

DATA STATION USING DATA SET 202S INSTALLATION AND CONNECTION

CONTENTS	PAGE
1. GENERAL	1
2. OPTIONS	3
A. Remote Test Option	4
B. Make-Busy Option	4
C. Grounding Option	4
3. INSTALLATION	4
A. Common Equipment	4
B. Two to Eight Data Sets	10
C. 9 to 16 Data Sets	11
D. 17 to 24 Data Sets	13
4. INSTALLATION TESTS	14
5. REFERENCES	14

1. GENERAL

1.01 This section covers the installation and connection procedures to be followed when installing a data station utilizing data set 202S. This station will be referred to in this section as a 202S data station (Fig. 1).

1.02 This section is reissued primarily for the following reasons:

- (a) Change Fig. 2 to add service line connections between data mountings.
- (b) Change Fig. 5 to add detail mounting of 1044A and 66E3 connecting blocks
- (c) Change Table A to reassign connections to central office

(d) Add arrangement utilizing the 830C and 831C telephone sets.

Due to extensive revision, change arrows are deleted.

1.03 The information in this section covers installation of the following station arrangements:

(a) For *two to eight data sets*, a 40A1 data mounting and a KS-20018-L12A cabinet, an 830C or 2830C telephone set (10-button), a KS-19252-L5 adapter, and *with ACUs*, two KS-19252-L1 bridging adapters.

(b) For *9 to 16 data sets*, two 40A1 data mountings and a KS-20018-L12A cabinet, plus:

- A 631DA-type Call Director telephone and a 233A adapter *or*
- An 831C or 2831C telephone set (20-button), two KS-19252-L5 adapters, and *with ACUs*, four KS-19252-L1 bridging adapters.

(c) For *17 to 24 data sets*, three 40A1 data mountings and a KS-20018-L11A cabinet, plus:

- A 631DA-type Call Director telephone and a 233A adapter *or*
- An 831C or 2831C telephone set, an 830C or 2830C telephone set, and three KS-19252-L5 adapters. If ACUs are provided, up to six KS-19252-L1 bridging adapters will be used.

Note: Telephone sets or Call Director telephones are not required at installations equipped for automatic answering or calling if manual operation or voice communication is not required. In this case, the adapters to interconnect the tel set or Call Director set with the 40A1 data mounting are not needed.

NOTICE

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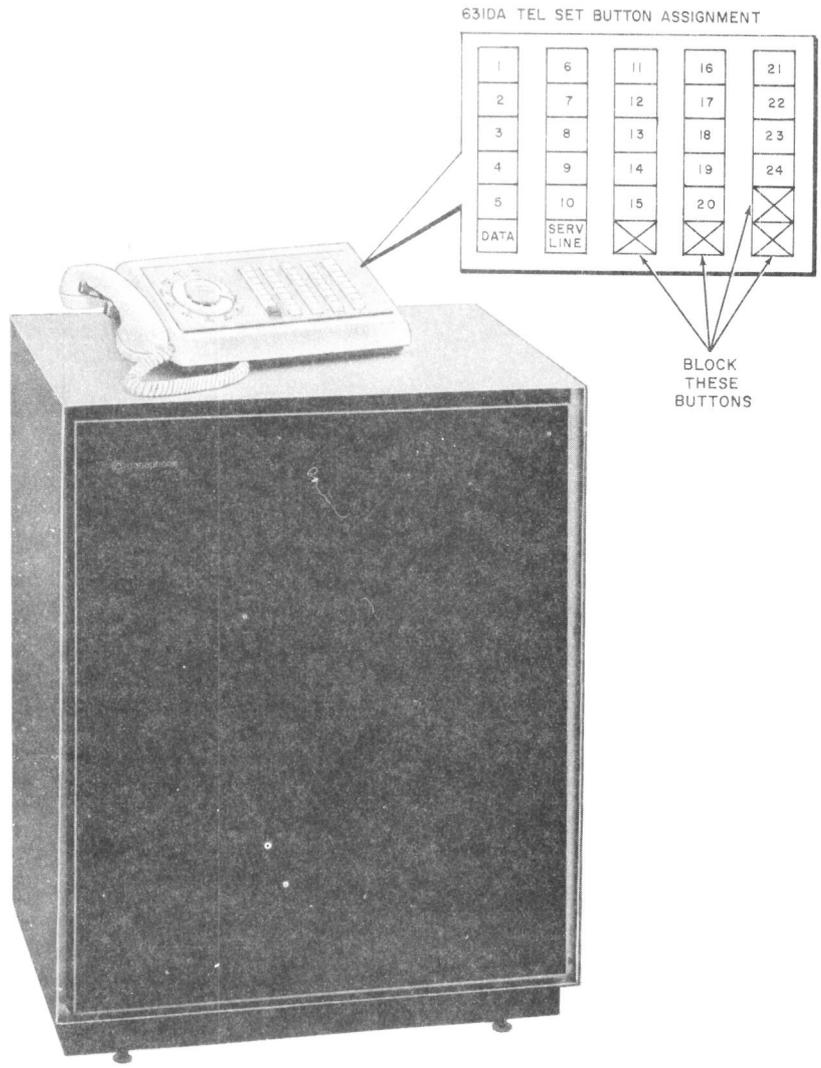


Fig. 1—202S Data Station

1.04 A 202S data station requires a standard 3-wire grounding-type ac power receptacle. The power supplied should be 105 to 129 volts and 57 to 63 Hz.

Note: The ac power receptacle must not be controlled by a switch.

1.05 The power supplies in the 40A1 data mountings use 70G (1/2 amp—red) and 70A (1-1/3 amp—white) fuses which may be easily replaced from the front of the unit. A blown fuse may be recognized by a protruding colored pin in the center of the fuse holder. Remove the fuses by rotating them counterclockwise and pulling out. Spare fuses are stored beneath the main power fuse on the power unit of the 40A1 data mounting.

1.06 In order to minimize the possibility of data errors due to potential differences between the data terminal ground and the data set ground, the receptacle supplying power to the data station should be served by the same distribution panel as the receptacle(s) powering the data terminal(s). If this arrangement is not possible, use a 6-type impulse counter to determine if excessive noise is present. The procedures for this test are given in Section 592-860-500. If the test requirements are not met, bond the data station frame ground and the terminal equipment frame ground together. In addition, frame ground must be connected to signal ground in the data mounting.



The method of providing the bond should be in accordance with local engineering instructions.

1.07 Verify with the plant service center that the overall facilities meet the requirements given in Section 314-205-501.

1.08 Verify that the location selected by the customer for the data station has adequate space for access to the front and rear of the cabinet. The data station should be located near the business machine, since the customer-provided interface cord should not exceed 50 feet in length (to reduce stray capacitance and to conform to Electronics Industries Association [EIA] standards). In order to minimize inductive interference with data signals, the telephone lines should not be carried in the same cable run as cable between the data set and the business machine **or** lines

connected to teletypewriter services. If this condition cannot be met, the telephone lines should be run in type SK (shielded) station wire from the building entrance. The shield should be grounded at one end only, preferably the distribution terminal end.

1.09 A 202S data station operates in an ambient temperature between 40 to 120°F. The relative humidity should be 20 to 95 percent at 70°F or 20 to 40 percent at 120°F.

Note: These environmental conditions are valid only under the condition that no condensation occurs.

1.10 A KS-20018-L7 cabinet may be substituted for a KS-20018-L11A cabinet provided there is no requirement to see the indicators on the front of the data sets, and the ambient temperature does not exceed 100°F. If higher ambient temperatures are expected, remove the rear panel of the KS-20018-L7 cabinet.

1.11 Audible ringing is not available in the data mounting. If audible ringing is desired, this must be locally engineered using the RD contacts available on the stub cable (P1). The RD contacts appear on the 66E3 connector block as follows:

- Data Set No.1—Term. 42
- Data Set No. 2—Term. 44
- Data Set No. 3—Term. 46
- Data Set No. 4—Term. 48
- Data Set No. 5—Term. 41
- Data Set No. 6—Term. 43
- Data Set No. 7—Term. 45
- Data Set No. 8—Term. 47

2. OPTIONS

2.01 The 40A1 data mounting has three options:

- Remote test option
- Make-busy option
- Grounding option.

A. Remote Test Option

2.02 Remote test on the service line (option ZY IN) in installations with line-hunting equipment is installed by inserting a black strapping plug into the terminals designated ZY above the relay on the backplane. Spare strapping plugs are stored in the space designated SPARES on the lower left side of the backplane. Remote test on the assigned telephone line (option ZY OUT) is installed by removing the black strapping plug from the terminals designated ZY. Store the strapping plug in the SPARE field.

B. Make-Busy Option

2.03 Make-busy option ZX connects a shunt on the line when the make-busy toggle switch is operated. This option is installed by inserting two red strapping plugs into the terminals designated ZX above the relay on the backplane. The data mounting is provided from the factory with the straps in the option strap storage field.

Note 1: Use only on terminate-only lines.

Note 2: For other than terminate-only lines, third wire (sleeve) make-busy is accomplished without option ZX by connecting lead ME2 to frame ground and connecting lead MB1 to the proper central office equipment.

C. Grounding Option

2.04 The 40A1 data mounting is shipped from the factory with frame ground connected to signal ground (option ZI). Frame ground of the 40A1 data mounting may be disconnected from signal ground (option ZJ) by removing the strap from the screw terminals of TS2 located on the rear of the power unit. It may be necessary to loosen the EIA interface connector bracket on the backplane to access this option strap.

2.05 Information pertaining to the options that may be installed in a data set 202S is given in Section 592-028-200.

3. INSTALLATION

A. Common Equipment

3.01 This part gives general installation procedures for the equipment that may be used in an

installation. Detailed procedures for installing the various configurations are given in parts 3B through 3E.

3.02 *KS-20018 Cabinet:* Position the cabinet in its permanent location and adjust the four leveling bolts until the cabinet is level, then tighten the locking nuts on the bolts. The outside dimensions of the cabinets are as follows:

- KS-20018-L11A: 30 inches high, 24 inches wide, and 19 inches deep
- KS-20018-L12A: 17 inches high, 24 inches wide, and 19 inches deep.

3.03 If the cabinet must be secured to the floor, remove the leveling bolts. Insert four 1/4-inch appropriate bolts or screws through the leveling bolt holes and into the floor.

3.04 *79 Backboard:* A KS-20018-L12A cabinet is to be equipped with one wooden 79 backboard, while a KS-20018-L11A is to be equipped with two. The backboards are used to mount the KS-19252 adapters or the 233A adapter and power outlet strip (if used) and as a fastening point for the various cables.



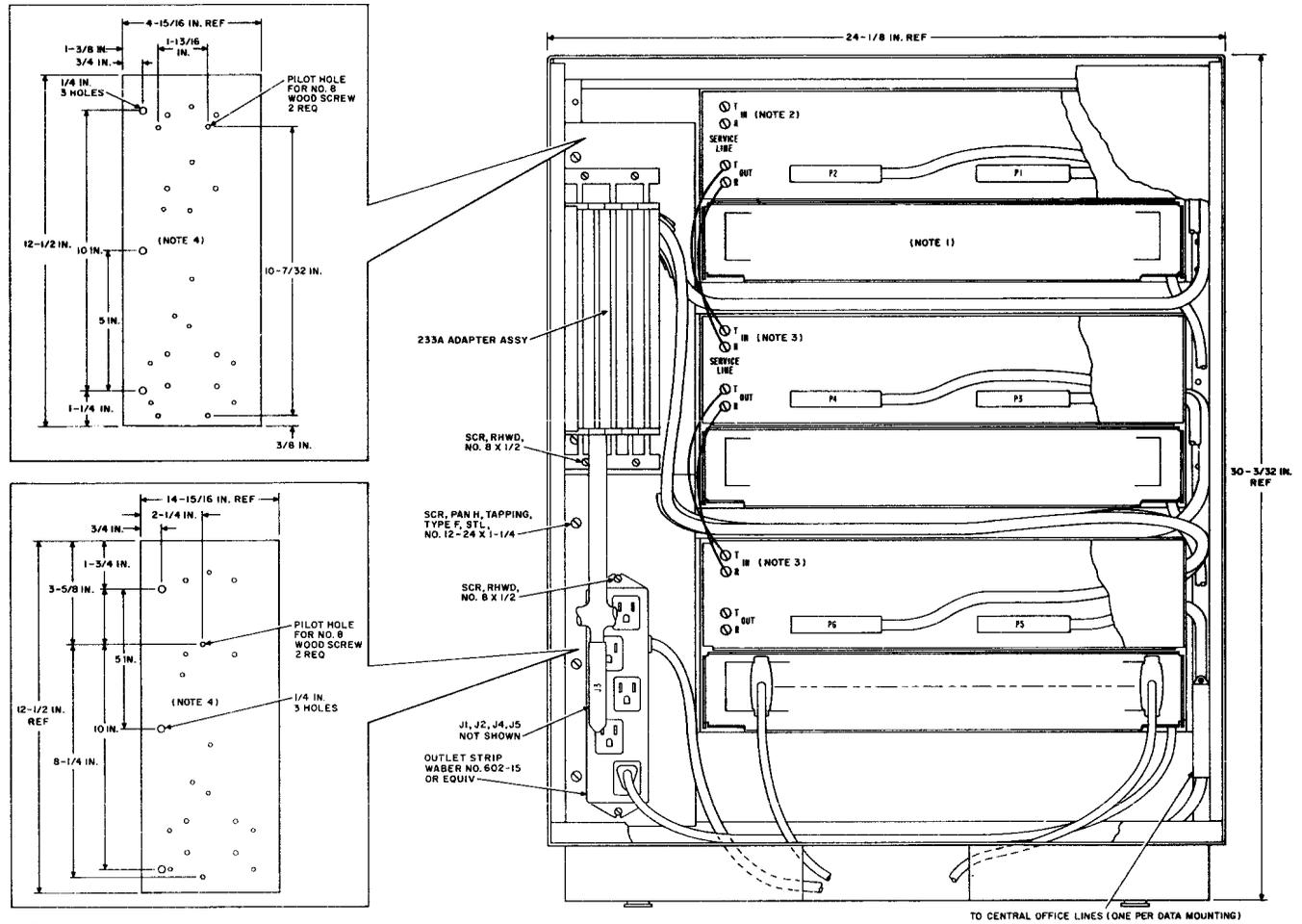
The 79 backboards must have holes drilled in accordance with the dimensions given in Fig. 2 if the 233A adapter is used.

3.05 Fasten the backboard(s) to the rear flange of the right-hand upright in the cabinet with three No. 12-24 × 1-1/4 inch steel screws (shipped loose with each data mounting).

3.06 *40A1 Data Mounting:* Rotate the right-hand mounting flange of the 40A1 data mounting for 23-inch mounting if this has not been done. Secure the 40A1 data mounting to the front flange of both uprights with four 12-24 × 1/2-inch screws (supplied with the data mounting).

Note: A long screw starter will facilitate the installation of the mounting in the cabinet.

3.07 If more than one 40A1 mounting is used, wire the SERVICE LINE OUT screw terminals of one to the SERVICE LINE IN screw terminals of the other, as shown in Fig. 2.



NOTES:

1. THE FIRST DATA MOUNTING IN THE CABINET MUST BE INSTALLED AT THE TOP. ADD DATA MOUNTINGS FROM THE TOP DOWN.
2. THE SERVICE LINE IN TERMINALS OF THE FIRST DATA MOUNTING ARE NOT USED.

3. THE SERVICE LINE OUT TERMINALS OF EACH DATA MOUNTING (EXCEPT THE LAST ONE) MUST BE CONNECTED TO THE SERVICE LINE IN TERMINALS OF THE SUCCEEDING DATA MOUNTING.
4. HOLES NOT DIMENSIONED ARE EXISTING HOLES IN THE '79 BACKBOARD.

Fig. 2—KS-20018 Cabinet With 233A Adapter (Rear View)

3.08 Data Set 202S: Before inserting the data set into the mounting, install options specified on the service order. To insert the data set into the mounting, first remove the designation/retainer strip from the 40A1 data mounting. Release the strip by pulling out on the black knob at each end. After the strip is moved out of the way, insert the data set into the appropriate slot and press firmly into place. Replace the designation/retainer strip.

Note: The data set positions are numbered from left to right from the front, that is, position 1 is nearest the power unit.

3.09 233A Adapter: Fasten the 233A adapter on the 79 backboard with four No. 8 ×

3/4-inch, round-head woodscrews, (shipped with the 233A adapter). Refer to Fig. 2 for the dimensions of the holes that must be drilled in the 79 backboard and for the physical arrangement of the adapter. Make connections on the 88-type connecting blocks of the 233A adapter using a 788F1 tool (Fig. 3). The 233A adapter lead assignments for use with automatic calling units (ACUs) are shown on Fig. 4. Information concerning the 88-type connector block is contained in Section 631-050-120. Plug the Call Director telephone cord into the corresponding connectors on the 233A adapter.

3.10 KS-19252-L1 and -L5 Adapters: Fasten the adapters on the 79 backboard with two No. 8 × 1/2-inch round-head woodscrews.

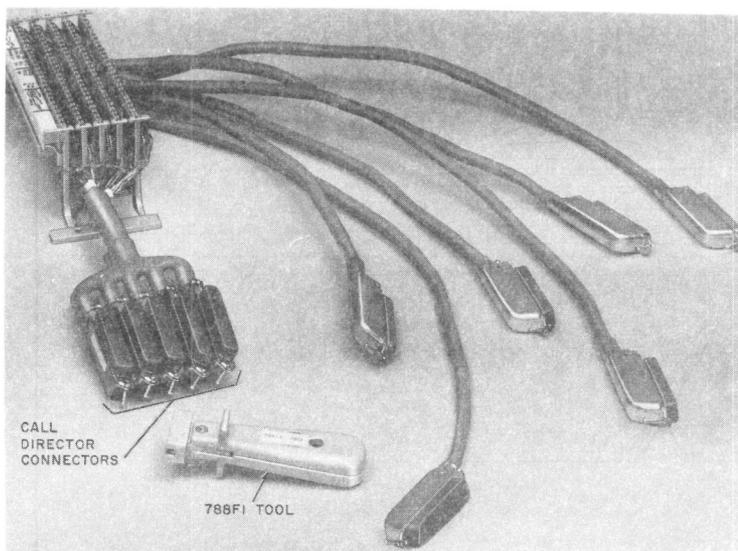


Fig. 3—233A Adapter

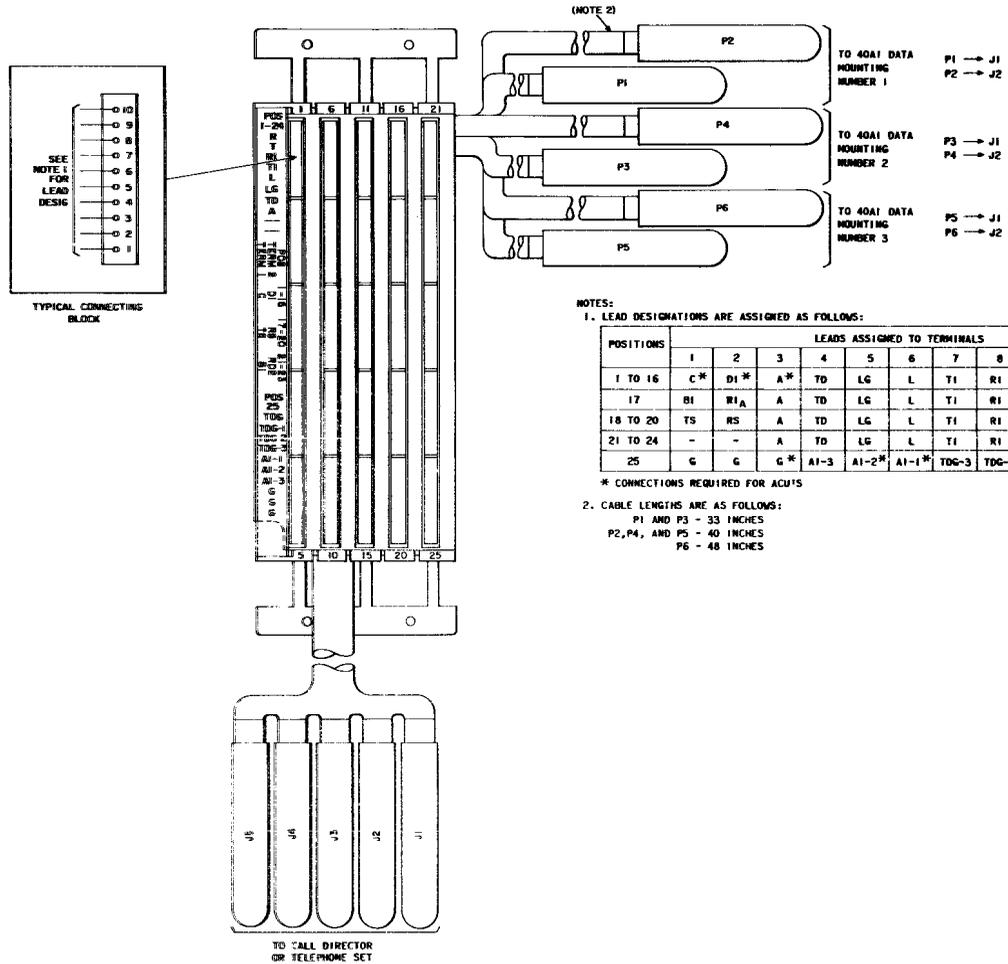
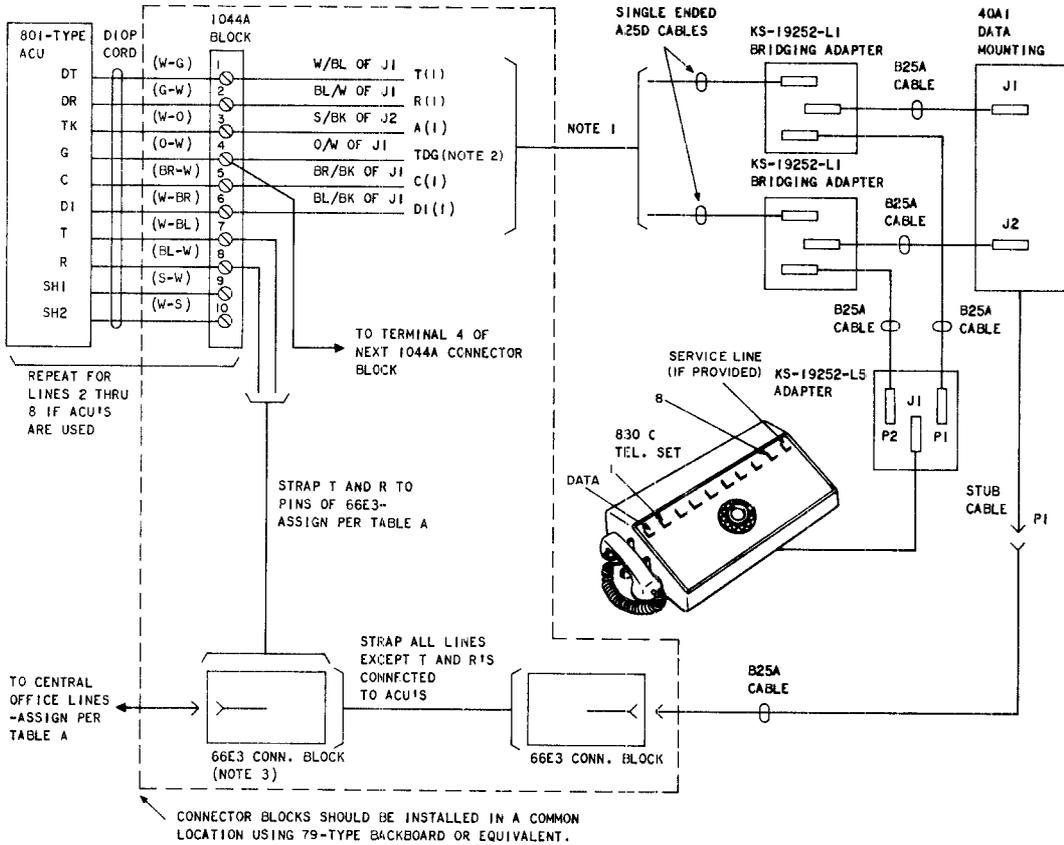


Fig. 4—Lead Assignments on 233A Adapter

3.11 Automatic Calling Units (ACUs):

(a) If an 830C or 831C telephone is used, connections to ACUs are made from KS-19252-L1 adapters to 1044A connecting blocks as shown in Fig. 5. Each position equipped with a data set can also be equipped with an ACU.

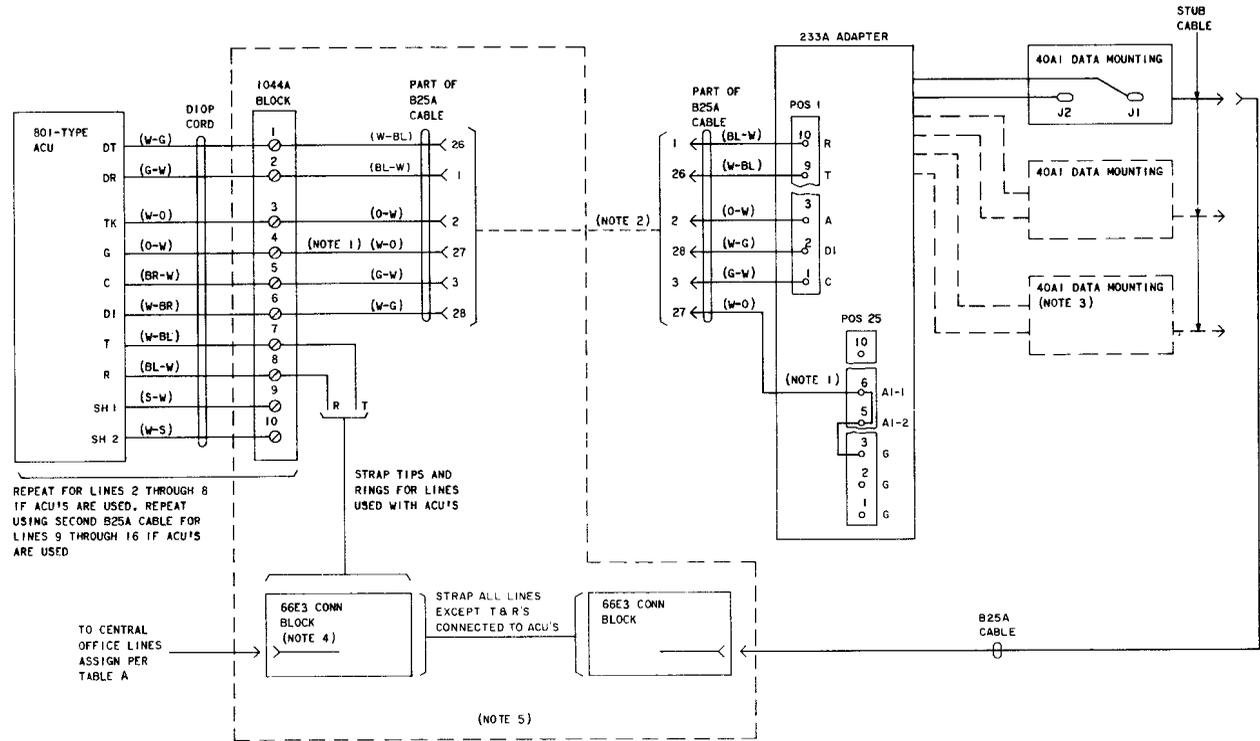
(b) If a 631DA-type Call Director telephone is used, connections to ACUs are made from the 233A adapter to 1044A connecting blocks as shown in Fig. 6. There are 25 connecting blocks (one block per position) on the upper level of the 233A adapter. **Each block (or position) has 10 terminals which are numbered from bottom to top.**



NOTES:

1. CONNECTIONS INDICATED ASSUME AN ACU IS ASSIGNED TO DATA SET POSITION ONE OF THE 40A1 DATA MOUNTING. FOR SUCCEEDING POSITIONS ASSIGNED ACU'S, PICK UP FUNCTIONS AND CORRESPONDING A25D CABLE WIRE COLORS TO BE TERMINATED FROM TABLE A (PIN NO. VS COLOR IS SAME AS A25D CABLE).
2. THIS GROUND LEAD IS RUN FOR THE FIRST ACU ONLY. GROUNDS FOR SUCCEEDING ACU'S ARE CONNECTED TOGETHER AT TERMINAL 4 OF THE INDIVIDUAL 1044A CONNECTING BLOCKS.
3. USE LARGER 66-TYPE BLOCK IF A SECOND MOUNTING IS INSTALLED WITH DATA SETS TO BE USED WITH ACU'S.

Fig. 5—202S Data Station Arrangement for 6 to 8 Data Sets With 830C Tel Set and ACUs



- NOTES:
1. THIS GROUND LEAD IS RUN FOR THE FIRST ACU ONLY. GROUNDS FOR SUCCEEDING ACU'S CAN BE CONNECTED TOGETHER AT TERMINAL 4 OF THE 1044A CONNECTOR BLOCK
 2. THIS CAN BE A B25A CABLE CUT IN HALF. CONNECT HALF TO A MAXIMUM OF EIGHT 1044A CONNECTOR BLOCKS. CONNECT OTHER HALF TO 233A ADAPTER.
 3. THIRD MOUNTING CANNOT BE WIRED FOR ACU'S.
 4. USE LARGER 66-TYPE BLOCK IF MORE THAN ONE MOUNTING IS INSTALLED WITH DATA SETS TO BE USED WITH ACU'S
 5. THE CONNECTOR BLOCKS SHOULD BE INSTALLED IN A COMMON LOCATION USING 79 BACKBOARD OR EQUIVALENT

Fig. 6—202S Data Station Utilizing 233A Adapter With Automatic Calling Units

3.12 On systems using the 631DA-type Call Director telephone, ACUs can be connected to the *first 16* lines of the data station. Make the connections on the 233A adapter and 1044A connector blocks as shown in Fig. 6. Terminal 6 of position 25 on the 233A adapter is the common ground connection for the data station. If terminals 1 and 2 on position 25 are filled, make a parallel ground connection to the 1044A connecting block of an ACU that is already installed.

Note: The wire used to connect to the 233A adapter should be PE or PVC 22-, 24-, or 26-gauge solid copper wire.

3.13 **830C or 2830C Telephone Set:** If an 830C or 2830C tel set is used, insert plug number 2 of the tel set into the J1 connector of the KS-19252-L5 adapter of the first 40A1 data mounting. Insert plug number 1 into the J1 connector of the KS-19252-L5 adapter of the second 40A1 data mounting. Plug P1 and P2 of the adapter into J1 and J2 of the 40A1 data mounting, respectively, using B25A cables (Fig. 7).

3.14 **831C or 2831C Telephone Set:** If an 831C or 2831C tel set is used, plug it into J1 of the KS-19252-L5 adapter. Plug P1 and P2 of each KS-19252-L5 adapter into J1 and J2 of the 40A1 data mountings (Fig. 8 and 9). Positions 9 and 10 on the tel set must be blocked.

B. Two to Eight Data Sets

3.15 The following equipment is included in this arrangement:

- One KS-20018-L12A cabinet
- One 79 backboard
- One 40A1 data mounting
- One KS-19252-L5 adapter
- Two KS-19252-L1 bridging adapters for installations using the 830C tel set and ACUs
- One 1044A block for each ACU installed
- One outlet strip (Waber No. 602-15, or a 1A2 power panel, or equivalent)

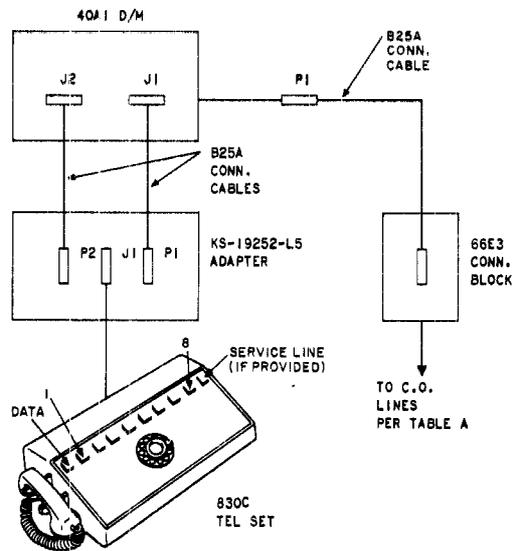


Fig. 7—202S Data Station Arrangement for 6 to 8 Data Sets With 830C Tel Set

- Maximum of eight data sets 202S
- One 830C tel set or 2830C tel set
- B25A and A25D cables.

3.16 Proceed as follows.

- (1) Install the cabinet per 3.02 and 3.03.
- (2) Install the 79 backboard per 3.04 and 3.05.
- (3) Install the 40A1 data mounting per 3.06.
- (4) Install the options for the data sets and data mounting.
- (5) Install the data sets per 3.08.
- (6) Install the KS-19252-type adapters per 3.10.
- (7) If ACUs are required, install per 3.11.
- (8) Install the telephone set per 3.13.
- (9) Install the outlet strip.

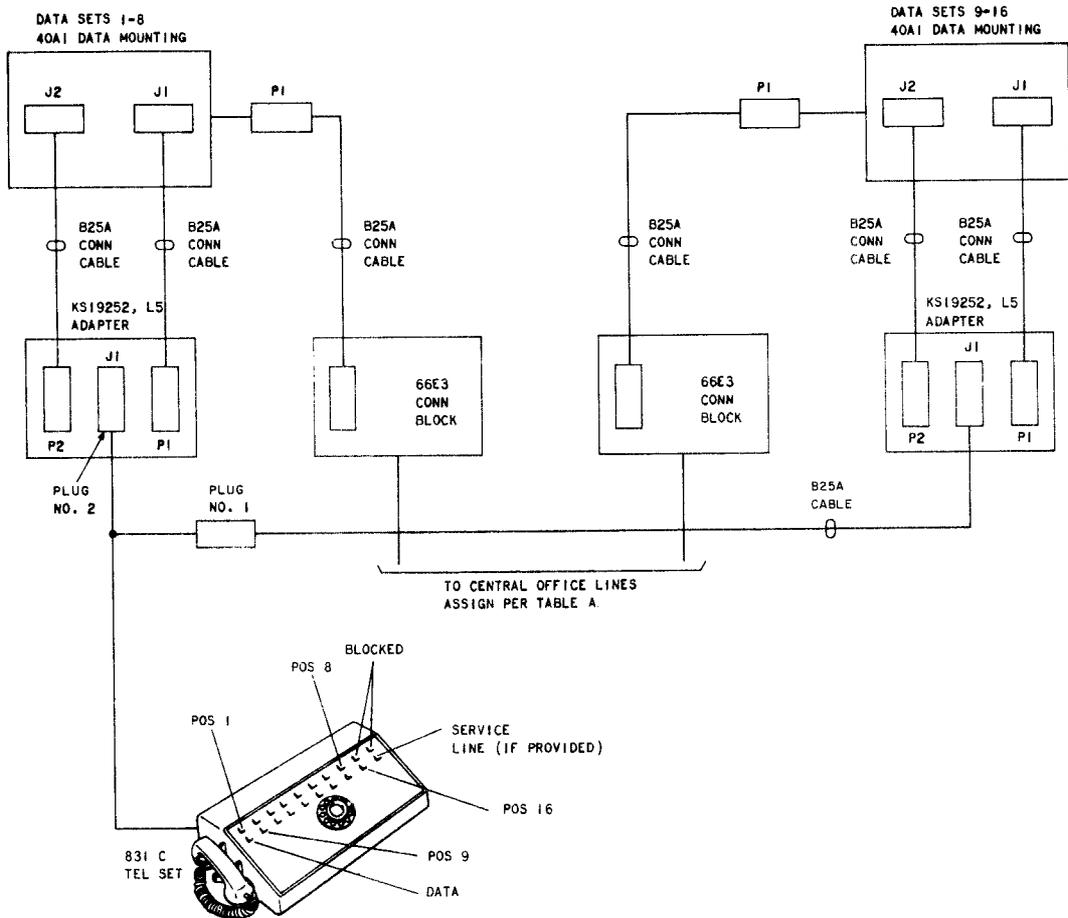


Fig. 8—2025 Data Station Arrangement for 9 to 16 Data Sets With 831C Tel Set

- (10) Connect lines from the central office to the stub cable on the 40A1 data mounting as specified in Table A.
- (11) Connect the service line (if required) to the stub cable on the data mounting as specified in Table A.
- (12) Connect the make-busy pairs (if required) to the stub cable on the data mounting as specified in Table A.

C. 9 to 16 Data Sets

3.17 The following equipment is included in this arrangement:

- One KS-20018-L12A cabinet
- One 79 backboard
- Two 40A1 data mountings
- One 1044A block for each ACU installed

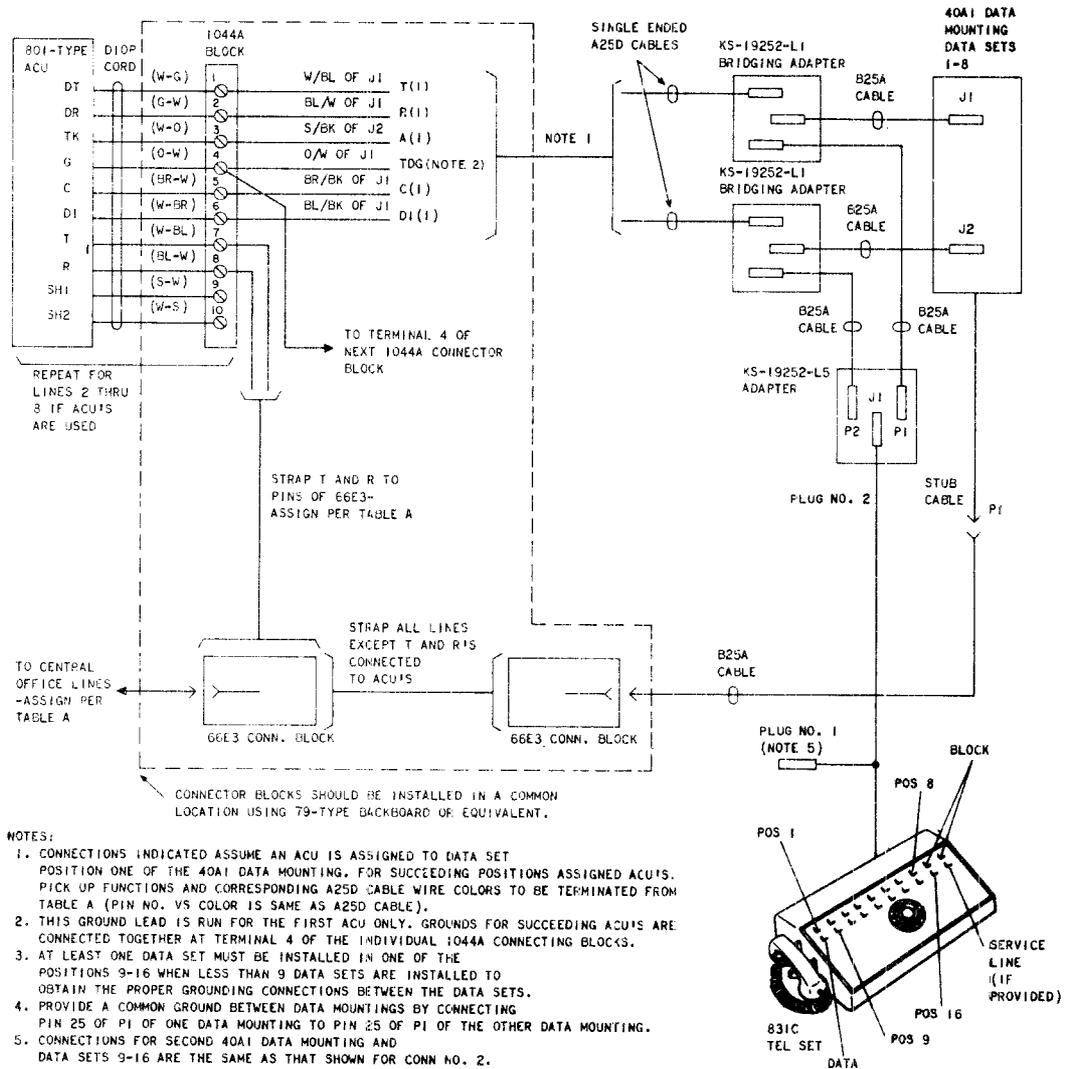


Fig. 9—2025 Data Station Arrangement for 9 to 16 Data Sets With 831C Tel Set and ACUs

- One 831C, 2831C or 631DA-type Call Director telephone set
- Two KS-19252-L5 adapters if 331C or 2831C tel set is used
- Four KS-19252-L1 adapters if 831C or 2831C tel set and ACUs are used.
- One outlet strip (Waher No. 602-15, or a 1A2 power panel, or equivalent)

- Maximum of 16 data sets
- One 233A adapter if 631DA-type Call Director telephone is used
- B25A and A25D cables.

3.18 Proceed as follows.

- (1) Install the cabinet per 3.02 and 3.03.
- (2) Install the 79 backboard per 3.04 and 3.05.
- (3) Install the 40A1 data mountings per 3.06.
- (4) Install the options for the data sets and data mounting.
- (5) Install the data sets per 3.08.
- (6) Install the 233A adapter per 3.09 (if required).
- (7) Install the KS-19252-type adapters per 3.10.
- (8) If ACUs are required, install per 3.11.
- (9) Install the telephone set per 3.14 or plug in the Call Director telephone (if used).
- (10) Install the outlet strip.



If a 233A adapter is used, place the outlet strip in the base of the cabinet, since the adapter covers most of the available space on the backboard.

- (11) If a service line is being installed, strap from the SERVICE LINE OUT terminals of the upper 40A1 data mounting to the SERVICE LINE IN terminals of the lower mounting.
- (12) Connect the lines from the central office to the stub cable on the 40A1 data mounting as specified in Table A.
- (13) On position 20 of the 233A adapter (if used), remove the wire straps from upper terminals 1 and 2.

Note: The terminals are numbered from bottom to top at each position.



Do not cut the wires that are removed. They may need to be replaced at a later date.

- (14) Connect the service line (if required) to the stub cable of the upper data mounting in accordance with Table A.
- (15) Connect the make-busy pairs to the stub cables of the data mountings in accordance with Table A.

D. 17 To 24 Data Sets

3.19 The following equipment is required in this arrangement:

- One KS-20018-L11A cabinet
- Two 79 backboards
- One 1044A connector block for each ACU installed
- Three 40A1 data mountings
- One 830C telephone **and** one 831C telephone **or** one 631DA Call Director telephone
- Three KS-19252-L5 adapters if 830C and 831C tel sets are used
- Six KS-19252-L1 adapters if 830C and 831C tel sets are used with ACUs
- One 233A adapter if Call Director telephone is used
- Maximum of 24 data sets
- B25A and A25D cables
- One outlet strip (Waber No. 602-15, or a 1A2 power panel, or equivalent).

3.20 Proceed as follows.

- (1) Install the cabinet per 3.02 and 3.03.
- (2) Install the 79 backboards per 3.04 and 3.05.
- (3) Install the 40A1 data mountings per 3.06.

- (4) Install the options for the data sets and data mounting.
- (5) Install the data sets per 3.08.
- (6) Install the 233A adapter (if required).
- (7) Install the KS-19252-type adapters per 3.10.
- (8) If ACUs are required, install per 3.11.
- (9) Fasten the outlet strip to the lower 79 backboard.
- (10) If the station is using a Call Director telephone, connect it to the 233A adapter.
- (11) If the 830C-831C telephone combination is being used, install per 3.13 and 3.14. The 830C telephone is for data sets 1 through 8; the 831C telephone is for data sets 9 through 24. Block the 10th button on the 830C telephone normally used for this service line. If a service line is required, it must appear on the 20th button on the 831C telephone.
- (12) If a service line is being installed, strap the SERVICE LINE OUT terminals of the upper 40A1 data mounting to the SERVICE LINE IN terminals of the middle mounting. Strap from the SERVICE LINE OUT terminals of the middle mounting to the SERVICE LINE IN terminals of the lower mounting.
- (13) Connect the lines from the central office to the stub cables on the 40A1 data mounting, as specified in Table A.
- (14) On positions 19 and 20 of the 233A adapter, remove the wire straps from upper terminals 1 and 2.

Note: The terminals are numbered from bottom to top at each position.



Do not cut the wires that are removed. They may need to be replaced at a later date.

- (15) Connect the service line (if required) to the stub cable of the upper data mounting only, in accordance with Table A.

- (16) Connect the make-busy pairs (if required) to the stub cables of the data mountings in accordance with Table A.

4. INSTALLATION TESTS

4.01 After installation is completed, the data station should be tested to determine if it is operating properly. Refer to the section entitled Data Station Using Data Set 202S--Test Procedures (592-860-500).

5. REFERENCES

5.01 Further information on the 202S data station is given in the following sections:

SECTION	TITLE
314-410-501	Data Systems--Dataphone® Service and Data Access Arrangements--Direct Distance Dialing Network--Test Requirements for Subscriber, Foreign Exchange, and Remote Exchange Lines
592-028-100	Data Set 202S Transmitter-Receiver--Description and Operation
592-028-180	Data Sets 202S--Summarizing Specification
592-028-200	Data Set 202S Transmitter-Receiver--Installation and Connections
592-860-100	Data Station Using Data Set 202S--Description and Operation
592-860-500	Data Station Using Data Set 202S--Test Procedures
598-010-201	Data Auxiliary Sets 801A5 and A6 for Automatic Calling--Installation and Connections
598-012-201	Data Auxiliary Sets 801C3 and 801C4--Installation and Connections
598-012-202	Data Auxiliary Sets 801C-L1--Installation and Connections
631-050-120	88-Type Connecting Block--Description and Use

TABLE A

CONNECTIONS FROM DATA MOUNTING TO CENTRAL OFFICE

TERMINAL ON 66E3 CONN BLOCK *	PIN NUMBER ON B25A CABLE ‡ TO DATA MOUNTING	DATA SET POSITION NUMBER §	LEAD DESIGNATION	TERMINAL ON 66E3 CONN BLOCK *	PIN NUMBER ON B25A CABLE TO DATA MOUNTING	DATA SET POSITION NUMBER	LEAD DESIGNATION
1	26	1	T	26	13	4	MB1
2	1	1	R	27	39	5	MB2
3	27	2	T	28	14	5	MB1
4	2	2	R	29	40	6	MB2
5	28	3	T	30	15	6	MB1
6	3	3	R	31	41	7	MB2
7	29	4	T	32	16	7	MB1
8	4	4	R	33	42	8	MB2
9	30	5	T	34	17	8	MB1
10	5	5	R	35	43	—	T _S OUT †
11	31	6	T	36	18	—	R _S OUT †
12	6	6	R	37	44	—	—
13	32	7	T	38	19	—	—
14	7	7	R	39	45	—	—
15	33	8	T	40	20	—	—
16	8	8	R	41	46	5	RD
17	34	—	T _S IN †	42	21	1	RD
18	9	—	R _S IN †	43	47	6	RD
19	35	1	MB2	44	22	2	RD
20	10	1	MB1	45	48	7	RD
21	36	2	MB2	46	23	3	RD
22	11	2	MB1	47	49	8	RD
23	37	3	MB2	48	24	4	RD
24	12	3	MB1	49	50	—	FG
25	38	4	MB2	50	25	—	SG

* Refer to Section 461-604-101 for information on 66E3 connecting blocks.

† Service line.

‡ For some station installations, it will be more convenient to substitute an A25D (single-ended) for the B25A cable connected to P1 of the data mounting to interface with the central office via a local distribution terminal instead of the 66E3 connecting block specified.

§ This table will be utilized for stations with more than the eight data sets specified. For lead designation assignments for data sets in a second data mounting (data sets 9 through 16), add 8 to the data set position number column. For lead designation assignments for data sets in a third data mounting (data sets 17 through 24), add 16 to the data set position number column.