

As Built Note 7 - Antenna Control Unit wiring correction

Reference design Report – Regional HF Station 20161121 (p18-19)

A correction to the circuit diagram and circuit of the MK 2 version description follows. The TX interlock removes the power from only the maglatch relay coils to prevent antenna switching while transmitting. Power (12V) must remain on the line to the selected antenna when the TX ON interlock operates to hold the RF relays in position.

Enable/Inhibit switches have also been added so that under normal operation selection of any ports with no antenna connected can be prevented.

Circuit Description of Antenna Control Unit

The purpose of this unit is to allow the six-position Antenna Selector Switch to be operated both locally and remotely.

Central to the unit's function are the six interlocked magnetic latching relays. These bi-stable devices "remember" the most recent command that was received from either the local push buttons or remotely via the SCADA. Commands are a short pulse (momentary ground) to select the required antenna. Each button has an enable/inhibit switch associated with it. This is so that under normal operation selection of any ports with no antenna connected can be prevented.

The purpose of the transistors is to drive the pulse required by the 6 relays (a total of about 80mA) when an antenna is selected. This means the current sinking required at the inputs (or by the local PB switches is therefore only 8mA.

There is a transmitter interlock provided. When pin 8 of the DB15 or the RCA connector is grounded this energizes the TX inhibit relay which removes the power from the mag-latch relay coils in the unit for the duration of transmitting. This prevents the Antenna Selector RF relays being changed during transmissions. Power (12V) must remain on the line to the selected antenna when the TX ON interlock operates.

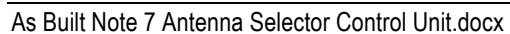
The RCA connector and the 2.1mm 12V power connector are provided to facilitate bench testing. When installed all connections are normally made through the DB15 connector.

The control cable between this control unit and the Antenna Selector Box is an 8 conductor low cost Cat 5e data cable with RJ45 male connectors. This allows the antenna selector box to be located up to 100metres away from the control unit if required. The SCADA cable between this unit and the SCADA unit is 15 conductor with male to male DB15 connectors.

Note the standard for SCADA is to always use female DB15, DB 25 and DIN on the equipment units so that all interconnecting cables are male to male.

Details of the actual phase switching to achieve directivity switching is detailed later under the heading **Antenna Directivity Switching** where the operation of the 4 Square Array Antennas is described.

Bistable Relays: DPDT DIL PCB Mounting RS Stock number 515-571
Spike suppression diode are fitted across each relay coil but are not shown in the circuit below





Bill of Materials for the Antenna Control Unit

Item	Description	Each	Approx Cost
1	Enclosure Jiffy box UB1 black 158x95x53	1	\$5.50
2	Bistable Relays	6	\$42.00
3	PB switch	6	\$12.00
4	LEDs and resistors	6	\$3.00
5	Vero Board	1	\$9.90
6	Transistors and resistors	6	\$3.00
7	Diodes 1N 914 or 1N4148	56	\$ 4.00
8	DB 15 Connector female chassis Mtg	1	\$5.50
9	DB15 Connector male free	1	\$2.50
10	RCA socket	1	\$2.50
11	2.1mm power plug (12v connection)	1	\$2.50
	Total:		\$92.40