DATA AUXILIARY SET 804L-TYPE

TEST PROCEDURES

1. GENERAL

1.01 This section contains information on testing Data Auxiliary Set 804L-type and the associated 4A-type, 5A-type, and 6A-type Data Mountings.

1.02 This section does not cover the testing of the individual data sets or data auxiliary sets associated with the data sets and data mountings. It is assumed that these units have been tested previously and are operating properly before a test of the 804L, 4A, 5A, and/or 6A is attempted. For testing information and test procedures on the data sets and data auxiliary sets, refer to the applicable BSP for the unit to be tested.

1.03 The service bay, switching equipment, and test center used in making the following tests are assumed to be operating properly. This is necessary in order to make a valid test of Data Auxiliary Set 804L-type and the 4A-type, 5A-type, and 6A-type Data Mountings.

1.04 No special test equipment is required to make the tests given in this section as proper operation of the equipment can be verified by lamp indication, and, where applicable, by audible indications and voice communications.

1.05 A test of the 804L and its associated equipment can be made by utilizing a control console. When a console is not provided as part of the installation and it is desirable to perform this type of test, a second Data Auxiliary Set 804L may be used to simulate a control console and to provide the required test functions. When a Data Auxiliary Set 804L-type and 4A-type Data Mounting are substituted for a control console, the controls on this unit will be referred to in this text as console controls. The controls on Data Auxiliary Set 804L-type which is being tested will be referred to as cabinet controls. This is to avoid confusion and to differentiate between the two units.

1.06 This section contains two separate test procedures for testing Data Auxiliary Set 804L-type and the associated 4A-type, 5A-type, and 6A-type Data Mountings. Either test procedure can be used since both procedures adequately test the equipment. The test procedure to be used is left to the discretion of the person or persons performing the test. The basic differences in these tests are indicated as follows:

(a) ***Nonsubstitution Method:*** This test checks the operation of the multiple data set station using the data sets and associated equipment as part of the test connections. For this test to be valid, the data sets associated with each line of the station and their data auxiliary sets must be working properly. This test has the advantage of checking the actual operation and connections of the multiple data set station. The test does not require the disconnection and reconnection of equipment.

(b) ***Equipment Substitution Method:*** This test makes use of six previously tested data sets which are known to be operating properly. This eliminates the chance of an invalid test being performed due to the associated equipment not operating properly. The test has a disadvantage in that the person or persons performing it must make a large number of disconnections and reconnections during the test procedure.

1.07 Data Auxiliary Set 804L-type is mounted in the center door of a KS-20093 L1 cabinet as shown by Fig. 1.

1.08 The data mountings are mounted inside the KS-20093 L1 cabinet. A typical installation is shown by Fig. 2.

2. PREPARATION FOR TESTING

2.01 Before starting a test of Data Auxiliary Set 804L-type and the associated mountings, inspect the installation to assure that the equipment is installed in accordance with the section entitled

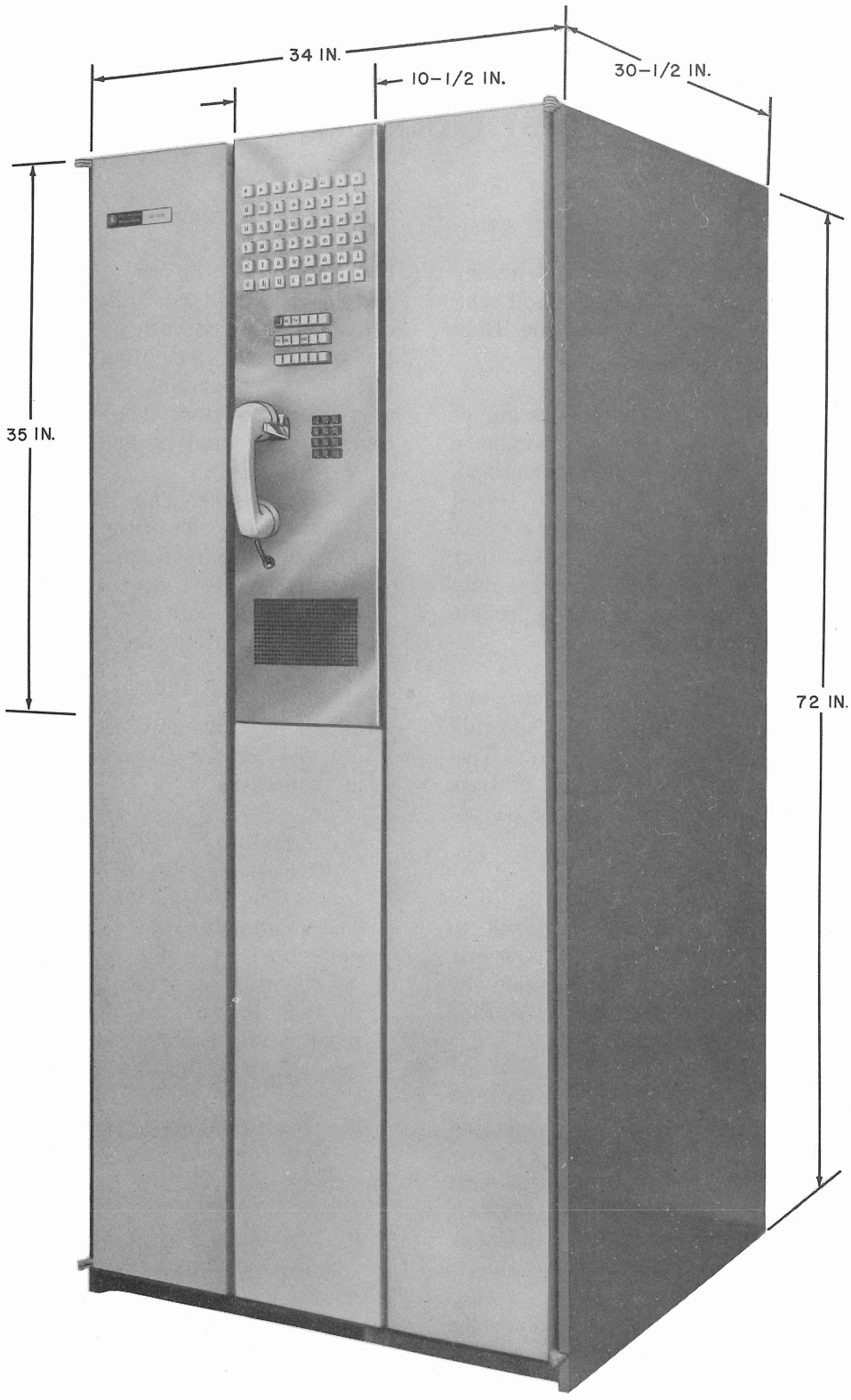

Fig. 1—Data Auxiliary Set 804L-Type Mounted in a KS-20093 L1 Cabinet

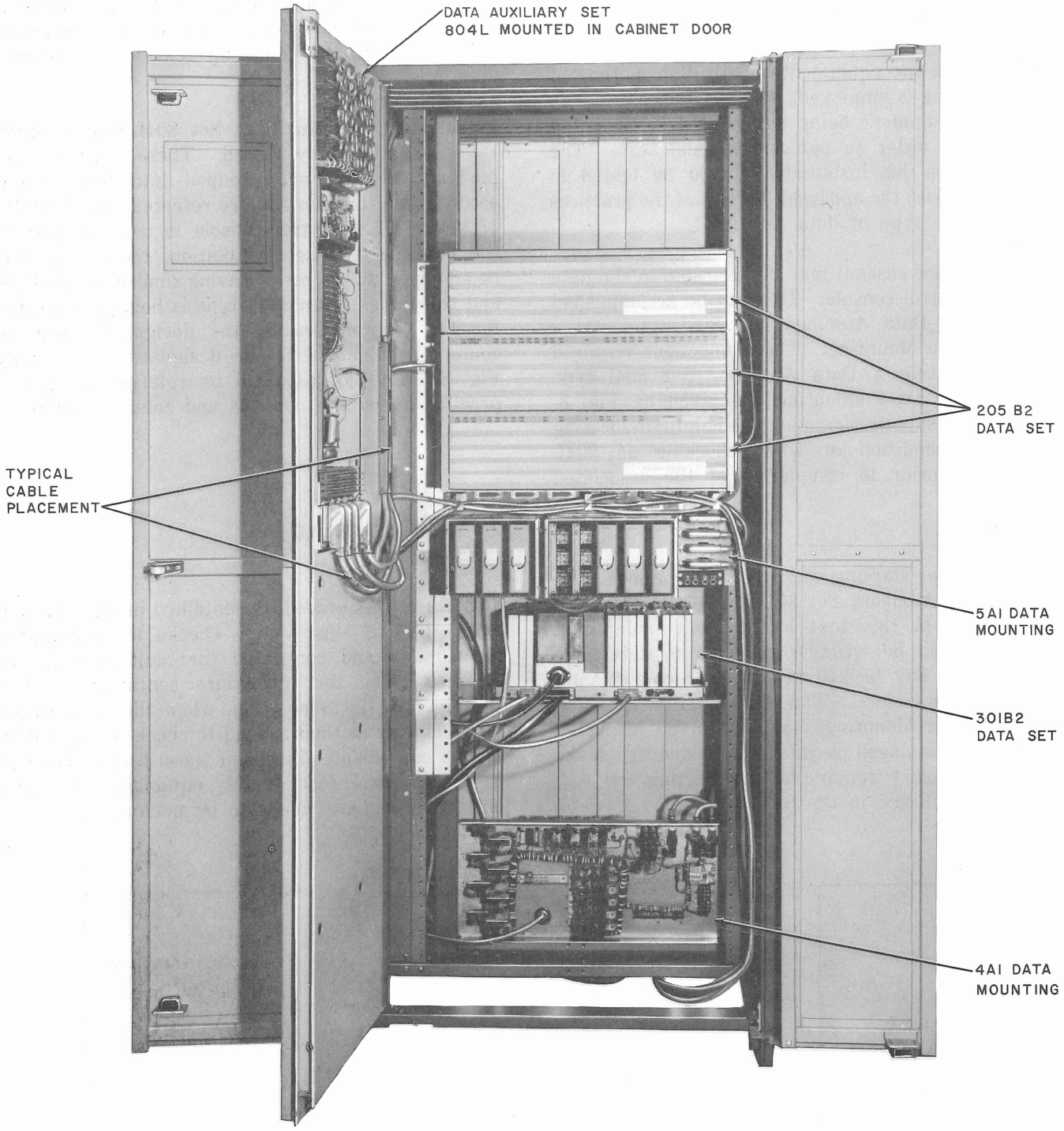

Fig. 2—Typical Multiple Data Set Installation in a KS-20093 L1 Cabinet

Data Auxiliary Set 804L-Type, Installation and Connections (598-056-200).

2.02 When the equipment substitution method of testing is employed, it is necessary to verify that the equipment being substituted is operating properly in order to perform a valid test. The sets used in this installation should be tested in accordance with the applicable section of the practices covering the type of data sets used.

2.03 In some cases it may be desirable to simulate a control console. This can be accomplished by using a Data Auxiliary Set 804L-type and a 4A-type Data Mounting. The connections required for substituting a Data Auxiliary Set 804L-type and 4A-type Data Mounting are given by Fig. 3. This type of substitution might be helpful in locating a trouble condition or when checking an 804L installation prior to completion of the associated console.

2.04 Before starting the test procedures, the Data Auxiliary Set 804L-type, which will be referred to in this text as the unit under test (UUT), should be visually inspected to determine if there are any broken or damaged components, cords, or connectors. The 4A-type, 5A-type, and 6A-type Data Mountings should also be inspected for signs of damaged circuits or components. Make all the necessary repairs before starting the test procedure outlined in the following text.

2.05 Fig. 4 through Fig. 7 show the physical locations and designations of the connectors referred to in the following text and connection diagrams.

2.06 The Data Auxiliary Set 804L-type controls are shown by Fig. 8. These controls, i.e., pushbutton keys, are grouped into four groups according to function and are referred to as "fields" of keys. If a control console is used as part of the multiple data set installation, the console will be equipped with controls having similar designations and functions. If an 804L-type is being substituted for the control console, the designation will, of course, be identical to the designations shown by Fig. 8. The controls will be referred to in this practice as cabinet controls and console controls.

3. TEST PROCEDURE

3.01 The test procedure contained in 3.02 through 3.07 of this section checks the equipment as installed and connected for multiple data set service. The test procedure contained in 3.08 through 3.15 is to be made when the substitution of equipment method is used to check the operation of this equipment. Either of these test procedures is an adequate test of this equipment and only one of these tests needs to be performed.

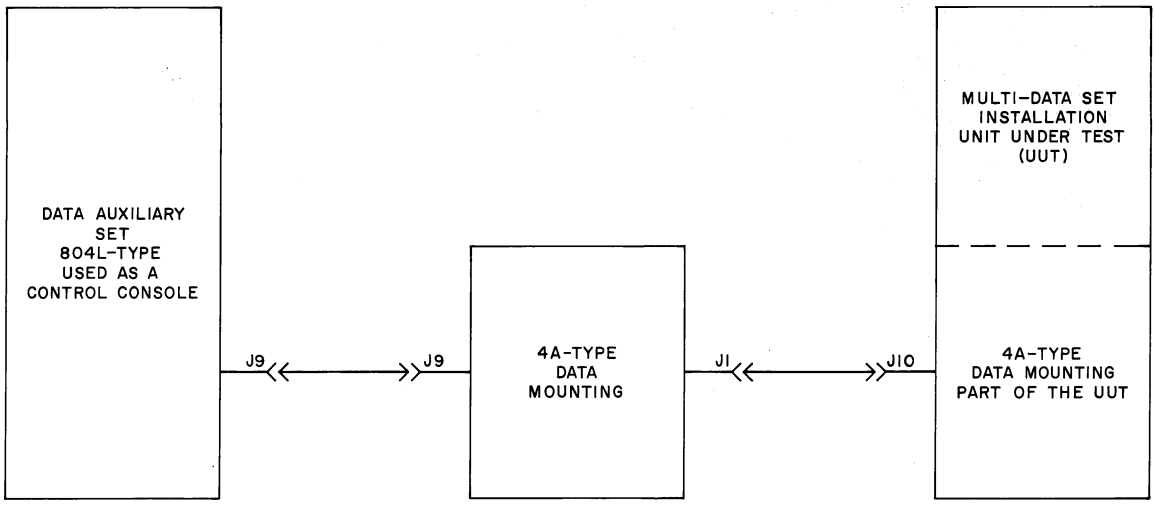

Fig. 3—Connections Required For Substituting a Data Auxiliary Set 804L-Type For a Control Console

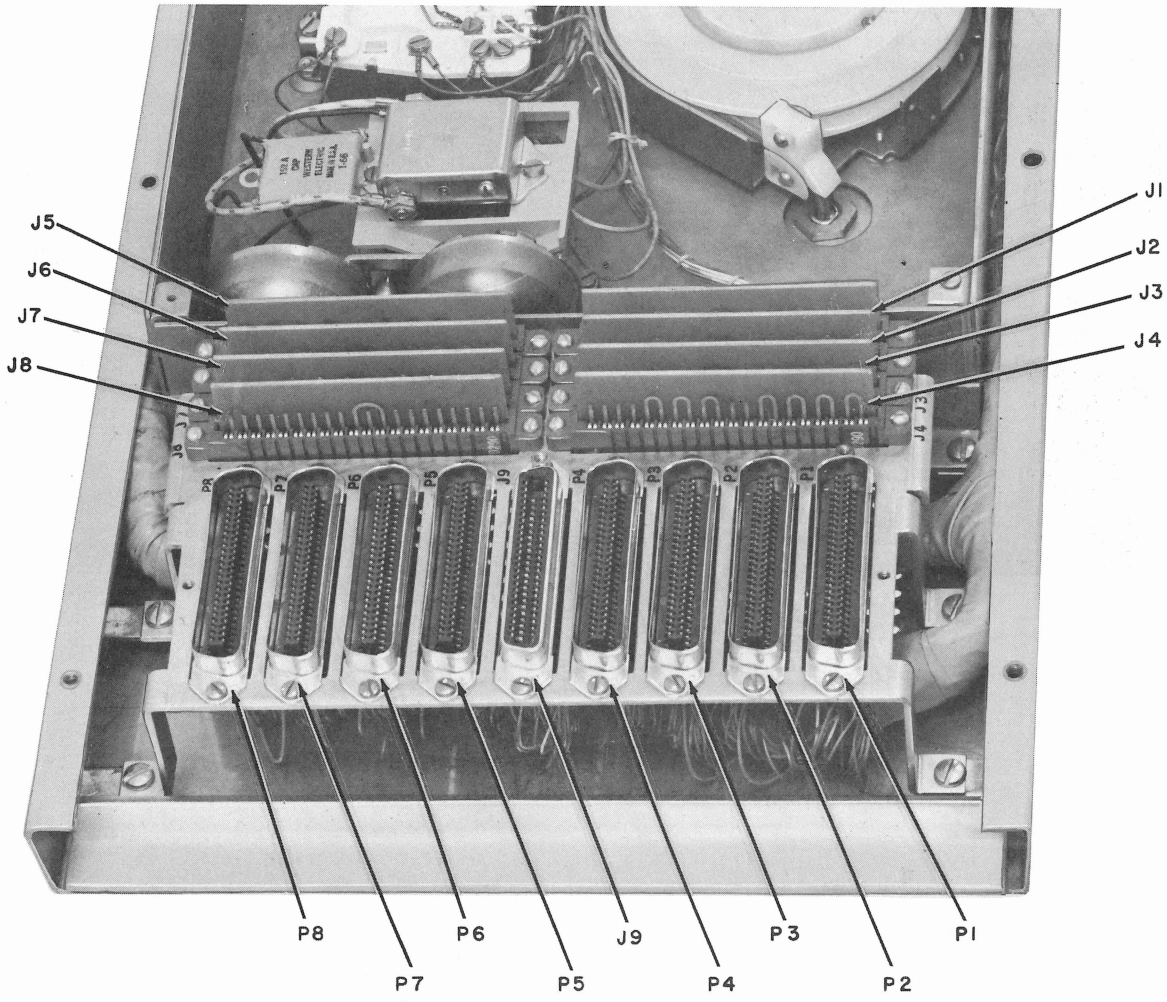

Fig. 4—Data Auxiliary Set 804L-Type, Identification of Connectors

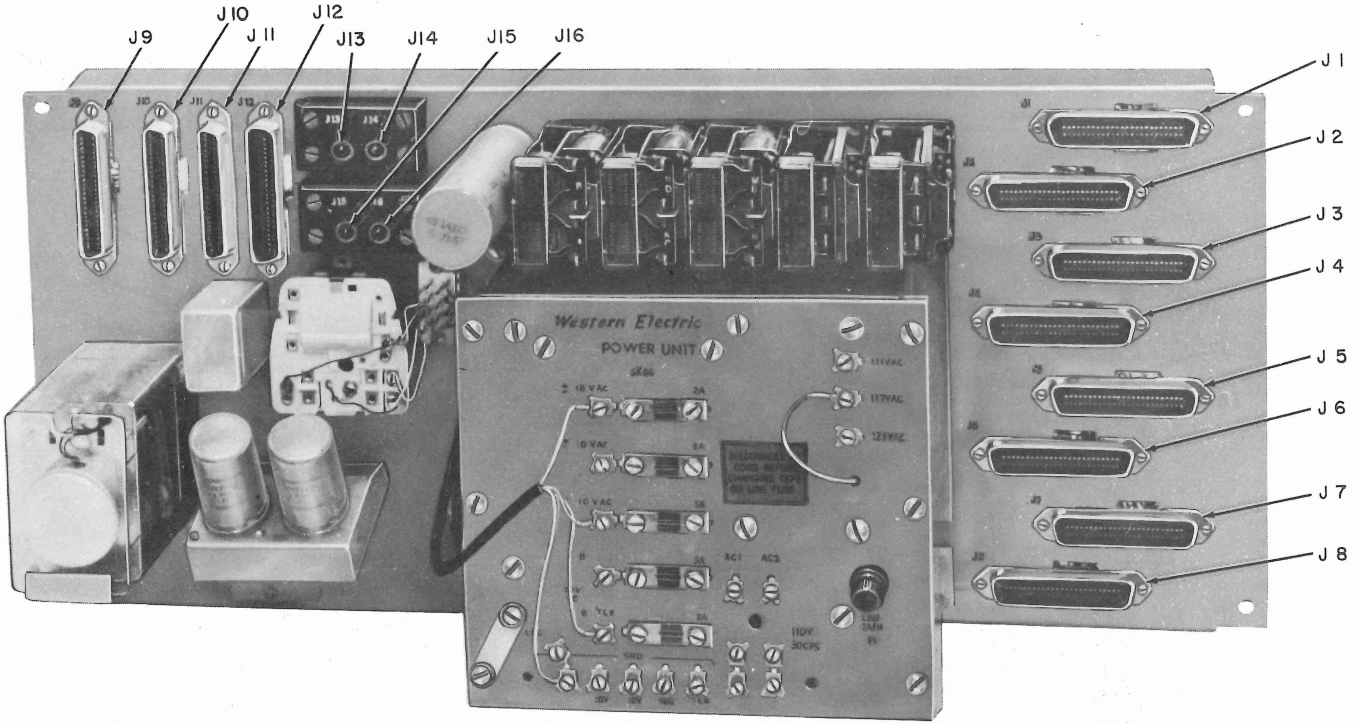

Fig. 5—4A-Type Data Mounting, Identification of Connectors

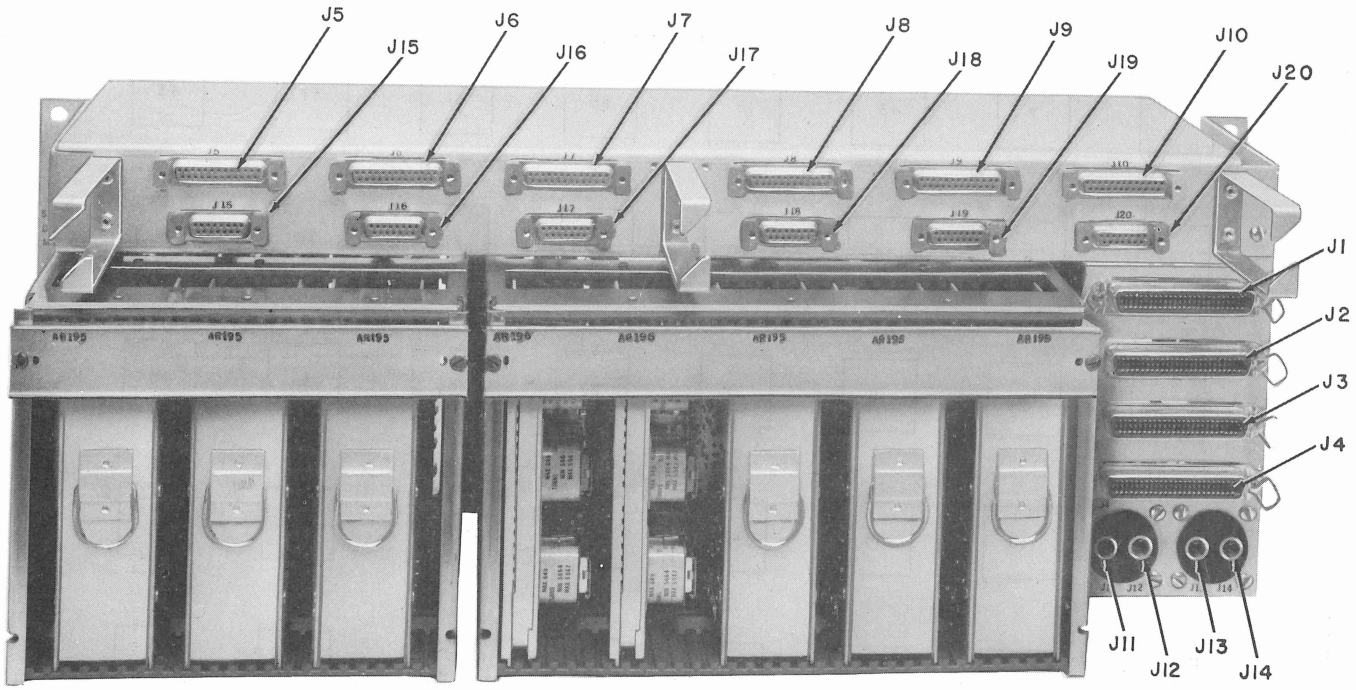

Fig. 6—5A-Type Data Mounting, Identification of Connectors

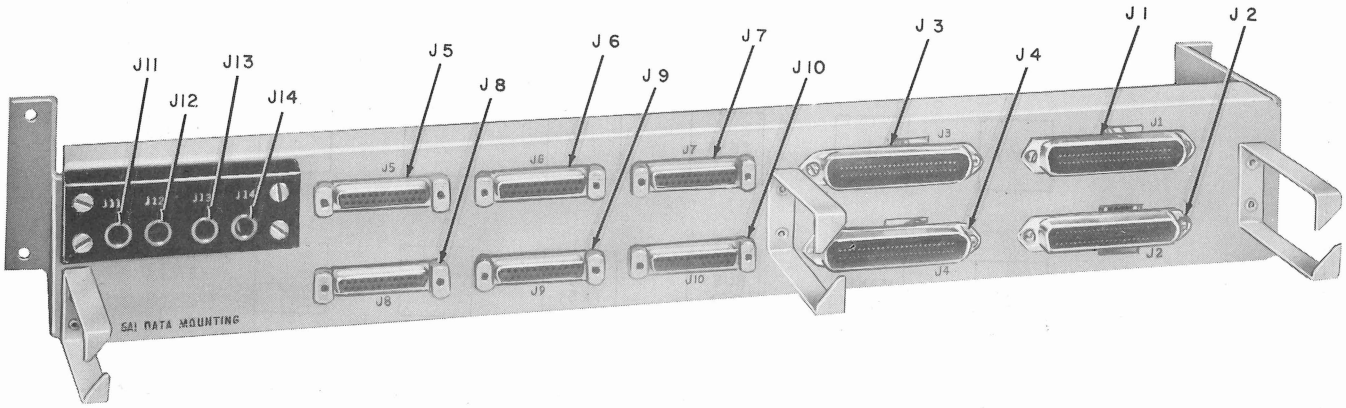

Fig. 7—6A-Type Data Mounting, Identification of Connectors

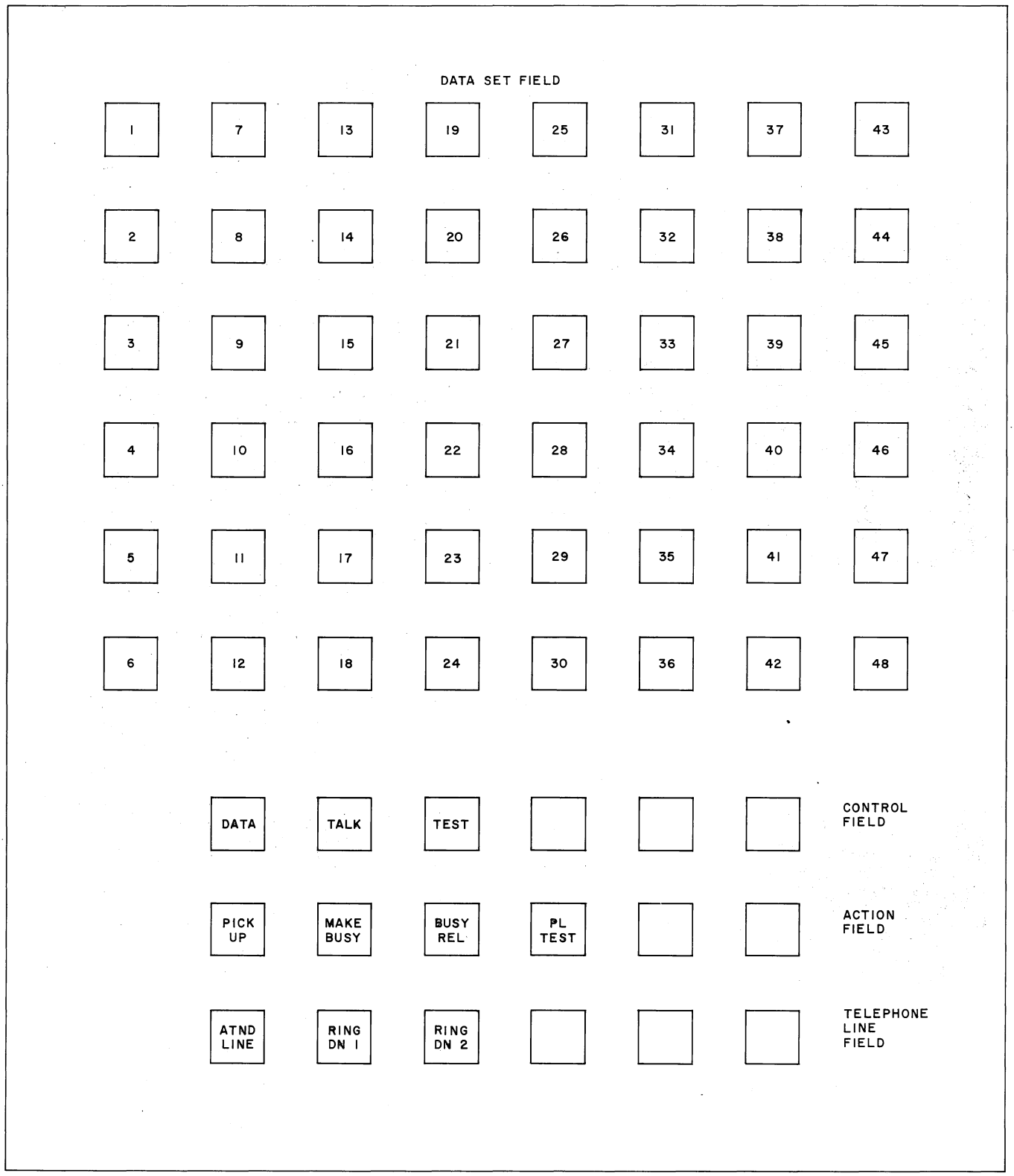

Fig. 8—Key Designations

NONSUBSTITUTION METHOD OF TESTING

3.02 Perform the following operation at the console and at the cabinet 804L. This test verifies the operation of the data set field keys that are used to select and access the data sets. This test checks the operation of the switched access equipment. A similar test is used to check the operation of the private line equipment. Check to assure that the switched network option boards (option Z) have been installed in the appropriate connectors associated with the switched network data sets.

Note: In all of the following tests, the lamp indications are referred to as "steady on," "wink," and "flash" conditions. These conditions are defined as follows:

- A "steady on" condition indicates that the lamp lights and remains lighted. This indicates a "talk" or "data" condition for switched access sets.
- A "wink" condition is a 2-1/2 pulse-per-second signal with an on-off ratio of 37 to 3. This indicates a "test" or "make busy" condition.
- A "flash" condition is a one pulse-per-second signal with an on-off ratio of 1 to 1. This indicates a "ringing" or "accessed" condition.

STEP	ACTION	VERIFICATION
1	Depress the TALK key and remove the handset from the switch hook.	
2	Operate the PICK UP key.	The lamp under the PICK UP key should go to the steady on condition.
3	Operate the key for the first switched network data set in the data set field.	The lamp under the key lights and remains lighted thereby indicating that the data set has been placed in the talk mode. Dial tone should be heard in the handset and the lamp under the PICK UP key should go the flash condition.
4	Attempt to break dial tone by use of the dial on the 804L.	Dial tone should be broken.
5	Depress the DATA key to go to the data mode. ***Note:*** The associated data set must have its Data Terminal Ready lead operated.	The DATA lamp lights steadily which indicates that the data set has been placed in the data mode.
6	Return to the talk mode by depressing the TALK key, then depress the TEST key to condition the data set for testing. ***Note:*** If a test of the data set is to be made, it can be performed at this time while the data set is in the test mode. If no test is to be performed, proceed to Step 9.	The DATA lamp extinguishes and the data set lamp goes to the wink condition which indicates that the data set is conditioned for testing.

STEP	ACTION	VERIFICATION
7	Remove the set from the talk mode by depressing an unused line key and replace the handset on the switch hook. (The above sequence must be followed.)	The data set should remain in the wink condition and the PICK UP lamp should remain in the flash condition.
8	After completing any testing, return to the talk mode by depressing the TALK key and removing the handset from the switch hook.	
9	Depress the DATA key.	The DATA lamp should light and the data set lamp should change from the wink condition to the steady on condition.
10	Depress the TALK key.	The DATA lamp should extinguish.
11	Go on-hook, i.e., replace the handset on the switch hook.	All lamps should extinguish.
12	Repeat Steps 1 through 11 for each key in the data set field which is associated with a switched access data set. This test is made to check the operation of the keys and associated equipment.	

3.03 The following test checks the operation of the equipment associated with the data sets used for private line service. This test is to be performed only on the equipment arranged for private line service. Perform the following test at the cabinet 804L. When a console is provided, repeat the test at the console to verify that the private line equipment can be placed in the test mode and removed from the test mode by operation of the controls. Check to assure that the private line option boards have been installed in the appropriate connectors before attempting to perform this test.

1	Depress the PL TEST (private line test) key.	The lamp under the PL TEST key will go to the steady on condition.
2	Depress the first key associated with the private line equipment in the data set field.	The lamp under the key will wink and the PL TEST lamp will extinguish when the key for the private line data set is released.
3	Repeat Steps 1 and 2 for each private line data set. ***Note:*** Any test which is to be performed can be made at this time while the equipment is in the test mode. If necessary, the test center can be called to verify that the equipment is in the test mode.	Observe the indications listed in Steps 1 and 2. This procedure places all of the private line data sets in the test mode and checks the operation of the keys and associated equipment.

STEP	ACTION	VERIFICATION
4	Release the data sets which have been placed in the test mode by depressing the data set field key (DS key) for each of the private line data sets. ***Note:*** The private line test condition can be cleared from either the cabinet or the console by depressing the DS key for the private line set to be cleared.	The light under each key should extinguish when the data set is released from the test mode.

3.04 When attendant lines are provided, perform the following test to determine if these lines are operating properly.

1	Depress the console ATND LINE key and go off-hook.	The ATND lamp will go to the steady on condition and dial tone will be obtained.
2	Call the cabinet-mounted Data Auxiliary Set 804L.	The cabinet telephone should ring.
3	At the cabinet, go off-hook and depress the ATND LINE key.	This procedure is used to answer an incoming call. The ATND LINE lamp goes to the steady on condition and voice communication can be established.
4	Go on-hook to terminate the call and repeat the above test, calling the console from the cabinet.	

3.05 When ringdown lines are provided between the test center and the console or the cabinet, perform the following test to determine if these lines are operating properly.

1	Depress the console RING DN 1 key and go off-hook.	The RING DN 1 lamp should go to the steady on condition. There should be no dial tone. The test center should receive the call and voice communication should be established.
2	Plug the headset into jacks J13 and J14 of the 4A-type Data Mounting.	Verify that voice communication can be established between the test center and the console 4A-type Data Mounting by using the jacks provided by the data mounting.
3	Go on-hook at both the console and the test center. Remove the headset jacks from the 4A-type Data Mounting.	The RING DN 1 lamp will extinguish. Ringing and lamp flash will occur at the terminating end of the line, i.e., at the test center if the headset is not unplugged.

STEP	ACTION	VERIFICATION
4	Request the test center to ring down the console.	Buzzing should be heard at the console and the RING DN 1 lamp should flash.
5	Go off-hook and depress the console RING DN 1 key.	This should cause the RING DN 1 lamp to go to the steady on condition. Voice communication should now be established.
6	Terminate the call by both the console and test center going on-hook.	The RING DN 1 lamp should extinguish.
7	Depress the cabinet RING DN 1 key and go off-hook.	The RING DN 1 lamp will go to the steady on condition. There should be no dial tone. The test center should receive the call and voice communication should be established.
8	Connect the headset to jacks J13 and J14 of the 4A-type Data Mounting.	Check to assure that voice communication can be established between the test center and the cabinet data mounting.
9	Connect the headset to jacks J11 and J12 of the 5A- and 6A-type Data Mountings. This test should be performed for all the data mountings provided.	Check to assure that voice communication can be established between the test center and the cabinet data mountings.
10	After checking the ringdown lines for all the data mountings, go on-hook and disconnect the headset to terminate the call.	The RING DN 1 lamp should extinguish. Ring and lamp flash will occur at the terminating end of the line, i.e., at the test center, if the headset is not unplugged from the data mounting jacks.
11	Request the test center to ring down the cabinet.	Buzzing should be heard at the cabinet and the RING DN 1 lamp should flash.
12	Go off-hook and depress the RING DN 1 key.	This should cause the RING DN 1 lamp to go to the steady on condition. Voice communication should now be established.
13	Terminate the call by going on-hook.	The RING DN 1 lamp should extinguish.
14	Depress the console RING DN 2 key and go off-hook.	The RING DN 2 lamp should go to the steady on condition. There should be no dial tone. The cabinet should receive the call and voice communication can be established.
15	Plug the headset into jacks J15 and J16 of the 4A-type Data Mounting.	Verify that voice communication can be established between the console 4A-type Data Mounting and the cabinet.
16	Go on-hook at both the console and the cabinet. Also remove the headset jacks from J15 and J16 of the 4A-type Data Mounting.	The RING DN 2 lamp should extinguish. Ringing and lamp flash will occur at the terminating end of the line, i.e., at the cabinet, if the headset is not unplugged.

STEP	ACTION	VERIFICATION
17	Request the cabinet to ring down the console by depressing the RING DN 2 key.	Buzzing should be heard at the console and the RING DN 2 lamp should flash.
18	Go off-hook and depress the console RING DN 2 key.	This should cause the RING DN 2 lamp to go to the steady on condition and voice communication can now be established.
19	Connect the headset to jacks J15 and J16 of the 4A-type Data Mounting.	Verify that voice communication can be established between the cabinet 4A-type Data Mounting and the console.
20	Connect the headset to jacks J13 and J14 of the cabinet 5A- and 6A-type Data Mountings. This test should be performed for all the data mountings provided.	Check to assure that voice communication can be established between the cabinet data mountings and the console.
21	After checking the ringdown line jacks of the data mountings, go on-hook and disconnect the headset to terminate the call.	The RING DN 2 lamp will extinguish. Ringing and lamp flash will occur at the terminating end of the line, i.e., at the console, if the headset is not unplugged from the data mounting jacks.

3.06 Perform the following test to check the chaining mechanism between the releasing keys.

1	Depress the PICK UP key.	The PICK UP lamp lights.
2	Depress the key for a switched network data set.	The PICK UP lamp goes to the flash condition.
3	Go off-hook.	
4	Simultaneously depress the TALK and RING DN 2 keys.	The data set lamp should go to the steady on condition and dial tone should be heard. The RING DN 2 lamp should remain extinguished and there should be no lamp or audible RING DN 2 indication at the cabinet.
5	Go on-hook and depress the DATA key.	This releases the data set, the TALK, and RING DN 2 keys.

3.07 Perform the following test to check the electrical interlock of the PICK UP, MAKE BUSY, BUSY REL, and PL TEST keys.

1	Depress the PICK UP key.	The PICK UP lamp will light steadily.
2	Depress the BUSY REL key.	The PICK UP lamp will extinguish and the BUSY REL key will light.

STEP	ACTION	VERIFICATION
3	Depress the PICK UP key.	The PICK UP lamp will light and the BUSY REL lamp will extinguish.
4	Depress the MAKE BUSY key.	The PICK UP lamp will extinguish and the MAKE BUSY lamp will go to the wink condition.
5	Depress the PICK UP key.	The MAKE BUSY lamp will extinguish and the PICK UP lamp will light.
6	Depress the PL TEST key.	The PICK UP lamp remains lighted and the PL TEST lamp will light.
7	Depress the MAKE BUSY key.	The PICK UP lamp extinguishes, the PL TEST lamp remains lighted, and the MAKE BUSY lamp will go to the wink condition.
8	Depress the BUSY REL key.	The PL TEST lamp and the MAKE BUSY lamp extinguish. The BUSY REL lamp lights.
9	Depress the MAKE BUSY key.	The BUSY REL lamp extinguishes and the MAKE BUSY lamp goes to the wink condition.
10	Depress the PL TEST key.	The MAKE BUSY lamp remains in the wink condition and the PL TEST lamp lights.
11	Depress the BUSY REL key.	The PL TEST lamp and the MAKE BUSY lamp will extinguish. The BUSY REL lamp will light.
12	Depress the PL TEST key.	The BUSY REL lamp remains lighted and the PL TEST lamp lights.
13	Clear the action field of keys by accessing a data set, i.e., depress the PICK UP key, then a switched network data set key, terminate the call by depressing the TALK key, and hang up. *Note:* The preceding test should be made at both the cabinet and console positions when a console is provided.	

EQUIPMENT SUBSTITUTION METHOD OF TESTING

3.08 When this method of testing is to be used, six previously tested data sets known to be good are required. These sets are connected to the data mounting which is to be tested. The data mounting is then connected to the 804L and associated equipment as shown by Fig. 9 and Table A. Refer to the previously referenced figures (Fig. 4 through Fig. 7) for the locations of the connectors listed in Table A and shown by Fig. 9. Use the cords provided for the installation of this equipment to make these required connections. After completing the applicable test connections for the column of keys to be tested, perform the applicable step-action-verification procedure. A different step-action-verification procedure is used for switched access and private line equipment; however, the connections shown by Fig. 9 and Table A are the same for either type of data set.

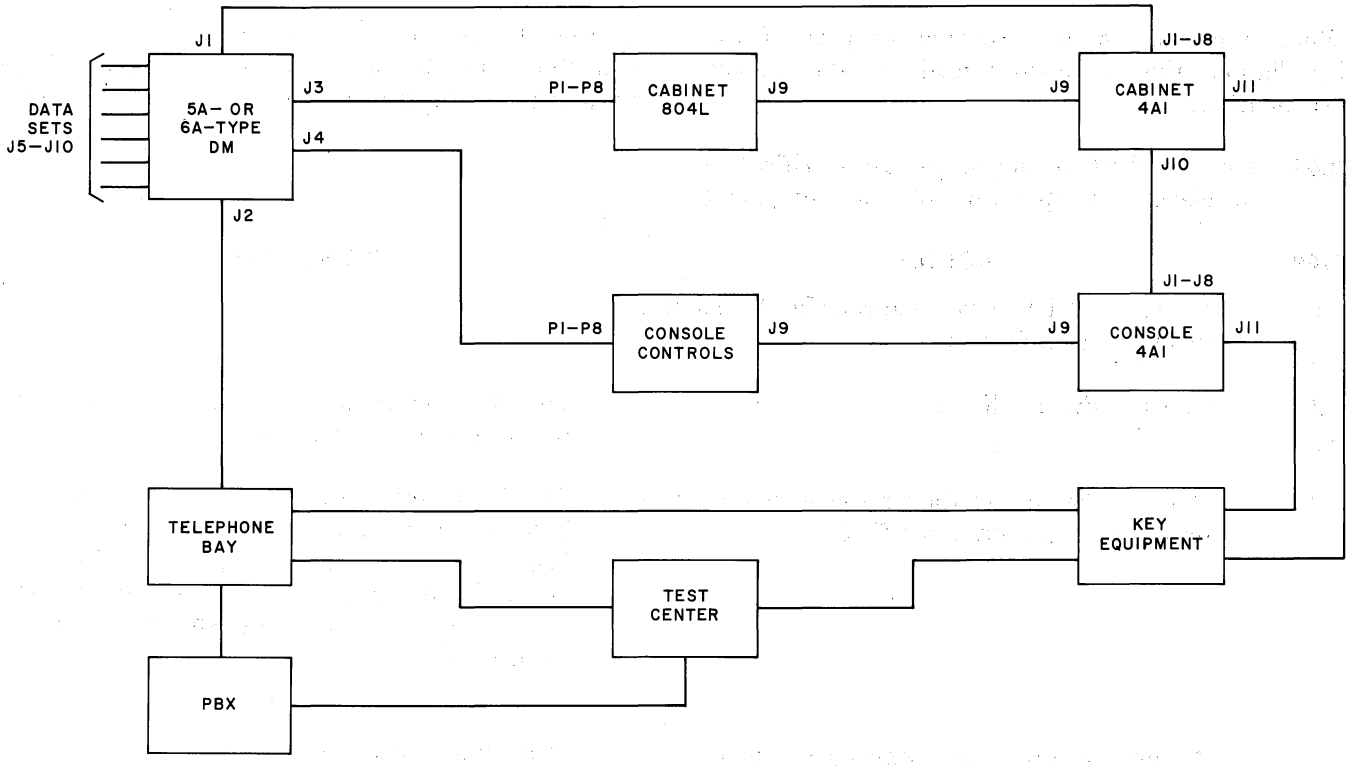

Fig. 9—Test Connections For Testing the Data Set Field Keys and Associated Circuits For Switched Access and Private Line Data Sets

TABLE A

TEST	5A1/6A1 TO CABINET 4A1	5A1/6A1 TO CABINET 804L	5A1/6A1 TO CONSOLE 804L	CABINET 4A1 TO CONSOLE 4A1	ENABLED DS KEYS (CABINET AND CONSOLE)
1	J1-J1	J3-P1	J4-P1	J10-J1	1-6
2	-J2	-P2	-P2	-J2	7-12
3	-J3	-P3	-P3	-J3	13-18
4	-J4	-P4	-P4	-J4	19-24
5	-J5	-P5	-P5	-J5	25-30
6	-J6	-P6	-P6	-J6	31-36
7	-J7	-P7	-P7	-J7	37-42
8	-J8	-P8	-P8	-J8	43-48

When a console is not provided as part of the installation, the connections made to the console are omitted.

3.09 Perform the following step-action-verification to check the operation of the equipment associated with the switched access data sets. This test should not be performed on columns of keys arranged for private line service.

STEP	ACTION	VERIFICATION
1	Depress the TALK key and remove the handset from the switch hook.	
2	Operate the PICK UP key.	The lamp under the PICK UP key should go to the steady on condition.
3	Operate the key for the first switched network data set in the data set field.	The lamp under the key lights and remains lighted which indicates that the data set has been placed in the talk mode. Dial tone should be heard in the handset and the lamp under the PICK UP key should go to the flash condition.
4	Attempt to break dial tone by use of the dial on the 804L.	Dial tone should be broken.
5	Depress the DATA key to go to the data mode. ***Note:*** The associated data set must have its Data Terminal Ready lead operated.	The DATA lamp lights steadily which indicates that the data set has been placed in the data mode.
6	Return to the talk mode by depressing the TALK key, then depress the TEST key to condition the data set for testing. ***Note:*** If a test of the data set is to be made, it can be performed at this time while the data set is in the test mode. If no tests are to be performed, proceed to Step 9.	The DATA lamp extinguishes and the data set lamp goes to the wink condition which indicates that the data set is conditioned for testing.
7	Remove the set from the talk mode by depressing an unused line key and replace the handset on the switch hook. (The above sequence must be followed.)	The data set should remain in the wink condition and the PICK UP lamp should remain in the flash condition.
8	After completing any testing, return to the talk mode by depressing the TALK key and removing the handset from the switch hook.	
9	Depress the DATA key.	The DATA lamp should light and the data set lamp should change from the wink condition to the steady on condition.

STEP	ACTION	VERIFICATION
10	Depress the TALK key.	The DATA lamp should extinguish.
11	Go on-hook, i.e., replace the handset on the switch hook.	All lamps should extinguish.
12	Repeat Steps 1 through 11 for each of the six keys in the column of keys being tested. Make the necessary connections indicated in Table A to test the next column of keys, and repeat the above test procedure for each column of keys associated with switched access data sets.	

3.10 The following step-action-verification checks the operation of the equipment associated with the data sets used for private line service. This test is performed on private line equipment only and requires six previously checked private line data sets known to be good. The connections required to check the data mountings and associated equipment are given by Table A and Fig. 9. Refer to the previously referenced figures (Fig. 4 through Fig. 7) for the location of the connectors used in these test connections. Use the cords provided for the installation of this equipment to make these connections. After completing the applicable test connections for the column of keys to be tested, perform the following step-action-verification procedure. When a console is not provided as part of the installation, the connections that would be made to the console are omitted.

1	Depress the PL TEST key.	The lamp under the PL TEST key will go to the steady on condition.
2	Depress the first key associated with the private line equipment.	The lamp under the key will wink and the PL TEST lamp will extinguish when the DS button for the private line data set is released.
3	Repeat Steps 1 and 2 for the six private line data sets associated with the column of keys and the data mounting being tested. ***Note:*** Any test that is to be performed can be made at this time while the equipment is in the test mode. If necessary, the test center can be called to verify that the equipment is in the test mode.	Observe the indications listed in Steps 1 and 2. This procedure places all of the private line data sets in the test mode and checks the operation of the keys and associated equipment.
4	Release the data sets which have been placed in the test mode by depressing the data set field key (DS key) for each of the private line data sets. ***Note:*** The private line test condition can be cleared from either the cabinet or the console by depressing the DS key for the private line set to be cleared.	The light under each key should extinguish when the data set is released from the test mode.
5	Refer to Table A and make the required test connections to test all other private line data sets.	

3.11 At this time, any of the components of the multiple data set installation that have been removed or disconnected previously should be reinstalled and connected. The station should be checked to verify that all the equipment is installed and connected in accordance with Section 598-056-200.

3.12 When attendant lines are provided, verify the operation of these lines by performing the step-action-verification procedure contained in 3.04 of this section.

3.13 Perform the step-action-verification procedure contained in 3.06 and 3.07 of this section to check the operation of the chaining mechanism between the releasing keys and the electrical interlocking of the PICK UP, MAKE BUSY, BUSY REL, and PL TEST keys. Completion of the above procedures completes the testing of this equipment.

3.14 If the multiple data set installation has passed either section of the preceding tests, the equipment may be considered to be operating properly.

3.15 Take the proper steps to insure that the customer is not billed for any test calls. Refer to the section entitled Crediting Charges On Test Calls (010-250-001).