

**DATA SERVICES—DATA ACCESS ARRANGEMENT USOC CBT
PROVIDED BY 1001B AND 1001D DATA COUPLERS
REFERENCE GUIDE**



1001B and 1001D Data Couplers

CONTENTS	PAGE	CONTENTS	PAGE
1. GENERAL	2	3. SERVICE ORDER INFORMATION . . .	3
2. PHYSICAL AND ELECTRICAL CHARACTERISTICS	2	4. CONVERSION AND DISPOSITION INFORMATION	7

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CONTENTS	PAGE
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5. MAINTENANCE SPARE GUIDELINES	7
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6. REFERENCES	7
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1. GENERAL

1.01 The 1001B [Manufacture Discontinued (MD)] and 1001D data couplers provide the means for connecting customer-provided automatic data equipment to the switched telecommunications network for data and voice communications. The units provide both the data access arrangement (DAA) and the network control signaling unit as described in appropriate tariffs.

1.02 This section is reissued to provide coverage of additional service options as listed in the current Technical Reference—PUB-41802, dated May 1974. Since this reissue constitutes a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 The 1001B and 1001D data couplers are designed to provide the following:

- Contact-type interface
- Automatic linear control of signal level above a specified threshold
- Protection of telephone company (telco) personnel and equipment from hazardous voltages which may be applied to the telephone line from customer-provided equipment. This also provides protection of customer equipment from surges occurring on telephone facilities.
- Detection of incoming ringing signals to permit customer to operate in unattended answering mode
- Test circuitry for appraising the coupler and line
- Off-hook control which allows customer equipment to dial-pulse for call origination
- Timed delay on all calls to protect automatic message accounting

- Switchhook indicator to provide customer status of switchhook on associated telephone set when provided

- 2-way transmission path

- Compatibility with multiple function telephone (MFT) which can provide audio monitoring and/or mode indication (MI)

- A line current status indicator (LCSI) when provided.

1.04 Additional telephone functions, such as alternate voice service, may be provided with an associated telephone set as a standard option when desired.

1.05 Customer equipment may be connected through the data coupler to local loop facilities or to Bell System private branch exchange (PBX) station lines.

1.06 At installations where TOUCH-TONE® calling service has been ordered, the customer may generate tone signals for originating calls through the transmission interface leads of the coupler.

1.07 Service offerings in which the data coupler is used provide the customer with end-to-end transmission performance characteristics comparable to DATA-PHONE® service on the switched telecommunications network. Because customer equipment, over which the Bell System has no design control, may contribute significantly to error performance, the Bell System cannot assume responsibility for the accuracy of transmitted data. End-to-end facilities, including the local loop, will be engineered and maintained to the equivalent DATA-PHONE service requirements. These requirements are specified in Sections 314-205-500 and -501.

2. PHYSICAL AND ELECTRICAL CHARACTERISTICS

2.01 Both the 1001B and 1001D data couplers are wall-mounted units enclosed in a gray plastic housing. The 1001B coupler is 9 inches wide, 11 inches high, 2-1/4 inches deep, and weighs approximately 2-1/2 pounds. The 1001D coupler is 4-3/4 inches wide, 7 inches high, 2 inches deep, and weighs approximately 1-3/4 pounds. Two keyhole slots and one screw hole are provided in

the base pans for mounting the units on a wall or other vertical surface.



The couplers must be vertically mounted to allow proper operation of mercury relay.

2.02 Circuitry for the couplers is mounted on a single printed circuit pack (CP). Ten screw terminals, located on the lower end under the small hinged cover, provide the interface for connecting customer equipment. Interface control leads use contact closures for signaling. The cord required for connecting customer equipment to the interface must be supplied by the customer.

2.03 A locking switch (TST) is located at the top of the 1001D coupler to provide control of the test mode condition.

2.04 Two locking switches (TST and ANS) and associated lamps are located at the top of the 1001B coupler to provide control and indication of test mode conditions. The two lamps glow dimly when the unit is not in test mode.

2.05 The data couplers are designed to operate over an ambient temperature range of 0 to 120°F, with a relative humidity up to 95 percent.

2.06 The data couplers require external dc power for operation. A 20- to 28-Vdc supply, capable of supplying 100 mA, will normally be provided to the interface (+V and -V) by the customer. This power supply should have no-load to full-load regulation of <10% and <5% ripple. Telco will optionally furnish the power. When telco is requested to provide power, a suitable power source is the 28A1 power unit (Section 167-445-101, Power Unit 28A1-Type—Identification, Installation, and Connections) or the 19B2 power unit [Section 167-440-201, Power Units 19B2, 19C2, 20B1 (MD), 20B2 and 20G2—Identification, Installation, Connections, and Maintenance]. The customer must provide a standard 2-pole, 3-wire grounded, 117-Vac 60-Hz power receptacle for either power unit. The receptacle must not be under control of a switch.

2.07 A 502A/B (rotary dial) or 2502B (TOUCH-TONE dial) telephone set is a standard option with the couplers. A 503C (rotary dial) or 2503C (TOUCH-TONE dial) MFT may be specified. The MFT may be used on an option basis to monitor

data transmission and voice answer-back signals and/or to provide the customer with a contact closure when the line is connected to the telephone (voice mode). Both the rotary dial and TOUCH-TONE dial versions of the MFT are available in a light gray housing; however, they may be enclosed in a standard 500- or 2500-type telephone housing of another color if required.

2.08 A switchhook mode indicator (MI) is available on the standard telephone set and appears at the interface for customer use.

3. SERVICE ORDER INFORMATION

3.01 Service orders for couplers should describe the desired service by uniform service order code (USOC). **Service orders should not specify coupler codes. Engineering or plant department personnel responsible for selecting couplers are not compelled to use any particular coupler codes specified or suggested on the service order.** To achieve maximum reuse of coupler apparatus, the first choice in selecting apparatus should be the oldest available model that will satisfy the service requirements as identified by USOC. When the desired coupler model is not available from telco stocks (field or class C), the use of an available substitute is preferred over the purchase of a new current model. Customer option decisions which must be made to determine the USOC suffix are listed in 3.04 through 3.06.

3.02 USOC encoding and decoding procedures are described in Section 590-000-100. An explanation of features and options common to most data services is given in Section 590-000-101. A rapid cross reference between USOC, data couplers, and reference guides is presented in Section 590-000-102. Intercity Service Manual (ISM) Section 87 gives customer billing nomenclature, shows tariff listings for data services, and provides general reference information.

3.03 Tabular service order information is provided as follows:

Table A—Service Offerings

Table B—Customer Options With USOC CBT

Table C—Customer Options With Multiple Function Telephone—USOC CBY

Table D—Customer Options With Line Current Status Indicator—USOC CBW.

Note that there is a separate USOC for the data coupler, the MFT, and the LCSi. **The service order should include the coupler USOC along with any other USOC(s) required.** Customer option decisions for the ACU are described in the appropriate ACU reference guide. Customer options for the coupler, MFT, and LCSi are described in 3.04 through 3.06. The only telco options are those which limit customer signal power to a level which will not exceed -12 dBm at the serving central office (SCO).

CUSTOMER OPTIONS FOR CBT

3.04 The following paragraphs provide detailed information on customer option decisions for USOC CBT. Options marked with an asterisk are telco-preferred options.

(a) **Decision A—With or Without an Associated Telephone Set:**

- * 1. **With Associated Telephone Set:** This is the standard option. Decision B must be made if Decision A is 1.
- 2. **Without Associated Telephone Set:** If Decision A is 2, no further decisions are required.

(b) **Decision B—Coupler or Telephone Set Controls Line (Standard Set or MFT):**

- * 3. **Coupler Controls Line (Automatic Operation):** This is the standard option. Decision C must be made to specify ringer option.
- 4. **Telephone Set Controls Line:** This option must be specified for manual operation.

TABLE A

SERVICE OFFERINGS

USOC	FEATURE	MODEL	REMARKS	
CBT	For connection of customer-provided data transmitting and receiving equipment.	1001B (MD)		
	Arrangement for unattended sending and receiving through a contact closure-type control interface and/or for use with customer-provided ACUs.	1001D	Replaces 1001B data coupler.	
CBY	Multiple Function Telephone	503C	Rotary dial	
		2503C	TOUCH-TONE dial	
CBW	Line Current Status Indicator			
CBV	20- to 28-Vdc power supply capable of furnishing 100 mA (required if customer does not provide dc power).		Number of couplers powered by CBV options.	
			1001B	1001D
		19B2	6	10
		28A1	2	4
		33A	0	1

TABLE B
CUSTOMER OPTIONS WITH USOC CBT

DECISION	OPTION
A	* 1. With associated telephone set 2. Without associated telephone set (note)
B	* 3. Coupler controls line 4. Telephone set controls line
C	5. With ringer connected on telephone set side of exclusion key * 6. With ringer connected on telephone line side of exclusion key

Note: If Decision A is 2, no further decisions are required.

* Indicates telco-preferred option.

TABLE C
CUSTOMER OPTIONS WITH MULTIPLE FUNCTION TELEPHONE – USOC CBY

DECISION	OPTION
A	1. With audio monitor * 2. Without audio monitor
B	3. With voice mode indicator (no further decision required) 4. Other indicators (go to Decision C)
C	5. With data mode indicator 6. With switchhook indicator

* Indicates telco-preferred option.

TABLE D
CUSTOMER OPTIONS
WITH LINE CURRENT STATUS INDICATOR
USOC CBW

DECISION	OPTION
A	* 1. LCSi contact indication 2. LCSi contact indication in parallel with switchhook.

* Indicates telco-preferred option.

Decision C must be made to specify ringer option.

- (c) **Decision C—Telephone Ringer Wiring Option (Standard Set or MFT):**
5. **Ringer Connected on Telephone Set Side of Exclusion Key:**

- When the coupler controls the line

When the exclusion key *is not operated*, the coupler RI interface lead can be activated but the telephone set cannot ring.

When the exclusion key *is operated*, the telephone set cannot ring and the coupler RI interface lead cannot be activated (since handset must be lifted to operate exclusion key and this causes dial tone).

- When the telephone set controls the line

When the exclusion key *is not operated*, the telephone set can ring but coupler RI interface lead cannot be activated.

When the exclusion key *is operated*, the coupler RI interface lead can be activated but the telephone set cannot ring.

*6. **Ringer Connected on Line Side of Exclusion Key:**

- When the coupler controls the line

When the exclusion key *is not operated*, the coupler RI interface lead can be activated and the telephone set can ring.

When the exclusion key *is operated*, the telephone set cannot ring and the coupler RI interface lead cannot be activated (since handset must be lifted to operate exclusion key and this causes dial tone).

- When the telephone set controls the line

When the exclusion key *is not operated*, the telephone set can ring but the coupler RI interface lead cannot be activated.

When the exclusion key *is operated*, the telephone set can ring and the coupler RI interface lead can be activated.

CUSTOMER OPTIONS FOR CBY

3.05 The following paragraphs provide detailed information on customer option decisions for MFT USOC CBY (Table C).

(a) **Decision A—With or Without Audio Monitor:**

1. **With Audio Monitor:** Allows monitoring of data transmission and voice answer-back signals through the telephone handset. Used

in digital inquiry voice answer-back (DIVA) applications.

- * 2. **Without Audio Monitor:** Does not allow monitoring.

(b) **Decision B—With or Without Voice Mode Indicator:**

3. **With Voice Mode Indicator:** Indicates that telephone line is connected to telephone set.

4. **Other Indicators:** Go to Decision C.

(c) **Decision C—With Data Mode or Switchhook Indicator:**

5. **With Data Mode Indicator:** Indicates that data coupler is connected to telephone line.

6. **With Switchhook Indicator:** Provides an indication of status of SH (ie, on-hook or off-hook).

CUSTOMER OPTIONS FOR CBW

3.06 The following paragraphs provide detailed information on the customer option decisions for LCS I USOC CBW (Table D).

(a) **Decision A—LCSI Contact Indication or With LCSI in Parallel With SH Indication:**

- * 1. **LCSI Only:** Provides LCSI contact indication on a separate connecting block.

2. **LCSI in Parallel With SH:** An indication is provided that either the telephone is off-hook or that telephone line current is flowing through the coupler. If no associated telephone is used, the indication is LCSI only. The LCSI indication is a closure between customer interface leads SH and SH1.

3.07 The line current status indicator (LCSI) is available for sensing and indicating (via a relay contact) the flow of loop current through the data coupler. The LCSI is a separately mounted unit 2.8 inches wide, 1.6 inches high, and 4 inches long. The purpose of the indicator is to enable

customer equipment to recognize interruption of telephone line current.

3.08 LCSi contact interface leads are ordinarily wired to a connecting block supplied for this purpose. If a telephone set is not associated with the data coupler, the LCSi leads may be connected to customer equipment via the data coupler A and A1 interface leads, and the flow of current will be indicated by a contact closure between SH and SH1.



Use of the LCSi to detect remote party disconnect is not recommended, as not all telephone switching systems are equipped to provide interruption of line current in response to far-end disconnect. Where the interruption occurs, its duration is not generally specified, and estimates range from a few ms to several hundred ms. Currently there is no standard battery switching interval used in all types of central offices. Also, central office battery may be interrupted for reasons other than remote terminal disconnect; for example, at calling stations, interruptions may be expected at any time up to 10 seconds or so after dialing has been completed and at answering stations any time up to 500 ms after answering a call. These interruptions, which may be of 300 to

400 ms duration, are caused by local central office switching operations and the LCSi will respond to them. For the above reasons, use of the LCSi for automatic disconnect is discouraged. To avoid responding to spurious interruptions in line current, all interruptions should be ignored for the first 10 seconds after completing dialing or for the first 500 ms after answering a call. Furthermore, interruptions of less than 5 ms should be ignored, since interruptions of this nature may infrequently result from momentary disturbances occurring on the telephone lines.

4. CONVERSION AND DISPOSITION INFORMATION

4.01 For conversion and disposition information on data couplers 1001B and 1001D, refer to Table E.

5. MAINTENANCE SPARE GUIDELINES

5.01 To reduce the types of data couplers in field stock, a common spare can be used for a group of in-service couplers containing various features. For a recommendation of the substitute coupler which should be stocked for maintenance spares, refer to Table F.

TABLE E

CONVERSION AND DISPOSITION INFORMATION

DATA COUPLER	MFG STATUS	REPLACED BY	CONVERTIBLE TO	UPDATE & REPAIR RECOMMENDATION
1001B	MD	1001D	—	Return for Salvage
1001D	Standard	—	—	Update & Repair

TABLE F

MAINTENANCE SPARE GUIDELINES

SETS IN SERVICE	COMMON MAINTENANCE SPARE
1001B	1001B
1001B 1001D	1001D

6. REFERENCES

6.01 The following documents provide additional information on 1001B and 1001D data couplers.

NUMBER	TITLE
PUB-41802	Technical Reference—Data Couplers CBS and CBT for Automatic Terminals (dated May 1974)

SECTION 590-000-112

NUMBER	TITLE	SECTION	TITLE
CD- & SD-1D206-01	1001-Type Data Couplers	502-501-102	Reference 502 A/B Telephone Sets
		502-501-120	References 503B, C, and 513 Telephone Sets
314-205-500	Data Systems—DATA-PHONE® Service on DDD Network—Overall Transmission Test Requirements for the Switched Message Network	502-503-102	Reference 2502B Telephone Sets
		502-503-120	Reference 2503C Telephone Sets
		590-103-106	1001B Data Coupler—Description, Installation, Maintenance, and Tests
314-205-501	Data Systems—Data-Phone® Service—DDD Network—Test Requirements for Subscriber, Foreign Exchange, and Remote Exchange Lines	590-103-109	1001D Data Coupler—Description, Installation, Maintenance, and Tests