



Tomorrow's Telemetry Today!

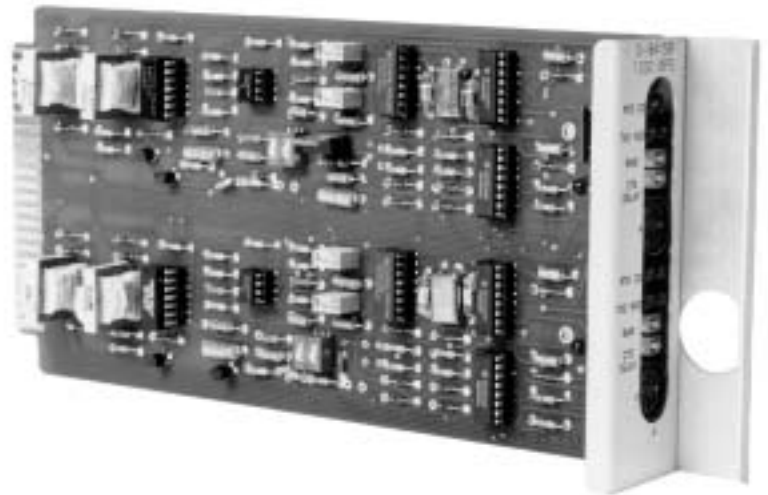
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G-8414B 1200 BPS TRANSCEIVER AND THE G-8415B DUAL 1200 BPS TRANSCEIVER INSTRUCTION INFORMATION

- **BELL 202 AND CCITT V23 OPERATION**
- **2-WIRE OR 4-WIRE OPERATION**
- **FRONT PANEL DIAGNOSTIC LED'S**
- **RS232 BUFFERED INPUT/OUTPUT**



GENERAL DESCRIPTION

The G-8415 Dual 1200 BPS Transceiver consists of a single card with two high quality FSK tone transceivers mounted on it. The G8414B 1200 BPS Transceivers has Modem B left off the pc board. The only part common between the two modems is the 5.0 V regulator.

The transceivers are designed around Texas Instruments' single chip modem, TCM3105. Hybrids are provided so the modems can be operated from either a 2 or 4 wire line. All inputs and outputs from the modem chip are buffered to EIA RS232C levels. The modems are strapped as standard for 1200 BPS, Bell 202 compatible. Strap positions are available for CCITT V23 and Bell 202 operation at 75, 150, 600 and 1200 BPS.

A compromise line equalizer, a bias distortion adjustment, an automatic gain control and carrier detector level adjustment are provided to optimize the performance and give the

lowest possible error rates. Switched capacitor filtering techniques are used in the modem.

Switches are provided so the circuits can be either full duplex for 4 wire operation or 1/2 duplex for 2 wire operation. An adjustable delay of 10 to 200 ms is provided for the clear to send (CTS) lead. This allows the communication circuit to stabilize after a request to send (RTS) signal before data transmission can begin. Optional 10 VA relay contacts may be installed to key local radio sets upon receipt of the RTS signal.

Front panel LED's indicate the condition of the RTS, CD, TD and RD leads of each transceiver. Test points monitor the 2 wire line, the receiver input level, the transmit data (TD) and the receive data (RD) of each modem.

SPECIFICATIONS

Clear-to-Send Line: Adjustable delays of CTS, 10 to 200 ms.

Modem Interface Levels: Standard RS232, +3 to +25 space; -3 to -25 mark; -Vdc space.

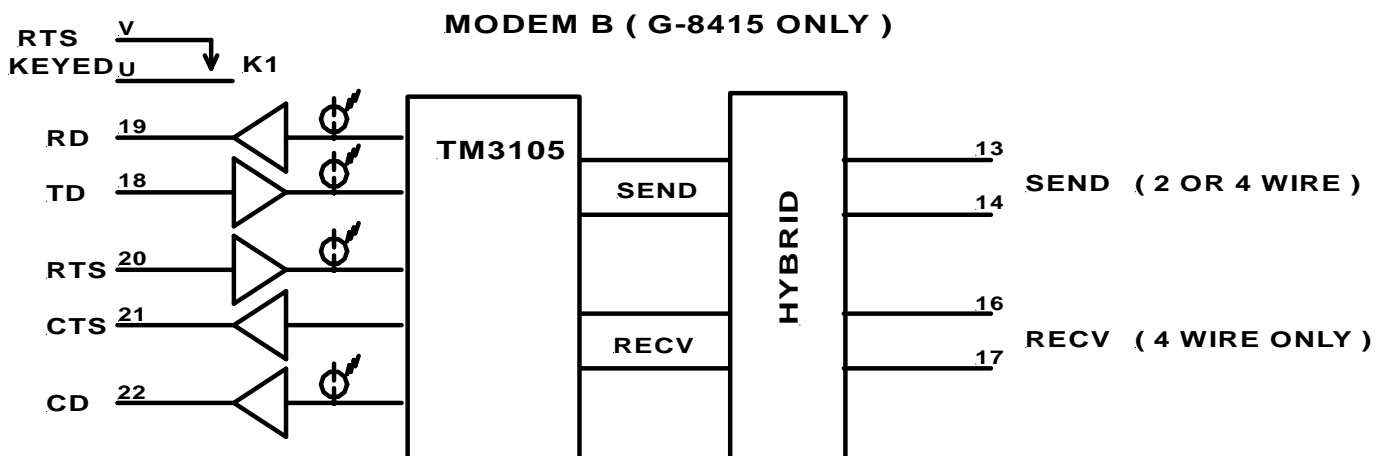
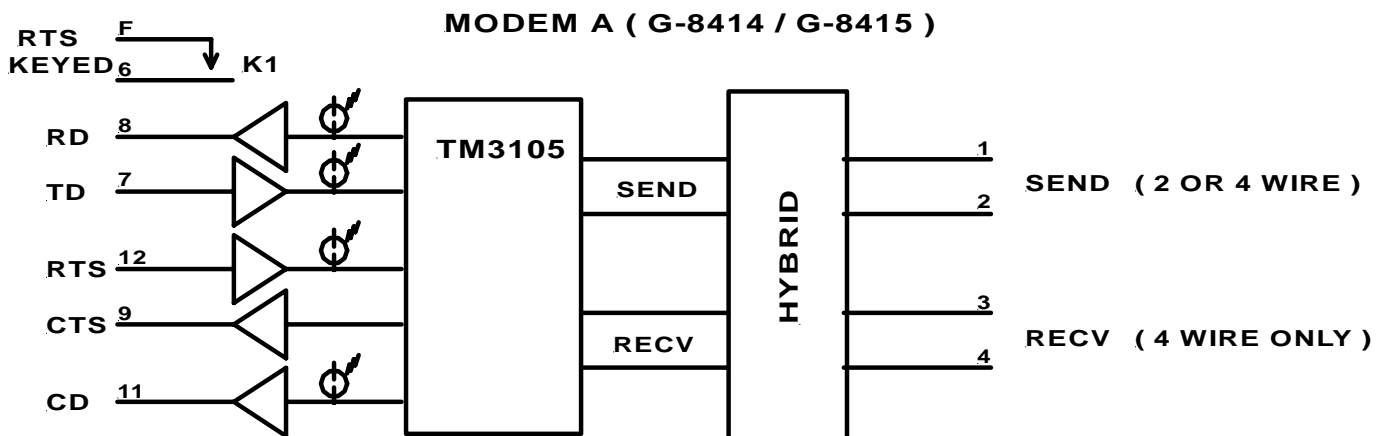
Operating Modes: Half duplex or full duplex, CCITT V.23 and Bell 202 rates of 75, 150, 600, and 1200 BPS.

Optional Relay Output: Reed type, rated 100 Vdc, 10 VA maximum, 500 mA, operation from the RTS input.

Transmission Line Interface: Balanced 600 ohm, 2 wire or 4 wire.

Front panel LED"s: TXD, RXD, RTS and CXR.

Power supply: +12 Vdc at 45 mA, -12 Vdc at 5 mA.



G-8415 DUAL 1200BPS MODEM

NOTICE

As of the date of this printing, the specifications for the G-8414B in this Instruction Information sheet apply to all G-8414B, except as indicated. Because all Da-Tel products are continually being refined and improved, these specifications are subject to change without notice.



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INSTRUCTION INFORMATION FOR THE G-8414 TRANSCEIVER OPERATIONAL ADJUSTMENTS

Four operational adjustments are required on the G-8415 1200 BPS Transceiver module. These are (1) output carrier level, (2) carrier threshold level, (3) request to send (RTS) to the clear to send (CTS) delay, and (4) the received data bias. The following descriptions are with reference to the A modem section. For the B modem section references will be identical unless noted in parentheses.

OUTPUT CARRIER LEVEL

To measure the output carrier level it is typically easiest and most accurate to bridge across the telephone 4 wire send of 2 wire lines. Use a AC signal level meter calibrated in dBm, 600 ohms bridging.

To proceed the module must be extended from the card shelf using the G-6813 card extender. The carrier is turned on by raising the RTS input, terminal 12 (20 for B modem) to +12 Vdc (terminal 5). Insure that the keying device can withstand this injection of +12 Vdc or simply disconnect the keying device. The actual level adjustment is made with R17 located in the upper middle of each modem section.

CARRIER THRESHOLD LEVEL

Typically the carrier threshold adjustment R20 is set fully clock-wise for maximum gain. This sets the carrier detector threshold at about -35 dBm. Turning R20 counter-clock-wise lowers this threshold. To access R20 the module must be extended from the card shelf using the G-6813 card extender. R20 is located in the lower middle of each modem section.

The state of this detector is displayed on the front of the module by the LED in the upper right of the modem's LED display per modem section. When carrier is present at a level above the threshold level the LED is on.

RTS TO CTS DELAY

When the sending device raises the RTS input a delay timer is initiated. At the time-out the CTS line is raised to signal the sending device to begin transmission. The setting of this delay (R12 located on the front of the module) requires a repetitive keying source to key the RTS input. The RTS input on terminal 12 (20) is displayed on the A channel of an oscilloscope. On the B channel of the scope the modem sections TP1 is displayed. The delay between the RTS being asserted high and the CTS output going high is adjusted by R12.

RECEIVED DATA BIAS

The received data bias adjustment is for balancing the mark and space data bits duration. The duration of the mark and space data bits should be ideally equal. At 1200 BPS both should be 0.83 milliseconds. This adjustment is not critical and can be difficult to make. The easiest method is to key a transmitter with a data string which is simply toggling mark and space, 50% duty cycle. Adjust the received data bias R19 for equal duration mark and space output. Alternately, in the field observe the data and check that single data bits are 0.83 milliseconds in duration.