



## Vortex Antenna Systems Remote Antenna Switch (V-RAT) V2.0 Data Information

Vortex Antenna Systems released the 'VRAT' (Vortex Remote Antenna Switch) MKII unit in the Autumn of 2019, however it never saw the light-of-day. The idea was to continue sales and improve on our already very popular MKI version which sold very well. However, shortly after [Steve - G0UIH] decided it was time to retire – hence the MKII was never commercially released as we still had about 15 MKI units [out of 50 or so] assembled in the workshop and ready for sale. The MKII unit was designed by **Steve G0UIH** at Vortex with the RF work by **Camtech PCB** in Haverhill, UK and was a step up from our first commercial unit and included **two major design updates** featured below.

Fifty [50] MKII units were produced and we are happy to offer them to buyers until all are exhausted. Remember – we won't be re-manufacturing any of these. As they say '**When they're gone – they're GONE!!**'

The VRAT consists of two parts, the indoor 'Switching Box' which would normally be located in the shack, and the outdoor/external 'Relay Box'. Both enclosures are professionally manufactured in the UK by '**PEP Engineering**' of Tewkesbury from 2mm aluminum with silk screen graphics and logos.

The switch box also includes fully detachable front and rear panels and LED's showing the output port and the 'Rat's Eyes' on power up. The shack units look really nice and make a pleasant change to the 'Black Boxes' that seem to swamp everyone's shack these days!



The switch operates 6 ports, covers all HF bands and is an impedance-controlled design.

**We have two major changes in the MKII.** Firstly, we've changed relays from big USA 'open frame' units to more a more compact style that's freely available in EU. We looked at many options and chose a very nice compact 25A Fujitsu relay

with a nice wide-gap and 8.5kv surge and standard 5kv insulation between the contacts.  
This should give us well over 4kw as a conservative figure key down without any issues.

Small compact relays have a real advantage in that because of their slim and compact design, big impedance swings don't exist anymore and should give better figures [even usable into VHF].

A second and equally major update is the new V-RAT has the facility to **automatically switch all un-used ports to ground**. The buyer now has the option to select un-used ports as being either '**Open**' which is the normal operating mode, or '**Grounded**' which is ideal for multiband antennas where the unused ports can be grounded by means of an internal jumper. Once the jumpers are set, automatic switching is achieved by a transistor and diode network making the whole thing seamless.

This is ideal if [for example] you have a '**5-Band Quad**' on Ports 1-5 and a 40/80m dipole on Port 6. In this instance, Ports 1-5 would have jumpers enabled. This is really important [especially for multi-band quads] as you don't really want the un-used Ports 'Floating' as it can affect the pattern and front to back of the active band. If the un-used ports are grounded at source – anomalies like this are unlikely to occur.

So, the MKII VRAT was produced and again our partners at '**Camtech PCB Design Services Ltd**' [company now closed as owner also retired 😊] designed the RF side of the PCB and likewise we used the 'PEP' [Tewkesbury UK] designed enclosures which are really first class!

The unit was available with either SO239 (PTFE) sockets as the outputs or 'N-Type' (PTFE) as an option.

Currently the only option available is SO239 sockets as all PCB's have been assembled and of course this unit is now NOS [New Old Stock] – as it's not manufactured anymore.

The control line is via an 8-core cable with 2 plugs [supplied] and 8-pin in-built sockets on the switch and relay box.  
A standard 13.8v DC power supply is all that's needed to power the unit and a DC lead and plug are also included.

As additional user protection, each port has a MOV (**Metal Oxide Varistor**) for additional lightning and static protection and the DC input on the switch box has reverse polarity protection.



# Features List

- VRAT – 6 Port Antenna Switch - 12 Fujitsu FTR-K3-WG Relays (2 per port) each rated 25A each
- Improved frequency coverage. Now covers up to the 6m band [1-54MHz]
- Power Rating – 4kw+ [conservative].
- Good for 2kw+ on 6m [50MHz]
- PCB mounted on 'stand-offs' to enable easier servicing. No de-soldering to un-mount the board
- SO239 chassis mounted sockets (With PTFE dielectric) as standard
- Impedance controlled design (50 ohms) for lower SWR and improved matching
- Designed by 'Camtech PCB' – a professional RF design service from Haverhill, UK
- Superior un-used port isolation by using 2 high-power FTR-K3 wide-gap compact relays per port
- User selectable grounding of un-used Ports. Ports can either be '**Open**' or '**Grounded**' using jumpers
- 2mm Aluminum relay control box and switch box both coated with silk screen graphics
- Operates from a nominal 13.8v DC supply
- MOV's for additional lightning/static protection
- Switch box has reverse polarity protection
- Switch box uses 2A DC high quality UK produced rotary switch [RS Components/CK Switches]
- User can select each port to either '**Ground**' or '**Open**' the un-used port. Ports can be selected individually via 'Jumpers' on the PCB. Ideal when using the switchbox to feed multi-band quads or loops where the user needs to define whether the un-used port is 'Open' or 'Grounded'. Default [Jumper 'Off'] is 'Open'
- The Vortex VRAT MKII is ideal for constructors wishing to source a robust and reliable antenna switching box for multi-band quads or loops, especially for constructors of the **KG6B Quad** design [and the subsequent G0UIH updates] as all the un-used ports can be set to be '**GROUNDED**' when not in use.

