



**TELEGRAPHIC TYPE SERVICES**  
**STANDARD INTERFACE SPECIFICATIONS**  
**SERIES 1000 CHANNELS**

**1. GENERAL**

- 1.001** This addendum supplements Section 312-011-101, Issue 1.
- 1.002** This addendum is issued to correct an error concerning performance objectives in Appendix 2 of Section 312-011-101.
- 1.003** This addendum should be filed with Appendix 2 of Section 312-011-101, Issue 1. The

attached pages should be inserted in the section in place of the correspondingly numbered pages.

**4. TRANSMISSION CHARACTERISTICS OF CHANNEL**

The following change applies to Part 4 in Appendix 2 of this BSP.

- (a) 4.03—Revised

**Attached:**

**Page 3 dated May 1973, reissued**  
**Page 4 dated May 1973, revised.**

#### 4. TRANSMISSION CHARACTERISTICS OF CHANNEL

##### CHANNEL DISTORTION—DEFINITION

**4.01** The 45-, 55- and 75-Baud Channels are normally lined-up and maintained by the Telephone Company using "start-stop" telegraph characters as a source of test signals. These characters will generally be transmitted at the highest rated speed of the channel ordered. The exception to this is where the configuration of a channel requires a regenerative repeater (see Paragraph 4.02) and thus must be tested using a precise speed and code format. The received signals will be measured in terms of "telegraph distortion."

The start-stop character used is composed of several elements: a single-unit "start" element which is a space; five, single-unit information elements, which may be mark or space; and a "stop" element which is a mark, and is one unit or longer in length. A typical 5-level character is illustrated in Figure 2.

Telegraph distortion is the measure of the maximum displacement of any mark-to-space or any space-to-mark transition from its ideal instant. The reference point used when measuring telegraph distortion is the initial mark-to-space transition of each character which occurs at the beginning of each "start" element. The slicing level for all measurements is at the 50% point on the rising or falling current waveforms.

Referring to Figure 2, transitions measured at the slicing level should occur at integral multiples of  $t_e$  for no distortion. If a transition occurs at time  $\Delta t$  earlier or later than this time, the distortion is:

$$\text{Percent Distortion} = \frac{\Delta t}{t_e} \times 100$$

For example, refer to Figure 2 and examine the distortion of information element No. 3 which is in the space condition. Assume the nominal element length  $t_e = 20$  milliseconds and that  $\Delta t_2 = 2$  milliseconds and that  $\Delta t_3 = 4$  milliseconds.

$$\text{Peak Distortion} = \frac{\Delta t \text{ max.}}{t_e} \times 100 = 20\% \\ \text{Per Character}$$

Thus, although the element is 30 percent shorter than its nominal length, its telegraph distortion by definition is 20 percent.

##### CHANNEL DISTORTION

**4.02** The amount of inherent channel distortion encountered on 45-, 55- and 75-Baud channels is a function of the channel length and its complexity (number of transmission links in tandem between any two stations). If the CPT character code format and Baud rate is any one of those listed in Table B, the Telephone Company may place a regenerative repeater in the channel to insure that it will perform as specified in paragraph 4.03. For this reason, the Telephone Company will generally ask for the speed and code format used by the CPT. However, if the CPT uses the channel for transmitting other codes, variable length bits or character, or if the CPT uses it alternately at different signal rates and/or different character code formats, standard regenerative repeaters can not be provided and the inherent distortion of the channel is not specified.

TABLE B  
COMMON DATA  
CHARACTER FORMATS

Start-Stop	
Start Element	— Unity length — Always "Space"
Information Elements	— 5, 6, 7, or 8 per character — Unity length — "Mark" or "Space"
Stop Element	— Unity or greater in length — Always "Mark"
Synchronous	
All Elements	— Unity length — "Mark" or "Space"

TABLE B (Cont'd)  
COMMON DATA RATES

- (0-75 Bauds)
- 45.55 Bauds
- 50.00 Bauds
- 56.85 Bauds
- 61.12 Bauds
- 66.67 Bauds
- 74.23 Bauds
- 75.00 Bauds

**PERFORMANCE OBJECTIVES**

**4.03** The long term objectives of 45-, 55-, or 75-Baud channels is to have an average performance of 1 error in  $10^5$  bits transmitted. The CPT should deliver no more than 8% telegraph distortion at the interface and should be capable of processing received data signals at the interface with up to 35% telegraph distortion. CPT's unable to meet these requirements may expect that special engineering and possible associated charges may be incurred.

**TURN AROUND TIME—HALF DUPLEX OPERATION**

**4.04** The near-end or local turn around time of a half duplex 45-, 55- or 75-Baud channel

(the required time interval for any Telephone Company supplied local transmission equipment to condition itself to reverse the direction of transmission) is essentially zero. However, the CPT should not be arranged to reverse its direction of transmission until it has received the entire nominal length "stop" pulse of the last received character in a message.

The far-end or distant turn around time of a half duplex channel (the time interval consisting of the two-way propagation time of the channel, delay through regenerative repeaters and directional control circuit operation in the transmission equipment) may be as high as 500 milliseconds. However, if far-end turn around time is critical to the CPT operating procedure, it is recommended that the specific case be discussed with the local Telephone Company representatives.

**CHANNEL FAILURE INDICATION**

**4.05** No separate leads are brought out at the interface to indicate when a channel failure or interruption occurs. If the channel goes into a steady spacing condition (no current on the receive data leads), this indicates a channel failure and the CPT equipment may use this signal condition as a channel failure indication, if so desired. However, certain channel failure conditions may not cause steady spacing to occur on the receive data (RD) leads.