



# Technical Newsletter

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**User's Attachment**  
**Manual**

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This Technical Newsletter provides replacement pages for the subject publication. Pages to be inserted and/or removed are:

4-11, 4-12

A technical change to the text or to an illustration is indicated by a vertical line to the left of the change.

**Summary of Amendments**

Add note in Teletypewriter Adapter Feature in Chapter 4 to ensure that the associated TTY unit is connected and powered on when the system is operating.

*Note.* Please file this cover letter at the back of the manual to provide a record of changes.



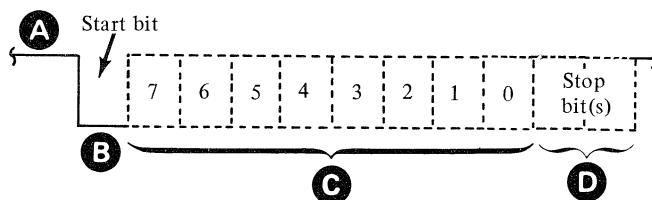
## Data Transmission

Data is transmitted and received by the teletypewriter adapter serially by bit. Data is transferred one 8-bit character at a time. Each data character is preceded by one *start* bit and is followed by one or two *stop* bits. Characters being transmitted from the teletypewriter adapter to an OEM device are always followed by two stop bits. Characters being received by the teletypewriter adapter may have one or two stop bits. A start bit is always a *space* or logical 0, and a stop bit is always a *mark* or logical 1. The transmit and receive lines are always held in the mark state when no data is being transferred. Figure 4-4 shows the format of an 11-bit transmitted or received character frame.

Because the teletypewriter adapter is a full-duplex attachment, where data can be transmitted and received concurrently, OEM devices attached to the teletypewriter adapter should be configured for full-duplex operation.

No error checking is done on transmitted or received data. The teletypewriter adapter is code transparent. All 256 combinations of 8-bit characters can be transmitted or received.

It is not possible to overrun on data being transmitted by the teletypewriter adapter, but it is possible to overrun on data being received by the teletypewriter adapter. If a second character is received before the first character is serviced by the software, the first character is *not* lost, but the second character is lost.



- Ⓐ The line is always held in a mark condition when no data is being transmitted.
- Ⓑ The start bit is always a space (logical 0).
- Ⓒ Eight data bits are transmitted for each character.
- Ⓓ Each bit is either a mark or a space, depending on the character code. The least-significant bit is transmitted first.
- Ⓓ The stop bit is always a mark (logical 1). On transmit, two stop bits are always used; on receive, one or two stop bits can be used.

**Figure 4-4. Format of an 11-bit transmitted or received character frame**

## Initial Program Load

The teletypewriter adapter provides initial program load (IPL) capability. A field-installable jumper on the card designates the teletypewriter adapter as the primary or alternate IPL source. If no jumper is installed, the teletypewriter adapter cannot perform IPL.

The IPL record length is 256 bytes, commencing at main storage location 0. The IPL data transfer starts when the adapter recognizes the first non-0 character from the attached OEM device.

The OEM device attached to the teletypewriter adapter must have some means of manually initiating a transmit operation to the teletypewriter adapter, if the OEM device is to be used for IPL.

This implies that the OEM device must be capable of *manually* initiating a read operation from some media (such as cards, tape, or disk) and transmitting the data to the teletypewriter adapter.

## Teletypewriter Adapter Operational Characteristics

Data is always transmitted by the teletypewriter adapter in an 11-bit frame: one start bit, eight data bits, and two stop bits. At the beginning of the first stop bit, the teletypewriter adapter sends an interrupt request to the processor to signal the completion of the current character transmission. This interrupt must be serviced and another transmit operation initiated by the end of the second stop-bit time if maximum transmission rate is to be maintained.

Devices that are designed to receive either one or two stop bits may be attached to the teletypewriter card. If the device is designed for only one stop bit, the second stop bit appears to be a one-bit-time separation between character frames.

The teletypewriter adapter can receive data formatted with either one or two stop bits. If the second stop bit is present, it appears to be a one-bit-time separation between character frames.

If a device is programmable for either one or two stop bits, it should be programmed for one stop bit. This increases the receive data rate of the teletypewriter adapter by approximately 9 percent.

If a device is programmable for several different data rates that are supported by the teletypewriter adapter, the device should be programmed for the highest data transfer rate that results in reliable operation in the environment in which the system is placed.

Although the following information describes the internal operation of the teletypewriter adapter, it is presented here as necessary information to understand the subsequent transmit and receive timing charts.

*Note:* If this feature is in a prepared condition and the associated TTY unit is powered-off or disconnected from the line, a continuous stream of interrupts is presented to the program at the teletypewriter adapter character rate. Processing of the interrupts can use too much processor time which causes the application program to fail. To avoid this condition, ensure that all devices attached to the Series/1 via Feature Code #7850 are connected with power on at all times when the system is operating.