

## microwapp™ HR 3A

### Microwave transverters for 9 cm band

Microwave transverters of Microwapp HRxx series represent the BTV sector of production covering microwave technology for radio amateurs. The typical design is based upon the idea to integrate the electronics with an antenna, so the users can operate from their "fireplaces". The compact integration of the antenna with the outdoor microwave transverter protects the sensitive parts from the elements (IP54 type protection). This design, new in the field of radio-amateur technology, reduces significantly the microwave loss known in designs where the two parts are separated. The new Microwapp HRxx series transverters utilize the outdoor system integrated with antenna, cable-connected with the indoor unit in which the power supply is integrated with DC bias tee and has the input/output IF connector and a PTT control interface. By turning the outdoor unit pole mount, signal polarization can be easily adjusted.

The transverters are designed to cooperate with common UHF transceivers for 70-cm band, with the frequency range of 430 to 440 MHz, with the RF output power of 5W. The frequency plan was calculated to match the IARU frequency table after conversion. As it was observed with long IF cables that their leakage allowed the operators to communicate at 70-cm band instead of at 9 cm, we chose the initial frequency to be 433 MHz instead of 432 as usual. This 1 MHz shift prevents confusion during contest activities, so without switching the transverter power off, the operator can distinguish the 70-cm signals from those at 9 cm.

When the transceiver is connected to transverter as recommended, no adjustments or tuning is needed to operate. One coaxial cable connection makes the system ready. The low required power with 13,8 V DC allows to operate the complete system from temporary QTHs, to use chemical or solar batteries. Optionally, BTV Plus can deliver the HR 3A transverters modified for QRP applications, to operate with only 50 mW IF input, Model HR 3QRP that can be used "from hand".

#### Specifications

Frequency Band	3,4 GHz	As in the IARU frequency table
Modes of Operation	CW, SSB, FM	
Modulation	As Required in Operation	
Transmitter Power	100 mW (HR 3A)	
ERP with FLAT Antenna	3 W (HR 3A)	
Input IF Power	5 W max. at 430-440 MHz	
Polarization	Horiz./Vert.	Adjustable
Antenna	FLAT - 8 elements	
Receiver Noise Figure		
Antenna Gain	15 dB	
DC Power	13,8 V, 270 mA RX, 460 mA TX	
Operation Temperature Range	-25 to +50 deg.C	
Size	22 cm(w) x 22 cm(h) x 14,5 cm(d)	including the mount
Weight	1,5 kg	including the mount
Manufacturer	B PLUS TV a.s.	

As specified, the typical RF output for HR 3A at 3,4 GHz is 100 mW. With the integrated FLAT antenna the ERPs are 3 W, respectively. By locating the HR 3A in the focus of a SAT offset dish with 1,2 m diameter, the ERP is approximately ten times higher, see Fig.2.

### Frequency Table

HAM band	Wave Length	Sector To Use	TRX IF Frequency
3,4 GHz	~ 9 cm	3400 - 3401 MHz	433 - 434 MHz

### Block Diagram of HR 3A Installation

### microwapp HR 3A

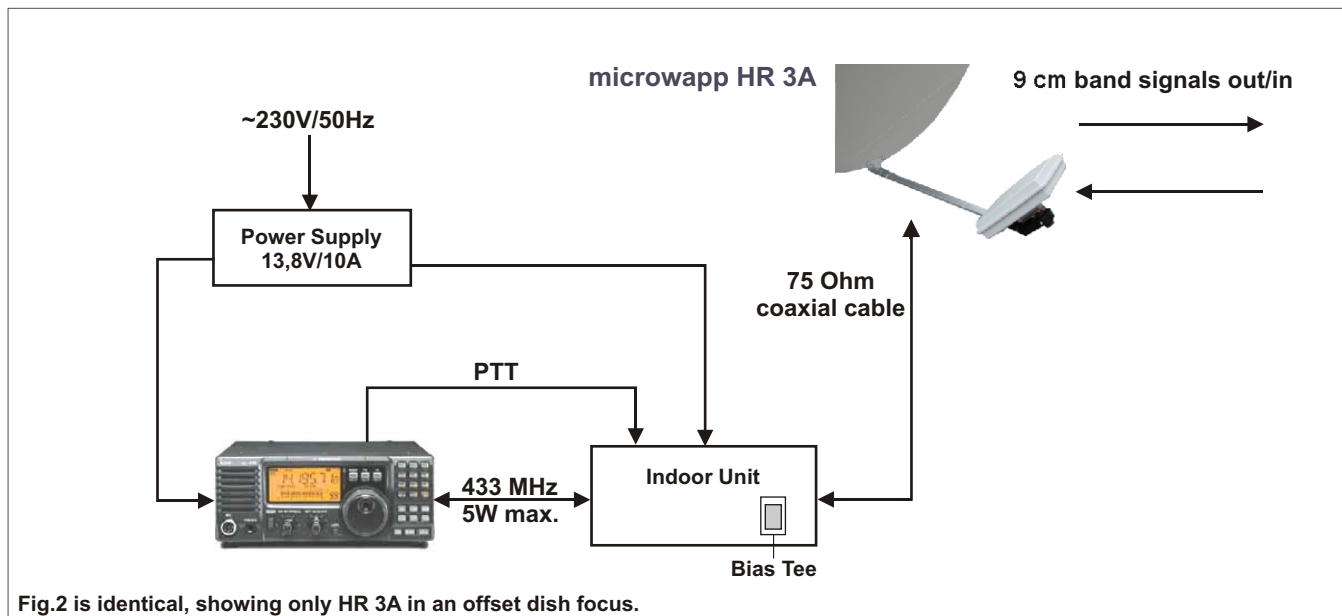
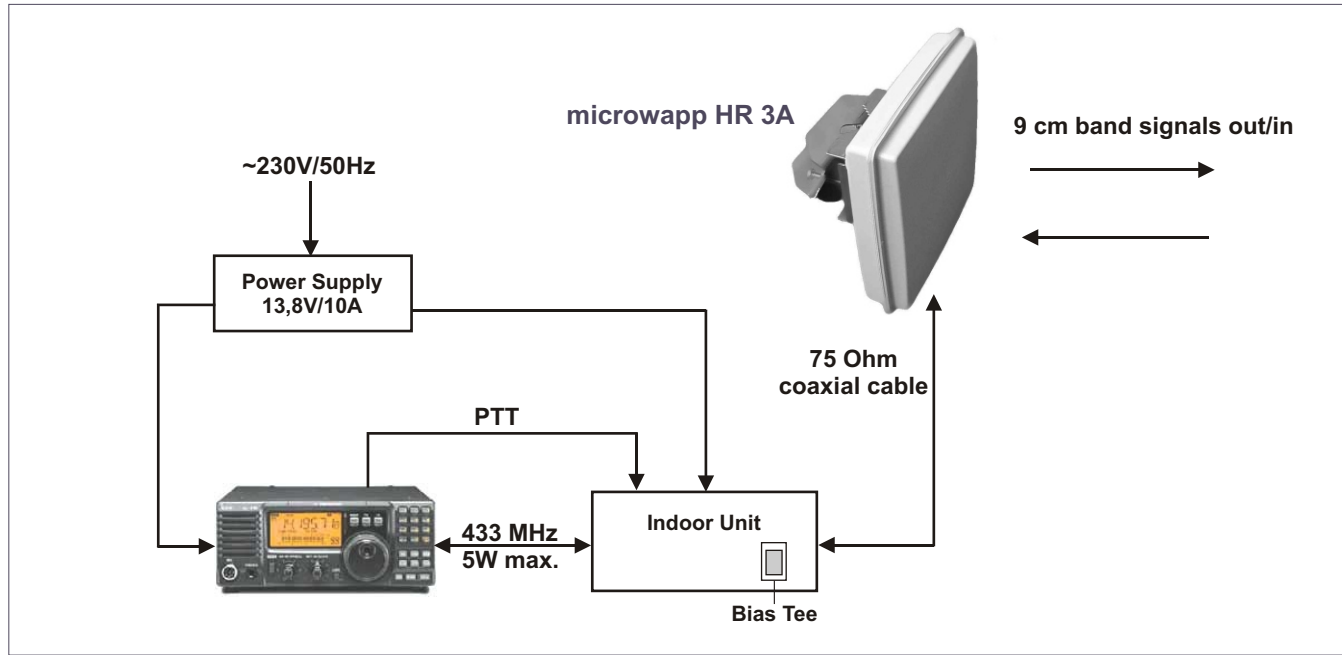


Fig.2 is identical, showing only HR 3A in an offset dish focus.