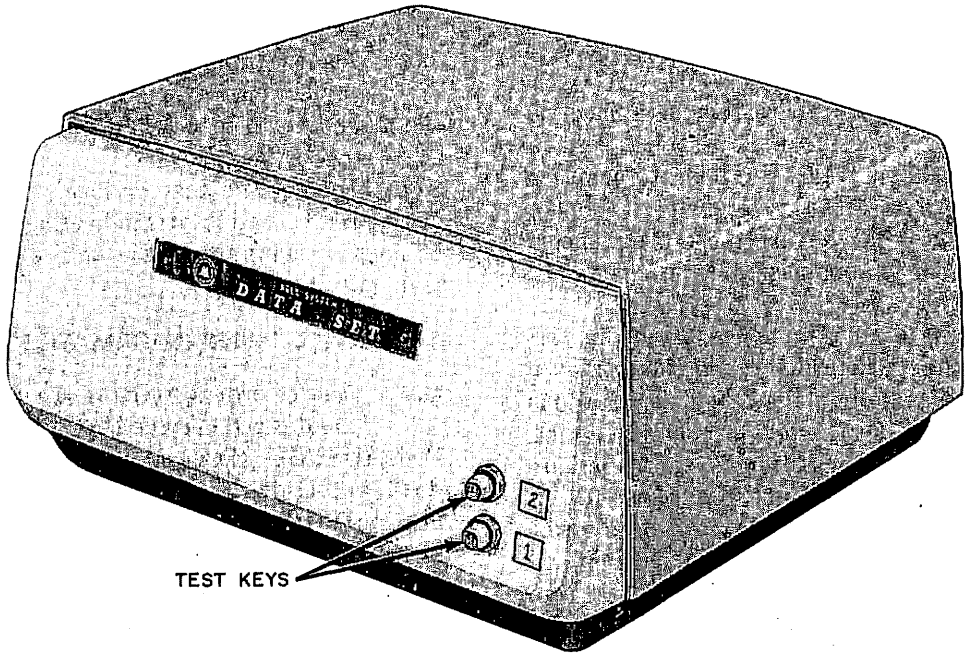
DATA SET 103F-TYPE

REFERENCE GUIDE



Data Set 103F2

1. GENERAL

1.01 Data Set 103F-type is a low-speed, binary, serial, voiceband transmitter-receiver which operates at speeds up to 300 bits per second on private lines only. The data sets are arranged for full-duplex frequency-shift-keying (FSK) operation on 2-wire voice circuits. No provision is made in the data sets for alternate voice communication.

1.02 This section is reissued to include new service order information and to give more detailed information concerning customer options. Since this reissue constitutes a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 Data Set 103F-type uses bipolar voltage signals that comply with Electronic Industries Association (EIA) Standard RS-232-B.

1.04 Data Set 103F1 is rated Manufacture Discontinued (MD); it has been replaced by Data Set 103F2.

1.05 Data Set 103F1 has one test key while Data Set 103F2 has two. The single test key on the 103F1 provides for remote testing of the data set in either permanently strapped mode of operation. When strapped for external mode control, Data Set 103F1 can be remotely tested only in that mode which the business machine holds. Data Set 103F2 may be remotely tested in both the originate and answer modes by the use of the second test key.

2. PHYSICAL AND ELECTRICAL CHARACTERISTICS

2.01 Data Set 103F-type requires 15 watts of 117-volt 60-Hz power supplied by the customer through a 3-wire receptacle.

2.02 The data sets have a 2-tone gray finish and measure 11 inches wide, 10-1/4 inches deep, and 5-1/2 inches high. Each data set weighs 15 pounds.

3. OPERATION

3.01 All functions of the data set are controlled by the business machine.

3.02 Data Set 103F-type converts business machine signals into voice-frequency tones. These frequencies are transmitted over point-to-point or multistation private lines to the receiving station(s). The receiving data sets convert these frequencies back to proper form for business machine use.

3.03 To transmit data between stations in the system, one station must be in the originate mode and the other station in answer mode. Stations in the same mode are not capable of communicating with each other. Mode selection is controlled by the business machine, unless the data set is permanently wired for either originate or answer mode. In 2-point and multipoint applications, all stations remain in the answer mode until one terminal signals its data set to originate a call. Only that data set goes into the originate mode, and is then ready to communicate with any other station on the system in the answer mode.

3.04 Data is transmitted over two bands within the voice channel, separated by frequency. The originating station transmits on the lower band and receives on the upper band. The answering station receives on the lower band and transmits on the upper band. Channel frequencies are as follows:

STATION MODE	TRANSMITTED SIGNAL	FREQUENCY (HZ)
Originating	Mark	1270
	Space	1070
Answering	Mark	2225
	Space	2025

3.05 In the absence of received carrier, the data set sends a mark signal to the business machine.

3.06 A test key on the data set permits remote testing from a data test center. When in the test mode, loop-back tests may be made on the data set.

3.07 An LO (local mode) relay in the data set under control of the business machine permits the attendant to test the business machine.

3.08 During the test or local mode, the data set ready lead is off, indicating to the associated business machine that the data set is not ready to transmit data.

4. SERVICE ORDER INFORMATION

4.01 Service orders for data service should describe the desired service by Uniform Service Order Code (USOC). Service orders ***should not*** specify data set codes. The ***encoding*** procedure to determine the appropriate USOC is described in Section 590-000-100. Customer option decisions which must be made to determine the USOC suffix are listed in 4.03. However, because Data Set 103F-type has only three possible customer option choices, USOC suffixes are given in Table B for ready reference. 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.

4.02 USOC ***decoding*** procedures are described in Section 590-000-100. 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 utilized first. The use of an available substitute from telephone company stocks (field or class C) is

strongly preferred over the purchase of a new data set.

4.03 Service offerings and customer options are outlined in Tables A and B, respectively. To provide the features desired by the customer, one of the two options under each of the following decisions must be selected.

(a) ***Decision A—Mode Controlled or Not Controlled by Terminal:***

(1) ***1. Mode Controlled by Terminal:*** If the mode controlled by terminal option is used, the operating mode (answer or originate) will be under control of the business machine with which the data set interfaces. This option should be used when the data set is connected on a multipoint network and is to be utilized at one time to transmit data to sets operating in the answer mode, and at other times to transmit data to data sets operating in the originate mode. This option should also be used on all data sets in a multipoint network if each data set is to broadcast data to all other sets within the group. Due to the number of possible system configurations, this decision should be made from a system standpoint rather than on the basis of an individual data set. If this option is selected, the USOC suffix is 01 and decision B is not appropriate.

(2) ***2. Mode Not Controlled by Terminal:*** If the station does not require operation in both operating modes (answer and originate), the data set may be permanently strapped for either the answer mode or the originate mode. Selection of this option also requires selection of a decision B option.

(b) ***Decision B—Permanent Answer Mode or Originate Mode Operation:***

(1) ***3. Permanent Answer Mode Operation:*** A data set wired permanently for answer mode always transmits on the upper band and receives on the lower band. One of two data sets on a 2-point system would normally be wired with this option, and the other with the originate mode option. If specified for one data set in a multipoint network, all other sets to which data communication is required must be operated in the originate mode and would not be capable of communicating with each other. (USOC suffix is 02.)

(2) ***4. Permanent Originate Mode Operation:*** A data set wired permanently for originate mode always transmits on the lower band and receives on the upper band. If specified for one data set in a multipoint network, all other sets to which data communication is required must be operated in the answer mode, and would not be able to communicate with each other. (USOC suffix is 04.)

4.04 The only telephone company (Telco) engineering option is the transmit levels of the lower band (f_1) and the upper band (f_2) frequencies. Each transmit level is adjustable in -2 dBm increments from 0 to -14 dBm. The transmit levels of f_1 and

TABLE A

SERVICE OFFERINGS

USOC	FEATURE	MODEL	REMARKS
DP3++	Full Duplex: Send and receive up to 300 bps on 2-wire private line only. (If marginal operation occurs at 300 bps, select and test the individual data set.)	103F1*	One test key which provides remote test capability in only one mode of operation.
		103F2	Has two test keys providing full test capability.

* First choice for applying data sets from Telco stocks to service orders or maintenance needs.

TABLE B

CUSTOMER OPTIONS AND USOC SUFFIXES

DECISION	CUSTOMER OPTION*	USOC SUFFIX
A (See note)	1. Mode controlled by terminal	01
	2. Mode not controlled by terminal	Decision B needed
B	3. Permanent answer mode operation	02
	4. Permanent originate mode operation	04

*Associated strapping connections can be found in Section 591-019-400.

Note: If A decision is option 2, B decision must be made.

f_2 frequencies are interdependent so that the transmit level of the lower band (f_1) may be equal to but never exceed the transmit level of the upper band (f_2). See Section 591-019-400 for strapping connections to obtain permissible combinations of transmit levels.

5. SUBSTITUTE DATA SETS

5.01 The data sets listed in Table A may be used to supply the services previously described in this section. Series change information given in Table C and the disposition and conversion information given in Table D are provided to allow optimum utilization of data set stocks.

6. REFERENCES

6.01 The following references provide additional information on Data Set 103F-type:

(a) BSPs 591-019-100, -200, -300, -400, -500

(b) PEL 7343

(c) BSRS 480.030

(d) Data Set 103F-type Interface Specificaiton.

TABLE C

SERIES CHANGE INFORMATION

DATA SET	SERIES	PURPOSE	RECOMMENDATIONS
103F1 103F2	1	Apparatus coding	—
103F1 103F2	2	To prevent a momentary false output on the CB lead	Update as required
103F1 103F2	3	To insure proper operation of the CB timer at low input voltage	Update as required
103F1 103F2	4	Input connector on power supply changed	—

TABLE D

DISPOSITION AND CONVERSION INFORMATION

DATA SET	MFG. STATUS	REPLACED BY	CONVERTIBLE TO	RECOMMENDATIONS
103F1	MD	103F2	—	Reuse units which have already been repaired. Junk* unrepaired units.
103F2	Std	—	—	Repair and update as required.

*Return to Western Electric for best salvage allowance.