

10B DATA LINE CONCENTRATOR INSTALLATION AND CONNECTIONS

1. GENERAL

1.001 This addendum supplements Section 591-811-201, Issue 1. The attached pages must be inserted in the section in accordance with the filing instructions above.

1.002 This addendum is issued to:

- (a) Revise 2.03 of the section.
- (b) Revise Steps 18, 19, and 29 of the procedure outlined in 5.06 of the section.

2. PREINSTALLATION SURVEY

The following change applies to Part 2 of this section:

- (a) 2.03—revised.

5. INSTALLATION TESTS (Before Lines are Connected)

The following changes apply to Part 5 of this section:

- (a) Steps 18, 19, and 29—revised.

Attached:

Page 3 dated March 1972—revised
Page 4 dated March 1972—reissued
Page 23 dated March 1972—reissued
Page 24 dated March 1972—revised
Page 25 dated March 1972—revised

10B DATA LINE CONCENTRATOR INSTALLATION AND CONNECTIONS

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1. GENERAL

1.01 This section covers the installation and connection procedures for the 10B Data Line Concentrator. A typical arrangement of a 10B Data Line Concentrator of 128 lines and 32 trunks when installed in a KS-20093-L1 cabinet is shown in Fig. 1. In the following text, the 10B Data Line Concentrator will be referred to as the "concentrator" and the word "module" will refer to a data mounting (or apparatus mounting) equipped with its associated circuit packs (CP).

1.02 The concentrator consists of the following major components.

(a) From one to four line and switch modules—18A1, 19A1, or 20A1 Data Mounting(s) equipped with one AR366 CP for every two lines to be served.

(b) One trunk module—21B1 (up to 16 trunks) or 22B1 (17 to 32 trunks) Data Mounting equipped with one AR488 CP for each trunk in

trunk group A and one AR382 CP for each trunk in trunk group B.

(c) One control module—23B1 Data Mounting equipped with the following CPs.

- (1) AR489—Clock circuit
- (2) AR377—Dual access control circuit
- (3) AR490—Alarms and registers circuit
- (4) AR383—Dual access line scanner
- (5) AR376—Dual access trunk scanner
- (6) FP1—Pulser circuit
- (7) AR597—Camp-on signal generator
- (8) AR381—Dc/dc converter circuit
- (9) AR464—Part of manual test equipment.

(d) One power supply module—71A1 apparatus mounting equipped with KS-20575-L1 rectifiers (1 for up to 32 lines and 3 for 33 to 128 lines) or 71B1 apparatus mounting equipped with J87308B converters (1 for up to 32 lines and 2 for 33 to 128 lines).

(e) One Data Auxiliary Set (DAS) 803E1—Part of manual test equipment.

1.03 The various modules that make up the concentrator are designed to mount in 23- or 25-inch relay racks. Any appropriately sized cabinet designed to mount 23- or 25-inch units may be used. However, this section describes the installation in a KS-20093-L1 cabinet.

2. PREINSTALLATION SURVEY

2.01 Verify that the overall facilities meet transmission requirements specified in the section entitled Private Line Data Circuits—Voice

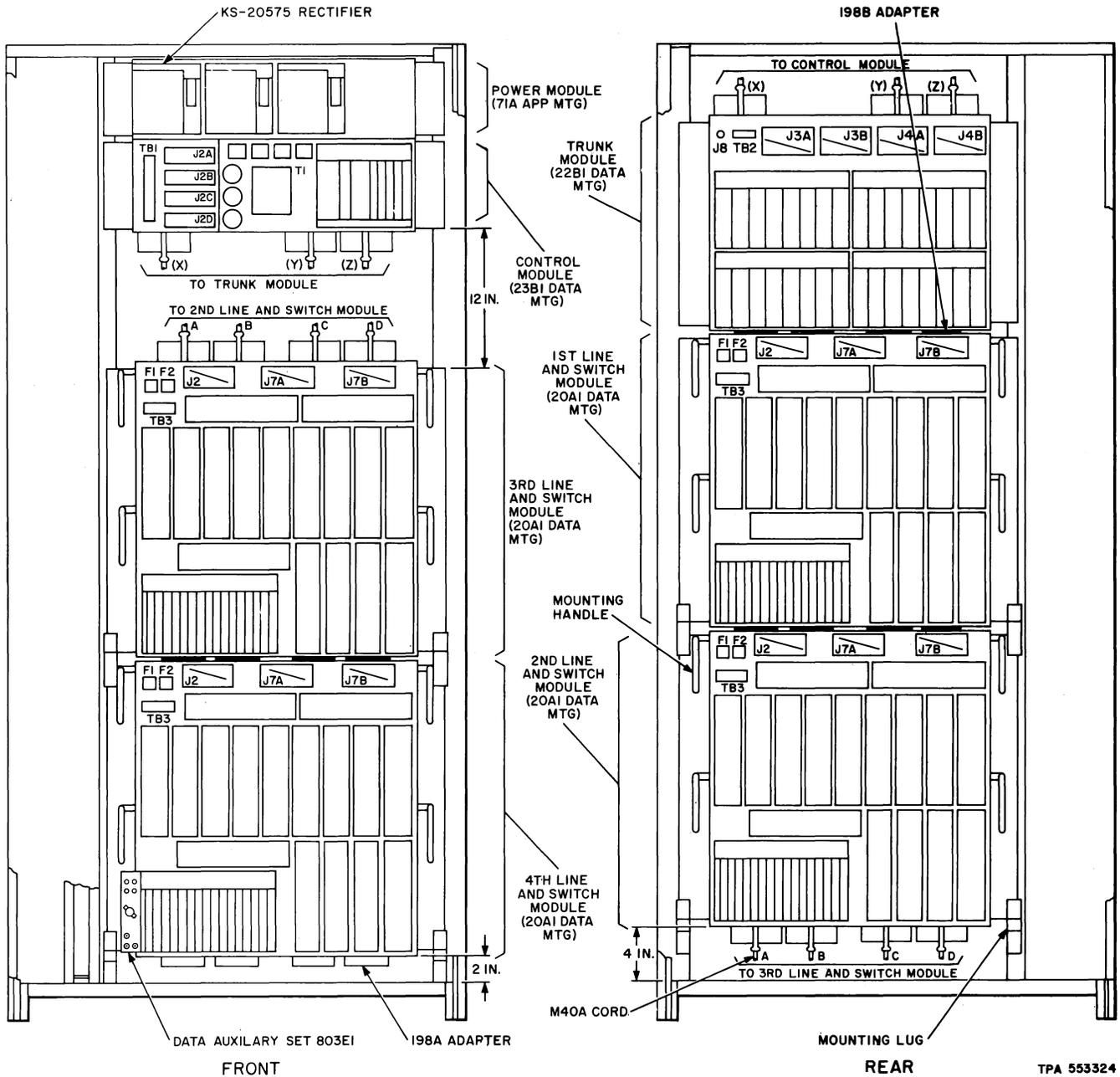


Fig. 1—10B Data Line Concentrator (132 Lines/32 Trunks)

Bandwidth Circuits for Miscellaneous Data—Overall Tests and Requirements (314-410-500).

2.02 Verify that the location selected by the customer for the concentrator is adequate for maintenance, keeping in mind such factors as sufficient clearance to remove circuit packs, get to

test points, remove data mountings, etc. If the concentrator is installed in a cabinet, ensure that adequate clearance is available for opening all cabinet doors.

2.03 Verify that the customer-provided power source is adequate. When an ac power

source is to be used, the concentrator requires 105 to 129 volts ac held to 57 to 63 Hz. The ac power drain is 115 watts for each KS-20575-L1 rectifier used. When a dc power source (such as central office -48 volts dc) is to be used, the dc power drain is 185 watts for each J87308B converter used.

2.04 Verify that the power source is within adequate distance of the proposed concentrator location. If an overhead power source (outlet) is used and the concentrator utilizes a power strip, such as the KS-20129 power strip, it is recommended that a Twist-Lock® (or equivalent) receptacle be provided. The standard plug provided on the power strip should be replaced with a mating Twist-Lock plug.

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3. TYPICAL EQUIPMENT ARRANGEMENTS USING KS-20093-L1 CABINET

3.01 Mounting arrangements depend on the trunk group size and the number of lines to be serviced (the number of line and switch modules required).

3.02 The KS-20093-L1 cabinet provides front and rear mounting in a back-to-back arrangement. The front of the cabinet is considered to be the side that contains the customer access compartment. Concentrator apparatus does not interface with customer-provided equipment. Since the concentrator is part of a total system, equipment that does interface with customer-provided terminals (CPT) may share the same cabinet. When possible, concentrator installations should utilize the rear of the cabinet and leave excess mounting area in the front of the cabinet for other apparatus that may be located within this cabinet and require connection with CPTs.

3.03 Equipment arrangements will normally be custom engineered by the operating company engineering staff and provided as a part of the installation instructions. However, typical arrangements shown in Fig. 2 cover most installations for KS-20093-L1 cabinets.

3.04 Always install power module nearest top of cabinet for most efficient heat dissipation.

Never store excess cables or place any other obstruction on the top of the KS-20093-L1 cabinet since this will block ventilation and interfere with the dissipation of heat.

3.05 Table A relates concentrator line and trunk size requirements to the applicable section of Fig. 2. The following paragraphs describe each of the corresponding arrangements shown in Fig. 2 (a through e).

- (a) This arrangement provides a concentrator which can accommodate up to 8 trunks and up to 128 lines.
- (b) This arrangement provides a concentrator which can accommodate up to 16 trunks and up to 64 lines.
- (c) This arrangement provides a concentrator which can accommodate up to 16 trunks and up to 128 lines.
- (d) This arrangement provides a concentrator which can accommodate up to 32 trunks and up to 32 lines.
- (e) This arrangement provides a concentrator which can accommodate up to 32 trunks and up to 128 lines.

4. INSTALLATION AND CONNECTIONS

A. General

4.01 Reference directions on the data mountings (left, right, front, and rear) are with respect to the side of the mounting (front) into which the circuit packs plug.

4.02 The KS-20093-L1 cabinet depends on the installation of the data mountings and associated components for support and rigidity. For this reason, the following procedure should be used to assure proper alignment and leveling of the cabinet.

Note: Installation of data mountings will be made easier by using a screw-retaining screwdriver.

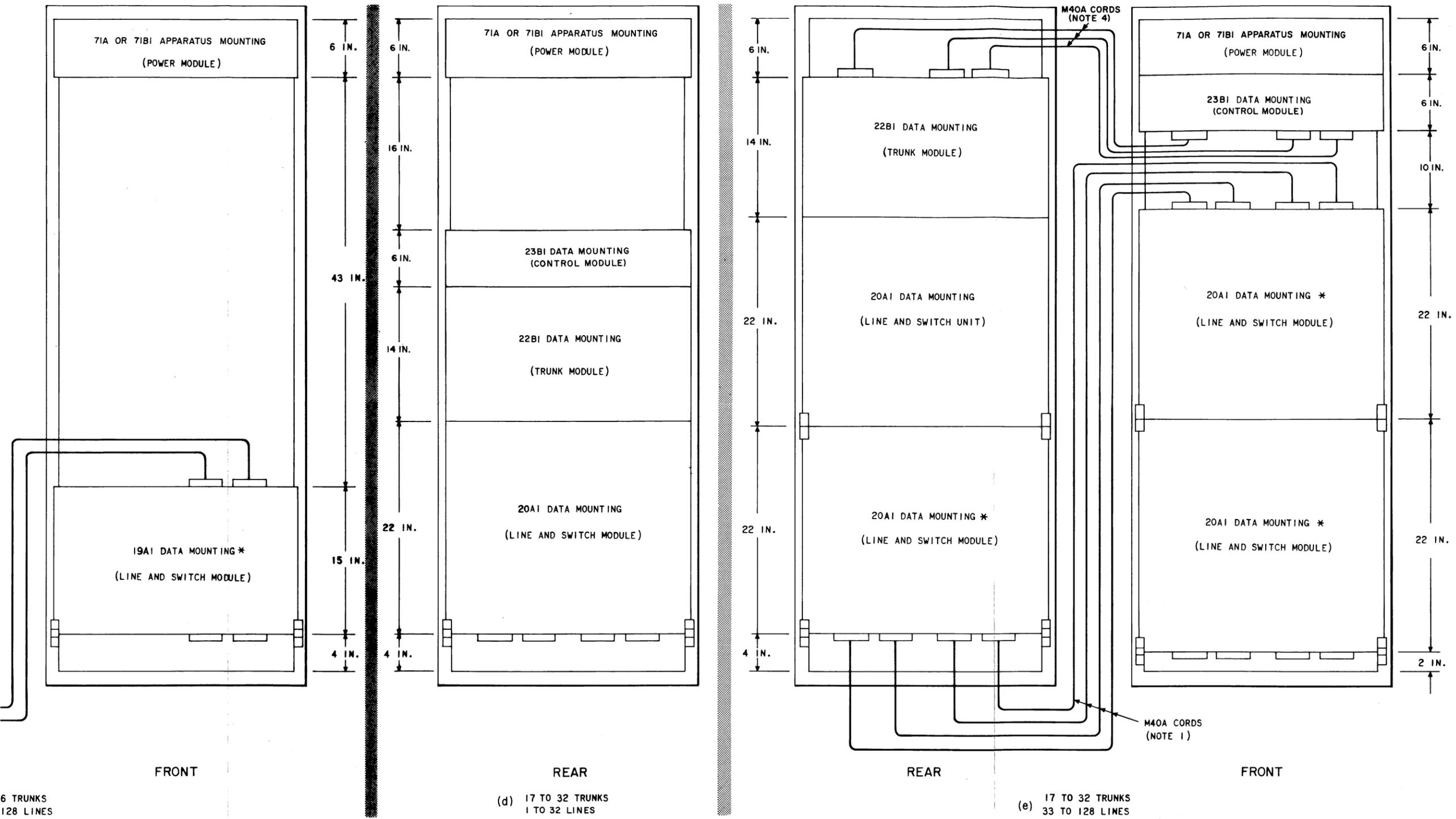
B. Leveling Procedures for KS-20093-L1 Cabinet

TABLE A
CONCENTRATOR SIZE (LINES X TRUNKS) AND
APPLICABLE SECTION OF FIG. 2

		TRUNKS		
		1-8	9-16	17-32
L I N E S	1-32	a*	b*	d*
	33-64			e*
	65-96		c*	
	97-128			

* Refers to part of Fig. 2.

STEP	PROCEDURE
1	Remove stiffeners and kick plates from inside of cabinet.
2	For natural convection, install kick plates in the positions nearest the center of the cabinet. If the cabinet is to be installed above a cooling duct in the floor, install the kick plates in the positions that are farthest from the center of the cabinet so that air will flow up through and out the top of the cabinet.
3	Lower the cabinet as far as possible by releasing the locknuts on the four leveling feet and turning the adjusting screws counterclockwise with a screwdriver.
4	Verify that the mounting brackets are arranged to mount on 25-inch racks as shown in Fig. 3.
5	Install a 71A apparatus mounting (Fig. 4) without rectifiers or 71B apparatus mounting (Fig. 5) without converters at the top of the mounting rack. Tighten the screws finger tight only.  <i>The mounting lugs (Fig. 6) shipped with the 19A1 and 201A Data Mountings align and support the mountings until hardware is applied. These two mountings are also provided with handles. When lifting these units, use the handles and do not support the units by the 258A switch cans.</i>
6	When using 19A1 or 20A1 Data Mountings, install two mounting lugs at the bottom of the mounting rack (Fig. 6) and leave adequate clearance as shown in Fig. 2. Position each mounting lug so that the lowest hole of the lug is 1-1/2 inches below the desired position of the bottom of the mounting. Place bolts only in the bottom two holes of each mounting lug. <i>Caution: Two men are required to lift and position either the 19A1 or 20A1 Data Mounting because of its weight.</i>



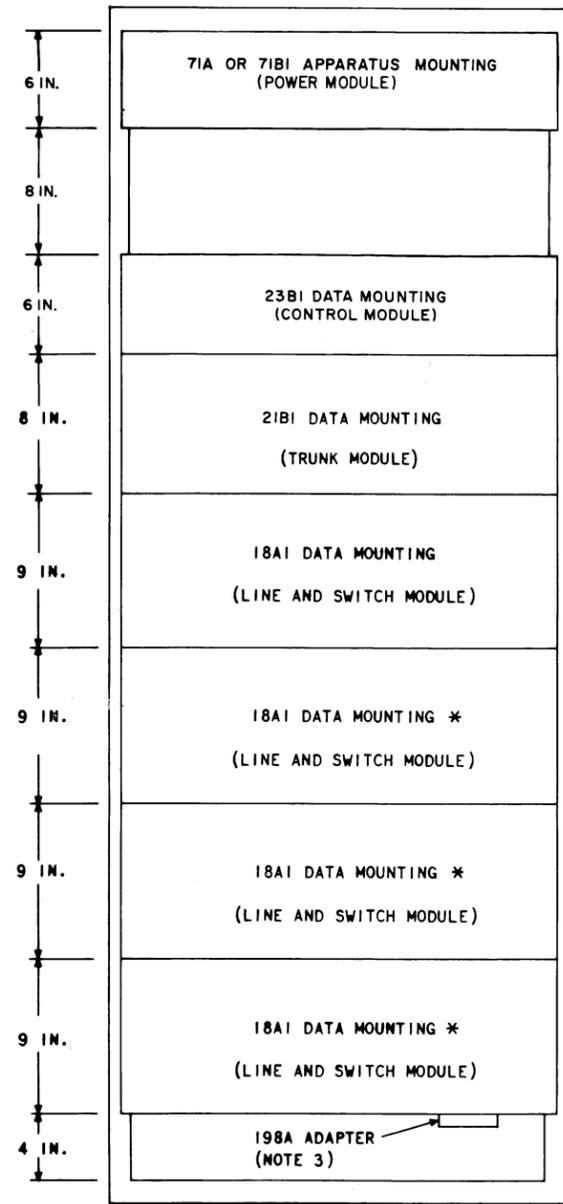
- NOTES:
1. USE M40A CORDS TO INTERCONNECT FRONT AND REAR LINE AND SWITCH MODULES AFTER 198B ADAPTERS HAVE BEEN INSERTED.
 2. MOUNTING LUGS ARE USED UNDER AND BETWEEN 19A1 AND 20A1 DATA MOUNTINGS.
 3. 198A ADAPTER(S) TERMINATES LAST LINE AND SWITCH MODULE. 198B ADAPTER(S) INTERCONNECT ADJACENT LINE AND SWITCH AND TRUNK MODULES.
 4. USE THESE LINE AND SWITCH MODULES, IF NECESSARY. SEE CHART BELOW.
- * USE THESE LINE AND SWITCH MODULES, IF NECESSARY. SEE CHART BELOW.
4. USE M40A CORDS TO INTERCONNECT CONTROL MODULES AND TRUNK MODULES THAT ARE NOT VERTICALLY ADJACENT AFTER 198B ADAPTERS HAVE BEEN INSERTED.

DATA MOUNTINGS REQUIRED FOR VARIOUS SIZE CONCENTRATORS

		TRUNKS		
		1-8	9-16	17-32
LINES	1-32	18A1 (1) † 21B1 (1)	19A1 (1) 21B1 (1)	20A1 (1) 22B1 (1)
	33-64	18A1 (2) 21B1 (1)	19A1 (2) 21B1 (1)	20A1 (2) 22B1 (1)
	65-96	18A1 (3) 21B1 (1)	19A1 (3) 21B1 (1)	20A1 (3) 22B1 (1)
	97-128	18A1 (4) 21B1 (1)	19A1 (4) 21B1 (1)	20A1 (4) 22B1 (1)

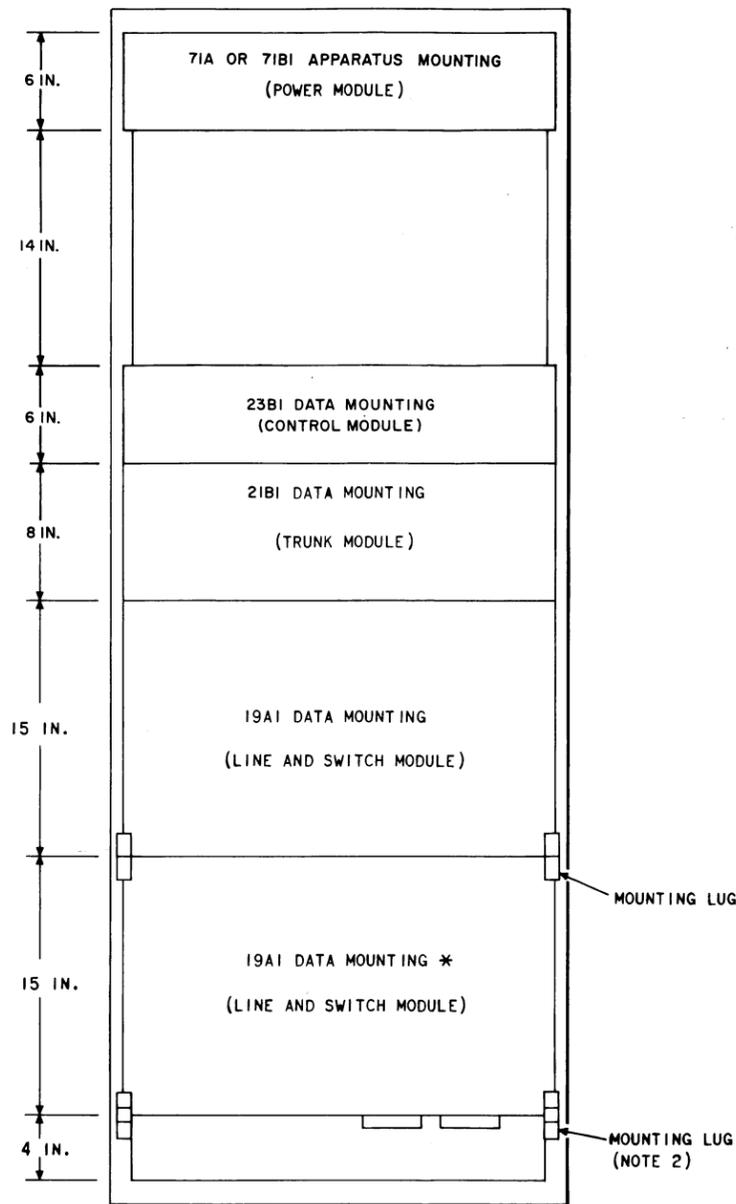
† NUMBER REQUIRED

Fig. 2—Typical Concentrator Installations



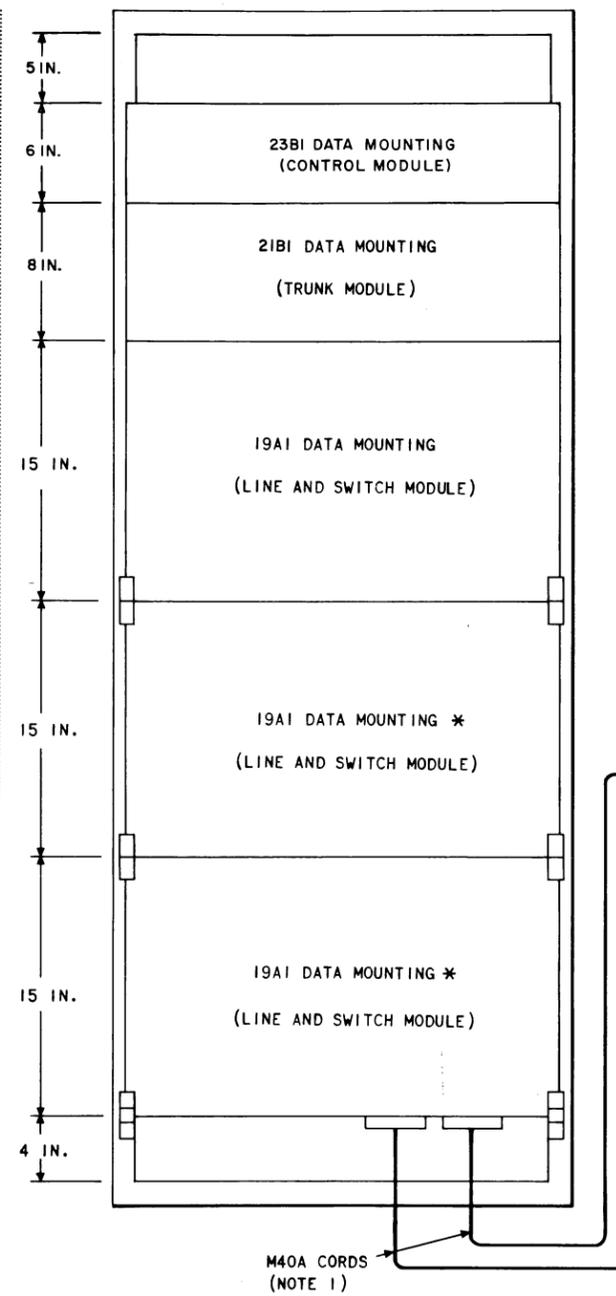
REAR

(a) 1 TO 8 TRUNKS
1 TO 128 LINES



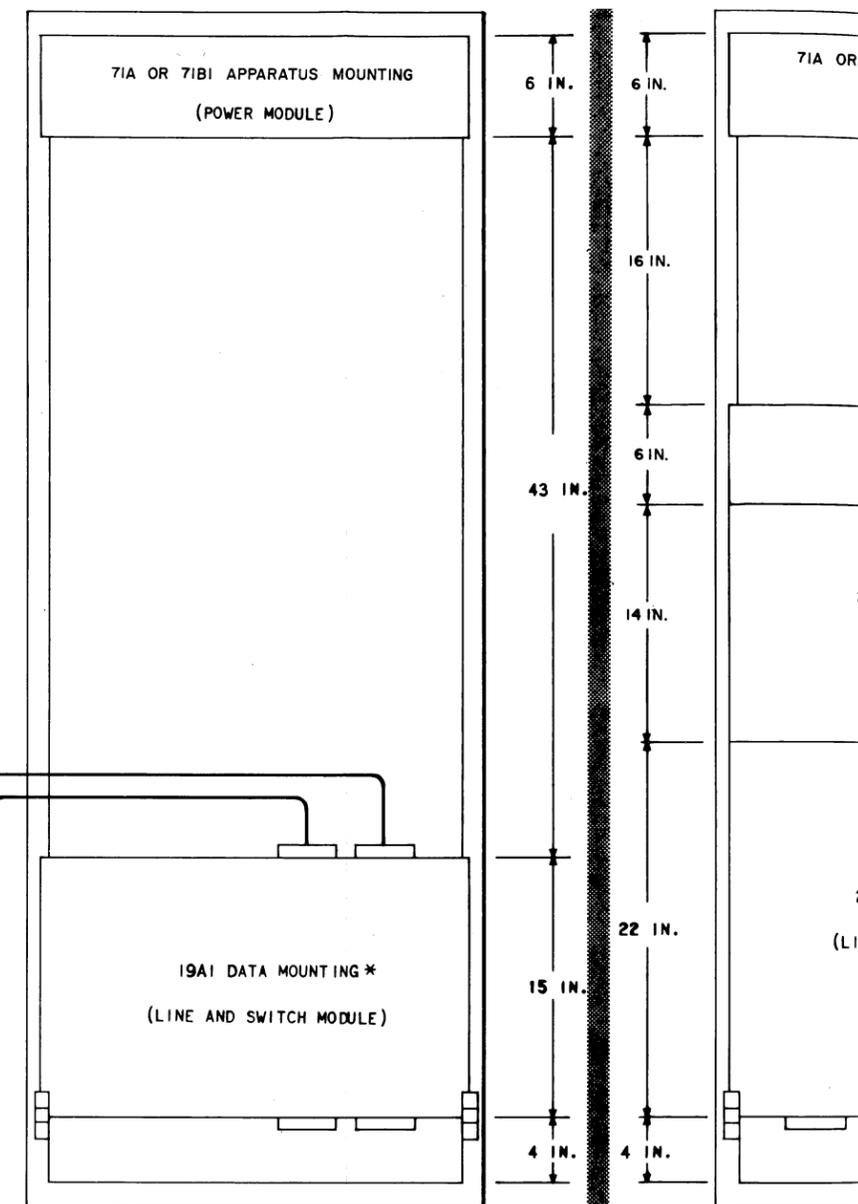
REAR

(b) 9 TO 16 TRUNKS
33 TO 64 LINES



REAR

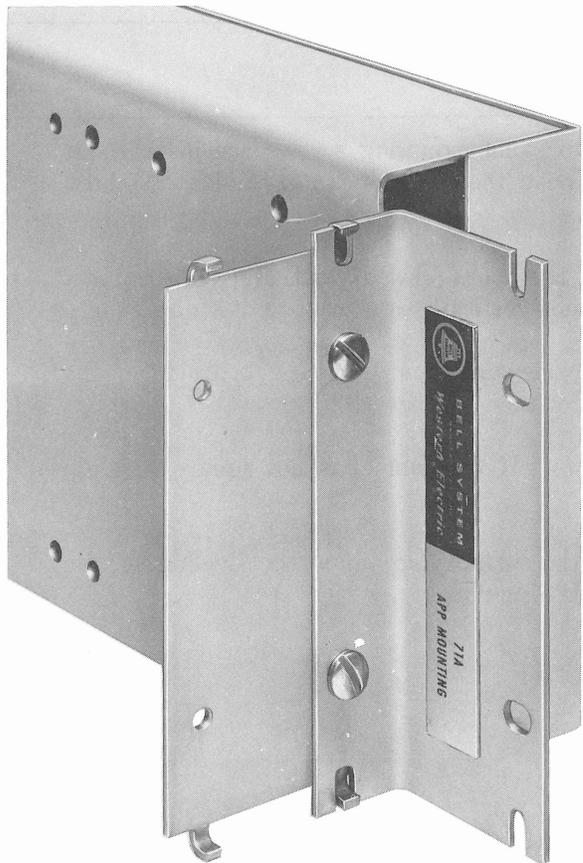
(c) 9 TO 16 TRUNKS
65 TO 128 LINES



FRONT

(d)

STEP	PROCEDURE
7	Balance the bottom mounting in position until two panel mounting screws are installed at the top of the mounting. Install two more screws in the lower mounting holes. Tighten these four screws finger tight only.
8	Place a level with plumb vial against the front of the doors (closed), and adjust the cabinet leveling screws at the bottom until the cabinet stands vertically in a front-to-rear direction.
9	Adjust the cabinet for squareness by applying a sideward hand pressure to a side of the cabinet top.
10	Securely tighten the bottom data mounting screws. If the cabinet is not square, the top edges of the doors will be noticeably misaligned.
11	Place a level with plumb vial against the side of the cabinet and adjust the leveling screws so that the cabinet stands vertically in a side-to-side direction.
12	Repeat Step 8, if necessary.
13	tighten the locknuts on the leveling feet.
14	Remove the 71A (or 71B) apparatus mounting.
15	Install the front door panel. Install the KS-20129 power strip (if required) as shown in B-746670, Fig. 2. (This drawing is packed with the power strip.)
16	When cabling is top fed, install cabinet duct work.



EQUIPPED FOR 25 INCH
MOUNTING RACKS



EQUIPPED FOR 23 INCH
MOUNTING RACKS

Fig. 3—Data Mounting Brackets Arranged for 23- or 25-Inch Racks

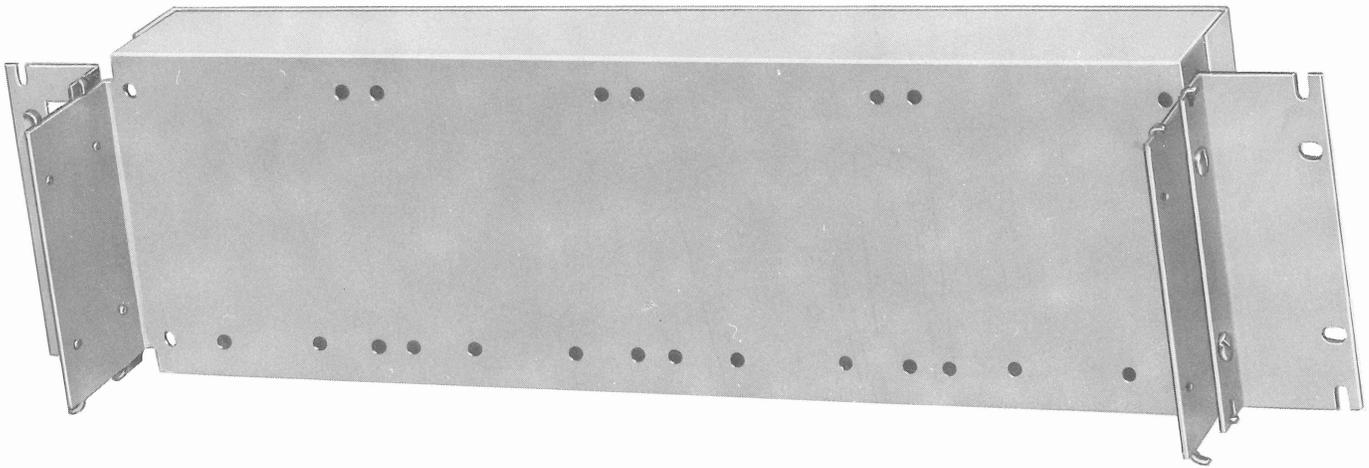


Fig. 4-71A Apparatus Mounting

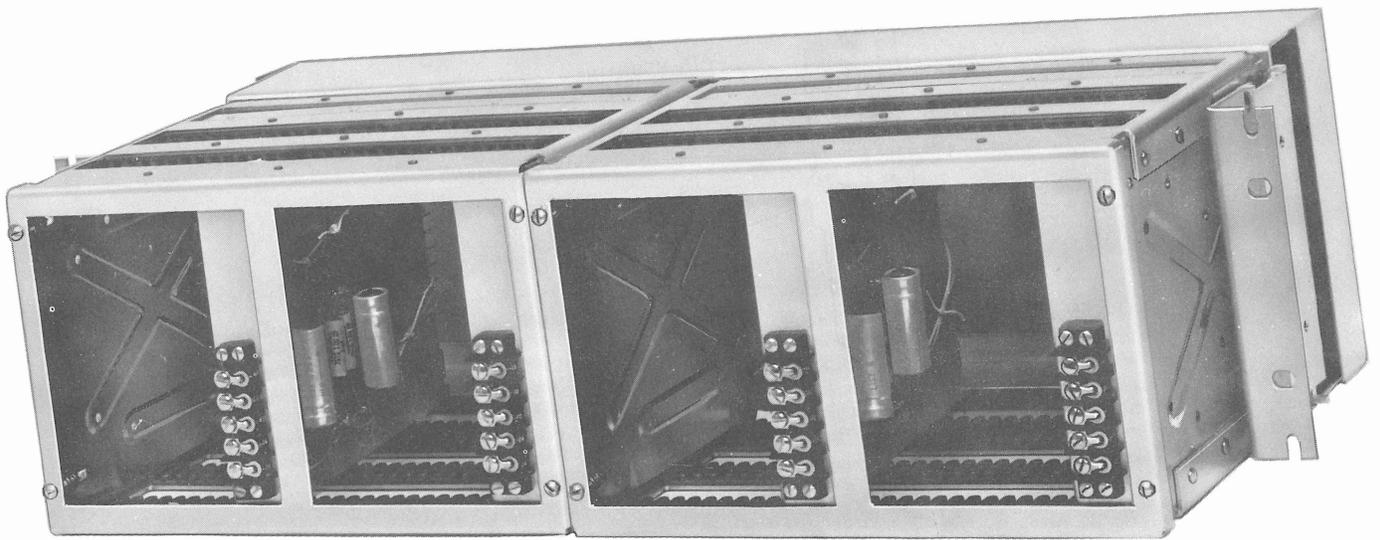


Fig. 5-71B Apparatus Mounting

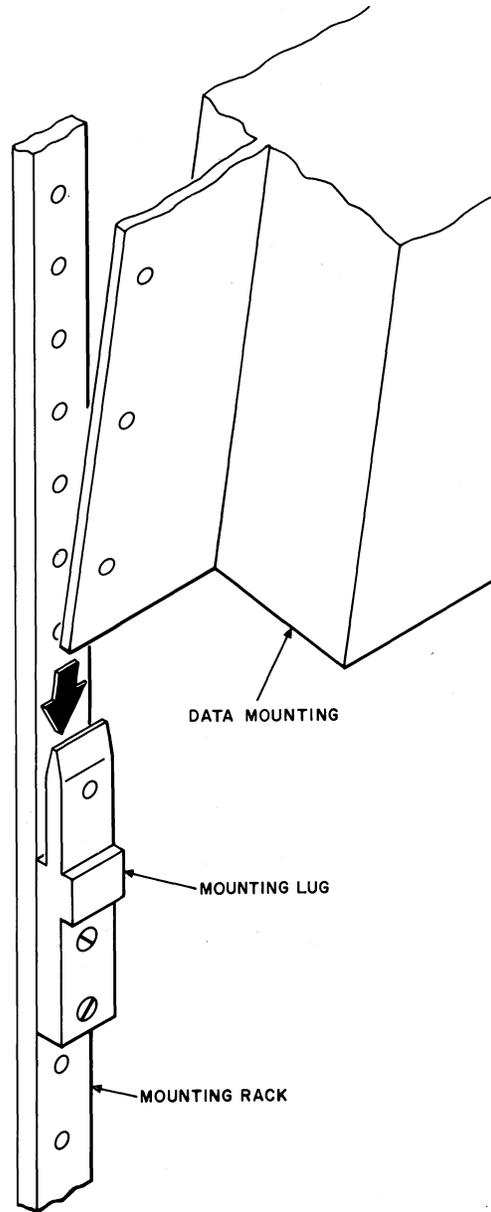


Fig. 6—Installation of Bottom Module Using Mounting Lug

C. Module Installation and Connection

STEP	PROCEDURE
1	<p>Install the power supply module as follows:</p> <p>(a) When 110-volts ac power is to be used, install one (for 1 to 32 line concentrator) or three (for 33 to 128 line concentrator) KS-20575-L1 rectifier(s) on the 71A apparatus mounting (Fig. 7).</p> <p>(b) When central office battery (-48 volts dc) is to be used, install one (for 1 to 32 line concentrator) or two (for 33 to 128 line concentrator) J87308B converter(s) on the 71B apparatus mounting (Fig. 8).</p>
2	<p>Install the power supply module in the top of the cabinet.</p> <p> Connections between vertically adjacent trunk modules and line and switch modules or trunk modules and control modules are made with 198B adapters (Fig. 9). Connections between trunk modules and line and switch modules or trunk modules and control modules that are not vertically adjacent require M40A cords in addition to the 198B adapters.</p>
3	<p>Insert the required number of 198B adapters into the top connectors on the lower data mounting.</p>
4	<p>When a 19A1 or 20A1 Data Mounting is to be placed above a lower one, install mounting lugs as shown in Fig. 10.</p>
5	<p>Lower second mounting carefully onto bottom, making certain that mounting does not tilt forward and that guide pins on lower module engage properly in top module.</p>
6	<p>Continue installing 198B adapters and stacking mountings.</p>
7	<p>When data mountings that must be interconnected are not vertically adjacent to another data mounting, insert 198B adapters in both mountings and interconnect by using M40A cords.</p>
8	<p>Terminate the last (bottom) 18A1, 19A1, or 20A1 Data Mounting by plugging 198A adapters (Fig. 11) into the bottom connectors.</p> <p>Note: The line and switch module that interconnects with the trunk module is considered to be the first line and switch module. The first line and switch module interconnects with the second, etc.</p>
9	<p>Using M50H cords or double-ended A25D connector cables, connect J2A, J2B, J2C, and J2D of the 23B1 Data Mounting to J2 of the first through fourth 18A1, 19A1, or 20A1 Data Mounting, respectively.</p>
10	<p>Using 16-gauge (or heavier) solid wire, connect power from the KS-20575 rectifiers (or J87308B converters) to the 23B1 Data Mounting and 21B1 (or 22B1) Data mountings as described in the following and shown in Table B.</p>

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STEP	PROCEDURE
	<p>(a) Cut three pieces of 16-gauge (or heavier) solid wire long enough to dress from TB1 of the 23B1 Data Mounting to the terminal strip of the first rectifier or converter to TB2 of the 21B1 (or 22B1) Data Mounting.</p> <p>(b) Remove a portion of the insulation near the center of each wire leaving one end long enough to reach from the rectifier terminal strip to TB1 of the 23B1 Data Mounting and the other end long enough to reach from the rectifier terminal strip to TB2 of the 21B1 (or 22B1) Data Mounting.</p> <p>(c) Wrap the exposed portion of one wire around the + terminal of the first rectifier (or converter) once and tighten the terminal screw at this time.</p> <p>(d) Strip one end of the wire, connect it to TB1 + of the 23B1 Data Mounting, and tighten the terminal screw.</p> <p>(e) Strip the other end of the wire, connect it to TB2 + (terminal 2) of the 21B1 (or 22B1) Data Mounting, and do not tighten the terminal screw.</p> <p>(f) Repeat Steps (c) through (e) for the – terminals.</p> <p>(g) Repeat Steps (c) through (e) for the GRD terminals.</p> <p>Note: The exposed portion of the GRD wire must be wrapped around the COM terminal of the rectifier once and then around the GRD terminal of the rectifier once before being delivered to the data mountings.</p> <p>(h) Complete wiring as shown in Table B.</p>
11	<p>Connect power to the 18A1, 19A1, or 20A1 Data Mounting(s) as shown in Table B and tighten all of the screw terminals on TB2 of the 21B1 (or 22B1) Data Mounting and 18A1, 19A1, or 20A1 Data Mounting(s).</p>
12	<p>When 110 volts ac is used to power the concentrator, plug strip into ac outlet and then plug KS-20575 rectifier(s) into power strip.</p>
13	<p>When central office battery (–48 volts dc) is used to power the concentrator, connect ground to terminals designated GRD and –48 volts dc to terminals designated –48 on the 71B apparatus mounting.</p>
14	<p>Using a KS-16979-L1 (or equivalent) volt-ohm-milliammeter (VOM), check the voltages and polarities at all data mounting power terminal strips. The dc voltages measured between the + and GRD terminals or – and GRD terminals shall be +23.5 to +26.5 volts dc and –23.5 to –26.5 volts dc, respectively. At installations serving more than 32 lines, the voltage measured between the M terminal (TB1-4) and GRD on the 23B1 Data Mounting shall be –47 to –53 volts dc.</p>
15	<p>Disconnect input power (110 volts ac or central office battery) from the concentrator.</p>
16	<p>Dress the cord neatly alongside of cabinet and secure, using clips provided. Magnetic cable retainers, such as the KS-20093-L8, should also be used in all but the smallest installations.</p>

STEP	PROCEDURE
17	Verify that the proper camp-on duration option strap is installed in the AR597 CP. The strap must be set to correspond to the speed of the stations being served; that is, to 300 for 300-baud station, 150 for 150-baud stations, or 75 for 75- to 110-baud stations.
18	<p>Install the following CPs in the respective slots of the 23B1 Data Mounting.</p> <ul style="list-style-type: none"> ● AR489—Clock circuit (slot 05) ● AR377—Dual access control circuit (slot 21) ● AR490—Alarms and registers (slot 07) ● AR383—Dual access line scanner (slot 17) ● AR376—Dual access trunk scanner (slot 19) ● FP1—Pulser (shipped in place) ● AR597—Camp-on signal generator (slot 13) ● AR381—Dc/dc converter (slot 01) ● AR464—P/o manual test circuit (slot 11). <p>Note: Pin assignments for line and trunk circuit equipment are compatible with key telephone wiring practices for 25-pair cables.</p>
19	Connect the lines to J7A and J7B of the 18A1, 19A1, or 20A1 Data Mounting(s) in accordance with Table C.
20	<p>Insert AR366 CPs (line circuits) into slots 1 through 16 (as required) of the 18A1, 19A1, or 20A1 Data Mounting(s).</p> <p>Note: Each AR366 CP contains two complete line circuits. Therefore, the total number of CPs required will be half the number of lines being served.</p>
21	Connect the trunks to J4A of the 21B1 Data Mounting or J4A and J4B of the 22B1 Data Mounting in accordance with Table D.
	 <p>Slots (CP positions) 1 through 8 and 1 through 16 of the 21B1 and 22B1 Data Mountings, respectively, are equipped to accept trunk group A (AR488) CPs only. Slots 9 through 16 and 17 through 32 of the 21B1 and 22B1 Data Mounting, respectively, are equipped (to accept EITHER trunk group A or trunk group B (AR382) CPs. For an 8-trunk system when the 18A1 Data Mounting is used, only slots 8 through 16 of the 21B1 Data Mounting can be equipped with trunk CPs.</p>
22	Insert AR488 CPs into all slots connected to trunks assigned to trunk group A.
23	Insert AR382 CPs into all slots connected to trunks assigned to trunk group B.

STEP	PROCEDURE
	<p><i>Note:</i> The AR488 and AR382 CPs provide one complete trunk circuit each. Therefore, one AR488 CP is required for each trunk assigned to group A and one AR382 CP is required for each trunk assigned to group B.</p>
24	Connect the 11-foot cord provided on the AR464 CP to P5 of the DAS 803E1. The DAS 803E1 is provided with a clip on the side to allow storage on the left side of the line and switch or trunk module.
25	Apply power to the concentrator as described in Step 11 or 12.
26	Repeat Step 13 using +22 to +26 volts dc, -22 to -26 volts dc, and -44 to -52 volts dc as the required voltages. The +24 and -24 volt readings must be within 2 volts of each other.
27	Perform Part 5 of this section.

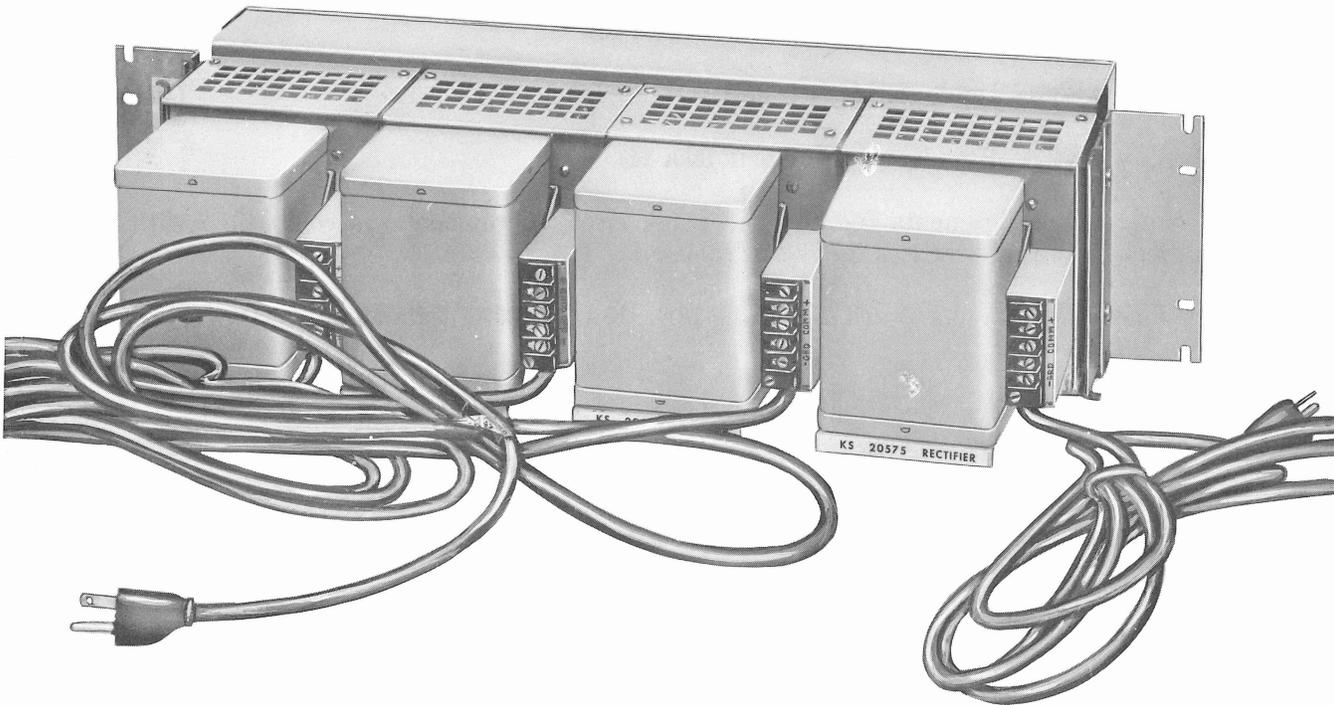


Fig. 7—71A Apparatus Mounting Equipped With Four KS-20575 Rectifiers

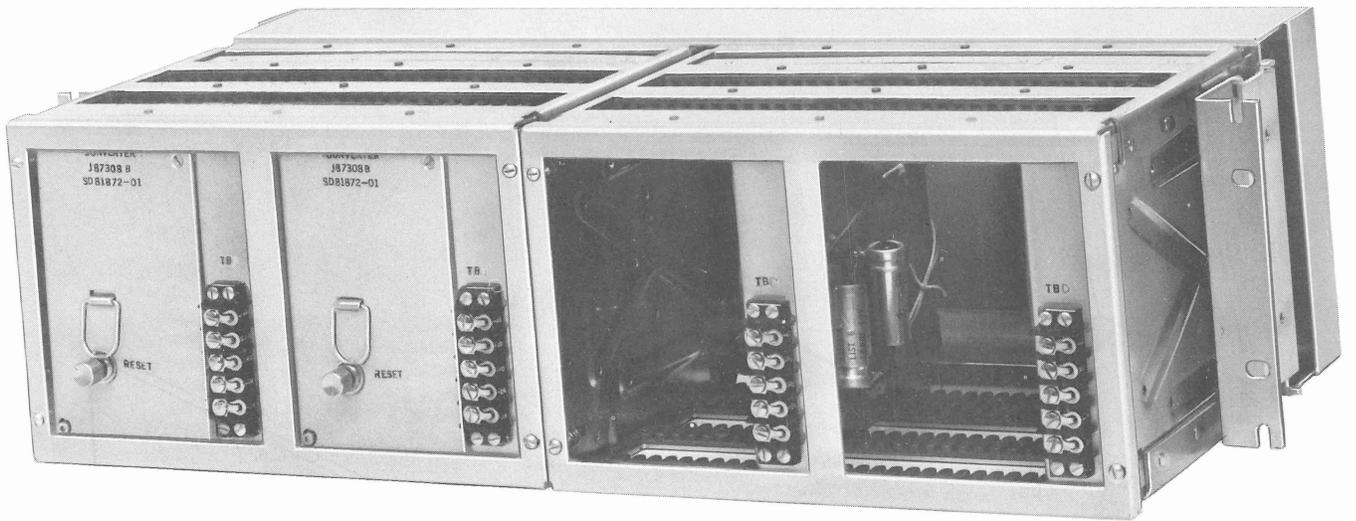


Fig. 8—71B Apparatus Mounting Equipped With Two J87308B Converters

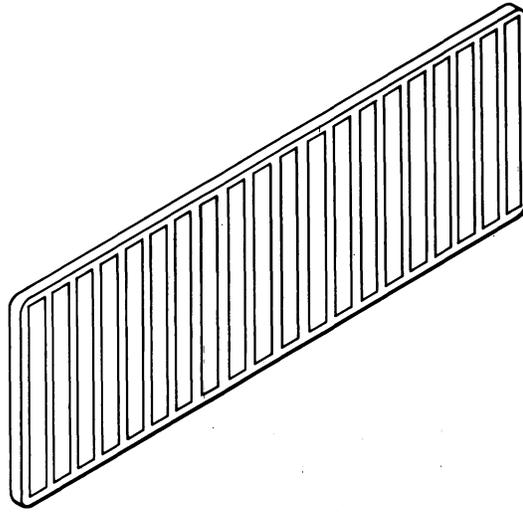


Fig. 9—198B Adapter

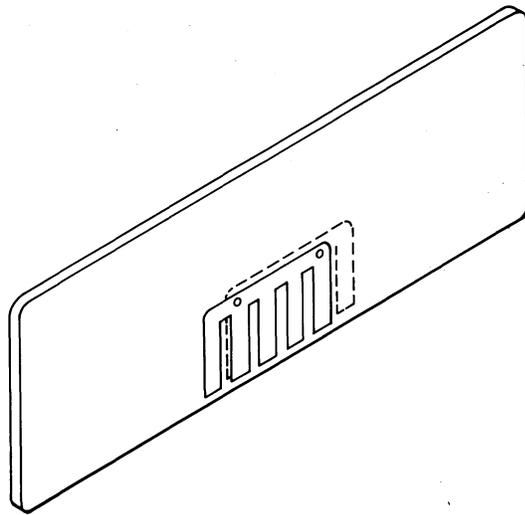
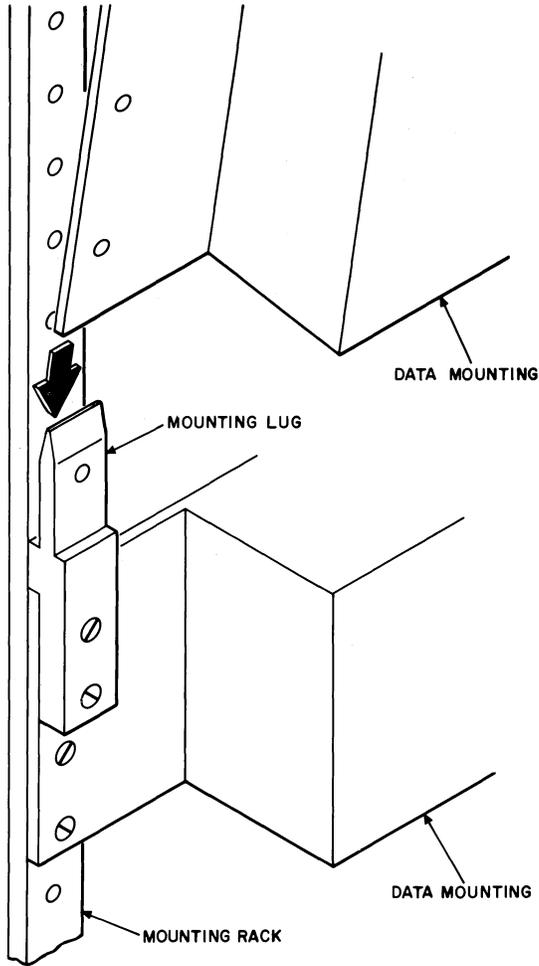


Fig. 11—198A Adapter

Fig. 10—Installation of One Module Above Another Using Mounting Lug

TABLE C

**LINE CONNECTIONS TO
LINE AND SWITCH MODULES**

CKT PACK	LINE NO.	PIN NO.		JACK
		TIP	RING	
1	1	1	26	J7A
	2	2	27	
2	3	3	28	
	4	4	29	
3	5	5	30	
	6	6	31	
4	7	7	32	
	8	8	33	
5	9	9	34	
	10	10	35	
6	11	11	36	
	12	12	37	
7	13	13	38	
	14	14	39	
8	15	15	40	
	16	16	41	
9	17	1	26	J7B
	18	2	27	
10	19	3	28	
	20	4	29	
11	21	5	30	
	22	6	31	
12	23	7	32	
	24	8	33	
13	25	9	34	
	26	10	35	
14	27	11	36	
	28	12	37	
15	29	13	38	
	30	14	39	
16	31	15	40	
	32	16	41	

TABLE D

**TRUNK CONNECTIONS TO
TRUNK MODULE**

TRUNK NO.	PIN NO.		JACK
	TIP	RING	
1	26	1	J4A
2	27	2	
3	28	3	
4	29	4	
5	30	5	
6	31	6	
7	32	7	
8	33	8	
9	34	9	
10	35	10	
11	36	11	
12	37	12	
13	38	13	
14	39	14	
15	40	15	
16	41	16	
17	26	1	
18	27	2	
19	28	3	
20	29	4	
21	30	5	
22	31	6	
23	32	7	
24	33	8	
25	34	9	
26	35	10	
27	36	11	
28	37	12	
29	38	13	
30	39	14	
31	40	15	
32	41	16	

5. INSTALLATION TESTS (Before Lines are Connected)

5.01 Two test procedures are described in the following text. The first utilizes the manual

test equipment and the second utilizes a test jig (Fig. 12) that may be built from standard parts. When the manual test set is used, about 30 seconds will be required to test each crosspoint. (The total

number of crosspoints is equal to the product of the number of lines and the number of trunks.) The second test fixture allows testing of each crosspoint in about three seconds.

Tests Using Manual Test Equipment

5.02 After the concentrator installation is complete, it may be tested for proper line to trunk connections by using the manual test equipment (DAS 803E1 and AR464 CP). A meter, such as

the KS-16979-L1 (or equivalent) VOM, is also required.

5.03 Maintenance personnel at the concentrator can establish any desired line-to-trunk connection through the concentrator switching network by using the manual test equipment.

5.04 The manual test equipment connects the line and trunk circuits through the use of two cords—a line cord from the DAS 803E1 and a

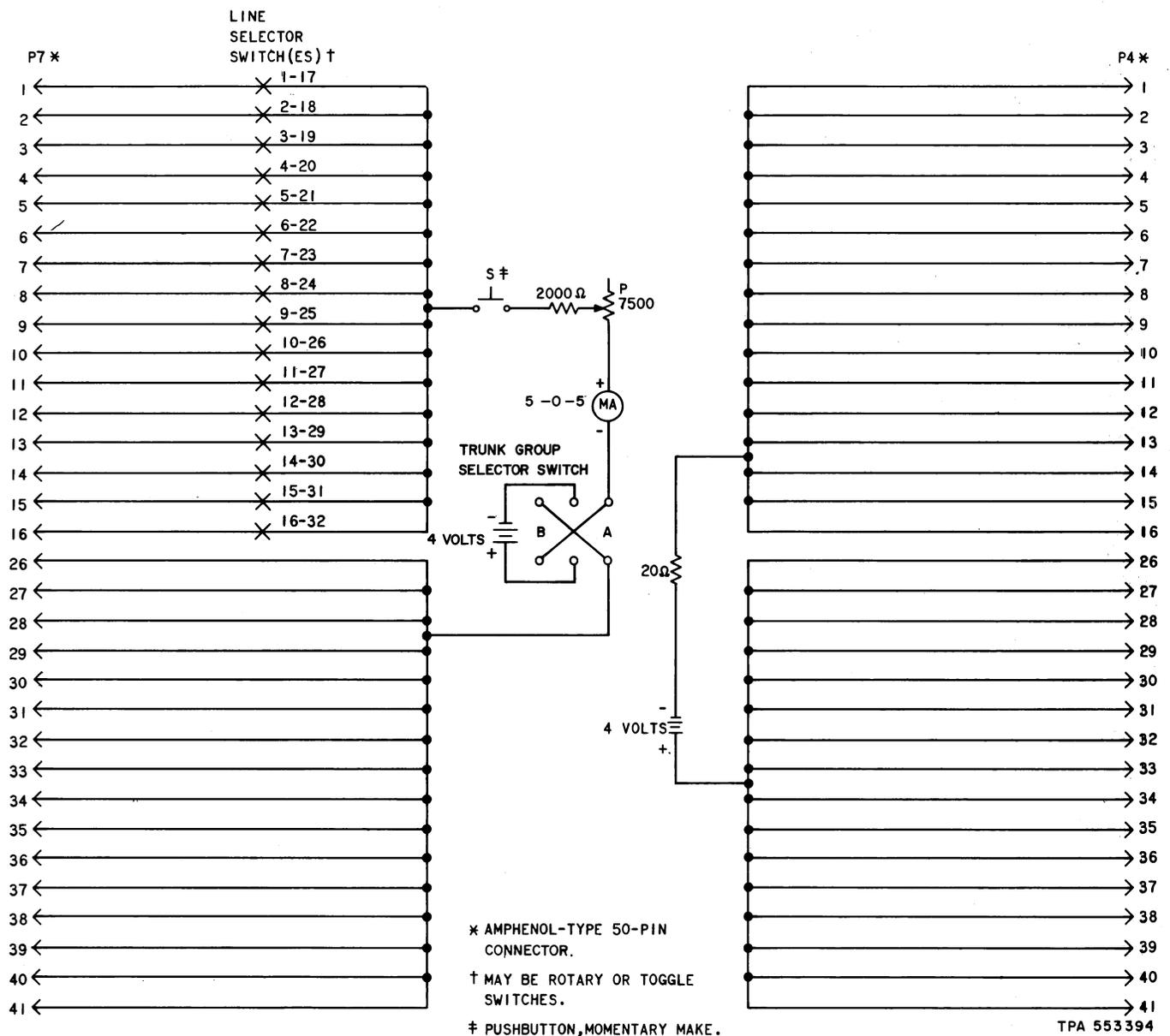


Fig. 12—Optional Concentrator Installation Test Set

trunk cord from the AR464 CP. The line and trunk cords connect to the line circuit packs (AR366) and trunk circuit packs (AR488 or AR382) corresponding to the line and trunk to be tested.

5.05 Initial installation testing consists of checking every crosspoint in the switching matrix. For small concentrators, the following procedure may be used.

STEP	PROCEDURE
1	<p>Operate the switch on front of DAS 803E1 (Fig. 13) to the OFF position.</p> <div data-bbox="560 567 1201 1312" style="text-align: center;"> </div>
2	<p>Connect test clips 2-10, 4-12, 5-13, and 6-14 (red) of the line cord (cord from DAS 803E1) to TP2, TP4, TP5, and TP6, respectively, of the AR366 circuit pack in slot 1 of the line and switch module.</p>
3	<p>Connect the test clip 3-1-11-9 (black) of the line cord to TP3 of the AR366 circuit pack of Step 2.</p>
4	<p>Connect test clips 1, 2, 9, 10, 11, 12, 13, and 14 (black) of the trunk cord (cord from AR464 circuit pack) to TP1, TP2, TP9, TP10, TP11, TP12, TP13, and TP14 of the AR488 CP in the first slot of the trunk module.</p>
5	<p>Operate the switch on front of DAS 803E1 to the TRK HOLD position.</p>

Fig. 13—Data Auxiliary Set 803E1

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STEP	PROCEDURE
	<p>Requirement: LB and TB lamps extinguished.</p> <p>Note: A lighted LB or TB lamp indicates the line circuit or trunk circuit, respectively, is busy. Step 6 cannot be performed until both lamps are extinguished. Ignore the CF lamp indication.</p>
6	<p>Operate switch on DAS 803E1 to LINE CONN position.</p> <p>Requirement: LB, TB, and CONN lamps lighted.</p>
7	<p>Operate switch on DAS 803E1 to TIP position.</p>
8	<p>Condition VOM to measure 200 ohms and measure resistance between the COM and RES binding posts on DAS 803E1 (see Fig. 13).</p> <p>Requirement: VOM indicates 200 ohms or less.</p>
9	<p>Operate switch on DAS 803E1 to RING/LINE position.</p> <p>Requirement: VOM indicates 200 ohms or less.</p>
10	<p>Operate switch on DAS 803E1 to the TRK HOLD position.</p>
11	<p>Disconnect line cord and connect test clips 2-10, 4-12, 5-13, and 6-14 (red) to TP10, TP12, TP13, and TP14 of AR366 CP in the first slot of line and switch module.</p>
12	<p>Connect test clip 3-1-11-9 (black) to TP11.</p>
13	<p>Repeat Steps 5 through 10.</p>
14	<p>Operate switch on DAS 803E1 to TRK HOLD position.</p>
15	<p>Disconnect line cord and repeat Steps 2, 3, and 5 through 14 for each AR366 CP mounted in the line and switch module.</p>
16	<p>Disconnect both the line cord and trunk cord.</p>
17	<p>Repeat Steps 2 through 16 for each AR488 CP mounted in the trunk module.</p>
18	<p>Perform Step 2 and connect test clip 3-1-11-9 (black) to TP1 of the AR366 in slot 1 of the line and switch module.</p>
19	<p>Connect test clips 1, 2, 9, 10, 11, 12, 13, and 14 (black) of the trunk cord to TP1, TP12, TP9, TP10, TP11, TP2, TP13, and TP14, respectively, of the first AR382 circuit pack in the trunk module.</p>
20	<p>Repeat Steps 5 through 10.</p>
21	<p>Disconnect line cord and perform Step 11.</p>

STEP	PROCEDURE
22	Connect test clip 3-1-11-9 (black) to TP9.
23	Repeat Steps 5 through 10.
24	Disconnect line cord and repeat Steps 18 and 20 through 23 for each AR366 CP mounted in line and switch module.
25	Disconnect both the line cord and trunk cord.
26	Repeat Steps 18 through 25 for each AR382 CP mounted in the trunk module.
27	Store DAS 803E1 on left side of line and switch or trunk module.

5.06 Initial installation testing may also be performed by using the apparatus shown in Fig. 12. This test set must be built by telephone

personnel; however, its use greatly reduces the time required to perform the test. The following procedure is to be used with the optional test set.

STEP	PROCEDURE
	21B1 or 22B1 Data Mounting
1	Using an M50H cord, connect P7 of the test set to P7A of the first line and switch module.
2	Using an M50H cord, connect P4 of the test set to P4A of the trunk module.
3	Set the LINE SELECTOR switch on the test set to the 1-17 position.
	Note: In this position, the trunks will be connected to line 1.
4	Operate TRUNK GROUP SELECTOR switch to A.
5	Condition the VOM to measure 24 volts dc.
6	Connect the + probe of the VOM to TP10 of the first AR488 CP in the trunk module.
7	Connect the - probe of the VOM to frame ground.
	Note: VOM indicates 24 volts when the trunk is idle and zero volts when it is connected to a line.
8	Operate potentiometer P fully counterclockwise (minimum resistance position).
9	Operate and hold operated switch S.
10	If VOM indicates 24 volts, repeatedly release and operate switch S until VOM indicates zero volts. When VOM indicates zero volts, hold switch S operated and perform Step 11.

STEP	PROCEDURE
11	<p>Decrease loop current with potentiometer P until line is disconnected (VOM indicates 24 volts).</p> <p>Requirement: If TRUNK GROUP SELECTOR switch is in position A— Meter on test set indicates between + 1.5 and +2.0 mA just prior to disconnect. If TRUNK GROUP SELECTOR switch is in position B— Meter on test set indicates between -1.5 and -2.0 mA just prior to disconnect.</p> <p>Note: Do not change the position of the TRUNK GROUP SELECTOR switch at any time while performing Step 11.</p>
12	<p>Return potentiometer P to fully counterclockwise position, release and operate switch S, and repeat Step 11.</p>
13	<p>If TRUNK GROUP SELECTOR switch is in position A— Repeat Step 12 for each remaining AR488 CP in trunk positions 1 through 16.</p>
14	<p>If TRUNK GROUP SELECTOR switch is in position B and the concentrator is equipped with the 21B1 Data Mounting— Repeat Step 12 for each remaining AR382 CP in trunk positions 9 through 16.</p> <p>Note: Do not change the position of the TRUNK GROUP SELECTOR switch at any time while performing Step 13 or 14.</p>
15	<p>Operate LINE SELECTOR switch to 2-18 position and repeat Steps 8 through 14.</p>
16	<p>Repeat Steps 8 through 14 with the LINE SELECTOR switch in each of positions 3-19 through 16-32.</p> <p>Note: If any slot in the line and switch module is not equipped with an AR366 CP, the corresponding position on the LINE SELECTOR switch should be omitted (eg, slots 14, 15, and 16 not equipped with circuit packs; omit positions 14-30, 15-31, and 16-32 on LINE SELECTOR switch).</p> <p>21B1 Data Mounting Only</p>
17	<p>Disconnect the VOM + probe, connect it to TP10 of the first AR382 CP in slots 9 through 16; operate TRUNK GROUP SELECTOR switch to the B position, set the LINE SELECTOR switch to 1-16 position), and repeat Steps 8 through 16.</p>
18	<p>Disconnect P7 of the test set, connect it to P7B of the line and switch module, and repeat Steps 2 through 17.</p> <p>Note: If testing a 21B1 Data Mounting, the test is now complete. If not, proceed with Step 19.</p> <p>22B1 DAta Mounting Only</p>
19	<p>Disconnect P7 of the test set, connect it to P7B of the line and switch module and repeat Steps 2 through 16.</p>

STEP	PROCEDURE
20	Disconnect P4 of the test set, connect it to P4B on the trunk module.
21	Disconnect the VOM + probe, connect it to TP10 of the first AR488 CP in slots 17 through 32 of the trunk module, and set LINE SELECTOR switch to 1-17.
22	Operate potentiometer P fully counterclockwise (minimum resistance).
23	Operate and hold operated switch S.
24	If VOM indicates 24 volts, repeatedly release and operate switch S until VOM indicates zero volts. When VOM indicates zero volts, hold switch S operated and perform Step 25.
25	Decrease loop current with potentiometer P until line is disconnected (VOM indicates 24 volts).
	<p>Requirement: If TRUNK GROUP SELECTOR switch is in position A—</p> <p>Meter on test set indicates between +1.5 and +2.0 mA just prior to disconnect. If TRUNK GROUP SELECTOR switch is in position B—</p> <p>Meter on test set indicates between -1.5 and -2.0 mA just prior to disconnect.</p> <p>Note: Do not change the position of the TRUNK GROUP SELECTOR switch at any time while performing Step 25.</p>
26	Return potentiometer fully to counterclockwise position, release and operate switch S, and repeat Step 25.
27	If the TRUNK GROUP SELECTOR switch is in position A—
	Repeat Step 26 for each remaining AR488 CP in trunk positions 17 through 32.
28	If the TRUNK GROUP SELECTOR switch is in position B—
	Repeat Step 26 for each remaining AR382 CP in trunk positions 17 through 32.
	Note: Do not change the position of the TRUNK GROUP SELECTOR switch at any time while performing Steps 27 or 28.
29	Repeat Steps 22 through 28 with the LINE SELECTOR switch in each of positions 2-18 through 16-32.
	Note: If any slot in the line and switch module is not equipped with an AR366 CP, the corresponding position on the LINE SELECTOR switch should be omitted.
30	Disconnect the VOM + probe, connect it to TP10 of the first AR382 CP in slots 17 through 32 of the trunk module, operate the TRUNK GROUP SELECTOR switch to B, set the LINE SELECTOR switch to 1-17, and repeat Steps 22 through 29.
31	Disconnect P7 of the test set, connect it to P7A of the line and switch module, operate the TRUNK GROUP SELECTOR switch to position A, and repeat Steps 21 through 30.
32	Test Complete. Disconnect both test set connectors and restore service connectors.