

**DATA SERVICE UP TO 1200 BPS ON THE SWITCHED NETWORK
PROVIDED BY DATA SET 202S-TYPE—REFERENCE GUIDE**



Data Set 202S-Type With 2565HK Telephone Set

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1. GENERAL

1.01 Data service up to 1200 bps on the switched network is provided by data set (DS) 202S-type. DS 202S is a medium-speed, nonsynchronous, frequency-shift-keyed (FSK), serial, voiceband transmitter-receiver. DS 202S operates on 2-wire facilities in a half-duplex (HDX) manner.

1.02 When this section is reissued, the reason for reissue will be contained in this paragraph.

1.03 Customer interface signals have the electrical characteristics of Electronic Industries Association (EIA) Standard RS-232-C.

NOTICE

Not for use or disclosure outside the Bell System except under written agreement

1.04 Automatic operation on the switched network is defined as unattended operation. This includes both manual and/or automatic call origination and answering and manual and/or automatic termination, because some data sets (not DS 202S) can be arranged for key control of these features.

1.05 For switched network operation, DS 202S can provide automatic operation. For automatic call origination, an automatic calling unit (ACU) is required and must be ordered separately.

1.06 DS 202S can be provided with a 565HK telephone set (rotary dial) or a 2565HK telephone set (TOUCH-TONE® dial).

1.07 All data sets 202-type are line compatible and different types of data sets may be used to provide a particular service. Consideration must be given to the specific features and limitations of each list code.

1.08 DS 202S provides status indicator lamps and self-test features not available on earlier model data sets.

1.09 An optional reverse channel allows the data set to signal at up to 5 bits per second (bps) in the opposite direction to the signal on the primary channel.

2. PHYSICAL AND ELECTRICAL CHARACTERISTICS

2.01 The basic DS 202S-L1 [Manufacture Discontinued (MD)] or -L1A transmitter-receiver is a printed wiring board circuit pack (CP) measuring 1.5 inches high, 5.6 inches wide, 10.4 inches deep, and weighing 1.5 pounds. When used in a "stand-alone" [202S-L1/2 (MD) or -L1A/2] configuration, the CP is enclosed in an extruded aluminum shell housing measuring 2.2 inches high, 5.8 inches wide, 10.8 inches long, and weighing 3.5 pounds. The front cover is molded black plastic with seven translucent designations and a cutout for the test switches on the CP. The rear cover is also molded black plastic with a cutout for the interface connectors and the power cord. When reverse channel is required, the reverse channel CP (1 inch high, 3.4 inches wide, and 7.5 inches deep) may be used. The data set with reverse channel is coded 202S-L1/3 (MD) or -L1A/3A, and when mounted in the stand-alone housing, is coded 202S-L1/2/3 (MD) or -L1A/2/3A.

2.02 A KS-21239-L1 (MD) or -L4 transformer cord is included with the housing. The transformer plugs into a standard nonswitched 3-wire, 117-volt 60-Hz outlet. The housing has two interface connectors and a power cord at the rear of the set. One connector is a KS-19087-L6, which is provided for the customer interface cord. The second connector is a KS-19088-L22, which is normally connected by an M13F cord to the associated telephone set.

2.03 DS 202S is designed to operate in an environment with a temperature range of +40 to +120°F and a relative humidity range of 20 to 95 percent.

2.04 DS 202S may be mounted for multiple arrangements using the 40A1 or 40A2 data mounting. Detailed information on multiple arrangements is contained in Section 592-860-100.

3. SERVICE ORDER INFORMATION

3.01 Service orders for data services should describe the desired service by uniform service order code (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 set apparatus, the oldest apparatus that will perform the service as described by USOC should be used first. When the desired data set model is not available from telephone company (telco) stock (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 suffixes are listed in 3.04. The USOC suffix **encoding** and **decoding** procedures are described 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 Service order information is provided in the following tables:

- Table A—Service Offerings

- Table B—Data Set 202S Customer Options for DATAPHONE® 1200 Service
- Table C—Telco-Engineered Timing Options for DATAPHONE 1200 Using Data Set 202S
- Table D—Customer-Engineered Timing Options for DATAPHONE 1200 Using Data Set 202S
- Table E—Telco Options for DATAPHONE 1200 on the Switched Network Using Data Set 202S

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 on the service order and what apparatus is required to provide the service.

CUSTOMER OPTIONS

3.04 The following paragraphs provide detailed information on customer options listed in Table B for services provided by DS 202S. To provide the type of service desired by the customer, one of the two options under each decision must be selected.

Decision A—Local Copy or No Local Copy on Primary Channel

1. Local copy on the primary data channel arranges the data set to give local feedback of the transmitted data signal to the transmitting data terminal, and is normally provided.
2. No local copy on the primary data channel gives no local feedback of the transmitted data signals to the data terminal. The customer must specify if local copy is not wanted.

Decision B—Local Copy or No Local Copy on Reverse Channel

3. Local copy on reverse channel allows the reverse channel receiver to monitor the reverse channel transmitter and give local feedback to the customer terminal on the secondary received line signal detector interface lead.

4. No local copy on reverse channel gives no local feedback to the customer terminal.

Decision C—Telco- or Customer-Engineered Timing Options

5. Telco-engineered timing options are listed in Table C. These options are engineered to maximize the protection against interfering phenomena and are recommended.
6. Customer-engineered timing options are to be selected from Table D. The options selected must be specified on the service order with descriptive remarks. The customer is responsible for the operation and interface trouble analysis for systems with customer-engineered customer timing options during the system startup periods. The telco is responsible for the steady state performance of these systems after the startup periods. Option C5 is recommended.

Decision D—Data Set Ready Interface Lead ON or OFF in Analog Loop-Back Test Mode

7. Data set ready interface lead **on** allows the customer to perform loop-back testing from the customer terminal with the data set output looped back to the receiver.
8. Data set ready interface lead **off** prevents the customer from performing loop-back testing from the customer terminal unless the customer can do so without a data set ready signal from the data set.

Decision E—With or Without Automatic Answer

9. When the automatic answer option is installed, the data set will detect and answer incoming calls automatically when the data terminal ready interface lead is held **on** by the terminal.
10. When the automatic answer option is not used, all incoming calls must be manually answered.

Decision F—Signal Ground Connected or Not Connected to Frame Ground

11. Signal ground is normally connected to frame ground within the data set to minimize noise.

TABLE A
SERVICE OFFERINGS

| USOC | FEATURE | APPARATUS REQUIRED | NOTES |
|------|--|--|-------|
| 13B | Send and receive up to 1200 bps on switched network. Individually housed data set with special features but without reverse channel. | DS 202S-L1A/2 or DS 202S-L1/2 with 565HK tel set | 1 |
| 13G | Same as 13B, but with reverse channel. | DS 202S-L1A/2/3A or DS 202S-L1/2/3 with 565HK tel set | 1, 2 |
| 13L | Same as 13B, but intended for grouping with station arrangement. | DS 202S-L1A/2 or DS 202S-L1/2 | 1 |
| 13C | Same as 13B, but with reverse channel and intended for grouping with station arrangement. | DS 202S-L1A/2/3A or DS 202S-L1/2/3 | 1, 2 |
| 1M4 | Same as 13B, but intended for multiple mounting in a station arrangement. | DS 202S-L1A or DS 202S-L1 | 1 |
| 1M7 | Same as 13B, but with reverse channel and intended for multiple mounting in a station arrangement. | DS 202S-L1A/3A or DS 202S-L1/3 | 1, 2 |
| NCS | Station arrangement for controlling a group of 2 to 5 individually housed data sets which are intended for grouping. | 565HK tel set with 6 buttons; KS-21253-L3 adapter with connecting cord | |
| MDE | Common equipment for multiple mounting of 8 data sets. | 40A1 data mounting; 830C tel set with 10 buttons; KS-19252-L5 adapter with connecting cord | |
| MOG | Common equipment for multiple mounting of 16 data sets. | Two 40A1 data mountings; 831C tel set with 20 buttons; two KS-19252-L5 adapters with connecting cord | |

Note 1: DS 202S-L1A has ring memory and optional control of data set ready lead in the analog loop-back test mode. These features are not available in DS 202S-L1.

Note 2: Sets with reverse channel installed can be used to provide service where reverse channel is not required, if desired.

TABLE B

DATA SET 202S CUSTOMER OPTIONS FOR DATAPHONE 1200 SERVICE

| DECISION | OPTION | |
|----------|---|----------------|
| | DESCRIPTION | DESIGNATION |
| A | 1. Local copy on primary channel | ZA |
| | 2. No local copy on primary channel | ZB |
| B | 3. Local copy on reverse channel | ZE |
| | 4. No local copy on reverse channel | ZF |
| C | 5. Telco-engineered timing options | (Table C) |
| | 6. Customer-engineered timing options | (Table D) |
| D | 7. Data set ready interface lead <i>on</i> in analog loop-back test mode | YI |
| | 8. Data set ready interface lead <i>off</i> in analog loop-back test mode | YJ (Note 1) |
| E | 9. Automatic answer IN | B |
| | 10. Automatic answer OUT | A |
| F | 11. Signal ground connected to frame ground | ZG (Note 2) |
| | 12. Signal ground not connected to frame ground | ZH (Note 2) |

Note 1: Option YJ not available on DS 202S-L1.

Note 2: SG and FG should be connected together unless customer specifically requests otherwise.

TABLE C

TELCO-ENGINEERED TIMING OPTIONS FOR DATAPHONE 1200
USING DATA SET 202S

| OPTION | |
|--|-------------|
| DESCRIPTION | DESIGNATION |
| a. Squelch (156 ms) and soft turnoff (24 ms) | R |
| b. Clear-to-send (180 ms) | G |
| c. Carrier detector acquisition timing OUT (23 ms) | N |
| d. Clamp IN — option F (IN) must be selected on DS 202S-L1; permanently wired IN on DS 202S-L1A | F |

12. Signal ground may be disconnected from frame ground if the customer requests it due to local procedures or conditions.

4. CONVERSION AND DISPOSITION INFORMATION

4.01 For information on conversion and disposition of DS 202S refer to Table F.

5. MAINTENANCE SPARE GUIDELINES

5.01 To reduce the types of data sets in the field stock, a universal spare may be used for a group of in-service data sets containing various features. For recommended substitute data sets which should be stocked for maintenance spares, refer to Table G.

TABLE D
CUSTOMER-ENGINEERED TIMING OPTIONS FOR DATAPHONE 1200
USING DATA SET 202S

| OPTION | |
|---|------------------|
| DESCRIPTION | DESIGNATION |
| a. Squelch OUT 9 ms 156 ms | Note |
| b. Soft turnoff 0 ms 8 ms 24 ms | Note |
| c. Clear-to-send 8 ms 30 ms 60 ms 180 ms | M K J G |
| d. Carrier detection acquisition timing IN (7 ms) OUT (23 ms) | Q N |
| e. Clamp IN — option F (IN) must be selected on DS 202S-L1; permanently wired IN on DS 202S-L1A | F |

Note: Designations for combinations of squelch and soft turnoff options.

| <i>SOFT TURNOFF</i> | <i>SQUELCH</i> | <i>DESIGNATION</i> |
|---------------------|----------------|--------------------|
| 0 ms | 0 ms | Z |
| 8 ms | 0 ms | Y |
| 24 ms | 0 ms | X |
| 0 ms | 9 ms | W |
| 0 ms | 156 ms | V |
| 8 ms | 9 ms | T |
| 8 ms | 156 ms | S |
| 24 ms | 156 ms | R |

TABLE E

**TELCO OPTIONS FOR DATAPHONE 1200
ON SWITCHED NETWORK USING DATA SET 202S**

| OPTION | | |
|---|-------------------------|-------------|
| DESCRIPTION | | DESIGNATION |
| Reverse Channel IN OUT | | ZC ZD |
| Transmit Line Signal Level (dBm) (Includes reverse channel signal level) | | |
| W/O REVERSE CHANNEL | WITH REVERSE CHANNEL | |
| 0 | -1 | ZK |
| -1 | -2 | ZL |
| -2 | -3 | ZM |
| -3 | -4 | ZN |
| -4 | -5 | ZO |
| -5 | -6 | ZP |
| -6 | -7 | ZQ |
| -7 | -8 | ZR |
| -8 | -9 | ZS |
| -9 | -10 | ZT |
| -10 | -11 | ZU |
| -11 | -12 | ZV |
| -12 | -13 | ZW |

TABLE F

CONVERSION AND DISPOSITION INFORMATION

| DATA SET | LATEST SERIES | MFG STATUS | REPLACED BY DS | CONVERT- IBLE TO | UPDATE & REPAIR RECOMMENDATION |
|----------|------------------|---------------|-------------------|---------------------|-----------------------------------|
| 202S-L1 | 4 | MD | 202S-L1A | — | REPAIR |
| 202S-L1A | 1 | Standard | — | — | REPAIR |

TABLE G
MAINTENANCE SPARE GUIDELINES

| DATA SET IN SERVICE | MAINTENANCE SPARE | NOTES |
|------------------------|----------------------|---------|
| 202S-L1 | 202S-L1/2/3 | 1 |
| 202S-L1A | 202S-L1A/2/3A | 1, 2 |
| 202S-L1/2 | 202S-L1/2/3 | 1 |
| 202S-L1A/2 | 202S-L1A/2/3A | 1, 2 |
| 202S-L1/3 | 202S-L1/2/3 | 1 |
| 202S-L1A/3A | 202S-L1A/2/3A | 1, 2, 3 |
| 202S-L1/2/3 | 202S-L1/2/3 | 1 |
| 202S-L1A/2/3A | 202S-L1A/2/3A | 1, 2, 3 |

Note 1: This code provides all the features required. Remove housing and/or reverse channel CP as required.

Note 2: DS 202S-L1A replaces DS 202S-L1 to add ring memory, transmit only option, and DSR control in analog loop-back mode.

Note 3: List 3A (JY2 CP) replaces list 3 to add independent reverse channel and is compatible with DS 202S-L1 or 202S-L1A.

6. REFERENCES**SECTION****TITLE**

6.01 The following BSPs provide additional information on DS 202S and associated equipment.

592-028-500

Data Set 202S Transmitter-Receiver—Test Procedures

592-860-100

Data Station Using Data Set 202S— Description and Operation

SECTION**TITLE**

590-000-100 Implementation of Data Services— Interdepartmental Coordination

598-012-101

Data Auxiliary Sets 801C3 and 801C4—Description and Operation

590-000-101 Description of Data Set Features and Options

6.02 The following schematic drawings (SD) and circuit descriptions (CD) contain pertinent information on data set 202S-type:

590-000-102 Reference Guides—Cross Reference Information

NUMBER**TITLE**

590-000-103 Data Apparatus Substitution Guide

SD-&CD-1A297-01

Electronic Switching System No. 1 Arranged With 2-Wire Features—Special Line Applique Circuit

592-028-100 Data Set 202S Transmitter-Receiver—Description and Operation

592-028-200 Data Set 202S Transmitter-Receiver—Installation and Connections

SD-&CD-1D238-01

Data Systems Station—Data Set 202S-Type and 40A1 Data Mounting

592-028-300 Data Set 202S Transmitter-Receiver—Maintenance

SD-&CD-1D269-01

Data Systems Station—40-Type Data Mounting