

## Buffer the Tokyo Hi-Power HL-1.5/2.5KFX Band Data Inputs

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Many popular transceivers output BCD band data for controlling auto-band switching of newer solid-state amplifiers and/or external band decoders used for driving antenna switches. The popular THP HL-1.5KFX and HL-2.5KFX solid-state power amplifiers have these BCD band data inputs. However, the THP amplifier band data inputs interface directly to an internal microprocessor with no isolation from external driving sources. Everything is fine as long as the amplifier is powered on. But when the amplifier is powered off, one of two things will occur:

- 1) When driven with typical open-collector BCD outputs with pull-up resistors, the THP amplifier will load down these outputs so any parallel-connected external band decoders will not operate properly.
- 2) When driven with a high-current driver, the driving current device can power-up the processor in the turned-off amplifier resulting in some LEDs lighting on the amplifier.

Fortunately, you can externally isolate the THP band data inputs. The easiest fix is for the HL-2.5KFX. This amplifier has internal pull-up resistors on the band data inputs. Therefore, all that is necessary is to add isolation diodes in-line with the amplifier band data inputs as you can see in Figure 1. Everything can be built into a small utility box. I chose to use a female DB9 connector on the transceiver-side of the box as you can purchase a 6-foot M/F DB9 cable very inexpensively ([www.cablewholesale.com](http://www.cablewholesale.com) 10D1-03206), cut-off one end, and then add your rig's band-data interface connector to the cut-off end. Then you can use an inexpensive DB9 splitter cable ([www.cablewholesale.com](http://www.cablewholesale.com) 30D1-27208) to provide parallel band-data outputs for both the amplifier and an external band decoder for controlling external antenna switches.

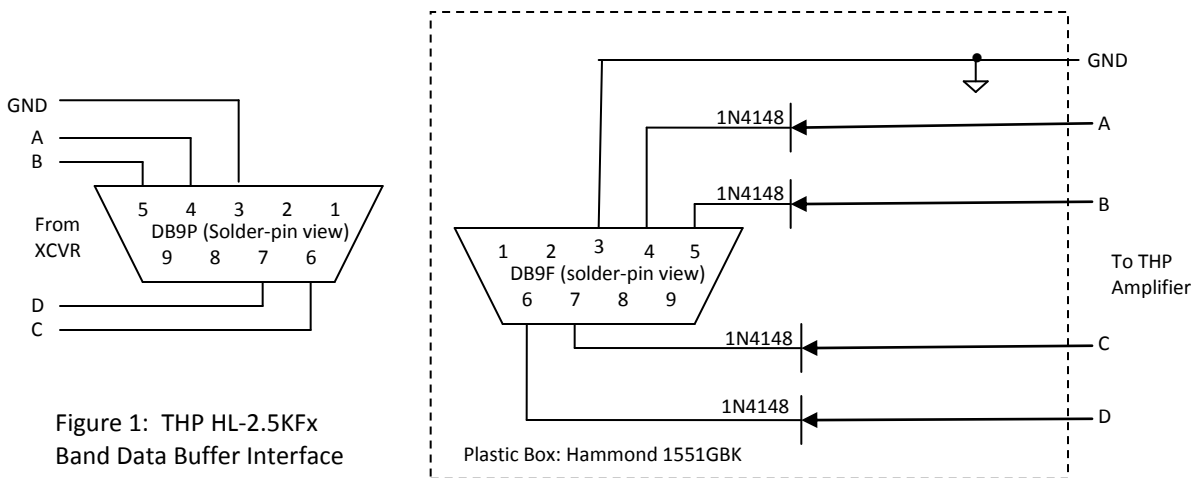
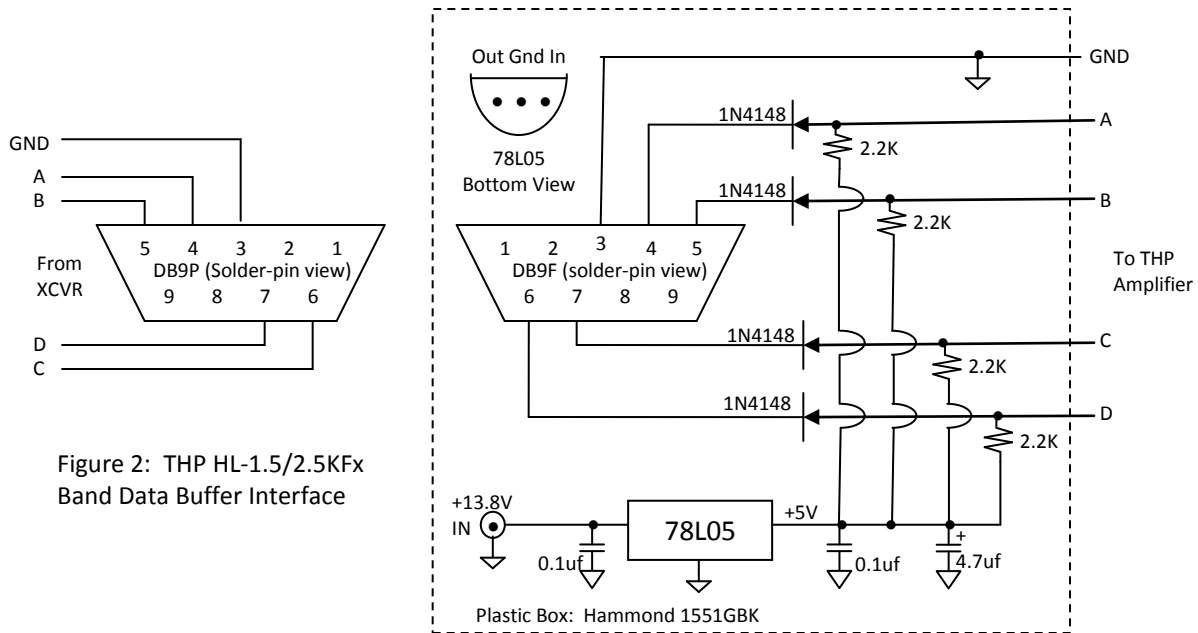


Figure 1: THP HL-2.5KFX  
Band Data Buffer Interface

Isolating the band data inputs of the THP-1.5KFX buffer is a bit more difficult. This is because the THP-1.5KFX band data inputs don't include pull-up resistors. Therefore, if you simply place isolation diodes in series with the amplifier band data inputs there will be no way to provide a logic "1" to any of the band data inputs – and you may even have poorly defined logic "0" inputs. So you must provide both pull-ups and isolation diodes in the external interface. Figure

2 shows a solution that works with both the HL-1.5KFx and HL-2.5KFx amplifiers. Note that you must provide an external +13.8VDC from your station supply for this interface box.



Photos A & B below show the internal wiring, and the completed unit.

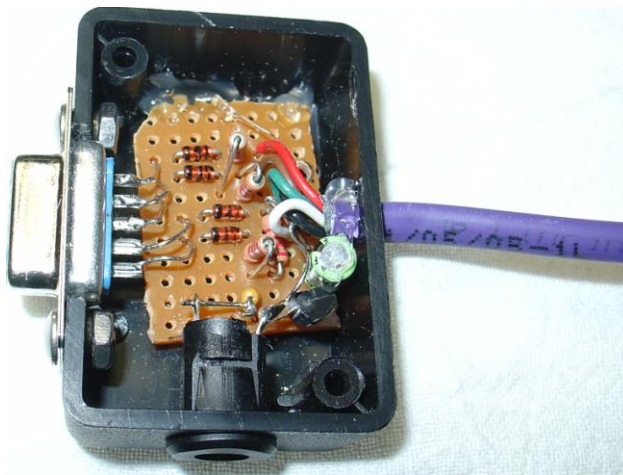


Photo A: Internal wiring of active buffer



Photo B: Completed Buffer

Finally, Figures 3 & 4 show the connectors necessary for the THP amplifiers. These connectors can be placed on a pigtail cable from the buffer box (the 5-conductor cable called out in the parts list). The HL-1.5KFx band data input is a DIN5F/240 degree connector. However, the DIN5P/240 degree connector is sometimes hard to find (it is available from All Electronics as of this writing). Most HL-1.5KFx band data inputs are actually a DIN6F connector where the center pin is not used so you can use the more standard DIN6P connector. Or if THP change to a true DIN5F/240 connector (where the center pin is eliminated), you can simply use a DIN6P and break-off the center pin with long-nose pliers.

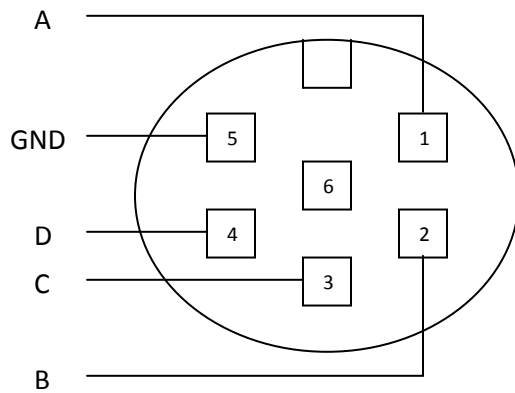


Figure 3: THP HL-1.5K Fx Band Data, DIN6P or DIN5P/240 deg. Solder-pin view

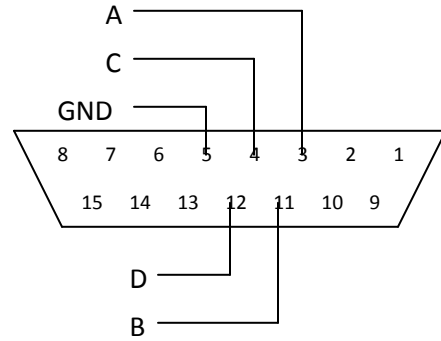


Figure 4: THP HL-2.5K Fx Band Data, DB15P. Solder-pin view

Table 1: Parts List

QTY	Description	Part number
1	1.97x1.38x0.79" box	All Electronics 1551-GBK
1	DB9-F D-connector	All Electronics DB-9S
4	1N4148 diodes	All Electronics 1N4148
4	2.2K ¼-watt resistors	All Electronics 291-2.2K
1ft	5-conductor shielded cable	All Electronics 5CS22
*1	2.1x5.5mm DC jack	All Electronics DCJ-21
*1	78L05 voltage regulator	All Electronics 78L05
*2	0.1uf 25V capacitor	All Electronics MCB-104
*1	4.7uf 50V elec. Cap.	All Electronics 4.7R50
*1	DIN5/240 plug	All Electronics DIN-524
**1	DB15-P D-connector	All Electronics DB-15P
**1	DB-15 hood	All Electronics DB-15H

\*Additionally needed for active THP-1.5K Fx buffer

\*\*Connector for THP-2.5K Fx

### Conclusion

Driving the band data inputs of the THP HL-2.5K Fx and HL-1.5K Fx amplifiers can be problematic when the amplifiers are turned off, especially when using parallel-connected external band decoders. The external diode isolation circuits described here resolve the problem.