NO. 4A CROSSBAR

ASSIGNMENT PRACTICES

TRUNK BLOCK CONNECTORS

CONTENTS PAGE

1. GENERAL

1.01 All one-way outgoing and two-way trunks are assigned on trunk block connectors. The aim in assignment to trunk block connectors is to secure a reasonable traffic balance between individual connectors within a train end, in two train-combined offices, to have an approximately equal load on each train. A balanced load over the trunk block connectors will prevent marker delays which would result from a disproportionately high marker demand for access to a few connectors. The following sections of this practice will describe the trunk block connector, the trunk selection process, practices for assigning trunks to trunk block connectors, and the difference in assignment methods for card translator and ETS-PBC offices.

2. TRUNK BLOCK CONNECTORS

2.01 Trunk block connectors consist principally of trunk block relays which operate in conjunction with information punched in translator cards (electro-mechanical) or written in data tables (electronic translator.) Contacts of the trunk block relays are connected to the outgoing trunk test leads which are arranged in orderly sequence via the assignment distributing frame for marker testing. From these leads, the marker selects an idle trunk for completion of the call and secures information as to its location on the link frames.

2.02 A trunk block connector consists of an "even" half connector and an "odd" half connector. Each half connector is an exact duplicate of the other and is designed in this manner so as to increase marker access and service protection. (See Figure 1)

Each half connector has access to the same 400 pairs of trunk test leads through operation of 10 trunk relays which in turn are subdivided into a "0" group and a "1" group. The "0" group of trunk block relays provides access to trunk block relays 0-4; whereas the "1" group provides access to trunk block relays 5-9.

2.03 Each marker has access to all the trunk block connectors in its train. Two markers may have access to a trunk block connector simultaneously, one in the even half connector and one in the odd half connector. However, only one marker can connect to the "0" group or "1" group of trunk block relays at any given time.

3. TRUNK SELECTION

3.01 The 40 terminals of a trunk block relay are closed simultaneously and the marker tests for an idle trunk by testing from the lower numbered to higher numbered terminals between the terminal limits assigned to a trunk group or subgroup on a trunk block relay. More than one trunk group may be assigned to the same trunk block relay since information punched on the associated translator cards or contained in the data tables determines the "start" and "end" test terminals for each trunk group or subgroup. The

"span" from the "group start" to the "group end" includes the terminals assigned to working trunks plus any prewired and/or spare terminals assigned to a particular group.

3.02 Markers in most offices are arranged to test four terminals when instructed to "follow with overflow". Markers in a few offices have been arranged to test two terminals when instructed to "follow with overflow". The specifications for the particular installation should be checked to verify which of the two options applies. Under no circumstances can both options be used in the same office. Two or four terminals, as determined above, are reserved immediately following the group in cases where Circuits Busy Announcement trunks are assigned to a final trunk group.

3.03 On the first attempt, the marker selects idle trunks within the group span in sequence from the low to high numbered terminals on the trunk block. If the marker secures an idle trunk but fails to establish connection through the links, a second marker and second decoder attempt is required. The order of test for the second attempt is in the reverse direction, that is, from the high to low numbered terminals on each span.

3.04 A marker always begins testing on an even trunk block terminal and ends on an odd terminal. Therefore, it is necessary to assign an even number of terminals for each trunk group or subgroup.

3.05 When the marker has found an idle outgoing trunk it tests for an idle path between the selected outgoing trunk and the incoming trunk and establishes the connection.

4. TRUNK ASSIGNMENT CONSIDERATIONS

4.01 An even number of trunk block connector terminals must be assigned to each group. Group starts must always be assigned to even-numbered terminals and group ends to odd-numbered terminals. Trunk block connector terminals should be assigned with spare terminals (10 to 50 per cent) included within the span assigned to each trunk group. A fairly long range view should be taken in the assignment of these spare terminals. Such factors as expected growth, the establishment or elimination of alternate routes, the splitting of two-way groups into two one-way groups, etc., should be taken into consideration. Terminals not required according to this estimate should be kept in reasonably large groups to be available for the establishment of new groups, unexpected changes in growth and conversions.

4.02 Two-way trunks at a No. 4A office are assigned so that selection by markers on the first attempt is in the reverse order from that at the distant end of the group in order to minimize call blockage due to simultaneous seizures and reduce the testing interval. This may be accomplished by assigning two-way trunks in accordance with the alphabetic order of the terminal cities. The terminal with the CLLI that would be listed first alphabetically will select a trunk starting with the lowest-numbered trunk in the group. The terminal whose CLLI would be listed last alphabetically starts its trunk selection with the highest-numbered trunk in the group.

4.03 If the total number of trunk block terminals required for a trunk group, including spare and CBA trunks, if any, are forty or less the assignment of the group is confined to a single trunk block relay.

4.04 For trunk group peg count and overflow registration purposes in card translator offices each trunk block relay has three pairs of leads provided (numbered 0, 1 and 2), one pair of which may be associated with each trunk group assigned to the block. Thus, there are normally provided peg count and overflow registration facilities for three trunk groups per block relay. However, in addition, there are also two pairs of leads per trunk block connector (numbered 3 and 4) which can be associated with any two trunk groups on the connector. These pairs of leads can be associated if necessary with the fourth groups on any two of the trunk blocks or with the fourth and fifth groups on one trunk block. If a trunk group is large enough to require more than forty trunk block terminals and is not associated with a decoder route relay, the first subgroup is arranged to score the peg count register only and the last subgroup to score the overflow register only. Intermediate subgroups, if any, do not require association with peg count or overflow registers.

All subgroups of groups associated with decoder route relays should be arranged for scoring peg count and the last subgroup should also be arranged to score overflow.

4.05 There are no special trunk block connector assignment considerations for peg count and overflow data in ETS-PBC offices. Peg count and overflow data can be obtained on any number of individual trunk groups on a trunk block relay. This information is not derived from relay punchings but is specified in and controlled by the ETS data tables. However, in ETS-PBC offices trunk group usage data can be obtained on only six groups per trunk block relay. It will be necessary, therefore, to exercise care in the assignment of small groups requiring usage data to assure efficient utilization of the trunk block capacity.

4.06 A savings is made in Plant test connector equipment by alloting intertoll trunks to trunk blocks numbered "0" and up and toll connecting trunks to trunk blocks numbered "9" and down. The exact arrangement of the allotment for a particular office may be determined from the traffic order. If necessary, intertoll groups may be assigned to "toll connecting" blocks or, conversely, toll connecting groups may be assigned to "intertoll blocks". However, any such groups so assigned, will not be available for test by automatic trunk test frames.

4.07 NC trunks should be assigned in subgroups with separate marker access. Reorder trunks should be assigned in subgroups with access by pairs of markers. Reorder Monitor Trunks should be assigned as first and last choice trunks in the reorder subgroup. Both the NC and reorder subgroups should be assigned to block relays of the type arranged for toll connecting trunks and preferably to different trunk block connectors. Separate marker access for NC and reorder trunks is obtained by indicating which marker or markers should have access to a particular trunk subgroup. Calls are routed to these subgroups by route relays in the markers, as specified in the marker cross connections.

5. TRUNK ASSIGNMENT EXAMPLES

5.01 Typical examples of the assignment of various types of trunk groups are shown below. It should be noted that in these examples all cases involving CBA trunks, four terminals are assigned beyond the group end. The trunk numbers used in these illustrations have been selected arbitrarily and do not necessarily conform with any Bell System trunk numbering plan.

5.02 *One-Way Outgoing Groups*

A special method of assigning one-way outgoing groups permit variations in the size of the group without affecting the trunks which are first and last choice. This is an important consideration when the trunks are assigned to the outgoing link frames as discussed in Sec. 13c (4). All one-way outgoing trunk groups should be assigned in the following manner: (These examples are for a card translator office and show the method for noting peg count and overflow leads using the Assignment Record form E-3699, Figure 2).

PC	TRK BLK																			
0	9	GROUP	ROA (IT MKRS 0 & 1) PC-1									NCA (IT MKR 0) PC 2								
1		CLASS																		
2		TRK.#	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
3		GROUP	OFFICE "A" PC-0																	
4		CLASS	1-WAY MF TOLL SW																	
		TRK.#	2	3	4	5	6	7	8	9	10	11	12	13	14							1
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		GROUP	OFFICE "B"														OPR. 501					
		CLASS															MANUAL					
0	8	TRK.#	22	23	24	25	26	27	28	29						1	2	3	4			1
1			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
2		GROUP	OFFICE "B" PC-0																	
3		CLASS	1-WAY DP TOLL SW																	
4		TRK.#	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

In the above examples it should be noted that in each case group starts are always assigned to even numbered terminals and group ends to odd numbered terminals. The lowest numbered trunk in each group is always made last choice and the next lowest numbered trunk first choice. The first and last choice trunks in the reorder group are reorder monitor trunks. Reorder monitor trunks are assigned to only one reorder trunk subgroup in each train.

If a one-way outgoing trunk group requires more than forty terminals for assignment, each subgroup is assigned in the following manner. Normally, each subgroup would be assigned to a different trunk block connector.

CCS		GROUP	"121" SUBGROUP "O"																		
		CLASS	MANUAL																		
0		TRK.#	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	1
1			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
2	7	GROUP	"121" SUBGROUP "O" - PCO																		
3		CLASS	MANUAL																		
4		TRK.#	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

CCS		GROUP	OFFICE "X"					OFFICE "B"													
		CLASS	CBA					2-WAY MF IT													
1		TRK.#			1	2	3	4				11	10	9	8	7	6	5	4	3	2	1
2			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
3	3	GROUP	OFFICE "X"																		
4		CLASS	2-WAY MF IT																		
5		TRK.#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17			
6			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

5.03 *One-Way Outgoing Groups Supplemented by Two-Way Groups*

One-way outgoing groups supplemented by two-way groups are assigned in the following manner. Two variations in the assignment of spare terminals with a span, depending upon the trunk selection of the two-way portion of the group, are shown in these examples. (The following examples are for an ETS office and show the method for noting usage assignments on Assignment Record form E-3699A, Figure 3).

CCS	TRK BLK	GROUP	OFFICE "Y"																		
		CLASS	1-WAY MF IT							2-WAY MF IT									CBA		
0		TRK.#	1	2	3	4	5			1	2	3	4	5	6				1	2	3	4
1			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
2	4	GROUP	OFFICE "A"																		
3		CLASS	1-WAY DP IT							2 WAY DP IT									CBA		
4		TRK.#	1	2	3	4	5					7	6	5	4	3	2	1	1	2	3	4
5			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
6																						

The order of test on the two-way trunks to office "Y" is low-to-high (1, 2, 3, etc.). To accommodate growth, spare terminals are left between the highest-numbered trunk and the CBA trunks. The order of test on the two-way trunks to office "A" is from high-to-low (7, 6, 5, etc.) with spare for growth put between the one-way and the two-way groups.

5.04 *Two-Way Groups*

Two-way groups are assigned in the following manner:

In this example, it is assumed that the group to office "B" is high usage, without a requirement for CBA trunks. The order of test to office "X" is from low-to-high.

6. PRECUTOVER ASSIGNMENTS

6.01 Lists or a set of cards, as noted below, should be prepared of all the intertoll, toll switching and miscellaneous circuit groups to be assigned to the trunk block connectors. These lists should include the number of spares to be allotted to each group and, in the case of intertoll groups, the number of terminals to be allotted for CBA trunks, if any. These lists also include spans reserved for special access groups and new groups, each large enough to care for the anticipated size of the group plus spares. Rather than prepare lists, it may be advantageous to list each trunk group with its associated information on an individual card. The cards can then be rearranged at will as the trunk groups are allocated to trains and to connectors.

6.02 Intertoll trunk groups are divided into morning or evening busy hour groups, by time zones, and arranged according to size in each classification. Toll switching trunk groups are similarly divided into morning or evening busy hour groups and the groups arranged according to size within each classification. Miscellaneous trunk groups are arranged according to size.

6.03 In two-train offices the groups in each category are allotted alternately to one train or the other so that an approximately equal load will be carried on each train. Differences in the busy hour and seasonal loads carried by the various groups should be considered to assure an even balance on each train during all the seasons of the year.

6.04 The trunk groups are then allotted to each connector in sequence in the order listed, reversing the direction of allotment at the end of each sweep. If a trunk group requires more than 40 terminals for assignment, each subgroup should be assigned to a different connector.

6.05 Normally, in card translator offices, no more than three groups should be assigned to a single block relay because of the peg count and overflow limitations described in paragraph 4.04. In ETS-PBC offices, six groups should be the maximum because of the usage limitations discussed in paragraph 4.05.

6.06 A frequent check should be made to determine if approximately the same number of trunks have been allotted to each connector. After a reasonable balance has been secured between connectors, the "O" and "1" group in each connector should be checked for approximate balance. Care should be taken to insure that the spare terminals remaining outside the trunk group spans are in the *largest* possible groups rather than in small isolated clusters.

7. ASSIGNMENT PROCEDURES – WORKING SYSTEMS

7.01 Assignment of new groups to working systems should be made according to the principles for precutover assignments discussed in Section 6. This requires that consideration be given to the characteristics of existing groups on a connector before assigning a new group onto it. Except for unusual conditions, these procedures should prevent a serious imbalance and the necessity to reassign trunks.

7.02 In ETS-PBC machines, trunk block connectors peg count data are available on an hourly, prescheduled basis. A peg count is scored each time a marker accesses the connector. These data should be examined periodically on morning and evening ABD busy hour and on peak days. This will indicate if a serious imbalance exists and provide guidance for the assignment of new trunks.

7.03 Card translator offices are equipped with two peg count registers per connector, one for the odd and one for the even half of each trunk block connector. These data should be used as described in 7.02.

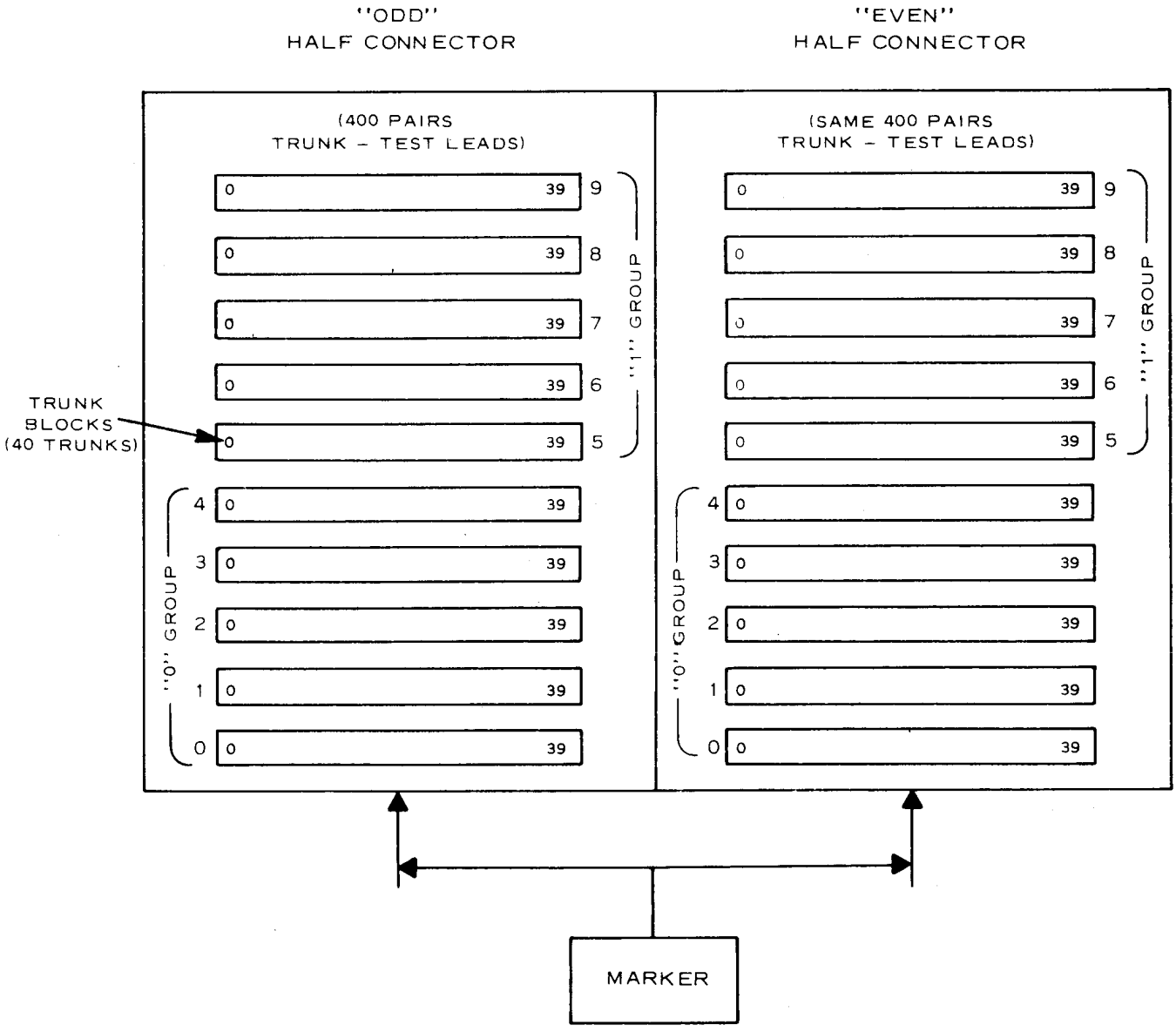
8. OFFICE RECORDS

8.01 Trunk Block Assignment Record, Form E-3699, is shown in Figure 2. This form may be used for the office record of assignments to trunk block connectors in card translator offices. Spaces are provided for trunk group or subgroup name, class, operation and trunk numbers. The "total" space at the bottom may be used to maintain a count of working trunks assigned to a connector.

8.02 On the left of each relay are numbers 0 through 4. These are to be used to indicate which register leads have been assigned within that trunk block relay. When a register lead is assigned to a trunk group, the number of that lead should be encircled. The register lead number should also be noted next to the trunk group name in the body of the form. Examples of this procedure are shown in paragraph 5.02.

8.03 Trunk Block Assignment Record, Form E-3699A is shown in Figure 3. This form may be used in ETS-PBC offices. Spaces for designations, trunk numbers, etc., are the same as described in 7.01. However, as noted in paragraph 4.05, there is a limitation of six groups per relay for which usage data may be obtained. On the left of each relay are numbers 1 through 6. As groups requiring usage data are assigned, these numbers should be circled, in ascending order, to facilitate future identification of relay capacities. The dial administrator does not assign a particular number to a group, as in card translator offices. This is done within the ETS program. Examples of this procedure for ETS-PBC offices are shown in paragraphs 5.03 and 5.04.

TRUNK BLOCK CONNECTOR



DIAL FACILITIES MANAGEMENT PRACTICES

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E-3699
(4-55)

TRUNK BLOCK CONNECTOR ASSIGNMENT RECORD

"0" GROUP

CONN. NO._____

PC	TRK BLK																				
0 1 2 3 4	4	GROUP																			
		CLASS																			
		TRK.#																			
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																			
		CLASS																			
		TRK.#																			
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0 1 2 3 4	3	GROUP																			
		CLASS																			
		TRK.#																			
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																			
		CLASS																			
		TRK.#																			
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0 1 2 3 4	2	GROUP																			
		CLASS																			
		TRK.#																			
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																			
		CLASS																			
		TRK.#																			
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0 1 2 3 4	1	GROUP																			
		CLASS																			
		TRK.#																			
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																			
		CLASS																			
		TRK.#																			
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0 1 2 3 4	0	GROUP																			
		CLASS																			
		TRK.#																			
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																			
		CLASS																			
		TRK.#																			
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
TOTAL																					

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E-3699
(4-55)

TRUNK BLOCK CONNECTOR ASSIGNMENT RECORD

"1" GROUP

CONN. NO._____

PC	TRK BLK																				
0 1 2 3 4	9	GROUP																			
		CLASS																			
		TRK.#																			
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																			
		CLASS																			
		TRK.#																			
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0 1 2 3 4	8	GROUP																			
		CLASS																			
		TRK.#																			
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																			
		CLASS																			
		TRK.#																			
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0 1 2 3 4	7	GROUP																			
		CLASS																			
		TRK.#																			
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																			
		CLASS																			
		TRK.#																			
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0 1 2 3 4	6	GROUP																			
		CLASS																			
		TRK.#																			
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																			
		CLASS																			
		TRK.#																			
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
0 1 2 3 4	5	GROUP																			
		CLASS																			
		TRK.#																			
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																			
		CLASS																			
		TRK.#																			
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
TOTAL																					

TRUNK BLOCK CONNECTOR RECORD FORM E3699
CARD TRANSLATOR OFFICES

DIAL FACILITIES MANAGEMENT PRACTICES

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TRUNK BLOCK CONNECTOR ASSIGNMENT RECORD

"0" GROUP

E3699A (7-73)

CONN. NO. _____

CCS	TRK BLK		20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
1 2 3 4 5 6	4	GROUP																				
		CLASS																				
		TRK. #																				
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 2 3 4 5 6	3	GROUP																				
		CLASS																				
		TRK. #																				
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																				
		CLASS																				
		TRK. #																				
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 2 3 4 5 6	2	GROUP																				
		CLASS																				
		TRK. #																				
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																				
		CLASS																				
		TRK. #																				
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 2 3 4 5 6	1	GROUP																				
		CLASS																				
		TRK. #																				
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																				
		CLASS																				
		TRK. #																				
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 2 3 4 5 6	0	GROUP																				
		CLASS																				
		TRK. #																				
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																				
		CLASS																				
		TRK. #																				
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
TOTAL																						

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TRUNK BLOCK CONNECTOR ASSIGNMENT RECORD

"1" GROUP

E3699A (7-73)

CONN. NO. _____

CCS	TRK BLK		20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
1 2 3 4 5 6	9	GROUP																				
		CLASS																				
		TRK. #																				
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 2 3 4 5 6	8	GROUP																				
		CLASS																				
		TRK. #																				
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																				
		CLASS																				
		TRK. #																				
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 2 3 4 5 6	7	GROUP																				
		CLASS																				
		TRK. #																				
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																				
		CLASS																				
		TRK. #																				
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 2 3 4 5 6	6	GROUP																				
		CLASS																				
		TRK. #																				
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																				
		CLASS																				
		TRK. #																				
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 2 3 4 5 6	5	GROUP																				
		CLASS																				
		TRK. #																				
			20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
		GROUP																				
		CLASS																				
		TRK. #																				
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
TOTAL																						

TRUNK BLOCK CONNECTOR RECORDS FORM E 3699-A

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