DATA STATION USING DATA SET 202S
DESCRIPTION AND OPERATION

CONTENTS PAGE

CONTENTS PAGE

1. GENERAL

1.01 This section describes the physical and functional characteristics of a data station utilizing up to 24 data sets 202S mounted in 40A1 data mountings and intended to be housed in a KS-20018 cabinet. This arrangement is referred to in this section as a 202S data station.

1.02 This section is reissued for the following reasons:

(a) To add new arrangements using 830C, 2830C, 831C, and 2831C telephones

(b) To remove information concerning arrangements using 565HK and 2565HK telephones

(c) To indicate that arrangements using the 233A adapter and 631DA Call Director® telephone are not recommended for new installations.

Because this reissue constitutes a general revision, change arrows are not used.

1.03 The 202S data station (Fig. 1) will provide up to 1200 bps, serial, FSK, half-duplex data transmission over the switched telecommunications network for a maximum of 24 customer terminals.

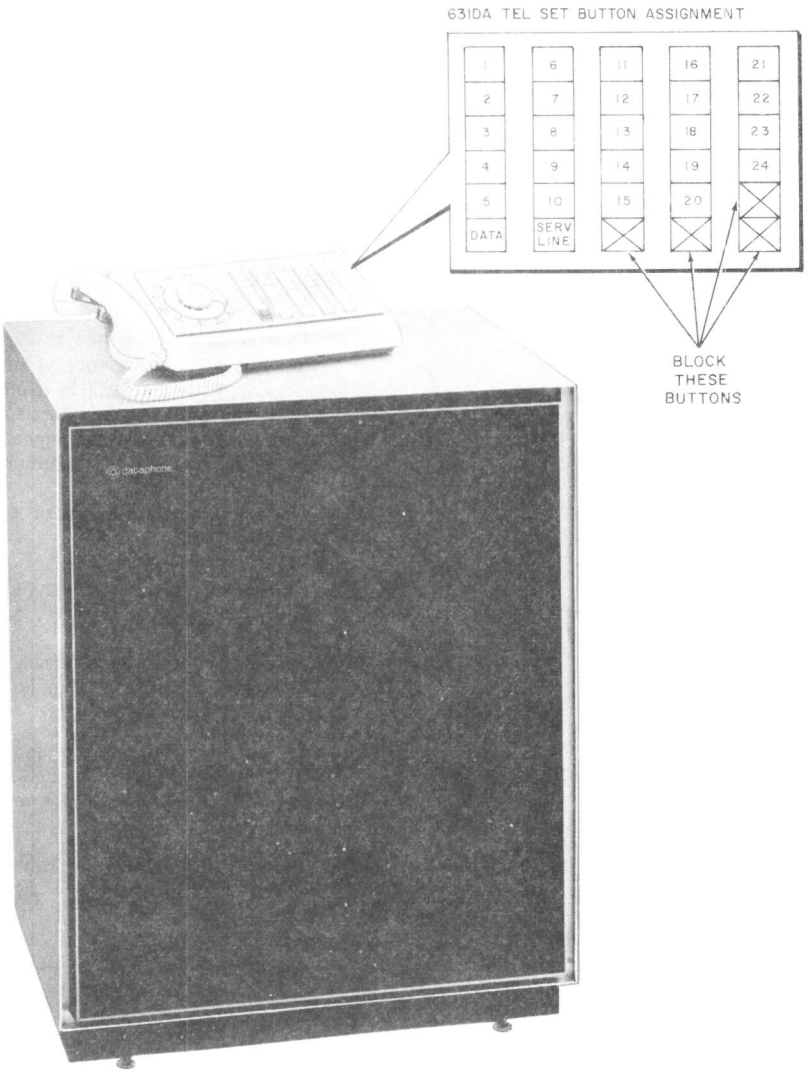

Fig. 1—202S Data Station

2. PHYSICAL DESCRIPTION

2.01 A 202S data station may be installed in one of the basic configurations listed in Table A and described in the text that follows. The choice of a particular configuration depends on customer requirements and expected growth.

TABLE A

DATA STATION CONFIGURATIONS

ARRANGE-MENT *	NUMBER OF DATA SETS	40A1 DATA MTG(S)	KS-20018 CABINET	TEL SET CODE	233A ADAPTER REQUIRED	NOTES
A	2-8	1	—L12A	830C	No	1
B	9-16	2	—L12A	831C	No	1
C	17-24	3	—L11A	1—830C 1—831C	No	1, 3
D	9-16	2	—L12A	631DA3	Yes	2
E	17-24	3	—L11A	631DA3	Yes	2

* These letter designations are not official and are used for explanation purposes in this section only.

Notes:

1. Recommended for new installations.
2. Not recommended for new installations.
3. Service line must be brought into the second tel set. The service line position in the first tel set must be blocked.
4. At least one data set must be in each data mounting so that TDG is connected to ground.

A. Data Set 202S

2.02 The basic data set 202S (coded 202S-L1 or L1A) is a printed wiring board measuring 1.5 inches high, 5.55 inches wide, and 10.4 inches long, and weighing 1.5 pounds. An optional reverse-channel circuit pack may be attached to the basic data set, adding approximately .25 pounds of additional weight. See Fig. 2. The data set with reverse channel is coded 202S-L1/3, L1/3A, or L1A/3A. Refer to Section 592-028-100 for a complete description of the data set.

B. 40A1 Data Mounting

2.03 The 40A1 data mounting shown in Fig. 3 accommodates up to eight data sets 202S-type (with or without reverse channel). The data mounting consists of a metal framework, an interconnection backplane assembly, and a power unit.

2.04 The 40A1 data mounting measures 6.9 inches high, 13.5 inches deep, and 22.9 inches wide, and weighs 20.75 pounds without data sets. The width may be shortened 4 inches by rotating the right-hand mounting bracket for mounting in a 19-inch framework.

2.05 The 24 Vac for each data set and the relays on the backplane are supplied by the power unit located on the left side of the mounting (Fig. 3). The power unit consists of an enclosure, 2 power transformers, a main fuse (type 70A), 16 output fuses (type 70G), and a 4-foot line cord. Each side of the center-tapped 24-Vac line to each data set is fused separately and labeled A for one side and B for the other; for example, the fuses for data set number 1 would be labeled 1 on fuse block A

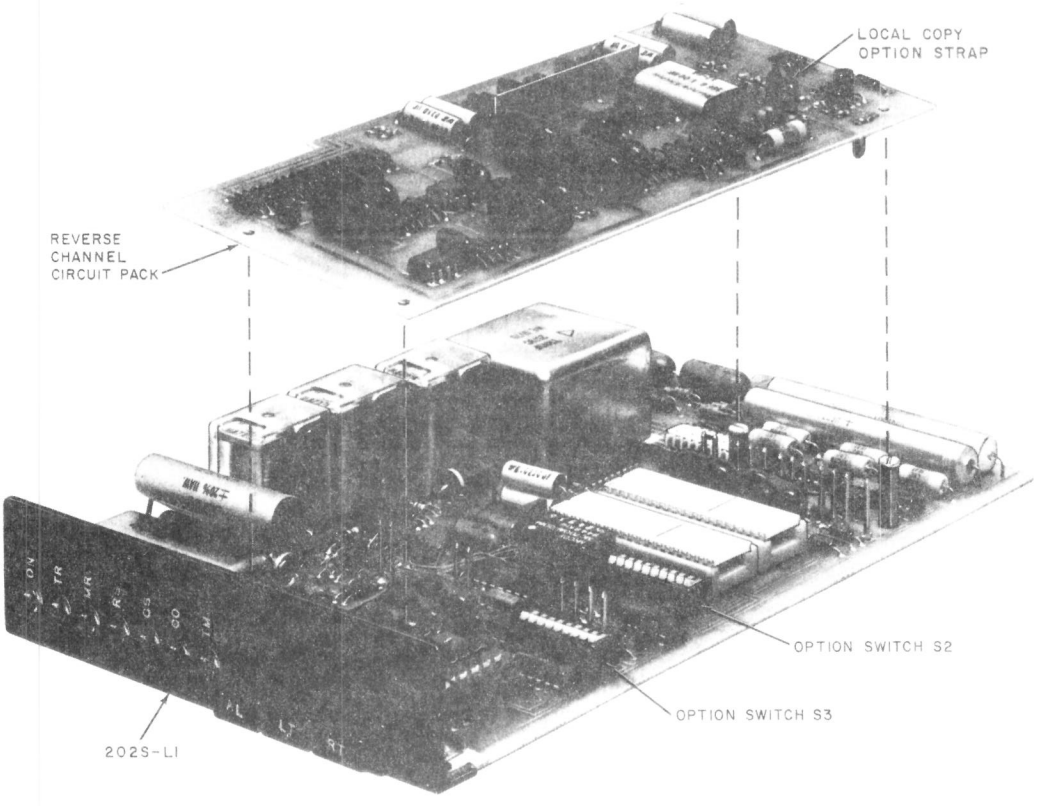

Fig. 2—Data Set 202S-L1/3

and 1 on fuse block B. The power requirement of a 40A1 data mounting containing eight data sets 202S is 50 watts at 105 to 129 Vac and 57 to 63 Hz.

2.06 The mounting is equipped with the circuitry needed for remote testing, connection to automatic calling units (ACUs), and operation behind line-hunting equipment. Each data set is inserted through guides in the top and bottom of the mounting into a 908L connector mounted at the rear of the mounting. The data sets are secured in the mounting by a retaining bar assembly which also serves as a labeling strip. The mounting brackets attached to the side of the housing will align with, and are fastened to, the upright supports in the KS-20018-L11A or -L12A cabinets.

2.07 Manual make-busy switches are provided for use in line-hunting arrangements where the customer desires to make one or more lines busy. The line is made busy when the switch is in the down position (refer to 3.11).

2.08 Interconnections to the data sets are made through the 908L connectors, which accept the contacts on the rear of the data sets. With the exception of power and ground leads (which are wired to the connector), all of the interface leads between the 908L connector, the customer interface connector, and the backplane of the

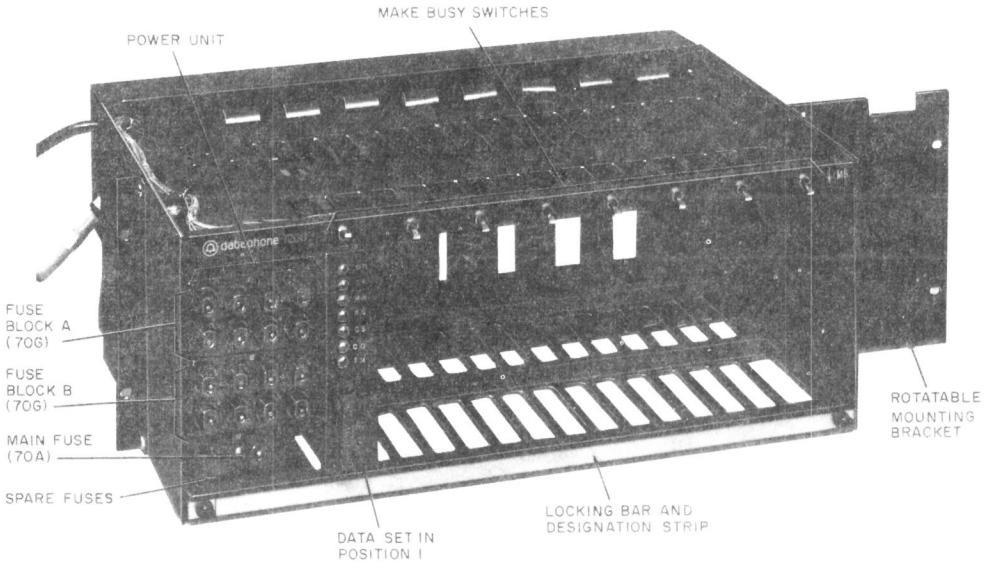

Fig. 3—40A1 Data Mounting (Front View)

mounting are via printed flex tape. Connections for tel set lights, talk-data control, and ACUs are provided on the backplane, where they may be accessed through 50-pin connectors J1 and J2 (Fig. 4). Data sets in positions 1 through 5 will be on J1, and 6 through 8 will be on J2 (except for ACU connections).

2.09 Access to the telephone lines is made through the 50-pin plug (P1) on the stub cable at the rear of the data mounting. This cable can be extended with a B25A cable.

2.10 The 40A1 data mounting does not provide circuitry for audible ringing. If this is needed, the circuits must be locally engineered utilizing the RD contacts available on the stub cable (P1) of the 40A1 data mounting.

C. KS-20018 Cabinet

2.11 The cabinet housing the 202S data station is either a KS-20018-L12A or KS-20018-L11A, depending on whether a maximum of two or three data mountings are installed or anticipated. The front cover on these cabinets is tinted plastic, which allows the illuminated light emitting diodes on the data sets to be seen from the outside. The cabinets have an opening in the rear for admitting the various cables. The cabinets may be secured to the floor by replacing the four leveling bolts with four appropriate 1/4-inch bolts or screws. Refer to the section entitled Data Sets—Multiple Installation Information (590-010-201) for additional information on KS-20018 cabinets.

D. Telephone Sets

2.12 Depending on the configuration, three types of telephone sets can be used with the 202S data station:

- 830C or 2830C
- 831C or 2831C
- 631DA or 2631DA.

The 830C (2830C) and 831C (2831C) telephones are recommended for all new installations and will be discussed first. The 631DA (2631DA) tel set is not recommended for new installations and is included

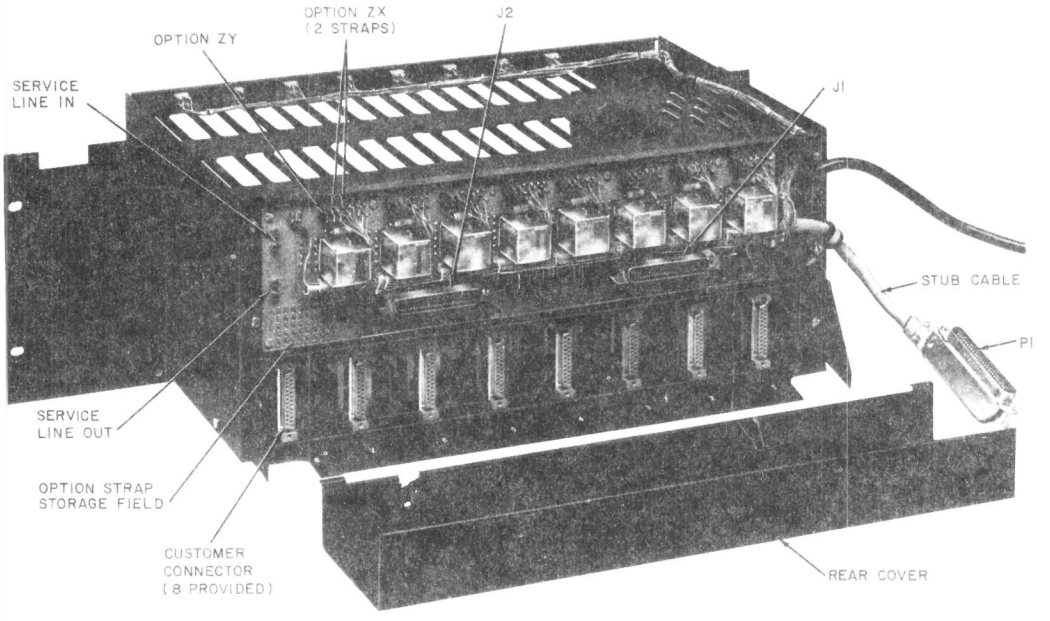

Fig. 4—40A1 Data Mounting (Rear View)

here for maintenance purposes at installations already in service.

2.13 The 565HK telephone can be used to connect a maximum of five individually housed data sets. Installation and connection information for individually housed data sets 202S-type is contained in Section 592-028-200. The 565HK telephone is not recommended for use with data sets 202S-type housed in a 40A1 data mounting.

2.14 ***830C or 2830C Telephone:*** This is a 10-button key telephone which can be used to control the voice/data transfer of up to 8 data sets. It is recommended for arrangements used with or without ACUs.

2.15 ***831C or 2831C Telephone:*** This is a 20-button key telephone which can be used to control the voice/data transfer of up to 16 data sets. It is recommended for arrangements used with or without ACUs.

2.16 ***631DA or 2631DA Telephone:*** This is a 30-button Call Director telephone set which is used in conjunction with the 233A adapter to handle the voice/data transfer functions of up to 24 data sets 202S-type. However, only 16 of the 24 data sets can be provided with ACUs.

E. 233A Adapter

2.17 The 233A adapter shown in Fig. 5 provides the necessary cross-connections between a maximum of 24 telephone lines and 24 data sets, permitting a "plug together" installation. Figure 6 shows a rear view of a data station with one mounting installed (eight data sets). The adapter consists of an 88-type wiring block with seven stub connector cables attached. Three pairs of the cables may be plugged into the data mountings (two per mounting), and the remaining cable is plugged into a 631DA or 2631DA Call Director telephone (if used). The adapter may be used with fewer than the maximum of 24 data sets by using only the appropriate connectors. It may also be used with a maximum of 16 ACUs by using open

terminals on the 233A adapter. The 233A adapter measures 10.6 inches long, 3.6 inches wide, and 3.25 inches high, excluding the cables and connectors.

3. FUNCTIONAL DESCRIPTION

3.01 The 202S data station provides a maximum of 24 interface circuits between the telephone line facilities and customer terminals. The 24 lines are interfaced to the data sets 202S by the 40A1 data mountings.

A. Service Line

3.02 When the data station is used behind line-hunting equipment, a service line is required for remote testing of the data sets. When an 830C (2830C), 831C (2831C), or a Call Director telephone is used, the service line appears on a pickup key.

3.03 The service line also appears on the SERVICE LINE OUT terminals at the rear of the 40A1 data mounting. When a data set is using the service line for remote test, the telephone set is excluded from the service line.

B. Typical 202S Data Station

3.04 The arrangements listed in Table A are described in 3.05 through 3.09.

Note: If the data station is installed with automatic calling and automatic answering and manual operation is not required, a telephone set or Call Director set need not be provided.

3.05 ***Arrangement A (2 to 8 Data Sets):*** This arrangement uses the 10-button 830C telephone. Position 1 is used for the talk/data transfer, positions 2 through 9 are for the data set positions, and position 10 is for the service line (if used). The 830C telephone connects to the 40A1 data mounting through a KS-19252-L5 adapter. If required, connections to ACUs are made on 1044A blocks which connect to KS-19252-L1 adapters with A25D cable.

3.06 ***Arrangement B (9 to 16 Data Sets):*** This arrangement uses 18 of the 20 buttons on an 831C telephone. Positions 1 through 8 and 12 through 19 are for the data sets. Positions 9 and

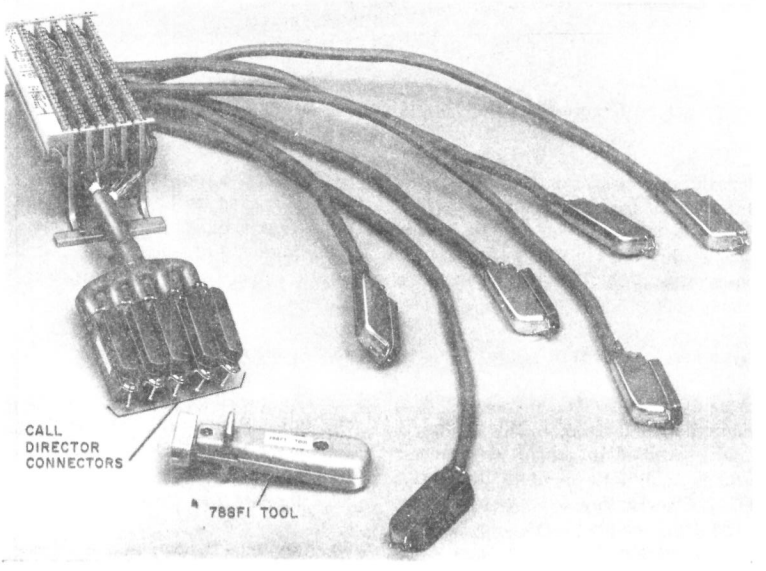

Fig. 5—233A Adapter

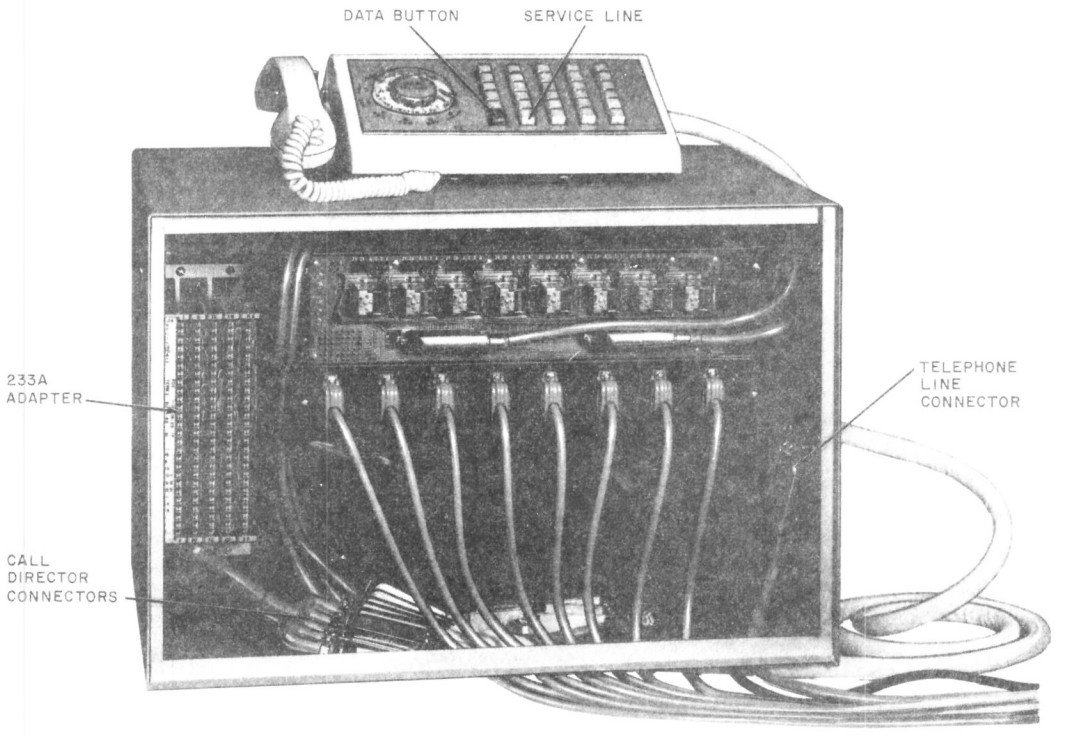

Fig. 6—202S Data Station—Rear Cover Removed

10 are blocked, position 11 is used for the talk/data transfer, and position 20 is for the service line (if required). The 831C telephone connects to the 40A1 data mountings through KS-19252-L5 adapters. If required, connections to ACUs are made on 1044A blocks which connect to KS-19252-L1 adapters with A25D cable.

3.07 ***Arrangement C (17 to 24 Data Sets):*** This is a combination of arrangements A and B. The 830C telephone is used to control data sets 1 to 8, and the 831C telephone is used to control data sets 9 to 24. The tenth button used for the service line on the 830C telephone must be blocked. If a service line is required, it must appear on the twentieth position of the 831C telephone. Connections to the 40A1 data mountings and to ACUs are made as described previously.

3.08 ***Arrangement D (9 to 16 Data Sets):*** This arrangement requires the 233A adapter and a 631DA3 Call Director telephone. The 233A adapter provides a plug-in access for the 631DA3 Call Director set as well as providing connecting points for ACUs.

3.09 ***Arrangement E (17 to 24 Data Sets):*** This arrangement is essentially the same as arrangement D with a third 40A1 data mounting added. However, this arrangement provides connections to ACUs for only the first 16 positions.

C. Remote Test Option

3.10 When the data sets are used behind line-hunting equipment, remote testing of the data set can be accomplished over the service line (option ZY IN). When line-hunting equipment is not used,

remote testing of the data sets can be accomplished over the assigned telephone line (option ZY OUT). There is one remote test relay on the backplane for each data set position. This relay is enabled when option ZY is installed and disabled when option ZY is removed. With the relay enabled, the data set is transferred from the assigned telephone line to the service line whenever the RT (remote test) button on the data set is depressed. In this case the data test center would call the number associated with the service line. With the relay disabled, the data set remains connected to the telephone line and would be accessed on that line by the data test center. Option ZY is installed by inserting a black strapping plug into the terminals above the relays on the backplane. Unused strapping plugs are stored in the storage field labeled SPARES.

Only one data set behind line-hunting equipment should be placed in remote test at a given time. Otherwise, serious service problems could result which will affect the operation of other data sets associated with the line-hunting equipment.

D. Make-Busy Option

3.11 When the data sets are used behind line-hunting equipment, it is sometimes necessary to make the line look busy to avoid tying up the line-hunting equipment. With option ZX installed, the make-busy feature is accomplished for terminate-only lines by connecting 196 ohms across the line when a toggle switch mounted on the framework above each data set position is operated, or when the test relay is operated during remote test. Without option ZX, the make-busy feature is provided for assigned lines by another pair to the central office. Third wire (sleeve) make-busy arrangements are provided by grounding one wire of the pair external to the data mounting. Even if the make-busy circuit is not installed, operation of the make-busy switch will disconnect the data set from the line. Care must be used to avoid accidental operation of these switches. The make-busy pairs appear at the stub cable on P1 of the 40A1 data mounting along with the tip data line pairs (Fig. 4).

3.12 Option ZX for each data set is installed by inserting two red strapping plugs into the terminals (labeled ZX) above the relays on the backplane.

E. Grounding Option

3.13 Frame ground is normally connected to signal ground in the data mounting (option ZI). The frame ground may be disconnected from signal ground (option ZJ) of each 40A1 data mounting by removing the strap from the screw terminals of TS2 located on the rear of the power unit.

4. OPERATION

A. Manual Operation

4.01 A call to or from the 202S data station is answered or placed manually by depressing the line key associated with the appropriate data set and then lifting the handset on the telephone set of Call Director telephone. This action places the telephone set or Call Director telephone in the talk mode. Transfer to the data mode is accomplished by depressing and releasing the DATA key and hanging up the handset. The lamp under the line key blinks at the rate of ringing until depressed and manually answered, or until the data set automatically answers and enters the data mode. The lamp glows steadily as long as the data set is in the data mode, then extinguishes when the line is dropped.

B. Automatic Answer

4.02 A data set in the 202S data station will automatically answer an incoming call if the following conditions are met:

- The data set has the automatic answer option installed.
- The customer is supplying a data terminal ready ON indication to the data set.

C. Operation With ACU

4.03 The ACU initiates a call in response to a call request from the terminal equipment. It seizes the telephone line, places the call, then waits to detect the answer tone from the called data set. After the ACU detects the answer tone, it transfers the line to the data set and causes it to enter the data mode.

D. Test Modes

4.04 Each data set 202S in the data station is capable of operation in the following three test modes, which are controlled by test keys on the data sets.

- Local self test
- Analog loop test
- Remote test.

The front panel of the KS-20018 cabinet must be removed in order to gain access to the test keys on the front panels of the data sets. For information on the operation of the data sets, refer to Section 592-028-100.

5. REFERENCES

5.01 The following BSPs contain additional information concerning the 202S data station.

SECTION	TITLE
590-010-201	Data Sets—Multiple Installation—Installation Information
590-102-131	40-Type Data Mounting—Identification
592-028-100	Data Set 202S—Transmitter-Receiver—Description and Operation
592-028-180	Data Set 202S—Summarizing Specification
592-860-200	Data Station Using Data Set 202S—Installation and Connections
598-010-100	Data Auxiliary Sets 801A1, 801A2, 801A3, and 801A4 for Automatic Calling—Description and Operation
598-010-101	Data Auxiliary Sets 801A5 and 801A6 for Automatic Calling—Description and Operation
598-010-200	Data Auxiliary Sets 801A1, 801A2, 801A3 and 801A4 for Automatic Calling—Installations and Connections
598-010-201	Data Auxiliary Sets 801A5 and 801A6 for Automatic Calling—Installation and Connections
598-010-500	Data Auxiliary Set 801A1, 801A2, 801A3, and 801A4 for Automatic Calling—Test Procedure
598-010-501	Data Auxiliary Set 801A5 and 801A6 for Automatic Calling—Test Procedures
598-012-100	Data Auxiliary Sets 801C1 and 801C2 for Automatic Calling—Identification and Operation
598-012-101	Data Auxiliary Sets 801C3 and 801C4—Description and Operation
598-012-102	Data Auxiliary Set 801C-L1/2—Description and Operation
598-012-200	Data Auxiliary Sets 801C1 and 801C2 for Automatic Calling—Installation
598-012-201	Data Auxiliary Sets 801C3 and 801C4—Installation and Connections
598-012-202	Data Auxiliary Set 801C-L1/2—Installation and Connection
598-012-500	Data Auxiliary Sets 801C1 and 801C2 for Automatic Calling—Test Procedures
598-012-501	Data Auxiliary Sets 801C3 and 801C4—Test Procedures
598-012-502	Data Auxiliary Set 801C-L1/2—Test Procedures