UM Unified Microsystems

BCD-14 Automatic Band Decoder
User's Manual
Revision 1.00
April 2012

Specifications
Size 2.3" X 2.6"
Input logic levels: 0/5V
Output: 12VC-24VDC, Open Collector (grounding), 500ma max
Logic Power: 12V
Relay Power 12-24 VDC

Overview
The BCD-14 decodes the BCD (binary coded decimal) signals from the radio or computer to automatically select antennas, filters, etc.

The input signals are standard 5V TTL/CMOS and are compatible with the K3, certain Yaesu® radios and logging programs such as N1MM. To provide maximum isolation between the radio or computer and the antenna switching system, the inputs are optically isolated from the decode logic and relay drivers and power supply.

The outputs are grounding type open collector. One output will be active, depending on the input signals. Outputs can be wired OR'd to select a single antenna for multiple bands. For example one relay may be used to select your tribander. With two jumpers on the BCD-14, the relay will be activated whenever your radio is set to 10, 15 or 20 meters.

The BCD-14 grounds the selected relay coil. This is known as low side switching. Some antenna and relay switches are designed for high side switching. With high side switching, each relay is grounded, and voltage is applied to the selected relay. You will need to build or buy a converter to use a high side switch. The Unified Microsystems HSD-9 is a transistorized module to perform this function.

Power
The logic portion of the BCD-14 requires a nominal 12VDC (9.0V-14V). Power for the logic is applied through the pads GND and +12V at J4. Power for the relays is applied to the pads GND and +VR at J3. This will be typically +12V or +24V, depending on the relays used in your system.

Note that there is a common ground for the logic and relay power. If you are using +12V for your relays, you can power both the relays and logic with the same power supply by installing a wire in jumper G1 (see Figure 1 for location of G1). The power can then be applied in either the logic or relay power pads at J3 or J4.

Inputs
The inputs are 5V logic level compatible. This is compatible with Yaesu band outputs, and computer printer ports (LPT). Connect the computer or radio ground to the BCD-14 COMM pin, and the four signals to the inputs A-D located at J2. Input A is the least significant bit, and Input D is the most significant bit.

Outputs
The output solder pads are located at J1. The outputs are grounding type open collector. They are rated at 50V, 0.5 A In normal use the voltage will be 24V or less and the current will be less than 200ma, resulting in high reliability.

The standard band definitions are printed next to the output pad. The relay to select a given band is connected to the corresponding band pad. For convenience, relay power pads are available adjacent to the output pads. They are labeled +VR.

Table 1. Input-Output Logic Table

D	C	B	A	Logic Value	Active Output
0	0	0	0	0	AUX0
0	0	0	1	1	160M
0	0	1	0	2	80M
0	0	1	1	3	40M
0	1	0	0	4	30M
0	1	0	1	5	20M
0	1	1	0	6	17M
0	1	1	1	7	15M
1	0	0	0	8	12M
1	0	0	1	9	10M
1	0	1	0	A	6M
1	0	1	1	B	2M
1	1	0	0	C	440
1	1	0	1	D	AUX13
1	1	1	0	E	Unavailable
1	1	1	1	F	Unavailable

0 = 0V, 1 = 5V

Multi-band antenna configuration

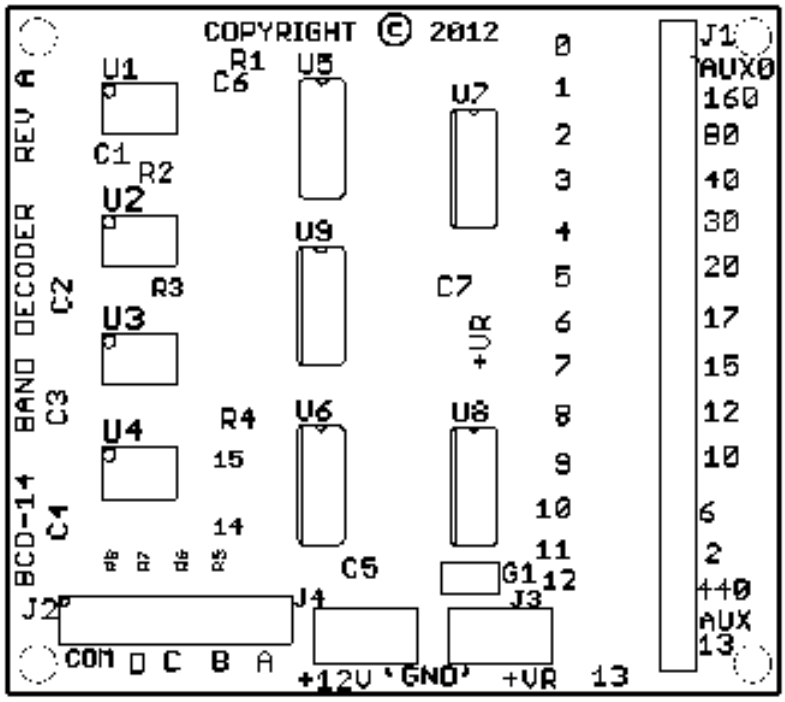
Since the outputs are open collector, they can be wired OR'd. This allows using a single antenna selection on multiple bands. There are a series of solder pads next to the output pads. Jumper the corresponding configuration pads to combine bands. Any number of bands may be combined. The relay to select a group of bands may be connected to any one of the combined band group pads.

Table 2. Wiring Input and Output Definitions

Name	Type	Definition
COMM (J2)	Input	Decode control signal ground
A (J2)	Input	Decode control signal, binary value 1
B (J2)	Input	Decode control signal, binary value 2
C (J2)	Input	Decode control signal, binary value 4
D (J2)	Input	Decode control signal, binary value 8
GND (J3 & J4)	Ground	Logic and relay power ground
+12V (J4)	Power	BCD-14 Logic power
+VR (J3)	Power	Relay Power
AUX0 (J1)	Output	Not normally used
160 (J1)	Output	160M band select
800 (J1)	Output	80M band select
40 (J1)	Output	40M band select
30 (J1)	Output	30M band select
20 (J1)	Output	20M band select

17	(J1)	Output	17M band select
15	(J1)	Output	15M band select
12	(J1)	Output	12M band select
10	(J1)	Output	10M band select
6	(J1)	Output	6 M band select
2	(J1)	Output	2 M band select
440	(J1)	Output	440 MHZ band select
AUX13 (J1)		Output	Not normally used

Figure 1. BCD-14 Part Placement



Testing and Help

Note that the BCD-14 has open collector outputs. You can't just hook up power and the inputs and measure output voltages with a voltmeter. If you want to test your circuit before connecting the relays, connect a 1K pull up resistor between the output and +12V. You can then check the outputs with a voltmeter or oscilloscope.

If you have questions or need help, email w9xt@unifiedmicro.com. Please put "BCD-14" in the subject line for fastest response. Also check the FAQ document at http://www.unifiedmicro.com/BCD_FAQ.pdf

Warranty Information

Unified Microsystems warrants the components workmanship of the BCD-14 for a period of 1 year from the date of purchase. A copy of the receipt must be included with any units returned for warranty repairs.

Unified Microsystems will, at its option, repair or replace defective units returned during the warranty period. Unified Microsystems reserves the right to change specifications of it products at any time without notice.

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