NO. 400 DATA PACKAGE

METHOD OF CONNECTING - INTERCONNECTING - INTERNAL WIRING

Contents

1. GENERAL

1.01 This section provides information necessary to make connections, add additional components, interconnect cabinets List 1 and List 4, and to place option strapping.

1.02 Installation of the No. 400 Data Package is covered in BSP 580-000-951. Installation tests are covered in Section 580-000-952.

1.03 All terminal strips (TS) intended for internal wiring are wire-wrap type. For information on connecting this type of terminal see Section 069-132-877. To place strapping see Section 069-133-801.

1.04 Station Lines, trunks, traffic peg counting registers, alarms and miscellaneous -48V battery and ground connections will be connected on or extended through the 66E3-25 type connecting blocks shown in Figure 1. For information covering this type of connecting block see Section 461-604-103.

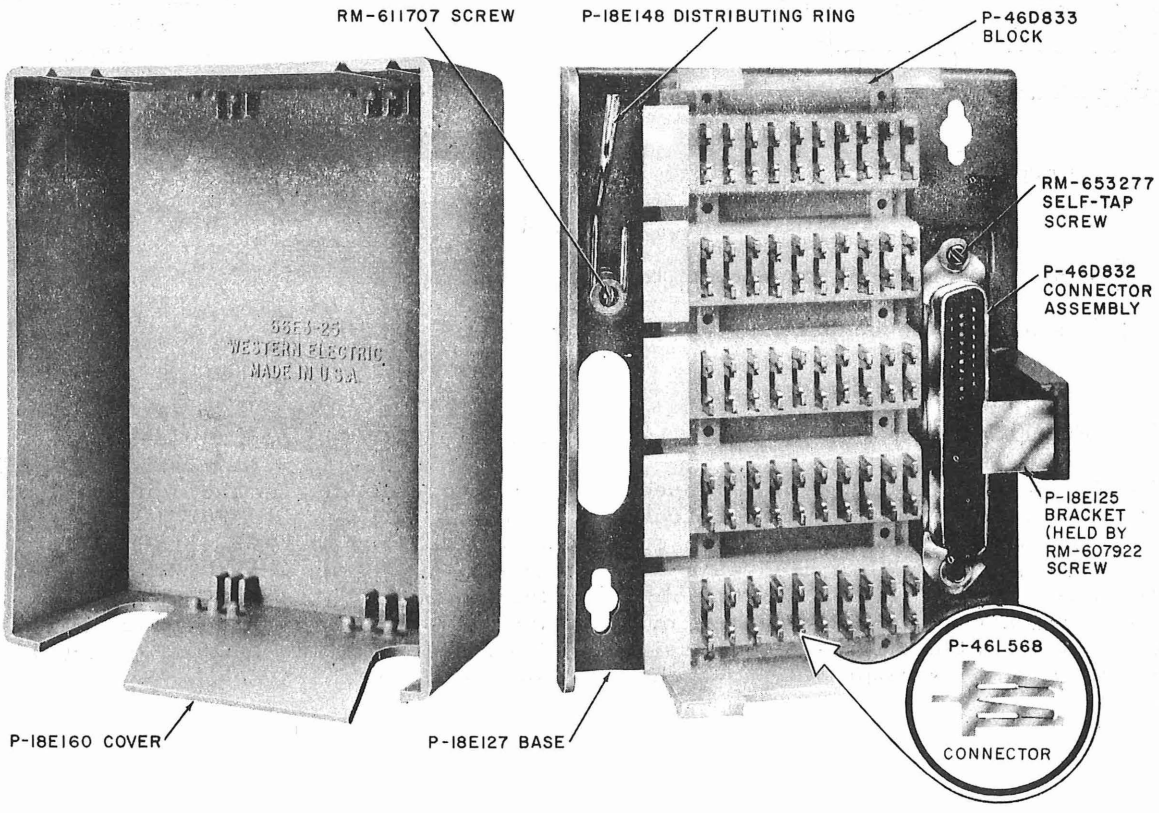


Fig. 1 - 66E3-25 Connecting Block

2. CONNECTING INFORMATION

2.01 To extend the line and traffic register leads from the No. 400 Data Package crown connectors use A25D connector cables. The cables are mated with the J and K connectors in the List 1 cabinet, and to the N, P, Q and R connectors in the List 4 cabinet. See PSD-2G030-01, CAD 11, 12, 14, 30, 31, 32, and 33 for details.

2.02 All inter-cabinet connections are made via plug-ended cables CT, DT, PT1, PT2, MA1, SF1, and SF2. These cables are located in the crown of the List 1 cabinet. They mate with similarly designated connector-ended cables from the crown of the List 4 cabinet as is shown in Figure 2. See PSD-2G030-01, Notes 302 and 303.

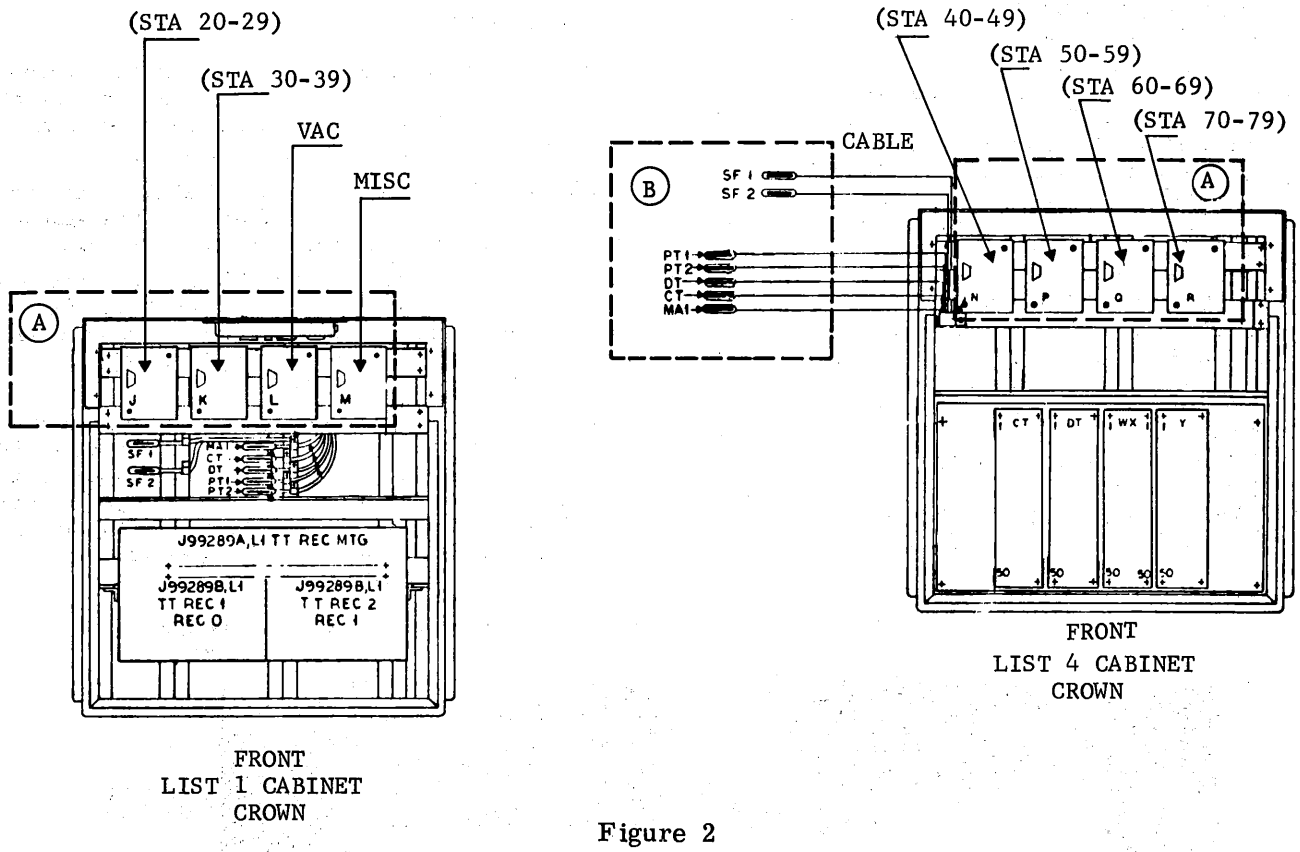


Figure 2

(A) Station and trunk connection terminals location

(B) AMPL cable connection for adding the List 4 cabinet

3. LINE CIRCUITS

3.01 The No. 400 Data Package is equipped with a universal type line unit. Circuits within this unit may be used either as a station line or as a trunk. When used as a trunk, the line circuit requires no strapping. When used as a station line, the circuit must be strapped for audible ringing. All unassigned line circuits must be strapped for no-such-number tone.

3.02 For all assigned station line circuits, strap the GEN terminal to the AT terminal corresponding to the units digit of the assigned line circuit. For all unassigned line circuits, strap the NSN terminal to the AT-terminal corresponding to the units digit of the unassigned line circuit. Figure 3 shows typical strapping arrangements on TS(A). Figure 4 shows the location of TS(A) on each line unit.

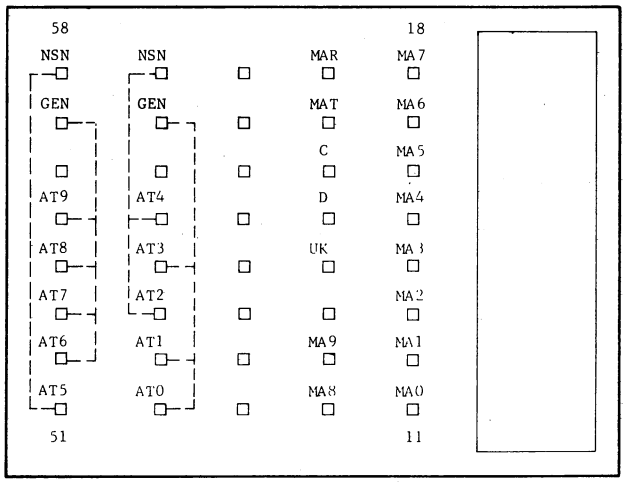


Figure 3

Typical strapping for assigned and unassigned ports (station or trunk terminations).

*TS A (20-29 Station Group)

EXAMPLE

Stations - 20, 21, 23, 26, 27, 28 and 29 are assigned stations.

Stations - 22, 24 and 25 are unassigned stations.

NOTE: When strappings adjacent terminal bare wire is to be used.

*Each tens group of line circuits is equipped with a TSA.

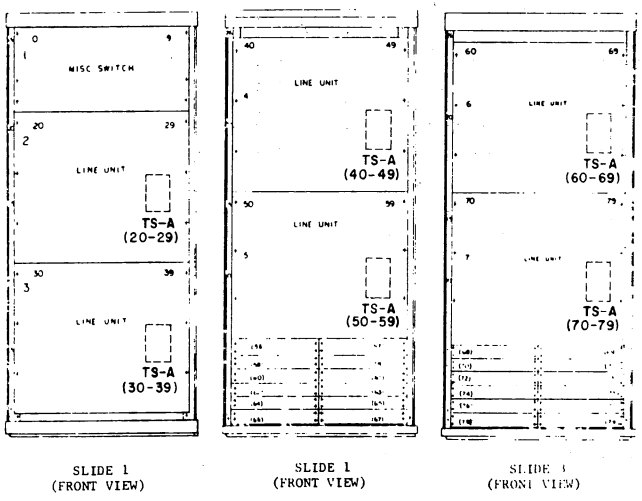


Figure 4
TS-A locations for individual tens groups line units.

3.03 Line circuits may be provided with wiring options for originating and terminating service (Options U and T), for originating service and primary number for call allotting (Options V and T), or for originating only service (Option U). Line circuits are normally furnished by the manufacturer wired for Options U and T. See PSD-2G031-01, Note 102, for further details.

3.04 Lines may be arranged within hunting groups so that when a called line within the group is busy, an idle line within the same group will be seized. The following hunting arrangements are possible within the No. 400 Data Package:

(a) Two way hunting, which provides no restriction on which station will be selected within the hunting group when a busy station is called.

(b) One way hunting, which restricts the search for an idle station to some single direction within a hunting group. This direction of search or hunting is determined through use of diodes.

(c) Combined hunting, which is a combination of both one way and two way hunting within the same hunt group. A hunting group is limited to not more than ten stations having the same ten digit.

(d) Sequential hunting, which is one way hunting arranged for either upward or downward selection of an idle station, but not for both (as is possible in one way hunting). It is limited to a single subgroup of not more than five stations having units digits 0 through 4, or 5 through 9.

3.05 Call allotting hunting is a special arrangement which uses a pilot number together with two stations arranged for two way hunting. A line circuit wired for Options V and T is used for the pilot number. Two stations in different hunting subgroups are arranged for two way hunting. The pilot number, being always busy to any incoming call, forces the call into hunting. Since the two hunting stations are in different subgroups, the ZU relay will act as an allotter, resulting in an equal average selection of the two stations.

3.06 The No. 400 Data Package is provided with a restrictive type class of service arrangement. With the exception of class 5, none of the classes have any definite assignment and may be used in any manner to best suit the requirements of the job.

3.07 With no class of service strapping provided, all stations have unlimited access. Any station can call any other station in the system. When a station is given a class of service, it is then limited to calling stations with a similar class.

3.08 By the use of diodes, stations may be assigned originate only or terminate only class of service.

3.09 Class of service 1 through 4 may be used in any order. They may also be combined, that is a station may be given more than one class of service. If this is desired, caution must be taken to insure that the straps and diodes used to not form unwanted paths.

3.10 Class of service 5 is used for retry denied class. Under this condition an originating station encountering a busy will receive busy tone immediately rather than advance to retry.

4. SIGNALING UNITS

4.01 All station lines or trunks must be equipped with a signaling circuit. At the time of initial installation, the Data Package may be equipped with only the actual amount of signaling units required at that time. Under these circumstances, additional units will have to be added as new station lines or trunks are added. There is also the possibility that the signal units may be changed for such reasons as change of location or reconnection of a line circuit to a different type of line facility. The facility and circuit design will determine which of the four types of signal units is required. These types include:

(a) DX signaling units

(b) 4-wire, loop-start or ground-start, signaling units

(c) 2-wire, loop-start or ground-start, signaling units

(d) Single-frequency (SF) signaling units

FEATURE OR OPTION				PROVIDE APP FIG	PROVIDE APP OR WRG	PROVIDE QUANTITY
WHEN CKT AT DISTANT END IS ARRANGED FOR MAX CONDUCTOR LOOP RESISTANCE RANGE OF 5000 OHMS				1		1 PER CKT
WHEN A & B REPEATER A & D OR USED T & R LEAD		LENGTH OF CABLE (ANY GA MAX 5000 OHMS CONDUCTOR LOOP RESISTANCE)				
CONNECT TO CABLE FACILITY VIA SX LEADS WITHOUT A SHUNT CAPACITOR AND THE DISTANT CKT HAS NO SHUNT CAPACITOR ACROSS THE A & B OR A & D LEADS	V4 REPEATER	0 TO 15 MILES			NONE	
		15 TO 60 MILES			H	
		60 TO 75 MILES			H	
CONNECT TO CABLE FACILITY VIA SX LEADS WITHOUT A SHUNT CAPACITOR ACROSS THE A & B OR A & D LEADS AND DISTANT CKT HAS A SHUNT CAPACITOR ACROSS ITS A & B OR A & D LEADS	V4 REPEATER	0 TO 15 MILES			J, G	
		15 TO 75 MILES			K, J, G	
TO CONVERT E & M SIGNALING TO 20 CYCLE RINGING LOOP OR GRD START	400 DATA PKG PER B OPTION (MD) PROVIDING OFF HOOK ON HOOK START DIAL		2 WIRE	2	R	1 PER CKT
			4 WIRE	3		
	400 DATA PKG PER S OPTION (STD) PROVIDING OFF HOOK START DIAL		2 WIRE	2	S	1 PER CKT
			4 WIRE	3		
WIRING REQUIRED FOR LOOP START INSTEAD OF GRD START IN APP FIG 2 OR 3					Z	

DX SIGNALING UNIT OPTION WIRING

OPT	*SIG UNITS TS-A	R REL WDG	A CAP TERM	R REL WDG	B CAP TERM
G	6—9 5—16				
H		4	T—8 B		T B
J			T—8 B—4		
K		8 4			B T
BIAS STRP	SEE NOTE 1				

Figure 5

*Terminal strip on each signaling circuit.

NOTE 1: Each DX signaling unit must be strapped, using the C, D and E resistors. The method used to calculate strapping requirement is:

a. Measure the loop resistance of one of the cable pairs to the station or to the C.O. providing signal repeating equipment.

b. Divide this loop resistance value by 2.

c. Add 1250 OHMs to loop resistance.

d. total of items C and B.

e. Strap out resistors C, D and E until the amount of D. ±125 OHMs remains in the circuit.

EXAMPLE:

(a) 1600 OHMs
(b) 1600 ÷ 2 = 800 Ohm
(c) Add 1250 Ohm
(d) Total 2050
(e) Strap as shown in Fig. 5 to obtain 2000 OHMs

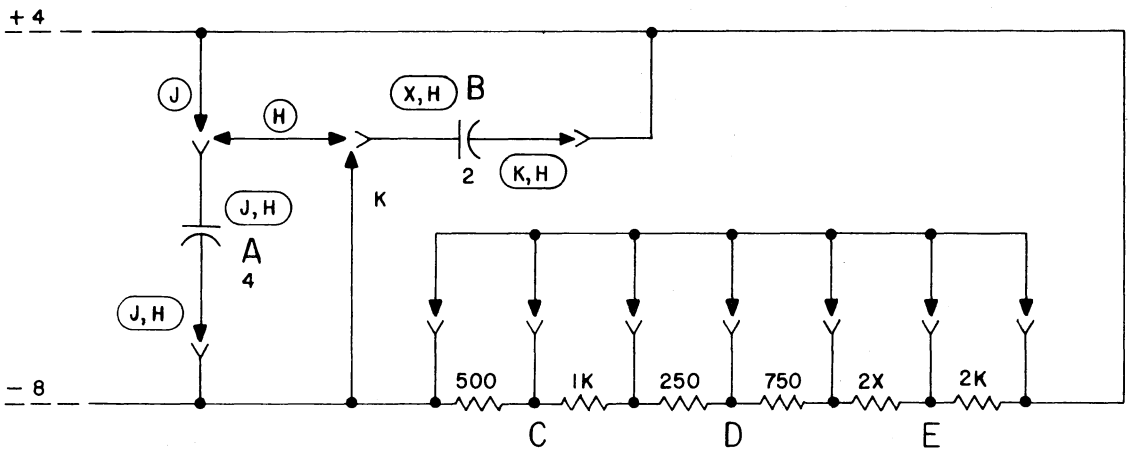


Figure 5
Part of the DX Signaling Unit

4.02 The DX signaling unit has options and strapping that are required at the time of installation. Changes to these initial options and strapping may be required at any time that changes to the transmission facility results in varying the DC loop resistance of the facility by more than 125 ohms from its initial value.

(a) Use Figure 5 wiring options for each station E/W DX signaling PSD-2G035-01-2-FS1 or List 6 signaling unit).

(b) If DX signaling unit has to be added, use Figures 6 and 7 to mount, wire and place otpions as required.

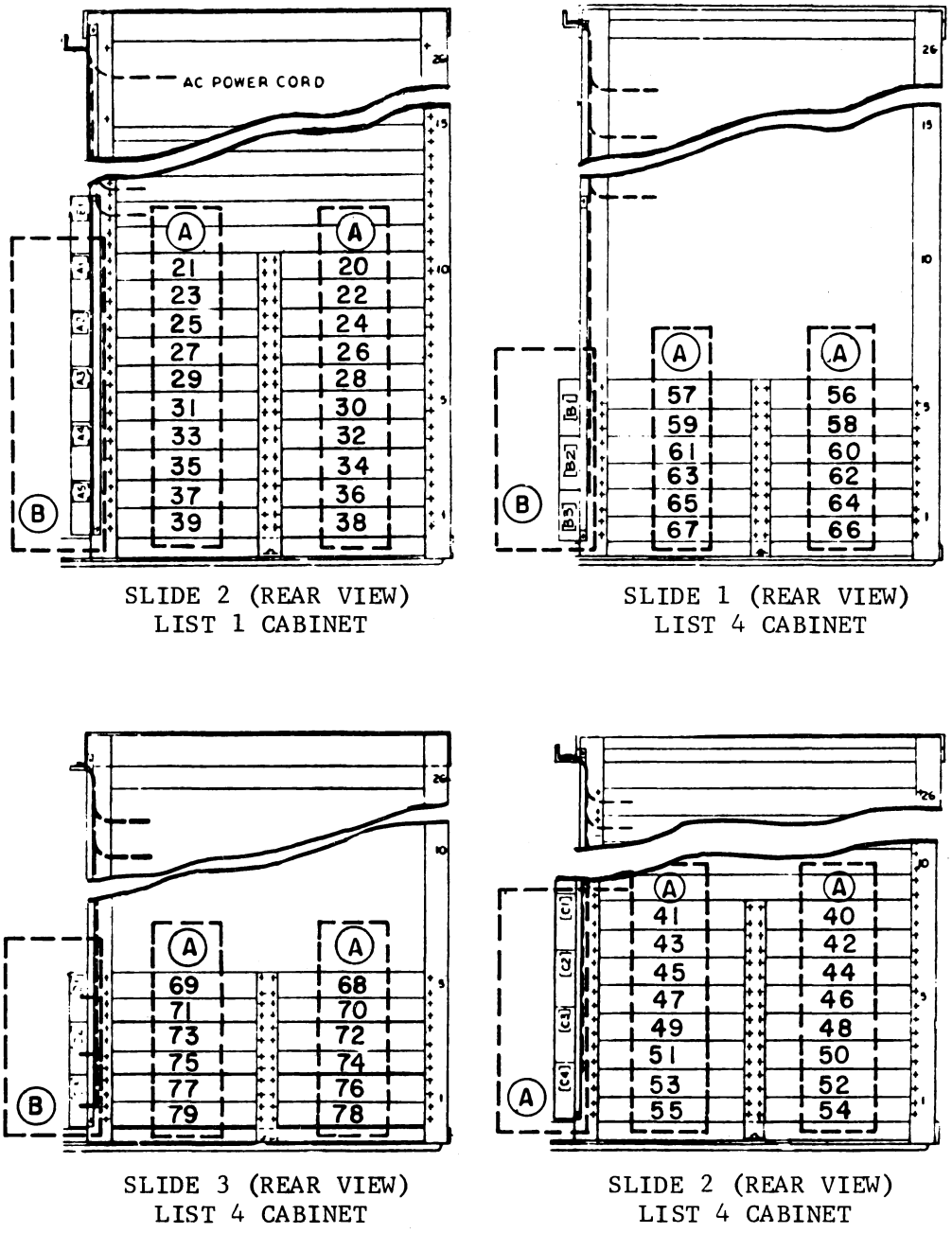
DX SIGNALING UNIT - CONNECTION CHART

Lead	DX Unit TS	PCHG	For	TS A1	A2	A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D1	D2	D3	See Note
E	3	9																	
M	4	10																	
A	6	11	STA	20	24	28	32	36	56	60	64	40	44	48	52	68	72	76	1,5,6
B	5	12																	
Grd	1	13																	
-48V	8	14																	
E	3	25																	
M	4	26																	
A	6	27	STA	21	25	29	33	37	57	61	65	41	45	49	53	69	73	77	2,5,6
B	5	28																	
Grd	1	29																	
-48V	8	30																	
E	3	41																	
M	4	42																	
A	6	43	STA	22	26	30	34	38	58	62	66	42	46	50	54	70	74	78	3,5,6
B	5	44																	
Grd	1	45																	
-48V	8	46																	
E	3	57																	
M	4	58																	
A	6	59	STA	23	27	31	35	39	59	63	67	43	47	51	55	71	75	79	4,5,6
B	5	60																	
Grd	1	61																	
-48V	8	62																	

Figure 6

NOTE 1: Strap PCHGS 1-5, 2-6, 3-7 and 4-8 on the TS A1-5, B1-3, C1-4 and D1-3 as required for new CKTS being added.
NOTE 2: Strap PCHGS 17-21, 18-22, 19-23 and 20-24 on TS A1-5, B1-3, C1-4 and D1-3 as required for new CKTS being added.
NOTE 3: Strap PCHGS 33-37, 34-38, 35-39 and 36-40 on TS A1-5, B1-3, C1-4 and D1-3 as required for new CKTS being added.
NOTE 4: Strap PCHGS 49-53, 50-54, 51-55 and 52-56 on TS A1-5, B1-3, C1-4 and D1-3 as required for new CKTS being added.
NOTE 5: Complete work shown on FIG. 5 for DX units being put in service.
NOTE 6: See FIG. 7 for MTG and TS locations for DX SIG units.

*Station (and DX unit) numbers appear in columns below TS used for their connection.



SLIDE 2 (REAR VIEW)
LIST 1 CABINET

SLIDE 1 (REAR VIEW)
LIST 4 CABINET

SLIDE 3 (REAR VIEW)
LIST 4 CABINET

SLIDE 2 (REAR VIEW)
LIST 4 CABINET

Figure 7

(A) SIG unit MTG locations

(B) TS-A1-5, B1-3, C1-4 and D1-3 locations.

4.03 4-Wire (Ground or Loop) Signaling Unit

This unit is basically used when a 4-wire circuit, from the Data Package to a station (or repeating equipment), not exceeding 1300 ohms of loop resistance, and requiring loop or ground start is required. It has only one option (Z) which changes its operation from ground to loop start.

(a) To add or remove 4-wire signaling units (PJ2G035A-1, List 2 Sig. Unit), use table in Figure 8.

FOUR WIRE SIGNALING "CKT. (GRD. OR LOOP START) CONNECTION CHART																			
Lead	Sig. Unit TS	To	Pchg	TS For	A1	A2	A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D1	D2	D3	See Note
T	3		1																	
R	11		2																	
T1	4		3																	
R1	12		4																	
TT	5		5																	
TR	13		6																	
RT	6		7																	
RR	14		8	Sta.	20	24	28	32	36	56	60	64	40	44	48	52	68	72	76	1,2
E	7		9																	
M	15		10																	
GRD	1		13																	
48V	8		14																	
RGRD	9		15																	
GEN	16		16																	
T	3		17																	
R	11		18																	
T1	4		19																	
R1	12		20																	
TT	5		21																	
TR	13		22																	
RT	6		23																	
RR	14		24	Sta.	21	25	29	33	37	57	61	65	41	45	49	53	69	73	77	1,2
E	7		25																	
M	15		26																	
GRD	1		29																	
48V	8		30																	
RGRD	9		31																	
GEN	16		32																	

Figure 8

FOUR WIRE SIGNALING "CKT. (GRD. OR LOOP START) CONNECTION CHART																		
Lead	Sig. Unit TS	To	Pchg.	TS For	A1	A2	A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D1	D2	D3	See Note
T	3		33																	
R	11		34																	
T1	4		35																	
R1	12		36																	
TT	5		37																	
TR	13		38																	
RT	6		39																	
RR	14		40	Sta.	22	26	39	34	38	58	62	66	42	46	50	54	70	74	78	1,2
E	7		41																	
M	15		42																	
GRD	1		45																	
48V	8		46																	
RGRD	9		47																	
GEN	16		48																	
T	3		49																	
R	11		50																	
T1	4		51																	
R1	12		52	Sta.	23	27	31	35	39	59	63	67	43	47	51	55	71	75	79	1,2
TT	5		53																	
TR	13		54																	
RT	6		55																	

Figure 8 (Cont'd.)

FOUR WIRE SIGNALING "CKT. (GRD. OR LOOP START) CONNECTION CHART																			
Lead	Sig. Unit TS	To	Pchg.	TS For	A1	A2	A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D1	D2	D3	See Note
RR	14		56																	
E	7		57																	
M	15		58																	
GRD.	1	6	61	Sta.	23	27	31	35	39	59	63	67	43	47	51	55	71	75	79	1,2
48V	8		62																	
RGRD	9		63																	
GEN	16		64																	

Figure 8 (Cont'd)

NOTES:

1. When connecting new stations or trunks strap with Z option when loop start (Par. 4.04) is required.
2. Mtg. and terminal strip locations can be found in Fig. 7.

EXAMPLE OF USE

1. Locate station number to be connected. — Sta. 66
2. Heading of stations column give T.S. to use for its connection. — T.S. B3
3. Connect the 14 leads from sig. units T.S. to T.S. associated with station number. — Wire - T.S. on sig. unit 66 to T.S. B3.

LOOP START (Z OPT) 2/4 WIRE SIG UNITS		
TYPE OF SIG UNIT	SIG UNIT RELAY	STRAP CONTACT TERMS
2 Wire	RA	4 ——4M
4 Wire	RA	4 ——4M

Figure 8A

4.04 2-Wire (Ground or Loop Start) Signaling Unit

The 2-Wire Signaling Unit can be used when the cable loop resistance from the No. 400 Data Package to the station or signal repeating equipment is under 1300 ohms. It can be optioned to work with a loop or ring ground start condition being furnished from the station end. Option and connect as follows:

(1) Options

A. Ground Start - remove Z opt. (See Figure 8A)
B. Loop Start - place Z opt. (See Figure 8A)

(2) To add or remove 2-wire signaling units (PJ2G035B-1, L1, Sig. Unit) use table in Figure 9.

TWO WIRE SIGNALING CKT (GRD OR LOOP START) WIRING																		
Lead	SIG Unit TS	PCHG	FOR	A1	A2	A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D1	D2	D3	See Note
T	3	1																	
R	11	2																	
T1	-	-																	
R1	-	-																	
TT	5	5																	
TR	13	6																	
RT	6	7																	
RR	14	8	STA	20	24	28	32	36	56	60	64	40	44	48	52	68	72	76	1,2
E	7	9																	
M	15	10																	
Grd	1	13																	
48V	8	14																	
R Grd	9	15																	
Gen	16	16																	
T	3	17																	
R	11	18																	
T1	-	-																	
R1	-	-																	
TT	5	21																	
TR	13	22																	
RT	6	23																	
RR	14	24	STA	21	25	29	33	37	57	61	65	41	45	49	53	69	73	77	1,2
E	7	25																	
M	15	26																	
Grd	1	29																	
48V	8	30																	
R Grd	9	31																	
Gen	16	32																	

Cont'd Page

TWO WIRE SIGNALING CKT (GRD OR LOOP START) WIRING																		
Lead	SIG Unit TS	PCHG	FOR	A1	A2	A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D1	D2	D3	See Note
T	3	33																	
R	11	34																	
T1	-	-																	
R1	-	-																	
TT	5	37																	
TR	13	38																	
RT	6	39																	
RR	14	40	STA	22	26	30	34	38	58	62	66	42	46	50	54	70	74	78	1,2
E	7	41																	
M	15	42																	
Grd	1	45																	
48V	8	46																	
R Grd	9	47																	
Gen	16	48																	
T	3	49																	
R	11	50																	
T1	-	-																	
R1	-	-																	
TT	5	53																	
TR	13	54																	
RT	6	55																	
RR	14	56	STA	23	27	31	35	39	59	63	67	43	47	51	55	71	75	79	1,2
E	7	57																	
M	15	58																	
Grd	1	61																	
48V	8	62																	
R Grd	9	63																	
Gen	16	64																	

Figure 9

NOTE 1: When connecting new stations or trunks strap with Z option when loop start (Par. 4.04) is required.

NOTE 2: MTG and terminal strip locations can be found in Fig. 7B

EXAMPLE OF USE

1. Locate station number to be connected.	STA 74
2. Heading of stations column gives TS to be used for its connection.	TS D2
3. Connect the 12 leads from TS on SIG unit to TS associated with station number.	Wire TS on SIG unit 74 to TS D2

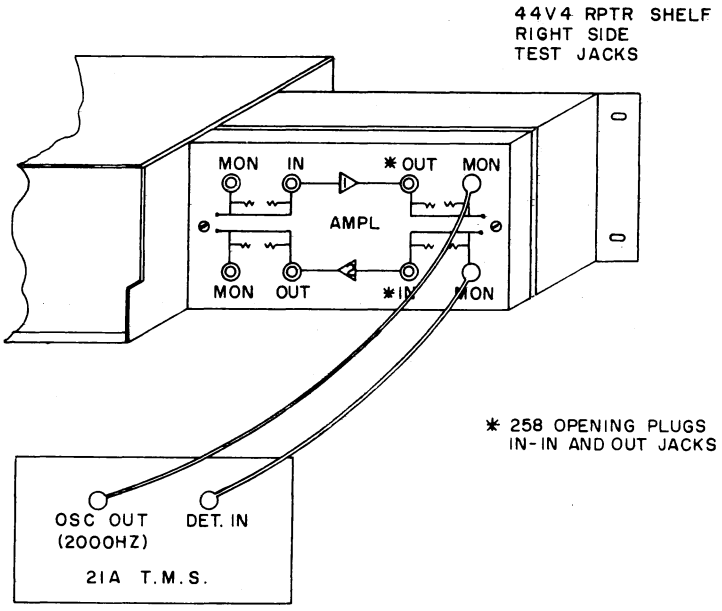


Figure 9A

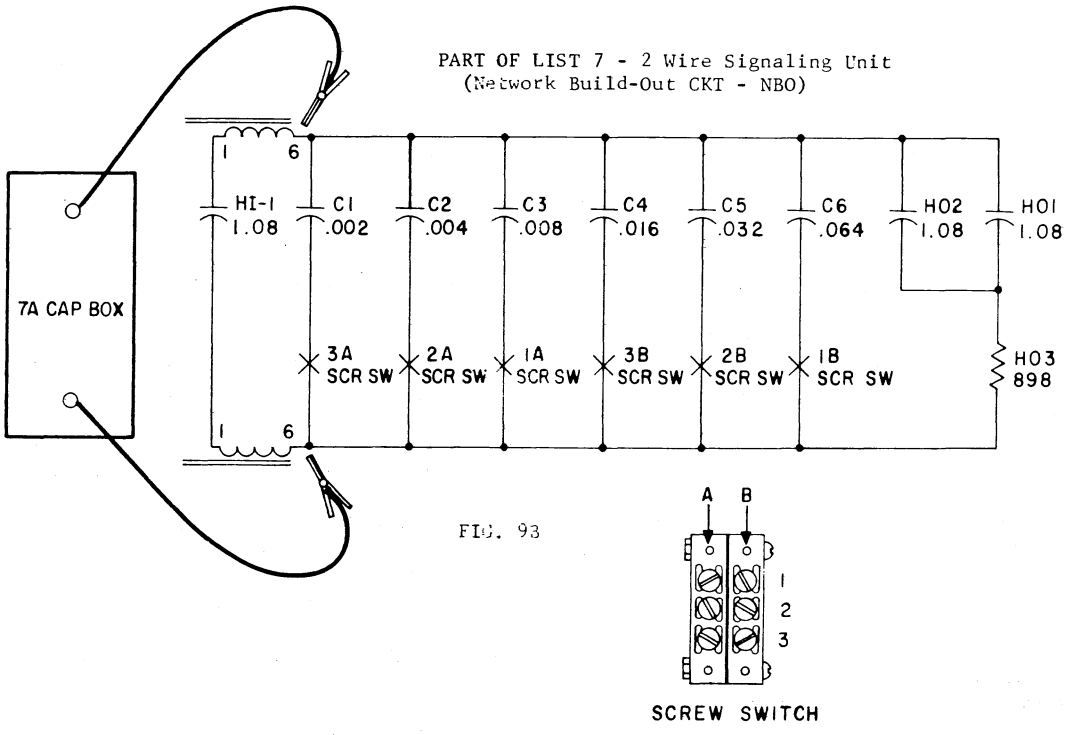


Figure 9B

NOTE: Whenever a station is connected that used the 2-Wire Signaling Unit, the NETWORK BUILD-OUT (N.B.O.) must be adjusted to eliminate singing in the circuit. Use Figure 9B to calculate and set the N.B.O.

STEP	FUNCTIONS TO SET N.B.O.
1	Secure the following test equipment: 1. 21A TMS or Equiv. 2. 7A CAP box 3. 900 ohm 2.15 MF CAP Term 4. 2-258 plugs 5. Patch cords
2	Place 258 opening plugs in TRANS - OUT and REC - In Jacks as shown in Fig. 9A.
3	Terminate station end of circuit with 900 ohm 2.15 MF series termination, station off-hook or a test set that will provide a 900 ohm termination.
4	Connect the 21A TMS as shown in Fig. 9A.
5	Send a 2 kHz 0-level tone.
6	Adjust the 7A CAP box (Fig. 9B) until the highest possible dB loss is read on the DET of the 21A TMS. If a 7A CAP box is not available it is possible to adjust the screw switches (Fig. 9B) until the highest dB loss is read on the 21A's DET.
7	Read the amount of capacitance used in the 7A CAP box - screw in screw switches (Fig. 9B) to add as near as possible the capacitance read on 7A CAP box.
8	Remove all test equipment.

Figure 9B

4.05 The single frequency (SF) signaling unit will be the basic signaling unit used in the California Law Enforcement Telecommunications System (CLETS). The SF singaling unit PSD-90075-01 differs from the signaling units described earlier in several respects. The signaling range of this unit is limited only by the transmission range of the facility, and not by DC loop resistance. No central office signal repeating equipment is required. A SF unit at the station works directly with a similar SF unit at the Data Package over the 4-wire transmission facility on an end-to-end basis.

4.06 One Single Frequency Tone Supply Unit, PSD-90075-01, is required for the Data Package, together with a SF Signaling Unit for each line circuit arranged for SF signaling. The later unit is installed in the EQL 2 socket of the 44V4 repeat circuit leaving the space required by the other three types of signaling units vacant. Strapping is required on the signal unit tie strips (TS A - 1, 2, 3, 4, 5 B - 1, 2, 3 C - 1, 2, 3, 4 D - 1, 2, 3). See Figure 6, Notes 1, 2, 3, and 4. Refer to PSD-2G030-01 CAD 5, CAD 23, and Notes 307 and 404.

5. REGISTER OPTIONS

5.01 The Registers have options that must be in place when the No. 400 Data Package is being installed, a tens group being added or disconnected, or when changing from the normal two digit to single digit calling. These options will provide the following:

Assigned tens groups (00-05, 20-79)
Assigned tens groups (80-89, 90-99)
Assigned Single Digit 8 or 9
Unassigned tens groups

Assigned Tens Groups (00-05, 20-79)

5.02 If a tens group is to be used, it requires strapping on both registers which allow tens information to be passed to the marker. Note 2 and 3 of Figure 10 show an example of strapping for tens groups 00, 20, 30 and 40. Use the following to place or remove strapping:

(a) Use Figures 10A to place or remove assigned or unassigned strapping for tens groups 00-05, 20, 30, 40, 50, 60, or 70

Assigned 80 of 90 Tens Digit

5.03 The 80 and 90 tens groups are not true tens groups. They have no equipment associated with them, and when dialed, they use the marker routing, crossbar switches and line units of the tens group they are strapped to. Figure 10, Note 4 shows an example of the tens group 90-99 strapped to where the 20-29 group is normally strapped.

Assigned Single Digit 8 or 9

5.04 The information in Paragraph 5.03 applies to the single digit 8 or 9 except when dialing you dial only one digit and can be connected to the station within the strapped tens group that ends with zero. If more stations within the tens group are desired, it may be accomplished by forming a hunt group including units number zero. See Figure 10, Note 5, for an example of single digit strapping. In this example, if you dialed 8, you would use marker routing, X-bar switch and the line unit for station 50.

(1) Use the table shown in Figure 10B and place or remove assigned or unassigned straps to the right of "digits dialed" 8 or 9 as applicable.

Unassigned Tens Groups

5.05 If a tens group is not equipped, it is considered to be unassigned (see Figure 10, example 1) and requires strapping as follows:

(1) Use Figures 10A and 10B to place or remove strapping for all unassigned tens groups.

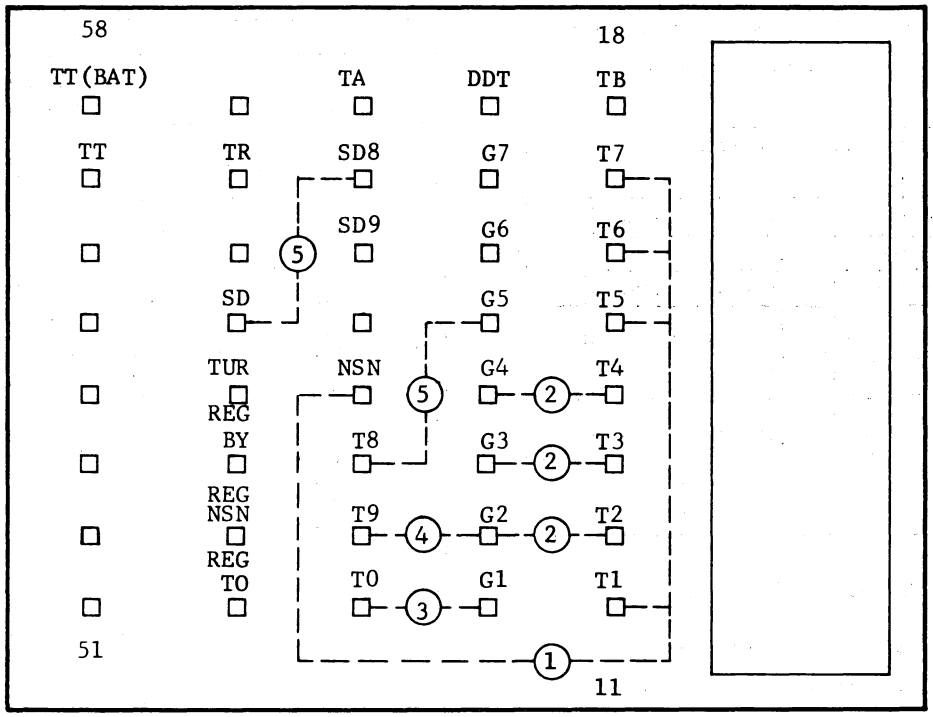


Figure 10

TS (A)

EXAMPLE

1. Unassigned tens groups 10, 50, 60 and 70.
2. Assigned tens groups 20, 30 and 40.
3. Tens group 0 (required at all times).
4. Using tens 9 (2 digit) into the 20's group.
5. Using tens 8 (1 digit) into the 50's group.

FIG. 10 TYPICAL STRAPPING
FOR THE REGISTERS

NOTE: Terminal strips are not stenciled.

REGISTERS TENS GROUPS STRAPPING					
Tens Group DESIG	Assigned Straps Registers TA-A DESIGS	PCHGS	Unassigned Straps Registers TS-A DESIGS	PCHGS	See Note
00-05	T0—G1	31—21			
10-19			T1—NSN	11—34	
20-29	T2—G2	12—22	T2—NSN	12—34	
30-39	T3—G3	13—23	T3—NSN	13—34	
40-49	T4—G4	14—24	T4—NSN	14—34	1-2
50-59	T5—G5	15—25	T5—NSN	15—34	
60-69	T6—G6	16—26	T6—NSN	16—34	
70-79	T7—G7	17—27	T7—NSN	17—34	

Figure 10A

NOTE 1: All TO-9 punchings require assigned or unassigned straps

NOTE 2: Registers TS-A located left side of registers

REGISTER STRAPPING - SINGLE OR TWO DIGIT TENS GROUPS 8 or 9						
DIGITS DIALED		Assigned Straps Registers TS-A		Unassigned Straps Registers TS-A		See Note
Single	Two	DESIGS	PCHGS	DESIGS	PCHGS	
8		T9—G2—7 SD—SD8	33—22—27 45——37	T8—NSN	33—34	
	80-89	T8—G2—7	33—22—27	T8—NSN	33—34	1-2-3
9		T9—G2—7 SD—SD9	32—22—27 45——36	T9—NSN	32—34	
	90-99	T8—G2—7	32—22—27	T9—NSN	32—34	

Figure 10B

NOTE 1: All TO-9 punchings require assigned or unassigned straps.

NOTE 2: Registers TS-A located left side of registers.

NOTE 3: Tens groups 8 or 9 will be strapped into tens groups 20-29, 30-39, 40-49, 50-59, 60-69 or 70-79 as desired, as they have no equipment components of their own.

6. MULTIPLE ADDRESS CIRCUIT

6.01 The Multiple Address amplifier (M.A.) is terminated either by line circuits, or by terminating resistors, or by combinations of both. Relay logic is provided so that an unchanging terminating impedance is presented to this amplifier regardless of the number of stations connected to the bridge. This impedance is equal to that presented by 60 line circuits. Since a Data Package may not be equipped with 60 line circuits, it will be necessary to place strapping options which will compensate for those unequipped line circuits as shown in Figure 11A.

6.02 The station limit feature of the multiple address circuit limits the number of stations that may be connected on each multiple address call. This limit may be provided for a minimum of two or a maximum of 41 stations. Wiring options T, V, W, X, Y, Z, singly or in combination provide for any specific number of stations between these limits. See Figure 11, refer to PSD-2G037-01, Note 1.02.

STATION LIMIT ON M.A. BRIDGE CONN.											
Stas on Brdg	Req. Option	Stas on Brdg	Req. Option	OPTION WIRING Opn	M.A. Resistors H	A	C	D	E	F	G
2	-	22	V,X	T	B	T					
3	Z	23	V,X,Z	V	B		B				
4	Y	24	V,X,Y	W	B			B			
5	Z,Y	25	V,X,Y,Z	X	B				C		
6	X	26	V,W	Y	B					B	
7	X,Z	27	V,W,Z	Z	B						B
8	X,Y	28	V,W,Y								
9	X,Y,Z	29	V,W,Y,Z								
10	W	30	V,W,X								
11	W,Z	31	Y,W,X,Z								
12	W,Y	32	Y,W,X,Y								
13	W,Y,Z	33	V,W,X,Y,Z								
14	W,X	34	T								
15	W,X,Z	35	T,Z								
16	W,X,Y	36	T,Y								
17	W,X,Y,Z	37	T,Y,Z								
18	V	38	T,X								
19	V,Z	39	T,X,Z								
20	V,Y	40	T,X,Y								
21	V,Y,Z	41	T,X,Y,Z								

Figure 11

NOTES:

1. If more than 41 stations are to be allowed insert 258 plug in the T.A. test jack.
2. To use this table - select the amount of stations to be allowed on each connection, note the required options - wire resistors as shown under option wiring (B denotes bottom and C center of card type resistors).

MA BRIDGE BUILD-OUT					
Switcher EQ with line units for	REQ Option	OPTION WIRING MA REPT Coil	M RES	N RES	See Note
10 STA	RS	4	T-B		1
20 STA	RS	4	T	T	1
30 STA	S	4	T		1
40 STA	P	4	B		1
50 STA	R	4		T	1
60 STA	-	-	-	-	1

Figure 11A

NOTE 1: When changing option remove options not required.

NOTE 2: To use this Table - use column 1 and 2 from the right to select the required options - wire options as shown under option wiring (T denotes top and B bottom of card type resistors).

6.03 In the event the station limit feature is not used, the TA relay should be disabled by inserting a No. 258 dummy plug in the TA TST jack, and insulating both make and break contacts of the TA relay.

7. TEST PORT OPTIONS AND CONNECTIONS

7.01 The No. 400 Data Package contains three test ports. These are the tone port, the test-board port, and the quiet port.

7.02 By placing the required option, the quiet port can be used for a quiet termination (Z option) or as a loop around port (Y option). This option will connect the transmit to the receive side of the test port Q equalizer, thereby providing A.C. continuity between the transmit and receive sides of the line to be tested. Figure 11B.

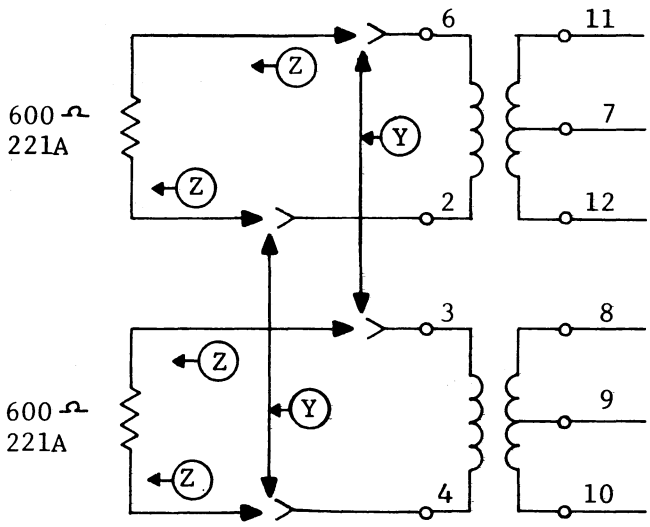


Figure 11B

NOTE 1: Z-Option, Quiet Termination

NOTE 2: Y-Option, Loop Around

NOTE 3: Q EQL. is mounted on MTG row 21, Slide 1 of the List 1 cabinet

7.03 The No. 400 Data Package is equipped with a test line which is to be a connection to a test center or toll testboard to provide a means of testing No. 400 Data Packages and its stations. It is equipped to be a 4-wire DX out of the switcher. To connect, proceed as follows:

(a) Use table in Figure 12 to connect transmit and receive pairs.

TEST BOARD TEST PORT CONN					
PAIR DESIG	CONNECTION LEAD	M-BLK PCHG	AMPL CA		See Note
REC	T1 R1	1 2	26 1	W-BL BL-W	1
TRAN	T R	3 4	27 2	W-O O-W	

Figure 12

NOTE 1: Connection can be made on M block or on cable M at the house feeder terminal.

NOTE 2: Complete option shown in Figure 5.

INTERRUPTED OR CONTINUOUS GENERATOR SUPPLY OPTIONS			
OPTION	TS PCHGS	FEATURE	See Note
X	9 10	Interrupted Gen.	1
Y	8 10	Continuous Gen.	1

Figure 12A

NOTE 1: The TS is located on MTG row 26, slide 2 of the list 1 cabinet.

8. POWER AND RINGING SUPPLY OPTIONS

8.01 The No. 400 Data Package must be arranged to provide either interrupted (Option X) or continuous (Option Y) ringing. Option Y is normally installed at the factory. Figure 12A for wiring options.

9. TRAFFIC USAGE REGISTERS CONNECTIONS

9.01 The No. 400 Data Package is equipped with leads to which external traffic registers may be connected as required. The table shown in Figure 13 indicated lead designation, description of function to be counted and connections for the individual leads. The Data Package supplies a ground on each of these leads.

TRAFFIC REGISTER CONNECTIONS TABLE						
Lead DESIG	Designation Meaning	FUNCTION TO BE PEG COUNTED	CONN.		AMPL.	CA.
			TS	PCHG.	Pin	Color
RBOP	Register Busy Over Flow Peg	Pegs each register connection attempt while both registers are busy.	*M	28	14	BR-BK
MCP	Marker completion peg	Pegs each completed connection through the marker.		27	39	BK-BR
RTP1	Retry peg RT REG 1	Pegs each usage of retry CKT No. 1		26	13	G-BK
RTP-0	Retry Peg RT REG 0	Pegs each usage of retry CKT No. 0		25	38	BK-G
RTT1	Retry Time-out RT REG 1	Pegs each timeout occurence of retry No. 1		24	12	O-BK
RTTO	Retry Time-out RT REG 0	Pegs each timeout occurrence of retry No. 0		23	37	BK-O
RP1	Register peg 1	Pegs each usage of register 1		22	11	BL-BK
RPO	Register Peg 0	Pegs each usage of register 0		21	36	BK-BL
BY1	Busy REG 1	Pegs any number of TA relay operations.		20	10	S-R

Figure 13

TRAFFIC REGISTER CONNECTIONS TABLE						
Lead DESIG	Designation Meaning	FUNCTION TO BE PEG COUNTED	CONN.		AMPL CABLE	
			TS	PCHG	PIN	COLOR
BYO	Busy REG 0	Pegs any number of TA relay operations.	*M	19	35	R-S
NSN1	No Such Number REG 1	Pegs any function that operates the NSN relay.		18	9	BR-R
NSNO	No Such Number REG 0	Pegs any function that operates the NSN relay.		17	34	R-BR
TO-1	Timeout REG 1	Pegs each time out of REG 1		16	8	G-R
TO-0	Timeout REG 0	Pegs each time out of REG 0		15	33	R-G
TUR (20-79)	Traffic Usage Register (Stations 20-79)	Pegs (in eight second intervals for duration of completed calls for the originating party.	See Par. 2.01			

Figure 13 (Cont'd)

* -48VDC Batt. For miscellaneous use on pchg's 82, 84, 86, 88 and 90 of TS-M. Connections can be made on M Blk. Pchg's. or extended by Ampl. CA. and made on colors shown.

10. ADDING LINE UNIT GROUPS

10.01 The No. 400 Data Package at initial installation, will be equipped with only the line units (in increments of 10) required at the time. Future growth will require mounting, plugging in, wiring, and option changes to install new tens groups of line units. Figure 14 shows the steps required to install a new tens group of line units:

STEP	WORK TO BE PERFORMED
1	Unpack and mount new line unit per Fig. 4.
2	Mount and wire 44V4 shelves for all ten line ckts. per Figure 15 (Equip. with plug-in components as necessary).
3	Mount and wire signaling units as required per Paragraph 4.02, 4.03, 4.04, 4.05 and 4.06.
4	Wire M.A. lead per PSD 2G031-01 CAD5 and PT 2G030-11 Fig. 1 and 2.
5	Plug-in AMPL connectors (located on wiring side of each line circuit group).
6	Remove unassigned tens group strapping shown in Paragraph 5.05.
7	Place assigned tens group strapping per Paragraph 5.02, 5.03 or 5.04.
8	Change M.A. options P, R and S. Fig. 11 A.
9	Place assigned or unassigned strapping for each individual line circuit as shown in Paragraph 3.02 and 3.03.
10	Place all other options as specified per the Paragraph covering them.

ITEM	REQUIRED WORK FUNCTIONS
1	Unpack and mount the 44V4 shelves in the proper mounting spaces as shown in Fig. 15 for the new line circuit group.
2	Wire the 5 new 44V4 shelves PAS 2G030-01 CAD 6 and 24 PT 2G030-11 Fig. 1 and 2
3	Equip all sockets of 44V4 circuits to be turned up as specified by the service orders.
4	Perform line up and tests as required.

Figure 14

11. ADDING 44V4 SHELVES

11.01 Whenever there is a requirement to install a new group of line units (Paragraph 10) each individual line unit must have an associated 44V4 repeater unit wired at the same time. The 44V4 shelf has two circuits per shelf as shown in Figure 15 below.

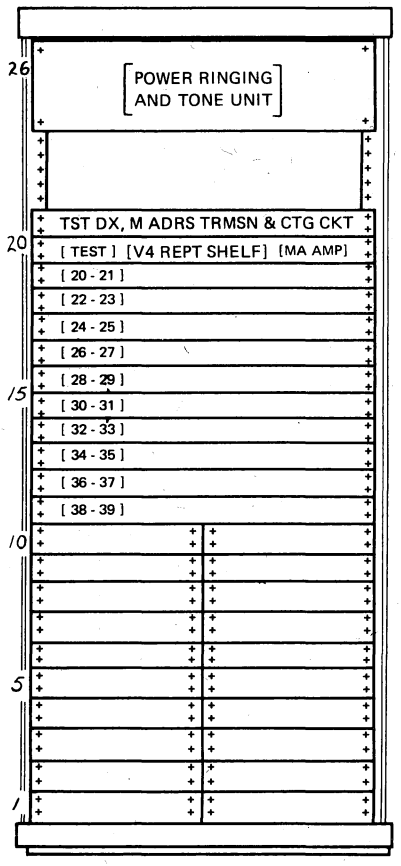
12. ALARM CONNECTIONS

12.01 The No. 400 Data Package contains leads for two alarms. The alarms must be locally provided and externally mounted.

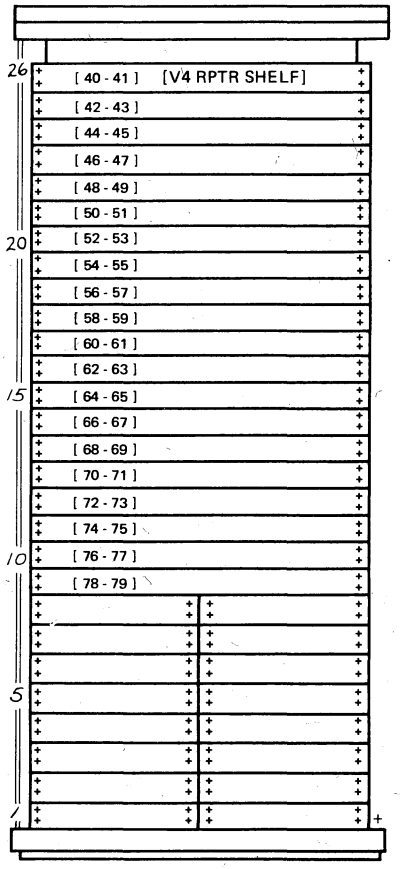
12.02 Any time the -48V battery supply is interrupted, the Power Failure (PF) relay releases, grounding the PF lead. The PF lead is located on Punching 47 TS-M in the crowns.

13. FUSE ALARM

13.01 When any fuse on fuse panels 1 and 2 is blown, it will operate the Fuse Alarm (FA) relay, which grounds the FA lead. The FA lead is located on Punching 48 TS-M in the crowns.



SLIDE 2
(FRONT VIEW)
List 1 CABINET



SLIDE 2
(FRONT VIEW)
List 4 CABINET

Figure 15

44V4 repeater shelves MTG locations