

## DATA SET 103G-TYPE REFERENCE GUIDE



Data Set 103G1

### 1. GENERAL

**1.01** Data Set 103G-type is a low speed asynchronous serial frequency-shift voiceband transmitter-receiver operating at speeds up to 300 bauds. It is for use as a full-duplex system in 2-wire DATA-PHONE® or TWX-CE service over the switched network.

**1.02** Data Set 103G-type is an integrated set using the 103E-type electronic package, a telephone set, control keys, a monitor amplifier with loudspeaker, and a power unit. A mounting cord and 3-wire power cord are also supplied with the data set.

**1.03** These data sets use EIA bipolar voltage interface signals which are converted to voice-frequency tones for transmission.

## SECTION 590-001-105

**1.04** Remote test capability is provided, permitting the data sets to be tested from a data test center. Echo suppressor disabling is also provided in these data sets to allow full-duplex operation.

**1.05** Data Set 103G-type is available with four types of dialing features as follows:

(a) Data Sets 103G1 and 103G3 are equipped with rotary dials, while Data Sets 103G2 and 103G4 are equipped with TOUCH-TONE® dials.

(b) Data Sets 103G3 and 103G4 are equipped with a card dialer.

**1.06** Data Set 103G is compatible with Data Auxiliary Set 801A-type (rotary dial) and Data Auxiliary Set 801C-type ( TOUCH-TONE dial) for automatic calling.

## 2. PHYSICAL AND ELECTRICAL CHARACTERISTICS

**2.01** Data Set 103G-type requires 117-volt 60-Hz power supplied by the customer through a 3-wire grounded receptacle.

**2.02** Data Sets 103G1 through 103G4 have the same housing, which measures 15-1/2 inches long, 9 inches wide, and 5-1/2 inches high. Weights vary slightly, but each set weighs approximately 16 pounds, depending on the kind of dial. The housing is 2-tone gray color.

## 3. OPERATION

**3.01** Data Set 103G-type is designed to transmit in one of two frequency bands and receive in the other band. The call-originating data set transmits in the band designated  $f_1$ . The receiving data set receives frequencies in the  $f_1$  band and answers in the  $f_2$  band. Normal frequencies for the  $f_1$  band are 1270 Hz for a mark and 1070 Hz for a space. Normal frequencies for the  $f_2$  band are 2225 Hz for a mark and 2025 for a space.

**3.02** Inverted frequencies are sometimes needed to meet customer requirements, and in the future will be supplied by an option. In such cases, the mark and space frequencies are interchanged.

## *Establishing Telephone Connection*

**3.03** The telephone set of the data set functions in the normal telephone manner with the handset removed from the cradle. "Hands-free" calls may be originated by operating the DATA key, with the handset on the cradle. With such calls, all supervisory signals are heard on the monitor loudspeaker. If the called party answers the call in the data mode, the data set will "handshake" and go directly into data mode. If the called party answers the call in the talk mode, voice communications may be established by lifting the handset and operating the TALK key.

*Note:* "Hands-free" calling is predicated on the business machine's being properly conditioned (CD lead ON) for such calls beforehand.

**3.04** The called data station:

(a) detects ringing and connects data set to the telephone line.

(b) sends  $f_2$  mark

(c) receives and processes  $f_1$  mark to complete the handshake sequence

## *Automatic Answer*

**3.05** With the data station conditioned for automatic answering, the incoming ringing voltage will cause the data set to go off-hook and start the handshake sequence. If  $f_1$  mark is not received within about 20 seconds the data set will disconnect and return to idle condition.

## *Data Operation*

**3.06** After completion of the handshaking sequence, the business machine is connected to the data set. The business machine may now transmit data by applying negative (mark) or positive (space) voltages to the data set modulator. The modulator generates appropriate voice frequencies for transmission to the distant data set.

**3.07** At the end of data transmission, the business machine may disconnect the data station.

**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. Options in Table B apply to the 103E5 electronic package.

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

MODEL	FEATURE	USOC
103G1	Rotary dial DS for single installation. No card dialer.	DES
103G2	TOUCH-TONE dial DS for single installation. No card dialer.	DJA
103G3	Rotary dial DS for single installation. Equipped with card dialer.	DXB
103G4	TOUCH-TONE DS for single installation. Equipped with card dialer.	DXM

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

DECISION	OPTION	DESIGNATION
A	1. Answer mode indication off	W
	2. Answer mode indication on	X *
B	3. Answer control separate	w/o M
	4. Answer control combined	M *
C	5. No send disconnect	w/o T
	6. Send disconnect (3-second spacing)	T *
D	7. Loss of CXR disconnect	S
	8. No loss of CXR disconnect	w/o S *
E (See Note)	9. Space disconnect	
	10. No space disconnect	w/o V, H
F	11. Long space disconnect	V *
	12. Short space disconnect	H

\* Factory-supplied option

**Note:** If decision E is 9, make decision F. If decision E is 10, make no further decision.

(a) **Decision A—Answer Mode Indication OFF or ON:**

(1) **1. Answer Mode Indication OFF:** With this option, the CE lead (which is an indication to the business machine that ringing current is being received) is ON only while ringing current is present.

(2) **2. Answer Mode Indication ON:** With this option, the CE lead is turned ON when ringing is initially received and remains on until after the call is completed.

(b) **Decision B—Answer Control Separate or Combined:**

(1) **3. Answer Control Separate:** Without option M, the business machine can override AUTO ANS key and inhibit automatic answer feature of data set.

(2) **4. Answer Control Combined:** With option M, the business machine cannot override AUTO ANS key and inhibit automatic answering.

(c) **Decision C—No Send Disconnect or Send Disconnect:**

(1) **5. No Send Disconnect:** If the Data Terminal Ready (CD) lead is turned off, the data set disconnects immediately.

(2) **6. Send Disconnect:** If the Data Terminal Ready lead is turned off, the data set transmits 3 seconds of spacing signal prior to disconnecting. The CLEAR lamp will light when CD is turned off.

(d) **Decision D—Loss of Carrier Disconnect or No Loss of Carrier Disconnect:**

(1) **7. Loss of Carrier Disconnect:** With this option, the data set will disconnect if carrier is removed for 160 msec. When disconnected due to loss of carrier, the data set will send 3 seconds of spacing signal. Therefore, a one-way loss of carrier would cause one station to disconnect on loss of carrier and the other to space disconnect if option V or H is provided.

(2) **8. No Loss of Carrier Disconnect:** With this option, data set will not disconnect with loss of carrier.

(e) **Decision E—Space Disconnect or No Space Disconnect:**

(1) **9. Space Disconnect:** With space disconnect, the data set will disconnect upon receipt of space disconnect signal (See Decision F).

(2) **10. No Space Disconnect:** When this option is provided, the data set will not disconnect on any length of spacing signal.

(f) **Decision F—Long or Short Space Disconnect:**

(1) **11. Long Space Disconnect:** With this option, the data set will disconnect and return to idle condition after receiving spacing signal for 1.5 seconds.

(2) **12. Short Space Disconnect:** With this option, the data set will disconnect and return to idle condition after receiving spacing signal for 400 msec.

**4.02** Telephone company engineering options listed in Table C apply to the 103E5 electronic package. The ITEM column provides a reference to descriptive information contained in Section 590-000-101.

**TABLE C**  
**TELCO ENGINEERING OPTIONS**

OPTION	DESIGNATION	ITEM
Originate-only test	G	
Common grounds	Q *	
Transmit level		C2
Combined Clear to Send and Carrier Detect leads (Note)	A	

\* Factory-supplied option

**Note:** This option must be used with IBM terminal equipment.

**4.03** Additional information on Telco options follows:

- (a) **Originate-only Test:** This option allows entrance to the test mode from the talk mode for use at originate-only stations.
- (b) **Common Grounds:** This option is used to connect frame and circuit ground to minimize noise.

#### 5. SUBSTITUTE DATA SETS

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

**TABLE D**  
**SUBSTITUTE DATA SETS**

USOC	SUBSTITUTE
DES	103G3 — card dialer not used
DJA	103G4 — card dialer not used

#### 6. REFERENCES

**6.01** The following references provide additional information of Data Set 103G-type and associated equipment.

- (a) BSPs 591-026-100, -200, -300, -500
- (b) CD- and SD-1D096-01