

UHF POWER AMPLIFIER

PA-80U



User Manual



Multifunction display bar operating modes

Mode	Color	Type	Blink	Function
Power measurement	Green	Bar-graph	No	Measure output power, 10Watt increments
Power setting display	Green	Bar-graph	Yes	Indicates actual power limit (10,20,30,40,50,60,70,80Watt)
SWR measurement	Green	Dot	No*	Shows VSWR
Error indicator	Red	Dot(s)	No	Indicates error condition

* Blinks on under/overrange

Pushbuttons 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 amplifier and receiver preamplifier functions are independent on each other. They can be toggled on/off by pressing respective pushbuttons: RX LNA and TX PA. When function is enabled, LED associated with pushbutton 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. Multifunction 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 bargraph. For AM modulation, carrier power should not exceed 10-15W, to accommodate modulation peaks without distortion. In case of SSB modulation, observe bargraph which is of PEP type, keeping 50W LED 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.

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 underrange. Highest reading is 1.90, crossing 2.00 will cause respective LED blinking, indicating overrange.

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 signalling

To signal error in amplifier operation, multifunction display bar LEDs change color to red. Apperance of any error denies power amplifier transmit operation.

<i>Error LED</i>	<i>Meaning</i>	<i>Amplifier reaction</i>
HIGH SWR	Excessive VSWR (over 2.1) detected. Typically caused by faulty antenna.	Deny transmitting, resume after PTT release
OVERDRIVE	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	430 MHz		470 MHz	
Maximum output power	75Watt	80Watt	85Watt	ALC limited
Input power range	0.7 Watt		7 Watt	Between carrier detect and overdrive thresholds
Input power for full output	3 Watt		5 Watt	Frequency dependent
Bypass power			50 Watt	
Harmonics suppression	65dBc			
Modulation	AM, FM, SSB			
Circuit type	Twin MOSFET, PUSH-PULL			
Specifications: Receiver preamplifier				
In-band gain	13dB	15dB	15.5dB	430 MHz - 470 MHz
Noise figure		2.4 dB	3 dB	
Specifications: General				
DC supply voltage	10.5 V	12.6 V	14.8 V	Operation at low end of range may not yield specified maximum power
Transmit supply current		12 A	13 A	Transmitting at maximum power. Frequency dependent.
Standby supply current		20 mA		All functions OFF
		35 mA		TX PA enabled
		80 mA		RX LNA enabled
		88 mA		TX PA and RX LNA enabled
RF connector	UHF (SO-239)			
Weight		1.15 kG		
Dimensions	H=50mm, W=125mm, L=210mm			