

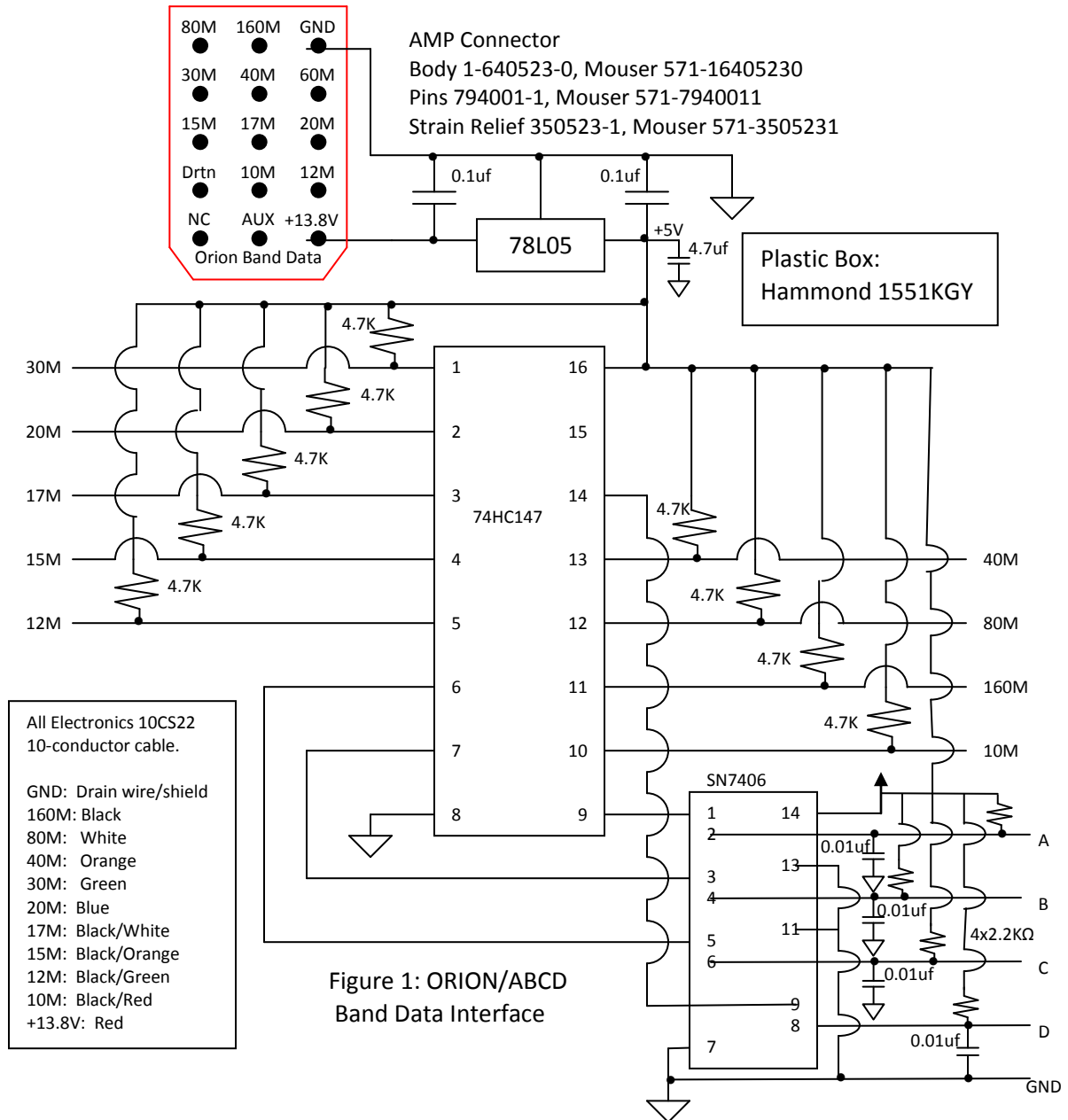
Orion Interfaces: Yaesu/Elecraft BCD and ICOM Band Voltage
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The Orion I&II Band Data output consists of individual band open-collector outputs that saturate for each band. This does not interface easily with many of the automatic antenna switches and automatic band-switching amplifiers available. Standard interfaces include the binary decimal coded interface (Yaesu ABCD or Elecraft 0123), and Band Voltage or CI-V (ICOM).

The BCD interface maps 160-6 meters sequentially as follows: 160M: 0001, 80M: 0010, 40M: 0011, 30M: 0100, 20M: 0101, 17M: 0110, 15M: 0111, 12M: 1000, 10M: 1001, and 6M: 1010. 60 meters may be recognized by some interfaces as 0000. Figure 1 is the schematic of an interface that converts the Orion band outputs to the BCD plan (60 meters is not mapped). Table 1 is the parts list. The 74HC147 10-to-4 line priority encoder inverted output feeds a SN7406 hex inverter whose open collector outputs have pull-ups to 5VDC to provide the standard 5V data interface.

Table 1: Orion/BCD Band Data components

<u>QTY</u>	<u>Description</u>	<u>Mouser Part Number</u>	<u>Price each</u>
1	74HC147	771-74HC147N	\$0.29
1	SN7406	595-SN7406NE4	\$0.97
1	78L05 voltage regulator	512-LM78L05ACZXA	\$0.23
1	16 pin IC socket	517-4816-3004-CP	\$0.20
1	14 pin IC socket	517-4814-3004-CP	\$0.13
9	4.7K Ω ¼-watt resistor	660-MF1/4LCT52R472G	\$0.07
4	2.2K Ω ¼-watt resistor	660-MF1/4LCT52R222G	\$0.07
2	0.1uf disk capacitor	81-RPER71H104K2P1A03	\$0.32
4	0.01uf disk capacitor	581-SR215C103K	\$0.24
1	4.7uf electrolytic capacitor	667-EEA-GA1H4R7	\$0.22
1	Plastic Box	546-1551KGY	\$2.00
1	AMP Plug Housing	571-16405230	\$1.76
1	Strain Relief	571-3505231	\$4.40
10	Female pins	571-7940011	\$0.38
1	¼" grommet	534-739	\$0.17
1	3/16" grommet	534-731	\$0.14
1ft	10-conductor shielded cable	All Electronics 10CS22	10ft/\$6.20
5ft	5-conductor shielded cable	All Electronics 5CS22	10ft/\$3.70
1	Perf-board (cut to size)	All Electronics PC-3	\$1.50



All circuitry is built on a 1.3" x 2.4" piece of perf-board. This provides the necessary room for the components, and fits nicely into the 3.15 x 1.58 x 0.79 plastic box called out in the parts list. Most of the resistors and capacitors are mounted vertically to save room. Place grommets on the input and output cables before stripping the cable. Nibble 0.3"-wide slots in the plastic box with a nibbling tool so the grommets can be slipped in-place. Photo A shows the slotted plastic box, Photo B shows the perf-board with all components mounted, and Photo C shows the completed assembly. When finished, add a few blobs of hot glue to hold the perf-board firmly in place. A little hot-glue on the inside of the grommets will also provide cable strain relief.



Photo A: Slotted box

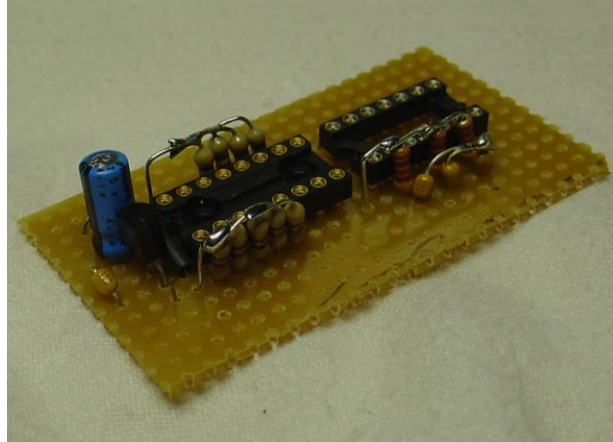


Photo B: Components mounted on perf-board

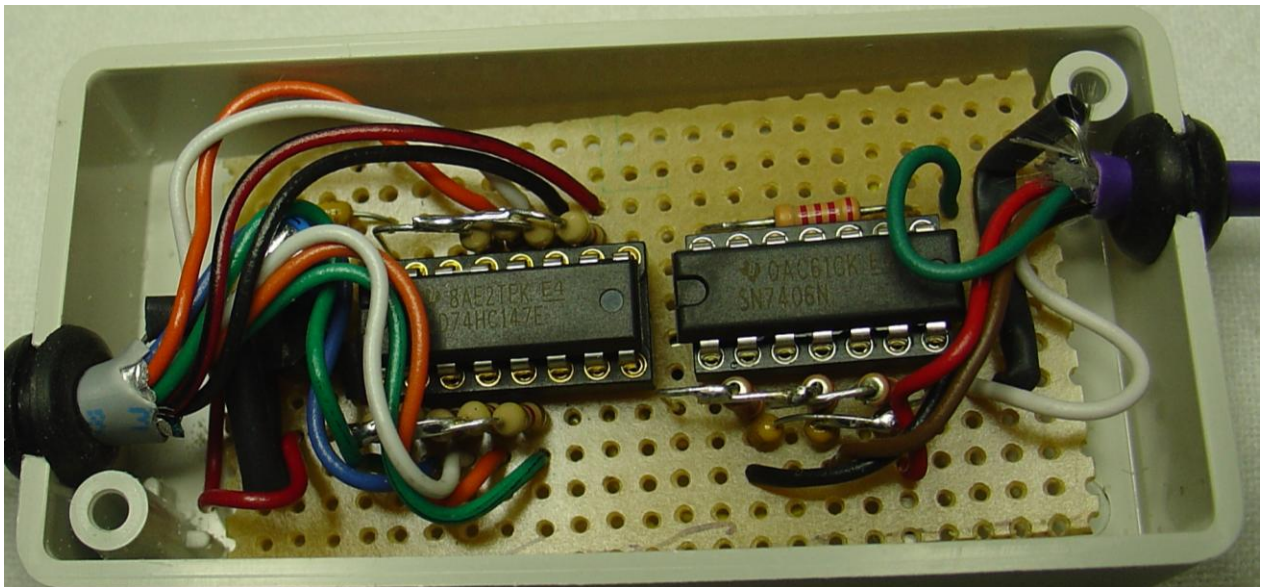


Photo C: Final completed assembly

Figures 2-5 show the connector interfaces for popular solid-state amplifiers (Tokyo Hi-Power HL1.5 and HL2.5, Elecraft KPA500, and the Ameritron ARI-500 used with the ALS-500/600/1300 amplifiers).

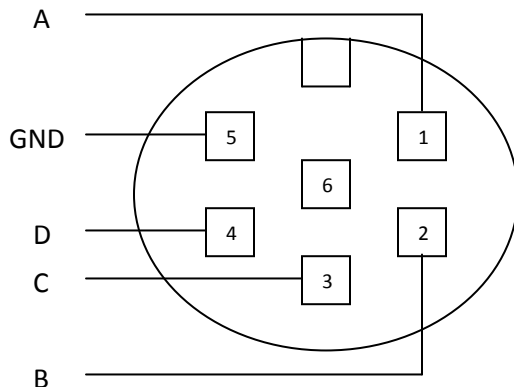


Figure 2: THP HL-1.5Kfx Band Data, DIN6P or DIN5P/240 deg. Solder-pin view

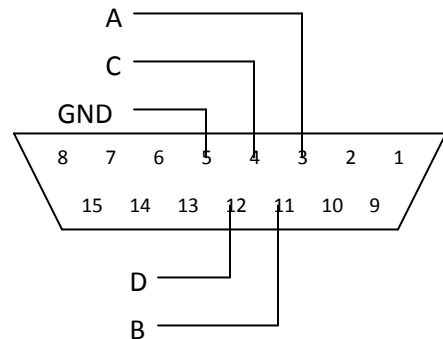


Figure 3: THP HL-2.5Kfx Band Data, DB15P. Solder-pin view

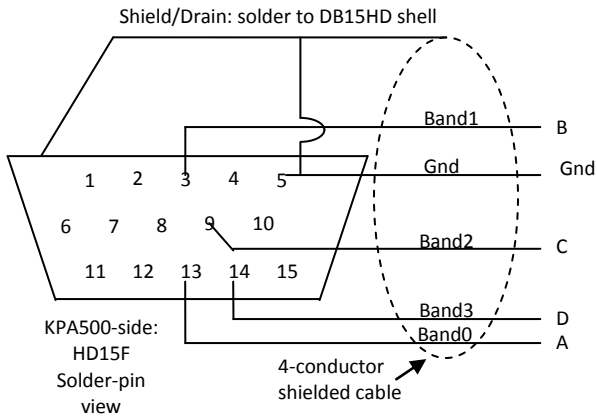


Figure 4: Elecraft KPA500, DB15HD Female. Solder pin view.

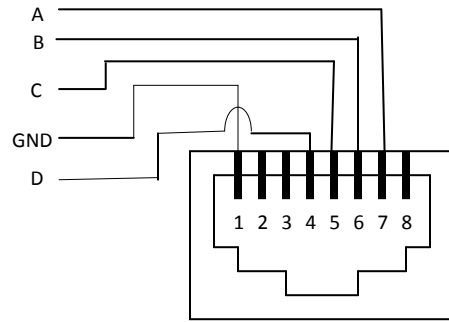


Figure 5: Ameritron ARI-500, RJ45

The BCD interface works well for interfacing the Orion with Yaesu and Elecraft amplifiers, and many remote antenna switches. However, if you have an ICOM amplifier (such as a PW1) you need either ICOM band voltage or CI-V. The ICOM band voltage interface is the easiest to implement. The schematic is shown in Figure 6. The disadvantage of this interface is that 15 & 17 meters are decoded as the same band, as are 12 and 10 meters.

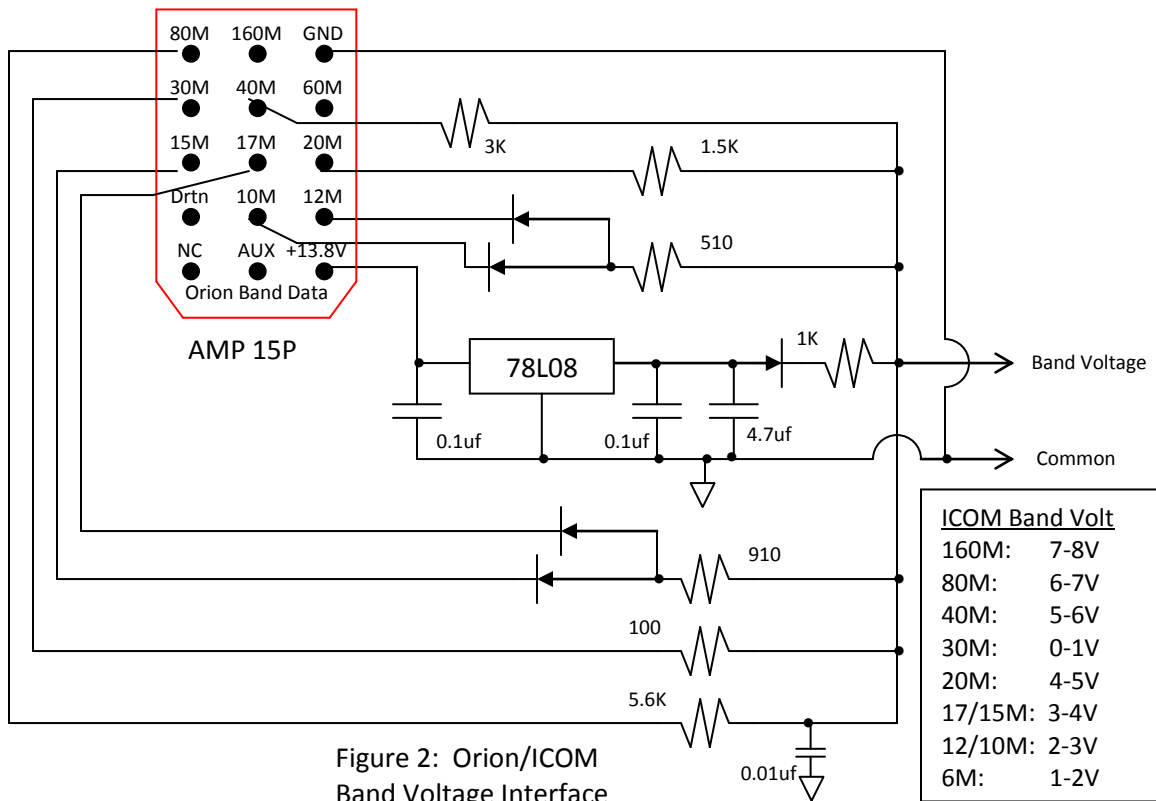


Figure 2: Orion/ICOM Band Voltage Interface

<u>QTY</u>	<u>Description</u>	<u>Mouser Part Number</u>	<u>Price each</u>
1	78L08 voltage regulator	512-MC78L08ACP	\$0.20
5	1N5711 shottky diodes	511-1N5711	\$0.11
1	3K Ω ¼-watt resistor	660-MF1/4LCT52R302G	\$0.07
1	1.5K Ω ¼-watt resistor	660-MF1/4LCT52R152G	\$0.07
1	510 Ω ¼-watt resistor	660-MF1/4DCT52R5100F	\$0.06
1	1K Ω ¼-watt resistor	660-MF1/4LCT52R102G	\$0.07
1	910 Ω ¼-watt resistor	71-CCF07910RGKE36	\$0.09
1	100 Ω ¼-watt resistor	660-MF1/4DCT52R1000F	\$0.06
1	5.6K Ω ¼-watt resistor	660-MF1/4LCT52R562J	\$0.07
2	0.1uf disk capacitor	81-RPER71H104K2P1A03	\$0.32
1	0.01uf disk capacitor	581-SR215C103K	\$0.24
1	4.7uf electrolytic capacitor	667-EEA-GA1H4R7	\$0.22
1	Plastic Box	546-1551KGY	\$2.00
1	AMP Plug Housing	571-16405230	\$1.76
1	Strain Relief	571-3505231	\$4.40
10	Female pins	571-7940011	\$0.38
1ft	10-conductor shielded cable	All Electronics 10CS22	10ft/\$6.20

Conclusion

The above circuits provide standard band data interfaces for the TenTec Orion I/II transceivers. The BCD interface is the most usefull, but the Band Voltage interface may be necessary if you have an ICOM solid-state amplifier..