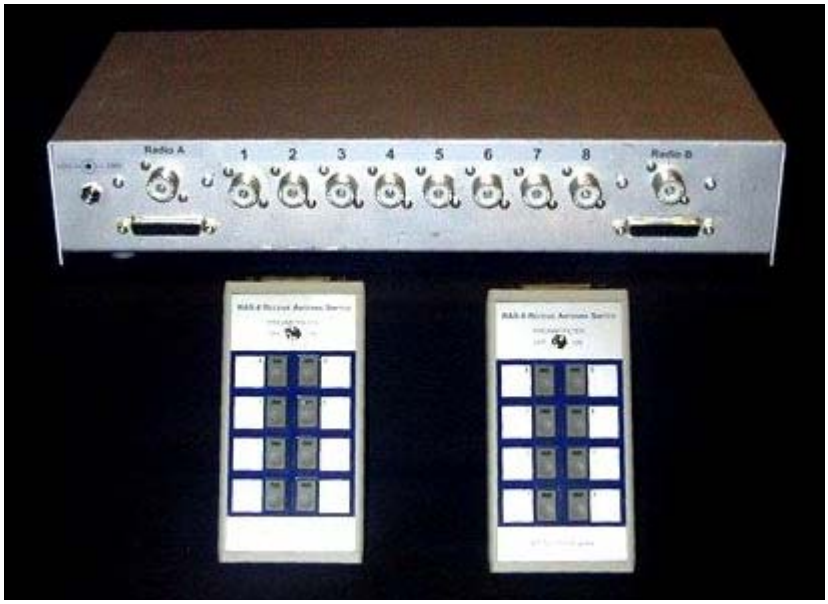
Installation Instructions:

AY Technologies
RAS-8x2 Receive Antenna Switching System



The RAS-8x2 provides flexible switching for your receiving antennas. Eight antennas can be routed to either of two radios, selected with remote keypads that fit easily into your shack. The standard preamp/filters for each radio provide 13-15 dB gain and filtering for 1.8-4.5 MHz (160M & 80M). When the preamps are OFF, the filters are also bypassed and the unit may be used on any frequency <0.5 MHz to 30 MHz.

The RAS-8x2 is provided with the input impedance of your choice: 50 or 75 ohms. Un-selected antennas are terminated with this impedance. Typical receive antennas are not very sensitive to termination impedance—and many receivers do not have true 50 ohm inputs—but it is important in a few situations, such as two-wire reversible Beverages. Otherwire, you can use any impedance antenna, as there is no discernible extra loss or reduced isolation with either impedance choice.

Included in this package:

(1) RAS-8x2 metal relay box and (2) pushbutton control keypads. Check the relay box to be sure that the connector types are what you ordered for the antenna inputs and receiver outputs (UHF, F or BNC).

You will also need:

12 VDC @ 500 mA (max.) to the 2.1 mm DC jack on the relay box.

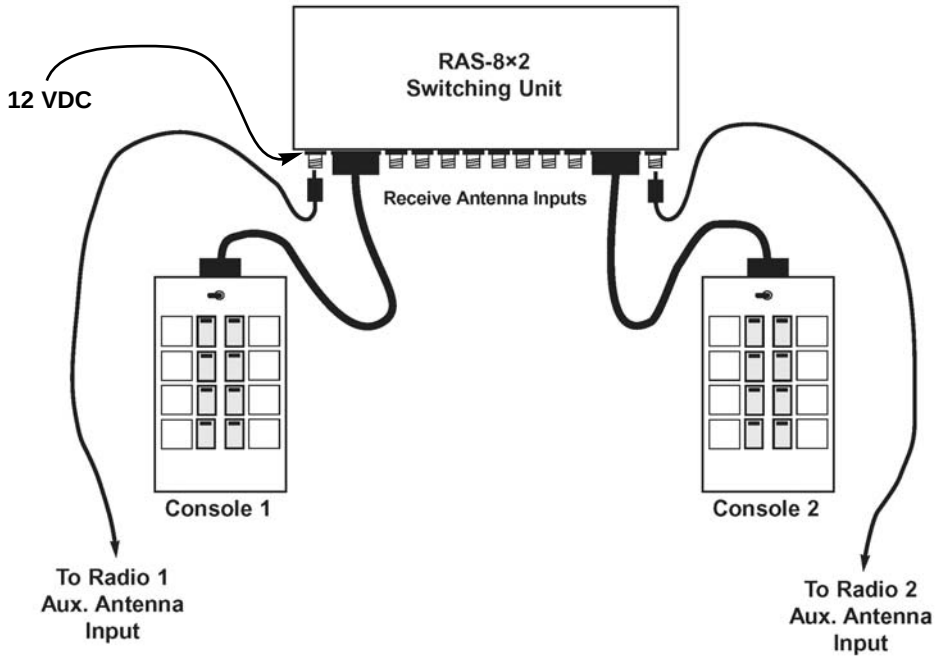
(2) Appropriate coax cables to run from the relay box to the auxiliary antenna input for each radio.

(2) DB-25 cables of the desired length, with male connectors on each end. Note: Some DB-25 cables are intended for serial data and do not have all 25 conductors. Cables identified as “extension” or “switch box” should be OK.

Installation instructions begin on the following page

INSTALLATION

Installation is easy — you just connect the antennas, the control keypads, receivers and DC power. The instructions below provide the details. The sketch below shows the basic connection scheme. The photo at the bottom of the page shows the relay box connections:

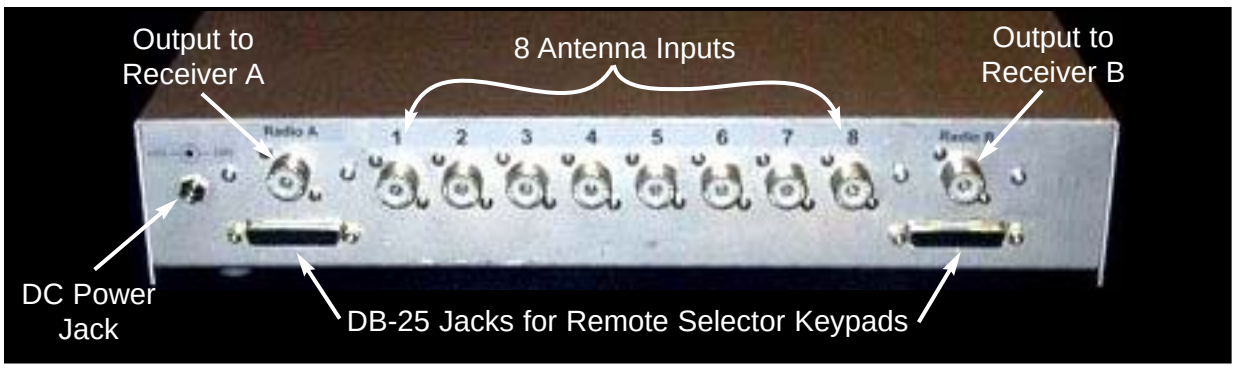


Installation Procedure:

- Choose a location that is accessible for the coax cables from your receiving antennas, yet not too distant from the radios and your operating position.

- To minimize RF and static problems, the antenna cables should be grounded where they enter the building. If the antennas and the rest of you equipment are properly grounded, the relay box usually will not need an additional ground — it will be grounded via the coax shields and DC common. If the antenna coaxes are not grounded near the building, you should ground the RAS-8x2 relay box using one of the screws on either side of boxes as the connection point. All station ground connections should go to a single point, or to a low inductance ground strap.

- Measure the distance required to run the two DB-25 control cables to the remote keypads and the coax cables to the radios. To be sure, we recommend that you run a piece of wire or rope along the cable's path, mark it, then remove it and measure the length. Leave enough extra to move the equipment around for maintenance, plugging in cables & accessories, etc.



- Obtain the necessary control and receiver cables and run them from the relay box to the receivers and to the location where the keypads will be placed.

- Connect the DB-25 cables to the keypads.

- Run 12 VDC from the station power supply (fused at 1/2 amp), or from a plug-in power supply ("wall wart") to the DC input connector on the relay box. A DC power plug is provided, should it be needed.

- When DC power is first applied, no antenna is selected and the LED indicators on the keypads will be blank. Once one of the pushbuttons is pressed, it will light up. Check operation of the keypads by pressing each of the eight buttons, one after another. You should be able to hear the relays clicking inside the relay box.

- Connect your antennas to the relay box inputs. Arrange them by number in a manner that you will understand. Most operators arrange them by direction. Antennas should be suitably protected from excessive RF and static-induced surges. We recommend that you disconnect them completely when threatened by lightning.

- Test the unit by listening on your receivers and selecting the various antennas.

- Test each preamp/filter by turning it on and off from the keypad. An increase in signal and/or noise will be evident. Note that the preamp/filter is completely bypassed when "off," which allows listening on other frequencies.

- When you have determined that the unit is operating properly, and you have the antennas connected as desired, identify the antennas in the spaces provided on the keypad. You can mark on small squares cut from stick-on labels, or write directly on the panel using a fine point permanent marker. If needed, the markings can be cleaned off with rubbing alcohol; glue residue from labels can be cleaned with "Goo Gone" or a similar cleaner.

OPERATION

- Push the button on the antenna selector keypad to choose the antenna to be routed to that radio. The new antenna is selected and the previous antenna is disconnected instantly.

- The preamp/filter is operated with the ON/OFF toggle switch on the keypads. Remember that the 12 dB preamp and the bandpass filter operate together. When off, the preamp/filter is bypassed with a relay.

- When power is removed, all antennas are disconnected from the receivers, and routed to terminating resistors. After applying power, no antenna will be connected until one is selected using the remote keypad.

Parallel antennas:

The RAS-8x2 can select more than one antenna at a time for each receiver. By pressing two pushbuttons, then releasing them at exactly the same time, both antennas will be connected to that receiver. You may need to practice this to get the right timing; a successful parallel connection will illuminate the LEDs for both antennas.

Why parallel antennas? Some installations with multiple Beverages can benefit from placing two of them in parallel. Like any phased array, this requires planning and design in antenna placement and feedline length. In an existing installation with several antennas, you might be lucky and find a combination of antennas that provides useful new coverage.

Useful applications of this feature include selecting individual Beverages or connecting them as a phased pair — or combining two Beverages in-phase to get a new pattern that provides coverage between the main directions of each.

Note on Impedance:

Although your RAS-8x2 was wired at the factory for either 50 or 75 ohm impedance, this is done primarily to assure that unused antennas are terminated in the proper impedance. This is essential for best performance when using bi-directional “two-wire” beverages.

The choice of impedance does not prevent you from using it with a different impedance antenna. There may be a very small change in signal level when switching, and a small reduction in receiver-to-receiver isolation when both radios have selected the same antenna. However, these slight performance changes will not be noticeable in normal operation.

Custom Options:

The most common customization is in preamp gain and/or filter passband. Preamp gain can be set at 10 to 18 dB, and nearly any filter requirement can be met. Also note that the RAS-8x2 operates normally down to 0.5 MHz or lower for other Medium Wave receiving applications.

We are able to adapt the basic RAS-8x2 for additional capabilities. For example, we have designed band-splitting diplexers and triplexers that allow the addition of a second or third RAS-8x2 unit — resulting in a system that supports two 160M radios, two 80M radios, plus 40M and higher bands for two radios. Any of these radios can independently select any of the eight antennas.

We have also designed both passive and amplified 2-way and 4-way power dividers that can create a “switch matrix” with any of the (8) antennas available to any of two, four or eight receivers. Please note, this type system has tradeoffs in high dynamic range and low insertion loss performance.

Please contact us with your custom requirements

Contact AY Technologies with any installation or operation problems

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