Installation Engineering Handbook 269
Western Electric Company, Incorporated
Northern Illinois Works

Section **503.34**

6-2-78

Replaces: Section 503.34
dated 11-5-76

NO. 3 ELECTRONIC SWITCHING SYSTEM
GENERAL INFORMATION
TRANSLATION TEST ASSIGNMENTS

CONTENTS

1. GENERAL INFORMATION

1.1 This section presents translation test requirements for a No. 3 ESS office. Shop and site testing require that special consideration be made in the office translations to support such testing.

1.2 Translation test requirements should be incorporated in with the regular office translations received at the field site. Therefore, no special effort should normally be required by the installer to incorporate these test translations into the test environment.

1.3 The information presented in this section is intended to acquaint the installer with (1) those translation test requirements which should normally be contained in the office translations.

1.4 The translation test requirements actually provided in the office translations should be briefly reviewed to insure that the basic requirements are available.

2. BASIC TRANSLATION TEST REQUIREMENTS

2.1 No. 3 ESS shop testing and installation testing procedures require that translation test line assignments be made. These assignments, plus full trunk, test and service circuit information must be contained within the first translation for any office to provide support to such testing.

2.2 Test line assignments contained within the translations reflect features and options which the office will have at cutover.

2.3 No. 3 ESS test line requirements consist of several basic types.

2.31 POTS - These test lines are used during load application (volume) testing to verify associated office features. A OE must be assigned for each required POTS test line.

2.32 COIN LINES - Representative coin lines, of the types for which the office would be equipped, require OE assignments. Each representative type is assigned two OEs. Each OE may be assigned to any concentrator group.

2.33 MULTIPARTY LINES - Representative multiparty lines, of the types for which the office would be equipped, require OE assignments. Each representative type is assigned one or two OEs. Each OE may be assigned to any concentrator group.

2.34 MISCELLANEOUS FEATURES - Representative miscellaneous features, of the types for which the office would be equipped, require OE assignments. Each representative type is assigned one OE on any concentrator group.

2.35 SPECIAL DIRECTORY NUMBERS - Special directory numbers are assigned. The special directory numbers are assigned route indexes which should terminate the call on some existing office test, maintenance or service feature.

2.36 The two access trunk circuit and the COMM LINE to the Trunk Test Line Panel (TLTP) are made in regular translations. These translations are required for test purposes.

2.37 Trunk, test and service circuit translations are made in regular translations. These translations are required for test purposes.

2.4 Those translations referred to in paragraphs 2.31 through 2.34 of this section may be left in the office translations through cutover. They may be reassigned as required to designated in-service usage by TELCo at any time after cutover.

3. LOAD APPLICATION (VOLUME) TEST LINE REQUIREMENTS

3.1 Eight (8) OEs are required for each office equipped concentrator group. Thus if the office is equipped with 3 concentrator groups (3 network frames) 24 OEs are required for load application testing.

3.2 All POTS test lines should be loop-start.

3.3 Test lines should be designated as DP or TT properly reflecting the actual office ratio, if known.

3.4 All test lines must be assigned directory numbers. The directory numbers should accurately reflect the proportion of NNX office codes contained within the office.

3.5 All test lines should be designated as TEST.

3.6 Four (4) TENs on each concentrator group should be assigned a 1-digit speed calling line to facilitate testing with the SCOATS Volume Test Set.

4. COIN LINE TEST LINE REQUIREMENTS

4.1 The following representative coin line test lines are required if the office would be so equipped:

Quantity	Coin Line
2	Dial-Tone-First Loop-Start
2	Prepay Ground Start

4.2 Individual OEs may be assigned to any concentrator group.

4.3 All coin lines test lines should be assigned directory numbers.

4.4 Assign one line as TT and the other as DP, for each type of coin line, if both TT and DP pulsing would be available for that type of coin line service.

5. MULTIPARTY LINE TEST LINE REQUIREMENTS

5.1 The following representative multiparty line test lines are required if the office would be so equipped:

Quantity	Party Line
2	Two-Party (Parties 1 and 2)
1	Four-Party (Parties 1 to 4)
1	Eight-Party (Parties 1 to 8)

5.2 Individual OEs may be assigned to any concentrator group.

5.3 All multiparty line test lines should be assigned directory numbers. Two-, four-, and eight-party lines require two, four, and eight directory numbers respectively.

5.4 TT pulsing is assigned whenever possible.

6. MISCELLANEOUS FEATURES TEST LINE

6.1 The following representative miscellaneous features test lines are required if the office would be so equipped.

Quantity	Miscellaneous Feature
1	All Features
1	Manual Line

6.2 Individual OEs may be assigned to any concentrator group.

6.3 All miscellaneous feature test lines should be assigned directory numbers.

6.4 TT pulsing is assigned whenever possible.

No arrows shown due to extensive changes.

Manager, ESS Installation & Field Engineering

5-5-78

Reason for Reissue:
  Extensive update.

Installation Engineering Handbook 269
Western Electric Company, Incorporated
Northern Illinois Works

Section

503.34

11-5-76

NO. 3 ELECTRONIC SWITCHING SYSTEM
GENERAL INFORMATION
PREFERENTIAL ASSIGNMENT LIST (PNAL)
AND
ASSOCIATED TRANSLATION TEST ASSIGNMENTS

CONTENTS

1. **GENERAL INFORMATION**

1.1 This section presents translation test requirements for a No. 3 ESS office. Shop and site testing require that special consideration be made in the office translations to support such testing.

1.2 Translation test requirements should be incorporated in with the regular office translations received at the field site. Therefore, no special effort should normally be required by the installer to incorporate these test translations into the test environment.

1.3 The information presented in this section is intended to acquaint the installer with (1) those translation test requirements which should normally be contained in the office translations, and (2) how they should normally be developed from available TENs and in relationship with other regular TEN requirements.

1.4 The translation test requirements actually provided in the office translations should be briefly reviewed to insure that the basic requirements are available.

2. **BASIC TRANSLATION TEST REQUIREMENTS**

2.1 No. 3 ESS shop testing and installation testing procedures require that translation test line assignments be made. These assignments, plus full trunk, test and service circuit information must be contained within the first translations for any office to provide support to such testing.

2.2 Test line assignments contained within the translations reflect features and options which the office will have at cutover.

2.3 No. 3 ESS test line requirements consist of several basic types.

2.31 POTS – These test lines are used during load application (volume) testing to verify associated office features. A TEN must be assigned for each required POTS test line.

2.32 COIN LINES – Representative coin lines, of the types for which the office would be equipped, require TEN assignments. Each representative type is assigned two TENs. Each TEN may be assigned to any concentrator group.

2.33 MULTIPARTY LINES – Representative multiparty lines, of the types for which the office would be equipped, require TEN assignments. Each representative type is assigned one or two TENs. Each TEN may be assigned to any concentrator group.

2.34 MISCELLANEOUS FEATURES – Representative miscellaneous features, of the types for which the office would be equipped, require TEN assignments. Each representative type is assigned one TEN on any concentrator group.

2.35 SPECIAL DIRECTORY NUMBERS – Special directory numbers are assigned. The special directory numbers are assigned route indexes which should terminate the call on some existing office test, maintenance or service feature. Therefore, TENs are not required to be assigned to these special directory numbers.

2.36 The two access trunk circuit and the COMM LINE to the Trunk Test Line Panel (TLTP) are made in regular translations. These translations are required for test purposes.

2.37 Trunk, test and service circuit translations are made in regular translations. These translations are required for test purposes.

2.4 Those translations referred to in paragraphs 2.31 through 2.34 of this section may be left in the office translations through cutover. They may be reassigned as required to designated in-service usage by TELCo at any time after cutover. It may be advisable however, to remove those translations referred to in paragraph 2.35 of this section not specifically required by TELCo.

3. LOAD APPLICATION (VOLUME) TEST LINE REQUIREMENTS

3.1 The TENs assigned for load application test requirements are derived from the No. 3 ESS Preferential Assignment List (PNAL). This list contains all available office terminals. It is developed from two root lists, referred to as List A and List B (refer to Tables 1 and 2 of this section). List A and List B each contain 192 designated terminals of one concentrator group (one concentrator group contains 384 terminals). List A contains exactly 1/2 of the terminals for concentrator 0 and exactly 1/2 of the terminals for concentrator 1. List B contains the remainder of those terminals for concentrators 0 and 1 not contained on List A. The terminals in each list are arranged in a sequential order, so that when contiguous and consecutive assignments are made from any block on the list, a balanced network is obtained.

3.2 The root lists are expanded by the integration of office concentrator groups. These lists are then combined, List A first and then List B, to arrive at the total office preferential assignment lists. Assignments normally would start at the beginning of the list and proceed toward the last terminal on the list.

3.3 Load application test line requirements start at the bottom of the list, or the last listed TEN on List B, and proceed toward the top of the list, or the first listed TEN on List A. This procedure should result in minimum conflict with actual office in-service requirements.

3.31 Eight (8) TENs are required for each office equipped concentrator group. Thus if the office is equipped with 3 concentrator groups (3 network frames) 24 TENs are required for load application testing. These 24 TENs would normally be the last block of 24 TENs contained within the total (List A and List B) preferential assignment list designated for the office.

3.32 If spare TENs are not available to satisfy load application test requirements, in-service office requirements are preempted until sometime after load application tests have been successfully completed. Only in-service loop start, single party lines are preempted to satisfy test TEN requirements. Particularly, trunk, test and service circuit TENs are not preempted. Those TENs which contain the loop-start/ground-start wiring option may be used if wired for the loop-start option.

3.33 The only restriction that should be observed, when skipping over nonpreemptible TENs, is that the overall concentrator group balance is maintained for test purposes. (At least 8 TENs are required per concentrator group.)

3.4 All POTS test lines should be loop-start.

3.5 Test lines should be designated as DP or TT properly reflecting the actual office ratio, if known. Otherwise, if not known, the test lines should be designated as half DP and half TT. The DP/TT designations should be spread as evenly as possible over the assigned TENs. (If the office is 1/3 TT and 2/3 DP, then adjacent TENs (on the No. 3 ESS Preferential Assignment List) should be assigned a sequence of TT, DP, DP, TT, DP, DP, TT..., etc.).

3.6 All test lines must be assigned directory numbers. The directory numbers should accurately reflect the proportion of NNX office codes contained within the office. Each office code should be represented by at least 1 TEN.

3.7 All test lines should be designated as TEST.

3.8 Do not assign any special features or equipment options to the test lines.

4. COIN LINE TEST LINE REQUIREMENTS

4.1 The following representative coin line test lines are required if the office would be so equipped:

QUANTITY	COIN LINE
2	Dial Tone First Loop Start
2	Prepay Ground Start

4.2 Those general rules presented for the assignment of POTS lines in paragraph 3.3 of this section (and which could apply or do not conflict) may be used for the TEN assignment of coin line test lines.

4.3 Individual TENs may be assigned to any concentrator group.

4.4 All coin lines test lines should be assigned directory numbers. Assign directory numbers with different NNX codes, as available, if the office has more than one NNX code.

4.5 Assign one line as TT and the other as DP, for each type of coin line, if both TT and DP pulsing would be available for that type of coin line service. Otherwise, assign either TT or DP pulsing to both coin lines, as would be available for that type.

5. MULTIPARTY LINE TEST LINE REQUIREMENTS

5.1 The following representative multiparty line test lines are required if the office would be so equipped:

QUANTITY	PARTY LINE
2	Two-Party (Parties 1 and 2)
1	Four-Party (Parties 1 to 4)
1	Eight-Party (Parties 1 to 8)

5.2 Those general rules presented for the assignment of POT lines in paragraph 3.3 of this section (and which could apply or do not conflict) may be used for the TEN assignment of multiparty line test lines.

5.3 Individual TENs may be assigned to any concentrator group.

5.4 All multiparty line test lines should be assigned directory numbers. Two-, four-, and eight-party lines require two, four, and eight directory numbers respectively.

5.5 TT pulsing is assigned whenever possible.

6. MISCELLANEOUS FEATURES TEST LINE

6.1 The following representative miscellaneous features test lines are required if the office would be so equipped:

QUANTITY	MISCELLANEOUS FEATURE
1	All Features
1	Manual Line
1	Call Waiting Only

6.2 Those general rules presented for the assignment of POT lines in paragraph 3.3 of this section (and which could apply or do not conflict) may be used for the TEN assignment of miscellaneous features test lines.

6.3 Individual TENs may be assigned to any concentrator group.

6.4 All miscellaneous feature test lines should be assigned directory numbers.

6.5 TT pulsing is assigned whenever possible.

7. SPECIAL DIRECTORY NUMBER ASSIGNMENTS

7.1 Special directory numbers are assigned with associated route indexes which provide access of associated calls to the following existing office test, maintenance or service features:

DN**	RI	TEST, MAINTENANCE, OR SERVICE FEATURE
–	*	Regular Intercept (ANNC or OP)
–	*	Disconnect Intercept (ANNC or OP)
–	*	Trouble Intercept (ANNC or OP)
–	*	Custom Calling Dialing Error
–	*	Blank Number, Blank Hundred's or Translation Error (ANNC or OP)
–	*	Permanent Signal Operator (Non-Coin)
–	*	Permanent Signal Operator (Coin)
–	*	Permanent Signal (ANNC)
–	*	Partial Dial (ANNC)
–	*	Dial Tone First Coin (ANNC)
–	*	Initial Coin Test, Prepay Only (ANNC)
–	*	Local Overload (ANNC)
–	*	1+ Dialing Errors (ANNC)
–	*	Permanent Busy Tone (INC TRK Test)
–	*	Shorted Termination
–	*	Open Termination
–	*	Balanced Termination
–	*	Loop Around Port
–	*	Milliwatt Test Port
–	*	Verification Request
–	*	Overflow (Reorder Tone)
–	*	Synchronous Test Line (INC TRK Test)
–	*	Operator Coin
–	*	Operator Non-Coin
–	*	Station Ringer

* Assign route indexes identified to that selected for the associated office test, maintenance or service feature.

** Assigned as required. (Refer to Paragraph 7.3.)

7.2 TENs do not have to be assigned for special directory number assignments.

7.3   The directory numbers assigned
      should be unique and not used for
any other purpose (during the installation
test phase).

PROCEDURE FOR DEVELOPING THE NO. 3 ESS PNAL

8.1   Xerox copies of List A and List B.
      Xerox one copy of each for each
concentrator group in your office (i.e.,
of the "Smalltown" office has three concen-
trator groups, then three copies of List A
and List B would be xeroxed).

8.2   Number the sheets of List A and
      List B, i.e., now List A has
sheets numbered 1,2,..., up to the number
of concentrator groups in your office. The
sheets of List B should be numbered in a
similar manner. (The Smalltown List A
sheets would be numbered 1,2, and 3. Like-
wise, the List B sheets would be numbered
1,2, and 3.)

8.3   Enter the number of the concentra-
      tor groups on the PNAL. Do this
by numbering the TENs listed on each list
as follows: starting with List A sheet 1
begin numbering as follows 1,1,2,2,3,3,...,
up to the number of concentrator groups in
your office, then repeat with 1,1,2,2,3,3,
..., List B sheet 1 will be numbered in a
similar manner. Smalltown's three concen-
trator group office's sheet 1 of Lists A
and B would appear.

List A	List B
Sheet No. 1	Sheet No. 1
10000	11000
11011	10011
20022	21022
21033	20033
30044	31044
31055	30055
10066	11066
11077	10077
20100	21100
21111	20111
30122	31122
31133	30133
10144	11144
11155	10155
.	.
.	.
.	.

8.4   Sheet 2 of Lists A and B should be
      numbered starting with the same
number as the sheet number (i.e., 2) and in
a cyclical mode continue as follows:
2,2,3,3,...,1,1,2,2,3,3. Smalltown's
Lists A and B sheet 2 for a three concen-
trator group office would appear thusly.

List A	List B
Sheet No. 2	Sheet No. 2
20000	21000
21011	20011
30022	31022
31033	30033
10044	11044
11055	10055
20066	21066
21077	20077
30100	31100
31111	30111
10122	11122
11133	10133
20144	21144
21155	20155
.	.
.	.
.	.

8.5   In a like manner number the remain-
      ing sheets of both Lists A and B,
begin the sequencing of the concentrator
group numbers with the same number as the
sheet number: For example, see the
following:

For an Eight Concentrator Group Office   For a Nine Concentrator Group Office

<u>List A</u>   <u>List B</u>

List A	List B
60000	91000
61011	90011
70022	11022
71033	10033
80044	21044
81055	20055
10066	31066
11077	30077
20100	41100
21111	40111
30122	51122
31133	50133
40144	61144
41155	60155
.	71166
.	70177
.	81200
	80211
	91222
	90233
	11244
	10255
	21266
	20277
	31010
	30021
	41032
	.
	.
	.

8.6 After all the OENs are numbered on
all the lists then the sheets are
to be placed in numerical order in two piles
(List A and List B); then List A is placed on
top of List B and all the sheets stapled
together. This is the PNAL for a specific
office.

TABLE 1

PNAL ROOT LIST A

CG	C	SG	S	L	CG	C	SG	S	L	CG	C	SG	S	L	CG	C	SG	S	L
0	0		0	0	0	0		2	0	0	0		4	0	0	0		6	0
1	0		1	1	1	0		3	1	1	0		5	1	1	0		7	1
0	0		2	2	0	0		4	2	0	0		6	2	0	0		0	2
1	0		3	3	1	0		5	3	1	0		7	3	1	0		1	3
0	0		4	4	0	0		6	4	0	0		0	4	0	0		2	4
1	0		5	5	1	0		7	5	1	0		1	5	1	0		3	5
0	0		6	6*	0	0		0	6	0	0		2	6*	0	0		4	6
1	0		7	7*	1	0		1	7*	1	0		3	7*	1	0		5	7*
0	1		0	0	0	1		2	0	0	1		4	0	0	1		6	0
1	1		1	1	1	1		3	1	1	1		5	1	1	1		7	1
0	1		2	2	0	1		4	2	0	1		6	2	0	1		0	2
1	1		3	3	1	1		5	3	1	1		7	3	1	1		1	3
0	1		4	4	0	1		6	4	0	1		0	4	0	1		2	4
1	1		5	5	1	1		7	5	1	1		1	5	1	1		3	5
0	1		6	6*	0	1		0	6	0	1		2	6*	0	1		4	6
1	1		7	7*	1	1		1	7*	1	1		3	7*	1	1		5	7*
0	2		0	0	0	2		2	0	0	2		4	0	0	2		6	0
1	2		1	1	1	2		3	1	1	2		5	1	1	2		7	1
0	2		2	2	0	2		4	2	0	2		6	2	0	2		0	2
1	2		3	3	1	2		5	3	1	2		7	3	1	2		1	3
0	2		4	4	0	2		6	4	0	2		0	4	0	2		2	4
1	2		5	5	1	2		7	5	1	2		1	5	1	2		3	5
0	2		6	6*	0	2		0	6	0	2		2	6*	0	2		4	6
1	2		7	7*	1	2		1	7*	1	2		3	7*	1	2		5	7*
0	0		1	0	0	0		3	0	0	0		5	0	0	0		7	0
1	0		2	1	1	0		4	1	1	0		6	1	1	0		0	1
0	0		3	2	0	0		5	2	0	0		7	2	0	0		1	2
1	0		4	3	1	0		6	3	1	0		0	3	1	0		2	3
0	0		5	4	0	0		7	4	0	0		1	4	0	0		3	4
1	0		6	5	1	0		0	5	1	0		2	5	1	0		4	5
0	0		7	6	0	0		1	6*	0	0		3	6	0	0		5	6*
1	0		0	7*	1	0		2	7*	1	0		4	7*	1	0		6	7*
0	1		1	0	0	1		3	0	0	1		5	0	0	1		7	0
1	1		2	1	1	1		4	1	1	1		6	1	1	1		0	1
0	1		3	2	0	1		5	2	0	1		7	2	0	1		1	2
1	1		4	3	1	1		6	3	1	1		0	3	1	1		2	3
0	1		5	4	0	1		7	4	0	1		1	4	0	1		3	4
1	1		6	5	1	1		0	5	1	1		2	5	1	1		4	5
0	1		7	6	0	1		1	6*	0	1		3	6	0	1		5	6*
1	1		0	7*	1	1		2	7*	1	1		4	7*	1	1		6	7*
0	2		1	0	0	2		3	0	0	2		5	0	0	2		7	0
1	2		2	1	1	2		4	1	1	2		6	1	1	2		0	1
0	2		3	2	0	2		5	2	0	2		7	2	0	2		1	2
1	2		4	3	1	2		6	3	1	2		0	3	1	2		2	3
0	2		5	4	0	2		7	4	0	2		1	4	0	2		3	4
1	2		6	5	1	2		0	5	1	2		2	5	1	2		4	5
0	2		7	6	0	2		1	6*	0	2		3	6	0	2		5	6*
1	2		0	7*	1	2		2	7*	1	2		4	7*	1	2		6	7*

```
CG – Concentrator Group
 C – Concentrator
SG – Switch Group
 S – Switch
 L – Level
```

* Ground Start TENs

TABLE 2

PNAL ROOT LIST B

First column group:

CG	C	SG	S	L
1	0		0	0
0	0		1	1
1	0		2	2
0	0		3	3
1	0		4	4
0	0		5	5
1	0		6	6*
0	0		7	7*
1	1		0	0
0	1		1	1
1	1		2	2
0	1		3	3
1	1		4	4
0	1		5	5
1	1		6	6*
0	1		7	7*
1	2		0	0
0	2		1	1
1	2		2	2
0	2		3	3
1	2		4	4
0	2		5	5
1	2		6	6*
0	2		7	7*
1	0		1	0
0	0		2	1
1	0		3	2
0	0		4	3
1	0		5	4
0	0		6	5
1	0		7	6
0	0		0	7*
1	1		1	0
0	1		2	1
1	1		3	2
0	1		4	3
1	1		5	4
0	1		6	5
1	1		7	6
0	1		0	7*
1	2		1	0
0	2		2	1
1	2		3	2
0	2		4	3
1	2		5	4
0	2		6	5
1	2		7	6
0	2		0	7*

Second column group:

CG	C	SG	S	L
1	0		2	0
0	0		3	1
1	0		4	2
0	0		5	3
1	0		6	4
0	0		7	5
1	0		0	6
0	0		1	7*
1	1		2	0
0	1		3	1
1	1		4	2
0	1		5	3
1	1		6	4
0	1		7	5
1	1		0	6
0	1		1	7*
1	2		2	0
0	2		3	1
1	2		4	2
0	2		5	3
1	2		6	4
0	2		7	5
1	2		0	6
0	2		1	7*
1	0		3	0
0	0		4	1
1	0		5	2
0	0		6	3
1	0		7	4
0	0		0	5
1	0		1	6*
0	0		2	7*
1	1		3	0
0	1		4	1
1	1		5	2
0	1		6	3
1	1		7	4
0	1		0	5
1	1		1	6*
0	1		2	7*
1	2		3	0
0	2		4	1
1	2		5	2
0	2		6	3
1	2		7	4
0	2		0	5
1	2		1	6*
0	2		2	7*

Third column group:

CG	C	SG	S	L
1	0		4	0
0	0		5	1
1	0		6	2
0	0		7	3
1	0		0	4
0	0		1	5
1	0		2	6*
0	0		3	7*
1	1		4	0
0	1		5	1
1	1		6	2
0	1		7	3
1	1		0	4
0	1		1	5
1	1		2	6*
0	1		3	7*
1	2		4	0
0	2		5	1
1	2		6	2
0	2		7	3
1	2		0	4
0	2		1	5
1	2		2	6*
0	2		3	7*
1	0		5	0
0	0		6	1
1	0		7	2
0	0		0	3
1	0		1	4
0	0		2	5
1	0		3	6
0	0		4	7*
1	1		5	0
0	1		6	1
1	1		7	2
0	1		0	3
1	1		1	4
0	1		2	5
1	1		3	6
0	1		4	7*
1	2		5	0
0	2		6	1
1	2		7	2
0	2		0	3
1	2		1	4
0	2		2	5
1	2		3	6
0	2		4	7*

Fourth column group:

CG	C	SG	S	L
1	0		6	0
0	0		7	1
1	0		0	2
0	0		1	3
1	0		2	4
0	0		3	5
1	0		4	6
0	0		5	7*
1	1		6	0
0	1		7	1
1	1		0	2
0	1		1	3
1	1		2	4
0	1		3	5
1	1		4	6
0	1		5	7*
1	2		6	0
0	2		7	1
1	2		0	2
0	2		1	3
1	2		2	4
0	2		3	5
1	2		4	6
0	2		5	7*
1	0		7	0
0	0		0	1
1	0		1	2
0	0		2	3
1	0		3	4
0	0		4	5
1	0		5	6*
0	0		6	7*
1	1		7	0
0	1		0	1
1	1		1	2
0	1		2	3
1	1		3	4
0	1		4	5
1	1		5	6*
0	1		6	7*
1	2		7	0
0	2		0	1
1	2		1	2
0	2		2	3
1	2		3	4
0	2		4	5
1	2		5	6*
0	2		6	7*

CG – Concentrator Group
C – Concentrator
SG – Switch Group
S – Switch
L – Level

* Ground Start TENs

Manager, ESS Installation & Field Engineering

10-8-76