

**DATA SERVICES**  
**2000 AND 2400 BPS PROVIDED BY DATA SET 201-TYPE**  
**REFERENCE GUIDE**



**Data Set 201 A or B**



**Data Set 201C**

**Data Set 201-Type**

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and 201C. Due to extensive changes, change arrows have been omitted.



*The list codes covered in this section should not be confused with the early equipment-coded J1D201A and J1D201B list types. The early list-coded data sets should be retired as soon as they are returned to the service center.*

**1.03** Data sets 201-type are designed for use with the following auxiliary apparatus:

- Data auxiliary set (DAS) 828A, or equivalent, to provide a standard 4-wire private line channel termination capable of 2- or 4-wire interface with or without alternate voice service.
- DAS 828C, or equivalent, to provide switched network capability on backup lines or to provide 4-wire transmission on two switched network lines.
- DAS 804A to provide line control, voice capability, and automatic answering on the switched network (201A3, A4, B3, B4, and 201A, B list type only).
- DAS 801-type to provide automatic calling on the switched network under control of the business machine. (201A1, A2, B1, and B2 will not work with DAS 801-type to provide automatic calling).

**1.04** In 2-wire operation, data set 201-type can transmit and receive, but not simultaneously. In this configuration when data sets 201A- and 201B-types transmit, the receiver monitors the transmitted data to provide local copy. In contrast, data set 201C does not provide local copy on 2-wire circuits. On 4-wire service, all data sets 201-type can transmit and receive simultaneously and independently. Local copy is not provided in 4-wire operation.

**1.05** The data set accepts serial binary data from the customer business machine. Two consecutive bits are combined to form a dibit, which is used to phase-modulate the carrier. The modulated carrier is transmitted to the line circuits which match impedance, provide a means for adjusting the transmit level, and provide a strapping for 2-wire or 4-wire operation.

**1.06** Data set 201-type transmitter requires a source of timing signals which may be provided internally by the data set or externally by the customer terminal.

**1.07** The data set receiver accepts the phase-modulated carrier from the line circuits. Control signals from the receiver alert the business machine that data is being received. The receiver converts the phase-modulated carrier into serial binary form, and delivers the received data to the business machine.

**1.08** The line circuits contain the electronic transmit-receive switch, transmit and receive input pads, a compromise equalizer for the received signal, and repeat coils for connecting the transmitter and receiver to the line. Optional modes of operation may be selected from strapping points provided on the circuit boards.

**1.09** Data sets 201A and B list types provide the following features in addition to the features of earlier models:

- Transmit level options which comply with FCC Tariff 263.
- Improved performance when used as a master station in polling applications.

Data sets 201A and B list types can provide any function previously provided by data sets 201A3, 201A4, 201B3, and 201B4.

**1.10** Data set 201C provides all the features provided by earlier model data set 201-type except local copy in 2-wire operation as specified in 1.04. In addition, data set 201C provides the following features:

- Status indicator lamps, remote and self test capabilities
- Self-contained line control for 2-wire switched network operation, which allows use of a standard key telephone set with manual operation and voice capability
- Capability of 2400-bps transmission on basic (unconditioned) voiceband private lines or the switched message network

- Capability of cabinet mounting in a multiple data set configuration using a 42A data mounting.

**1.11** The data set codes used to provide the services described in this section are listed in Table A along with the Uniform Service Order Code (USOC) and significant features.

## 2. PHYSICAL AND ELECTRICAL CHARACTERISTICS

### Data Sets 201A and 201B

**2.01** Each data set 201A- or 201B-type contains a transmitter, receiver, and power supply encased in a dark gray housing with a light gray front panel. The set measures 7-3/4 inches high, 17-1/2 inches wide, 11-5/8 inches deep, and weighs approximately 35 pounds.

**2.02** Data sets 201A- and 201B-types are designed to operate at an ambient temperature of 40 to 120°F and at a relative humidity of 20 to 95 percent.

**2.03** Three cords are provided with the data sets. The 25-conductor cord (D25D-61) connects the data set to a connecting block or a bridging adapter. Another cord (M50J-61) is furnished to connect the DAS 804A connecting cord to the bridging adapter. The 3-conductor, light gray power cord (KS-14532-L15) connects 117-volt 60-Hz power to the data set.

**2.04** The customer must furnish an interface cord to connect the business machine to the data set. The socket on the data set is a KS-19087-L2 25-pin receptacle. The customer interface cord should be equipped with the mating DB-19604-432 Cinch or Cannon plug and a DB-51226-1 Cinch hood (or equivalent). The length of the cord should not exceed 50 feet.

**2.05** The J87212B power supply in data sets 201A- and 201B-type is capable of supplying +12 volts at 0.65 ampere and -12 volts at 0.28 ampere. A 24-volt, 0.132-ampere series connection from the -12 to the +12 volt terminal provides unfiltered power for DAS 804A. The power supply requires 105 to 130 volts at 60 ( $\pm 0.5$ ) Hz to be delivered on a 3-wire grounded cord. The ground is connected to the data set frame and should be common with the ground furnished to the customer business equipment.



*Data sets 201A1, A2, B1, and B2 contain a J87212A power supply.*

### Data Set 201C

**2.06** Data set 201C-L1 consists of a transmitter and a receiver circuit mounted on two printed circuit boards interconnected by flexible cable. List 2 adds a 100A-type power supply, which is connected to the circuit boards via flexible cable and an ac power cord. List 3 provides a third circuit board (line control and switched network remote test) and an M13F cord for connection to the telephone set. List 4 adds an enclosure described in 2.07. List 5 adds an M8K cord for connection to DAS 828-type, or equivalent.

**2.07** The enclosure for the data set consists of a clear anodized aluminum housing with front and rear molded black plastic covers. The housing has a brushed finish.

**2.08** The overall dimensions of the data set are 10.5 inches across the front, 4.3 inches high, and 14 inches deep. The data set weighs 13 pounds.

**2.09** Data set power is provided by the 100A power unit in the data set, which provides +12, -12, and +5 volts. The power unit requires 105-130 volts ac power at 60  $\pm 3$  Hz. Maximum power consumption is approximately 27 watts.

**2.10** The data set is provided with a customer interface, a tel line connector, and a power cord connector at the rear of the set. The lower 25-pin connector is a KS-19087-L2 and provides the digital interface leads for interface with the customer-provided terminal equipment, and is labeled CUST IN. The upper 25-pin connector is a KS-19088-L2 and provides the connections for the telephone network, and is not labeled. The power cord connector is a twist-lock type to accept the power cord provided with the data set.

**2.11** The customer must furnish an interface cord to connect the business machine to the data set. The socket on the data set is a KS-19087-L2 25-pin receptacle. The customer interface cord should be equipped with the mating DB-19604-432 Cinch or Cannon plug and a DB-51226-1 Cinch hood (or equivalent). The length of the cord should not exceed 50 feet.

**TABLE A**  
**SERVICE OFFERINGS**

FEATURE	USOC (NOTE 1)	USABLE DATA SET	NOTES
2000 bps Send and Receive With Internal Timing (Private Line or Switched Network)	DFS	201A1	2
		201A3	3
		201A-L1/2A/3/6/7A	4, 9
		201A-L1A/2A/3/6A/7A	9
2000 bps Send and Receive With External Timing (Private Line or Switched Network)	DNA	201A2	2
		201A4	3
		201A-L1/2A/4/6/7A	4, 9
		201A-L1A/2A/4/6A/7A	9
2400 bps Send and Receive With Internal Timing (Private Line)	DGS	201B1	2, 8
		201B3	8
		201B-L1/2A/3/6/7B	4, 8
		201B-L1A/2A/3/6A/7B	8
		201C-L1/2/5	5, 7
2400 bps Send and Receive With External Timing (Private Line)	DNS	201B2	2, 8
		201B4	8
		201B-L1/2A/4/6/7B	4, 8
		201B-L1A/2A/4/6A/7B	8
		201C-L1/2/5	5, 7
2400 bps Send and Receive (Switched Network)	24V	201C-L1/2/3	5, 7
		201C-L1/2/3/4	6, 7

*Note 1:* Determine USOC suffix from Tables B, C, and D and Section 590-000-100.

*Note 2:* This data set must be used only with contact closure interface and *cannot* be used with DAS 804A or 801-type ACUs. When alternate voice is required, a 569-type telephone set is used. This data set cannot provide automatic answer with 4-wire operation. It cannot be used in private line service where ACUs may be used.

*Note 3:* Compatible with DAS 804 for alternate voice and automatic answer and DAS 801-type for automatic calling.

*Note 4:* These codes are created by converting older data sets (eg, 201A3) to the newer list coding and *not* by manufacture.

*Note 5:* For multiple installations (without housing for cabinet mounting with 42A data mounting).

*Note 6:* For stand-alone installations (individually housed).

*Note 7:* On all data sets 201C, internal and external timing are available as a strapping option.

*Note 8:* Provide channel which meets C2 limits. All Plant and Engineering records must show channel is to meet C2 limits.

*Note 9:* Transmit level options allow compliance with FCC 263 and additional polling capability is provided.

### 3. SERVICE ORDER INFORMATION

**3.01** Data service orders should describe the desired service by USOC. Service orders should not specify data set codes. Engineering or Plant Department personnel responsible for selecting data sets are not compelled to use any particular data set codes specified or suggested on the service order. To achieve maximum reuse of data station 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 data set model is not available from telephone company 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 3.09 through 3.11.

**Note:** The *encoding and decoding procedure* to determine the appropriate USOC suffix is contained in Section 590-000-100. An explanation of features and options common to most data sets is given in Section 590-000-101. A rapid cross-reference between USOC, data sets, 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.

**3.02** Tabular service order information is provided as follows:

- Table A—Service Offerings
- Table B—Customer Options for 2000-BPS Switched Network and Private Line Service (USOCs DFS and DNA)
- Table C—Customer Options for 2400-BPS Private Line Service (USOCs DGS and DNS)
- Table D—Customer Options for 2400-BPS Switched Network Service (USOC 24V).

**3.03** Because of the variety of configurations available for providing the services described in this section, the required service cannot always be uniquely identified by the USOC and a 2-digit suffix. Additional information in these cases must be provided in the REMARKS section of the service order. Information in this part will aid the user in determining what additional information must

be specified in the service order and what apparatus is required to provide the service.

**3.04** When 2400-bps private line service is required by the customer, it is provided by following orderable items:

- (a) A basic 3002-type channel
- (b) An arrangement capable of providing 2400-bps service, which has a supportable error performance on basic channels.

**3.05** The arrangement capable of providing 2400-bps service [3.04(b)] can use either a data set 201C or 201B. When using data set 201B, the channel parameters must be adjusted to meet C2 limits. The choice of arrangement used for any particular installation is to be made at the discretion of the operating telephone company in light of the following considerations:

- It is particularly advantageous to use data set 201B on those facilities which require a minimum of cost to meet C2 limits.
- Additions to existing systems and new systems should be provided so that a mix of data sets 201B-types and 201C is avoided where possible.
- When the 201B arrangement is to be provided, all Engineering and Plant records must show that the channel is to meet C2 limits, even though C2 conditioning is not specified on the service order.

**3.06** Data sets 201-type (except 201A1, A2) can be used in conjunction with DAS 801-type to provide automatic calling on the switched network. If automatic calling is required, it should be specified in the REMARKS section of the service order, when the service requested is 2000-bps switched network. For 2400-bps switched network service, automatic calling is included in the customer option table. In both cases, the proper USOC for the desired automatic calling unit must be specified on the service order (refer to Section 590-008-100 and 590-008-101).

**3.07** The customer may choose to provide external timing to the data set transmitter. For USOCs DFS, DNA, DGS, and DNS, the choice of internal or external timing is designated by the

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USOC. For USOC 24V, which can be provided only by data set 201C, this choice is designated as a customer option, since it can be provided or not by option strapping. The timing signal must be 2000 Hz ( $\pm 0.01$  percent) for data set 201A, 2400 Hz ( $\pm 0.001$  percent) for data set 201B, and 2400 Hz ( $\pm 0.005$  percent) for data set 201C. The signal must consist of a square wave having a 50 percent ( $\pm 0.5$  percent) duty cycle.

**3.08** Data set 201C has an option which allows frame ground and signal ground to be disconnected. It is recommended that frame ground and signal ground remain connected unless the customer specifically requests they be disconnected. If the customer requests that frame and signal ground be disconnected, it must be indicated in the REMARKS section of the service order.

### CUSTOMER OPTIONS

#### 2000-BPS Switched Network and Private Line Service

**3.09** The following paragraphs provide detailed information on customer options listed in Table B for services provided by data set 201A-type. To provide the features requested by the customer, one of the two options under each decision must be selected.



**Data sets 201A1 and A2 must be used only with contact closure interface and CANNOT be used with DAS 804A or 801-type ACUs. When alternate voice is required, a 569-type telephone set is used.**

(a) **DECISION A—EIA Voltage or Contact Closure on Control Lead Interface**

1. **EIA Interface**—When this option is selected, EIA standard bipolar voltage signals are used on all interface leads.
2. **Contact Interface**—When this option is selected, contact interface is provided only on the following leads.

- Ring indicator 1 to ring indicator 2
- Remote control, remote release, and ready for auto answering

- The interlock lead provides a ground for OFF and +6 volts for ON.

(b) **DECISION B—With or Without Alternate Voice**

3. **With Alternate Voice**—Alternate voice may be provided in various ways, depending upon whether the service is switched network or private line. For private line applications, DAS 828A-L1/2 or an equivalent arrangement can be used to provide alternate voice for data set 201A if automatic answer is not required. For switched network applications or private lines where automatic answer is required, DAS 804A is provided for alternate voice.

4. **Without Alternate Voice**—For private line, DAS 828-L1 or equivalent can be used for data only service. DAS 804A is not required unless auto answer is required for switched network service.

(c) **DECISION C—New Sync Feature Used or Not Used**

5. **With New Sync**—The new sync feature allows the data terminal to condition the data set to synchronize more rapidly on a sequence of incoming messages from different outlying transmitters. This option is generally used at the master station on multipoint private line systems.

6. **Without New Sync**—If new sync is not required, this option inhibits the new sync interface lead.

(d) **DECISION D—2-Wire or 4-Wire**

7. **2-Wire Private Line or Switched Network**—This option conditions the data set to transmit or receive but not simultaneously. When the data set is in the transmit mode, the receiver monitors the transmitted data to provide local copy.

8. **4-Wire**—When this mode of operation is selected, data may be transmitted and received simultaneously. Decision E must be made to further define the operating mode required by the customer.

TABLE B  
CUSTOMER OPTIONS FOR 2000 BPS SWITCHED NETWORK AND PRIVATE LINE SERVICE  
(USOCs DFS AND DNA)

DECISION	OPTION	DESIGNATION		
		DATA SET 201A1,A2	DATA SET 201A3,A4	DATA SET 201A LIST TYPE
A	1. EIA Interface		ZD, ZF	ZR, ZT
	2. Contact Interface	Note 1	ZE, ZG	ZS, ZU
B	3. Alternate Voice (Note 2)	Note 3	Z, Y	Note 4
	4. w/o Alternate Voice (Note 2)		ZJ	Note 4
C	5. With New Sync	Note 5	ZK	ZM
	6. w/o New Sync	A	W	ZL
D	7. 2-wire (Note 6)		ZC	A
	8. 4-wire (Decision E required)	ZP, E	ZA or ZB	E or B
E	9. 4-Wire Private Line (Continuous Carrier)	ZN	ZA	E
	10. 4-Wire Private Line (Carrier Controlled by Request-to-Send or Multiparty)	ZO	ZB	B

*Note 1:* Contact interface always provided.

*Note 2:* Specify if automatic answer is required in REMARKS column of service order. It is normally provided as key-controlled (option E in DAS 804A). If automatic answer is to be permanently wired, state on service order in REMARKS column, "Automatic Answer Permanently Wired," and use option B in DAS 804A.

*Note 3:* Provided by a 569-type telephone.

*Note 4:* No option required in data set.

*Note 5:* Remove option A.

*Note 6:* If decision D is 7, decision E is not required.

(e) **DECISION E—4-Wire Operation Continuous Carrier or Carrier Controlled by Request-to-Send**

9. **Continuous Carrier**—This option allows the transmitter to be kept ON continuously. However, it will still be necessary for the business machine to apply request-to-send and wait 8 to 9 ms for clear-to-send before sending data. No particular advantage in time saving is realized. One use of continuous carrier is to provide a continuity check of the transmission path by monitoring the carrier-on lead at the distant data set. The

customer may also wish to obtain timing signals for external use. This is the preferred option for point-to-point systems, master stations on multipoint polling systems, and when two 2-wire switched network lines are used for 4-wire switched network service.

10. **Carrier Controlled by Request-to-Send**—With this option, the transmitter is OFF until the business machine turns request-to-send ON. After 8 to 9 ms, the data set turns clear-to-send ON, indicating that the data set is ready to transmit data. This option

is required on multiparty systems, since only one transmitter may be on the line at a time.

#### 2400-BPS Private Line Service

**3.10** The following paragraphs provide detailed information on customer options listed in Table C for service provided by data sets 201B or 201C. To provide the features requested by the customer, one of the two options under each decision must be selected.



*Data sets 201B1 and B2 must be used only with contact closure interface and CANNOT be used with DAS 804A or 801-type ACUs. When alternate voice is required, a 569-type telephone set is used.*

(a) **DECISION A—EIA Voltage or Contact Closure on Control Lead Interface**

1. **EIA Interface**—When this option is used, EIA Standard bipolar voltage signals are provided on all leads.
2. **Contact Interface**—When this option is used with data set 201B, the interlock (data set ready) lead provides 0 to +0.5V for OFF and +6V for ON.

**Note:** This option is not available with data set 201C.

(b) **DECISION B—With or Without Alternate Voice**

3. **With Alternate Voice**—Alternate voice is provided as part of the private line termination in DAS 828A-L1/2 or an equivalent arrangement.
4. **Without Alternate Voice**—See 3.09(b).

(c) **DECISION C—New Sync Feature Used or Not Used**

5. **With New Sync**—See 3.09(c).
6. **Without New Sync**—See 3.09(c).

(d) **DECISION D—2-Wire or 4-Wire**

7. **2-Wire**—This option conditions the data set to transmit or receive but not simultaneously.

When data set 201B is provided, the receiver will monitor transmitted data to provide local copy. The service order should indicate in the REMARKS column if local copy of the transmitted signal is required by the customer. Local copy is provided only with data set 201B.

8. **4-Wire**—When this mode of operation is selected, data may be transmitted and received simultaneously. Decision E must be made to further define the operating mode required by the customer.

(e) **DECISION E—4-Wire Private Line; Continuous Carrier or Carrier Controlled by Request-to-Send**

9. **Continuous Carrier**—This option allows the transmitter to be kept ON continuously. However, it will normally still be necessary for the business machine to apply request-to-send and wait 8 to 9 ms for clear-to-send before sending data. An option exists in data set 201C which provides a 0-ms RS-CS interval. The customer can indicate a preference for the 0-ms over the 7-8 ms RS-CS interval, which should be indicated in the REMARKS column of the service order. However, the telephone company will not guarantee availability since the data set provided for the service may be a 201B or 201C, subject to the considerations in 3.05. A possible use of continuous carrier is to provide a continuity check of the transmission path by monitoring the carrier-on lead at the distant data set. The customer may also wish to obtain timing signals for external use. This is the preferred option for point-to-point systems and when two 2-wire switched network lines are used for 4-wire switched service.

10. **Carrier Controlled by Request-to-Send**—With this option, the transmitter is OFF until the business machine turns request-to-send ON. After approximately 8 to 9 ms, the data set turns clear-to-send ON, indicating that the data set is ready to transmit data. This is the required option for remote stations on 4-wire private line multiparty

TABLE C  
CUSTOMER OPTIONS FOR 2400-BPS PRIVATE LINE SERVICE  
(USOCs DGS AND DNS)

DECISION	OPTION (NOTE 8)	DESIGNATION			
		DATA SET 201B1, B2	DATA SET 201B3, B4	DATA SET 201B LIST	DATA SET 201C
A	1. EIA Interface		ZD	ZR	Note 1
	2. Contact Interface	Note 2	ZE	ZS	
B	3. Alternate Voice		Z, Y	Note 4	Note 4
	4. w/o Alternate Voice	Note 3	ZJ	Note 4	Note 4
C	5. With New Sync	Note 5	ZK	ZM	YB
	6. Without New Sync	A	W	ZL	YA
D	7. 2-Wire (Note 6)	ZP, E	ZC	A	XE
	8. 4-Wire		ZA or ZB	E or B	XB or XC or XA
E	9. 4-Wire Private Line (Continuous Carrier)	ZN	ZA	E	XB or XC Note 7
	10. 4-Wire Private Line (Car- rier Controlled Request- to-Send or Multiparty)	ZO	ZB	B	XA

*Note 1:* EIA always used on private line.

*Note 2:* Contact interface always provided.

*Note 3:* Provided by 569-type telephone set or channel terminating equipment.

*Note 4:* No option required in data set.

*Note 5:* Remove option strap A.

*Note 6:* If decision D is 7, decision E is not required.

*Note 7:* Option XB has a 7-ms clear-to-send delay. Option XC has a 0-ms clear-to-send delay.

*Note 8:* Protective ground is normally connected to signal ground within the data set. It is recommended that the connection remain intact; however, if the customer desires this connection broken, it must be noted in the REMARKS column of the service order.

systems, since only one transmitter may be on the line at a time.

#### 2400-BPS Switched Network Service

**3.11** The following paragraphs provide detailed information on customer options listed in Table D for service provided by data set 201C. To provide the features requested by the customer, one of the two options under each decision must be selected.

#### (a) *DECISION A—Internal or External Timing*

1. **Internal Timing**—This option is chosen when the customer does not wish to provide timing to the data set transmitter from the terminal.
2. **External Timing**—This option is provided when the customer wishes to provide timing to the data set transmitter. The customer-provided signal must be 2400 Hz

TABLE D  
CUSTOMER OPTIONS FOR 2400-BPS SWITCHED NETWORK SERVICE  
(USOC 24V)

DECISION	OPTION	DESIGNATION
A	1. Transmitter Timed by Data Set (Internal)	YC
	2. Transmitter Timed by Terminal (External)	YD
B	3. Without 801 ACU	Note 1
	4. With 801 ACU	Note 1
C	5. EIA Ring Indicator	YG
	6. Contact Ring Indicator	YH
D	7. Without Automatic Answer (Note 2)	YE
	8. With Automatic Answer	YF or YE
E	9. Automatic Answer Permanent	YF
	10. Automatic Answer Selective	YE

*Note 1:* No option required in the data set.

*Note 2:* If decision D is 7, decision E is not required.

( $\pm 0.005$  percent) square wave having a 50 percent ( $\pm 0.5$  percent) duty cycle.

(b) **DECISION B—Without or With DAS 801-Type Automatic Calling Unit**

3. **Without DAS 801-Type ACU**—This option is specified if the customer does not require that calls be originated automatically, under control of the business machine.
4. **With DAS 801-Type ACU**—This option allows the customer business machine to originate calls to switched network stations through DAS 801-type ACU.

(c) **DECISION C—EIA or Contact Closure on Ring Indicator Leads**



*In addition to the provision for a ring indicator option, data set 201C has the capability to accept from the customer (without strapping) either EIA or contact closure signals on the data terminal ready (DTR, pin 20) and ready (RDY, pin 21) interface leads. When contact interface is used, the contact on DTR and/or RDY must be closed to the remote release (RR, pin 19) interface lead.*

5. **EIA Ring Indicator**—When this option is used, an EIA standard bipolar voltage signal is provided on the ring indicator lead when ringing is received.
  6. **Contact Ring Indicator**—This option provides a contact closure between ring indicator (RI) and RG2 when ringing is received.
- (d) **DECISION D—Without or With Auto Answer**
7. **Without Auto Answer**—When the customer uses manual talk/data transfer and does not require auto answer, this option is installed. The customer maintains an ON condition (EIA or contact) on the data terminal ready interface lead when transfer to the data mode is required. The customer does not use or maintain an OFF condition (EIA or contact) on the ready interface lead.
  8. **With Auto Answer**—When the customer requires auto answer, decision E must be made to determine the type of control required.
- (e) **DECISION E—Auto Answer, Permanent or Selective**
9. **Permanent Auto Answer**—This option is installed when the customer requires all

calls to be automatically answered. The customer must maintain an ON condition (EIA or contact) on the data terminal ready interface lead when transfer to the data mode is required. The customer does not use or maintain an OFF condition (EIA or contact) on the ready interface lead.

10. **Selective Auto Answer**—When this option is provided, the customer can select auto answer via the ready interface lead. An ON condition (EIA or contact) on the ready lead conditions the data set for auto answer. An OFF condition (EIA or contact) on the ready lead conditions the data set for manual answer. The customer must maintain an ON condition (EIA or contact) on the data terminal ready interface lead when transfer to the data mode is required.

**3.12 Telco Information:** Table E shows options which must be determined by the Telco for installation of data set 201-type. Designations for the various types of data sets are also shown.

#### 4. SERIES INFORMATION

**4.01** Table F shows the series changes to data set 201A and B-types which resulted from significant modifications, and briefly describes the changes to aid in determining allowable substitutions.

#### 5. CONVERSION AND DISPOSITION INFORMATION

**5.01** For information on conversion and disposition of data sets 201-type, refer to Table G.

#### 6. MAINTENANCE SPARE GUIDELINES

**6.01** To reduce the types of data sets in field stock, a universal spare may be used for a group of in-service data sets containing various features. For a recommendation of the substituted data sets which should be stocked for maintenance spares, refer to Table H.

#### 7. REFERENCES

**7.01** The following Bell System Practices provide additional information on data sets 201A- and 201B-types and associated equipment.

SECTION	TITLE
592-011-101	Data Sets 201A3, A4, and 201B3, B4—Transmitter-Receiver — Description and Operation
592-011-102	Data Sets 201A- and 201B-List Type—Transmitter-Receiver — Description and Operation
592-011-201	Data Sets 201A3, A4, and 201B3, B4—Transmitter-Receiver — Installation and Connections
592-011-202	Data Sets 201A- and 201B-List Type—Transmitter-Receiver — Installation and Connections
592-011-301	Data Sets 201A3, A4, and 201B3, B4—Transmitter-Receiver — Maintenance
592-011-302	Data Sets 201A- and 201B-List Type—Transmitter-Receiver — Maintenance
592-011-501	Data Sets 201A3, A4, and 201B3, B4—Transmitter-Receiver — Test Procedures
592-011-502	Data Sets 201A- and 20B-List Type—Transmitter-Receiver — Test Procedures
592-029-100	Data Set 201C—Transmitter-Receiver—Description and Operation
592-029-200	Data Set 201C — Transmitter-Receiver—Installation and Connections
592-029-300	Data Set 201C — Transmitter-Receiver—Maintenance
592-029-500	Data Set 201C — Transmitter-Receiver—Test Procedures
598-010-101	Data Auxiliary Sets 801A5 and 801A6 for Automatic Calling—Description and Operation
598-012-100	Data Auxiliary Sets 801C1 and 801C2 for Automatic Calling—Identification and Operation

TABLE E  
TELCO OPTIONS

OPTION				DESIGNATION WITH DATA SETS			
				201C	201A1, A2 B1, B2	201A3, A4 B3, B4	201A, B LIST TYPE
Compromise Equalizer	IN (always strapped IN)			ZS			
	OUT			ZT			
Carrier ON Sensitivity	-24 dBm PRIVATE LINE			ZU			
	-44 dBm SWITCHED NETWORK			ZV			
Use With DAS 828-Type	YES			YI			
	NO			YJ			
Echo Delay	USED (switched network or 2-wire PL)				E	V	ZN
	NOT USED—SHORT CLEAR-TO-SEND INTERVAL (4-wire PL—generally used)					T	ZP
	NOT USED—LONG CLEAR-TO-SEND INTERVAL (4-wire PL—special application)				B	ZL	YB
Terminal Impedance	600 OHMS (private line)			ZQ	G	Y	ZJ
	900 OHMS (switched network)			ZR	F	X	ZK
Transmitter Line Signal Level (dBm)							
	0			ZA	ZI	C	X
	-1			ZB			W
	-2			ZC	ZJ	F	V
	-3			ZD			T
	-4			ZE	ZK	E	S
	-5			ZF			R
	-6			ZG	ZL	B	Q
	-7			ZH			N
	-8			ZI	ZM	A	M
	-9			ZJ			K
	-10			ZK			J
	-11			ZL			G
	-12			ZM			F
	-13			ZN			
	-14			ZO			
-15			ZP				
Receiver Signal Level (dBm)		Max Line Noise (dBmnc)					
	-50 to -20	Compromise Equalizer OUT	28		ZA	S	ZA
	-44 to -14		34		ZB	R	ZB
	-38 to -8		40		ZC	Q	ZC
	-32 to -2		46		ZD	N	ZD
	-42 to -12	Compromise Equalizer IN	36		ZE	M	ZE
	-36 to -6		42		ZF	K	ZF
	-30 to 0		48		ZG	J	ZG
	-24 to +6		54		ZH	H	ZH

**TABLE F**  
**SERIES INFORMATION**

DATA SET	SERIES NUMBER	PURPOSE OF CHANGE IN SERIES NUMBER
201B3 and 201B4	1	Initial manufacture.
	2	Some shielded cable used in chassis wiring was changed to twisted pair. Cost reduction.
	3	To correct an offset in the receiver timing recovery circuit which is caused by a frequency drift in 4029B networks.
	4	To identify sets tested following Issue 4 of the X-spec.
	5	To identify sets using a J87212C-L1 power supply.
201A3 and 201A4	1	Initial manufacture.
	2	Change in nameplate on data set.
	3	Some shielded cable used in chassis wiring was changed to twisted pair. Cost reduction.
	4	To correct an offset in the receiver timing recovery circuit which is caused by a frequency drift in 4029A networks.
	5	To identify sets tested following Issue 4 of the X-spec.
	6	To identify sets using a J87212C-L1 power supply.
201A and 201B List Type	1	Initial manufacture.
	2	To identify sets tested with Issue 2 of X-spec X-17595.
	3	To change chassis wiring. On externally timed 201 list type data sets, transitions of the DCT signal were coupling into transmitter circuitry causing errors in the transmit signal.
	4	To identify sets using a J87212C power supply.

**TABLE G**  
**DISPOSITION AND CONVERSION INFORMATION**

DATA SET	LATEST SERIES	MFG. STATUS	REPLACED BY	CONVERTIBLE TO	REMARKS
J1D201A L1, 2, 3, 6		MD	201A1		* Scrap
J1D201A L1, 2, 4, 6		MD	201A2		* Scrap
J1D201B L1, 2, 3, 6		MD	201B1		* Scrap
J1D201B L1, 2, 4, 6		MD	201B2		* Scrap
201A1		MD	201A3		
201A2		MD	201A4		
201B1		MD	201B3		
201B2		MD	201B4		
201A3	6	MD	201A-L1A/2A/3/6A/7A	201A-L1/2A/3/6/7A	List 6A circuitry is used with list 1A plastic housing. List 6 circuitry is used with list 1 metal housing.
201A4	6	MD	201A-L1A/2A/4/6A/7A	201A-L1/2A/4/6/7A	
201B3	5	MD	201B-L1A/2A/3/6A/7B	201B-L1/2A/3/6/7B	
201B4	5	MD	201B-L1A/2A/4/6A/7B	201B-L1/2A/4/6/7B	
201A-L1A/2A/3/6A/7A	4	Current			
201A-L1A/2A/4/6A/7A	4	Current			
201B-L1A/2A/3/6A/7B	4	MD	201C-L1/2/4/5		
201B-L1A/2A/4/6A/7B	4	MD	201C-L1/2/4/5		
201C-L1/2/3		Current		201C-L1/2/5	
				201C-L1/2/3/4	
				201C-L1/2/4/5	
201C-L1/2/3/4		Current		201C-L1/2/3	
				201C-L1/2/4/5	
				201C-L1/2/5	
201C-L1/2/4/5		Current		201C-L1/2/5	
201C-L1/2/5		Current		201C-L1/2/3	
				201C-L1/2/3/4	
				201C-L1/2/4/5	

\* Scrap — Return units to Western Electric Co. centers for best allowance.

TABLE H  
MAINTENANCE SPARE GUIDELINES

SETS IN SERVICE	COMMON MAINTENANCE SPARE	REMARKS
J1D201A L1, 2, 3, 6 201A1	201A1	
201A1 201A3	201A3	
201A 201A3 201A-L1/2A/3/6/7A 201A-L1A/2A/3/6A/7A	201A-L1/2A/3/6/7A (Note 1) or 201A-L1A/2A/3/6A/7A	Note 2
J1D201A L1, 2, 4, 6 201A2	201A2	
201A2 201A4	201A4	
201A2 201A4 201A-L1/2A/4/6/7A 201-L1A/2A/4/6A/7A	201A-L1/2A/4/6/7A (Note 1) or 201A-L1A/2A/4/6A/7A	Note 2
J1D201B L1, 2, 3, 6 201B1	201B1	
201B1 201B3	201B3	
201B1 201B3 201B-L1/2A/3/6/7B 201B-L1A/2A/3/6A/6B	201B-L1/2A/3/6/7B (Note 1) or 201B-L1A/2A/3/6/7B	Note 2
J1D201B L1, 2, 4, 6 201B2	201B2	

TABLE H (Cont)

SETS IN SERVICE	COMMON MAINTENANCE SPARE	REMARKS
201B2		
201B4	201B4	
201B2		Note 2
201B4		
201B-L1/2A/4/6/7B	201B-L1/2A/4/6/7B (Note 1)	
201B-L1A/2A/4/6A/7B	or 201B-L1A/2A/4/6A/7B	
201C-L1/2/5		Note 3
201C-L1/2/4/5	201C-L1/2/3/4	
201C-L1/2/3		
201C-L1/2/3/4		

*Note 1:* This code is created by converting older data sets (eg, 201A3) to the newer list coding and *not* by manufacture.

*Note 2:* Either data set type will provide backup for this group of sets in service.

*Note 3:* For private line service, unplug the line control circuit JC1 connector, tape and store connector. Multiple installations may support their own maintenance spares.

SECTION	TITLE	SECTION	TITLE
598-012-101	Data Auxiliary Sets 801C3 and 801C4—Description and Operation	598-080-101	Data Auxiliary Set 828C—Description and Operation
598-030-100	Data Auxiliary Set 804A-Type—Description and Operation	668-102-500	Data Test Center 904B- and 904D-Types—Test Procedures—Data Set 201-Type Dynamic Test
598-080-100	Data Auxiliary Set 828A—Description and Operation		