

**CCITT G.703
64 kb/s CODIRECTIONAL TIMING
INTERFACE
(MODEL 40323-01)
OPERATING MANUAL**

February 1985

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SECTION 1 GENERAL INFORMATION

1.1 INTRODUCTION

This interface adapter allows the FIREBERD 1500, 1500A, 2000, and 2000-1 test sets to test communications systems that use the CCITT G.703 64 kb/s codirectional interface specification. The term codirectional is used in the G.703 specification to describe an interface across which both data and associated timing signals are transmitted in the same direction.

1.2 G.703 SIGNALS

The 64 kb/s codirectional signals include timing information embedded in the data stream. These timing signals consist of a 64 kHz clock and an 8 kHz timing signal referred to as octet timing. The Interface Adapter can transmit data either with or without an octet timing signal and can receive data with or without octet timing.

The G.703 signals are serial, differential return-to-zero (RZ) pulses. They are generated according to the following rules, which are illustrated in Figure 1-1.

Step 1 A 64 kb/s bit period is divided into four unit intervals.

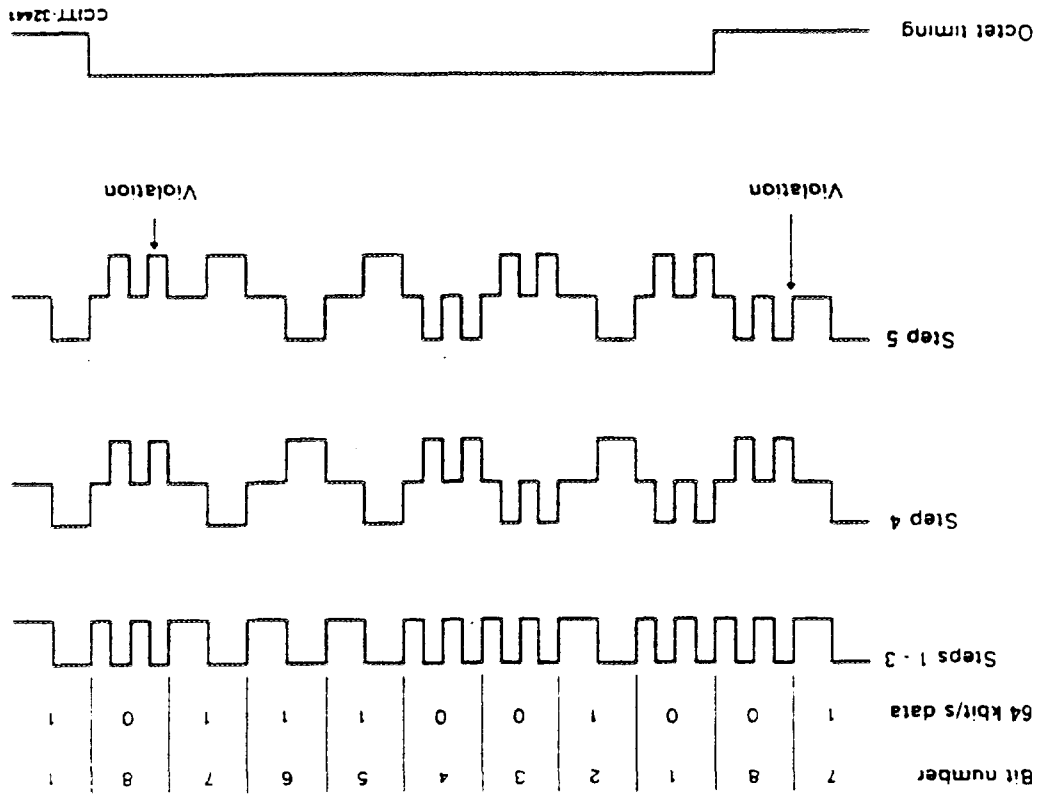
Step 2 A binary one is coded as a block of the following four bits:

1 1 0 0

Step 3 A binary zero is coded as a block of the following four bits:

1 0 1 0

Figure 1-1
 Generation of G.703 Signals



Step 4 The binary signal is converted into a three-level signal by alternating the polarity of consecutive blocks.

Step 5 The alternation in polarity of the blocks is violated every 8th block. The violation block marks the last bit in an octet, which carries an 8 kHz timing signal.

1.3 OPERATING MODES

1.3.1 Transmit Timing

A switch on the G.703 Interface Adapter panel selects one of two timing sources for the transmitted data: a 64 kHz crystal oscillator (XTAL OSC) or the clock signal recovered from the received data (RECOV'D CLK). The FIREBERD must be set as follows to use either of these clock sources:

FIREBERD 1500 - CLOCK SELECT set to EXT
FIREBERD 1500A - GENERATOR CLOCK set to EXT I/F
FIREBERD 2000 - GENERATOR CLOCK set to EXT
FIREBERD 2000-1 - GENERATOR CLOCK set to EXT

The use of other transmit timing sources is discussed in Section 3, Installation.

1.3.2 Octet Timing

There are two transmitting modes controlled by the RTS switch on the FIREBERD front panel. When the RTS switch is "ON," octet timing is enabled and the alternation in polarity of the signal blocks is violated every 8th block. When the RTS switch is "OFF," octet timing is disabled and there are no violations of polarity alternation.

1.3.3 Loop Test

The Interface Adapter includes a relay that is activated by the FIREBERD front panel LOOP TEST switch. In the "TEST" position, the data line driver is connected

to the data line receiver. This provides a quick verification of the operation of the FIREBERD and its interface. The interface cable need not be removed during the test because complete isolation is provided by the relay when testing. (Note that the interface will not operate correctly in the loop test mode if the recovered clock is selected for transmit timing, as the interface will not have a stable transmit clock.)

1.4 SIGNALLING

1.4.1 FIREBERD Panel

The yellow RLSD (Receive Line Signal Detect) LED on the FIREBERD panel lights whenever the Interface Adapter detects and locks to octet timing.

1.4.2 Interface Adapter Panel

A green LED on the Interface Adapter panel lights whenever the Interface Adapter detects and locks to octet timing.

1.5 CONNECTOR

A 25-pin female D-subminiature connector is provided with the pin assignments shown in Table 1-1.

TABLE 1-1
25-PIN CONNECTOR SIGNAL CONNECTIONS

Pin Number	Signal
1	TX GND
2	TX DATA (+)
3	RX DATA (+)
4	-
5	-
6	-
7	-
8	-
9	-
10	-
11	-
12	-
13	-
14	TX DATA (-)
15	RX GND
16	RX DATA (-)
17	-
18	-
19	-
20	-
21	-
22	-
23	-
24	-
25	-

SECTION 2 SPECIFICATIONS

2.1 OUTPUT SPECIFICATIONS

Output pulses shall conform to Figure 2-1, which is a reproduction of Figure 5/G.703 of CCITT Recommendation G.703 (Yellow Book).

2.2 INPUT SPECIFICATIONS

The digital signal presented at the input port shall be as defined in Paragraph 2.1 above, but modified by the characteristics of a balanced transmission line with an attenuation of 0 to 3 dB at 128 kHz. The clock frequency shall be 64 kHz \pm 100 ppm as specified in the CCITT G.703 64 kb/s codirectional interface specification.

2.3 CRYSTAL OSCILLATOR SPECIFICATIONS

The crystal oscillator of the Interface Adapter shall have a frequency of 64 kHz \pm 50 ppm.

Pulse Masks of G.703 kb/s Codirectional Signal

Figure 2-1

Note - The limits apply to pulses of either polarity.

