NO. 4 ELECTRONIC SWITCHING SYSTEM
ASSIGNMENT PRACTICES

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FIGURES

1. GENERAL

1.01 This section of the Dial Facilities Management Practices (DFMP) provides the No. 4 Electronic Switching System (ESS) machine administrator with information necessary to make the basic assignments required by the No. 4 ESS. A list of abbreviations used in this section is provided in Table A.

1.02 Assigning the No. 4 ESS involves the following processes which will be discussed in this section:

- Establish trunk subgroups (TSG)
- Assign trunks to the TSGs
- Include the TSGs in routing data blocks (RDB)

TABLE A

GLOSSARY OF ABBREVIATIONS

ABBREVIATION	DEFINITION
ADC	Acceptable Digit Count
AOCI	Automatic Out-of-Chain Routing Data Block Index
AOCRDB	Automatic Out-of-Chain Routing Data Block
ATB	All Trunks Busy
BSP	Bell System Practices
BTFN	Base Traffic Number
CAMA	Centralized Automatic Message Accounting
CBN	Callback Number
CCIS	Common Channel Interoffice Signaling
CCSA	Common Control Switching Arrangement
CIN	Circuit Identification Name
CRT	Cathode Ray Tube
CS	Call Store
DDD	Direct Distance Dialing
DESEP	Destination Traffic Separation Class
DFMP	Dial Facilities Management Practices
DI-GROUP	Digital Group
DOCRN	Dynamic Overload Control Receive Number
DOCTN	Dynamic Overload Control Transmit Number
DP	Dial Pulse
ESS	Electronic Switching System
ETS	Electronic Translator System
FS	File Store
FTFN	First Traffic Number
FWA	F-Type Signaling Unit
G	Go
GDF	Group Distributing Frame
GNS	Go/No-Go Screening
GNSC	Go/No-Go Screening Class

TABLE A (Cont)

GLOSSARY OF ABBREVIATIONS

ABBREVIATION	DEFINITION
HNPA	Home Numbering Plan Area
INSEP	Incoming Traffic Separation Class
INWATS	Inward Wide Area Telephone Service
INWST	Inward Wide Area Telephone Service State Index
INWT	Inward Wide Area Telephone Service Type
IS	Inward Wide Area Telephone Service State
LCI	Local Call Intercept
MAC	Machine Administration Center
MBTOVER	Maintenance Busy Threshold Override
MOC	Maintenance Operations Center
MTF	Metallic Trunk Frame
MTS	Multiple Treatment Screening
MTSC	Multiple Treatment Screening Class
MTSI	Multiple Treatment Screening Index
N	No-Go
NAHTR	No Automatic Hard-to-Reach Determination
NBS	Near Building Subdivision
NCA	No Circuit Announcement
NEOTR	Near-End Operational Test Responsibility
No 10 FHT	Disallowed Intra-NPA 10-Digit Dialing Final Handling Treatment
NPA	Numbering Plan Area
NTD	Number of Translatable Digits
ODA	Office Data Assembler
OTMTN	Operational Terminating Test Number
OTMTT	Operational Terminating Test Type
OTSTN	Operational Through Switch Test Number
OTSTT	Operational Through Switch Test Type
OZD	Originating Zonal Band Digit

TABLE A (Cont)

GLOSSARY OF ABBREVIATIONS

ABBREVIATION	DEFINITION
PCM	Pulse Code Modulation
PCR	Principal City Routing
POTS	Plain Old Telephone Service
POVC	Pass Originating Validity Check
QTFN	Quantity of Traffic Numbers
QTKS	Quantity of Trunks
RCAM	Recent Change Action Message
RCBI	Remote Office Test Line Callback Index
RCDM	Recent Change Data Message
RDB	Routing Data Block
RDBFHT	Routing Data Block Final Handling Treatment
RDBI	Routing Data Block Index
RFA	Ring Forward Allowed
RFMP	Ring Forward Miscellaneous Point
ROTL	Remote Office Test Line
SAC	Special Area Code
SF	Single-Frequency Signaling Unit
SK	Skip
SMAS	Switched Maintenance Access System
SNPA	Served Numbering Plan Area
SP	Signal Processor
SPC	Switching and Permuting Circuit
SUGRP	Supervisory Group
SUPOS	Supervisory Position
TAN	Trunk Appearance Number
TCA	Test Control Area
TD	Time Division
TG4	No. 4 ESS Translation Guide
TMS	Time Multiplexed Switch
TMZD	Terminating Maximum Zonal Band Digit

TABLE A (Cont)

GLOSSARY OF ABBREVIATIONS

ABBREVIATION	DEFINITION
TN	Trunk Number
TP	Test Position
TSG	Trunk Subgroup
TSI	Time Slot Interchange
TSIF	Time Slot Interchange Frame
TSN	Trunk Scanner Number
TTY	Teletypewriter
UTE	Unitized Terminal Equipment
VCA	Vacant Code Announcement
VIU	Voice Interface Unit
WATS	Wide Area Telephone Service
WECo	Western Electric Company
XBT	Crossbar Tandem
XTMTN	Transmission Terminating Test Number
XTMTT	Transmission Terminating Test Type
XTSTN	Transmission Through Switch Test Number
XTSTT	Transmission Through Switch Test Type

- Direct codes to the RDBs
- Provide necessary screening
- Other assignment considerations.

1.03 Before making assignments, the machine administrator should be familiar with the traffic equipment order for the office. The traffic equipment order includes equipment quantities and memory allocations.

1.04 Initial office assignments are entered onto forms designed for input to the office data assembler (ODA). The ODA compiles these data. The machine administrator and the routing supervisor prepare the input forms.

1.05 The No. 4 ESS recent change system is used to modify data structures created by ODA. The machine administrator and/or the routing supervisor initiate a recent change message. The changes may involve all or part of the processes described in 1.02.

1.06 The No. 4 ESS Translation Guide (TG4) describes the entries necessary for all ODA input forms and Bell System Practices (BSP) Section 234-105-005 describes recent change messages. The Western Electric Company is responsible for issuing and maintaining TG4.

1.07 This section does not supersede TG4 but provides information necessary to make the proper assignment considerations prior to preparing ODA input forms or recent change messages. After the assignment considerations described in this

section have been made, the necessary ODA input forms or recent change messages can be completed using TG4 and BSP Section 234-105-005 as references.

1.08 Distribution of TG4 will be made on an individual or bulk basis from a standing order list. Additions or deletions to the existing standing order lists, changes of names or addresses, and requests for individual pages should be forwarded to:

Western Electric Company, Inc.
Reproduction Organization
Department 9164-3
2025 Windsor Drive
Oakbrook, Illinois 60521

Orders must include the telephone company area and accounting codes for billing purposes, plus the complete information ***exactly*** as found within the appropriate category below:

(a) ***Addition to Standing Order:***

Standing Order

(Quantity) Document TG4, Translation Guide, No. 4 ESS: Complete (include binders and complete set of tabs for each document specified in quantity above) and all subsequent issues.

(b) ***Changes of Names or Addresses on Existing Standing Order:***

Document TG4, Translation Guide, No. 4 ESS, 4-Wire

Change:

OLD - TG Number (from address label)

Name, address, city, state, and zip code.

NEW - Name, address, city, state, and zip code.

(c) ***Deletion of Addressee From Standing Order:***

Document TG4, Translation Guide, No. 4 ESS, 4-Wire

Delete:

TG Number (from address label). Name, address, city, state, and zip code.

(d) ***Individual Items to Standing Order Customer Only:***

Nonrecurring

Document TG4, Translation Guide, No. 4 ESS, 4-Wire

(1) Pages:

(Quantity) Page number, section, division

(2) Binder (empty):

(Quantity) Volume number

(3) Index Tabs:

(Quantity) Tabs number(s). On all orders include name, address, city, state, and zip code.

2. OFFICE DATA ASSEMBLY

General

2.01 When the machine administrator and the routing supervisor have completed all ODA input forms, the forms must be forwarded to the Western Electric Company, as described in TG4. The machine administrator must prepare and include transmittal forms ESS 410A, B, and C. The data on all input forms is entered onto keypunch cards and loaded into the ODA.

2.02 The ODA is a computer program used by the Western Electric Company to compile data into a format which can be used by the No. 4 ESS. The ODA error-checks the data and forms it into data structures called "translators." The ODA output is on magnetic tape for input to the No. 4 ESS.

Input Form Responsibilities

2.03 The machine administrator is responsible for preparing the following ODA input forms:

- ESS 401—TSG Information

- ESS 402—Trunk Assignments
- ESS 406—Miscellaneous
- ESS 410—Administrative.

2.04 The routing supervisor is responsible for the remaining forms:

- ESS 403—Code Grouping
- ESS 404—Centralized Automatic Message Accounting (CAMA) Screening
- ESS 405—RDB Information.

2.05 Cooperation between the machine administrator and the routing supervisor is required in completing these forms—particularly RDB and trunk assignments.

2.06 The input forms may be prepared after completing the assignment considerations described in this DFMP section. TG4 provides detailed instructions for preparation of the input forms.

2.07 A list of each ODA input form and a reference to its use in this section is provided in Table B.

3. RECENT CHANGE

3.01 The recent change system provides the capability for changing translation data within the No. 4 ESS. The recent change system uses two classes of messages, recent change data message (RCDM) and recent change action message (RCAM).

Recent Change Data Messages

3.02 An RCDM is used to specify the data which is to be inserted into the translation system. RCDMs are initiated by the machine administrator or the routing supervisor.

3.03 When an RCDM is placed into the No. 4 ESS, it may optionally be placed into one of three states: the buffered state, the test state, or the active state. It is recommended that all RCDMs initially be placed into the buffered state. An important exception to this sequence occurs with TSG characteristics and trunk assignment RCDMs. These messages are in the final state when in the test mode.

3.04 When the recent change system receives an RCDM to be placed into the buffered state, it checks the message for proper format and stores it in memory.

3.05 The machine administrator is responsible for inputting the following RCDMs:

- 100 Series—TSG Information
- 200 Series—Trunk Assignments
- 600 Series—Miscellaneous.

3.06 The routing supervisor is responsible for initiating the remaining RCDMs:

- 300 Series—Code Grouping
- 400 Series—CAMA Screening
- 500 Series—RDB Information.

3.07 A list of each RCDM and a reference to its use in this DFMP section is provided in Table C.

3.08 The machine administrator, when initiating a recent change, is responsible for buffering the message and coordinating the change until completion. The coordination procedures for each type of change are described individually in this DFMP section.

3.09 The routing supervisor may have access to a remote routing administration port. Using the remote routing and administration port, an RCDM may be placed directly into the buffered state in No. 4 ESS memory. A hard copy of the message is printed in the Machine Administration Center (MAC). The machine administrator is then responsible for coordination of the change until completion.

3.10 If the routing supervisor is not using a remote routing administration port, an RCDM form will be prepared. RCDM forms are identical to cathode-ray tube (CRT) displays for RCDMs. The routing supervisor forwards the completed form(s) to the machine administrator who has the

TABLE B
ODA INPUT FORMS

FORM NO. ESS	CAN BE FOUND IN PARAGRAPH	FUNCTION
401A	4.06	2-Way TSG characteristics
401B	4.06	One-way incoming TSG characteristics
401C	4.06	One-way outgoing TSG characteristics
401D	4.17	Multiple traffic number block assignment
401E	4.44	Nonmessage TSG characteristics
403A	7.39	Intra-area 7/10-digit dialing
403B	7.40	Inter-NPA 7-digit dialing
403C	7.21	Non-POTS 3-digit translator storage
403D	7.05	3-digit code grouping
403E	7.05	4-, 5-, and 6-digit code grouping
403F	7.10	4-, 5-, and 6-digit implied code grouping
403G	7.05	7-, 8-, and 9-digit code grouping
403H	7.10	7-, 8-, and 9-digit implied code grouping
403I	8.16	Multiple treatment screening
403J	7.41	Same INWATS treatment
403K	7.35	Code type
404A	8.28; 8.34	CAMA screening LCI code grouping
404B	8.34	CAMA screening LCI blocking pattern
404C	8.30	CAMA unauthorized area codes
404D	8.30	CAMA unauthorized office codes
405A	6.33	In-chain routing data block storage
405B	6.13	In-chain routing data block
405C	6.21	INWATS routing data block
405D	6.25	Automatic out-of-chain RDB
406A	6.33	ROTL callback
410A	2.01	ODA input identification data
410B	2.01	ODA input form page inventory
410C	2.01	ODA input coordination

responsibility for buffering the message and coordinating the change until completion.

3.11 The machine administrator should maintain a Come-Up File of recent changes to ensure their timely activation. A description of this file is found in DMFP Division H, Section 9e, "No. 4 ESS Machine Administration Records."

3.12 The machine administrator and routing supervisor must assign a unique order number to each RCDM initiated. The order number will be a 6-digit identifying number.

3.13 The routing supervisor uses order numbers 000,000 through 499,999. The machine administrator uses order numbers 500,000 through 999,999.

3.14 The machine administrator must randomly select an "Order Number" card from the recent change file when initiating an RCDM. The order number on the card may be assigned to the RCDM. DFMP Division H, Section 9e, describes the recent change records involved.

3.15 Most RCDMs are input in the English language as a functional message. A functional RCDM

TABLE C

RECENT CHANGE DATA MESSAGES

RCDM	CAN BE FOUND IN PARAGRAPH	FUNCTION
1	4.06	Add a new 2-way TSG
2	4.06	Add a new one-way incoming TSG
3	4.06	Add a new one-way outgoing TSG
4	4.06	Change TSG characteristics for all of a TSG
5	4.06	Change TSG characteristics for part of a TSG
6	4.17	Add a traffic number block to TSG
7	4.46	Change characteristics for miscellaneous TSG
8	4.17	Delete traffic number block from TSG
9	4.46	Delete a TSG
18	7.39	Add a new SNPA
19	7.40	Protect terminating office codes
20	7.21	Add a new non-POTS domain
21	7.05	Change 3-digit translation
22	7.05	Change 4-, 5-, or 6-digit translation
23	7.05	Change 7-, 8-, or 9-digit translation
24	8.16	Add an MTSI
25	8.16	Change MTS for an existing index
26	7.41	Same INWATS treatment
27	7.35	Change digit-type translator
28	8.16	Delete an MTSI
29	7.05	Increase number
30	7.05	Decrease number of translatable digits
31	8.28; 8.34	Point office codes at a profile
32	8.34	Change LCI blocking pattern
33	8.37	Add a terminating NPA to a profile
34	8.30	Block unauthorized area codes
35	8.30	Block unauthorized office codes
37	8.37	Delete a terminating NPA from a profile
38	6.33	Add a group of RDBIs
39	6.13	Add a new in-chain RDB
40	6.21	Add a new INWATS RDB
41	6.25	Add an AOCRDB
42	6.13	Change in-chain RDB characteristics
43	6.21	Change INWATS RDB characteristics
44	6.13	Add TSGs to an existing RDB
45	6.25	Add TSGs to AOCRDB
46	6.21	Add TSGs to INWATS RDB
47	6.13	Delete TSGs from existing RDB
48	6.25	Delete TSGs from existing AOCRDB
49	6.13	Delete an RDB

TABLE C (Cont)

RECENT CHANGE DATA MESSAGES

RCDM	CAN BE FOUND IN PARAGRAPH	FUNCTION
50	6.25	Delete an AOCRDB
51	9.06	Grow unit-type equipage bits
52	9.06	Modify unit-type equipage bits
53	3.16	Functional translator change
54	3.16	Absolute word change
55	9.04	Add ROTL callback translator
56	3.26	Activate more than one recent change

is designed to handle all translation changes necessary to perform a specific function. An example of a functional recent change message is one to add a new TSG. The recent change system uses the information in the functional message to automatically update all translators necessary to add the TSG.

3.16 Machine language changes must be made to individual translators for which no functional English language RCDM is available. RCDM 53 or 800 is used to make translator changes in machine language. To initiate RCDM 53 or 800, the machine administrator must notify the Maintenance Operations Center (MOC) personnel of the change desired. The MOC personnel buffer, test, and activate the RCDMs.

Caution: Extreme caution must be used when processing RCDM 53 or 800. An error could cause loss of system integrity.

Recent Change Action Messages

3.17 An RCAM specifies actions to be taken on an RCDM. RCAMs reference RCDMs via the RCDM order number. The following nine types of RCAMs are used:

(a) Request an RCDM form

(b) Print order numbers contained in the RCDM buffer

(c) Print space remaining in the RCDM buffer

(d) Cancel a buffered RCDM

(e) Clear the RCDM buffer

(f) Output a hard copy of a buffered RCMD

(g) Place a buffered RCDM into the test state

(h) Activate a test state RCDM

(i) Cancel an RCDM in the test state.

3.18 When the recent change system receives RCAM "request an RCDM form," it causes an RCDM form to be displayed on the CRT. The RCDM may then be buffered by making entries on the form display. The RCDM is placed in the buffer in the spaces found available by the program. If two consecutive blocks of 32 words are required but not available, a reject message is returned. The machine administrator will then have to administer the buffer to provide the required space.

3.19 RCAM "print order numbers contained in the RCDM buffer" causes the system to print a list of the order numbers of each message contained in the buffer.

3.20 The RCDM buffer stores a maximum of 511 average length RCDMs. The actual number depends upon the length of the messages. RCAM "print space remaining in the RCDM buffer" is used to determine the amount of space remaining in the buffer.

3.21 RCAM "cancel a buffered RCDM" is used to specify an RCDM which is to be canceled. An RCDM may only be canceled in the buffered state except as discussed in 3.02 through 3.16.

RCAM "cancel an RCDM in the test state" is used to cancel these messages while in the test state.

3.22 RCAM "clear the RCDM buffer" causes all RCDMs in the buffer to be canceled.

3.23 RCAM "output a hard copy of a buffered RCDM" causes a hard copy of a buffered RCDM to be output to the RC channel. The type of terminal assigned to this channel (CRT or teletypewriter [TTY]) will dictate whether the output is displayed or paper copy.

3.24 When the recent change system receives RCAM "place a buffered RCDM into the test state," the specified RCDM is retrieved from memory and inserted into translators. The recent change system will seize spare storage space and build new translators as necessary. The new data can only be accessed for testing purposes. This is the final state for trunk and TSG characteristic RCDMs. RCDMs requiring an activate RCAM can only be verified for proper translation data.

3.25 When the recent change system receives RCAM "activate test state RCDM," the new translators are made accessible to operational programs and the recent change is complete. When it is desired to activate more than one RCDM at a time, RCDM 600 must be used to specify the order numbers. The machine administrator is responsible for initiating RCDM 600.

3.26 Recent change messages may be initiated after completing the assignment considerations described in this DFMP section. BSP Section 234-105-005 provides detailed instructions for the preparation of recent change messages.

4. ESTABLISHING TRUNK SUBGROUPS

GENERAL

4.01 All trunks which terminate in the No. 4 ESS are members of a TSG. A TSG is made up of all trunks with common characteristics which connect the same two points.

4.02 All TSGs are members of a trunk group. A trunk group is made up of all trunks which connect the same two points. A trunk group may include one or more TSGs.

4.03 A subset of the common language codes for the two points connected by a trunk group identifies the trunk group. BSP Section 795-100-100 describes the use of common language codes. When no common language code exists for a point which terminates trunks from the No. 4 ESS, a locally derived code may be used. All inputs to the No. 4 ESS involving that trunk group must use the exact same code. All trunks which terminate at the same two points, as identified by the common language codes, will be members of the same trunk group. Fig. 1 illustrates the subset of common language codes.

4.04 A new TSG must be established whenever two new points are connected (a new trunk group), or when trunks are added to an existing trunk group and the new trunks have characteristics which are different from any existing TSG.

4.05 The characteristics which must be common for all trunks in a TSG are the items on Forms ESS 401A, B, C, or E.

4.06 ODA input Forms ESS 401A, B, and C are used to establish 2-way, one-way incoming, and one-way outgoing message TSGs, respectively. For working offices, RCDMs 100, 101, and 102 are used, respectively, to add 2-way, one-way incoming, and one-way outgoing message TSGs. To change message TSG characteristics, RCDM 103 is used.

4.07 The machine administrator is responsible for preparing ODA input forms and RCDMs for TSGs and for placing the RCDMs into the buffered state and testing them. There is no active state for TSG RCDMs. No traffic will be affected until trunks are added to the TSGs and the TSGs are included in RDBs. After placing the RCDMs into the test state, the machine administrator uses verify message 1a, 1b, or 1c to check the translator structures. The check assures that all data listed in the verify message is the same as the intended input. The verify messages are described in BSP Section 234-105-005.

ASSIGNMENT CONSIDERATIONS

4.08 The assignment considerations discussed in 4.09 through 4.24 must be made prior to adding any message TSG.

COMMON LANGUAGE CIRCUIT IDENTIFIER

CODING DATA	TRAFFIC NUMBER	TRUNK TYPE				OFFICE "A" IDENTIFICATION				TYPE AND DIRECTION OF PULSING	OFFICE "Z" IDENTIFICATION			
		TRAFFIC CLASS	OFFICE CLASS	TRAFFIC USE	MODIFIER	TOWN	STATE	BUILDING	BUILDING SUBDIVISION		TOWN	STATE	BUILDING	BUILDING SUBDIVISION
CHARACTER POSITIONS	1–4	5 & 6	7 & 8	9 & 10	11–17	18–21	22 & 23	24 & 25	26 & 28	29 & 30	31–34	35 & 36	37 & 38	39–41

NO. 4 ESS TRUNK GROUP IDENTIFICATION

CODING DATA	OFFICE "A" IDENTIFICATION				OFFICE "Z" IDENTIFICATION			
	TOWN	STATE	BUILDING	BUILDING SUBDIVISION	TOWN	STATE	BUILDING	BUILDING SUBDIVISION
CHARACTER POSITIONS	1–4	5 & 6	7 & 8	9–11	12–15	16 & 17	18 & 19	20–22

CIN FOR INDIVIDUAL CIRCUITS

CODING DATA	TRAFFIC NUMBER	OFFICE "A" IDENTIFICATION				OFFICE "Z" IDENTIFICATION			
		TOWN	STATE	BUILDING	BUILDING SUBDIVISION	TOWN	STATE	BUILDING	BUILDING SUBDIVISION
CHARACTER POSITIONS	1–4	5–8	9 & 10	11 & 12	13–15	16–19	20 & 21	22 & 23	24–26

CIN FOR TSGs

CODING DATA	BASE TRAFFIC NUMBER	OFFICE "A" IDENTIFICATION				OFFICE "Z" IDENTIFICATION			
		TOWN	STATE	BUILDING	BUILDING SUBDIVISION	TOWN	STATE	BUILDING	BUILDING SUBDIVISION
CHARACTER POSITIONS	1–4	5–8	9 & 10	11 & 12	13–15	16–19	20 & 21	22 & 23	24–26

ABBREVIATED CIN FOR INDIVIDUAL CIRCUITS

CODING DATA	TRAFFIC NUMBER	DISTANT OFFICE IDENTIFICATION				NEAR END
		TOWN	STATE	BUILDING	BUILDING SUBDIVISION	BUILDING SUBDIVISION
CHARACTER POSITIONS	1–4	5–8	9 & 10	11 & 12	13–15	16–18

ABBREVIATED CIN FOR TSGs

CODING DATA	BASE TRAFFIC NUMBER	DISTANT OFFICE IDENTIFICATION				NEAR END
		TOWN	STATE	BUILDING	BUILDING SUBDIVISION	BUILDING SUBDIVISION
CHARACTER POSITIONS	1–4	5–8	9 & 10	11 & 12	13–15	16–18

Fig. 1—Circuit Identification—Relationship Between Common Language Codes, CINs, and Abbreviated CINs

Circuit Identification Name

4.09 The TSG is identified by the trunk group identification (subset of common language codes of the two connected points) preceded by a base traffic number (BTFN). The combination of BTFN and trunk group identification codes is called a circuit identification name (CIN). All TSGs are identified by their CIN.

4.10 The CIN for individual trunks is designated by the traffic number followed by the subset of common language codes for the connected points. Traffic numbers are the circuit numbers assigned on the circuit layout record card.

4.11 ODA input forms and recent change messages use an abbreviated CIN. The abbreviated CIN for a TSG includes the BTFN and the subset of the common language codes for the far end of the TSG. The near building subdivision (NBS) is the only part of the near-end common language code used in the abbreviated CIN. The NBS is the only near-end identification necessary because the rest of the near-end common language code is always constant. The abbreviated CIN for an individual trunk includes the traffic number, the subset of common language codes for the far end, and the NBS.

4.12 Fig. 1 illustrates the relationship between common language codes, CINs, and the abbreviated CINs.

Traffic Numbers

4.13 The BTFN is the first traffic number assigned to the TSG. The BTFN distinguishes the various TSGs within a trunk group. Traffic numbers may not be duplicated within a trunk group.

4.14 After the BTFN is assigned to a TSG, a quantity of traffic numbers (QTFN) must be specified. The No. 4 ESS automatically assigns traffic numbers consecutively, starting with the BTFN.

4.15 The assignment of traffic numbers to a TSG does not establish trunks within the TSG, and no cost penalty is created by assigning large blocks of numbers. Traffic number blocks assigned to a TSG merely identify which traffic numbers within a trunk group are associated with that TSG. Large blocks of traffic numbers should be assigned, thereby limiting future requirements to add traffic number blocks. The assignments should reflect a long-term view of trunks to be added.

4.16 Consider a trunk group which contains 2-way trunks, one-way incoming trunks, and one-way outgoing trunks. The trunk group must be broken into three TSGs. The traffic numbers could be assigned as follows:

TSG	TRAFFIC NUMBERS RESERVED	BTFN	QTFN
2-Way	1 — 984	1	984
One-Way Incoming	5001 — 5984	5001	984
One-Way Outgoing	8001 — 8984	8001	984

4.17 To assign an additional block of traffic numbers, an additional input must be made. For ODA input, use Form ESS 401D. For systems already in service, RCDM 104 adds blocks of traffic numbers and RCDM 105 deletes blocks of traffic numbers.

4.18 Assigning a new block of traffic numbers does not change the BTFN for the TSG. For example, to add a block of 984 traffic numbers to the one-way outgoing TSG described in 4.16, the new traffic numbers could be 7001 through 7984. However, the BTFN remains 8001 because 8001 was the first traffic number assigned to the TSG. The BTFN for a TSG remains the same until the traffic number is deleted from the TSG. It is recommended that the BTFN never be deleted from a TSG.

4.19 To add the new block of traffic numbers, the TSG would be identified using its abbreviated CIN. The abbreviated CIN must be exactly as it was listed when the TSG was established (using BTFN 8001 in the example).

When inputting CINs to the No. 4 ESS, the number entered into the BTFN field may be any traffic number assigned to that TSG. The No. 4 ESS always uses the actual BTFN for output. Inputting a traffic number other than the BTFN could serve as a check to ensure that the traffic

number is associated with the correct TSG in No. 4 ESS memory.

4.20 Now specify a first traffic number (FTFN) for the new block of numbers to be assigned, ie, 8001 in the example. Then a quantity of traffic numbers which are to be assigned consecutively starting with the FTFN may be specified. (In the example, the QTFN would be 984.)

Domain

4.21 All message TSGs must be assigned to a domain. The domain assignment separates TSGs and routing information into classes of traffic which have a common switching objective. All message TSGs for use in the direct distance dialing (DDD) network should be assigned to the plain old telephone service (POTS) domain. Other nonmessage TSGs—eg, TSGs for use in a private common control switching arrangement (CCSA) network—are assigned to a domain number between 20 and 83. The routing supervisor contacts the machine administrator whenever a non-POTS domain is established, and a domain number is assigned by mutual agreement.

Testing Responsibilities

4.22 Assignments for trunk testing responsibilities must be made on ODA input forms or RCDMs. These assignments may include:

- Supervisory Group (SUGRP)
- Supervisory Position (SUPOS)
- Near-End Operational Test Responsibility (NEOTR)
- Operational Through Switch Test Type (OTSTT)
- Operational Through Switch Test Number (OTSTN)
- Operational Terminating Test Type (OTMTT)
- Operational Terminating Test Number (OTMTN)
- Transmission Through Switch Test Type (XTSTT)
- Transmission Through Switch Test Number (XTSTN)
- Transmission Terminating Test Type (XTMTT)
- Transmission Terminating Test Number (XTMTN).

When required, these assignments should be obtained from the personnel responsible for trunk testing.

> ***Note:*** Trunk testing personnel may use the terms "test control area" (TCA) and "test position" (TP) to indicate SUGRP and SUPOS, respectively.

Network Management

4.23 Certain requirements for network management data may also be required on ODA input forms or RCDMs. These include:

- No Automatic Hard-to-Reach Determination (NAHTR)
- Dynamic Overload Control Transmit Number (DOCTN)
- Dynamic Overload Control Receive Number (DOCRN)

These assignments should be obtained from the network manager, when required.

Ring Forward Miscellaneous Point

4.24 TSGs which terminate in a switchboard or testboard position capable of receiving 130-volt ring-forward signals must be identified to the No. 4 ESS. TSGs terminating in positions which may receive 130-volt ring-forward signals must have "ring forward miscellaneous point" (RFMP) specified.

CONSIDERATIONS FOR ADDING 2-WAY AND ONE-WAY INCOMING TSGs

4.25 The considerations discussed in 4.25 through 4.40 must be made prior to adding 2-way or one-way incoming TSGs. They are not necessary for one-way outgoing TSGs.

Traffic Separation

4.26 Traffic separation classes are assigned to one-way incoming and 2-way trunk groups and to destination codes. The classes are used to obtain counts of different types of traffic which are switched by the No. 4 ESS.

4.27 Traffic separation counts are used by the operating companies for division of revenue among the companies whose traffic may be switched by the No. 4 ESS. They are also used by the network manager to determine traffic patterns which affect the DDD network. The machine administrator uses traffic separation counts to determine the quantities of various types of traffic which use the No. 4 ESS.

4.28 A total of 32 incoming traffic separation classes (INSEP) are available for assignment to trunk groups. There are 63 destination traffic separation classes (DESEP) available for assignment to code groups.

4.29 Each call switched by the No. 4 ESS scores traffic separation peg counters and usage counters based on the INSEP of the trunk group which originates the call and the DESEP of the destination code received. The combinations of INSEP and DESEP give 2016 classes of traffic which may be measured. (Refer to DFMP Division H, Section 9f, "No. 4 ESS Traffic Measurements," for exceptions and further details of traffic separation counts.)

4.30 The machine administrator is responsible for assigning traffic separation classes. The type of traffic assigned to each class must be listed on Form E6352, "No. 4 ESS Traffic Separation Assignments." A description of this form may be found in DFMP Division H, Section 9e, "No. 4 ESS Machine Administration Records." The machine administrator must furnish the routing supervisor with a current copy of the record. The routing supervisor uses the record to assign DESEPs to code groups.

4.31 Before assigning INSEPs and DESEPs to types of traffic, the machine administrator must contact the network manager and the operating company's division of revenue supervisor to obtain their requirements for traffic separation counts.

4.32 The machine administrator assigns the classes in any manner which meets both the division of revenue and the network management requirements. The machine administrator may supplement these requirements as desired, but the supplementary assignments must not reduce the capability to provide the data required for division of revenue and network management.

INWATS State Index

4.33 The No. 4 ESS is capable of handling originating inward wide area telephone service (INWATS) traffic from a maximum of six INWATS states. Each 2-way and one-way incoming message TSG, which is allowed to originate INWATS traffic to the No. 4 ESS, must be assigned an INWATS state index (INWST). The index is a digit which identifies the INWATS state from which the TSG originates traffic.

4.34 The routing supervisor assigns an INWST for each INWATS state which originates traffic to the No. 4 ESS. The machine administrator must maintain a record of the index assignments on Form E6353, "No. 4 ESS INWATS States." The INWST for each TSG may be determined from Form E6353. A description of Form E6353 is found in DFMP Division H, Section 9e. The routing supervisor furnishes the assignments for this record.

4.35 INWATS routing within the No. 4 ESS is further described in 6.09 through 6.13. DFMP Division E, Section 5, "Customer Services—Inward Wide Area Telecommunications Service," provides a description of INWATS service.

Screening

4.36 A multiple treatment screening class (MTSC) and a go/no-go screening class (GNSC) must be assigned to each 2-way and one-way incoming TSG. When a special screening assignment is required, the routing supervisor determines the MTSC and GNSC.

4.37 The machine administrator assigns an MTSC of 0 and a GNSC of 0 to all TSGs unless notification is received from the routing supervisor of special screening requirements.

4.38 Part 8 of this DFMP section contains a description of the screening capabilities within the No. 4 ESS.

4.39 The machine administrator must notify the routing supervisor of any local requirements for screening.

Ring Forward Allowed

4.40 One- and 2-way intertoll trunks from switching machines, switchboards, one-way incoming non-CAMA traffic service position system (TSPS) trunks, and testboard trunks are the only message trunks which should be identified for wink-ring-forward signaling. Other circuits (one-way intertoll and 2-way toll connecting) should not be arranged to send a ring forward.

4.41 One-way incoming and 2-way TSGs which are allowed to receive flashes on the E lead (ring forward) must be identified to the No. 4 ESS. Ring forward allowed (RFA) should be on intertoll, TSPS, and secondary intertoll trunks. It should ***not*** be specified for DDD access or CAMA trunks.

CONSIDERATIONS FOR ADDING 2-WAY TSGs

4.42 The considerations discussed in 4.43 through 4.49 must be made prior to adding 2-way TSGs.

4.43 ***Glare Control:*** When the offices at both ends of a 2-way TSG simultaneously seize the same trunk, the condition is called "glare." Responses to this situation depend on the type of switching system involved.

4.44 ESS machines respond in the following manner:

- No. 1 ESS is arranged to always release the trunk, thus allowing the distant end to complete.
- No. 2 and No. 4 ESS can be programmed to release the original trunk and search for a new one or hold the original trunk until the distant end releases.

4.45 Non-ESS machines (IE, 4A, XBT, etc) have no provision for releasing a trunk to allow the distant end to complete.

4.46 Considering the arrangements described above, the following rules should apply to glare control assignments in the No. 4 ESS:

(a) If the distant end of the TSG terminates in a non-ESS, the No. 4 ESS should be assigned to release.

(b) If the distant end of the TSG terminates in a No. 1 ESS, the No. 4 ESS should be assigned to retain control of the trunk.

(c) If the distant end of the TSG terminates in a No. 4 or a No. 2 ESS, the "A" office should be assigned to maintain control of the trunk. The "Z" office should be assigned to release. The "A" office is the first of the two alphabetically and the "Z" office is the last alphabetically. Common language codes should be used for alphabetical determination of the "A" and "Z" offices.

4.47 Certain nonmessage TSGs are required in the No. 4 ESS. These miscellaneous TSGs are defined in TG4. ODA Form ESS 401E is used to establish miscellaneous TSGs.

4.48 Miscellaneous TSGs must be assigned to an SUGRP and SUPOS. These assignments should be obtained from personnel responsible for trunk testing.

4.49 RCDM 7 is used to change miscellaneous TSG assignments. RCDM 9 is used to delete any TSG from the No. 4 ESS.

5. TRUNK ASSIGNMENTS

General

5.01 The MAC is responsible for trunk assignments in the No. 4 ESS. This responsibility begins with initial assignments via ODA input forms and includes assignments in an outgoing system via recent change.

5.02 An understanding of how the parts of equipment fit together in the No. 4 ESS is necessary in order to perform the assignment job correctly.

5.03 The machine administrator will be somewhat limited in the assignment capability. Much of the equipment will be connectorized by Western

Electric Company during installation. This will obviously preclude the possibility of associating various pieces of equipment together for a particular circuit.

Equipment

5.04 The unitized terminal equipment (UTE) will be cabled to one side of a group distributing frame (GDF). Within the UTE bay, the A6 channel bank, the F-type signaling unit (FWA), the single-frequency signaling unit (SF), and the echo suppressor will all be associated with that particular UTE. The UTE will also be connectorized to a signal processor (SP). The voice interface unit (VIU) will be connected to a particular time slot interchange frame (TSIF) and switching and permuting circuit (SPC). The result will be as shown in Fig. 2.

5.05 The machine administrator may select a particular A6 UTE. This selection could be the result of starting with some other particular equipment type. For example, a UTE may be selected based on the SP it is associated with, or the VIU, or the time division (TD) network appearance.

5.06 To further understand these associations, it would be worthwhile to become familiar with "core" floor plans.

Core Area

5.07 The basic core area arrangement should take into consideration the equipment needed to terminate trunks, ie, the UTE or metallic trunk frames (MTF), the VIUs for analog to pulse code modulation (PCM) conversion, the SP, and service circuits for signaling.

5.08 This layout is centered around the SP. The SP has the largest terminating capacity of any single equipment within the No. 4 ESS. An SP can terminate 4080 trunks; that is, it can have that number of trunks associated with it.

5.09 In order to fully equip an SP, sufficient UTEs and MTFs must be part of the core area to terminate that number of trunks. An A6 frame without echo suppressors would terminate 96 trunks. Standard lineups provide either 480 or 960 trunks.

5.10 Most offices have the need to terminate some metallic trunks. Therefore, it is preferable that some termination on the SP be on the metallic types. The line engineer cares for this assignment in laying out various core areas.

Equipment Reliability

5.11 The next part of understanding required in making assignments in the No. 4 ESS is

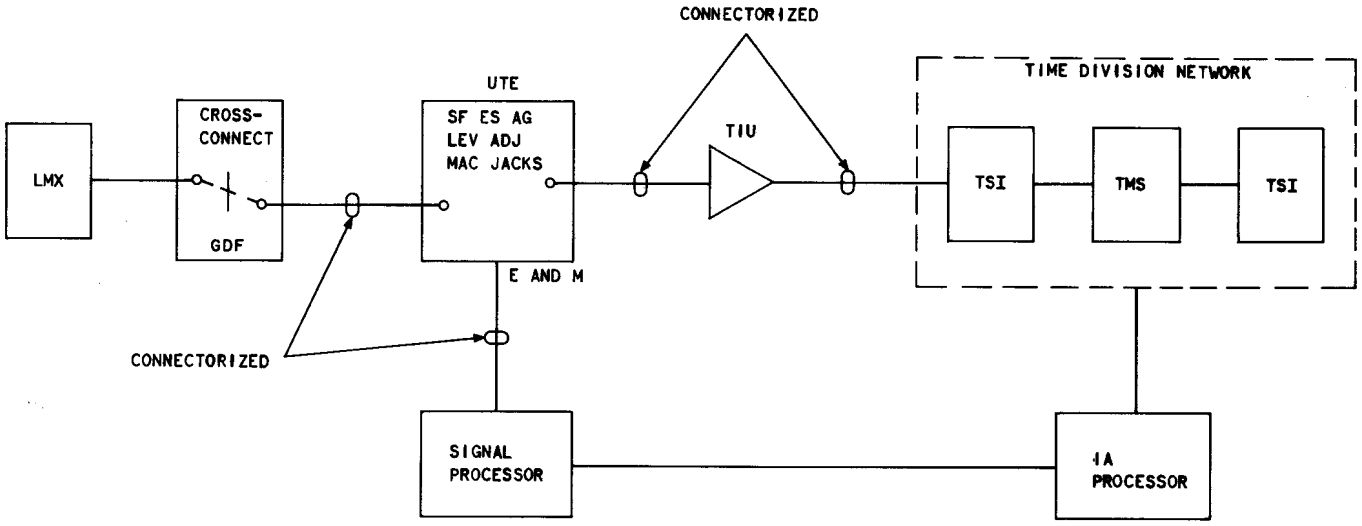


Fig. 2—Connectorized Equipment—Block Diagram

equipment reliability. The overused phrase "virtually nonblocking" does not help the machine administrator when the assignments being made are a committment to service.

5.12 Being familiar with the reliability and redundance built into the No. 4 ESS equipment helps the machine administrator to recognize where safeguards might be required during the assignment process.

5.13 Within the UTE, the most sensitive areas for maintaining service will probably be the carrier supply and the office battery. These are not ***new*** items of concern, they must be dealt with in all existing systems. The protection provided in this area is not inferior to existing systems. An arrangement is provided to ensure that service may continue if one carrier supply is lost. Reliability of trunks terminated digitally are also of concern. The digital group terminal has one spare unit that is switched automatically if a working unit fails.

5.14 The next equipment on analog trunks to be considered is the VIU. Each VIF has eight VIUs. Seven may be used for service and the eighth is a standby spare. If one of the working units should fail, the spare is automatically switched into service.

5.15 Entry into the TD network begins with the time slot interchange (TSI). A TSI controller acts as the interface between the 1A processor and the SPC. Both the controller and the SPC are duplicated.

5.16 Signals are passed from the TSI through the time multiplexed switch (TMS). The TMS is fully duplicated.

5.17 The SP has two controllers. This duplication ensures continued operation even though an SP controller develops trouble.

5.18 As indicated by the redundance and reliability designed in No. 4 ESS equipment, assignments with service protection in mind should be minimal.

Load Balancing

5.19 Load balancing in the No. 4 ESS is not required. Two factors are primarily responsible for this condition. First, a decorrelation algorithrm is designed into the TSI. This allows the assignment of several trunks within a TSG to consecutive trunk assignment numbers (TAN). (When assigning trunks to TANs, an assignment is actually being made on the A buffer of the TSI.) Each SPC has seven A buffers, and 120 trunks can be assigned to each. The decorrelation will spread those 120 trunks assigned to one A buffer over eight output B buffers. (See Fig. 3.)

5.20 The effect of the decorrelation will spread a focused load coming in on one A buffer across the entire TMS via the B buffers.

5.21 The second part of this consideration has to do with deloading. A TSI has seven A buffers (input buffers) and eight B buffers (output buffers). This means that although there are 120 inputs on an input buffer, there are only 105 outputs per the B buffers. Therefore, a deloading effect takes place.

Assignment Considerations

5.22 There are some assignment rules that, in general, are due to limitations within the No. 4 ESS. First, the signal processor can serve a limited number of dial pulse (DP) trunks. DP call processing requires no special device for digit reception and digit outpulsing. The SP performs this function by collecting pulses of each digit and storing them in a DP worklist until a full digit is received or outpulsed. This worklist is a 128-workpiece of memory with the capacity for serving 126 DP calls simultaneously. This worklist may become full if more than 2000 equivalent one-way DP trunks are assigned to one SP.

5.23 A second limitation is also associated with the SP. A trunk's appearance on an SP is called a trunk scanner number (TSN). A TSN is a 7-digit number. The first two digits identify the SP number, the third number identifies the matrix, and the last four digits identify the scan point. An example is shown in Table D.

5.24 Numbers are not duplicated within the SP. Each TSN has a unique appearance. Within call processing, several algorithrms are used in translating from TSN to TAN, TSN to trunk number (TN), etc. Also, a special code is used to indicate when a scan point is unassigned. That happens to be an all-zero field: 0000000. This is the same as the first TSN on SP 00. Therefore, a trunk cannot be assigned to this TSN, a trunk

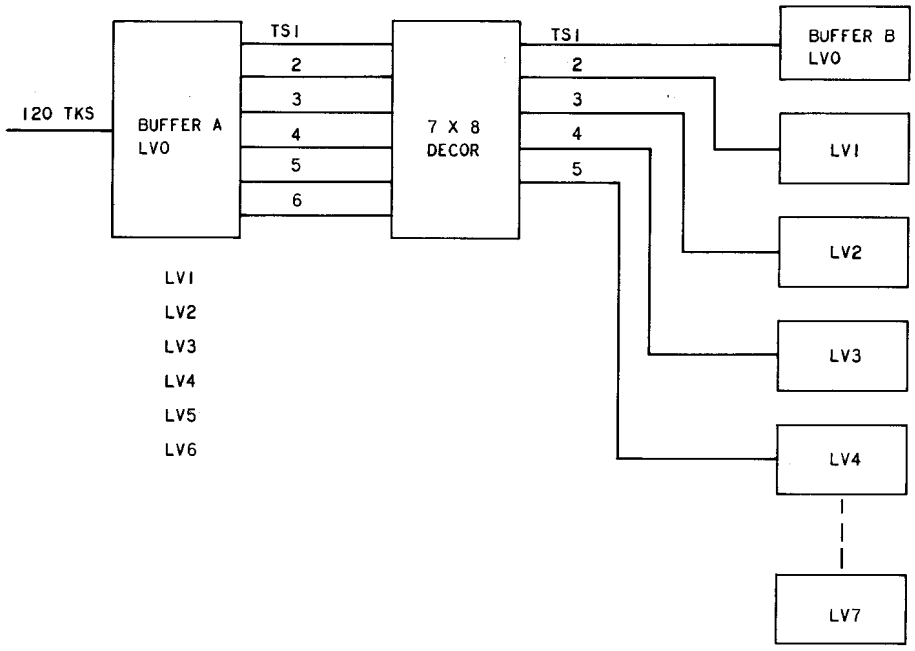


Fig. 3—Load Balancing

cannot be assigned to TSN 0000001. One algorithrm involves subtracting the number "1" from the TSN to identify a particular location.

5.25 This information should be considered by the line engineer when inputting data to the TAGS and CARTS programs. If this limitation is neglected at that time, an A6 or D-type channel bank may be started at that location. If so, instead of being unable to assign only two appearances, 12 appearances cannot be assigned if an A6 or 24 if a D-type channel bank.

5.26 It is recommended that TSGs be assigned to more than one SP. For example, when establishing a TSG between A and B with 120 trunks, 72 trunks may be assigned to consecutive TANs associated with SP 00, the other 48 then could be assigned to TANs on SP 01. By assigning these trunks to more than one SP, they automatically are assigned to more than one VIF, VIU, TSIF, and SPC. To further split assignments for diversification over these units seems unreasonable.

5.27 As an office grows, it may be necessary to assign trunks to more than two SPs; for example, if the TSG had been split initially and those SPs had become fully assigned since that time, then obviously a third SP must be used. To split trunks over more than two SPs initially, however, does not appear desirable.

5.28 For small trunk groups modularly engineered, it may not be possible to split a TSG over two SPs. For example, a circuit order is received adding a 12-circuit group and they are modularly assigned, ie, circuit 1 = channel 1, circuit 2 = channel 2, etc, then it will not be possible to split that group. This could also happen on a circuit group modularly assigned to a D channel bank.

5.29 It may be necessary to split a single channel bank when establishing a TSG with small quantities of trunks. For example, one A6 channel bank may be used as facilities for two or more trunk groups. (See Fig. 4.)

5.30 In this situation, the channel bank is split at an intermediate point with six channels being connected to office A and six channels being connected to office B. ODA Form ESS 402A associated with these groups will have made the assignment in memory.

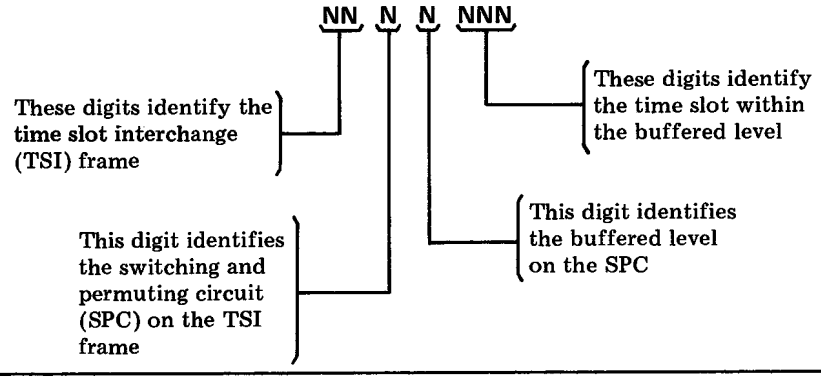
5.31 To proliferate assignments of this nature in the No. 4 ESS without just cause will result in additional time for form preparation. Another disadvantage is related to testing at the UTE bays.

TABLE D

TRUNK ASSIGNMENT IDENTIFICATION

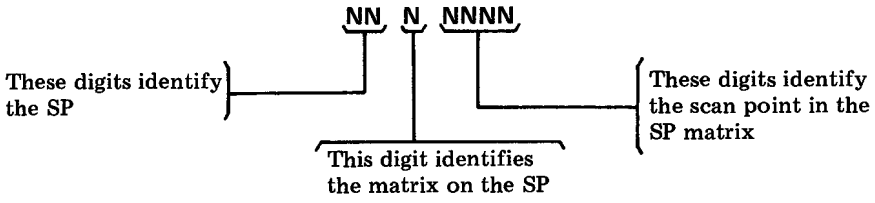
Trunk Appearance Number (TAN)

A TAN describes the appearance of a trunk on the switching network. A TAN is a 7-digit number, broken down as follows:



Trunk Scanner Number (TSN)

A TSN describes the appearance of a trunk on a signal processor (SP). A TSN is a 7-digit number, broken down as follows:



Note: For common channel interoffice signaling (CCIS) trunks, no SP appearance is required. The TSN for CCIS trunks is a number representing a ficticious SP.

Since some companies may decide not to purchase switched maintenance access system (SMAS) connectors, some testing may be required at the UTE bay via the MAC jacks. If trunks are scattered all over the office, this will result in additional testing time and inconvenience.

5.32 The inherent design and layout of the system as discussed in 5.01 through 5.32 precludes the assignment of trunks within a TSG to each component of equipment. Unlike the No. 4 crossbar, the internal networks of the No. 4 ESS are virtually nonblocking; therefore, spreading of trunks for balance is not a requirement. For protection of service and effect of impact on a connecting switching machine, in the event of component failure, spreading of trunks should be made using the following guidelines:

(a) All assignments of trunks are made in modules of 12 for analog facilities and 24 for digital facilities.

(b) Assignments of TANs to trunks must be made by ownership of the toll terminal equipment and trunks. An exception exists

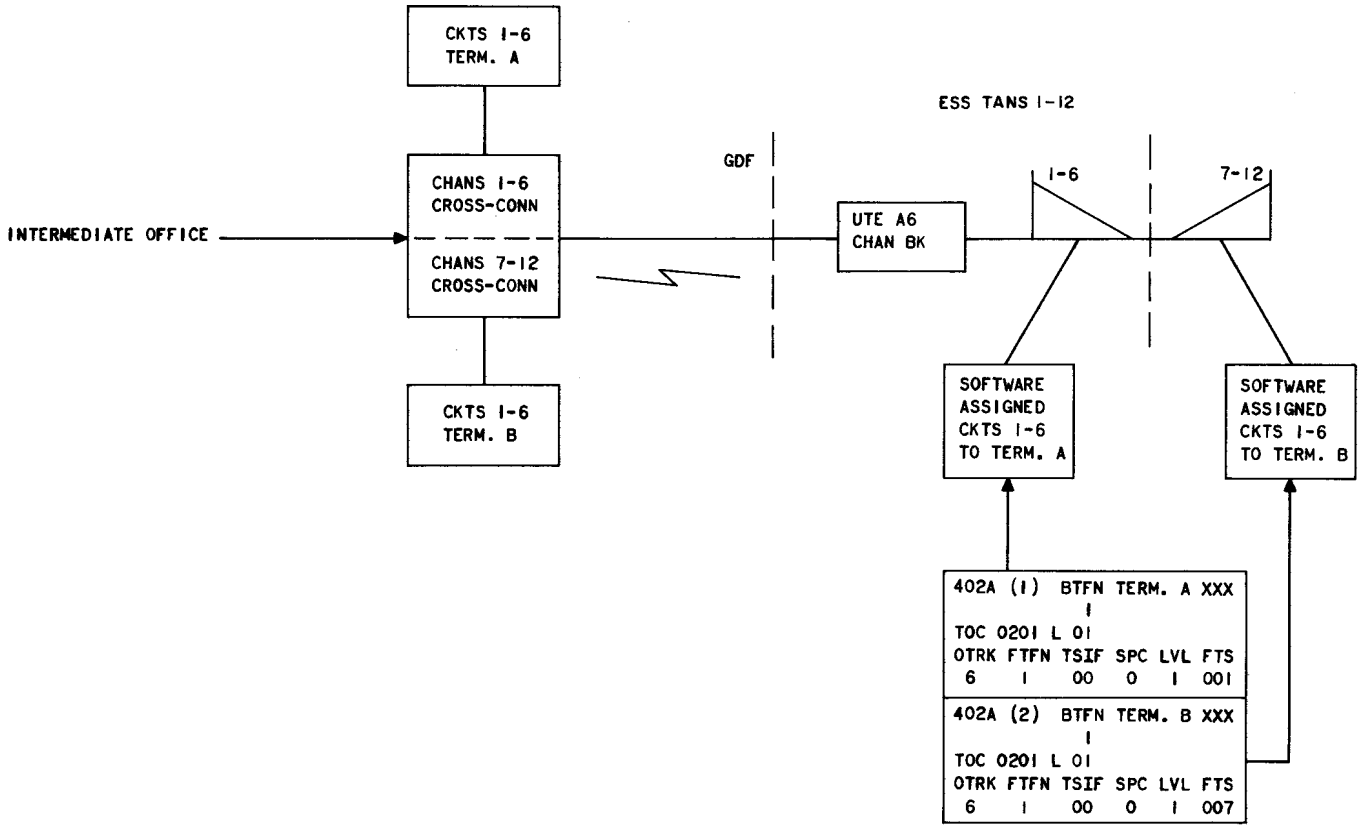


Fig. 4—Trunk to Channel Bank Assignments

where TANs are cross-connected to terminal equipment.

(c) The maximum assignment of 2000 equivalent one-way incoming DP trunks should be made to an SP. DP trunks should be spread over all SPs.

(d) All equipped SPs should have an equal load of TSGs assigned. There should be no assignment of TSNs 000000 and 000001.

(e) No TSGs are to be assigned over more than two SPs. An exception occurs when the currently assigned SP is fully assigned. Growth trunks may then be assigned to two additional SPs by assignment modules.

(f) Alternate route TSG paths for any given TSG should not be assigned to the same TSI on toll terminal equipment in the same UTE bay.

(g) All trunks within a TSG should not be assigned to the same TSI.

(h) All trunks within a TSG should not be assigned to the same UTE.

(i) Each assigned TSI should contain a mix of TSGs by traffic type, ie, 2-way, CAMA, operator tandems, etc. These should be assigned based on modularity.

(j) An even spread of first choice and last choice outgoing trunks should be maintained across all SPs.

6. ROUTING DATA BLOCKS

General

6.01 RDBs are assigned by the routing supervisor. This part will familiarize the machine administrator with RDBs and the associated responsibilities.

6.02 An RDB is identified by a 4-digit number called a routing data block index (RDBI). Each RDBI identifies one RDB. The RDB identifies a sequence of TSGs to be searched by calls directed to that RDBI. Parts 7 and 8 of this DFMP section describe the code grouping and screening functions which direct calls to RDBs. An RDB may be used by more than one code group; therefore, it is not necessary to establish duplicate RDBs unless different delete and prefix information is required.

6.03 An RDB directs calls to TSGs. This necessitates prior or simultaneous establishment of the TSGs, and assignment of trunks to them. Parts 4 and 5 of this DFMP section describe procedures for establishing TSGs and assigning trunks. The abbreviated CIN of each TSG must be specified exactly as it appeared in the message which established the TSG.

When inputting CINs to the No. 4 ESS, the number entered into the BTFN field may be any traffic number assigned to that TSG. The No. 4 ESS will always use the actual BTFN for output. Inputting a traffic number other than the BTFN could serve as a check to ensure that that traffic number is associated with the correct TSG in No. 4 ESS memory.

Digit Deleting and Prefixing

6.04 In addition to the sequence of TSGs, an RDB contains digit deleting and prefixing information for each route. When a route is selected, the No. 4 ESS will delete the first "n" digits received. (The "n" is the number of digits which the RDB specifies for deletion; up to 14 digits can be specified.)

6.05 After performing any specified digit deletion, the No. 4 ESS prefixes the digits specified by the RDB. Up to six digits can be prefixed. Digit deleting and prefixing are performed prior to outpulsing.

6.06 In some cases, calls originating from a served numbering plan area (SNPA) would require different delete or prefix information than calls originating in the home numbering plan area (HNPA). In these cases the delete or prefix information for calls which originate in the HNPA should be specified. The No. 4 ESS will internally perform any additional deleting or prefixing required prior to digit translation of calls which originate in SNPAs.

6.07 Code conversion can be accomplished by a combination of deleting and prefixing digits. Digit deletion is always performed prior to prefixing any digits.

6.08 Some examples of deleting, prefixing, and code conversion are shown in Table E.

In-Chain RDBs

6.09 An in-chain RDB is used to identify a sequence of up to 14 TSGs. These TSGs are searched sequentially for an idle trunk.

6.10 Calls which do not find an idle trunk in the in-chain RDB are directed to an automatic out-of-chain RDB (AOCRDB). AOCRDBs are discussed in 6.22 through 6.25.

RDB Final Handling Treatment

6.11 If no AOCRDB index (AOCI) is assigned, the call will be routed to the in-chain RDB final handling treatment (RDBFHT). The RDBFHT will normally be a no circuit announcement (NCA). The machine administrator must notify the routing supervisor of any local requirements for special RDBFHT assignments.

Acceptable Digit Count

6.12 In addition the sequence of TSGs, digit deleting and prefixing information, AOCI, and RDBFHT assignments, in-chain RDBs specify the acceptable digit count (ADC). The ADC identifies which quantities of digits may be received on a call directed to that RDB. Any call whose quantity of digits received is not specified as acceptable by the RDB will be routed to vacant code announcement (VCA).

> ***Note:*** If the call received incoming dial pulses in a quantity less than the highest ADC specified, but not equal to any ADC specified, the call will be routed to 120-ipm tone rather than VCA.

6.13 ODA Form ESS 405B or RCDM 500 is used to establish an in-chain RDB. RCDMs 505, 508, 503, and 510 are used respectively to add TSGs to, delete TSGs from, change the characteristics

TABLE E

RDB INFORMATION

DIGITS DIALED	DELETE	PREFIX	DIGITS OUTPULSED
818+999-9999	—	—	818+999-9999
818+999-9999	3	—	999-9999
999-9999	3	—	9999
999-9999	2	—	9-9999
818+999-9999	3	600	600+999-9999
818+999-9999	6	600	600-9999
999-9999	3	818600	818+600-9999
999-9999	3	7	7-9999
999-9999	—	818	818+999-9999
9-9999	—	81899	818+999-9999

of, and delete in-chain RDBs. The routing supervisor is responsible for initiating these messages.

INWATS Routing Data Blocks

6.14 INWATS calls access special RDBs. INWATS RDBs contain additional information necessary to complete INWATS calls.

6.15 Personnel assigning, checking, testing, or activating an INWATS RDB should be familiar with the nationwide INWATS routing plan. DFMP Division F, Section 5, provides a general description of that plan.

6.16 In addition to the information provided by in-chain RDBs, INWATS RDBs describe the following:

- INWATS Type (INWT)
- Originating Zonal Band Digit (OZD)
- Terminating Maximum Zonal Band Digit (TMZD).

INWATS RDBs do not have provisions for automatic out-of-chain routing.

6.17 The INWT specifies the type INWATS routing associated with the RDB. This may be originating, through, or terminal screening.

6.18 The OZD is the number of bands the originating INWATS state is from the terminating INWATS state. This is used for originating-type and originating-terminating INWATS only. The OZD is used to determine the band identification digit to be outpulsed or terminal screened.

6.19 The No. 4 ESS is capable of handling originating INWATS traffic from a maximum of six INWATS states. Each INWATS state (IS) is identified by an INWATS state index (INWST). The assignment of INWSTs to TSGs is described in 4.33 through 4.35. A different OZD may be assigned in the RDB for calls arriving on TSGs from each originating INWATS state.

6.20 The TMZD is used for terminal screening of INWATS calls. TMZD identifies the subscribed to band.

6.21 ODA Form ESS 405C or RCDM 501 is used to establish an INWATS RDB. RCDMs 507, 508, 504, and 510 are used, respectively, to add TSGs to, delete TSGs from, change the characteristics of, and delete INWATS RDBs. The routing supervisor is responsible for initiating these messages.

Automatic Out-Of-Chain RDBs

6.22 Calls which do not find an idle trunk in an in-chain RDB may be directed to an AOCRDB. The AOCRDB may identify a maximum of seven additional TSGs. Overflow from the sequence of in-chain TSGs is spread equally among all TSGs in the AOCRDB.

6.23 Each call will search only one of the TSGs identified by the AOCRDB. If an idle trunk is not found in the out-of-chain route, the call will be directed to the in-chain RDBFHT.

6.24 The network manager is responsible for all out-of-chain routing and must furnish the routing supervisor with requirements for AOCRDBs.

6.25 ODA Form ESS 405D or RCDM 502 is used to establish an AOCRDB. RCDMs 506, 509, and 511 are used, respectively, to add TSGs to, delete TSGs from, and delete AOCRDBs. The routing supervisor is responsible for initiating these messages.

RDB Storage

6.26 In-chain RDBs may optionally be stored in either of two types of memory:

- Primary storage in core type call store (CS) memory backed up by a copy in disk file store (FS) memory.
- Primary storage in FS with no copy in CS.

Note: FS is duplicated for reliability.

6.27 The central control can access CS memory more rapidly than FS. FS, however, is considerably less expensive than CS.

6.28 CS has the advantage of rapid access. This provides a savings in processor real-time usage, thereby increasing the capacity of the processor. FS uses a greater amount of processor real time but provides an economic advantage. The cost of FS is approximately one-tenth that of CS. Load balance should be maintained with the heavy load on CS to take advantage of rapid access.

6.29 The machine administrator, the routing supervisor, and the traffic engineer are jointly responsible for efficient RDB storage. This requires a coordinated effort in providing and assigning memory which is allocated for RDBs.

6.30 The traffic engineer must provide each type of memory in quantities which will permit efficient assignment. This requires consultation with the machine administrator. They must analyze the amount of processor real time which is currently being used and that which is projected for future use. DFMP Division H, Section 9f, "No. 4 ESS Traffic Measurements," describes processor real-time analysis.

6.31 The next step is to contact the routing supervisor and obtain an estimate of future RDBs. Finally, specific amounts of CS and FS must be engineered to store the expected RDBs.

When determining the cost savings obtained by the use of FS, consideration should be given to the cost and service hazards attendant with moving RDBs. Rearrangements may become necessary when system growth causes the use of processor real time to approach capacity. It is recommended that nearly all RDBs, which serve POTS calls, be assigned to CS. Only RDBs which will be accessed by a relatively small number of calls should be assigned to FS. This may include some RDBs which are accessed by test numbers, etc.

6.33 ODA Form ESS 405A or a 500-series message, when available, is used to assign blocks of RDBIs to CS or FS. The routing supervisor is responsible for initiating these messages.

6.34 When the routing supervisor assigns an RDB, an RDBI will be chosen which has been assigned to CS. The machine administrator must notify the routing supervisor of any requirements for RDBs to be stored in FS only.

6.35 The machine administrator must check each RDB RCDM which is initiated by the routing supervisor. The check should assure that the information in the RCDM is reasonable. After determining that the message is acceptable, the machine administrator is responsible for testing and activating it.

6.36 To test an RDB RCDM, the machine administrator must initiate an RCAM to place the RCDM into the test state. Verify message 5a, 5b, or 5c may then be used to check that the translator structures are consistent with the desired input.

6.37 The machine administrator should initiate RCAMs to activate the RDBs at the date and time the orders are due.

7. CODE GROUPING

General

7.01 The routing supervisor is responsible for code grouping. This part will familiarize the machine administrator with code grouping and the associated responsibilities.

7.02 A code group is a group of codes, each of which receives the same routing treatment. Code groups direct calls to some type of disposition. Most calls will be directed to an RDBI. This necessitates establishing an RDB prior to, or simultaneous with, a code group being directed to it. Other dispositions include announcements, tones, and test lines.

7.03 The code group may point directly or indirectly to a disposition. An example of indirectly determining the disposition is pointing code groups to a multiple treatment screening index (MTSI). The MTSI identifies a screening block which points to RDBIs, announcements, tones, and/or test lines. Screening is described in Part 8.

> ***Note:*** When a code group points to an MTSI, the MTSI must be established prior to, or simultaneous with, the code group.

7.04 Code groups are classified by their number of translatable digits (NTD). All codes with an NTD of 3, which receive identical routing, are members of one code group. All codes with an NTD of 6, which receive identical routing, are members of another code group. The 3- and 6-digit code groups may or may not have routing characteristics which are common to each other. Code groups may be established with any NTD of 3 through 9.

7.05 ODA Form ESS 403D is used to establish 3-digit code groups. Form ESS 403E is used to establish 4-, 5-, or 6-digit code groups and Form ESS 403F is used to establish 7-, 8-, or 9-digit code groups. RCDMs 300, 301, and 302 are used respectively to change these code groups. RCDMs 29 and 30 are used respectively to expand or decrease the NTD for a code group. The routing supervisor is responsible for initiating code grouping messages.

Implied Code Grouping

7.06 Implied code grouping is another means of directing calls to RDBs. Implied code grouping may be used for NTDs of 4 through 9. Implied code groups specify a disposition for all codes identified as members of the implied code group. Implied code grouping is restricted to the ODA function.

7.07 Without implied code grouping, any codes which are not specified as members of code groups are routed to VCA. With implied code grouping, codes which are not specified in code groups are identified as members of the implied code group whose common digits match the code. If no implied code group exists for that code, it is routed to VCA.

7.08 Before directing any codes to the implied code group, the ODA removes all vacant (unused) codes. The Western Electric Company maintains a list of vacant codes to be removed. The vacant codes are routed to VCA. If it is desired to obtain a routing other than VCA for a code which is included on the Western Electric Company vacant code list, that code should be included in a code group. Part 8 of this DFMP section describes vacant code screening for the No. 4 ESS.

7.09 Implied code groups may be used to lessen the number of entries required on code grouping forms. The largest group of codes in each of the following categories may be omitted from the code grouping forms:

NTD	COMMON DIGITS
4	ABC
5	ABC
6	ABC

7	ABCDEF
8	ABCDEF
9	ABCDEF

Example: The largest group of codes each of which requires 6-digit translation, each of which has the same A, B, and C digits, and each of which receives the same routing treatment would be omitted from code groups. An implied code group would be established to specify the routing for the unlisted codes.

7.10 ODA Form ESS 403E is used for 4-, 5-, or 6-digit implied code grouping. Form ESS 403F is used for 7-, 8-, or 9-digit implied code grouping. Implied code grouping cannot be performed by the recent change system.

7.11 Fig. 5 provides a flowchart of the ODA vacant code screening process.

7.12 The combination of incoming TSG and digits received is used by the No. 4 ESS to determine routing. This is not always sufficient information to route a call. The case arises when one code has two uses in the same domain. (Conflicting use of NPA codes and central office codes.) Such a case is called "indeterminate routing."

7.13 Indeterminate routing arises with the use of interchangeable numbering plan area (NPA) codes and central office codes. A 3-digit code may be used to identify both an NPA and a central office. Calls carrying that code may be intended for either use.

7.14 When an indeterminate routing case exists, two dispositions for the code must be established. The call will be directed to the disposition that has an ADC equal to the number of digits actually received.

Domain

7.15 All code groups must be assigned to a domain. The domain assignment separates TSGs and routing information into classes of traffic which have a common switching objective. All

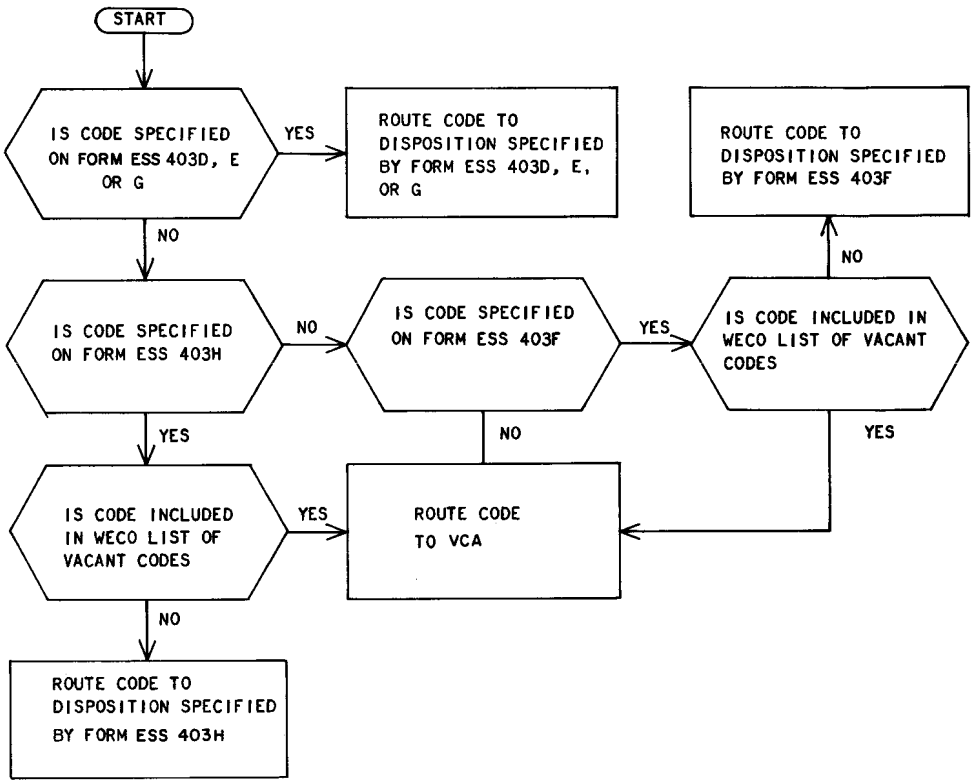


Fig. 5—ODA Vacant Code Screening Process

code groups for use in the DDD network should be assigned to the POTS domain. Other code groups (code groups for use in a private CCSA network) will be assigned to an arbitrary domain number ranging from 20 through 83. The routing supervisor contacts the machine administrator when a non-POTS domain is established, and a domain number may be assigned by mutual agreement. A record of domain assignments must be maintained on Form E6357, "No. 4 ESS Domain Assignments." DFMP Division H, Section 9e, "No. 4 ESS Machine Administration Records," describes Form E6357.

Three-Digit Translator Storage

7.16 The 3-digit translator for non-POTS domains may optionally be stored in either CS or FS. When the routing supervisor contacts the machine administrator to assign a domain number, the machine administrator must also provide the 3-digit translator storage assignment.

7.17 The machine administrator and the traffic engineer are jointly responsible for efficient 3-digit translator storage. This requires a coordinated effort in providing and assigning memory which is allocated for 3-digit translators.

7.18 The traffic engineer must provide each type of memory in quantities which will permit efficient assignment. This requires consultation with the machine administrator. They must analyze the amount of processor real time which is currently being used and that which is projected for future use. DFMP Division H, Section 9f, "No. 4 ESS Traffic Measurements," describes processor real-time analysis.

7.19 The next step is to contact the routing supervisor and obtain an estimate of future 3-digit translation in the non-POTS domains. Finally, specific amounts of CS and FS must be engineered to store the expected 3-digit translators.

When determining the cost savings obtained by the use of FS, consideration should be given to the cost and service hazards attendant with moving 3-digit translators. Rearrangements may become necessary when system growth causes the use of processor real time to approach capacity. It is estimated that nearly all non-POTS 3-digit translators could be assigned to FS.

7.21 ODA Form ESS 403C or RCDM 20 is used for non-POTS domain 3-digit translator storage assignments. The routing supervisor is responsible for initiating these messages.

Traffic Separation

7.22 Traffic separation classes are assigned to one-way incoming and 2-way trunk groups and to destination codes. The classes are used to obtain counts of different types of traffic which are switched by the No. 4 ESS.

7.23 Traffic separation counts are used by the operating companies for division of revenue among the companies whose traffic may be switched by the No. 4 ESS. They are also used by the network manager to determine traffic patterns which affect the DDD network. The machine administrator uses traffic separation counts to determine the quantities of various types of traffic which use the No. 4 ESS.

7.24 A total of 32 INSEPs are available for assignment to trunk groups. There are 63 DESEPs available for assignment to to code groups.

7.25 Each call switched by the No. 4 ESS will score traffic separation peg counters and usage counters based on the INSEP of the trunk group which originates the call and the DESEP of the destination code received. The combinations of INSEP and DESEP give 2016 classes of traffic which may be measured.

7.26 See DFMP Division H, Section 9o (5), "No. 4 ESS Traffic Measurements," for exceptions and further details of traffic separation counts.

7.27 The machine administrator is responsible for assigning traffic separation classes. The type of traffic assigned to each class must be listed on Form E6352, "No. 4 ESS Traffic Separation Assignments." A description of this record may be found in DFMP Division H, Section 9e, "No. 4 ESS Machine Administration Records." The machine administrator must furnish the routing supervisor with a current copy of the record. The routing supervisor uses the record to assign DESEP classes to code groups.

7.28 Before assigning INSEPs and DESEPs to types of traffic, the machine administrator must contact the network manager and the operating

company division of revenue supervisor to obtain their requirements for traffic separation counts.

7.29 The machine administrator may assign the classes in any manner which meets both the division of revenue and the network management requirements. The machine administrator may supplement these requirements as desired, but the supplementary assignments must not reduce the capability to provide the data required for division of revenue and network management.

Universal Treatment Codes

7.30 Codes which are classified as universal treatment codes must be identified to the No. 4 ESS. Universal treatment codes are those which have a common system destination and are not associated with an NPA code.

7.31 An example of a universal treatment code is 182. Code 182 is used universally throughout the system to route calls toward a common destination. The common destination for this code is the White Plains international switching center. The NPA code for White Plains (914) is not used in conjunction with code 182.

Nonreroutable Codes

7.32 Codes which are disallowed from rerouting by the network management program must be identified to the No. 4 ESS. This includes codes which could be routed improperly by an arbitrary via office. The ODA is preset to consider codes 000 through 199 as nonreroutable. Changes to this will have to be handled by the machine administrator.

Dial Pulse 3-Digit Codes

7.33 The 3-digit codes corresponding to the A, B, and C digits of potential 3-, 4-, and 5-digit calls must be identified to the No. 4 ESS to conserve call processing time. This is only necessary when TSGs which received dial pulses are capable of passing the codes to the No. 4 ESS.

Dial Pulse 6-Digit Codes

7.34 The 3-digit codes corresponding to the D, E, and F digits of potential 6-digit calls must be identified to the No. 4 ESS to conserve call processing time. This is only necessary when TSGs which receive dial pulses are capable of passing the codes to the No. 4 ESS. It is also not necessary if the A, B, and C digits which precede these D, E, and F digits where identified as a dial pulse 3-digit code.

7.35 Universal treatment codes, nonreroutable codes, dial pulse 3-digit codes, and dial pulse 6-digit codes are identified to the No. 4 ESS by ODA Form ESS 403I or RCDM 27. The routing supervisor is responsible for initiating these messages.

Served Numbering Plan Areas

7.36 The No. 4 ESS is capable of handling calls for toll-connecting trunks which originate in any of eight NPAs. The eight NPAs include the HNPA and seven SNPAs. The No. 4 ESS allows a customer in the HNPA and each SNPA to dial only seven digits for intra-NPA calls. The necessary digit deleting and prefixing will be accomplished internally by the No. 4 ESS.

7.37 The No. 4 ESS provides optional capability for customers in each NPA to dial intra-NPA calls using ten digits. If 10-digit intra-NPA dialing is not permitted, a final handling treatment (No 10 FHT) must be specified. The routing supervisor will specify a No 10 FHT of VCA on ODA Form ESS 403A unless notification is received from the machine administrator of a local requirement.

7.38 Each SNPA has an arbitrary 1-digit identifying number which is assigned by the routing supervisor. The machine administrator maintains a record of SNPA assignments on Form E6355, "No. 4 ESS Served NPAs." A description of this form is found in DFMP Division H, Section 9e, "No. 4 ESS Machine Administration."

7.39 SNPAs must be identified to the No. 4 ESS using ODA Form ESS 403A or RCDM 18. The routing supervisor is responsible for initiating these messages.

Inter-NPA 7-Digit Dialing

7.40 Inter-NPA calls may be allowed to originate from any local office within the HNPA or an SNPA on a 7-digit basis. The codes involved are called "protected codes" because they may not exist in both NPAs. Protected codes must be identified to the No. 4 ESS using ODA Form ESS 403B or RCDM 19. The routing supervisor is

responsible for initiating these messages. The necessary digit deleting and prefixing will be accomplished internally by the No. 4 ESS.

Same INWATS Treatment

7.41 ODA Form ESS 403J or RCDM 26 must be used to associate INWATS XXX codes with 1NB codes. This association must be made for each INWATS NXX which the No. 4 ESS serves as terminating INWATS principle city. The routing supervisor is responsible for initiating these messages.

7.42 The No. 4 ESS will use this association to establish common routing information for the INWATS and INB codes. This eliminates the necessity for duplicate translation data. Calls arriving at the No. 4 ESS in the format of 800 plus the INWATS NXX will receive the same INWATS treatment as calls arriving with the associated 1NB code.

7.43 The machine administrator must check each code grouping RCDM which is initiated by the routing supervisor. The check should assure that the information in the RCDM is reasonable. After determining that the message is acceptable, the machine administrator is responsible for testing and activating the RCDM.

7.44 To test a code grouping RCDM, the machine administrator must initiate an RCAM to place the RCDM into the test state. Verify message 3a, 3b, 3c, 3d, or 3f may then be used to check that the translator structures are consistent with the desired input.

7.45 The machine administrator should initiate RCAMs to activate the code grouping messages at the date and time the orders are due.

8. SCREENING

General

8.01 The routing supervisor is responsible for screening. This part will familiarize the machine administrator with screening and the associated responsibilities. The machine administrator must notify the routing supervisor of any local requirements for screening.

8.02 The following four types of screening are used in the No. 4 ESS:

- Vacant Code Screening
- Multiple Treatment Screening
- Go/No-Go Screening
- CAMA Screening.

Vacant Code Screening

8.03 The No. 4 ESS should perform screening of vacant (unused) central office codes which reside within each NPA. Vacant code screening is accomplished by proper preparation of ODA input forms.

8.04 Form ESS 403F should be used to specify 6-digit implied code grouping for each NPA. The implied code group should be directed to the disposition which is common to the largest number of central office codes within the NPA.

8.05 All central office codes (excluding vacant codes) which are destined for a disposition other than the implied code group disposition should be included in a code group. The code group should be listed on Form ESS 403E, G, or H. ODA routes these codes as specified.

8.06 ODA routes all vacant codes (excluding any listed on form 403E, G, or H) to VCA. The Western Electric Company maintains a list of vacant codes for ODA use. This eliminates the necessity of vacant codes being specified by the routing supervisor or the machine administrator.

8.07 All codes which have not been specified on Form 403E, G, or H and are not included in the Western Electric Company's list of vacant codes are routed to the disposition specified by the implied code group. Fig. 5 provides a flowchart of the ODA vacant code screening process.

8.08 After the office is in service, the routing for each code is maintained individually. When a previously vacant code is placed in service, RCDM 300, 301, or 302 is used to change the routing from VCA to the new disposition.

8.09 The machine administrator is responsible for assuring proper vacant code screening within the No. 4 ESS. This is accomplished by:

(a) Assuring that ODA input forms and RCDMs are properly prepared to accomplish vacant code screening

(b) Periodic routing verification checks as described in DFMP Division H, Section 9e, "No. 4 ESS Machine Administration Records."

8.10 The machine administrator is also responsible for determining the reasons calls are switched to VCA. DFMP Division H, Section 9f, "No. 4 ESS Traffic Measurements," describes the analysis of switching calls to VCA. One method of determining the reasons for switching calls to VCA is through live operator intercept. The machine administrator may assign codes for live intercept by:

(a) Establishing a TSG containing trunks to the operator who handles live intercept of vacant codes. The trunks must not return answer supervision to the No. 4 ESS.

(b) Establishing an RDB which identifies the live intercept TSG. The RDBFHT should be VCA.

(c) Initiating RCDM 300, 301, or 302 to change the disposition of codes from VCA to the RDBI which points to the live intercept group.

Multiple Treatment Screening

8.11 Multiple treatment screening (MTS) allows different TSGs in the same domain to be given separate routing treatments. This separation may be accomplished even though the same digits are received over each TSG.

8.12 Sixteen MTS classes (MTSC) are available for assignment to TSGs. This allows up to 16 different routing treatments for a single code or code groups.

8.13 Any code group which requires MTS should be directed to an MTSI. The MTSI identifies a screening block which specifies the 16 distinct dispositions. Code groups which are not specified for MTS will provide the same disposition for all TSGs regardless of MTSC.

8.14 A maximum of 1024 screening blocks are available within the No. 4 ESS. Any quantity of codes may be directed to the same screening block. Duplicate screening blocks should be avoided in order to preserve memory space. A screening block must be established prior to, or simultaneous with, directing codes to its MTSI.

8.15 The machine administrator assigns MTSC 0 to all TSGs unless notification is received from the routing supervisor of special screening requirements. The routing supervisor directs MTSC 0 in each screening block to the route used by the greatest number of TSGs. The machine administrator must notify the routing supervisor of any local requirements for MTS.

8.16 ODA Form ESS 403I or RCDM 303 is used to establish a screening block. RCDM 304 is used to change a screening block; RCDM 305 deletes screening blocks. The routing supervisor is responsible for initiating these messages.

8.17 The machine administrator must check each MTS RCDM which is initiated by the routing supervisor. The check assures that the information is reasonable. After determining that the message is acceptable, the machine administrator is responsible for testing and activating it.

8.18 To test an MTS RCDM, the machine administrator initiates an RCAM to place the RCDM into the test state. Verify message 3e may then be used to check that the translator structures are consistent with the intended input.

8.19 The machine administrator initiates RCAMs to activate the MTS messages at the date and time the orders are due.

8.20 Table F contains an example of MTS.

Go/No-Go Screening

8.21 Go/no-go screening (GNS) provides a function similar to MTS, but in a limited version. Four GNS classes are available for assignment to TSGs, but only two separate dispositions may be obtained for any code. GNS can be used in combination with MTS to provide many unique treatments. (A code group may be directed to an MTSI which has GNS applied to some of its classes.)

TABLE F

MULTIPLE TREATMENT SCREENING

<table>
<tr><th>EXAMPLE</th><th>EXPLANATION</th></tr>
<tr><td>A</td><td>MTSCs assigned to TSGs:

MTSC — TSGs
0 — Interstate intertoll TSGs
1 — Intrastate intertoll TSGs
2 — Toll-connecting TSGs from Bell System offices
3 — Toll-connecting TSGs from independent company offices
4 — Operator toll tandem TSGs</td></tr>
<tr><td>B</td><td>Dispositions assigned to code groups:

Code — Disposition
103 — Test Line 103
312 — RDBI 1024
651 — VCA
895 — MTSI 128
999 — Tone</td></tr>
<tr><td>C</td><td>Dispositions assigned to screening block:

MTSI 128

MTSC — Disposition
0 — RDBI 996
1 — RDBI 192
2 — RDBI 32
3 — RDBI 4096
4 — VCA</td></tr>
</table>

TABLE F (Cont)

MULTIPLE TREATMENT SCREENING

EXAMPLE	EXPLANATION
D	RDBs:

RDBI	1st Route	1st Alt. Route	RDB FHT
32	Local Office 895	Local Tandem Office A	Tone
192	Local Office 895		NCA
996	Local Office 895	Local Tandem Office A	NCA
1024	Chicago 3, Illinois	Norway, Illinois	NCA
4096	Local Office 636		NCA

E

The following will be effected by the assignment examples in A, B, C, and D above:

1. Calls from any TSG forwarding code 103 will be routed to 103 test lines.
2. Calls from any TSG forwarding code 312 will be first routed to Chicago 3, Illinois, alternately routed to Norway, Illinois, and given a final handling treatment of NCA.
3. Calls from any TSG forwarding code 651 will be routed to VCA.
4. Calls from interstate intertoll TSGs forwarding code 895 will be first routed to local office 895, alternately routed to local tandem office A, and given a final handling treatment of NCA.
5. Calls from intrastate intertoll TSGs forwarding code 895 will be first routed to local office 895, will not be allowed to alternate route, and will receive a final handling treatment of NCA.
6. Calls from toll-connecting TSGs originating in Bell System offices and forwarding code 895 will be first routed to local office 895, alternately routed to local tandem office A, and receive a tone for final handling treatment.
7. Calls from toll-connecting TSGs originating in independent company offices and forwarding code 895 will be first routed to local 636, will not be allowed to alternate route, and will receive a final handling treatment of NCA.
8. Calls from operator toll tandem trunks forwarding code 895 will be routed to VCA.
9. Calls from any TSG forwarding code 999 will be routed to a tone source.

8.22 A code group which uses GNS may direct some calls to an RDB and others to VCA. These are the only dispositions available with GNS. Code groups which have GNS applied must specify an RDBI, a GNS class (GNSC), and a go (G) or no-go (N) condition.

8.23 When a TSG forwards a code which is specified for GNS, the call will be directed as follows:

G/N SPECIFICATION	CODE GROUP GNSC MATCHES TSG GNSC	DISPOSITION
G	Yes	RDBI specified by code group.
G	No	VCA
N	Yes	VCA
N	No	RDBI specified by code group.

8.24 The routing supervisor effects GNS by making appropriate entries in code grouping or MTS messages. No special messages are required for GNS.

8.25 The machine administrator assigns GNSC 0 to all TSGs unless notification is received from the routing supervisor of special screening requirements. When GNS is employed, the routing supervisor directs GNSC 0 to the disposition used by the greatest number of TSGs. The machine administrator must notify the routing supervisor of any local requirements for GNS.

8.26 Table G contains an example of GNS.

CAMA Screening

8.27 CAMA calls are screened in each of three methods by the No. 4 ESS:

- Screening calls with invalid calling codes
- Screening calls with unauthorized called codes
- Local call intercept.

These screening functions are in addition to any MTS and GNS which may be applied.

TABLE G

GO/NO-GO SCREENING

<table>
<tr><th>EXAMPLE</th><th>EXPLANATION</th></tr>
<tr><td>A</td><td>GNSCs assigned to TSGs:

GNSC — TSGs
0 — Intertoll TSGs
1 — Toll-connecting TSGs from Bell System offices
2 — Toll-connecting TSGs from independent company offices.
3 — Operator toll tandem TSGs</td></tr>
<tr><td>B</td><td>GNS applied to code groups:

Code — RDBI — G/N — GNSC
862 — 256 — N — 3
232 — 4196 — G — 0</td></tr>
<tr><td>C</td><td>The following will be effected by the examples in A and B above:

1. Calls from operator toll tandem trunks forwarding code 862 will be routed to VCA.
2. Calls from other than operator toll tandem TSGs forwarding code 812 will be directed to RDBI 256.
3. Calls from intertoll trunks forwarding code 232 will be directed to RDBI 4196.
4. Calls from other than intertoll TSGs forwarding code 232 will be routed to VCA.</td></tr>
</table>

Screening Calls With Invalid Calling Codes

8.28 All offices which are allowed to originate CAMA calls to the No. 4 ESS must be identified on ODA Form ESS 404A or RCDM 400. The TSG over which that office is allowed to originate CAMA calls is identified in the same message. When the calling office code is not authorized for the TSG which originates the call, the call will be routed to a CAMA operator to determine the correct calling code.

8.29 Any originating office code which is allowed over more than one trunk group must have instructions to pass originating validity check (POVC). When a code which has POVC instructions is received by the No. 4 ESS, the screening of invalid calling codes is canceled.

Screening Calls With Unauthorized Called Codes

8.30 Codes which are unauthorized for receipt over CAMA trunks must be identified to the No. 4 ESS on ODA Form ESS 404C or 404D. Offices already in service must use RCDM 403 or 404.

8.31 Any call arriving on a CAMA trunk which forwards an unauthorized code for CAMA is routed to VCA.

8.32 The machine administrator must notify the routing supervisor of any local requirements for unauthorized codes.

Local Call Intercept

8.33 In most cases, it is undesirable for calls to be completed over CAMA trunks if the customer has local free service. Completing the call over a CAMA trunk uses toll facilities and the toll switching machine. The blocking of these calls is local call intercept (LCI).

8.34 Blocking patterns for LCI must be identified to the No. 4 ESS. A combination of ODA Forms ESS 404A and B or RCDMs 400 and 401 is used for this identification.

8.35 All codes included on one ODA Form ESS 404A or in one RCDM 31 must have the following common characteristics:

- They must all be allowed to originate CAMA calls over the same TSG.
- They must all have the same POVC specification.
- They must all have the same LCI blocking pattern.

A group of codes with these common characteristics is a CAMA screening LCI code group.

8.36 The blocking pattern for a CAMA screening LCI code group is called a "profile." An arbitrary number is used to identify a profile. More than one CAMA screening LCI code group can point to the same profile. Duplicate profiles should be avoided to prevent unnecessary use of memory.

8.37 ODA Form ESS 404B or RCDM 401 is used to identify the blocking pattern for a profile. RCDM 401, 402, or 406 is used to change the blocking pattern.

8.38 When a CAMA call is originated to the No. 4 ESS, the profile number is read from the CAMA screening LCI code group. The called code is matched against the blocking pattern for the profile. If the called code is included in the blocking pattern, the call is routed to VCA.

CAMA Screening Responsibilities

8.39 The routing supervisor is responsible for initiating all CAMA screening messages.

8.40 The machine administrator must check each CAMA screening RCDM which is initiated by the routing supervisor. The check assures that the information is reasonable. After determining the message acceptable, the machine administrator is responsible for testing and activating it.

8.41 To test a CAMA screening RCDM, the machine administrator must initiate an RCAM to place the RCDM into the test state. Verify message 4a, 4b, 4c, 4d, or 4f may then be used to check that the translator structures are consistent with the intended input.

8.42 The machine administrator initiates RCAMs to activate the CAMA screening at the date and time the orders are due.

8.43 Fig. 6 contains a flowchart of the CAMA screening process.

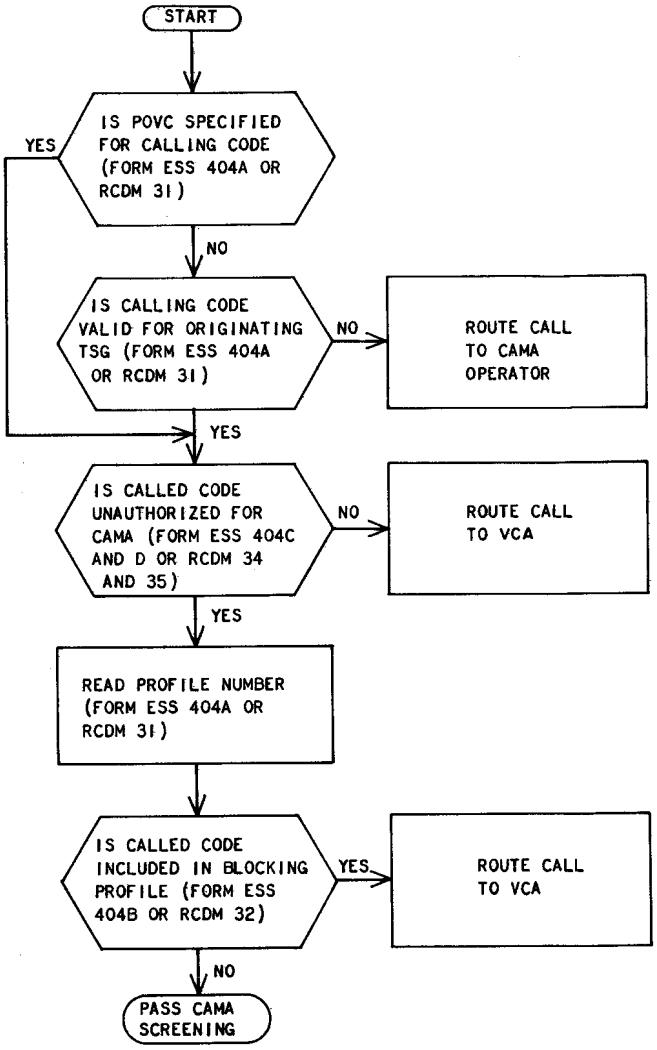


Fig. 6—CAMA Screening

9. OTHER ASSIGNMENT CONSIDERATIONS

9.01 Certain other considerations are necessary to complete the No. 4 ESS assignments. The machine administrator is responsible for initiating the appropriate messages.

Remote Office Test Line Callback Translator

9.02 The remote office test line (ROTL) callback translator is used to store telephone numbers of up to eight locations which are authorized to condition trunks in the No. 4 ESS. The telephone numbers, called callback numbers (CBN), are used by the No. 4 ESS to "call back" the office originating the test. The callback limits access to authorized offices. Each location authorized to condition trunks is identified by a 1-digit ROTL callback index (RCBI). The RCBI corresponds to a digit which is to be received from the originating office.

9.03 In addition to CBNs, the ROTL callback translator stores maintenance busy threshold override (MBTOVR) authorizations. ROTL callback translator assignments should be obtained from personnel responsible for trunk testing.

9.04 ODA Form ESS 406A or RCDM 55 is used to make ROTL callback translator assignments. The machine administrator must place RCDM 55 into the test state and the activate state at the request of the personnel responsible for trunk setting.

Unit-Type Translator

9.05 The unit-type translator is used to store data associated with hardware and other units. The information is placed into the ODA by the Western Electric Company.

9.06 When the equipage of unit types are changed and a new ODA tape is not prepared, RCDM 700 or 701 must be used to grow or modify the unit-type translator. TG4 describes the specific units to be included. The member equipage must be grown and degrown in specific order. MOPs should be used to prevent untimely delays in processing U-type RCDMs.

9.07 RCDMs 51 and 52 are always entered into the test state. The MOC is responsible for entering, testing, and activating the messages.