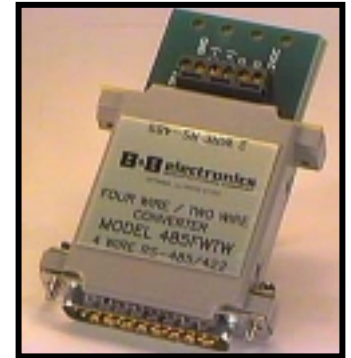


## Four-Wire RS-422/485 to Two-Wire RS-485 Converter Model 485FWTW

The 485FWTW converts balanced half-duplex RS-422 or RS-485 four-wire signals (separate TD and RD lines) to two-wire balanced half-duplex signals. RS-485 is an enhanced version of the RS-422 Balanced Line Standard. It allows multiple drivers and receivers on a two-wire system.

The four-wire RS-422/RS-485 port uses a male DB25P type of connector with pins 2 (A) and 14 (B) as Transmit Data, and pins 3 or 5 (A) and 16 or 17 (B) as Receive Data. Protective Ground (pin 1) and Signal Ground (pin 7) are also connected. The two-wire RS-485 port is a 6-position terminal block with Data A, Data B, Signal Ground, Protective Ground, and 12 Volt DC power inputs.



Termination resistors are optional, depending on the line length, baud rate, etc. R8 is the location of an optional termination resistor. The resistors should be about the impedance of the line used, but in no case should they be less than 120 ohms each. No special software requirements are needed since the RS-485 driver is enabled by the first transition on the RS-422/RS-485 Transmit Data (pin 2 and pin 14) line. Any transition on the TD line keeps the 485 driver enabled by preventing the monostable multivibrator from timing out. The transmitter is disabled approximately 1ms after the last transmitted character. This 1ms timeout allows continuous transmission of data at 9600 baud or higher. R14 and C3 are the two timeout components. Figure 1 shows where these components are located. Contact B&B Technical Support if you have questions on changing timeout components. When the converter is transmitting data, the receiver on the two-wire RS-485 side is disabled. Figure 1 also shows the location of R7, which can be removed to constantly enable the RS-485 receiver.

Up to 32 receivers can be driven by any one generator. This allows you to put together large systems with many drop points. The termination resistors should be located approximately at the opposite ends of the system.

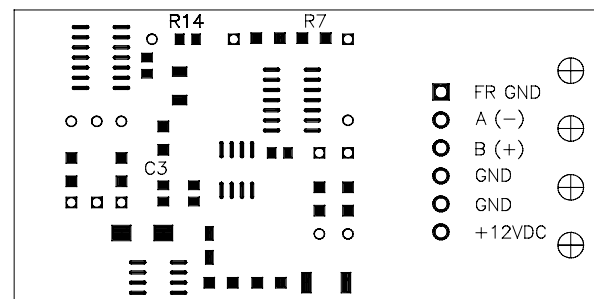
Proper operation of any RS-485 system requires the presence of a signal return path. The RS-485 Standard recommends that a third wire be used for this. For safety, a 100 ohm 1/2 watt resistor should be connected between pin 7 and the "reference" wire at every drop point. While it may be possible to interconnect signal grounds (pin 7's) directly, this is not recommended due to the danger of circulating currents possibly being present.

No wire type or maximum run length is listed in the RS-485 Standard. However, the RS-422 Standard, which is very similar, recommends number 24 AWG twisted-pair telephone cable with a shunt capacitance of 16 picofarads per foot and no more than 4000 ft. of distance.

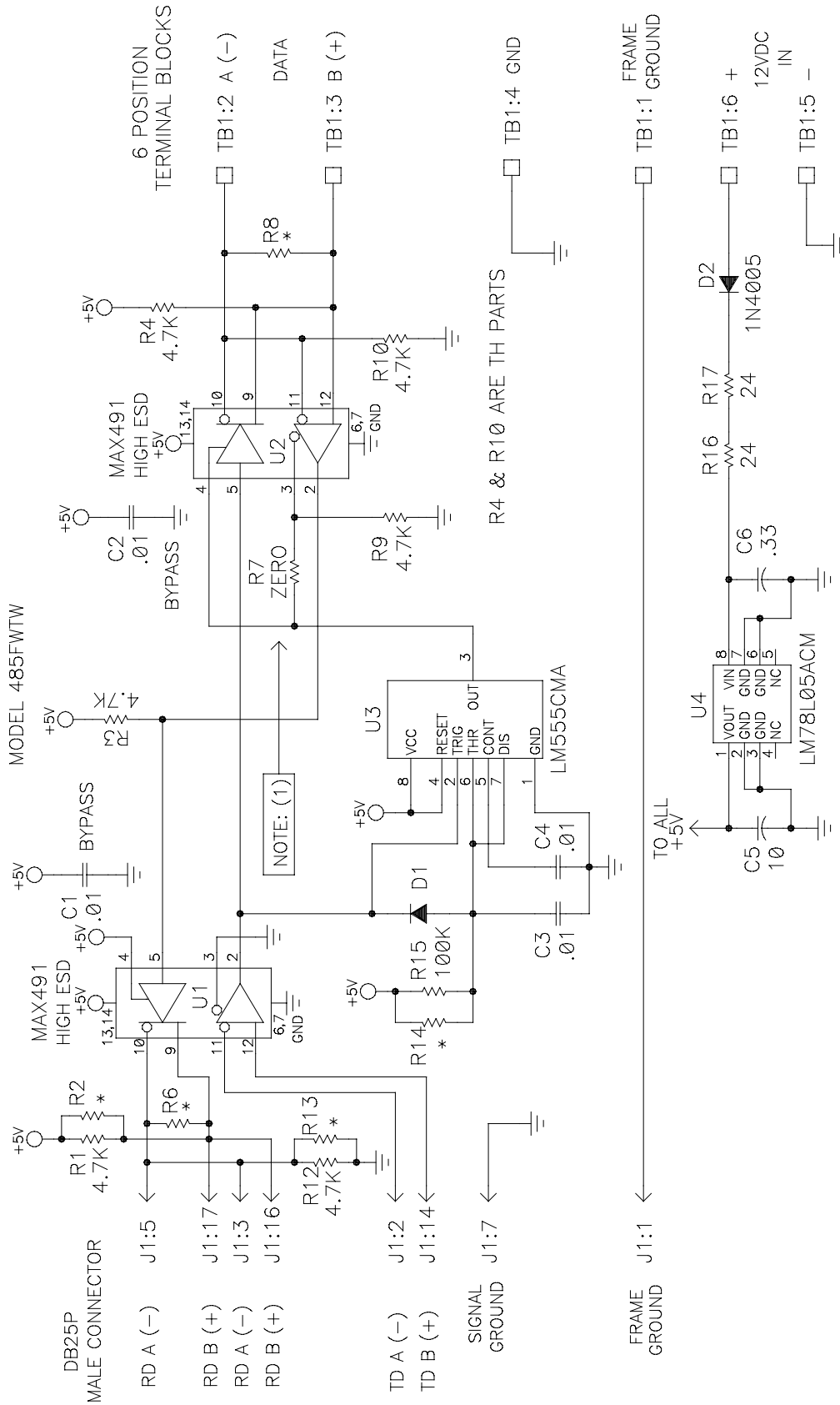
<b>Table 1</b>			
<b>COMPONENT REPLACEMENTS FOR CHANGING BAUD RATE TIMEOUTS</b>			
<b>Baud Rate</b>	<b>Time (ms)</b>	<b>Resistor (R14) (ohm)</b>	<b>Capacitor (C3) (mfd)</b>
300	33.3	330K	0.1
600	16.6	160K	0.1
1200	8.33	820K	0.01
2400	4.16	430K	0.01
4800	2.08	200K	0.01
9600	1.04	100K	0.01
19.2K	0.52	56K	0.01
38.4K	0.26	27K	0.01
57.6K	0.176	16K	0.01
115.2K	0.0868	8.2K	0.01

**Figure 1**

REMOVE R7 FOR CONSTANT RECEIVER ENABLE



\* R14 IS TO BE MOUNTED ON BOTTOM SIDE OF BOARD



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Home Page: [www.bb-elec.com](http://www.bb-elec.com)  
E-mail: [sales@bb-elec.com](mailto:sales@bb-elec.com)  
[support@bb-elec.com](mailto:support@bb-elec.com)

**B&B Electronics**  
MANUFACTURING COMPANY

Phone 815-433-5100 • FAX 815-434-7094  
707 Dayton Road • PO Box 1040  
Ottawa, IL 61350 USA