PTT release and voltage restored
HIGH TEMP	Chassis temperature over 60°C	Deny transmitting, resume after cooling down
PA FAIL	Amplifier electrical failure	Deny transmitting, resume after PTT release

Specifications: Power amplifier

Parameter	Min	Typ.	Max	Remarks
Frequency range	400MHZ		470MHZ	
Maximum output power	75W	80W	85W	ALC limited
Input power range	0.7W		7W	Between carrier detect and overdrive thresholds
Input power for full output	3W		5W	Frequency dependent
Bypass power			50W	
Harmonics suppression	63dBc			
Modulation	AM,FM,SSB			
Circuit type	Twin MOSFET, PUSH-PULL			

Specification: Receiver preamplifier

In-band gain	13dB	15dB	15.5dB	400-470MHZ
Noise figure		2.4dB	3dB	

Specification: General

DC Supply voltage	10.5V	12.6V	14.8V	Operation at low end of range may not yield specified maximum power
Transmit supply current		12A	13A	Transmitting at maximum power. Frequency dependent
Standby supply current		20mA		All functions OFF
		35mA		TX PA enable
		80mA		RX LNA enable
		88mA		TX PA & RX LNA enable
RF connector	N-Type connector			
Size	50H*125W*210L mm			