

As Built Note 6 four Square controller 20170223

Ref Design Report 20161121 - drawing 14

This note describes a modification to the four Square Controller.

The four square array controllers in their original form contained a Load alarm and associated circuit board. This has been replaced with a simple passive meter sensitivity adjustment through the front panel.

The Four Square Control Unit obtains a 12 Volt supply from the Site SCADA Unit via pin 20 of the DB25 on the Ant Four Square Control Unit. The 2.1mm 12 volt connector on this unit is to assist bench testing and is not the normal supply connection.

Circuit Description

The controller described is used where remote operation is intended. This the unit has the following features:

- Antenna direction switching using 12 volts over low cost computer data cable and RJ45 connectors
- Input and outputs for SCADA on a DB25 connector.
- Momentary push-button selection of antenna direction either at the field end or the base station end.
- Memory of last selected Antenna direction is retained when power is removed from the control unit at the remote site.
- Additional 2.1mm power plug and RCA TX inhibit connectors for bench testing the unit.

If remote operation is not required then a simple 4 position rotary switch would normally be used for local selection of the antenna direction. The extra complexity added by this unit facilitates local and remote control of the Four Square Phase Switcher out at the antenna.

Bistable relays (Maglatch) are used, one for each antenna selection. For example when pushbutton A1 is depressed momentarily, bistable 1 (BS1) switches and applies 12v to output RJ45 pin 1. At the same depression BS2, BS3 & BS4 have a pulse applied to their coils to deselect them. Similarly when A2 is depressed momentarily, BS2 switches power to RJ45 Pin 2 and at the same time a pulse is applied to BS1, BS3, & BS4 to deselect them. An LED across each output on the RJ45 indicates which output is active (with 12v on it).

The relay contacts wired to the DB 25 pins 14,15,16, & 17 are used to tell the SCADA the status of the bistables in this box.

When DB25 pin 6 (or TX RCA) is earthed power is cut from the the bistable relay coils so that antennas cannot be changed while transmitting. The RCA connector is not normally used but is to assist during bench testing of the unit.

Any RF power flowing into the Load in the Four Square Phase Switcher Unit is rectified to provide a DC voltage and comes back to the control unit on pin 5 of the RJ45 to drive the "Balance Load" meter on the unit. This voltage also is fed out on pin 7 of the DB25 to supply an A to D converter in the Site SCADA Unit to provide a RF level indication back to the Base Node.

