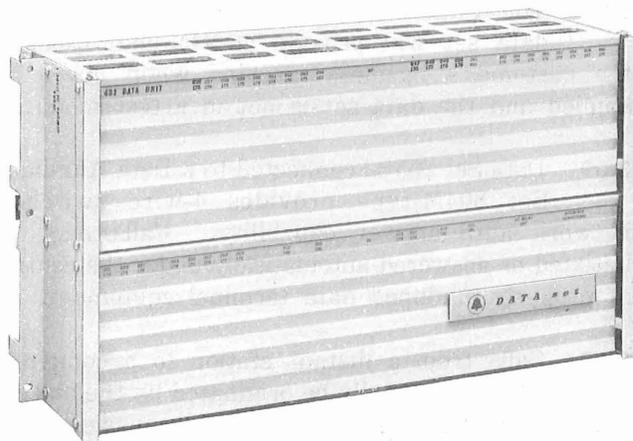


## DATA SET 205B-TYPE REFERENCE GUIDE



Data Set 205B-Type

### 1. GENERAL

**1.01** Data Set 205B-type is a 4-wire synchronous full-duplex serial operation voiceband transmitter-receiver for use on conditioned private lines. This set operates at speeds of 600, 1200, or 2400 bits per second (bps) and is primarily used by agencies of the Federal Government. The transmission rate may be selected independently for each direction of transmission.

**1.02** Accurate timing signals allow the receiver to maintain synchronization with the transmitter for a minimum of 6 seconds in the absence of data transitions or in case of circuit interruptions.

**1.03** Two Data Sets 205B-type can be used back-to-back as a regenerative repeater when operating over long-haul facilities.

**1.04** Data Set 205B1 has been rated Manufacture Discontinued (MD); it is replaced by Data Set 205B2. The 205B2 has all of the features of the 205B1, and also has the added capability of operation over a 4-wire switched network when used with Data Auxiliary Set (DAS) 804M-type (single station) or Data Unit 5A-type (multiple

station). Data Set 205B2 is also compatible with Data Auxiliary Set 801C4 (automatic calling unit). Data Auxiliary Set 819A1 or 819A2 provides power for Data Set 205B-type.

### 2. PHYSICAL AND ELECTRICAL CHARACTERISTICS

**2.01** Data Set 205B-type is designed for rack mounting. The set is 23 inches wide, 12 inches high, and 9 inches deep; it weighs 31 pounds.

**2.02** The data set is powered by +18 V dc and -18 V dc which may be provided by the customer or by DAS 819A1 or 819A2. Data Auxiliary Sets 819A1 and 819A2 require 117-volt 60-Hz power at 58 and 116 watts, respectively.

### 3. OPERATION

**3.01** The mode of operation is selected as follows.

(a) **Data Set 205B1:** The 4-wire telephone line is connected to the data set through either the SWITCHED CARRIER plug (P1) or the CONTINUOUS CARRIER plug (P2). Selection of the connecting plug determines the data set mode of operation.

(b) **Data Set 205B2:** The mode of operation is determined by a 4-position rotary switch. The switch positions are as follows:

- (1) Switched Carrier (SC)
- (2) Switched Carrier—Auto Answer (SCA)
- (3) Continuous Carrier (CC)
- (4) Continuous Carrier—Auto Answer (CCA).

**3.02** In the continuous carrier mode, the data set transmitter is conditioned to remain on-line continuously. The Request-to-Send (RS) control signal from the business machine in the OFF condition causes the data set to generate and transmit an idle code suitable for maintaining the

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clock synchronization of the distant receiver. If RS is on, transmission on the Send Data (SD) interface lead begins as soon as the Clear-to-Send (CS) indication from the data set is given to the business machine.

**3.03** In the switched carrier mode, the data set transmitter is conditioned to remain off while RS is off. When RS is turned on, the data set transmitter is also turned on and generates a synchronizing code for a period of time adequate to bring the distant data set receiver into synchronization. At the end of this time period, the CS is turned on, and SD signals are processed correctly.

**3.04** The data set receiver is always on-line in either continuous carrier or switched carrier mode of operation.

**3.05** The receiver circuits contain an automatic gain control circuit with a 30-dB dynamic range and a maximum input sensitivity of -39 dBm. Attenuation pads at the receiver input may be strapped to reduce the sensitivity.

**3.06** When two Data Sets 205B-type are interconnected to make a 4-wire regenerative repeater, each data set transmitter derives external timing from the receiver of the other data set. Receive Data (RD) signals from each receiver are applied to the SD input of the other transmitter.

**3.07** The data set may be remotely tested over 4-wire facilities with a 904E-type Data Test Center. The customer or operator must either apply an ON signal to the Remote Test (RMT)

interface lead or manually operate the line and test key to REMOTE TEST position to place the data set in the remote testing mode. To return the data set to normal operation, the customer must change the RMT signal to OFF or manually return the line and test key to LINE position.

**3.08** The Data Set Ready (DSR) circuit in the data set will provide an ON indication to the customer's business machine when power is applied and the data set is not in a test mode.

**3.09** Data Set 205B2 connected to a Data Auxiliary Set 804M-type provides 4-wire switched network auto answer capability. Calls may be initiated or answered automatically under the control of properly equipped data terminal equipment.

**3.10** Calls from a distant station to a computer site will normally be originated by the distant station attendant and automatically answered by the first nonbusy station associated with the Data Set 205B2 group. During this condition, the distant station attendant must switch to data mode at the end of the 2025-Hz answer tone and before the 2.56-second burst of 1000 idle code ends.

**4. SERVICE ORDER INFORMATION**

**4.01** Refer to Section 590-000-101 entitled Reference Guide—Description of Data Set Features and Options for a more detailed explanation of features and options common to most data sets. Service offerings and customer options are outlined in Table A and Table B, respectively. The ITEM column provides a reference to descriptive information contained in Section 590-000-101.

**TABLE A**  
**SERVICE OFFERINGS — CURRENT STANDARD MODELS**

MODEL	FEATURE	USOC
205B2	Send and receive 600, 1200, or 2400 bps with manual change from one speed to another; 4-wire private line only; for use by agencies of the Federal Government.	DPW

**TABLE B**  
**CUSTOMER OPTION DECISION TABLE**

DECISION	OPTION	DESIGNATION	ITEM
A	1. Internal Timing*		A1
	2. External Timing		A2
B	3. With DAS 804M-type		B7
	4. Without DAS 804M-type		
C	5. Test key controlled by inter- face*		
	6. Test key not controlled by in- terface		

\* Factory wired

**4.02** The following paragraphs provide more detailed information on customer options.

(a) **Decision A—Internal or Customer-Supplied Transmitter Timing:**

(1) **1. Internal Timing:** With this option,

Data Set 205B-type provides its own timing signal generator that has a long term accuracy of  $\pm 0.0005$  percent. The Serial Clock Transmit External (SCTE) lead is grounded to prevent false timing corrections due to noise.

(2) **2. Customer-Supplied Timing:** With

this option, the customer provides a timing signal at the data bit rate over the SCTE lead to phase-correct the internal transmitter clock. This external timing signal must be accurate to at least  $\pm 0.01$  percent. Receiver timing hold-over will be diminished if the accuracy of the external timing source is reduced.

(b) **Decision B—With or Without DAS 804M-Type:**

(1) **3. With DAS 804M-type:** The following two modes of operation may be selected by option strapping in Data Set 205B2 when DAS 804M-type is used.

- In the first mode, when the data set is idle (DSR off), the transmitter is turned off. If a connection is established and the data set is placed on-line, DSR is turned on and the transmitter is turned on. Data Set Ready and the transmitter remain on as long as

the data set is on-line. When Request-to-Send (RS) is off, the idle code is transmitted. When RS is turned on, Clear-to-Send (CS) turns on, and the transmitted signal is controlled by the Send Data (SD) lead. This provides quick start-up for the on-line data set, since the idle code holds the distant receiver in synchronization. This method also provides continuous carrier which may be used as a continuity check by monitoring the Data Carrier Detector lead. The DAS 804M-type also provides for automatic answering of incoming calls.

- In the second mode of operation, when the data set is idle (DSR off) the transmitter is off. When a connection is made and the data set is placed on-line in the data mode (DSR on), the transmitter remains off if RS is off. If DSR is on and RS is turned on, the transmitter turns on and transmits the idle code for 2.56 seconds for synchronization and then turns CS on. The transmitted signal is then controlled by the SD lead. This method is usually specified if fast start-up is not required.

(2) **4. Without DAS 804M-type:** When DAS 804M-type is not used, automatic answering is not provided. The following two modes of operation may be selected by option strapping.

- In the first mode, Data Set 205B-type transmits carrier to the line at all times, regardless of the condition of the RS lead.

If RS is off, the idle code is transmitted. If RS is on, CS is turned on, and the transmitted signal is controlled by the SD lead. This type of operation provides a fast start-up, because the idle code holds the far-end receiver in synchronization. A continuity check may be provided by monitoring the Data Carrier Detector lead, and the carrier signal may be used to obtain timing signals.

- In the second mode of operation, Data Set 205B-type transmits carrier to the line only when RS is on. When RS is off, the transmitter is idle. When RS is turned on, the data set will transmit the idle code for a period of time (ie, 640 msec at 2400 bps) before returning CS, in order to achieve synchronization. When CS turns on, the transmitted carrier is controlled by the Send Data lead. This mode of operation is used for 2-point private line systems where fast start-up time is not required, and on multiparty systems.

(c) **Decision C—Remote Test Controlled or Not Controlled Through Customer Connector:**

- (1) **5. Controlled Through Customer Connector:** This option allows the customer to place the data set in the proper condition to allow remote testing of the data set from a data test center by operating the local TEST-LINE-REMOTE TEST key to REMOTE TEST position when instructed by the data

test center attendant. An ON voltage on the RMT lead also puts the data set into Remote Test condition. An OFF voltage must be applied to RMT lead to take the data set out of Remote Test.

(2) **6. Not Controlled Through Customer**

**Connector:** If this option is chosen, there are three ways to place the data set in the Remote Test condition, which are as follows:

- Operation of the local TEST-LINE-REMOTE TEST key to REMOTE TEST position.
- Operation of the TEST key on the line control unit (DAS 804M-type) This is only available on Data Set 205B2.
- By placing a contact closure between pins 13 and 16 on the control connector (Data Set 205B2 without DAS 804M-type only) for the duration of the test.

**4.03** Telephone company engineering options are listed in Table C.

**5. SUBSTITUTE DATA SETS**

**5.01** The data set listed in Table D may be substituted to supply the services previously described in this section. Customer and Telco options previously listed do not necessarily apply to the substitute data set.

**TABLE C**

**TELCO ENGINEERING OPTIONS**

OPTION	DESIGNATION	ITEM
Transmit Level    0 dBm* -3 dBm -6 dBm -9 dBm		C2
Receiver Sensitivity    +5 to -23 dBm* 0 to -28 dBm -5 to -33 dBm -10 to -38 dBm		C5

\* Factory wired

**TABLE D**  
**SUBSTITUTE DATA SET**

USOC	SUBSTITUTE	REMARKS
DPW	205B1 (MD)	May be substituted for the 205B2.

**6. REFERENCES**

6.01 The following references provide additional information on Data Set 205B-type and associated equipment:

(a) BSPs 592-017-101, -201, -301, -501

(b) BSP 598-057-100 (DAS 804M-type)

(c) SD- and CD-1D085-01

(d) EL 33

(e) PEL 7502

(f) Data Set 205B-Type Interface Specification.