ASE Dual-Channel Bell-202/V.23 Modem User Guide

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INTRODUCTION

This document is intended to provide set-up and adjustment information for the Applied Systems Engineering, Inc. (ASE) dual-channel Bell-202/V.23 modem. This modem was initially developed for use in conjunction with the ASE family of Communication Test Sets, the Comm/64 and ASE2000. However, the modem can also be used as a general purpose, stand-alone modem, independent of a test set.

MODEM PHYSICAL CHARACTERISTICS

The modem is based on the OKIDATA MSM6947 modem chip for Bell-202 operation and the OKIDATA MSM6927 modem chip for V.23 operation. It operates on 5VDC @110 ma input and has adjustable transmit levels from 0 to –16 dBM, and adjustable receive levels from 0 to –40dBM. Telephone line connections utilize standard 600-Ohm loads. All components are contained on a single PC board with approximate dimension of 12.5 x 12 cm. The board is mounted in a plastic box with overall dimensions of 13.5 x 12.5 x 4cm. Rubber pads on the bottom of the modem case provide a non-skid grip for flat surface mounting.

This product has been in field operation since 1993.

MODEM CONNECTIONS AND INDICATIONS

The modem has power (5VDC) and DB-25 female RS-232 connections on one end (End 1) and RJ-11 telephone jack connections and gain adjustments on the other end (End 2).

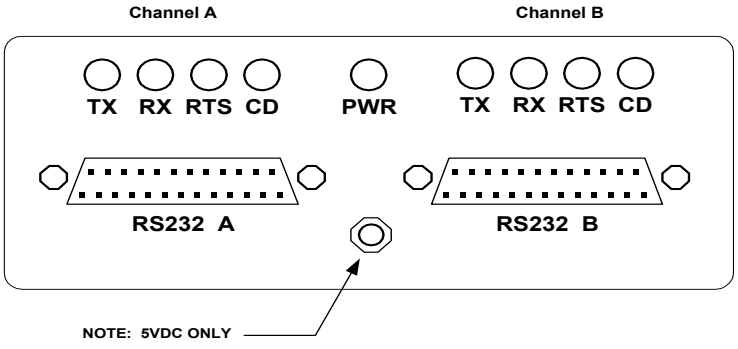

Figure 1. – End 1

The modem contains two separate channels, Channel A and Channel B, so all connections, indicators, and adjustments are duplicated with the exception of power.

Connections – End 1

- **RS232 A, RS232 B** - RS232 connections, one per channel, utilizing standard DB-25 female connections.
- **Power Jack** - 5VDC power input

Indicators – End 1

- **TX** – Transmit Data, on when modem is transmitting data
- **RX** – Receive Data, on when modem is receiving data
- **RTS** – Request to Send, on when RTS has been asserted on pin 4 of the DB-25
- **CD** – Carrier Detect, on when carrier frequency is sensed on the corresponding channel on the analog side of the modem
- **PWR** – Power On indication, on when 5VDC is applied to the power input for the modem.

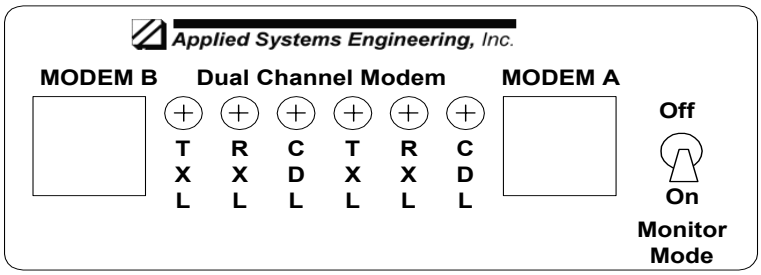

Figure 2. – End 2

Connections – End 2

- **MODEM A, MODEM B,** RJ11 jacks, one per channel, for connecting modem channel to analog telephone circuit.

Switch – End 2

- **Monitor Mode** – This switch is used to if the modem is to be used in a "receive only" mode for communications monitoring. When set to on, the switch forces the modem to run in high-impedance mode by removing the 600 Ω load from the receive line

MODEM SET-UP AND ADJUSTMENT

This section illustrates and explains the *gain* and *sensitivity* adjustments on the ASE Bell-202 Dual-Channel Modem.

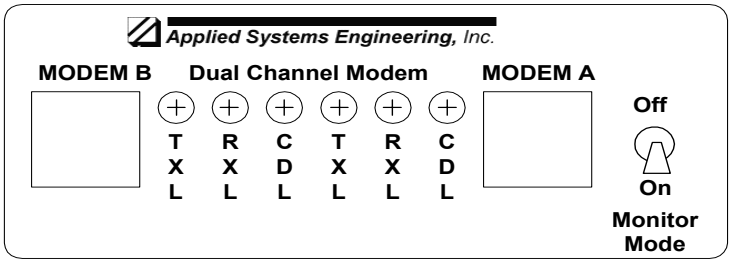

Figure 3. - Modem Adjustments

The modem contains six potentiometers as shown in the diagram above, three for Channel A and 3 for Channel B. The adjustments control transmitter gain, receiver gain, and carrier detect sensitivity levels.

NOTE: There are two types of potentiometers that are assembled in the modems. Most of the modems are supplied with white potentiometers but some modems manufactured after 1998 have yellow or orange colored potentiometers. The adjustment direction for these potentiometers is reversed from the white potentiometers. Consequently, the meanings of cw and ccw are interchanged.

NOTE: Identify the type of potentiometer before attempting adjustments.

The type of potentiometer can be determined by looking through the adjustment hole to determine the color.

Adjusting Modems With White Colored Potentiometers

TXL Transmitter Gain - Factory setting is 1/8 of a turn from the counterclockwise (ccw) end. Transmit levels range from –50 dBm in the ccw direction to –6 dBm in the clockwise (cw) direction.

RXL Receiver Gain - Factory setting is ¼ of a turn from the counterclockwise end. Receive sensitivity levels range from –6 dBm in the ccw direction to –54 dBm in the cw direction.

CDL Carrier Detect Sensitivity - Factory setting is completely counterclockwise. Sensitivity is –30 dBm in the ccw direction to –48 in the cw direction.

Adjusting Modems With Orange or Yellow Colored Potentiometers

TXL Transmitter Gain - Factory setting is 1/8 of a turn from the clockwise (cw) end. Transmit levels range from –50 dBm in the cw direction to –6 dBm in the counterclockwise (ccw) direction.

RXL Receiver Gain - Factory setting is ¼ of a turn from the clockwise end. Receive sensitivity levels range from –6 dBm in the cw direction to –54 dBm in the ccw direction.

CDL Carrier Detect Sensitivity - Factory setting is completely clockwise. Sensitivity is –30 dBm in the cw direction to –48 in the ccw direction.

MODEM TIMINGS

This section describes the various time settings that are used in the modem. There are no configuration jumpers or switches inside the modem box. All gain and sensitivity adjustments are performed through potentiometers accessible from outside the box and most modem timings are either fixed or under program control. Since the modem was designed primarily for use with the Test Set, the modem had to accommodate a wide range of situations that include many non-standard timing conditions. As a result, the timings are under program control rather than switches and jumpers.

- **RTS-CTS Delay** – This is also called Pre-Mark time and is the time between asserting RTS and the receipt of CTS. This time is, essentially, zero. The modem will return CTS almost immediately after RTS is asserted. The amount of pre-mark time is under program control and will be the amount of time after receipt of CTS and the first character transmitted.

- **Carrier Turn-Off Delay** – This is also called Post-Mark time and is the time between the de-asserting of RTS and the actual turn-off of the carrier by the modem. This time is, essentially, zero. The modem turn off the carrier signal almost immediately after RTS is de-asserted. The amount of post-mark time is under program control and will be the amount of time after the last character has been transmitted and de-asserting of RTS.

- **Carrier Detect Delay** – This is also called Squelch timing and is the time between the recognition of a valid carrier frequency and asserting Carrier Detect. This time is approximately 3 milliseconds and is fixed in the modem. Additional squelch timing (start-on noise filtering) must be handled under program control.