

## REFERENCE GUIDE

### DESCRIPTION OF DATA SET FEATURES AND OPTIONS

#### 1. GENERAL

**1.01** The information in this section is intended to aid the users of the Reference Guides in better understanding the features, customer options, and Telco options of the various Data Sets. Generally, it is expected that the use of this section, along with Section 590-000-100, will aid the people involved in the implementation of data services by providing a better understanding of data set features and options.

**1.02** Each description of a data set feature or option will be identified by an item number, used as a cross reference, which may be referred to in the Reference Guides as a source of additional information. Some options are described in general in this section and a more detailed description is given in the applicable Reference Guide.

#### 2. ARRANGEMENT OF INFORMATION

**2.01** The descriptive information in this practice is divided into three categories in the following manner:

- (a) **Service Features:** These features are the distinguishing characteristics of certain data set codes which make them different from other data sets of the same general type.
- (b) **Customer Options:** These options normally are specified by a Sales or Marketing representative based on information supplied by the customer or business machine representative.
- (c) **Telco Options:** These options normally are specified by either Engineering or Plant and are dependent upon circuit design, maintenance requirements, facilities used, etc.

#### 3. DESCRIPTION OF SERVICE FEATURES

**3.01** Determination of the type of service offering desired by the customer and consequently the features required is the first step in selling a

data service. This establishes the Tariff and defines the basic Uniform Service Order Code (USOC). The following descriptions are intended to give the data sales personnel a better understanding of available data set service features. The item designation is used so that references may be made from the applicable Reference Guide to this section for further information.

- (a) **Item A1 Internal Timing:** The clock circuitry for provision of timing information is provided within the data set.

**Note:** In some applications, Internal Timing is an option.

- (b) **Item A2 External Timing:** Clock must be provided by the business machine.

**Note:** In some applications, External Timing is an option.

- (c) **Item A3 Reverse Channel:** Provides a means of simultaneous signaling in a direction opposite to the normal flow of data on 2-wire circuits. Normally used as a circuit assurance feature.

- (d) **Item A4 Tone Answer Back:** Provides a means for an audible tone to be transmitted in the opposite direction to signal flow. This answer-back signal is available only when data is not being transmitted in the forward direction.

- (e) **Item A5 Voice Answer Back:** Provides a means for voice signals to be transmitted in the opposite direction to normal signal flow while the data set is in the data mode. This feature is only available when data is not being transmitted in the forward direction.

- (f) **Item A6 Answer Tone and Dial Tone Detection:** This feature is used in Automatic Calling Units that can detect the dual-frequency TOUCH-TONE® dial tone, and therefore do not require ground start operation. This ACU will

also detect the presence of a valid answer signal and transfer the telephone line to the associated data set.

(g) **Item A7 Without Signal Answer Back:**

This feature relates to Automatic Calling Units that perform the automatic calling function without answer or dial tone detection and requires a ground start line.

**4. DESCRIPTION OF CUSTOMER OPTIONS**

**4.01** The description of customer options is provided to assist the data sales personnel in making the decisions necessary for determination of the Universal Service Order Code suffix. Some of the options described in general in this section are also described in terms of a particular data set in the applicable Reference Guide.

(a) **Item B1 With or Without Automatic Calling Unit (ACU):**

By the use of an ACU, distant stations may be automatically dialed under the control of the customer business machine. When the 801A ACU is used, the telephone line must be arranged for ground-start operation. When 801C ACU is used, the telephone line must be arranged for TOUCH-TONE signaling. Normally a spare key on the data set or attendant set is unblocked and redesignated "DIAL TONE". Since some 801-type ACUs are arranged for ground start central office lines, the "DIAL TONE" key provides a means to signal the central office for dial tone when the ACU is disabled. When the ACU is not used, the ground start feature is removed and the spare key is disabled.

(b) **Item B2 EIA Voltage or Contact Interface:**

(1) **EIA Voltage Interface:** When this option is used, the signals on the interface leads are bipolar voltage signals which conform to the requirements of EIA standard RS-232B.

(2) **Contact Interface:** With this option, signals between the data set and the business machine are in the form of contact closures to ground or between interface leads. This option is required by some older business machines.

(c) **Item B3 With or Without Automatic Answer:**

Automatic answering of incoming

calls is provided by the data set or, in some cases, by an attendant set such as an 804A Data Auxiliary Set (DAS). This function is normally under control of the business machine. In some cases, provision is made to provide both manual and automatic answering capabilities under control of a key switch. If automatic answering is not provided, all incoming calls must be answered manually by an attendant.

(d) **Item B4 Local Copy or No Local Copy:**

If the customer desires a local copy of outgoing traffic, this option should be installed. It is applicable only if the business machine operates in the half-duplex mode.

(e) **Item B5 Half Duplex (2-wire) or Full Duplex (4-wire):**

In the full-duplex mode, simultaneous 2-way and independent transmission in both directions is possible. In the half-duplex mode, alternate one-way-at-a-time, independent transmission is required.

(f) **Item B6 Attended or Unattended Operation:**

If the attended option is used, an attendant must answer all calls and manually place the data set in the data mode. If the unattended option is used, the data set automatically answers all incoming calls and places itself off-hook in the data mode.

(g) **Item B7 With or Without 804-Type Data Auxiliary Set:**

The 804-type DAS is intended for use with data sets on the telephone switched network and various private line networks. The DAS is used as a telephone set and control unit which provides control for the normal switching functions required by data sets that do not have integrated control features. The different versions of the 804-type DAS are denoted by changes in the lettered suffix. Without the 804-type DAS, telephone and control functions must be supplied by the data set or other customer-provided facilities.

**5. DESCRIPTION OF TELEPHONE COMPANY OPTIONS**

**5.01** The description of telephone company options is provided to make the users of the Reference Guides aware of the engineering decisions required for the implementation of various data services. Some of the telephone company options which apply to a particular data set are explained in the Reference Guide for that data set.

(a) **Item C1 Terminal Impedance:**

(1) **600 ohms:** The data set is strapped so that a terminal impedance of 600 ohms is presented to the line. Normally used for private line service.

(2) **900 ohms:** The data set is strapped so that a terminal impedance of 900 ohms is presented to the line. Normally used for DDD network service and 900-ohm private line facilities.

(b) **Item C2 Transmit Signal Levels:** A choice of output signal levels is provided so that a specified signal level can be presented to the serving central office regardless of variations in local loop loss.

(c) **Item C3 Reverse Channel Level:** A choice of Reverse Channel output signal levels is provided so that a predetermined signal level can be presented to the serving central office regardless of variations in local loop loss.

(d) **Item C4 Answer Back Tone Level:** A choice of answer back tone levels is provided so that a predetermined signal level can be presented to the serving central office regardless of variations in local loop loss.

(e) **Item C5 Receiver Signal Level (Sensitivity):**  
This option allows selection of the allowable range of received level. By adding attenuation in 5-dB steps, the receiver range may be changed from its most sensitive range (-38 to -10 dBm) to its least sensitive range (-23 to +5 dBm). This decision is based on the expected received signal level and maximum line noise. Generally the least sensitive option is used.

(f) **Item C6 Amplitude Equalizer (In or Out):**  
Amplitude or slope equalization is required for switched network (DDD) applications. It is not used on private lines when precision equalizers are used but may be used in some applications. These are **compromise** equalizers in that they are designed to correct for the average slope encountered on switched facilities.

(g) **Item C7 Delay Equalizer (In or Out):**

Delay equalization is required for switched network (DDD) applications but is not required on private lines where equalization is provided on the lines. These are **compromise** equalizers in that they are designed to correct for the average envelope delay distortion encountered on switched facilities.

(h) **Item C8 Echo Delay: Two Wire or Four Wire:**

(1) **Echo Delay 2-Wire:** When this option is used there is about 200 milliseconds of delay between Request-To-Send and Clear-To-Send. This delay allows time for echo suppressor operations and for the distant receiver to establish synchronization. In addition, this option clamps the receiver for about 100 milliseconds after the transmitter is turned off to permit line echoes to decay before the receiver is enabled. Generally, this option will be used when Data Set 201A is used on 2-wire lines.

(2) **Echo Delay 4-Wire:** When this option is used, the delay between Request-To-Send and Clear-To-Send is reduced to about 8-1/2 milliseconds and the receiver clamp is removed allowing fast turn-around time. Generally, this option will be used on 4-wire lines where echo is not a problem. This option may be used on **Very Short** 2-wire lines where no echo suppressors are present if fast turn-around time is desired.

(i) **Item C9 Six-dB Pad In or Out:** The 6-dB pad provides attenuation to both the received data signal and unwanted noise signals. It should be used if it drops the noise level below the receiver threshold. Since the signal level is also attenuated, this option is limited to short loops where the received data signal is expected to be much higher than the threshold value. With the 6-dB pad out, maximum receiver sensitivity is provided and this is used in most applications.