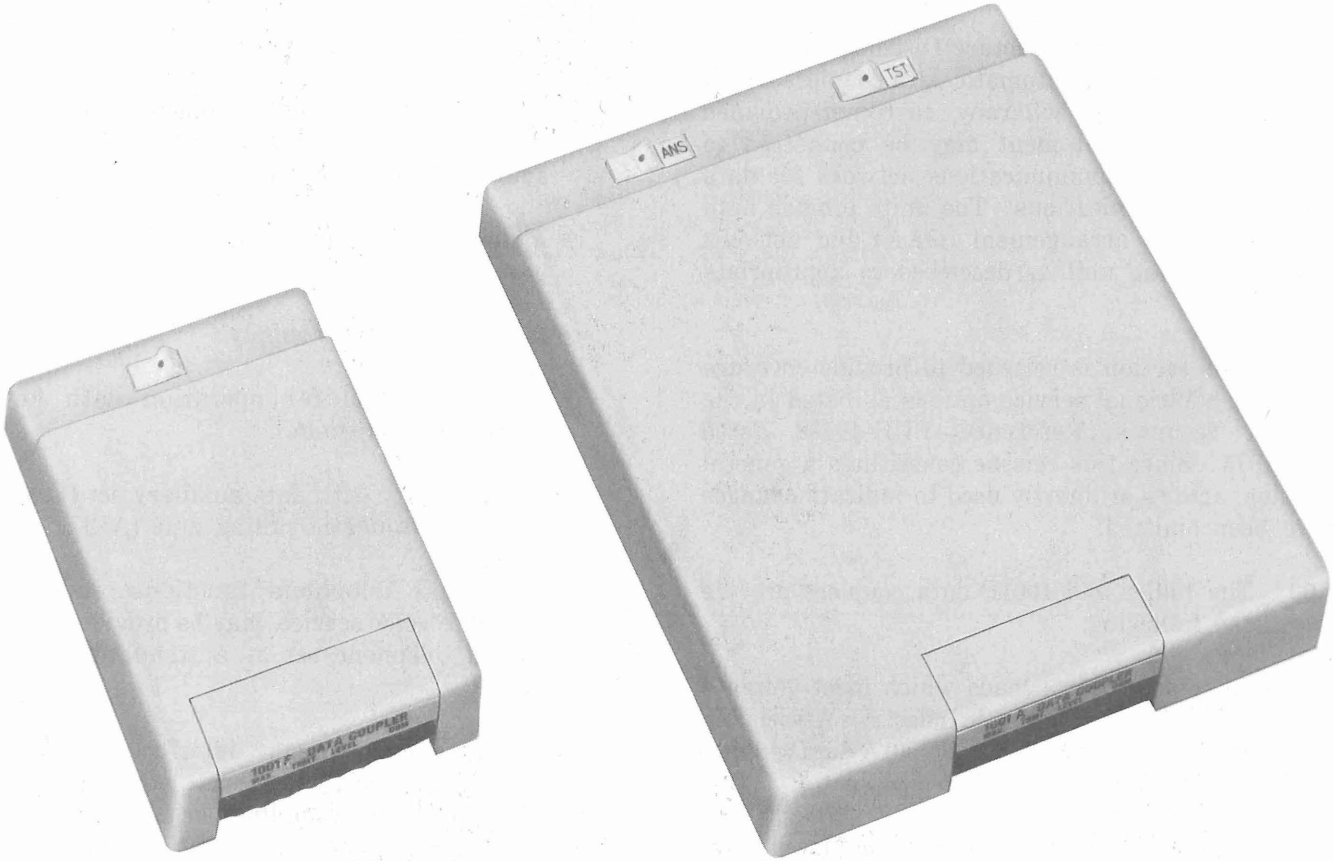
DATA SERVICES—DATA ACCESS ARRANGEMENT USOC CBS PROVIDED BY 1001A AND 1001F DATA COUPLERS REFERENCE GUIDE



1001F DATA COUPLER

1001A DATA COUPLER

1001A and 1001F Data Couplers

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1. GENERAL

1.01 The 1001A [Manufacture Discontinued (MD)] and 1001F are automatic data couplers which provide the means whereby customer-provided automatic data equipment may be connected to the switched telecommunications network for data and voice communications. The units provide both the data access arrangement (DAA) and 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 1001A and 1001F data couplers provide the following:

- Interface control leads which meet voltages as specified in Electronic Industries Association (EIA) Standard RS-232-B (1001A data coupler) or RS-232-C (1001F data coupler)
- 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
- A call-delay in giving access to telephone line on incoming calls to permit proper operation of automatic message accounting equipment
- 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
- Internal dc power supply
- *A* lead control for operation with key telephone equipment
- Compatibility with data auxiliary set (DAS) 801-type automatic calling unit (ACU).

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 The data coupler may interface customer equipment directly to local loop facilities, key telephone system station lines, 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 The service offering in which the data coupler is used provides 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 accuracy of transmitted data. End-to-end facilities, including the local loop, will be engineered and maintained to the equivalent DATA-PHONE service requirement. These requirements are specified in Section 314-205-501

for local loops and Section 314-205-500 for the direct distance dialing (DDD) network.

2. PHYSICAL AND ELECTRICAL CHARACTERISTICS

2.01 Both the 1001A (MD) and 1001F data couplers are wall-mounted units enclosed in a gray plastic housing. The 1001A data coupler is 9 inches wide, 11 inches high, 2-1/4 inches deep, and weighs approximately 2-1/2 pounds. The 1001F data coupler is 4-3/4 inches wide, 7 inches high, 2 inches deep, and weighs approximately 1-3/4 pounds. The 1001A data coupler has two keyhole slots and one screw hole in the base pan for vertical mounting. The 1001F data coupler has one keyhole slot and one screw hole for vertical mounting.

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

2.02 Circuitry for the 1001A data coupler is mounted on a single printed circuit pack (CP). Eight screw terminals on the lower end of the CP provide the interface for connecting customer equipment. Two additional unmarked terminals are open-ended (not connected) on the board and provide extra tie points when required. Control leads present at the interface use EIA RS-232-B voltage levels. The cord required for connecting the customer modem to the interface must be supplied by the customer.

2.03 Circuitry for the 1001F data coupler is mounted on two printed CPs. Ten screw terminals on the lower end of the CP provide the interface for connecting customer equipment. Control leads present at the interface use EIA RS-232-C voltage levels. The cord required for connecting the customer modem to the interface must be supplied by the customer.

2.04 Two locking switches (TST and ANS) and associated lamps are located at the top of the 1001A data 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 A single locking switch (TST) is located at the top of the 1001F data coupler to provide control and indication of test mode conditions.

2.06 A KS-20426-L1 external transformer is provided with the couplers to step down the standard 117-Vac power to the nominal voltage (24 Vac) required by the power rectifier within the coupler. The internal rectifier provides dc power to all the coupler circuitry.

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 an EIA ON voltage or 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 desired.

2.08 If a 1001F data coupler, series 4 or later, is used and the ring indicator ***on*** time is too short for the customer equipment, a series 1 coupler can be substituted or the V option wiring can be cut as specified in Section 590-103-111.

2.09 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 CBS

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 CBS

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

(a) ***Decision A—With Customer or Telco-Provided DC Power:***

1. ***With Customer-Provided DC Power:*** This option can only be provided with the 1001F data coupler. Option X must be applied.

* 2. ***With Telco-Provided DC Power:*** The coupler is used with a telco-provided KS-20426-L1 external transformer.

(b) ***Decision B—With EIA RS-232-B or RS-232-C Customer Interface:***

* 3. ***With EIA RS-232-B Customer Interface:*** This option can be furnished with both the 1001A and the 1001F data couplers.

4. ***With EIA RS-232-C Customer Interface:*** This option can only be provided with the 1001F data coupler.

(c) ***Decision C—With or Without Telephone Set:***

* 5. ***With Telephone Set:*** An associated telephone set is a standard option with the coupler. Line control and ringing options must be specified in Decisions D and E.

6. ***Without Telephone Set:*** No further decisions are required.

(d) ***Decision D—Coupler or Telephone Set Controls Line (Standard Set or MFT):***

* 7. ***Coupler Controls Line (Automatic Operation):*** This is the standard option. Decision E must be made to specify ringer option.

8. ***Telephone Set Controls Line:*** This option must be specified for manual operation. Decision E must be made to specify ringer option.

(e) ***Decision E—Telephone Ringer Wiring Option (Standard Set or MFT):***

9. ***With Ringer Connected on Telephone Set Side of Exclusion Key:***

- When coupler controls 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 telephone set controls line

TABLE A

SERVICE OFFERINGS

USOC	FEATURE	USABLE MODEL	REMARKS
CBS	Data Coupler	1001A	RS-232-B
		1001F	RS-232-B or C
	Telephone	502A/B	Rotary dial
		2502B	TOUCH-TONE dial
CBY	Multiple Function Telephone	503C	Rotary dial
		2503C	TOUCH-TONE dial
CBW	LCSI		Made by installer
DAY	ACUs (refer to Section 590-008-100 or 590-008-101)	801A	Rotary dial with EON operation
DLB		801A	Rotary dial with answer tone detection
DAZ		801C	TOUCH-TONE dial with EON operation
DLC		801C	TOUCH-TONE dial with answer tone detection

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 coupler RI interface lead can be activated but the telephone set cannot ring.

* 10. ***Ringer Connected on Telephone Line Side of Exclusion Key:***

- When coupler controls 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 telephone set controls 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

TABLE B

CUSTOMER OPTIONS WITH USOC CBS

DECISION	OPTION
A	1. With customer-provided power (Note 1) *2. With telco-provided power
B	*3. EIA RS-232-B customer interface 4. EIA RS-232-C customer interface (Note 2)
C	*5. With associated telephone set 6. Without associated telephone set (Note 3)
D	*7. Coupler controls line 8. Telephone set controls line
E	9. Ringer connected to telephone set side of exclusion key *10. Ringer connected to line side of exclusion key

Note 1: If Decision A is 1, can only be provided with 1001F.

Note 2: If Decision B is 4, can only be provided with 1001F.

Note 3: If Decision C is 6, 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.

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).

3.06 The line current status indicator (LCSI) is available as an option (USOC CBW) 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.

3.07 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 contacts may be connected to the customer equipment via the data coupler A and A1 interface leads, and the flow of line current will be indicated by an EIA voltage on SH.

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 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.

CUSTOMER OPTIONS FOR CBW

3.08 The following paragraphs provide detailed information on customer option decisions for LCSI USOC CBW (Table D).

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

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

2. ***LCSI in Parallel With SH:*** Indicates that either the telephone handset is off-hook or that telephone line current is flowing through the coupler. If no associated telephone set is used, the indication is LCSI only. The LCSI indication will be a voltage on the SH lead at the customer interface.

4. CONVERSION AND DISPOSITION INFORMATION

4.01 For conversion and disposition information on 1001A and 1001F data couplers, 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
1001A	MD	1001F	—	Return for Salvage
1001F	Standard	—	—	Update and Repair

TABLE F

MAINTENANCE SPARE GUIDELINES

SETS IN SERVICE	COMMON MAINTENANCE SPARE
1001A	1001A
1001A 1001F	1001F

6. REFERENCES

6.01 The following documents provide additional information on 1001A and 1001F data couplers:

NUMBER	TITLE
PUB 41802	Technical Reference—Data Couplers CBS and CBT for Automatic Terminals (dated May 1974)
CD- & SD-1D206-01	1001-Type Data Couplers
SECTION	TITLE
314-205-500	Data Systems—DATA-PHONE® Service and Data Access Arrangements on Direct Distance Dialing Network—Overall Data Transmission Test Requirements
314-205-501	Data Systems—DATA-PHONE® Service and Data Access Arrangements on Direct Distance Dialing Network—Test Requirements for Subscriber, Foreign Exchange, and Remote Exchange Lines
502-501-102	Reference 502 A/B Telephone Sets
502-501-120	References 503B, C, and 513 Telephone Sets
502-503-102	Reference 2502B Telephone Sets
502-503-120	Reference 2503C Telephone Sets

SECTION	TITLE	SECTION	TITLE
590-000-101	Reference Guide—Description of Data Set Features and Options	590-103-104	1001A Data Coupler—Description, Installation, Maintenance, and Tests
590-000-102	Data Service Reference Guides—Cross-Reference Information	590-103-111	1001F Data Coupler—Description, Installation, Maintenance, and Tests