UK Microwave Group 24GHz Loan Equipment – Basic Description and Operating Instructions.

SYSTEM DESCRIPTION

Built for G3LQR by DC0DA back in the 1990s, it consists of a DB6NT 144 MHz to 24 GHz transverter, an early DB6NT LO and a DB6NT amplifier. A waveguide switch reverses the amplifier around between transmit and receive. The dish and feed are believed to be from ex-BT 18 GHz equipment.

The transverter is connected to the antenna by a short piece of waveguide to form a single robust unit that is easily transported and readily fixed to a tripod.

Around 1W in is needed at 144 MHz for full output of around 10mW at 24GHz and the unit is accurate to within a few kHz after a relatively short warm up period.

A 2m IF of 144.100 MHz corresponds to 24048.100 MHz.

A suitable 144MHz IF transceiver is the Yaesu FT817 but it has been used successfully with a Yaesu FT290 MkII. It is straightforward to use any 2m transceiver subject to the following guidance:

PLEASE ENSURE YOU SET THE TRANSMIT POWER ON THE 144MHz IF RIG TO A MAXIMUM OF 1W AND/OR USE A SUITABLE RF ATTENUATOR ON THE 2m INPUT.

SYSTEM FRONT PANEL

The transverter has the following connectors and controls:

- 12v Supply Banana Sockets
- 144 MHz In/Out BNC
- PTT Audio type Socket
- Standby Switch - STBY
- Manual TX/RX waveguide switch

(The SMA socket marked "TCVR" is not used and can be left unconnected).

The transverter has the following indications:

- "Operate" LED – Green
- RF Output Level Meter

CONNECTING UP THE SYSTEM

Connect a stable 12V-13.8V 2A supply to the front panel banana sockets. Once the 12v supply is switched on the frequency generating circuitry will be active. The "Operate" LED will not be illuminated.

Connect the 2m radio (subject to the guidance above) to the front panel BNC connector.

If automatic PTT (Gnd for TX) is available then connect it to the audio type front panel connector. Otherwise a toggle switch can be plugged into the connector to manually control the PTT line.

OPERATING THE SYSTEM

A soon as a 12v supply is connected and switched on the frequency reference circuitry is active and draws 0.5A dropping to 0.15A after a few minutes. To fully activate the transverter for a QSO the "STBY" switch needs to be operated so that the green LED is illuminated.

1) Check the WG switch is set to the "RX" position.
2) Check that the "STBY" toggle switch is in the up position.
3) Apply 12v supply and allow about 15mins to stabilise.
4) Activate the "STBY" switch and ensure the green LED is illuminated.

The transverter is now in a receive condition. 144.100 MHz on the 2m receiver = 24048.100 MHz to within a few kHz. To switch to transmit:

5) Switch the WG switch to the "TX" position.
6) If manually operated, ground the PTT line. (Audible click and 2m RX noise decreases)
7) Switch the 2m transceiver to transmit.
8) Check that "whistle-up" provides an indication of around 3 to 4 on the RF level meter.

At the end of the over carry out the reverse:

9) Switch the 2m radio to receive and deactivate the PTT line. (Listen for click and 2m RX noise increase).
10) Switch the WG switch back to "RX". (Easy to forget).

The following helps provide confidence that all is well:

Action	**12v Supply Current**	**2m Noise level / Output level**
12v supply applied	0.5 A decreases to 0.15A	N/A
"STBY" activated	0.67A	Large noise increase / N/A
WG switch to TX	0.67A	Decrease in noise / N/A
PTT activated	0.67A	Decrease in noise / N/A
Whistle up	0.67A	N/A / "3 to 4"

IN USE

During 2017 the gear was used to successfully complete several two-way QSO's including one at 65km between the Guildford area and Walbury Hill with S9 signals received both ways. As with any microwave operation it is useful to have a good idea of the correct heading and to be able to operate in a beacon mode for dish alignment. The frequency accuracy of this transverter is excellent and the QSO mentioned above nominally targeted for 144.200 MHz took place on an indicated 144.1975 MHz.

(See: pic.twitter.com/BTBVoola9F)

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