

REPLACING PAGE ADDENDUM

Filing Instructions:

1. REMOVE FROM THE SECTION THE PAGES NUMBERED THE SAME AS THOSE ATTACHED TO THIS PINK SHEET.
2. INSERT THE ATTACHED PAGES INTO THE SECTION IN THEIR PLACE.
3. PLACE THIS PINK SHEET AHEAD OF PAGE 1 OF THE SECTION.

DATA SET 103E-TYPE
DATA STATION
USING KS-20093 CABINETS
DESCRIPTION AND OPERATION

1. GENERAL

1.001 This addendum supplements Section 591-025-101, Issue 3. The attached pages must be inserted in the section in accordance with the filing instructions above.

1.002 This addendum is reissued to incorporate information on the answer-only modifications for the 103E-type Data Station.

The following changes apply to Part 1 of this section:

- (a) Table of Contents—revised
- (b) Note following 1.06—added
- (c) 1.07—revised

2. PHYSICAL DESCRIPTION

The following changes apply to Part 2 of this section:

- (a) 2.21—revised
- (b) 2.33—revised

Attached:

Pages 2, 7, 8, 9, 10, 12, 22, and 25 dated July 1972, revised.

Pages 2.1, 26, and 27 dated July 1972, added.

Page 11 and 21 dated July 1972, reissued.

3. FUNCTIONAL DESCRIPTION

The following changes apply to Part 3 of this section:

- (a) 3.02 and 3.03—transposed
- (b) 3.03—revised
- (c) Fig. 9—revised

4. OPERATION

The following changes apply to Part 4 of this section:

- (a) 4.01—revised
- (b) Table D—revised

5. DATA SET 103E-TYPE DATA STATION—ANSWER-ONLY ARRANGEMENT

Part 5 of this section (5.01 through 5.06) is added.

6. REFERENCES

The references are renumbered as Part 6 of this section.

DATA SET 103E-TYPE
DATA STATION
USING KS-20093 CABINETS
DESCRIPTION AND OPERATION

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1. GENERAL

1.01 This section covers the physical and functional description as well as operating procedures for Data Set 103E-type when used for a data station arrangement on customer premises and contained in a KS-20093-L1 cabinet (Fig. 1).

1.02 This section is reissued to add information on the Data Set 103E6. Information on the Data Sets 103E2 and 103E5 has been retained in this section to provide coverage for those data sets still in use. Due to extensive revision of this section change arrows have been omitted.

1.03 A Data Set 103E-type data station provides for up to 40 low-speed, full-duplex, frequency-shift-keyed, serial data circuits for DATA-PHONE® service.

1.04 The 103E-type Data Station consists of up to 40 Data Sets 103E-type, up to 20 2A1 Data Mountings, a 1A1 Data Mounting, a 1A2 Data Mounting (if more than 20 data sets are required), and a Data Auxiliary Set (DAS) 804J-type, all mounted in a KS-20093-L1 cabinet.

1.05 Data Set 103E-type accepts data from the customer-provided terminal equipment in the form of voltage signals that conform to the Electronic Industries Association (EIA) Standard. These voltage signals are converted into voice-frequency tones by Data Set 103E-type for transmission over the switched telephone network (DDD). Received data, in the form of voice-frequency tones, is converted to EIA voltage signals and delivered to the customer terminal equipment.

Note: The Data Set 103E6 conforms to EIA Standard RS-232-C except when the E6 is

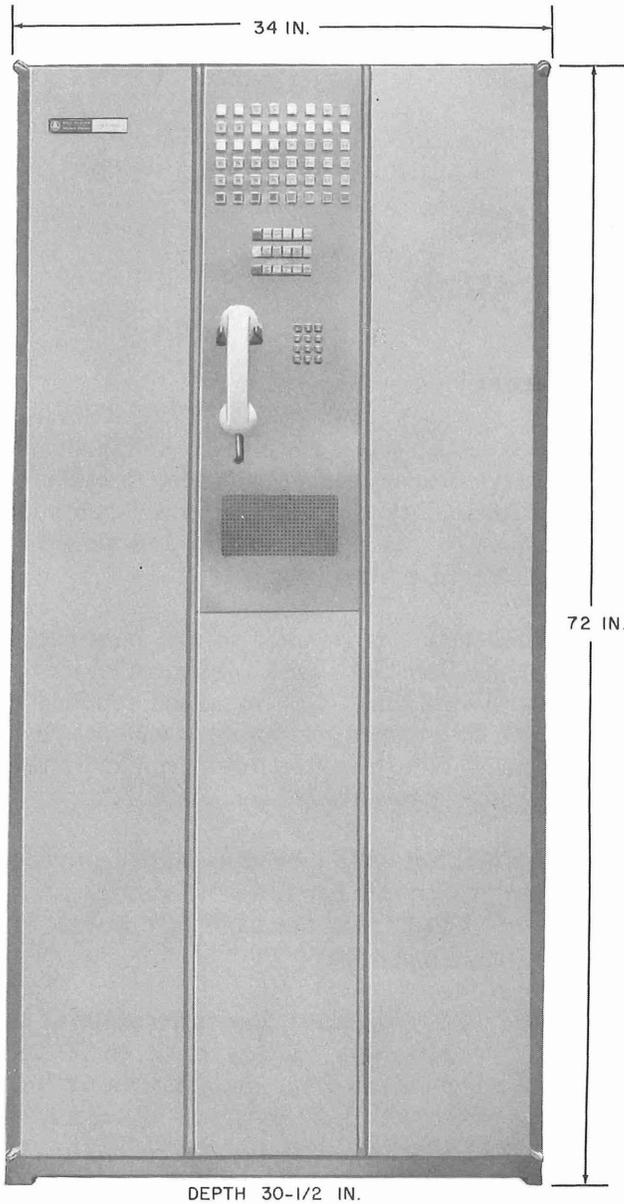


Fig. 1—Data Set 103E-Type Data Station

equipped with the ZD option. The Data Sets 103E2, 103E5, and 103E6 with ZD option, conform to EIA Standard RS-232-B.

1.06 The following description of a typical DATA-PHONE system (Fig. 2) is provided to illustrate the capabilities of the 103E-type Data Station.

Note: The text of this section has been divided into several parts with the first four parts describing the normal operation of the 103E-type Data Station. Part 5 of this section has been added to provide information on the differences in the station and operation when the 103E-type Data Station is modified to provide answer-only service.

1.07 Station *A* is usually located at large computer locations where a great number of input/output data circuits are required, such as time-shared computers. When the customer terminal equipment is a computer, the data sets are usually arranged for automatic answering. With the exception of answer-only service, the data sets may also be equipped with DAS 801-type for automatic origination of calls by the terminal equipment.

1.08 For example, station *D* may call station *A* and transmit data through their common central office. Suppose station *D* requests data, but station *A* requires additional data from station *B* before station *D* may be answered. The computer (customer terminal equipment) at station *A* (if equipped with DAS 801-type) terminates the call from station *D* and places a call to station *B* by using the DDD network. Data is requested from station *B* and when received at station *A*, station *A* then places a local call to station *D* and transmits the required answer to station *D*.

1.09 When automatic calling capabilities are provided, an additional KS-20093-L1 cabinet may be required to house the automatic calling units (ACUs). For information on installation of automatic units as part of this station, refer to the practices entitled Data Set 103-Type—Data Station Using KS-20093 Cabinets—Installation and Connections (591-025-201) and the following applicable automatic calling unit practices.

For Rotary Dial Central Offices:

Data Auxiliary Sets 801A5 and 801A6 For Automatic Calling—Identification and Operation (598-010-101)

For TOUCH-TONE® Dial Central Offices:

Data Auxiliary Set 801C3 and 801C4—
Description and Operation (598-012-101)



When data sets are provided with DAS 801A5, 801C3, and 801C4 (option-wired for ground start), the incoming data lines must be equipped for ground-start operation. In addition, it is recommended that the service line be equipped for ground-start operation to facilitate testing the DAS 801-type using the service line. The DAS 804J3 and 804J4 are equipped

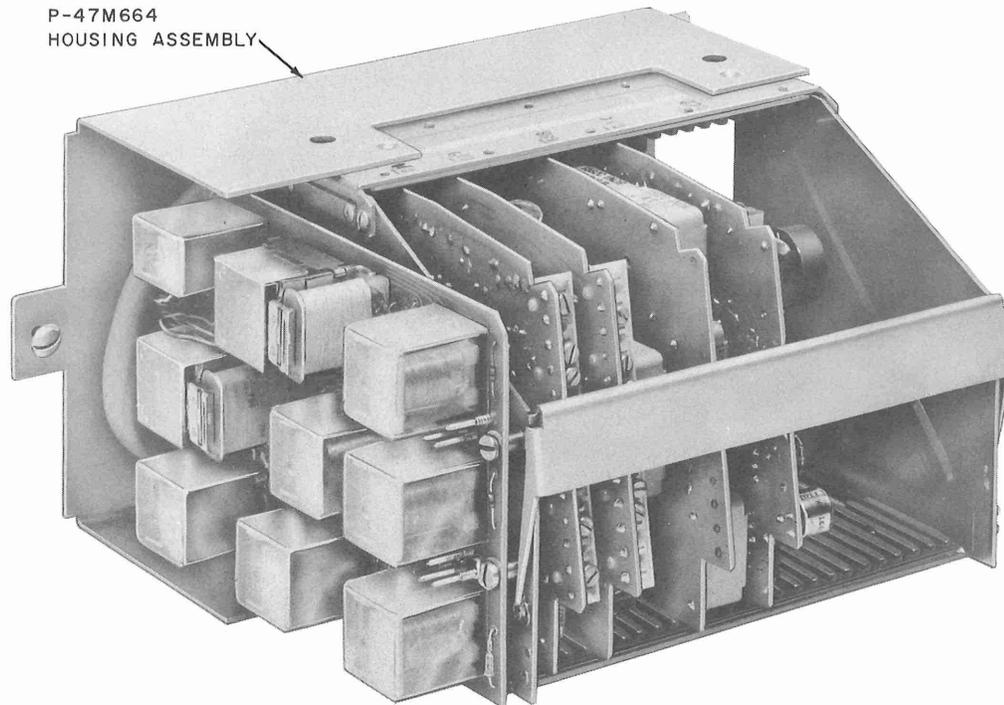


Fig. 5—Data Set 103E5

weighs approximately 12 pounds without the data sets installed.

D. 1A1 Data Mounting

2.17 The 1A1 Data Mounting (Fig. 8) contains the common control logic circuits that are used to control the status of the data sets. A common power unit (31A) provides +18 Vdc 5 amps, -18 Vdc 5 amps, -24 Vdc 0.5 amps, and 10 Vdc 1.5 amps to drive the logic circuits in the 1A1 Data Mounting, the lamps and buzzer on DAS 804J-type, and up to 20 data sets with their associated 2A1 Data Mounting circuitry. Sixteen 50-pin connectors are provided to interconnect the 1A1, 2A1, 1A2 Data Mountings, DAS 804J-type, the telephone lines, and key telephone equipment (if provided). An interrupter (KS-19175-L1) is also provided to generate various lamp indications.

2.18 Each data set powered from the 1A1 Data Mounting is individually fused by a 1-1/3 ampere (70A) fuse in both the positive and negative 18-volt dc leads.

2.19 The sixteen connectors (J1 through J16) interconnect the 103E-type Data Station as shown in Table A.

2.20 The relays on the 1A1 Data Mounting control the following:

- Data set selection
- Make busy and busy release functions
- Data set mode (talk, data, and auto answer)
- Lamps in Data Auxiliary Set 804J-type
- Data set transfer to service line.

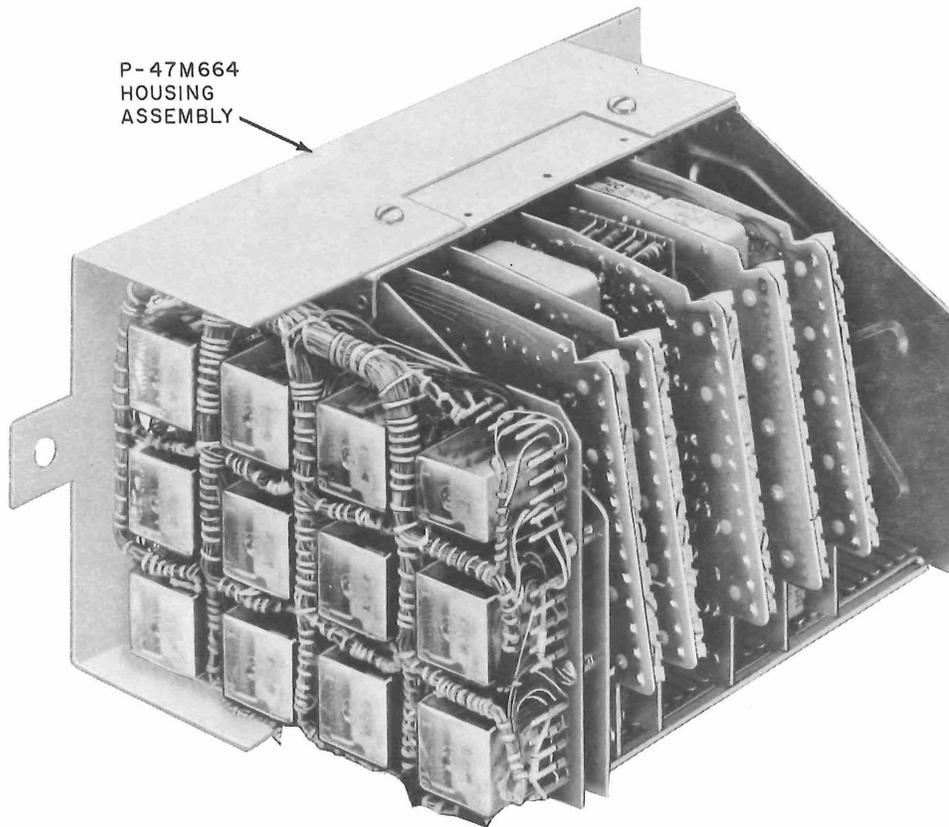


Fig. 6—Data Set 103E2

2.21 Circuit pack AR256 provides the circuits to drive lamps in the DAS 804J-type to indicate the condition of the interface leads on the *selected* data set. A circuit also provides for an audible signal in DAS 804J-type when ringing is present on the line of the *selected* data set. A flutter generator provides the timing to drive the lamp for a *selected* data set. When the station is modified to provide answer-only service, the buzzer in DAS 804J-type is disconnected to disable the audible signal.

2.22 The 1A1 Data Mounting measures 25 inches wide, 16 inches high, 9-3/4 inches deep, and weighs approximately 24 pounds without the 31A power unit installed.

E. 1A2 Data Mounting

2.23 The 1A2 Data Mounting contains a common power unit (31A) that drives lamps on DAS

804J-type and up to 20 data sets with their associated 2A1 Data Mounting circuitry. Fifteen 50-pin connectors are provided to interconnect the 1A2 Data Mounting into the 103E-type Data Station.

2.24 The fifteen connectors (J1 through J16 excluding J3) are interconnected as shown in Table B.

2.25 The 1A2 Data Mounting is not equipped with circuit pack AR256, a KS-19175-L1 interrupter, or the control relays. The 1A1 Data Mounting is equipped with these components which are jointly used by the 1A2 Data Mounting.

2.26 The 1A2 Data Mounting measures identically to the 1A1 Data Mounting and weighs approximately 18 pounds without the 31A power unit installed.

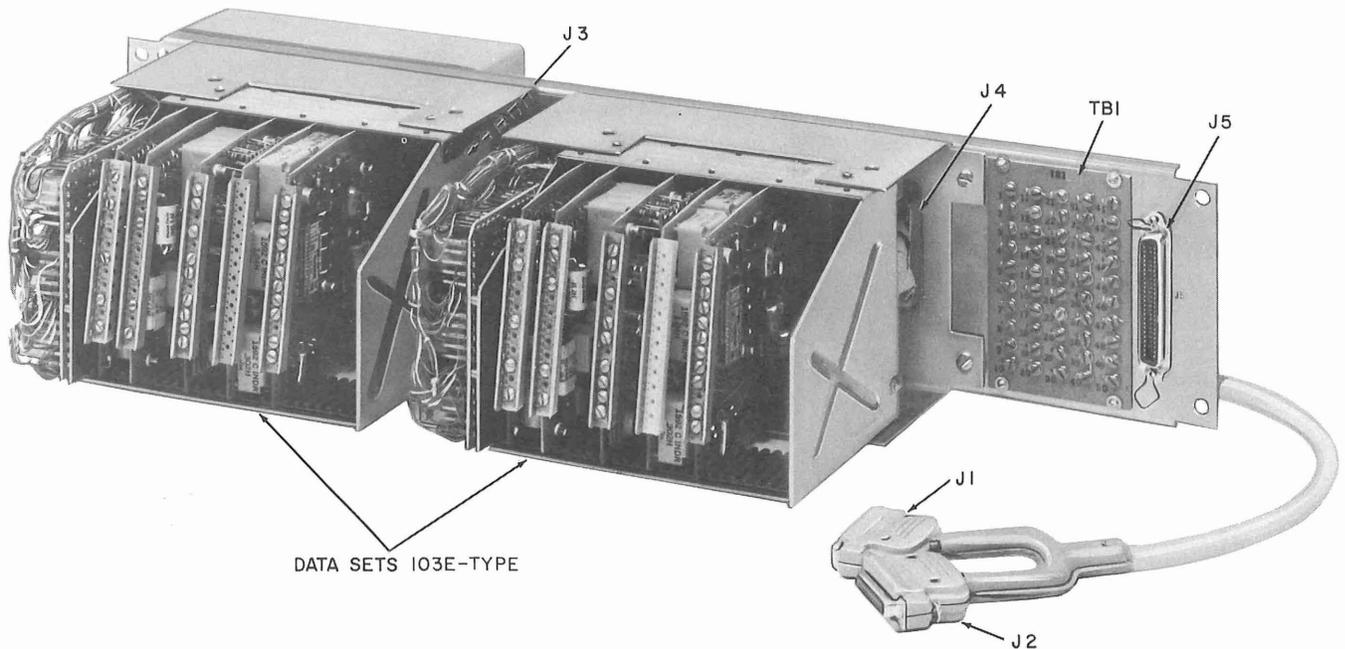


Fig. 7—2A1 Data Mounting With Data Sets 103E-Type Installed

F. Data Auxiliary Set 804J-Type

2.27 The DAS 804J-type (Fig. 9) is available in four types. DAS 804J1 and 804J3 are provided with a rotary dial (9C-58), and DAS 804J2 and 804J4 are provided with a TOUCH-TONE pad (35A3A). In addition, DAS 804J3 and 804J4 are equipped with a DIAL TONE key in the *action field* for manual origination of calls on telephone lines equipped for ground-start operation. Other than the above differences, all other equipment components are the same for the four types.

2.28 Table C summarizes DAS 804J-type keys, lamps, and the function of each.

2.29 At the top of DAS 804J-type, there are 40 nonlocking keys with associated lamps designated 1 through 40. Each of the keys and lamps is associated with a particular data set. These keys are referred to as the *select field* and are used (in conjunction with the keys of the *action field*) to control the individual data set in the complete system.

2.30 Just below the *select field* is a row of eight lamps referred to as *monitor lamps*. These

lamps are used to monitor the condition of certain customer interface leads on the selected data set.

2.31 Below the *monitor lamps* is a row of six keys, of which four are used, referred to as the *control field*. These keys function with a selected data set in the same manner as a single data set installation.

2.32 Below the *control field* is a second set of six keys, referred to as the *action field*. These keys provide for data set selection, transfer of data set to a service line, make busy, and when required, receipt of dial tone to originate a call on ground-start lines.

2.33 Below the *action field* is a third set of six keys referred to as the *attendant line field*. These keys function to connect the DAS 804J-type telephone circuit to any of the key telephone lines or to the service line (except at answer-only modified stations where the key telephone lines are excluded).

2.34 DAS 804J-type measures 10-1/2 inches wide, 35 inches high, 6-1/2 inches deep, and weighs approximately 27 pounds.

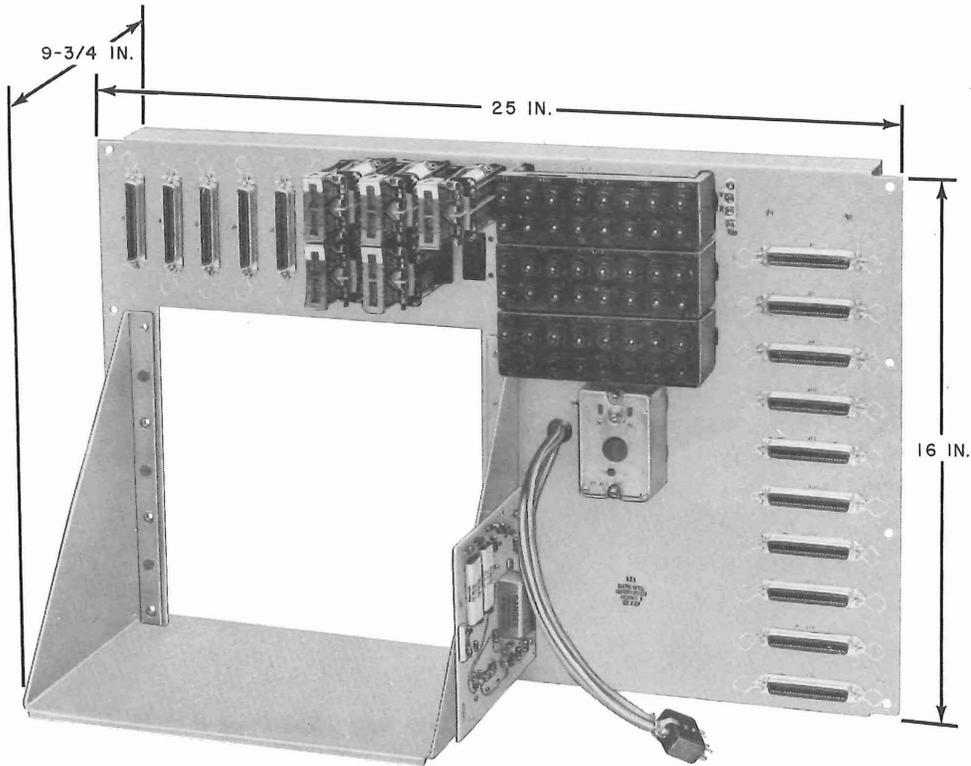


Fig. 8—1A1 Data Mounting

3. FUNCTIONAL DESCRIPTION

A. Data Set 103E-Type Data Station

3.01 A functional description of the Data Set 103E-type Data Station (Fig. 10) is given in the following text to provide information on the operation of the data station and its major components.

3.02 The normal operation of a 103E-type Data Station is equivalent to the operation of up to 40 individual data sets. In order to simplify the explanation of the data station operation, the operation of one data set is described in the following text. This description of the number 1 or first position data set operation is applicable to all other data sets in the station.

3.03 When the interface is conditioned to accept incoming calls from the telephone lines, the

call will be automatically answered by the associated Data Set 103E-type. This is the same as a single data set conditioned for automatic answering.

3.04 When the telephone line is seized by an incoming data call, the ringing current passes through the 1A1 Data Mounting and the control circuits of the 2A1 Data Mounting into the control circuits of the first position data set, ie, Data Set 103E-type (1). The data set automatically answers the call, handshakes, and connects in the data mode. The data set control circuits signal the terminal equipment that the incoming call has been answered and data may be exchanged.

3.05 The terminal equipment transmits EIA voltage signals to the data set through the control circuits of the 2A1 Data Mounting. The transmit circuits of the data set convert the EIA

TABLE A

| 1A1 DATA MTG CONNECTOR | CONNECTS TO | ON UNIT |
|---------------------------|----------------|-----------------------------------|
| J1 | J1 | Data Auxiliary Set 804J |
| J2 | J2 | |
| J3 | J3 | |
| J4 | | Incoming Telephone Lines |
| J5 | | External Key Equipment |
| J6 | J6 | 1A2 Data Mounting (When required) |
| J7 thru J16 | J5 | 2A1 Data Mountings |

TABLE B

| 1A2 DATA MTG CONNECTOR | CONNECTS TO | ON UNIT |
|---------------------------|----------------|--------------------------|
| J1 | J4 | Data Auxiliary Set 804J |
| J2 | J5 | |
| J4 | | Incoming Telephone Lines |
| J5 | | External Key Equipment |
| J6 | J6 | 1A1 Data Mounting |
| J7 thru J16 | J5 | 2A1 Data Mountings |

voltage signals into voice-frequency tones for transmission over the telephone line to the distant data station. These voice-frequency tones pass through the control circuits of the 2A1 Data Mounting, the 1A1 Data Mounting, and out the telephone line.

3.06 Incoming data signals in the form of voice-frequency tones pass through the 1A1 Data Mounting and the control circuits of the 2A1 Data Mounting to the receive circuits of the data

set. The data set converts the voice-frequency tones into voltage signals that conform to EIA standards. The EIA voltage signals pass through the control circuits of the 2A1 Data Mounting and the customer interface to the terminal equipment.

3.07 The control circuits allow the DAS 804J-type and its associated keys and lamps to select a specific data set for testing, make busy, etc. These control circuits may also be used to provide for control of other apparatus at the data station.

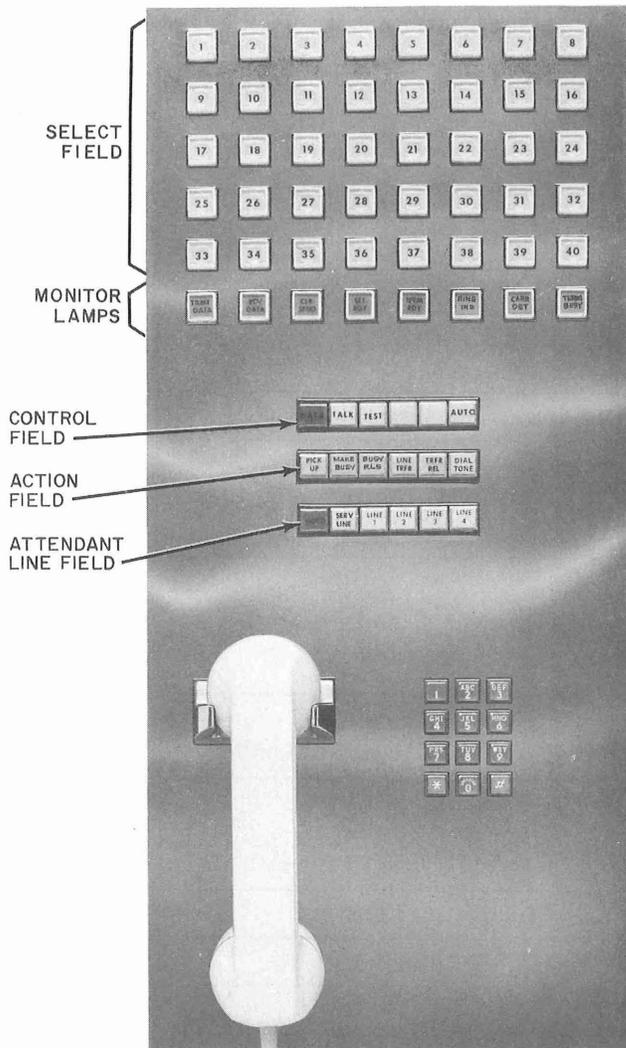


Fig. 9—Data Auxiliary Set 804J44

B. Data Sets 103E-Type

3.08 Data Set 103E-type is designed to transmit in one of two frequency bands and receive in the remaining frequency band. The proper filter (*flt*) for the transmitted frequency band and received frequency band is selected by the method of establishing the call. When the data set originates a call, the transmitting band is F1. The frequencies of this band are 1270 Hz for a mark and 1070 Hz for a space. The receiving frequencies will be 2225 Hz for a mark, 2025 Hz for a space, and are called F2. This is the *normal* frequency mode of operation. Data Sets 103E5 and 103E6 operate only in the *normal* frequency mode. Data Set 103E2, in addition to operating in the *normal*

frequency mode, may be operated in the *inverted* frequency mode. Option screw switches are provided for the selection of the frequency mode of operation when Data Set 103E2 is installed.

Note: When *inverted* frequency operation is used, F1 frequencies are 1070 Hz for a mark and 1270 Hz for a space. The F2 frequencies are 2025 Hz for a mark and 2225 Hz for a space.

3.09 When the data set answers a call, the transmitting band is F2 and the receiving band is F1.

3.10 The following paragraphs of data set operation refer to the block diagram of Fig. 11.

Note: The Data Set 103E6 conforms to EIA Standard RS-232-C except when it is equipped with the ZD option. Data Sets 103E2, 103E5, and 103E6 with ZD option conform to EIA Standard RS-232-B. When Data Set 103E6 conforms to RS-232-C, the timing of the data set ready (CC) indication is changed so that the CC lead is off during dialing and is turned on after carrier has been received for 100 ms (simultaneously with the CF lead). There is no change in the timing of the CC off indication during a disconnect sequence and no change in the timing of the CC indication at an answering station. When the Data Set 103E6 is equipped with ZD option, the timing of the CC indication is the same as the Data Set 103E5 as both conform to EIA Standard RS-232-B.

Establishing Telephone Connection

3.11 Prior to automatically answering an incoming call, the terminal equipment is required to condition the data terminal ready (CD) and the answer control (CM), if provided, interface leads with a positive (ON) voltage. These signals indicate that the terminal equipment is available to receive and/or transmit data. The CD signal must remain on for the duration of data communications. If the terminal equipment turns lead CD off, a disconnect sequence will be originated (if data set is in the data mode), or the data set will not connect during handshaking.

Note: Data Set 103E6 does not provide an answer control (CM) lead.

- If T option is *not* provided, the *send spc tmr* is disabled and the data set will immediately disconnect and go on-hook.

3.19 If the incoming data line power level decreases below -57 dBm, the *carr detr* conditions the *cfr tmr* to start the carrier loss timer (*carr loss tmr*) via the *conn ckts*. If the loss of carrier (S) option is provided, the *carr loss tmr* when operated overrides the CD lead from the terminal equipment and initiates a 3-second space disconnect sequence independent of the T option covered in 3.18.

3.20 The answer timer (*ans tmr*) is used when the data set receives an incoming call. The *ans tmr* ensures that the data set will be conditioned to *answer* incoming calls for up to 4 seconds after the *ring detr* returns to the off condition. Eight seconds after the *ring detr* returns to the off condition, the data set will be in the originate mode.

C. 2A1 Data Mounting

3.21 The 2A1 Data Mounting provides the control circuits and interface cabling required to connect two Data Sets 103E-type into the 103E-type Data Station. The normal function of the data mounting is to provide the data set interface cable to the customer interface for both of its associated data sets, control circuits used in the selection of a particular data set for testing, make busy, etc, and the necessary cabling to interconnect the data mounting into the station.

3.22 When a data set is to be tested by a 904-type Data Test Center (DTC), the data set is first selected. The line transfer (LINE TRFR) key is operated on DAS 804J-type that switches the selected data set to the service line. In addition, the telephone line normally associated with the transferred data set appears busy to the central office. On an option basis, the terminal equipment has the ability to make any data set appear busy via an additional interface lead (CN).

Note: The terminal equipment make busy option (Q and N option) must *not* be supplied unless the terminal equipment is prepared to maintain an OFF (negative voltage) condition on the CN interface lead during normal operation. A positive voltage, or an open

condition on CN will make the telephone line busy.

3.23 A selected data set will have certain interface leads extended to the DAS 804J-type *monitor lamps*.

3.24 The monitored interface leads are as follows:

- BA—Transmitted Data
- BB—Received Data
- CB—Clear to Send
- CC—Data Set Ready
- CD—Data Terminal Ready
- CE—Ring Indicator
- CF—Data Carrier Detector
- CN—Make Busy (if provided)

D. Data Auxiliary Set 804J-Type and 1A1 Data Mounting

3.25 The combination of DAS 804J-type and 1A1 Data Mounting provides the keys, lamps, telephone set, and control keys for an entire 103E-type Data Station of up to 40 data sets; however, the 31A power unit and connectors of the 1A1 Data Mounting provide for 20 data sets. To provide the power and connectors for the remaining 20 data sets that complete the 103E-type Data Station, a 1A2 Data Mounting will be required. The 1A2 Data Mounting is similar to the 1A1 Data Mounting in connectors and a 31A power unit, but is not equipped with control circuits. The 1A2 Data Mounting shares the control circuits of the 1A1 Data Mounting via connector J6.

3.26 The telephone lines for the 20 data sets associated with the 1A1 Data Mounting and the service line connect into the 103E-type Data Station via connector J4. Connector J4 of the 1A2 Data Mounting serves the same function with the exception that no service line is required. Only one service line is provided and is common to all data sets in the installation.

3.27 When key telephone equipment is provided for additional telephone line access, these

TABLE D
DATA SET STATUS AND LAMP INDICATIONS

| LAMP INDICATION | DATA SET STATUS |
|-----------------|---|
| FLUTTER | Data set selected and under control of the keys in the <i>control field</i> . This indication prevails over all other indications. |
| WINK | Data set line has been made busy. |
| STEADY ON | Data set is in use and in the data mode. |
| FLASH | Incoming ringing current being received but data set has not yet answered. Answer-only modified stations have the flash indication disabled. The lamps will be steady off during ringing. |
| STEADY OFF | Data set is idle and in the automatic answer mode. |

Note: *Flutter* is a 10 pulse per second signal with an on-off ratio of 3 to 1. *Wink* is a 2-1/2 pulse per second signal with an on-off ratio of 37 to 3. *Flash* is a one pulse per second signal with an on-off ratio of 1 to 1.

lines are connected to DAS 804J-type via connector J5 on the 1A1 or 1A2 Data Mountings. The lines are under control of the *attendant line field*.

Note: The method of installing (mounting, connecting, etc) the key telephone equipment should be locally engineered.

3.28 In addition to controlling additional telephone lines, if provided, the *attendant line field* provides for access of the attendant telephone set to the service line for voice communications.

3.29 The *action field* controls the action that will take place when a key in the *select field* is operated. An example would be the conditioning of the control circuit for data set selection by operation of the PICK UP key. Subsequent operation of a *select field* key would select the data set.

3.30 The *control field* is used with a selected data set in the same manner as a single data set installation. An example of a control function (TEST key) is the operation of the test

mode relays in the data set for loop-back tests by a data test center.

3.31 When a data set is selected, control circuits of its associated 2A1 Data Mounting extend certain customer interface leads to the *monitor lamps* located on DAS 804J-type.

Note: The *monitor lamps* will light when the customer interface lead is positive and extinguish when the interface lead is negative.

4. OPERATION

4.01 Normal operation of the 103E-type Data Station does not require any operating procedures by an attendant. The data sets are normally arranged for automatic answering of incoming calls. ♦With the exception of answer-only operation (see Part 5 of this section), automatic call origination can be provided by DAS 801-type.♦

4.02 The *select field* (Fig. 9) lamps of DAS 804J-type may be used to check the status of each data set. Table D summarizes the data set status and the lamp indications for each status.

to reoperate the BUSY RLS key for each data set that is to be released.

- (5) The "winking" lamp(s) associated with the operated number key(s) will extinguish.

5. DATA SET 103-TYPE DATA STATION—ANSWER-ONLY ARRANGEMENT

5.01 The data station can be arranged for answer-only operation similar to the 113B by restricting some of the features that are provided. The suggested modifications are nondestructive so that the 103E-type Data Station can be restored to normal operation at a later time if required.

5.02 When the 103E-type Data Station is used to provide answer-only service, the following features should be restricted as indicated.

- Auxiliary telephone lines are disconnected.
- Automatic calling units are removed.
- Manual call origination on the data line is restricted by providing answer-only lines from the central office.
- Audible ring indication (incoming call on the selected data line) is disabled.
- Visual ring indication (flash for incoming call on the data line) is disabled.
- Data set operation in the originate mode is prohibited.
- Space disconnect option is not provided.
- Send disconnect option is not provided.
- Answer mode indication (CE lead ON) option is not provided.

Information on disabling these features is contained in the section entitled Data Set 103E-Type Data Station Using KS-20093 Cabinets—Installation and Connections (591-025-201).

5.03 When answer-only service is to be provided by a 103E-type Data Station with the service line terminated in a 500-type telephone set, the following additional modification is required. The

interface monitor circuits and data lamp indications must be disabled by removing the following lamps in the DAS 804J-type:

- TRMT DATA
- RCV DATA
- CLR SEND
- SET RDY
- TERM RDY
- CARR DET
- TERM BUSY
- RING IND
- DATA (key lamp).

5.04 The information given in the preceding text on the description and operations of a 103E-type Data Station is applicable to all modified stations with the following exceptions.

- (a) None of the information pertaining to the use of the features restricted in 5.02 is applicable.
- (b) For data calls originated on the service line, the data set will operate in the answer mode and not in the originate mode as would be the case with an unmodified data station.
- (c) None of the references to the data and monitor lamp indications are applicable when the data station is modified as indicated in 5.03.

5.05 A 103-type Data Station that has been modified to simulate the features provided by a 113-type Data Station has the following major operational differences, listed in (a) through (j).

- (a) The AUTO key at the 103E Data Station can be used to inhibit the automatic answer feature of a data set without the data set being connected to the service line. The automatic answer feature of the 113-type Data Station can be inhibited by operating the TALK key, but only when the data set is connected to the service line.

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- (b) Voice communication on a data line is possible at a 103E-type Data Station but not possible at a 113-type Data Station.
- (c) Manual answer of an incoming call on a data line is possible at a 103E-type Data Station but difficult to coordinate when line hunting equipment is used at the serving central office. Manual answer of an incoming call on a data line is not possible at a 113-type Data Station.
- (d) Data-to-talk and talk-to-data mode transfer is possible on any line at a 103E-type Data Station. Neither transfer is possible at a 113-type Data Station except when the data set is connected to the service line.
- (e) At a 103E-type Data Station, the appropriate select field lamp will flutter when that data set is selected. At a 113-type Data Station, the MON lamp is used to indicate that a set has been selected and the number of the data set selector switch identifies the set.
- (f) At a 103E-type Data Station, the select field lamp indication for a data set connected to the service line is steady ON if the set is in either the data or the test mode and WINK if it is not. Therefore, if one or more data lines have been made busy it is not possible to ascertain which set (if any) is connected to the service line. At a 113-type Data Station the data set connected to the service line is readily identified by observing into which set the service line is plugged.
- (g) At a 103E-type Data Station, any attempt to make a data line busy while that set is in the data mode will operate a flip-flop circuit which will make the line busy when it becomes idle. At a 113-type Data Station, a data line can be made busy when a set is in the data mode. This will disconnect the data set from the telephone line.
- (h) At a 103E-type Data Station, the TEST lamp indicates that the selected data set is connected to the telephone line and in the test mode. At a 113-type Data Station, the data set conditioned for the test mode is identified by observing into which set the test mode connector is plugged. DATA lamp ON indicates that an OFF-HOOK signal is being given by the data set to the central office.
- (i) Data Sets 103E- and 113B-type provide the same set of business machine-data set interchange circuits. Although both sets of interchange circuits conform to the EIA Standard RS-232-B/C, they are not electrically identical. Therefore, different impedances, output levels, switching times, and other characteristic differences should be expected.
- (j) The handshake sequences for Data Sets 103E- and 113B-types are similar but not identical. The important differences are listed below.
- (1) Data Set 113B-type automatically answers the call at the end of a ringing cycle, whereas Data Set 103E-type answers the call during ringing.
 - (2) Data Set 113B-type has a SFG interval timer to delay transmission of F2 mark. Some Data Sets 103E-type do not have the SFG interval time delay.
 - (3) The abort timing interval for the two data sets is different.
 - (4) When F1 mark is detected by a Data Set 113B-type, the CB and CF leads turn ON and the mark hold function is removed from the BA and BB leads within a millisecond of each other. At a Data Set 103E-type, the events can differ by as much as 200 milliseconds. Similar differences occur during disconnect.
 - (5) During disconnect due to loss of carrier, Data Set 103E-type will send 3 seconds of spacing signal. Data Set 113B-type does not send the 3-second space signal.
- 5.06** When the 103E-type Data Station is also modified as indicated in 5.03 (by removal of the lamps), the major operational differences between the 113-type Data Station without a DAS 804J-type and the 103E-type Data Station are as follows.
- (a) The differences in operation previously outlined in 5.05 apply.
 - (b) At a 103E-type Data Station, the select field lamps indicate those data sets which are in the data mode. The 113-type Data Station does

not provide any indication for data sets in the data mode.

(c) At a 103E-type Data Station, the select field lamps indicate those data lines which have been made busy. At a 113-type Data Station, only those lines made busy by inserting the dummy telephone line plug into the service line jack can be identified.⚡

6. REFERENCES

6.01 The following Bell System Practices pertain to Data Set 103E-type Data Station using KS-20093 cabinets.

| SECTION | TITLE |
|-------------------------------------|-----------------------------------|
| 103E Data Station | |
| 591-025-101 | Description and Operation |
| 591-025-201 | Installation and Connections |
| 591-025-301 | Maintenance |
| 591-025-501 | Test Procedures |
| Data Set 103E-Type | |
| 591-025-100 | Identification |
| 1A-Type Data Mounting | |
| 590-102-100 | Identification |
| 2A-Type Data Mounting | |
| 590-102-102 | Identification |
| Data Auxiliary Set 804J-Type | |
| 598-053-100 | Identification |
| Data Sets | |
| 590-010-201 | Multiple Installation Information |

| SECTION | TITLE |
|---|---|
| Data Auxiliary Sets 801A5 and 801A6 for Automatic Calling | |
| 598-010-101 | Identification and Operation |
| 598-010-201 | Installation and Connections |
| 598-010-301 | Maintenance |
| 598-010-501 | Test Procedures |
| Data Auxiliary Sets 801C3 and 801C4 | |
| 598-012-101 | Description and Operation |
| 598-012-201 | Installation |
| 598-012-301 | Maintenance |
| 598-012-501 | Test Procedure |
| 6.02 The following schematic drawings (SD) and circuit descriptions (CD) pertain to the apparatus required for a Data Set 103E-type Data Station installation. | |
| SD-&CD-1D147-01 | 103E5 and 103E6 |
| SD-&CD-1D095-01 | Data Set 103E1, 2, 3, 4 |
| SD-&CD-1D122-01 | 1A1 Data Mounting |
| SD-&CD-1D123-01 | 1A2 Data Mounting |
| SD-&CD-1D124-01 | 2A1 Data Mounting |
| SD-&CD-1D125-01 | Data Auxiliary Set 804J-Type |
| SD-&CD-1D106-01 | 103E Multiple Installation, Application Schematic |
| SD-&CD-81878-01 | 31A Power Unit |
| SD-&CD-1D082-01 | Data Auxiliary Set 801A-Type |
| SD-&CD-1D103-01 | Data Auxiliary Set 801C-Type |