

## DATA SYSTEMS—9600 BITS-PER-SECOND MULTIPLEX SYSTEM USING DATA SET 209A-L1 INSTALLATION AND CONNECTIONS

### 1. GENERAL

**1.01** This section provides additional information needed when installing data sets 209A-L1, and/or data sets 208A-L1A and 201C on multiplex systems. General installation information for data set 209A-L1 is contained in Section 592-032-200. For references to other associated Bell System Practices, refer to Part 3 of this section.

**1.02** Data set 209A-L1 can be used for three multiplex applications, as follows:

- Point-to-point multiplexing
- Many-point multiplexing
- One-to-many multiplexing.

A description of these applications is provided in Section 592-032-101.

### 2. INSTALLATION

**2.01 *Point-to-Point Multiplex System:*** Installation procedure for point-to-point multiplex systems is the same as for nonmultiplex systems. Refer to Section 592-032-200 for data set installation information. The data set options are shown on Fig. 1. Refer to Section 592-032-500 for installation test procedures.

**Note:** Set the multiplex selector switch to the proper position.

**2.02 *Many-Point or One-to-Many Multiplex Systems:*** Typical interconnections for these systems are shown on Fig. 2 and Fig. 3. The data set options for these systems are shown on Fig. 4 and 5.



*The M8M and M23B cords must be ordered separately.*

**2.03** The M23B cord to customer equipment is approximately 6 inches long and is terminated in a 25-pin connector. This connector is designed to mate with a customer-provided Cinch or Cannon DB-19604-432 plug equipped with a DB-51226-01 hood. The M8M cord is available in 4-foot and 10-foot lengths.

**2.04** A many-point or one-to-many multiplex system can be divided into three possible categories:

- Data set 209A with collocated 201C/208A
- Data set 209A without collocated 201C/208A
- Remote extension 201C/208A.

**Note:** The collocated data sets are the 201C or 208A which are at the same location as the 209A.

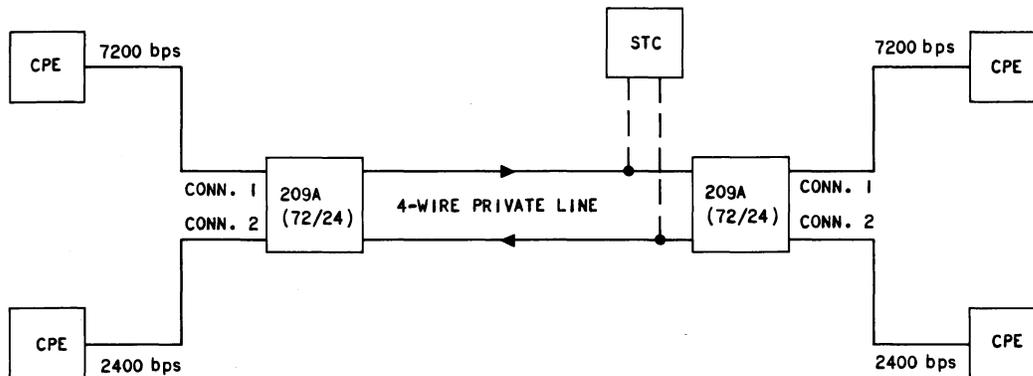
**2.05 *Data Set 209A with Collocated 201C/208A:*** The installation procedure is as follows:

- (1) Install data set 209A as directed in Section 592-032-200 and 592-032-500. Set the multiplex selector switch to the proper position.

**Note:** It may not be possible to turn equipment over to customer at this time.

- (2) After completing installation tests, connect M8M cord(s) to appropriate interface connectors.

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| SELECT                            | DATA SET 209A OPTIONS               | SELECT                            |
|-----------------------------------|-------------------------------------|-----------------------------------|
| * 72/24, 48/48, 48/24/24, OR 4-24 | MULTIPLEX OPTION                    | * 72/24, 48/48, 48/24/24, OR 4-24 |
| INTERNAL                          | TRANSMITTER TIMING                  | INTERNAL                          |
| CONTINUOUS                        | CARRIER CONTROL                     | CONTINUOUS                        |
| PER CPEs                          | REQUEST-TO-SEND CONTROL             | PER CPEs                          |
| ALL DISABLED †                    | ELASTIC STORES                      | ALL DISABLED †                    |
| NOT PROVIDED †                    | SLAVED TIMING                       | NOT PROVIDED †                    |
| PER CPEs                          | DATA SET READY CONDITION IN AL MODE | PER CPEs                          |
| PER CPEs OR LOCAL PRACTICE        | GROUNDING                           | PER CPEs OR LOCAL PRACTICE        |
| IN                                | 1-SECOND HOLDOVER                   | IN                                |

\* THE MULTIPLEX OPTION MUST BE THE SAME FOR BOTH DATA SETS.  
 † REQUIRED OPTION.

Fig. 1—Typical Customer Options, Point-to-Point Multiplex System

(3) If collocated 201C/208A sets have already been installed, also connect the M8M cord to these data sets.

(4) If collocated 201C/208A sets have not been installed, they should be installed next. Refer to Part 3 for the appropriate BSP numbers.

**Note:** The collocated data sets must have the external timing option installed.

(5) Connect the M8M cord between the 209A and the collocated data sets.

**Note:** If the collocated 201C/208AA sets are a master (central) for an external multipoint polling system, the *new sync not used* option must be installed.

**2.06 Data Set 209A without Collocated 201C/208A:**  
 The installation procedure is as follows:

(1) Install data set 209A as directed in Section 592-032-200 and 592-032-500. Set the multiplex selector switch to the proper position.

**Note:** It may not be possible to turn equipment over to the customer at this time.

(2) If this is the final data set being installed in the system (including extensions), end-to-end tests must be conducted as specified in Section 592-032-500. Conduct tests through each active port (interface connector).

**2.07 Remote Extension 201C/208A:** The installation procedure is as follows:

- (1) Install remote extension data sets 201C/208A. Refer to Part 3 for the appropriate BSP numbers.

**Note:** It may not be possible to turn equipment over to the customer at this time.

- (2) Verify that the remote extension data sets 201C/208A have the external timing option installed.
- (3) After completing installation tests, install the M23B cord.
- (4) Call STC to determine if additional end-to-end testing is required. If so, refer to Section 592-032-501.

**2.08** When the entire system has been installed and all analog links have been tested individually, the system must be tested end-to-end. Refer to Section 592-032-501 for installation test procedures.

### 3. REFERENCES

**3.01** Refer to the following Bell System Practices which provide information on equipment associated with 9600-bps multiplexing systems.

| SECTION     | TITLE   |
|-------------|---|
| 314-410-105 | Voice Bandwidth Private Line Data Circuits—High Performance Data Conditioning—Description and Test Requirements |

#### *Data Set 208A-Type*

|             |                           |
|-------------|---------------------------|
| 592-027-100 | Description and Operation |
| 592-027-200 | Installation              |
| 592-027-300 | Maintenance               |

| SECTION     | TITLE   |
|-------------|---|
| 592-027-500 | Test Procedures   |
| 666-511-503 | Test of Services Provided By Data Set 208A-Type From a Private Line Test Room |

#### *Data Set 201C*

|             |  |
|-------------|--|
| 592-029-100 | Description and Operation  |
| 592-029-200 | Installation   |
| 592-029-300 | Maintenance  |
| 592-029-500 | Test Procedures  |
| 666-511-501 | Test of Services Provided By Data Set 201C From a Private Line Test Room |

#### *Data Set 209A-L1 Point-to-Point*

|             |   |
|-------------|---|
| 592-032-100 | Description and Operation   |
| 592-032-200 | Installation  |
| 592-032-300 | Maintenance   |
| 592-032-500 | Test Procedures   |
| TI-388      | Test of Point-to-Point Services Provided By Data Set 209A-L1 From a Private Line Data Test Room |

#### *Data Set 209A-L1 Multiplex*

|             |   |
|-------------|---|
| 592-032-101 | Description and Operation   |
| 592-032-301 | Maintenance   |
| 592-032-501 | Tests   |
| TI-405      | Test of 9600 Bits-Per-Second Multiplex System From a Private Line Test Room |

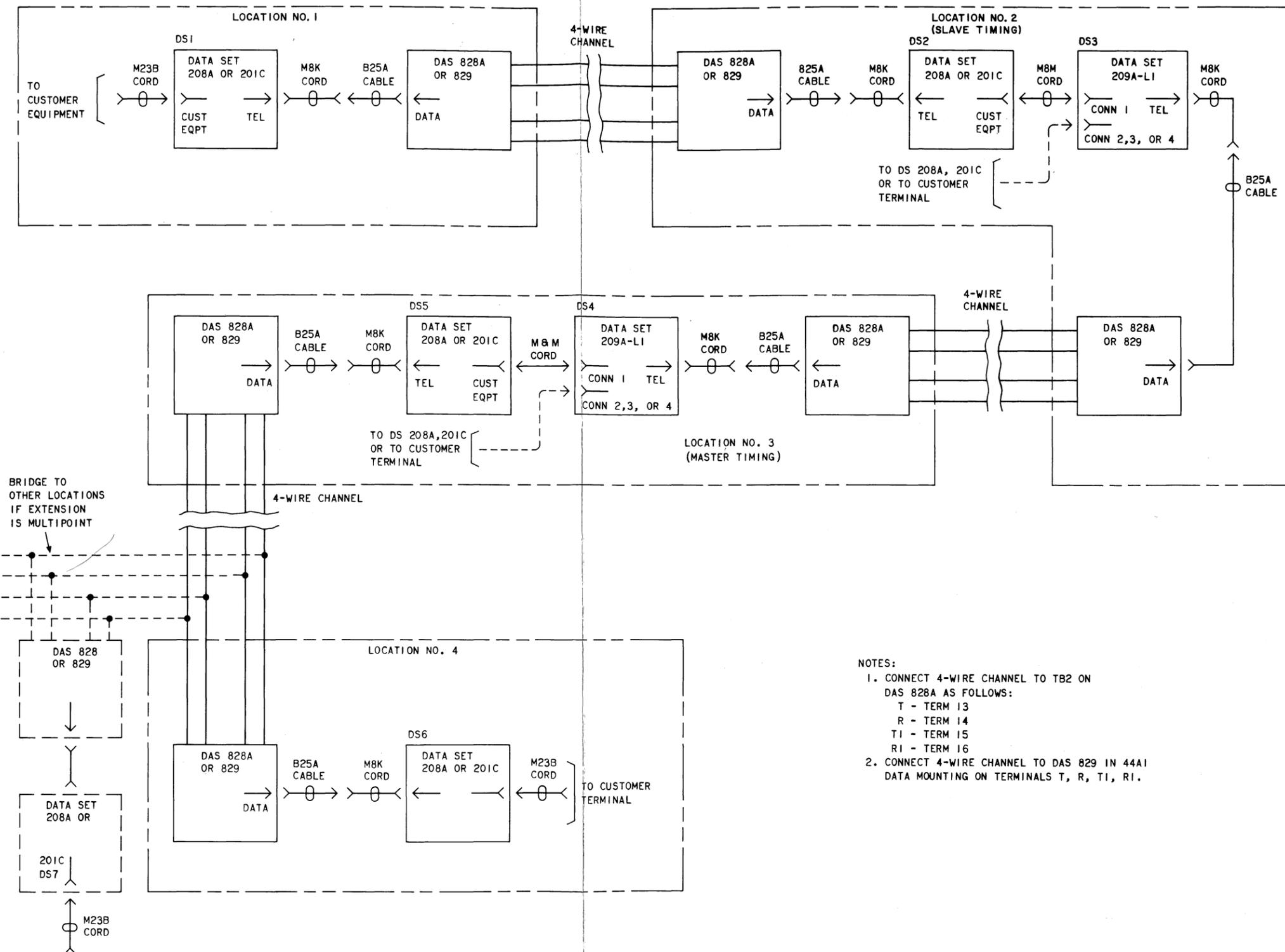


Fig. 2—Many-Point Multiplex System, Connection Diagram

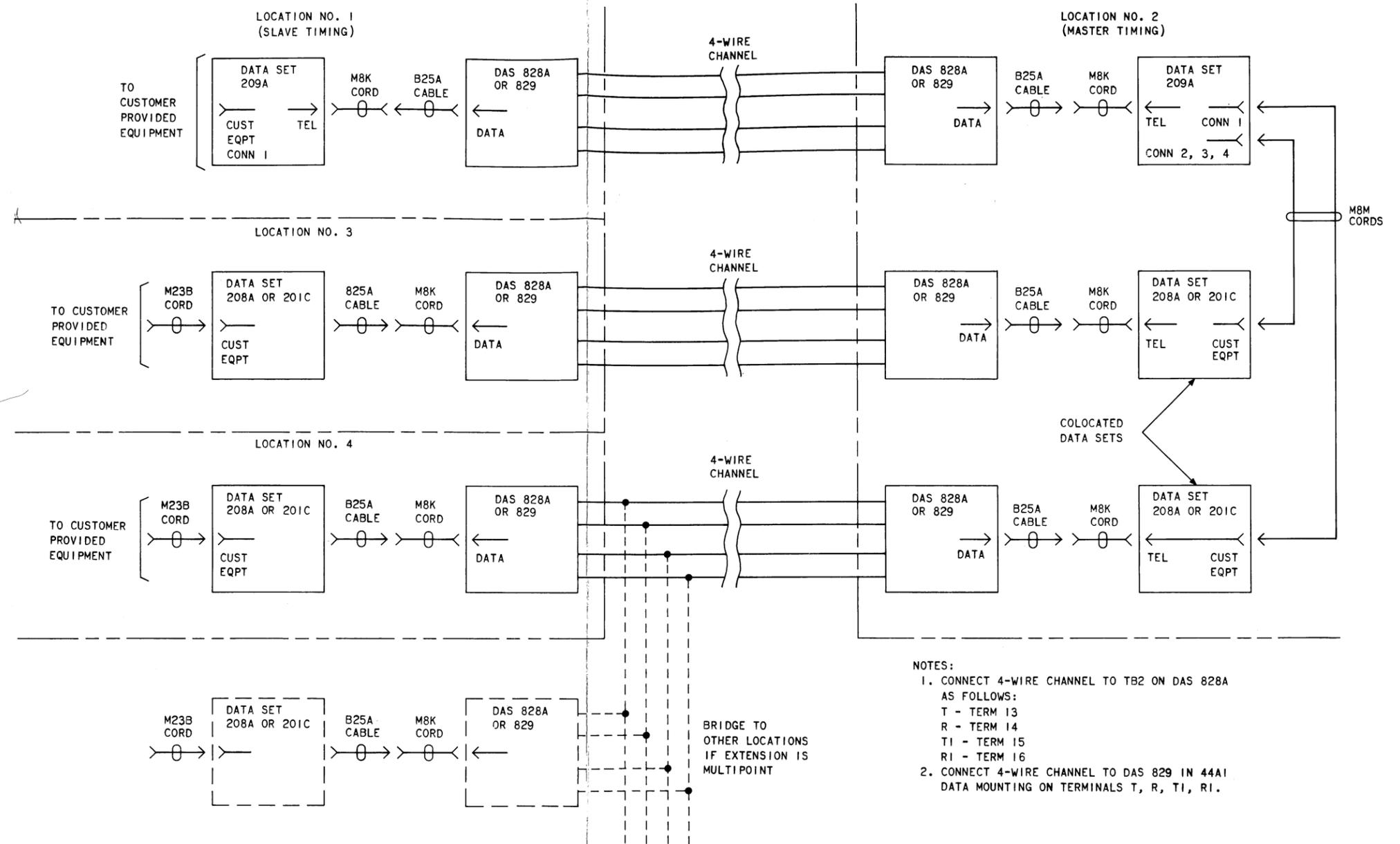
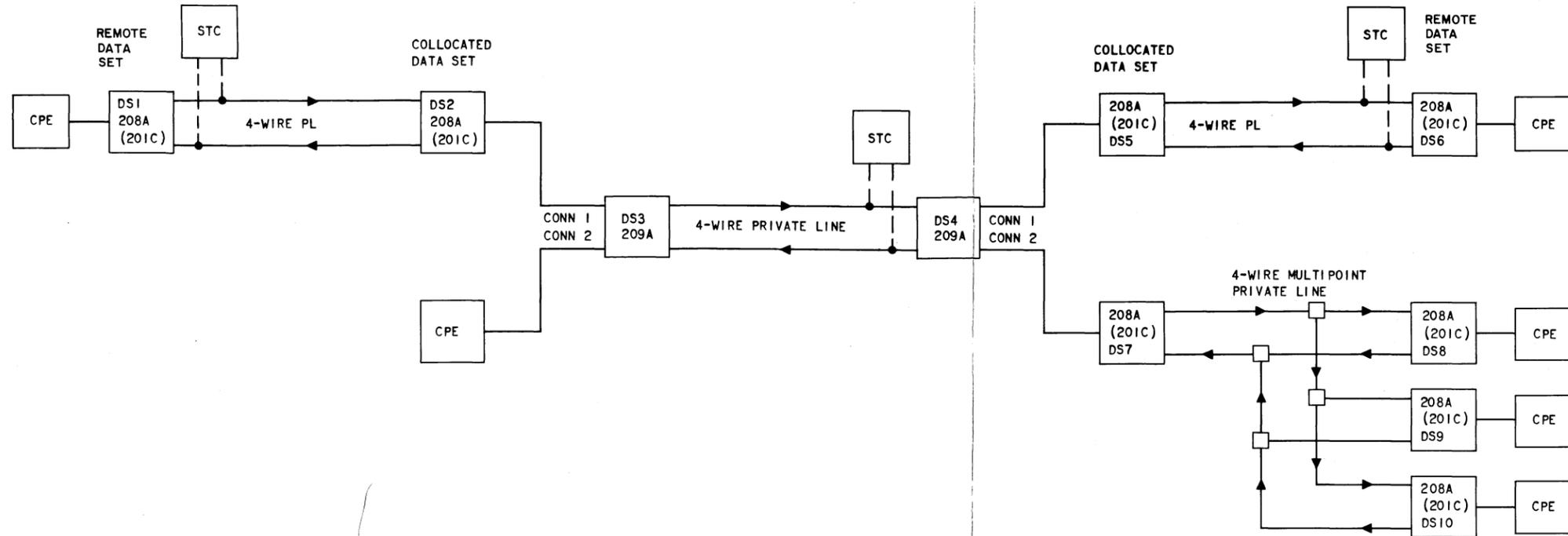


Fig. 3—One-to-Many Multiplex System, Connection Diagram



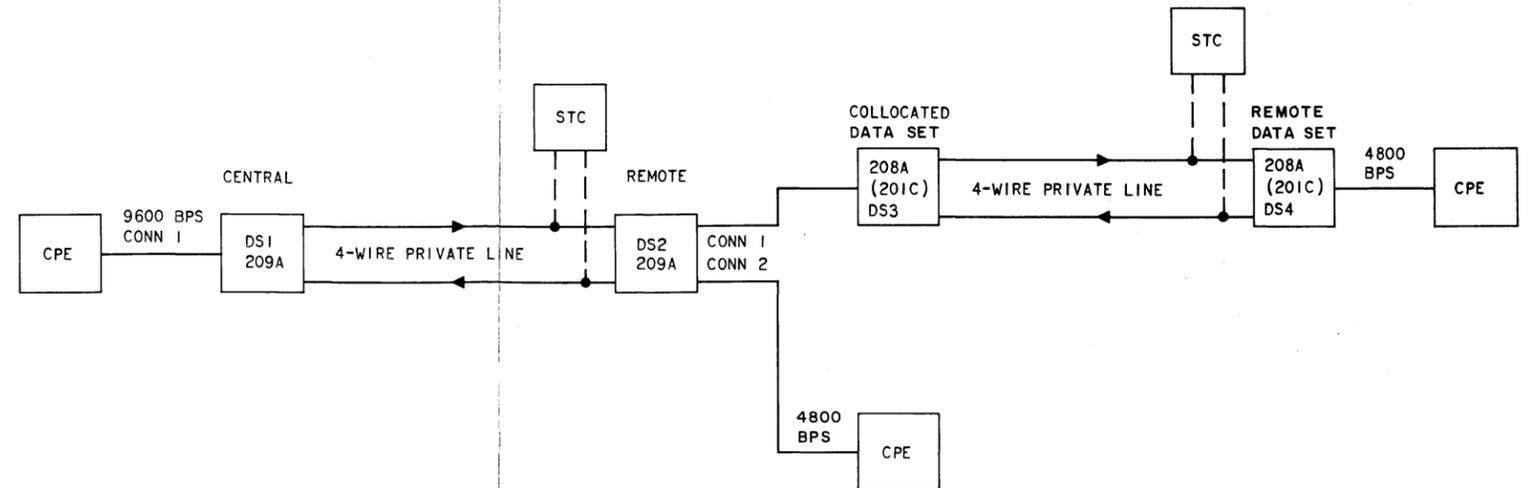
| (REMOTE) SELECT           | DATA SET 208A OPTIONS ON PT-TO-PT EXTENSION CHANNEL | (COLLOCATED) SELECT      |
|---------------------------|---|--------------------------|
| EXTERNAL *                | TRANSMISSION TIMING                                 | EXTERNAL *               |
| CONTINUOUS                | CARRIER CONTROL                                     | SWITCHED *               |
| 0 OR 8 MS PER CPE         | REQUEST TO SEND OPERATION                           | NOT APPLICABLE           |
| IN                        | 1-SECOND HOLDOVER                                   | IN                       |
| NOT USED *                | NEW SYNC  | NOT USED *               |
| CC ON OR CC OFF PER CPE   | DATA SET READY CONDITION IN AL TEST MODE            | CC OFF IN AL TEST MODE * |
| PER CPE OR LOCAL PRACTICE | GROUNDING   | AA CONNECTED TO AB *     |
| (REMOTE) SELECT           | DATA SET 201C OPTIONS ON PT-TO-PT EXTENSION CHANNEL | (COLLOCATED) SELECT      |
| EXTERNAL *                | TRANSMITTER TIMING                                  | EXTERNAL *               |
| CONTINUOUS                | CARRIER CONTROL                                     | SWITCHED *               |
| 0 OR 7 MS PER CPE         | REQUEST-TO-SEND/CLEAR-TO-SEND DELAY                 | 7 MS *                   |
| NOT USED *                | NEW SYNC  | NOT USED *               |
| PER CPE OR LOCAL PRACTICE | GROUNDING   | AA CONNECTED TO AB *     |

| SELECT   | DATA SET 209A OPTIONS                    | SELECT                                       |
|--|--|--|
| ANY BUT 96 (48/48 FOR EXAMPLE SHOWN)           | MULTIPLEX OPTION                         | ANY BUT 96 (48/48 FOR EXAMPLE SHOWN)         |
| INTERNAL *                                     | TRANSMITTER TIMING                       | INTERNAL *                                   |
| CONTINUOUS *                                   | CARRIER CONTROL                          | CONTINUOUS *                                 |
| CONTINUOUS †                                   | REQUEST-TO-SEND CONTROL                  | CONTINUOUS                                   |
| 1 IN<br>2-4 OUT<br>(FOR EXAMPLE SHOWN)         | ELASTIC STORES *                         | 1 & 2 IN<br>3 & 4 OUT<br>(FOR EXAMPLE SHOWN) |
| OUT<br>IN                                      | SLAVED TIMING ‡ *                        | IN<br>OUT                                    |
| PER CPE AT POLLING CENTRAL (FOR EXAMPLE SHOWN) | DATA SET READY CONDITION IN AL TEST MODE | CC OFF IN AL TEST MODE *                     |
| AA CONNECTED TO AB *                           | GROUNDING                                | AA CONNECTED TO AB *                         |
| IN   | 1-SECOND HOLDOVER                        | IN   |

† NOT REQUIRED EXCEPT FOR MULTIPOINT  
 ‡ SLAVE TIMING IS USED IN ONE 209A OR THE OTHER, BUT NOT BOTH.  
 \* REQUIRED

| (COLLOCATED) SELECT      | DATA SET 208A OPTIONS ON MULTIPOINT EXTENSION CHANNEL | (REMOTE) SELECT           |
|--------------------------|---|---------------------------|
| EXTERNAL *               | TRANSMITTER TIMING                                    | EXTERNAL *                |
| SWITCHED *               | CARRIER CONTROL                                       | SWITCHED *                |
| NOT APPLICABLE           | REQUEST TO SEND OPERATION                             | NOT APPLICABLE            |
| OUT *                    | 1-SECOND HOLDOVER                                     | IN *                      |
| NOT USED *               | NEW SYNC  | NOT USED *                |
| CC OFF IN AL TEST MODE * | DATA SET READY (CC) CONDITION IN AL TEST MODE         | CC ON OR CC OFF PER CPE   |
| AA CONNECTED TO AB *     | GROUNDING   | PER CPE OR LOCAL PRACTICE |
| (COLLOCATED) SELECT      | DATA SET 201C OPTIONS ON MULTIPOINT EXTENSION CHANNEL | (REMOTE) SELECT           |
| EXTERNAL *               | TRANSMITTER TIMING                                    | EXTERNAL *                |
| SWITCHED *               | CARRIER CONTROL                                       | SWITCHED *                |
| 7 MS *                   | REQUEST-TO-SEND/CLEAR-TO-SEND DELAY                   | 7 MS *                    |
| NOT USED *               | NEW SYNC  | NOT USED *                |
| AA CONNECTED TO AB *     | GROUNDING   | PER CPE OR LOCAL PRACTICE |

Fig. 4—Typical Customer Options, Many-Point Multiplex System



WHEN AN EXTENSION CHANNEL IS USED, OPTIONS MUST BE SELECTED IN THE COLLOCATED AND REMOTE DATA SETS (EITHER 208A OR 201C).

| (CENTRAL) SELECT              | DATA SET 209A OPTIONS                    | (REMOTE) SELECT  |
|-------------------------------|--|--|
| 96 *                          | MULTIPLEX OPTION                         | ANY MULTIPLEX OPTION   |
| INTERNAL *                    | TRANSMITTER TIMING                       | INTERNAL *   |
| CONTINUOUS                    | CARRIER CONTROL                          | CONTINUOUS *   |
| PER CPE                       | REQUEST TO SEND CONTROL                  | CONTINUOUS WITH EXTEN CHANNEL (CONT OR SWITCHED W/O EXTEN CHANNEL) |
| ALL OUT *                     | ELASTIC STORES                           | 1 IN *<br>2-4 OUT *<br>(FOR EXAMPLE SHOWN)                         |
| OUT                           | SLAVED TIMING † ‡                        | IN (WITH EXTENSION CHANNEL)<br>OUT (WITHOUT EXTENSION CHANNEL)     |
| PER CPE                       | DATA SET READY CONDITION IN AL TEST MODE | CC OFF IN AL TEST MODE   |
| PER CPE OR LOCAL PRACTICE     | GROUNDING                                | AA CONNECTED TO AB * (ONLY IF USED WITH EXTENSION)                 |
| IN WHEN EXTENSION IS NOT USED | 1-SECOND HOLDOVER                        | IN   |

\* REQUIRED  
 † REQUIRED WHEN AT LEAST ONE EXTENSION IS USED  
 ‡ SLAVE TIMING IS USED IN ONE 209A OR THE OTHER, BUT NOT BOTH

| (COLLOCATED) SELECT      | DATA SET 208A OPTIONS ON PT-TO-PT EXTENSION CHANNEL | (REMOTE) SELECT           |
|--------------------------|---|---------------------------|
| EXTERNAL *               | TRANSMITTER TIMING                                  | EXTERNAL *                |
| SWITCHED *               | CARRIER CONTROL                                     | CONTINUOUS                |
| NOT APPLICABLE           | REQUEST-TO-SEND OPERATION                           | 0 OR 8 MS PER CPE         |
| IN                       | 1-SECOND HOLDOVER                                   | IN                        |
| NOT USED *               | NEW SYNC  | NOT USED *                |
| CC OFF IN AL TEST MODE * | DATA SET READY (CC) CONDITION IN AL TEST MODE       | CC ON OR CC OFF PER CPE   |
| AA CONNECTED TO AB *     | GROUNDING   | PER CPE OR LOCAL PRACTICE |

| (COLLOCATED) SELECT  | DATA SET 201C OPTIONS ON PT-TO-PT EXTENSION CHANNEL | (REMOTE) SELECT           |
|----------------------|---|---------------------------|
| EXTERNAL *           | TRANSMITTER TIMING                                  | EXTERNAL *                |
| SWITCHED *           | CARRIER CONTROL                                     | CONTINUOUS                |
| 7 MS *               | REQUEST-TO-SEND/CLEAR-TO-SEND DELAY                 | 0 OR 7 MS PER CPE         |
| NOT USED *           | NEW SYNC  | NOT USED *                |
| AA CONNECTED TO AB * | GROUNDING   | PER CPE OR LOCAL PRACTICE |

Fig. 5—Typical Customer Options, One-to-Many Multiplex System