DATA GENERAL

DATA SERVICES SUPPORT

DIGITAL AND ANALOG DATA TRANSMISSION SERVICES

1. GENERAL

1.01 This section provides an overview of the support provided for voiceband data services on private line (PL), the Public Switched Network (PSN), and private Switched Services Networks (SSN). The various categories of service arrangements and the criteria used to define the support of data services provided by Bell operating companies (BOC) are described. Data services on PL, the PSN, and SSN involve different support terminology and definitions, so the applications are treated separately.

1.02 Whenever this section is reissued, the reason(s) for reissue will be given in this paragraph.

1.03 Data services on facilities offered to other common carriers (OCC) are covered by different sections and tariffs. Operations information on these service arrangements is given in Sections 471-110-020 and 314-300-ZZZ.

1.04 Data services provided on the Digital Data System (DDS) are not covered in this section. Operations information covering DDS can be found in Sections 314-900-100 and 314-900-300.

1.05 Local area data channels (LADC) are not covered in this section. The LADC is covered in Section 314-410-312.

1.06 Special applications such as DATAPHONE® Select-A-Station (DSAS) and Telemetry/Alarm Bridging Service are not covered in this section. Operational informaton or DSAS is covered in Section 314-410-550 and Telemetry/Alarm Bridging Service is covered in Section 314-410-560.

2. DEFINITION OF SUPPORT

2.01 Support is an assurance that published performance standards will be maintained. The Bell System specifies these standards for a PL circuit, an end-to-end connection on the PSN, and an end-to-end connection on SSN where there is no intervening customer provided equipment or facilities. This part describes the standards specified for data transmission.

2.02 All services offered by the Bell System are supported for a minimum quality level, recognizing that some services are supported to a higher degree than others. For instance, a 2-point PL 3002 channel (data communication system), as described in this section, is supported for data in terms of transmission parameters and error performance. Whereas an arrangement such as foreign exchange (FX) circuit when used for data transmission to locations beyond the radius of 200 airline miles from the dial tone office is supported for voice only. The Bell System has an obligation

to insure its customers that all services meet their *designed* specifications, even though the circuits are not being used for their designed purpose.

3. PRIVATE LINE DATA SERVICES

3.01 Data services on PL are available as 2-point [Fig. 1(c) and (d)] or multipoint arrangements. The customer must specify the desired conditioning at the time of ordering the service, usually as recommended by the manufacturer of the terminal equipment (data set). The service and support definitions for private line data services are characterized as either *Systems or Assemblies.*

3.02 Voice-grade only parameters apply to PL circuits ordered for voice communication. Voice-only PL circuits apply to any circuit administered by the Bell System Practice (BSP) 310 division and not ordered for data transmission. It is recognized that some customers may use these arrangements for data transmission and satisfactory service may result.

3.03 Data-grade parameters apply to PL circuits administered by Section 314-410-ZZZ. The controlled parameters for C- and D-type conditioning are specified in FCC Tariff 260.

A. Systems

3.04 Systems are PL channels that are designed for data transmission and are used within their designed capabilities. The telephone company (TELCO) has no control over the customer's choice of data set [TELCO or customer-provided equipment (CPE)]. (A TELCO is any telephone company, BOC or independent, that provides service and equipment to customers in its franchised area.) More significantly, the TELCO has no control over how often the customer may change between TELCO and CPE data sets. Because the customer may order a channel equipped with TELCO data sets and later may change to CPE without TELCO knowledge, systems are further defined as follows:

- *Data Transmission System:* The TELCO provides a channel only. The service, in terms of transmission parameters only, is provided between the channel interface units (CIU). Typically, the CIU is a data auxiliary set (DAS) 829.

- *Data Communication Systems:* The TELCO provides the channel and data sets. The channel must be ordered with the recommended channel conditions (C- and/or D-type). In addition to the transmission parameters, as specified for data transmission systems, an error performance is also specified as covered in the various data set documentation.

B. Assemblies

3.05 Assemblies are PL channels or arrangements of channels that were not normally intended or designed for data transmission. (Assemblies could be a channel designed and intended for data transmission but not designed to the specifications recommended by the modem supplier.) However, these arrangements will not be improved beyond their designed specifications. Channels are supported as ordered, and it is understood data services *may* perform satisfactorily. The TELCO has not specified and does not support assemblies for error performance.

4. SWITCHED DATA SERVICES

4.01 Switched data services may provide a large number of possible tandem arrangements of equipment and facilities on successive calls between two specific locations. It would be impractical to attempt to specify transmission requirements for every arrangement and to maintain each arrangement to its separate requirement. Therefore, networks are designed so that regardless of the routing, the characteristics of each transmission path are bounded.

A. Switched Services on the PSN

4.02 There are several ways in which to gain access to or from the PSN with each type having its own transmission design limitations. The access lines design limitations are critical in determining the support of an end-to-end connection. Accesses to the PSN may be obtained through:

(1) Normal business or residence lines (loops)

(2) FX lines

(3) Wide Area Telecommunication Service (WATS)

(4) 800 Service

(5) Remote Exchange (RX) Lines

(6) PBX extensions (either on-premises or off-premises) which access the PSN by:

- PBX-CO trunks

- WATS trunks

- FX trunks.

In a given connection, the terminating access may be similar to the originating access line or any of the others.

4.03 Additional considerations used to determine the support of data transmission on the PSN are interpositioning and interconnection. The various methods that are used to terminate station equipment, including the above, are covered in Section 314-010-103.

4.04 Supported data service over the PSN is defined in paragraph 4.05. It is recognized that customers may use other arrangements for data transmission and satisfactory service may result. For these arrangements, voice-grade only parameters for each telephone company provided element will be assured. Examples of unsupported data arrangements are as follows:

- Data transmission between a station on an FX line to a station on the PSN located more than 200 airline miles from the serving (FX dial tone) office regardless of the length of the FX line.

- Data transmission originating and terminating in two FX lines.

- Data transmission from any station to any other station through customer provided facilities or equipment (includes digital performance through CPE modems or PBXs). See Section 314-010-103.

- Data transmission on PSN from any SSN using off-net access lines.

- Switched data transmission to any countries other than the 50 states and Canada.

- Switched data transmission provided by an office or PBX with features, such as call-waiting, executive override, bridged

stations without the exclusion feature, etc. (These arrangements are not recommended and will most likely not work for data.)

- Data transmission using acoustically or inductively coupled stations [Fig. 1(b)].

Note: At the present time, data sets behind PBXs cannot be installed to operate with an output level exceeding -9 dBm. Therefore, there may be cases where the PBX extension and trunk losses will cause the data signal level at the serving CO to be below -12 dBm. Support for this service is therefore limited to voice-grade parameters. In order to support high speed data, it is necessary for the customer to order a direct CO line (loop) with a data jack.

4.05 Data service is fully supported for direct access PSN connections using data jacks (or grandfathered data sets). Grandfathered equipment and registered jacks are covered in Section 314-010-103. Fully supported data service on the PSN implies an objective of satisfactory data performance for 85 percent of connections.

4.06 For the PSN, satisfactory data performance is defined in terms of data-grade parameters for an end-to-end connection, called minimum acceptable performance (MAP) [Fig. 1(a)]. The MAP program is given in Section 314-205-503. In complaint cases, this level of performance may require treatment of the access lines. The overall objective is that at least 85 percent of the calls will meet or exceed the end-to-end (jack-to-jack) MAP criteria. These measurements are made as a last resort and require the guidance or assistance of data technical (DATEC) support personnel. The MAP program is applied only when access to the PSN is made, as outlined in Section 314-205-501, for the following lines:

- Subscriber

- FX (for connections to stations within 200 miles from the FX dial tone office)

- PBX (from PBX-CO trunk)

- WATS.

4.07 An error rate may be assured by the TELCO on end-to-end connections where the MAP

program applies and TELCO data sets are used. See Fig. 1(a).

B. Private Switched Services Networks

4.08 There are four types of SSN. They are:

- Tandem Tie Trunk Network (TTTN)

- Electronic Tandem Networks (ETN)

    Note: TTTN and ETN are not sold as a pure network; they are a switching capability where the customer has some power to define his own network.

- Common control switching arrangements (CCSA)

- Enhanced private switched communication service (EPSCS).

Each has different design guidelines and operation procedures. The SSNs are covered in Sections 309-YYY-ZZZ.

4.09 In general, SSN offers PL channels for use as a small switched network. Although most channels are defined in PL tariffs, support definitions are similar to those for data services on the PSN. All SSNs offer off-net access, allowing the interconnection of two separate networks. While this arrangement is useable for voice communication, it is not intended for data services and therefore is not supported.

4.10 *Tandem Tie Trunk Networks (TTTNs):* These are switched PL network arrangements that provide voice service, and in some cases data transmission, to business customers with a number of locations to be served. When used for data transmission, a voiceband connection is established by normal dialing and then connecting data sets and terminals at each end. Support of data transmission is based, among other criteria, on the number of tie trunks used to complete the connection.

4.11 *Common Control Switching Arrangements (CCSA):* These provide for the interconnection of customer locations via dedicated access lines and intermachine trunks and shared common control switching. The CCSA networks are terminated at the customer's location by telephone sets, data sets,

key telephone systems, or main PBXs/centrexes. Data transmission on CCSA networks provides a similar quality of service as that of the PSN.

4.12 *Electronic Tandem Networks (ETN):* These provide for the interconnection of customer locations via access tie trunks, intertandem tie trunks, and switching provided by either DIMENSION® 2000 PBXs or No. 1 ESS centrex. Data service is offered as two options, both of which are based on the number of trunks used to complete the connection and the speed of the data transmitted.

4.13 *Enhanced Private Switched Communication Service (EPSCS):* This service provides voice grade service between customer locations by means of intermachine trunks and access lines. The intermachine trunks and access lines are designed to permit data transmission at speeds up to 4800 b/s.

4.14 Switched Service Networks provide for both voice and data services. However, support for data differs from one type of network to the next. For this reason, support for data is covered as part of each type of network in Sections 309-YYY-ZZZ.

4.15 The data conditioning requirements associated with SSN are C3, C7, C8, and/or D3. These parameters are specially applicable to the following:

- TTTN trunks

- CCSA trunks

- EPSCS trunks [Fig. 1(f)] and access lines

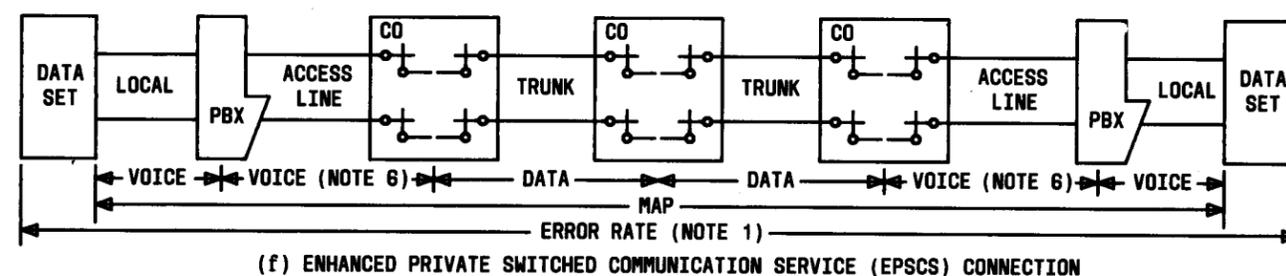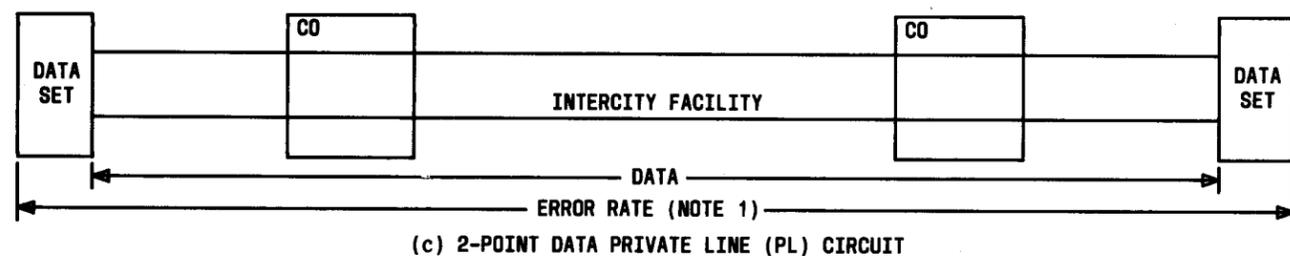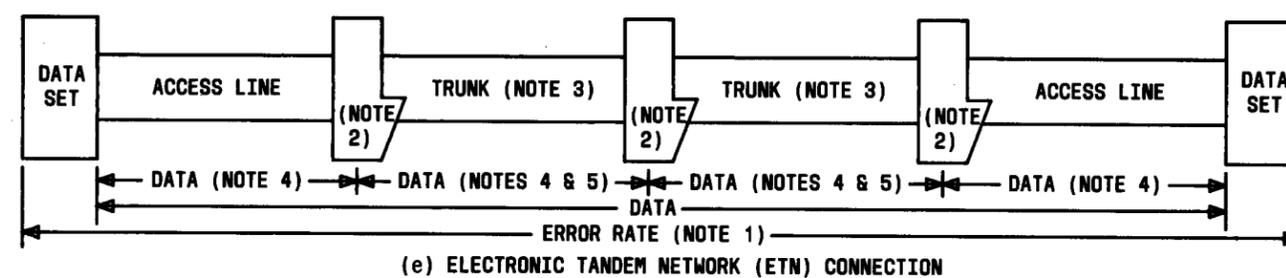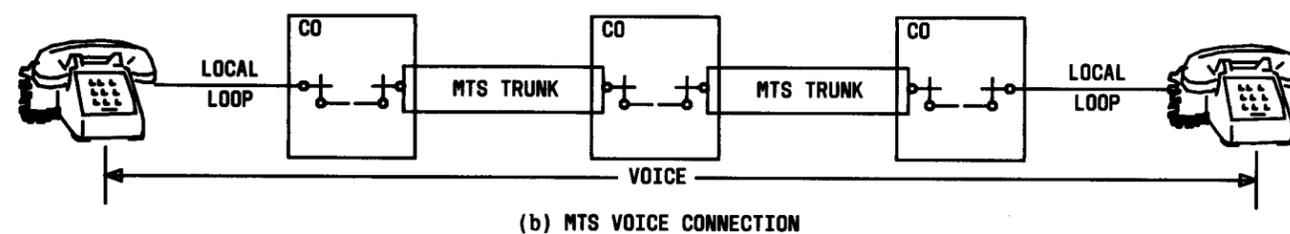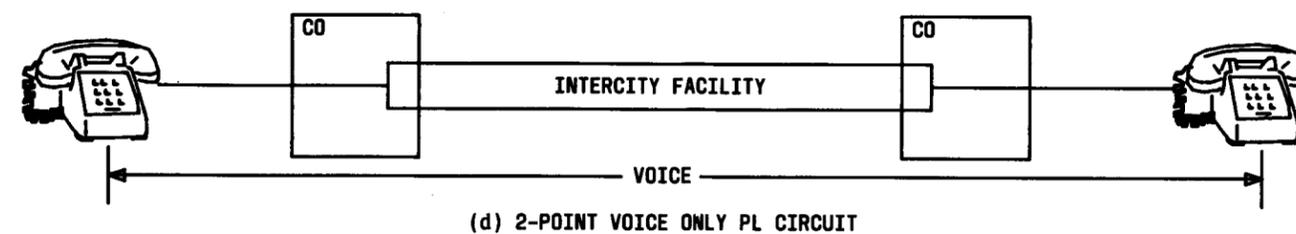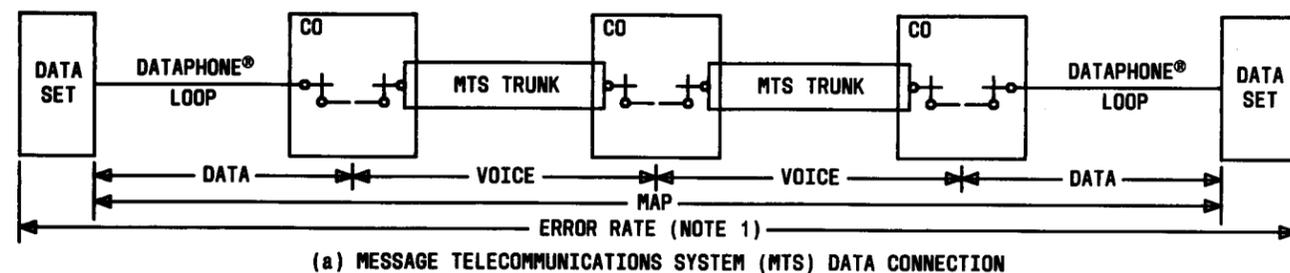- ETN trunks [Fig. 1(e)] and off-premises station (OPS) lines.

The parameters are also covered in Sections 309-YYY-ZZZ.

5. REFERENCES

5.01 The following sections provide additional information on data services support of voiceband analog data transmission:

310-300-300   Two-point Private Line Circuits— Voice Only—Tests Requirements and Objectives

314-010-100   Data General—Transmission Parameters

314-010-103   Data General—Interconnection/ Interpositioning

314-305-300   Data Systems—DATAPHONE® Service—Overall Maintenance Procedures

314-205-500   Data Systems—DATAPHONE® Service—Overall Data Transmission Test Limits

314-305-501   Data Systems—DATAPHONE® Service—Test Requirements

314-205-503   Data Systems—DATAPHONE® Service—Minimum Acceptable Performance (MAP)

314-410-100   Private Line Circuits—Voice Bandwidth—Description

314-410-500   Private Line Circuits—Voice Bandwidth—Requirements

471-110-020   Special Services—Voice Grade and Voice Grade Data Facilities Provided to Other Common Carriers

471-200-001   Special Services—Other Common Carriers—Installation and Repair Responsibilities for Facilities Furnished to Other Common Carriers

(a) MESSAGE TELECOMMUNICATIONS SYSTEM (MTS) DATA CONNECTION

(b) MTS VOICE CONNECTION

(c) 2-POINT DATA PRIVATE LINE (PL) CIRCUIT

(d) 2-POINT VOICE ONLY PL CIRCUIT

(e) ELECTRONIC TANDEM NETWORK (ETN) CONNECTION

(f) ENHANCED PRIVATE SWITCHED COMMUNICATION SERVICE (EPSCS) CONNECTION

NOTES:
1. SPECIFIED ONLY WHEN BELL SYSTEM DATA SETS ARE USED [MAY INCLUDE INDEPENDENT COMPANY (ICO) DATA SET IF TERMINATED IN ICO TERRITORY]
2. DIMENSION® PBX.
3. CENTRAL OFFICES NOT SHOWN.
4. MUST BE ORDERED BY THE CUSTOMER, OTHERWISE VOICE ONLY.
5. MAXIMUM 2 OR 3 IN TANDEM, DEPENDING ON DESIRED SPEED OF TRANSMISSION (SEE SECTION 309-400-300).
6. MAY BE DATA IF ORDERED BY CUSTOMER FOR HIGHER SPEED OF TRANSMSSION.

Fig. 1—Examples of Voice Only and Data Supported Services