

Bell System

DCW

PUB 40000

TECHNICAL REFERENCE

CATALOG
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33

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BELL SYSTEM TECHNICAL REFERENCES

GENERAL

Bell System Technical References provide interface information to designers and manufacturers of business machines, communications systems and terminal equipment. At the present time, publications are available in the following basic categories: Data Communications, Voice Communications, Radio and Transmission Engineering, PICTUREPHONE® Service, Attestation Programs, Conformance Programs, Functional Product Class Criteria, Direct Electrical Connection of Voiceband Terminal Equipment, Bell System Engineering Standards, Bell System Equipment Coding Procedures, Bell System Documentation Standards, and Network Distribution Products.

As further needs are determined, additional Technical References will be provided in both new and existing categories.

Technical References are prepared in two forms, Standard and Preliminary. Standard Technical References (e.g., Data Set 208B Interface Specification — August 1973) are provided for equipment and services which are expected to remain unchanged and available for a relatively long period of time. Preliminary Technical References (e.g., AD1 — Preliminary — October 1974) are provided for new equipment and services and indicate information which may be changed or revised. This does not mean that a manufacturer should not build equipment that is compatible with the information listed, but it does offer a caution that the information presented may change.

This catalog of Technical References lists all current Bell System Technical References. Included for each Technical Reference is the title, a synopsis and an ordering number (PUBXXXX). In addition, listings are provided to permit ordering of complete sets of Technical References.

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Each Protective Connecting Arrangement is further defined by a Uniform Service Order Code (USOC), e.g., QKT, which should be used for ordering purposes when the customer desires the installation of a connecting arrangement.

It is the responsibility of the manufacturer to advise the customer of the proper USOC; and it is the customer's responsibility to order the proper USOC from the Telephone Company.

Attention. Certain Attestation Programs, Data Access Arrangements and Couplers, as well as Voice (Protective) Connecting Arrangements, noted marginally by a bullet symbol (•) next to specific PUB numbers involved, are now invalid or may no longer be available for connection of customer-provided equipment to Telephone Company facilities.

ORDERING OF TECHNICAL REFERENCES

One-Time Orders

All orders should indicate the Technical Reference(s) desired by catalog number and quantity using the following format:

(Quantity) Technical References (Catalog Number)

If all Technical References in a particular category are desired, they may be ordered as a set using the catalog number assigned to that category. For example:

(Quantity) Complete Set of Data Communications Technical References — PUB41000

Standing Orders

In addition to one-time orders, it is also possible to place a standing order for all new and revised Technical References in a given category (e.g., Catalog, Voice or Data Communications). To place a standing order, use the following words:

Standing order for (Quantity) copies of all new [Category, (e.g., Catalog, Voice or Data Communications)] Technical References

Bell System Companies

Bell System Organizations may order Technical References using Form IND-1.80.80FA and addressing it to:

Western Electric Company, Incorporated
 Indiana Publication Center
 P.O. Box 26205
 Indianapolis, Indiana 46226

Please note that ordering procedures vary slightly from company to company. Correct procedures should be determined before ordering.

Non-Bell Companies

Non-Bell companies should submit requests for Technical References and related pricing information — in writing — to:

American Telephone and Telegraph Company
 Information Distribution Center, Room C190
 Attn: Technical References
 P.O. Box 3513
 New Brunswick, New Jersey 08903

All orders should be prepaid. The prepaid amount must include all applicable sales taxes or an exemption certificate. Shipping addresses should also be included. Billing will be rendered by the Western Electric Company, therefore, all checks should be made payable to same.

Pricing Information

The current Commercial Price for Technical References is as follows:

| Technical References | Price | Technical References | Price |
|-----------------------------|--------------|-----------------------------|---------------|
| PUB 40000 (Catalog) | No Charge | PUB 41210 | 5.60 |
| PUB 40001 (Binder) | 16.80 | PUB 41211 | 4.70 |
| PUB 41001 | 3.00 | PUB 41211A | No Charge |
| PUB 41002 | 1.60 | PUB 41212 | 3.90 |
| PUB 41003 | 3.50 | PUB 41213 | 5.20 |
| PUB 41004 | 5.60 | PUB 41214 | 3.20 |
| PUB 41005 | 2.40 | PUB 41215 | Not Available |
| PUB 41006 | 6.20 | PUB 41301 | 2.70 |
| PUB 41007 | 10.10 | PUB 41302 | 4.60 |
| PUB 41008 | 4.60 | PUB 41304 | 5.30 |
| PUB 41009 | 3.90 | PUB 41403 | 3.10 |
| PUB 41011 | 2.70 | PUB 41408 | 2.40 |
| PUB 41012 | 5.80 | PUB 41409 | 3.50 |
| PUB 41013 | 3.70 | PUB 41417 | 1.60 |
| PUB 41014 | 4.60 | PUB 41450 and ADD | 2.40 |
| PUB 41021 | 1.60 | PUB 41451 | 2.70 |
| PUB 41022 | 1.60 | PUB 41452 | 4.90 |
| PUB 41023 | 7.60 | PUB 41601 | 1.60 |
| PUB 41028 | 1.95 | PUB 41603 | 1.60 |
| PUB 41105 | 3.30 | PUB 41605 | 1.60 |
| PUB 41106 | 2.70 | PUB 41701 | 4.60 |
| PUB 41201 | 3.10 | PUB 41703 and ERRATA SH | 4.20 |
| PUB 41202 | 4.30 | PUB 41704 and ERRATA SH | 5.70 |
| PUB 41204 | 8.20 | PUB 41714 | 4.60 |
| PUB 41208 | 2.30 | PUB 41715 | 1.60 |
| PUB 41209 | 4.10 | PUB 41716 | 3.40 |
| | | PUB 41717 | 2.30 |

| Technical References | Price | Technical References | Price |
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| PUB 41718 | 1.80 | PUB 42408 | 1.90 |
| PUB 41801 | 2.00 | PUB 42501 | 2.50 |
| PUB 41802 | 4.10 | PUB 42502 | 3.60 |
| PUB 41803 | 4.80 | PUB 42503 | 4.20 |
| PUB 41804 | 5.00 | PUB 42504 | 3.10 |
| PUB 41805 | 6.70 | PUB 42505 | 3.80 |
| PUB 41806 | 1.60 | PUB 42601 | 4.50 |
| PUB 41807 | 4.00 | PUB 42601A SUPPL | No Charge |
| PUB 41901 | Not Available | PUB 42602 | 1.85 |
| | | PUB 42603 | 1.60 |
| PUB 42101 | 4.60 | PUB 42604 | 3.00 |
| PUB 42102 | 8.90 | PUB 42605 | 1.70 |
| PUB 42103 | 3.40 | PUB 42606 | 3.20 |
| PUB 42104 | 5.00 | PUB 42607 | 1.60 |
| PUB 42105 | 2.70 | PUB 42608 | 1.60 |
| PUB 42106 | 2.70 | PUB 42609 | 1.60 |
| PUB 42107 | 4.70 | PUB 42701 | 3.40 |
| PUB 42108 | 1.60 | PUB 42702 | 1.90 |
| PUB 42109 | 1.60 | PUB 42703 | 1.60 |
| PUB 42201 | 1.60 | PUB 42704 | 1.60 |
| PUB 42202 | 1.60 | PUB 42704A ADD | No Charge |
| PUB 42203 and ADD | 2.40 | PUB 42705 | 2.30 |
| PUB 42204 | 2.80 | PUB 42706 | No Charge |
| PUB 42205 | 1.80 | PUB 42707 | 2.30 |
| PUB 42206 | 4.40 | PUB 42707A ADD | No Charge |
| PUB 42206A ADD | No Charge | PUB 42708 | Not Available |
| PUB 42207 | 1.60 | PUB 42709 | 1.90 |
| PUB 42208 | 1.60 | PUB 42901 | 1.60 |
| PUB 42209 | 7.90 | | |
| PUB 42210 | 3.90 | PUB 43101 | 3.90 |
| PUB 42211 | 2.70 | PUB 43201 | 5.20 |
| PUB 42212 | 1.60 | PUB 43301 | 4.10 |
| PUB 42213 | 1.60 | PUB 43302 | 9.40 |
| PUB 42214 | 1.60 | PUB 43303 | 2.60 |
| PUB 42301 | 4.00 | PUB 43401 | 2.10 |
| PUB 42302 | 2.60 | PUB 43601 | 1.60 |
| PUB 42303 | 3.00 | PUB 43701 | 3.40 |
| PUB 42304 | 2.60 | PUB 43720 | 1.60 |
| PUB 42305 | 2.50 | PUB 43801 | 6.80 |
| PUB 42306 | 3.40 | | |
| PUB 42307 | 2.00 | PUB 44101 | 7.70 |
| PUB 42401 | 2.40 | | |
| PUB 42402 | 1.90 | PUB 45001 | 2.10 |
| PUB 42403 | 5.30 | PUB 45001A ADD | No Charge |
| PUB 42403A ADD | No Charge | PUB 45002 | 2.40 |
| PUB 42404 | 6.90 | PUB 45002A ADD | No Charge |
| PUB 42405 | 3.00 | PUB 45101 | 1.60 |
| PUB 42405A ADD | No Charge | PUB 45101A ADD | No Charge |
| PUB 42406 | 1.60 | | |
| PUB 42407 | 1.75 | PUB 46001 | 1.95 |
| | | PUB 46001A ADD | No Charge |

| Technical References | Price | Technical References | Price |
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| PUB 47001 | 2.30 | PUB 53120 | 1.80 |
| PUB 47002 | 1.60 | PUB 53121 | 17.20 |
| PUB 48001 | 2.60 | PUB 53145 | 3.40 |
| PUB 48002 | 8.40 | PUB 53200 | 3.40 |
| PUB 48003 | 3.30 | PUB 53304 | 1.60 |
| PUB 48004 | 4.70 | PUB 53305 | 2.90 |
| PUB 51001 | 11.50 | PUB 53324 | 14.00 |
| PUB 52001 | 7.40 | PUB 53325 | 2.00 |
| PUB 53111 | 1.70 | PUB 53328 | 34.80 |
| PUB 53112 | 2.50 | PUB 53329 | 18.60 |
| PUB 53115 | 3.40 | PUB 53333 | 4.30 |
| | | PUB 53337 | 1.80 |
| | | PUB 53351 | 2.10 |
| | | PUB 53401 | 2.90 |

There is no charge for Addenda. Prices are subject to change without notice. The price of a complete set of a PUB series (i.e., PUB41000) is determined by the prices of individual references. Prices do not include taxes or premium mailing charges.

ADMINISTRATION

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| *PUB40000 | Technical Reference Catalog — January 1980 | Lists all current Bell System Technical References and provides ordering information, catalog numbers and synopses. |
| PUB40001 | Technical Reference Binder | A general purpose four-ring binder suitable for all categories of Bell System Technical References. This binder will hold approximately 15 individual Technical References. |

DATA COMMUNICATIONS

- PUB41000 Complete Set of Data Communications Technical References

Facilities for Data Communications

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| PUB41001 | 30-Baud Private Line Channels Interface Specification — December 1967 | Describes a private line channel capable of transmitting two-state ("mark-space", "binary") signals at rates up to 30-baud for metering, supervisory control and miscellaneous signaling purposes. Metallic continuity, end-to-end, is not a requirement of this channel and will generally not be available. The interface signal is two-state direct current. |
| PUB41002 | 45- 55- & 75-Baud Private Line Channels Interface Specification — December 1967 | Describes three private line channels capable of transmitting two-state ("mark-space", "binary") signals up to their respective rated speeds for teletypewriter, data, metering, supervisory control and miscellaneous signaling purposes. Metallic continuity, end-to-end, is not a requirement of this channel and will generally not be available. The interface signal is two-state direct current. |
| PUB41003 | 150-Baud Private Line Channels Interface Specification — September 1975 | Describes a private line channel capable of transmitting two-state ("mark-space", "binary") signals at speeds up to 150-baud for teletypewriter, data, metering, supervisory control and miscellaneous signalling purposes. Metallic continuity, end-to-end is not a requirement of this channel and will not be available. The interface to business machines is EIA Standard RS-232C type. |
| PUB41004 | Data Communications Using Voiceband Private Line Channels — October 1973 | Describes voiceband channel arrangements for private line data transmission. Provides analog impairment limits supported on channels and digital performance supported with Bell System service offerings, interface requirements for analog channels, engineering considerations for two-point and multipoint channel usage, and information on maintenance and channel availability. |

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| PUB41005 | Data Communications Using The Switched Telecommunications Network — May 1971 | Describes the structure and operation of the DDD network, presents switching and transmission performance data on the network, and discusses topics related to data communications on the DDD network. |
| PUB41006 | Attenuation and Envelope Delay Characteristics from the 1969-70 Switched Telecommunications Network Connection Survey — June 1973 | Provides detailed information on attenuation and envelope delay characteristics on toll connections from the 1969-70 Switched Telecommunications Network Connection Survey. |
| PUB41007 | 1969 - 70 Switched Telecommunications Network Connection Survey (Reprints of Bell System Technical Journal Articles) — April 1971 | Describes analog transmission parameter performance, low-speed data transmission performance, and high-speed voiceband data transmission performance of the Switched Telecommunications Network. This is a series of three Bell System Technical Journal Articles which summarize Bell Telephone Laboratories' 1969-70 Connection Survey. |
| PUB41008 | Analog Parameters Affecting Voiceband Data Transmission — Description of Parameters — July 1974 | A tutorial describing analog parameters which may affect data transmission over voiceband channels. |
| PUB41009 | Transmission Parameters Affecting Data Transmission — Measuring Techniques — May 1975 | This Technical Reference briefly defines the parameters affecting data transmission described in the companion Technical Reference (PUB41008) and describes the techniques used by the Bell System to measure these parameters. In addition, physical and environmental requirements of test equipment used by the Bell System are provided. |
| PUB41011 | Transmission Specifications for Voice Grade Private Line Audio Tone Protective Relaying Channels — March 1978 | This Technical Reference provides information on the voice grade private line channel specifically designed for power industry audio tone protective relaying applications. By providing an increased signal-to-noise ratio for audio tone signals in the local loop portion of the channel, improved reliability is obtained for protective relaying systems during the power fault interval over that which can be obtained from any other voice grade channel. The information includes a description of the channel arrangements provided, interface criteria, transmission facility parameter limits, systems design considerations, and maintenance considerations. |

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| PUB41012 | 1A Data Station, Multichannel Arrangement Used in Provision of Two-Point Channelizing Service — June 1973 | The 1A Data Station, Multichannel Arrangement is a frequency division multiplexer capable of deriving 75 and/or 150 baud channels from a 3002 private line voiceband channel. It is arranged for mounting on the customers' premises and provides test capability for trouble sectionalization. |
| PUB41013 | Transmission Specifications for Low Speed Signaling System Channels — July 1975 | Describes a private line channel capable of unidirectional transfer of customer generated signals generally characterized as "McCulloh" systems. Metallic continuity is not a requirement of this channel. |
| PUB41014 | Data Communications Using DATAPHONE® Select-A-Station Service — February 1978 | Provides a guide for users and manufacturers of interface equipment for DATAPHONE Select — A — Station service. A multipoint private line voiceband data offering, this service allows a master station to exchange information with a number of remote stations, one at a time, in a rapid sequence. |
| PUB41021 | Digital Data System — Channel Interface Specifications — Preliminary — March 1973 | Describes the Digital Data System (DDS) and the interface between the channel termination equipment of the DDS, contained in a Channel Service Unit (CSU) and the customer's data terminal equipment. A CSU is used when the customer's equipment performs the following functions: coding and decoding, timing recovery, synchronous sampling, formatting, and generation and recognition of control signals. Also see PUB41450. |
| PUB41022 | Multistation DATAPHONE Digital Service — Preliminary — September 1974 | Describes the Multistation DATAPHONE Digital Service which utilizes the Digital Data System (DDS) to provide a full-duplex transmission capability between a control station and two or more remote stations. Each station may have the service terminated in either a DDS Channel Service Unit (CSU) or a Data Service Unit (DSU), described in PUB's 41021 and 41450, respectively. Data can be transmitted at the synchronous data rates of 2.4, 4.8, 9.6, or 56 kb/s. |

- PUB41023 DATAPHONE Switched Digital Service — Channel Interface Specifications — Preliminary — March 1976
- PUB41028 Data Communications Using Local Area Data Channels — June 1979
- Describes the Switched Digital Data System (SDDS) and the interface between the channel termination equipment of the SDDS, contained in a Channel Service Unit (CSU) and the customer's data terminal equipment. A CSU is used when the customer's equipment performs the following functions: coding and decoding, timing recovery, synchronous sampling, formatting, generation and recognition of control signals, call origination, call addressing, call answering, and call termination. Also describes the system operation, including station addresses, the Not Ready condition and operating procedures. Also see PUB41452.
- Provides information on Local Area Data Channels, the Bell System standard offering of private line channels for limited distance data transmission. The information includes a description of the channel arrangements provided, interface criteria, transmission facility parameters, and maintenance considerations.

Data Sets, Data Auxiliary Sets and Data Service Units

- PUB41106 Data Sets 103J, 113C, 113D-Type Interface Specification — April 1977
- PUB41209 Data Set 208A Interface Specification — November 1973
- PUB41210 Data Set 201C Interface Specification — April 1973
- Data Sets 103J, 113C, and 113D provide full-duplex, asynchronous, binary, serial data at speeds up to 300 bps over the switched network. Data Set 103J is an originate and answer set. Data Set 113C is an originate only set, and Data Set 113D is an answer-only set.
- The Data Set 208A provides synchronous, binary 4800 bps service over basic (unconditioned) 3002-type four-wire channels. Features include automatic adaptive equalization, 50 millisecond turnaround time, status lamps and loop-around test capabilities. These features make the set especially well suited for multipoint polling applications as well as point-to-point systems.
- The Data Set 201-type transmits serial binary data over voice bandwidth facilities using PSK modulation. Operation is synchronous full-duplex or half-duplex and may be at 2000 bps (201A) or at 2400 bps (201B or 201C) over the switched telecommunications network or private line channels.

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| PUB41211 and *PUB41211A | Data Set 208B Interface Specification — August 1973 Addendum — November 1979 | The Data Set 208B provides synchronous, binary 4800 bps service on the switched telecommunications network. Features include automatic adaptive equalization, 50 millisecond turnaround time, built-in line control, status lamps, and extensive testing capabilities. These features make the set especially well suited for switched network systems requiring reliable high thruput service. |
| PUB41212 | Data Sets 202S and 202T Interface Specification — July 1976 | Data Sets 202S and 202T provide 1200 bps asynchronous service on the switched network and 1800 bps asynchronous service on private line facilities, respectively. These data sets are line compatible with all 202-type data sets; and provide an optional 5 bps reverse channel, indicator lamps that visually display the status of the set, and test features which provide the customer with fault isolating capabilities. |
| PUB41213 | Data Set 209A Interface Specification — Preliminary — May 1974 | The Data Set 209A is a synchronous, binary serial 9600 bps data set for use on a voiceband (a 3002 data channel equipped with Type D-1, High Performance Data Conditioning) 4-wire private line. The data set features multiplexing options, rapid start-up times and extensive customer testing capabilities. |
| PUB41214 | Data Set 212A Interface Specification — January 1978 | The Data Set 212A is a 2-wire DDD full-duplex data set which operates at 0-300 bps, or 1200 bps. At 0-300 bps it is compatible with most 100-series data sets and at 1200 bps it is only compatible with another 212 data set. |
| *PUB41215 | Data Sets 108F, 108G, 108H, and 108J Interface Specification — October 1979 | Data Sets 108F, 108G, 108H and 108J are serial, asynchronous, low-speed data sets for use on private line service. The 108F and 108G data sets find application in 2- or 4-wire service when an EIA interface with the terminal is desired. The 108H and 108J data sets find application in 2-wire service when a 20mA DC interface with the terminal is desired. |
| *PUB41216 | Data Set 201C/LIC Interface Specification — Preliminary — December 1979 | The Data Set 201C/LIC is a synchronous, binary, serial, 2400 bps data set for use on the switched telecommunications network (DDS). This set uses PSK modulation and is line signal and interface compatible with Data Set 201C/LI for operation on the DDD network. |

*New Technical References

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| *PUB41217 | Data Set 201C/LID Interface Specification — Preliminary — January 1980 | The Data Set 201C/LID is a synchronous, binary, serial, 2400 bps data set for use on basic (unconditioned) 3002-Type 2- or 4-wire voiceband private lines. This set uses PSK modulation and is line signal and interface compatible with Data Set 201B and 201C/LI type for private line applications. |
| PUB41302 | Wideband Data Stations 303-Type Interface Specification — December 1974 | Data Stations 303 comprise a family of wideband data stations for use in the transmission of serial binary synchronous or nonsynchronous data. Speeds available range from 19.2 to 460.8 kbps and operation may be over either analog or digital facilities. |
| PUB41304 | Wideband Data Set 306-Type Interface Specification — July 1971 | Data Set 306A provides for the transmission of serial binary synchronous data at the transfer rate of 1.344 mb/s over T1 carrier facilities. |
| PUB41403 | Data Set 401J Interface Specification — September 1965 | Data Set 401J is a multi-frequency data receiver intended for use on DATAPHONE service. It can receive either 3-out-of-14 or 2-out-of-8 parallel signals at a speed of up to 20 characters/second. |
| PUB41408 | Data Set 407 Interface Specification — Preliminary — June 1975 | Data Set 407 is a multi-frequency data receiver designed for multiline installations. The data set receives at a rate of up to ten (10) characters per second over the switched telephone network or over basic (unconditioned) private lines from TOUCH-TONE® telephone sets, TOUCH-TONE pads, Bell System 401-type data sets transmitters in the "numeric mode" (two out of eight signals), or equivalent signal sources. |
| PUB41409 | Data Set 407C Interface Specification — November 1977 | The 407C data set is a multiple data set designed for use in short message inquiry/response using TOUCH-TONE signals for the inquiry. This document is intended to provide complete details about the features, options, and operation of the 407C. The 407C provides optional serial or parallel interface and a Frequency Shift Keyed (FSK) data transmitter. |
| **PUB41450 | DATAPHONE Digital Service — Data Service Unit Interface Specifications — February 1980 | A Data Service Unit (DSU) is used on data services provided via the Digital Data System (DDS). It provides plug-for-plug interchangeability with existing EIA Type D or E interfaces at synchronous speeds of 2400, 4800, and 9600 bits per second. At 56,000 bits per second the DSU provides the standard CCITT balanced dc interface. Also see PUB41021. |

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*New Technical Reference

**Revised — Supersedes "Digital Data System — Data Service Unit Interface Specifications—Preliminary — March 1973" and "Addendum — November 1974".

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| PUB41451 | 1.544 Mbps Digital Service — Channel Interface Specifications (Including 1.344 Mbps Service Option) — May 1977 | This Technical Reference describes the 1.544 Mbps digital service channel interface, the 551A channel service unit, the 1.344 Mbps service option utilizing a Data Service Unit (the 306A data set described in PUB41304), service objectives, and signal constraints. This service provides point-to-point, full-duplex transmission of serial, bipolar, synchronous pulses at a transfer rate of 1.544 Mbps with signal format constraints. At the customer's option, utilizing a data service unit, the service provides full-duplex transmission of serial binary pulses at a transfer rate of 1.344 Mbps without signal constraints. |
| PUB41452 | DATAPHONE Switched Digital Service — Data Service Unit Interface Specification — Preliminary — March 1976 | A 56,000 bps Data Service Unit (DSU) is used on data services provided via the Switched Digital Data System (SDDS). The DSU provides the standard CCITT V.35 type interface. The DSU also provides, as an option, a standard EIA RS-366 type — Automatic Calling Interface for automatic call origination. Also as an option, manual call origination and termination are provided via a manual call controller (DAS821A). See also PUB41023. |
| PUB41601 | Data Auxiliary Set 801A (Automatic Calling Unit) Interface Specification — March 1964 | The Data Auxiliary Set 801A is a dc dial pulse Automatic Calling Unit (ACU) which permits a business machine to place calls over the switched telecommunications network. In operation, a telephone number stored in the business machine is passed to the ACU which sets up the call and transfers the circuit to the associated data set for the automatic transmission of data. |
| PUB41603 | 801C-L1/2 Data Auxiliary Set Interface Specification — Preliminary — November 1976 | The Data Auxiliary Set 801C is a TOUCH-TONE dialing Automatic Calling Unit (ACU) which permits a business machine to place calls over the switched telecommunications network. In operation, a telephone number stored in the business machine is passed to the ACU which sets up the call and transfers the circuit to the associated data set for the automatic transmission of data. |

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| PUB41605 | Local Area Data Set (LADS) 48230 Interface Specification — Preliminary — April 1978 | The 48230 Local Area Data Set (LADS) provides full-duplex synchronous data transmission at speeds of 2400, 4800, 7200, 9600 and 19200 bps over 4-wire Type 83 Local Area Data Channels (LADC). The LADS supports services between locations on contiguous or non-contiguous property for a maximum route distance of six (6) miles at 2400 and 4800 bps, four (4) miles at 7200 bps, three (3) miles at 9600 bps, and two (2) miles at 19200 bits per second. |
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Data Communications Systems and Terminals*

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| PUB 41701 | 83B3 Teletypewriter Selective Calling System — September 1967 | The 83B3 Teletypewriter Selective Calling System is a five-level, half-duplex, private line system using Model 28 equipment at speeds up to 100 words per minute. The traffic flow is governed by a control station which automatically polls the other stations to start their tape readers. |
| PUB41703 | 86A1 and 86A2 Data Selective Calling Service Stations — June 1969 | The 86A1 and 86A2 Data Selective Calling Service Stations are used in providing eight-level, half-duplex selective calling systems. The 86A1 station provides for 100 wpm operation using Model 33 or 35 equipment while the 86A2 station provides for 150 wpm operation using Model 37 equipment. Control of these stations is from a customer-provided computer (line control stations). 86A-type stations are used in applications where the customer-provided computer controls both half- and full-duplex circuits. |
| PUB41704 | 86B-Types Data Selective Calling System Stations — November 1968 | 86B-type Data Selective Calling System Stations are used in providing eight-level, full-duplex selective calling systems. The 86B1 stations operate at 100 wpm using Model 33 and 35 equipment. The 86B2 stations operate at 150 wpm using Model 37 equipment. Control of these stations is from a customer-provided computer. |
| PUB41714 | 9131 Teletypewriter Selective Calling Station Arrangement — January 1974 | The 9131 Teletypewriter Selective Calling Station Arrangement is used in providing an eight-level, half-duplex, private line selective calling system. It provides for 100 wpm operation using Model 33 or 35 teletypewriters. It is a contention type system (i.e., not controlled by a master station) intended primarily for handling intraline traffic. |

*PUB's 41702, 41706, 41707, 41708, 41709, 41710, 41712, and 41713 have been deleted as the products that they cover are no longer current.

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| PUB41715 | DATASPEED® 40 Stations for DATAPHONE Service — Preliminary — December 1973 | The DATASPEED 40 is a medium speed data terminal which provides advanced facilities for entering, displaying, editing, printing, sending and receiving data. DATAPHONE operation at 1050 or 1200 bits per second using 202-type data sets is described. |
| PUB41716 | DATASPEED 40/4 Data Terminals — June 1978 | The DATASPEED 40/4 is a clustered station arrangement with capability for up to 24 keyboard display and 12 printer devices. Data organization is field oriented with binary synchronous line protocol providing error checking and correcting. The line protocol also regulates message traffic by polling and selecting in a method similar to that used in selective calling systems. Data transmission is synchronous at 2400, 4800, or 9600 bps over point-to-point private line facilities using 201C, 208, or 209 data sets; or 2400 or 4800 bps over multipoint private line facilities using 201C or 208 data sets. |
| PUB41717 | 43 Teleprinter KSR — February 1978 | This Technical Reference describes the operation and line characteristics of the Model 43 KSR Teleprinter over the switched network. |
| *PUB 41718 | DATASPEED 40 Forms Access Printer — July 1979 | The DATASPEED 40 Forms Access Printer is an 80-column, tractor-feed printer used in asynchronous 40/1, 40/2, 40/3 and Receive Only Printer (ROP) applications as well as in synchronous 40/4 and ROP configurations. It provides the user immediate access to the printed form which eliminates wasted forms and paper. |

Data Interconnection

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| (•)PUB41801 | Data Access Arrangement CDT for Manual Originating and Answering Terminals — May 1973 | Data Access Arrangement CDT is used to connect customer-provided terminal equipment to the switched telecommunications network. It provides for manual origination and answering of calls and includes a standard telephone set equipped with an exclusion key used to manually transfer between the TALK and DATA modes. |
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*New Technical Reference

- (●)PUB41802 Data Couplers CBS and CBT for Automatic Terminals — May 1974
- Data Couplers CBS and CBT are used to connect customer-provided terminal equipment to the switched telecommunications network. They provide for automatic answering, terminating and/or dc dial pulse originating of calls and include a network control signaling unit and a data access arrangement. Data Coupler CBS provides EIA RS-232C voltage type control leads. Data Coupler CBT provides contact closure type control leads. The conditions under which customer-provided data stations may generate tone signals for the purpose of addressing the switched telecommunications network are described.
- PUB41803 Acoustic and Inductive Coupling For Data and Voice Transmission — October 1972
- Provides information of interest to the designer of acoustically or inductively coupled data and voice transmission equipment. Information includes system design considerations, transmission speeds, transmission to other data sets, power limitations, and a test instrument assembly.
- PUB41804 Switched Network Transaction Telephone System Interfacing With Audio Response Units — July 1976
- This Technical Reference defines all the operational characteristics of the Transaction Telephone System interfacing with audio response units.
- *PUB41805 Switched Network Transaction Telephone System Interfacing With Transmission Control Units (Primary Response Mode Frequency Shift Keying) — January 1980
- This Technical Reference covers the operation of the Transaction telephone system as it interfaces with serial Transmission Control Units or Customer computers. Specifically, the operation of the system as three interfaces is defined. They are the interfaces between the customer computer and the telephone company equipment, between the telephone line and the Transaction telephone, and between the Transaction telephone and the user. Additional telephone company equipment at the computer location, including Automatic Call Distributors to concentrate and distribute calls, and CALL DIRECTORS® are discussed. The functions and operation of both the Transaction I and Transaction II telephones, and the 407CR data set, are described in detail.

®Registered Trademark AT&T Co.

*Revised — Supersedes "Switched Network Transaction Telephone System Interfacing with Transmission Control Units (Primary Response Mode Frequency Shift Keying) — April 1977".

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| PUB41806 | Transaction III Terminal — Preliminary — January 1977 | The Transaction III terminal is a new station device intended to provide polled access to Transaction Network Service (TNS). TNS is a new service intended to provide the basic communication requirements of inquiry/response systems. |
| PUB41807 | Transaction Printer — Preliminary — November 1977 | Describes the Transaction printer and its use with a Transaction II telephone or a Transaction III terminal. The printer provides the means for printing — on forms or slips of paper — ASCII coded Frequency Shift Keyed (FSK) response messages containing transaction data transmitted to the Transaction II telephone or Transaction III terminal from a remotely located data base. |
| **PUB41901 | DATAPHONE II Service System Description — Preliminary — October 1979 | DATAPHONE II service is a synchronous private line data set offering at 2400, 4800 and 9600 bps. In addition to diagnostic testing within the data sets, a Diagnostic Console and a Network Controller are offered to provide two additional levels of testing and control. |

VOICE COMMUNICATIONS

PUB42000 Complete Set of Voice Communications Technical References

Protective Connecting Arrangements — Manual, Terminal*

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| PUB42101 | QKT — June 1971 | Manual connecting arrangement used for the connection of customer-provided voice transmitting and/or receiving equipment or communications systems to a PBX or central office station line through a Telephone Company-provided telephone set equipped with an exclusion key. |
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*PUB41803 listed under the Data Interconnection section provides information of interest to the designer of acoustically or inductively coupled devices for Voice as well as Data Transmission.

**New Technical Reference

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| PUB42102 | CDX — February 1973 | Manual voice connecting arrangement used to connect a customer-provided device, typically patching devices, which enables the connection of an incoming call to a Telephone Company-provided PBX and an outgoing central office trunk line from a Telephone Company-provided PBX. |
| PUB42103 | CEBAX/CEBBX — Preliminary — June 1970 | Voice Connecting Arrangement CEBAX permits a customer to manually connect and disconnect customer-provided equipment, typically, multi-line conferencing devices, to a specific line terminated on a Telephone Company-provided key set (control station). For use with customer-provided equipment with only one supervisory contact. Furnished on a per line per control station basis. Voice Connecting Arrangement CEBBX permits a customer to manually connect and disconnect customer-provided equipment, typically multi-line conferencing devices, to a specific line terminated on a Telephone Company-provided key set (control station). For use with customer-provided equipment with two supervisory contacts. Furnished on a per line basis. |
| PUB42104 | LOH — Preliminary — July 1970 | Voice connecting arrangement permitting the connection of customer-provided background music or other recorded material to central office lines terminated in a Telephone Company-provided switchboard. |
| PUB42105 | LVH — Preliminary — July 1970 | Voice connecting arrangement permitting the connection of customer-provided background music or other recorded material to central office or PBX lines, terminated in Telephone Company-provided key telephone sets, while the line is in the hold mode. |
| PUB42106 | CEBAV — Preliminary — August 1970 | Voice connecting arrangement which permits a customer to manually connect and disconnect customer-provided equipment, typically manual announcement sets, which answers an incoming call, to a specific line terminated on a Telephone Company-provided key set (control station). For use with customer-provided equipment with only one supervisory contact. |

- PUB42107 CEBAW — Preliminary —
August 1970
- Voice connecting arrangement which permits the customer to manually connect and automatically disconnect customer-provided equipment, typically intercom systems, to a specific line terminated on a Telephone Company-provided key set (associated station). For use with customer-provided equipment with two supervisory contacts.
- PUB42108 FTP — Preliminary —
April 1974
- Voice Connecting Arrangement FTP provides a means of connecting a customer-provided source of music or recorded information to the Music-On-Hold and/or Background-Music-Over-Paging features of the Telephone Company-provided Com-Key® 718 and 1434 Communications Systems.
- PUB42109 FTM — Preliminary —
November 1975
- Protective Connecting Arrangement FTM provides a means of connecting a customer-provided source of music or recorded information to the Music-On-Hold feature of a Telephone Company-provided key telephone system.

Protective Connecting Arrangements — Automatic Terminal

- PUB42201 CAU/SU3/SU4/SU6 —
October 1975
- Protective Connecting Arrangement CAU is an alarm coupler which provides one-way transmission for use with a customer-provided alarm device with dial pulse signaling.
- SU3 is a tone signaling unit for use with Protective Connecting Arrangements CAU or SU6 — permits the operation of the alarm device to be tested or verified from a remote location.
- Protective Connecting Arrangement SU4 is the combination of Protective Connecting Arrangements CAU and SU3. There is no assigned code for the combination of Protective Connecting Arrangements SU6 and SU3.
- Protective Connecting Arrangement SU6 is an alarm coupler modified to provide two-way transmission, to permit detection of dial tone or proper signal from a remote point. See SU6AQ.
- (●)PUB42202 SU7QW —
April 1975
- Protective Connecting Arrangement SU7QW provides the means for automatically connecting customer-provided dial pulse repertory dialers.
- (●)PUB42203 RTT — Preliminary —
and January 1970
- (●)PUB42203A Addendum — October 1974
- Connecting arrangement that generates a tone to both parties under control of a customer-provided call duration timer.

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- (●)PUB42204 RDL/RDM — Preliminary —
January 1973
- Voice Connecting Arrangement RDL is a recorder coupler arranged for one-way recording or one-way announcements-not arranged for both at the same time. Voice Connecting Arrangement RDM is a recorder coupler modified to provide two-way simultaneous transmission. See RDMZR.
- (●)PUB42205 RCZ —
July 1975
- Recorder connector used to connect customer-provided two-way recording equipment which provides a distinctive "beep" tone and includes a filter.
- (●)PUB42206 RC1 — Preliminary —
and June 1971
- (●)PUB42206A Addendum — October 1974
- Connecting arrangement which provides the means for customer-provided equipment to cause a short burst of 1400Hz tone to be sent to the local part; used for call duration timing.
- PUB42207 C2ACP/C2AKS —
February 1975
- Protective Connecting Arrangement C2ACP is an automatic arrangement used to connect customer-provided terminal equipment to a WATS access line, a central office station line, or a PBX/Centrex extension line.
- Protective Connecting Arrangement C2AKS is an automatic arrangement used to connect customer-provided terminal equipment to a WATS access line, a central office station line, or a PBX/Centrex extension line which concurrently terminates in a Telephone Company-provided station.
- (●)PUB42208 STC — Preliminary —
February 1974
- Voice connecting arrangement that provides the means of automatically connecting customer-provided transmitting and receiving speech terminal equipment, e.g., telephone sets, utilizing a three-wire interface.
- (●)PUB42209 RDMZR/RDY —
December 1973
- Voice Connecting Arrangement RDMZR provides the means for automatically connecting customer-provided receive-only speech terminal equipment, e.g., answering sets; it supersedes and replaces Voice Connecting Arrangement RDM.
- Voice Connecting Arrangement RDY provides all of the features of Voice Connecting Arrangement RDMZR and, in addition, provides volume-limited receive transmission.

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| (•)PUB42210 | SU6AQ/STS — Preliminary — June 1971 | Voice Connecting Arrangement SU6AQ provides the means for automatically connecting customer-provided transmitting and receiving speech terminal equipment, e.g., alarm systems, utilizing a multi-wire interface; it supersedes and replaces Voice Connecting Arrangement SU6. |
| | | Voice Connecting Arrangement STS provides all of the features of Voice Connecting Arrangement SU6AQ and, in addition, permits the transmission of customer-provided supervisory tone signals; it provides an alternative to Voice Connecting Arrangement SU3. |
| PUB42211 | CEZ — Preliminary — November 1971 | Voice connecting arrangement which permits the manual connection and automatic disconnection of customer-provided equipment (typically conferencing devices) to a specific line on an associated Telephone Company-provided key telephone set. |
| PUB42212 | STP/C2F — Preliminary — March 1977 | Voice Connecting Arrangement STP provides a means for automatically connecting customer-provided transmitting and receiving speech terminal equipment, e.g., key telephone systems. |
| (•)PUB42213 | ADI — Preliminary — October 1974 | Connecting Arrangements ADI provides a means to associate dial pulse dialers with single or multi-line telephone sets. |
| (•)PUB42214 | GTS — Preliminary — December 1974 | Protective Connection Arrangement GTS provides a means of connecting an automatic answering device to a telephone line. The customer-provided answering device connects via a standard 4-prong telephone jack. |

Protective Connecting Arrangements — Manual, System

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| PUB42301 | 2A (CDB) — Preliminary — February 1969 | Manual voice connecting arrangement used to connect a line from a customer-provided system, which provides supervisory signals, to a central office trunk line through a Telephone Company-provided cord switchboard position. |
| PUB42302 | 1A (CDA) — Preliminary — June 1969 | Manual voice connecting arrangement used to connect a cord switchboard position of a customer-provided system, which provides supervisory signals, to an exchange trunk line. |
| PUB42303 | 3A (CDN) — Preliminary — June 1969 | Manual voice connecting arrangement used to connect a line from customer-provided system, which provides supervisory signals, to an exchange line through a Telephone Company-provided key station. |

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| PUB42304 | CD1 — Preliminary — July 1969 | Manual voice connecting arrangement used to connect a cord switchboard position of a customer-provided system, which does not provide supervisory signals, to an exchange trunk line. |
| PUB42305 | CD4 — Preliminary — August 1969 | Manual voice connecting arrangement used to connect a line from a customer-provided system, which does not provide supervisory signals to an exchange trunk line through a Telephone Company-provided cord switchboard position. |
| PUB42306 | CD5 — Preliminary — August 1969 | Manual voice connecting arrangement used to connect a line from a customer-provided system, which does not provide supervisory signals, to an exchange line through a Telephone Company-provided key telephone station. |
| PUB42307 | CDY — Preliminary — October 1969 | Voice connecting arrangement used to terminate — without exchange connection — a line from a customer-provided system in a Telephone Company-provided key telephone station. |

Protective Connecting Arrangements — Automatic, System

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| PUB42401 | CDH and CBF — March 1974 | Automatic voice connecting arrangement used to connect the attendant position and dial switching equipment of a customer-provided system to an exchange trunk line arranged for two-way combination rotary or TOUCH-TONE service. Connecting Arrangement CBF is provided in addition to CDH when Data Communications equipment is used behind the PBX. CBF provides a linear attenuator which limits the three-second average power level transmitted to the central office without distorting the signal. The maximum allowable power level is determined at the time of installation. |
| PUB42402 | CD7/CD8/CD9/ and CBF — March 1974 | Voice Connecting Arrangement CD7 is an automatic arrangement used to connect the attendant position of a customer-provided system to an exchange trunk line arranged for one-way outgoing rotary or TOUCH-TONE service. Voice Connecting Arrangement CD8 is an automatic arrangement used to connect the dial switching equipment of a customer-provided system to an exchange trunk line arranged for one-way outgoing rotary or TOUCH-TONE service. |

Voice Connecting Arrangement CD9 is an automatic arrangement used to connect the attendant position of a customer-provided system to an exchange trunk line arranged for two-way rotary or TOUCH-TONE service.

Connecting Arrangement CBF is provided in addition to CD7, CD8, or CD9, when Data Communications equipment is used behind the PBX. CBF provides a linear attenuator which limits the three-second average power level transmitted to the central office without distorting the signal. The maximum allowable power level is determined at the time of installation.

PUB42403 CET — Preliminary —
and October 1970
PUB42403A Addendum — June 1974

Automatic voice connecting arrangement used to connect a customer-provided system to an exchange trunk line arranged for one-way service to the operator position of a Telephone Company long distance switchboard (the equivalent of a toll terminal).

PUB42404 CD6 — Preliminary —
December 1969

Automatic voice connecting arrangement used to connect an exchange trunk line arranged for one-way incoming service to the attendant position of a customer-provided system.

PUB42405 CED — Preliminary —
and April 1970
PUB42405A Addendum — June 1974

Automatic voice connecting arrangement used to connect a customer-provided system to an exchange trunk line, arranged for two-way service, to the operator position of a Telephone Company long distance switchboard (the equivalent of a toll terminal).

PUB42406 C22 — Preliminary —
July 1976

Automatic voice connecting arrangement used to connect an exchange trunk line arranged for one-way direct inward dialing (DID) service to the dial switching equipment of a customer-provided system.

PUB42407 C24/C2H — Preliminary —
October 1971

Voice Connecting Arrangement C24 is an automatic arrangement used for two-way service which provides a four-wire voice transmission interface for connecting customer-provided channel facilities to a Telephone Company PBX. An E and M type signaling interface is provided.

Voice Connecting Arrangement C2H is an automatic arrangement used for two-way service which provides a four-wire voice transmission interface for connecting customer-provided channel facilities to Telephone Company Centrex service. An E and M type signaling interface is provided.

PUB42408 C27/C2K — Preliminary —
October 1971

Voice Connecting Arrangement C27 is an automatic arrangement used for two-way service which provides a two-wire voice transmission interface for connecting customer-provided channel facilities to a Telephone Company PBX. An E and M type signaling interface is provided.

Voice Connecting Arrangement C2K is an automatic arrangement used for two-way service which provides a two-wire voice transmission interface for connecting customer-provided channel facilities to Telephone Company Centrex service. An E and M type signaling interface is provided.

Protective Connecting Arrangements — Private Line

PUB42501 CDQ4W — Preliminary —
August 1969

Automatic voice connecting arrangement arranged for two-way service which provides a four-wire voice transmission interface to customer-provided dial switching equipment — used with a Telephone Company-provided four-wire private line channel equipped with Telephone Company-provided channel signaling with a contact-type signaling interface.

PUB42502 CDQ2W/CDQ2X —
Preliminary —
June 1971

Voice Connecting Arrangement CDQ2W is arranged for two-way service, and provides a two-wire interface to customer-provided dial switching equipment. Used with Telephone Company-provided private line channel and Telephone Company-provided channel signaling with a contact-type signaling interface.

Voice Connecting Arrangement CDQ2X is arranged for two-way service, and provides a two-wire interface to customer-provided dial switching equipment. Used with Telephone Company-provided private line channel and Telephone Company-provided channel signaling with an E and M type signaling interface.

PUB42503 C234W — Preliminary —
February 1971

Voice connecting arrangement for two-way service, which provides a four-wire voice transmission interface to customer-provided dial switching equipment. Used with a Telephone Company-provided four-wire private line channel and customer-provided channel signaling.

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| PUB42504 | C232W — Preliminary — September 1971 | Voice connecting arrangement arranged for two-way service, which provides a two-wire interface to customer-provided dial switching or station terminal equipment. Used with a Telephone Company-provided private line channel and customer-provided channel signaling (inband signaling only). |
| PUB42505 | CDQ4X — Preliminary — October 1971 | Automatic voice connecting arrangement arranged for two-way service, which provides a four-wire interface to customer-provided dial switching equipment. Used with a Telephone Company-provided four-wire private line channel equipped with Telephone Company-provided channel signaling with an E and M signaling interface. |

Protective Connecting Arrangements — Miscellaneous

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| PUB42601 | CEK — Preliminary — April 1970 | Connecting arrangement used to associate customer-provided message registers where the customer is providing the communications system and the necessary equipment to associate the station with the message registers with a central office trunk line. |
| (●)PUB42602 | CAK — Preliminary — May 1972 | Specification CAK describes a procedure used by AT&T Co. for the evaluation of customer-provided antique/decorator set housings. Replaces B drawings previously furnished by the local Telephone Companies. |
| PUB42603 | C1V/RCX/GC2 — Preliminary — June 1972 | <p>Connecting Arrangement C1V is used to connect customer-provided elapsed time or pen register equipment to PBX WATS lines, PBX central office trunks or station lines. This arrangement provides a closure that is maintained when the line is off-hook and will not follow dial pulses.</p> <p>Connecting Arrangement RCX is used to connect customer-provided elapsed time or pen register equipment to PBX WATS lines, PBX central office trunks, or station lines. This arrangement provides a closure that is maintained when the line is off-hook and opens on each dial pulse.</p> <p>Connecting Arrangement GC2 consists of an ac ring-up relay bridged across the line. Provides a contact closure to customer-provided equipment when ringing voltage is present. Used with ring indicator devices.</p> |

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| PUB42604 | C25 — Preliminary — July 1971 | Connecting arrangement used to connect the customer-provided automatic number identification equipment of a customer-provided communications system to a Bell System central office for automatic identified outward dial (AIOD) service. |
| PUB42605 | CTD — June 1975 | Protective connecting arrangement used to connect customer-provided call diversion equipment to a Telephone Company CO trunk terminated on a Telephone Company PBX. The arrangement provides a high impedance line status indication of the supervisory and address signals on the trunk and receives a contact closure to cause diversion of an outgoing call from the PBX in the normal manner. |
| PUB42606 | HZM — Preliminary — November 1972 | Connecting Arrangement HZM is used to connect customer-provided traffic measuring equipment to station lines, PBX CO trunks, and some types of tie lines. Permits the deduction of on-hook, off-hook, dial pulse, TOUCH-TONE, and signaling through a high resistance connection to the line. |
| PUB42607 | VCP — NOTICE — May 25, 1973 | Connecting Arrangement VCP provides the capability for a customer, on an optional basis, to supply the dc power to voice connecting arrangements associated with customer-provided PBX's and certain other voice connecting arrangements where specifically provided for in its technical reference. |
| PUB42608 | KTX — Preliminary — October 1973 | Connecting arrangement used to connect customer-provided call diversion equipment to a Telephone Company line terminated in a Telephone Company Key Telephone System. The arrangement provides a high impedance line status indication of the supervisory and address signals on the line and receives a constant closure to divert an outgoing call. Restriction tone or an announcement is provided by the customer. |
| PUB42609 | CTH — Preliminary — December 1973 | Protective connecting arrangement used to connect customer-provided call diversion equipment to a Telephone Company CO trunk terminated in a Telephone Company PBX. The arrangement provides a high impedance line status indication of the supervisory and address signals on the trunk and receives a contact closure to cause diversion of the call. Restriction tone or an announcement is provided by the customer. |

Protective Connecting Arrangements — PBX Adjuncts

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| PUB42701 | DCT — Preliminary — June 1971 | Voice connecting arrangement (formerly designated Recorded Telephone Dictation Trunk Circuit) which provides trunk level access, e.g., dial “7”, from a station on a Bell System PBX or Centrex system to customer-provided dictation equipment. |
| PUB42702 | DCW — Preliminary — July 1971 | Voice connecting arrangement (formerly designated Interface Trunk Circuit) which provides a two-part trunk level access, e.g., dial “7”, from a station on a Bell System PBX or Centrex system to customer-provided equipment capable of receiving dialed digits (serial or parallel coded) for central purposes. |
| PUB42703 | DCK/DCL — October 1974 | Voice Connecting Arrangements DCK and DCL provide trunk level access, e.g., dial “7” from a station on a Bell System PBX or Centrex system to customer-provided equipment (e.g., dictation or radio paging) capable of receiving TOUCH-TONE digits directly or dial pulse digits over a separate pair for control purposes. |
| PUB42704 and PUB42704A | TSPXY/TSPZ1 — Preliminary — March 1975 Addendum — December 1976 | Protective Connecting Arrangements TSPXY and TSPZ1 provide a means of connecting customer-provided recording and control equipment to PBX trunks. With these arrangements, an outgoing trunk can be split to allow dialing extra digits or to pulse a number into the central office. |

Customer Switching Systems

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| *PUB42705 | Recorded Magnetic Tape — Formats For Station Message Detail Recording Features on Dimension® PBXs — Preliminary — June 1979 | Describes the formats of call detail data which are recorded on nine-track magnetic tape to provide the Station Message Detail Recording function in the Bell System Dimension family of Customer Switching Systems. |
| **PUB42706 | Direct Output Data Formats For Station Message Detail Recording Feature on Dimension PBXs — Preliminary — December 1979 | This is a general revision to PUB42706 dated April 1977 and includes information on a number of new features and enhancements to SMDR with the introduction of new Dimension software programs. |

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*Revised — Supersedes “Recorded Magnetic Tape Data — Formats for Station Message Detail Recording Feature on Dimension® PBXs — Preliminary — August 1979”.

**Revised — Supersedes “Direct Output Data Formats For Station Message Detail Recording Feature on Dimension PBXs — Preliminary — April 1977” and “Addendum — May 1978”.

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| PUB42707 | Dimension PBX Feature Package 9 — Property Management System Data Link Interface Specification — Preliminary — April 1978 | This Technical Reference provides a description of the Property Management System (PMS) data link interface that is provided as a feature on the Bell System Dimension PBX equipped with Feature Package 9. The interface allows a PMS to provide front office and back office hotel/motel management features with communications related functions coordinated with Dimension PBX. |
| *PUB42708 | Recorded Magnetic Tape Data Formats for No. 1 and No. 1A ESS Local Message Detail Recording Provided by the 93A Customer Premises System — September 1979 | Describes the formats of call detail which are recorded on nine-track magnetic tape of the 93A CPS to provide the Station Message Detail Recording function in Centrex ESSX-1 and Electronic Tandem customers served by Bell System 1/1A ESS. |
| **PUB42709 | Tie Trunk Signaling Compatibility For Connecting to a Dimension PBX — July 1979 | This document describes a) How Electronic Tandem Service is provided by a Dimension PBX equipped with Feature Package 8 and b) the signaling compatibility for PBXs connecting to a Dimension (e/w FP8) in a tandem switching environment. |

Miscellaneous Customer Equipment Items

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| PUB42901 | Acoustics of Teleconference Rooms — Preliminary — August 1977 | This Technical Reference provides basic rules for installing audio equipment consistent with speech intelligibility and easy talker recognition. |
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RADIO AND TRANSMISSION ENGINEERING

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| PUB43000 | Complete Set of Radio and Transmission Engineering Technical References | |
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Private Line Facilities

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| PUB43101 | Voice Grade Entrance Facilities For Extending Customer-Provided Communications Channels — Preliminary — May 1969 | Describes the various entrance facility serving arrangements, provides transmission characteristics of entrance facilities, describes signal power limitations and discusses the division of responsibility for design, operation and maintenance. |
| PUB43201 | Private Line Interconnection Voice Applications — Preliminary — June 1970 | Describes the standard private line offerings for voice applications which may be interconnected at one or both ends with customer-provided voice communications systems or terminal equipment. Also describes minimum protection criteria, signaling arrangements and maintenance techniques. |

*Revised — Supersedes "Recorded Magnetic Tape Data for 93A Customer Premises System for Use With 1 ESS — ETN — Preliminary — June 1979".

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| PUB43401 | Transmission Specifications for Private Line Metallic Circuits — Preliminary — December 1971 | Describes the signal level criteria objectives for private line metallic circuits (cable pairs without signal battery or amplification devices). This material is provided for those who use the metallic continuity of local private line channels implemented by wire pairs. It should be noted that the Telephone Companies have no obligation to provide private line channels on a metallic basis. |
| PUB43601 | Lightning and 60Hz Disturbances at the Bell System Network Terminal Interface — Preliminary — June 1978 | This Technical Reference provides a description of the non-telephone voltages and currents that may be encountered between the Bell System network and terminal equipment. These voltages and currents are caused by lightning or abnormalities on power systems. |
| PUB43701 | Private Line Interconnection — Connection to a Channel of a Communications System — Preliminary — February 1977 | Revisions to Tariff FCC 260 permit the connection of 260 private line services to a customer or OCC provided communications channel. PUB43701 supplies information concerning the technical parameters of FCC No. 260 private line services, and is intended to serve as both a design and ordering aid to the customer. The document describes the voiceband services which can be provided, associates each service with all applicable terminations, and describes the functional operation of the service. In addition, PUB43701 lists the interfaces with which the services can be terminated for connection to a customer or OCC provided communications channel and describes, in detail, the characteristics of each interface. |
| PUB43720 | Private Line Interconnection — Operational Features of Bell System Switch Terminations — Preliminary — February 1977 | Revisions to Tariff FCC 260 permit the connection of 260 private line services to a customer or OCC provided communications channel. The revisions also direct that a summary of the operational features of Telephone Company-provided switching equipment located at the remote ends of the customer's composite communications configuration be supplied (to the customer) to allow the customer to ensure the compatibility of the remote terminations. PUB43720 describes the technical content and use of the compatibility checklists. These forms are provided by the Operating Telephone Company to the customer and describe certain characteristics of the Bell switch termination. These characteristics include the type of outpulsing control that can be provided (delay dial, wink start, dial tone), the type of addressing that can be generated outgoing and accepted incoming (TOUCH-TONE or Dial Pulse), and the maximum number of digits that can be outpulsed. |

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| PUB43801 | Digital Channel Bank — Requirements and Objectives — Preliminary — December 1978 | Describes technical, administrative, and maintenance criteria listed as requirements which a digital channel bank should meet in order to ensure network integrity. The publication is intended to identify those administrative, engineering, maintenance, and technical requirements and objectives that should be met in order to ensure satisfactory operation in a Bell System environment. The criteria contained in the document describes the characteristics and features which to the best of our knowledge will ensure proper functioning of the product if used by the Telephone Company. |
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Mobile Radio

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| PUB43301 | Domestic Public Land Mobile Telephone Service — Customer- Provided Dial Stations — Preliminary — March 1973 | Provides information needed to interface customer-provided mobile telephone dial stations with Telephone Company-provided mobile telephone radio systems. |
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| PUB43302 | Intermodulation Interference in Radio Systems — November 1972 | With the explosive growth of radio systems, problems of "overpopulation" are beginning to misuse valuable radio spectrum. One of the principal overpopulation problems encountered today, yet one about which relatively little information is available, is intermodulation interference. This Technical Reference represents present views of the problem and presents some possible solutions. |
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| PUB43303 | Domestic Public Land Mobile and Maritime Radio Service System Interface Criteria — Preliminary — June 1974 | This Technical Reference is a guide for designers, manufacturers, and operators of common carrier radio systems which interface with the Bell System telephone network. The document describes the electrical information which must pass between a Bell System Central Office and a common carrier radio system in order to originate and terminate calls. This Technical Reference is not intended to provide complete design specifications or parameters, or to assure the quality or performance of the common carrier radio system. |
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PICTUREPHONE SERVICE

PUB44000 Complete Set of PICTUREPHONE Service Technical References

PICTUREPHONE Interconnection

PUB44101 PVF — Preliminary —
September 1970

PICTUREPHONE connecting arrangement which permits the connection of customer-provided video/audio terminal equipment to PICTUREPHONE facilities using a Telephone Company-provided TOUCH-TONE telephone set.

ATTESTATION PROGRAMS

PUB45000 Complete Set of Attestation Program Technical References

Headsets

PUB45001 4-Wire Headset Interface
and
PUB45001A Terminations and Interface
Specification 1001 —
Preliminary — July 1973
Addendum — August 1974

Provides the procedural requirements and technical specifications (Interface Specification 1001) for the attestation of certain customer-provided 4-wire headsets for use with headset jacks (Headset Interface Terminations) in Bell System attendant switchboards, attendant consoles, and telephone sets.

PUB45002 6-Wire Headset Interface
and
PUB45002A Terminations and Interface
Specification 1002 —
Preliminary — October 1974
Addendum — January 1975

Provides the procedural requirements and technical specifications (Interface Specification 1002) for the attestation of certain customer-provided 6-wire headsets for use with headset jacks (Headset Interface Terminations) in Bell System attendant switchboards, attendant consoles, and telephone sets.

Non-Powered Conferencing Devices

(●)PUB45101 Interface Termination JTC and
and
(●)PUB45101A Interface Specification 2001 —
Preliminary — May 1973
Addendum — October 1973

Provides the procedural requirements and technical specifications (Interface Specification 2001) for the attestation of certain non-powered conferencing devices for use with Interface Termination JTC which is associated with Bell System key telephone system stations.

CONFORMANCE PROGRAMS

PUB46000 Complete Set of Conformance Program Technical References

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| (•)PUB46001 and (•)PUB46001A | Conformance Program for Answering Devices Incorporating Authorized Protective Connecting Modules — Preliminary — January 1975 Addendum — October 1975 | Provides the procedural requirements and technical specifications (Interface Specification 3001) for the conforming of certain customer-provided automatic answering devices for use with individual line exchange service or PBX/Centrex station service. |
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DIRECT ELECTRICAL CONNECTION OF VOICEBAND TERMINAL EQUIPMENT

PUB47000 Complete Set of Technical References for Direct Electrical Connection of Voiceband Terminal Equipment

PUB47001 Electrical Characteristics of Bell System Network Facilities at the Interface With Voiceband Ancillary and Data Equipment — Preliminary — August 1976

Describes the electrical characteristics at the interface between the Bell System Network and customer-provided ancillary and data equipment. Describes normal telephone system voltages and currents and terminal equipment characteristics which are required for compatibility with the Bell System Network at the interface.

PUB47002 Electrical Characteristics of Bell System PBX and Key Equipment at the Interface With Voiceband Ancillary and Data Equipment — Preliminary — August 1976

Describes the electrical characteristics at the interface between certain Bell System PBX and key equipment and customer-provided remote ancillary and data equipment. Describes normal telephone system voltages and currents and terminal equipment characteristics which are required for compatibility with Bell System PBX and key equipment at the interface.

*PUB47101 Standard Plugs And Jacks — Preliminary — September 1979

This Technical Reference describes the standard jack arrangements to be provided by Bell Operating Companies for the connection of Telephone Company-provided and customer-provided registered equipment to the public switched network.

*New Technical Reference

FUNCTIONAL PRODUCT CLASS CRITERIA

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| PUB48000 | Complete Set of Functional Product Class Criteria Technical References | |
| PUB48001 | Functional Product Class Criteria — Automatic Answering Devices — Preliminary — August 1978 | This Technical Reference is intended as an aid for the technical evaluation of automatic answering devices which will be directly connected to the Bell System telecommunications network facilities. The set of criteria contained within represent the functional and performance standards employed by the Bell System to judge the suitability of automatic answering devices for use by the Bell System Operating Companies and their customers. |
| PUB48002 | Functional Product Class Criteria — PBX — Preliminary — September 1978 | This Technical Reference presents criteria which are the minimum necessary to determine if a Private Branch Exchange (PBX) is technically suitable to be considered for standardization by AT&T. It contains technical requirements which are intended to assure the proper functional performance of a PBX when used in its various intended applications within the Bell System. |
| PUB48003 | Functional Product Class Criteria — Alarm Dialing Systems — Preliminary — December 1978 | This Technical Reference is intended as an aid for the technical evaluation of ancillary dialing systems which will be directly connected to the Bell System telecommunications network facilities and use such facilities for the purpose of reporting trouble conditions to remote locations. |
| *PUB48004 | Functional Product Class Criteria — Ancillary Repertory Dialer — Preliminary — June 1979 | This document is intended as an aid for the technical evaluation of series ancillary repertory dialers that will be directly connected to the Bell System telecommunications network facilities. |

BELL SYSTEM ENGINEERING STANDARDS

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| PUB51000 | Complete Set of Bell System Engineering Standard Technical References | |
| PUB51001 | New Equipment and Building System (NEBS) — May 1976 | This Technical Reference covers the equipment-building interrelation requirements for all new central office (CO) equipment systems. The effective integration of these equipment-building requirements is commonly referred to as NEBS. The Technical Reference includes spatial requirements for all types of frame-mounted equipment, requirements for support systems, and performance information for varying central office equipment environments. |

*New Technical Reference

BELL SYSTEM EQUIPMENT CODING PROCEDURES

- PUB52000 Complete Set of Bell System Coding Procedure Technical References
- PUB52001 General Trade Products Information Required for Common Language Equipment Identification Coding and Marking — January 1978
- This Technical Reference outlines the kind of information needed from General Trade suppliers whose transmission products may be suitable for use within the Bell System's circuit provision process. It also contains guidelines for marking the common language equipment identification code on products.

BELL SYSTEM DOCUMENTATION STANDARDS

- PUB53000 Complete Set of Bell System Documentation Standard Technical References

General Documentation Information

- PUB53111 Master Numerical Index — Bell System Practice Divisions — March 1976
- Provides a Master Numerical Index of all division numbers and subjects covered by each division of Bell System Practices.
- PUB53112 Master Alphabetical Index — Bell System Practice Divisions — November 1975
- Provides an alphabetically arranged list of the subjects covered in all divisions of the Bell System Practices.
- PUB53115 Bell System Practices — General Plan — July 1978
- This Technical Reference outlines the general plan for the nine digit series of Bell System Practices. A recent revision provides General Trade Manufacturers an arrangement of thirteen characters, using four alphas and nine numeric characters (AAAA-XXX-YYY-ZZZ).
- PUB53120 Bell System Practices — Printing Specification — July 1977
- This Technical Reference provides standard printing requirements used in the preparation of Bell System Practices.
- PUB53121 Bell System Practices — Typesetting Specification — November 1975
- Provides standard typesetting requirements for (a) Bell System Practices (BSP's), (b) Addenda to BSP's, and (c) Appendices to BSP's.
- PUB53145 Bell System Practices — Illustrating Specification — November 1975
- Provides standard methods, procedures, and other general information used when preparing line illustrations, continuous tone illustrations, reproducible copy, and final printer's negatives for reproduction in letter size (8-3/8 by 10-7/8 inches) Bell System Practices.

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| PUB53200 | Standard Word List — Bell System Practices — November 1975 | Provides the standard word list for use in preparing and editing Bell System Practices. |
| *PUB53250 | Quality Program Evaluation — October 1979 | This Technical Reference contains the guidelines utilized by the Bell System in evaluating quality programs of potential suppliers of telecommunications products. The evaluation assesses the capability of a supplier's program to provide assurance that the product will conform to engineering requirements and standards of good workmanship. It identifies the basic elements of a quality program which suppliers of telecommunications products may reasonably be expected to have implemented and documented, and gives guidelines for persons performing a Quality Program Evaluation. |

Drawings and Related Information

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| PUB53304 | Circuit Drawings, Requirement Tables, Circuit Description X Specifications, Assignment Lists — Description — November 1975 | This Technical Reference contains descriptions of Circuit Drawings, Requirements Tables, Circuit Description X Specifications, Wiring Lists, and Terminal Assignment (Power Punching) Lists. |
| PUB53305 | General Trade Supplier Guidelines for Product Change Notices — March 1979 | Provides General Trade manufacturers of telecommunications equipment with guidelines and procedures for furnishing product change information and notifications to the Bell Operating Companies and Bell System Purchased Products Division. This document describes the various types of product change classifications and routines regarding the manner in which these changes are applied. |
| PUB53324 | Wiring Diagrams — Methods Used — November 1975 | This Technical Reference describes the point-to-point (full line) method, the former highway method, the present airline and simplified airline methods, and the manufacturing schematic method of showing connections on wiring diagrams. It also includes a description of critical wiring. |
| PUB53325 | Tabular Wiring Diagrams — Description — November 1975 | Provides explanatory information and may be used as an aid in reading tabular wiring diagrams. It is not intended to be used as an instruction on how to prepare this type of wiring diagram. Refer to PUB53324 for description of pictorial type (airline method) wiring diagram. |

*New Technical Reference

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| PUB53328 | Symbols for Circuit Schematic Drawings — November 1975 | This Technical Reference covers graphic symbols used in Bell System circuit schematic drawings. The symbols agree with the American National Standard "Graphic Symbols for Electrical and Electronic Diagrams" 432.2. |
| PUB53329 | Detached — Contact Type Schematic Drawings (SD's) — November 1975 | Describes a type of circuit drawing being issued by the Bell Telephone Laboratories, Inc., in the SD drawing series. The drawings are called detached-contact schematics. The manner of presenting the circuit information, the symbols and conventions employed, and other facts concerning detached-contact schematics are covered in this Technical Reference. |
| PUB53333 | Winding and Spring Designations — Apparatus Connecting Points Referred to in Circuit Requirements Tables — November 1975 | Describes the method used in designating winding and spring terminals of relays and other apparatus specified as connecting points in circuit requirements tables. It also describes conventions employed to represent apparatus on attached contact type circuit drawings. The figures shown in this Technical Reference are merely representative examples of the general designation scheme for a particular type of apparatus. They do not cover all the various arrangements of winding and spring terminals. |
| PUB53337 | Transmission Test Requirement Tables — Description — November 1975 | Describes the transmission test requirements tables and transmission notes as shown on the circuit drawings. |
| PUB53351 | Wiring Symbols, Wiring Abbreviations and Definitions — Wiring and Cabling — November 1975 | Provides the wiring symbols and abbreviations generally used in equipment work. It also includes a list of definitions of wiring terms. |

Color Combinations

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| PUB53401 | Color Combinations and Uses — Wiring and Cabling General Equipment Requirements — November 1975 | This Technical Reference covers the general principles underlying the use of colors in the wiring and cabling of central office equipment. |
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NETWORK DISTRIBUTION PRODUCTS

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| PUB55000 | Complete Set of Network Distribution Product Technical References | |
| *PUB55001 | Standard 83nf/mile Plastic Insulated Conductor Multipair Telecommunications Cable — March 1980 | This specification details the construction and requirements for telecommunications cables with an average mutual capacitance of 83 nanofarads per mile at one kilohertz intended for aerial or buried application. |
| *PUB55002 | 88mh Loading Coil Units — March 1980 | This specification details the construction and requirements for 88mh loading coil units which are intended for use in outside plant with voice frequency non-phantomed circuits transmitted over cable pairs. |

*New Technical References