

Sometimes a great notion. If your station is comprised of ICOM gear, here's a device you can build for it that will create an automatic antenna switch.

How To Build An Automatic Antenna Switch For ICOM Transceivers

BY ART RIDEOUT*, WA6IPD

At my station I have five antennas covering 160 through 10 meters. Each antenna is selected by the use of an Ameritron five-position remote coax switch. The system works well, except that I frequently surf, and when I do, I have to constantly change antennas via the manually operated coax switch. To alleviate this constant aggravation, I have designed a simple electronic antenna

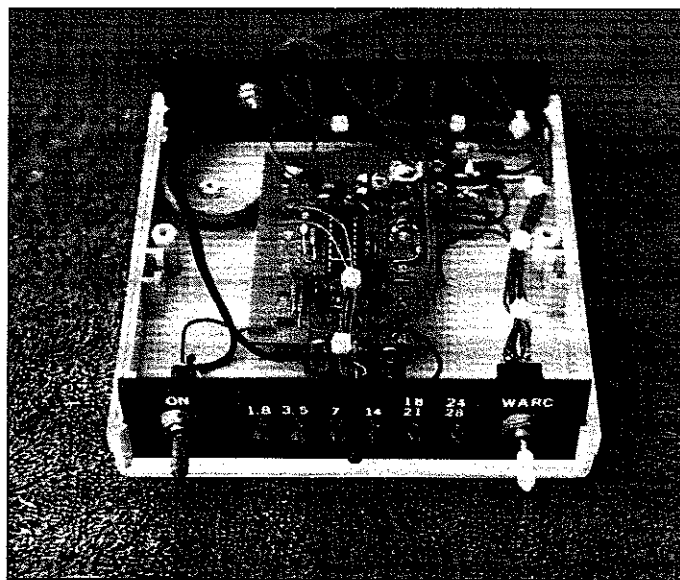
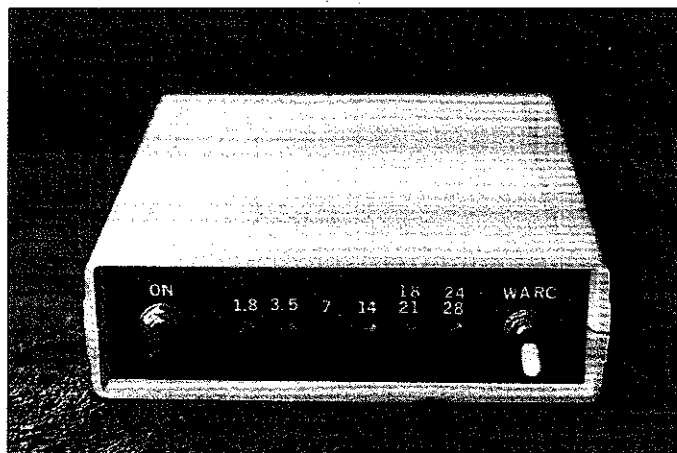
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switch that automatically turns on with my transceiver and then automatically selects the correct antenna.

Description

ICOM transceivers have accessory connectors on the rear to provide the various voltages and signals for accessory equipment. One of the voltages provided is for switching automatic antenna tuners and linear amplifiers. The voltage is in steps between 1.2 and 8.0 volts, corresponding

to the bands between 1.8 and 28 MHz. In this design, the voltage which is from pin 4 of ACC(2) is applied to the input of an LM-3914 IC. The output of the IC is used to activate transistors which are used as switches to provide 12 volts DC for the remote coax relays. For example, if I switch my transceiver to the 14 MHz band, I get a voltage of 4.0–4.5 at pin 4 of ACC(2). This voltage is applied to input pin 5 of the IC, which will activate a switching transistor connected to IC pin 16. The 12 volt out-



(Top left)- Front view of the completed project. It makes a nice addition to the shack.

(Top right)- The interior view shows the open nature of construction using readily available components.

(Bottom left)- The rear view shows the simple barrier strip hook-up.

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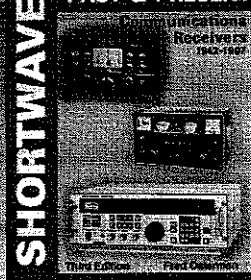
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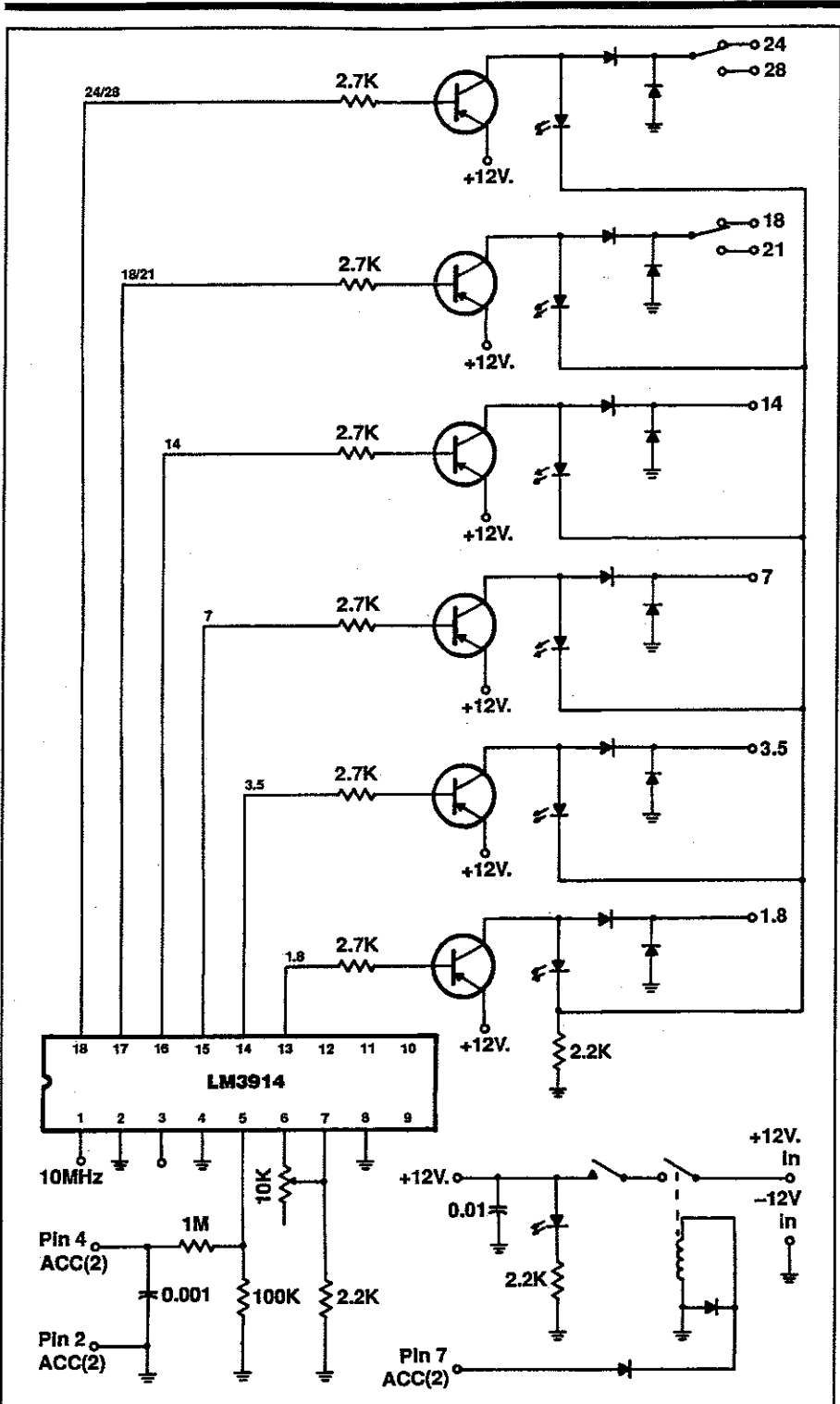


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Abbreviated Parts List

- Transistors: MPS2907
- Integrated circuit: LM-3914
- LEDs: 5 mm 10 ma @ 2 V
- Diodes: 1N914
- Resistors: all 1/4 watt 5%
- Capacitors: disc ceramic

I recommend three sources for parts: DC Electronics, 1-800-467-7736
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Fig. 1— Schematic diagram for the automatic antenna switch.

put from the switching transistor then activates the remote 14 MHz antenna relay.

Construction

This unit is very simple to construct. I mounted the components on one half of a RadioShack printed circuit board and used one of their project boxes as a case. If you drill the holes for the LEDs slightly small and then carefully ream out the holes, the LEDs can be pressed into the front panel with no glue necessary. A 10K ohm PC-mount potentiometer is installed between pins 6 and 7 on the IC. This is a scaling adjustment and is adjusted so that only one LED is lit at a time. Setting this control to 4K is a good starting point. Approximately one volt will be dropped across the switching transistor, so the power source should be at least 13 volts. I found the wall-plug 12 volt power supplies usually provide an output voltage of between 13 and 16 volts, which is excellent. The supply should have a minimum rating of 300 ma. Also use caution connecting the supply. If you reverse the polarity to the IC, it will not forgive you.

Pin 7 on ACC(2) provides 12 VDC when the transceiver is operating. I use this voltage to operate a small relay, thus providing an automatic power-on feature. You will note that I did not include the 10 MHz band. This was a personal choice, but if you wish, you can easily include this band by duplicating the output circuitry and connecting to IC pin 1. The LEDs are connected to a common 2.2K resistor because only one LED at a time will be activated. The transceiver output voltages for the WARC bands are the same as those for the 21 and 28 MHz bands. To make this operate, a DPDT switch is mounted on the right of the front panel. See the schematic for switching details. MARS operators might want to use a 3-pole double-throw for this switch, because when the transceiver is tuned above 4 MHz, the 7 MHz antenna is automatically selected.

Operation

The 12 volt switched output from each transistor terminates on a rear panel terminal strip. At this point the outputs may be jumpered together if necessary. For example, if you use a triband beam, then you will want to jumper the 14, 21, and 28 MHz output terminals. As you change bands and wish to operate on the WARC frequencies, it will be necessary to flip the right-hand switch to the up position. This is in accordance with Murphy's Second Law, "Nothing will ever be perfect."

With nearly everything automated in today's transceivers, about the last thing that can be automated is the selection of the antenna. This circuit does that. Once you enjoy the ease of automatic antenna switching, you will want nothing less. ■

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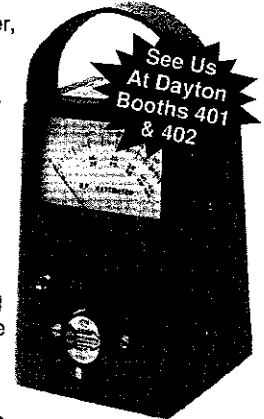
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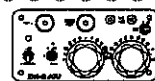
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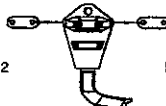
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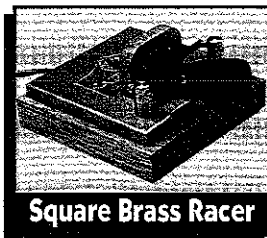
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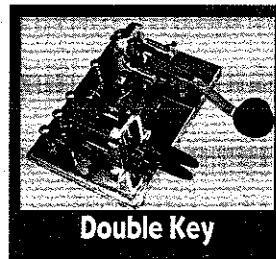
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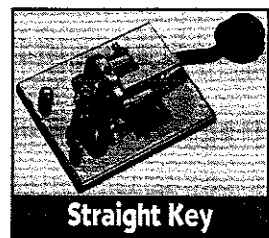
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