SWITCHING SYSTEMS MANAGEMENT
NO. 4A/4M PBC CROSSBAR
INTEGRATED RECENT CHANGE

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FIGURES

1. INTRODUCTION

1.01 This section provides an outline of the responsibilities of the machine administrator in a No. 4A or 4M Crossbar Toll Switching System, equipped with the Electronic Translator System (ETS) and the Peripheral Bus Computer (PBC), for the administration of the integrated recent change (IRC) program.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 The title for each figure includes a number(s) in parentheses which identifies the paragraph(s) in which the figure is referenced.

1.04 Integrated recent change is a program which is available in machines operating with Generic Programs, PG-68500-3A.X for the PBC and PG-68000, Issue 11, for the ETS stored program control (SPC). When these two generic programs are provided, the machine administrator can introduce recent changes to both the PBC and SPC with one recent change message. Prior to the introduction of integrated recent change separate change messages were required: one to change SPC variable data tables, and one to change PBC variable data tables.

1.05 When the integrated recent change system is provided, all recent change messages shown in Fig. 1, with the exception of WRT-08 and WRT-09 messages, are input from the PBC channel 20 or channel 21 DATASPEED 40® terminal (Fig. 2). Channel 20 is required for all PBC installations and channel 21 is optional (as shown in the PBC block diagram in Fig. 3) Formats for the integrated recent change messages shown in Fig. 1 can be found in the PBC Input Manual, IM-68500.

1.06 A Series 4200 DATASPEED Magnetic Tape Terminal (Fig. 4) can be used with either or both channels 20 and 21 to allow integrated recent change orders to be prepared off-line prior to inputting these orders to the PBC. The DATASPEED Magnetic Tape Terminal can also be used to store backup integrated recent change orders in case the data bases need to be reconstructed or to store integrated recent change orders which have been prepared and checked in advance of activation.

1.07 With the introduction of integrated recent change, recent change capabilities for the SPC teletypewriters (TTYs), channel 10, are retained for WRT-08, data table change messages, and WRT-09, emergency generic program messages, only. The WRT-08 and WRT-09 messages can be input directly on the SPC TTY or can be prepared off-line on the TTY paper tape and read into the SPC and TTY channel 10. The formats for WRT-08 and WRT-09 messages can be found in the ETS Input Manual, IM-68000.

1.08 Additional detailed procedural information on the integrated recent change system can be found in the following documents:

- ETS Input Message Manual, IM-68000
- ETS Output Message Manual, OM-6800
- PBC Input Message Manual, IM-68500
- PCB Output Message Manual, OM-68500
- No. 4A-ETS Translation Guide

References to these documents will be made throughout this practice.

2. RECENT CHANGE OVERVIEW

GENERAL

2.01 The PBC integrated recent change system is a feature designed for No. 4A ETS/PBC switching machines. Integrated recent change combines the previously separate ETS and PBC recent change systems and allows the machine administrator to maintain both the PBC and SPC office variable data bases from the PBC, channel 20 or 21, DATASPEED 40 terminal.

2.02 There are two states a recent change order progresses through during the recent change process:

- Buffered State
- Activate State

The actions which affect a recent change order as it progresses from the "buffered state" to the "activated state" shall be discussed in subsequent paragraphs.

BASIC OPERATIONAL FEATURES

2.03 The main component of the integrated recent change system is the ***change order software*** which accepts recent change orders inputted through the DATASPEED 40 terminal channels 20 and 21. These orders may be placed on the DATASPEED 40 display either manually via the keyboard or automatically via a model 4210 magnetic tape terminal reading a cartridge tape. Regardless of how the change order gets to the DATASPEED 40 display, it may then be visually checked for errors and then manually executed by pressing the "return" key for each inputted message.

2.04 Another component of the integrated recent change system is its ***data table readout capability.*** This old data verification printout occurs as a by-product of entering a change message and also as a result of entering specific verification messages. Both of these are described in Part 5.

2.05 The third component of the integrated recent change system is the ***off-line preparation and storage capability*** which is not really an integral part of the change order software. This was also true of ETS recent change since the channel 10 paper tape reader/punch was not a part of the software. Likewise, the model 4210 magnetic tape terminal is not necessary to integrated recent change operation. The provision of the model 4210 terminal for off-line preparation and storage of recent change orders is an option of an operating company and depends on the number of recent change orders implemented over a given time interval and local practices. A smaller office with infrequent integrated recent change activity may elect to depend exclusively on DATASPEED 40 keyboard entry. The integrated recent change system will also retain paper tape capabilities on SPC TTY channel 10 for WRT-08/09 messages (see Part 6.)

ORDER NUMBER ASSIGNMENT

2.06 The PBC recent change process is done on an order basis. A recent change order is made up of all the recent change input messages necessary to make the desired PBC memory change. The change information, obtained from the change message, is stored on a disk file called an order buffer.

2.07 The change order numbers (0-999) serve to identify a particular order and should not be confused with an order buffer number (0-23) which is discussed in Part 4. The order number range was made large to be used by the operating company to distinguish recent change orders over a reasonable period of time and thus aid in recording recent change orders. When an order number is assigned to an order, it cannot be reused until the order is released either by and ACT:RCORD or CAN:RCORD input message.

3. RECENT CHANGE MESSAGES

GENERAL

3.01 The PBC and SPC recent change process is done on an order basis. A recent change order is made up of all the recent change input messages necessary to make the desired memory change. The change information, obtained from the change message, is stored on a disk file call an order buffer. Order buffering will be discussed in greater detail in Part 4.

INPUT MESSAGES

3.02 Recent change input messages are divided into control messages and change messages. Recent change orders are built by entering these messages in the proper sequence.

A. Control Messages

3.03 The control messages are used to begin, end, activate, and cancel a recent change order. The control messages and their functions are as follows:

MESSAGE	FUNCTION
BEG:RCORD	This message is used to start a recent change order. This must be the first recent change message entered when making a change. This message assigns an order buffer to the recent change order and designates either both SPC buses or which SPC bus to read and write if there are SPC change messages in the order.
END:RCORD	This message is used to end a recent change order. This is the last recent change message entered before the change is activated or canceled. The integrated recent change system will accept another begin message after the end message has been entered.
ACT:RCORD	This message is used to activate change messages which were entered between BEG:RCORD: and END:RCORD: messages. No PBC or SPC memory is changed until the ACT:RCORD: message is entered. The order buffer assigned to the change order will be released and made available for future change orders after the ACT:RCORD: message.
CAN:RCORD	This message is used to cancel the order. No data will be changed by an order which is canceled. The order buffers assigned to the change order will be released and made available for future change orders.
CLR:SPC	This message initializes all SPC resident flags and buffers associated with the integrated recent change system. It is used primarily to "disarm" the SPC old data restoration feature that is automatically "armed" when an order is activated.

NOTE: Upon activation of a recent change, the old data in the SPC buffer will automatically be placed in a hold state by the generic program. The old data will be subject to reinstatement by an interrupt or call-processing recovery phase. This state exists until the CLR:SPC message is typed. The CLR:SPC message should be entered as soon as the new data appears to be performing as anticipated. This will eliminate the inadvertant replacement of the old data (for this order only.)The old data hold state is also cleared when the next BEG or END message is entered.

B. Change Messages

3.04 The change messages are used to define the data table changes. When a change message is entered, a corresponding change routine will be executed. The change routine will generate change data to be placed in the order buffer of the PBC. When the END:RCORD message is entered, all SPC change data in the order, if any, will be transferred to a buffer in the SPC. If the ACT:RCORD message is then entered, the desired changes will be written into PBC and SPC memory. An order cannot be activated until the END:RCORD message has been entered.

3.05 A complete description of all integrated recent change messages is provided in the PBC Input Manual IM-68500 and the ETS Input Manual IM-68000. Fig. 1 provides additional background information on current recent change messages.

DATA TABLE CHANGES

3.06 Figures 5, 6, and 7, in conjunction with Tables A, B, and C, show the relationship between the PBC data tables and the ETS data tables when recent changes are made to related

tables in the two separate data bases. For recent changes, the PBC data tables can be considered as members of three groups; trunk related data (Table A and Fig. 5), sender related data (Table B and Fig. 6), and miscellaneous data (Table C and Fig. 7). When recent changes are made in the ETS data tables, a recent change may be needed in the PBC memory.

INPUT MESSAGE SEQUENCE

3.07 Control and change messages are inserted in the PBC system in a specific sequence when making a change order. The sequence is as follows:

(1) BEG:RCORD:ORDNO=n,BUS=1

(2) One or more changes messages

(3) END:RCORD:ORDNO=n

(4) ACT:RCORD:ORDNO = nor CAN:RCORD: ORDNO = n

3.08 In the above sequence n = the order number. This number (0-999) is used for record keeping, (n) must be in the same number in all messages above. Once an order number is entered in a BEG:RCORD message, it cannot be reused until the order is either activated or canceled. The BUS field designates either both SPC buses or which SPC bus to read and write if there are SPC changes in order.

3.09 All of the messages BEG:RCORD through END:RCORD are used to create and store the change data necessary for order number (n). Order number (n) can remain stored until the change is activated, canceled, or the PBC system is restarted (manually or automatically) or reloaded. No memory is changed until the ACT:RCORD message is entered.

3.10 When making recent changes, proceed as follows.

(1) Use Figs. 5, 6, and 7 and Tables A, B, and C to determine if any data tables changed in SPC must be changed in PBC.

(2) Determine the recent changes required in the SPC and PBC.

(3) Using ETS Input Manual IM-68000 and PBC Input Manual IM-68500, enter the integrated recent change as shown in 3.06; but do not activate the order.

(4) Check old data/new data printout. This is an automatic printout after each change message is entered.

(5) If SPC memory is to be changed, run test calls at decoder-marker test frame using the new data. An RC01 output message on TTY channel 10 (see ETS Output Manual OM-68000) indicates that the test was completed.

(6) Activate the new data by using the ACT:RCORD:n message. At this time, the old SPC data is saved and will be reinstated should a call processing phase or a maintenance interrupt occur.

(7) When the new data appears to be functioning properly, use the CLR:SPC message to clear the old SPC data which was being saved as a result of step 6. The BEG and END messages for order number (n) may be entered on DATASPEED 40 channel 21 at some arbitrary time. At some later time, the END message may be reentered for that same order number (n) from channel 20 at the 4A switching center in order to run a decoder marker test (DMT). The ACT or CAN message for order number (n) could then be entered from either channel 20 or 21.

4. RECENT CHANGE BUFFERING

4.01 When an integrated recent change message is entered on the DATASPEED 40 terminal it is placed in an order buffer area on the PBC disk which is used to store change information. There are 24 order buffers on the PBC disk as shown in Fig. 8, and each order buffer is 256 words long. A recent change order may use any number of order buffers, depending on the size of the change.

4.02 The change information is stored in the order buffer in the form of change records. A change record indicates the address of the word to be changed, the start bit and size of the field within the word to be changed, and the old and new data values. There is one change record

placed in the order buffer for each field to be changed. A change record is four words long for core changes and five words long for disk changes. Each order buffer can contain 64 core changes or 51 disk changes maximum. Core and disk changes may be mixed in any order.

4.03 The number of order buffers (24) limits the number of orders which may be stored at any time at 24. Each recent change order must be at least one order buffer; however, an order may use more than one order buffer if it is a large order. If any order stored in the order buffer area uses more than one order buffer the total number of orders which can be stored is decreased.

4.04 A core resident head table (OBHEAD) is used to associate the 24 order buffers to the order numbers. This table also indicates the number of words used in each order buffer.

4.05 When the BEG:RCORD message is entered a routine checks OBHEAD for a vacant order buffer. If an order buffer is vacant it is assigned to the order number entered with the message. Each change message, entered after the BEG:RCORD message, generates change records, and places them in the order buffer. When the order buffer is full, another order buffer will be assigned to the order. If no more order buffers are available, the change order must be ended and either activated or canceled. When any order is activated or canceled the associated order buffers will be free to be used by subsequent orders. An order cannot be activated or canceled until the END:RCORD message has been entered. The END:RCORD message indicates the change is complete and no more change messages are to be stored with this order.

4.04 The order number (0-999) serves only to identify a particular order and should not be confused with an order buffer number (0-23). If an order number is assigned to an order, it cannot be reused until the order is released either by an ACT:RCORD or CAN-RCORD input message.

4.05 Integrated recent change orders that have been ended with the END:RCORD message exist in disk memory until one of the following occurs:

(1) The order is activated with an ACT:RCORD message.

(2) The order is canceled with a CAN:RCORD message.

(3) An automatic (SYSERR) restart occurs.

(4) A manual hard or soft restart is initiated.

(5) A magnetic tape is loaded (PG, AL, OD, or SO).

4.06 If an automatic restart, manual restart, or magnetic tape load is necessary, then all recent change orders in disk memory which have not been activated or canceled must be reentered manually via the DATASPEED 40 keyboard or automatically by reading the change messages from the pertinent 4210 magnetic tape terminal tape cartridge onto the DATASPEED 40 display and then executing them.

5. DATA VERIFICATION

SPC/PBC AUTOMATIC DATA TABLE VERIFICATION

5.01 After each integrated recent change message is entered, an automatic old data/new data printout is printed. This printout provides a check for the machine administrator to verify the current change before it is activated. The new change data and the data which is being replaced is printed for verification.

PBC MANUAL DATA TABLE VERIFICATION

5.02 In addition to the automatic verification report printed out as each integrated recent change is entered, the resident PCB Data Table Verification Program can be used to verify the contents of the PBC memory at any time on a demand basis. The verification routines are executed by entering the desired verification input message on any PCB DATASPEED 40 channel. A complete listing of verification messages can be found in the PBC Input Manual IM-68500.

5.03 There is a general verification which can be used to verify any PBC core or disk area. This type of verification can be used by entering a VER:CORE, VER:DSKPG or VER:DISK input message on any DATASPEED 40 input channel. The general verification will generate an output

message reporting the address and octal contents of each word that was requested.

5.04 The incoming trunk group data (ITGDATA) and outgoing trunk group data (OTGDATA) PBC resident trunk group data entries can be read either by entering the VER:ITGDAT or OTGDAT input message with an entry index (incoming trunk group index (ITGI) or trunk routing index (TRI)) or a common language location identifier (CLLI) on any PBC DATASPEED 40 channel. If the entry addressing method is used, only the portion of the table containing the desired entry is read. If the CLLI method is used, the appropriate table ITGDATA or OTGDATA is searched until the entry containing the indicated CLLI is found. See PBC Input Manual, IM-68500, and PBC Output Manual OM-68500 for more detailed information.

SPC MANUAL DATA TABLE VERIFICATION

5.05 Presently, prior to the incorporation of integrated recent change system, the customary data table verification messages for SPC resident data tables are found in ETS Input Manual IM-68000. These messages can be input on the channel 10 TTY to verify SPC data tables. After the incorporation of the integrated recent change system, the SPC data table verification capability via the channel 10 TTY is lost. Procedures for the manual verification of SPC data tables following an integrated recent change are described in paragraph 5.06.

SPC/PBC MANUAL DATA TABLE VERIFICATION

5.06 All tables entries in PBC and SPC memories, for which there exists a change message, may be verified by the following procedure:

(1) Enter a BEG: message on channel 20 or 21.

(2) Enter the change message without specifying any change data for the table entry to be verified.

(3) Read the old data from the resulting old data/new data printout. The old data/new data columns will contain, in this case, identical data for each field because no changes were specified.

(4) Enter a cancel CAN: message.

6. ALTERNATE RECENT CHANGE PROCEDURES USED AS A BACKUP TO PBC

6.01 In the event that the PBC is inoperable at the time mandatory SPC memory changes must be made, the SPC WRT-08, octal address/data message, described in the ETS Input Manual IM-68000, is used. In order to use this feature, the machine administrator must develop the WRT-08 data messages in advance of important recent activation dates in order to minimize the service disruption which might occur should the PBC become inoperative prior to and during the prescribed incorporation time.

6.02 In order to prepare for such a contingency, the machine administrator should prepare the octal address and data information for the WRT-08 messages in advance of the order activation date.

6.03 The format for a recent change order entered on the SPC TTY channel 0 or 10 is as follows:

(1) BEG-00-BUS:B, TP:N.

(2) WRT-08-aaaaaaa, ddddddd.

(3) END-00-.

(4) ACT-00-.

(5) CL-00-.

6.04 The machine administrator should next:

(1) Use Figs. 5, 6, and 7 and Tables A, B, and C to determine if any data tables changed in SPC must be changed in PBC.

(2) Determine the recent changes required in the SPC and PBC.

(3) To obtain the already calculated WRT-08 octal address and data from the PBC/SPC machines, proceed as follows:

(a) Enter BEG, change and END messages from channel 20 or 21.

(b) Determine the number of SPC words in the order by entering a RC:STATUS message.

(c) Read this number of address words from the SPC memory location ADRBUF using the RED-00- message. (See COMPOOL or DTCG02 listing for the addresses of ADRBUF and DATBUF.)

(d) Read the number of data words specified by the results of (b) from the SPC memory locations in DATBUF.

(e) Enter CAN message.

(f) The words read in (c) are the octal addresses for WRT-08 messages, and the words read in (d) are the respective octal data items.

(4) Prepare the required WRT-08 contingency messages

6.05 In the event the PBC is inoperative, the preprepared WRT-08 messages can be entered via the SPC TTY channels 0 or 10. When the PBC returns on-line, the PBC change messages must be entered through the PBC DATASPEED 40 terminal to bring the PBC up-to-date with the SPC.

> ***Note:*** As previously mentioned, WRT-09 messages, which allow emergency generic program overwrite capability, can be input from SPC channels 0 and 10. The message should not be used as an alternate to recent change procedures.

7. RECORD MAINTENANCE

7.01 As an integral part of the integrated recent change system, the machine administrator shall be responsible for maintaining and updating the "Questionnaire Form Code" records to reflect recent change activity. A recent change order form, shown in Fig. 9, which is similar to the current ETS recent change order form, shall be used to record pertinent change information. The information contained on this form shall be used to update the questionnaire form codes affected by the change.

TABLE A
TRUNK RELATED DATA

TRUNK RELATED CHANGE	PBC															SPC (ETS)				
	ITGDATA	ITG - - - (ITGEQP)	ØW-USE	LITGI	TKEQPD	TGIDENT	HCITGDAT	HCØTGDAT	LTRI	ANCMTRI	ANCMTBC	TØRCNAME	ØTGDATA	ØTGEQI/T	TBUSE	ØTKTAB	LTRIND	LTGIND	ITKTAB	TGP - -
(1) Add a 1-way outgoing trunk within a working TB span.	no	no	no	no	yes	no	no	no	no	no	no	no	yes	yes	yes	no	no	no	no	no
(2) Add a 1-way incoming trunk to a working group.	yes	yes	If Usage Required	no	yes	no	no	no	no	no	no	no	If associated	no	no	no	no	no	no	yes
(3) Add a 2-way trunk to a working group, within the TB span.	yes	yes	If Usage Required	no	yes	no	no	no	no	no	no	no	yes	yes	yes	no	no	no	no	yes
(4) Extend a TB span, exclusive of trunk circuit changes.	no	no	no	no	no	no	no	no	no	no	no	no	no	no	yes	yes	no	no	no	no
(5) Change GB relay size, adding a TB span, exclusive of trunk changes.	no	no	no	no	no	no	no	no	no	no	no	no	no	no	yes	yes	no	no	no	no
(6) Activate a preplanned dummy TB span, exclusive of trunk changes.	no	no	no	no	no	no	no	no	no	no	no	no	no	no	yes	As Required	no	no	no	no
(7) Change a trunk's SLF assignment and trunk relay equipment (drop).	no	yes	If Usage Required	no	no	no	no	no	no	no	no	no	no	yes if, 2-way trunk	no	no	no	no	no	yes
(8) Add a "nonassociated" 1-way outgoing trunk group.	no	no	no	no	yes	As Required	no	no	As Required	no	no	no	yes	yes	yes	yes	As Required	As Required	no	no
(9) Add a "nonassociated" 1-way incoming trunk group.	yes	yes	If Usage Required	As Required	yes	As Required	no	no	no	no	no	no	no	no	no	no	no	no	yes	yes
(10) Add a 2-way, or 1-way in/1-way out associated trunk group.	yes	yes	If Usage Required	As Required	yes	As Required	no	no	As Required	no	no	no	yes	yes	yes	yes	As Required	As Required	yes	yes
(11) Add a 2nd part (GB relay) to a group exclusive of trunk changes.	no	no	no	no	no	As Required	no	no	As Required	no	no	no	yes	no	yes	yes	As Required	As Required	no	no
(12) Change a trunk's incoming or outgoing trunk link frame assignment.	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no

TABLE B

SENDER RELATED DATA

SENDER RELATED CHANGE	PBC								SPC (ETS)											X
	SØGNAME	SLFHED	SDØPID	SGPERCG	SØGASSCN	SDRFRAMS			GRPIN1	GRPIN2	GP--KF	SLF- - -	SDRID	DCTAB	DCMAX	CØNTIN				NOTES
(1) ADD A SENDER TO A SENDER GROUP. (SENDER ALREADY EQUIPPED)	YES	NO	YES	NO	YES	NO			NO	NO	YES	NO	YES	YES	NO	NO				1
(2) ADD A SENDER LINK FRAME TO A CONTROLLER GROUP	NO	YES	NO	NO	NO	NO			NO	NO	NO	YES	NO	NO	NO	NO				1
(3) ADD A LINK CONTROLLER TO A CONTROLLER GROUP	NO	NO	NO	YES	NO	NO			NO	NO	NO	NO	NO	NO	NO	YES				1
(4) ADD A COMPLETE CONTROLLER GROUP AND SENDER GROUP	YES	YES	YES	YES	YES	YES			YES	YES	YES	YES	YES	YES	YES	YES				1

Note:

1. Also see miscellaneous PBC data for probable data changes.

TABLE C

MISCELLANEOUS PBC DATA

CHANGE	PBC																			X
	DATERMEQ	DTERMALT	REGIØN	NAMTB	CAMAIRL	CCEQPD	CCUSE	TDCREG												NOTES
ADD A DATA TERMINAL WITH OR WITHOUT A DATA SET	YES	YES	NO	NO	NO	NO	NO	NO												
CHANGE OFFICE STATUS TO OR FROM "REGIONAL"	NO	NO	YES	NO	NO	NO	NO	NO												
CHANGE OFFICE NAME (CLLI)	NO	NO	NO	YES	NO	NO	NO	NO												
ADD CAMA CAPABILITY TO OFFICE	NO	NO	NO	YES	YES	YES	YES	YES												
ADD COMMON CONTROL EQUIPMENT	NO	NO	NO	NO	AS REQD	YES	YES	YES												1, 2

Note:

1. For sender related growth, check also for changes in "sender related data".
2. Change ETS "CHINPT" data table when DCH circuits are added.

PBC Recent Change Messages

RC:CCUSE
RC:CØCØTB
RC:CØDEGP
RC:CØRE
RC:CTØC
RC:CTØD
RC:DISK
RC:DSKPG
RC:DTØC
RC:DTØD
RC:ITGDAT
RC:ITGXXX
RC:ITKTAB
RC:LITGI
RC:LTRI
RC:ØTGDAT
RC:ØTKTAB
RC:ØTSUB
RC:PPDATA
RC:RPTAB
RC:TGPX
RC:ØTGEQ
RC:ØWAUSE
RC:RCØRD
RC:SLFHED
RC:TBUSE
RC:TDCREG
RC:TGREF

Note: With the introduction of Integrated Recent Change, the only SPC recent change messages retained are the WRT-08 and WRT-09 messages. See Paragraph 1.07.

Fig. 1—PBC Integrated Recent Change Message

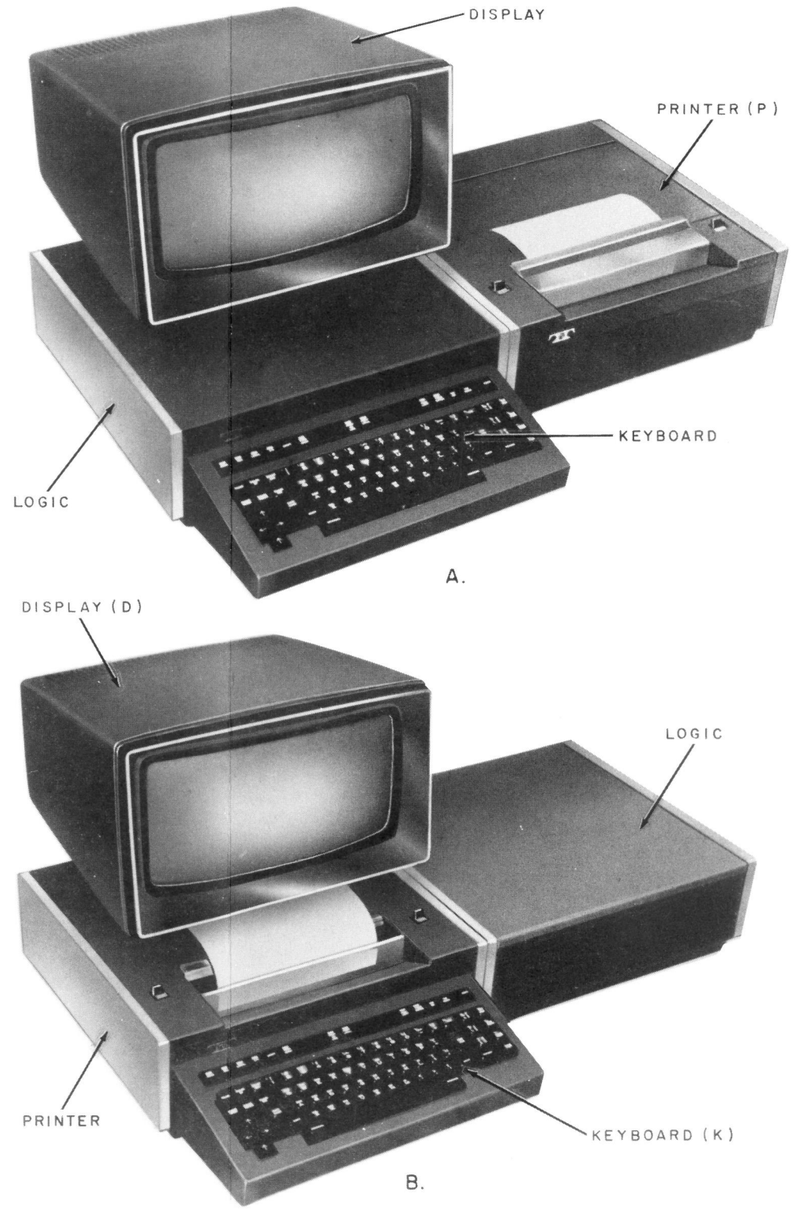


Fig. 2—DATASPEED 40® Terminal

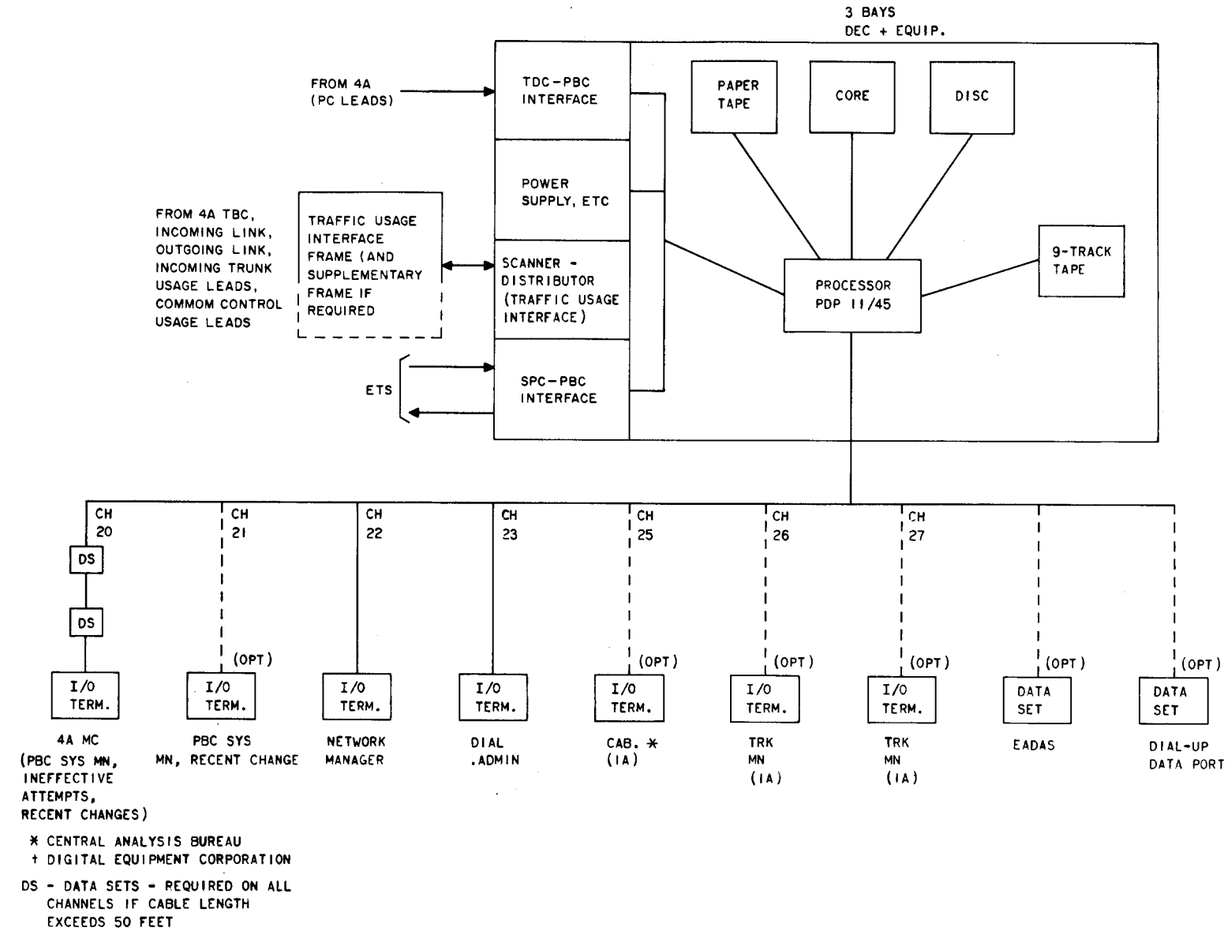


Fig. 3—PBC Minicomputer Block Diagram Showing I/O Channels

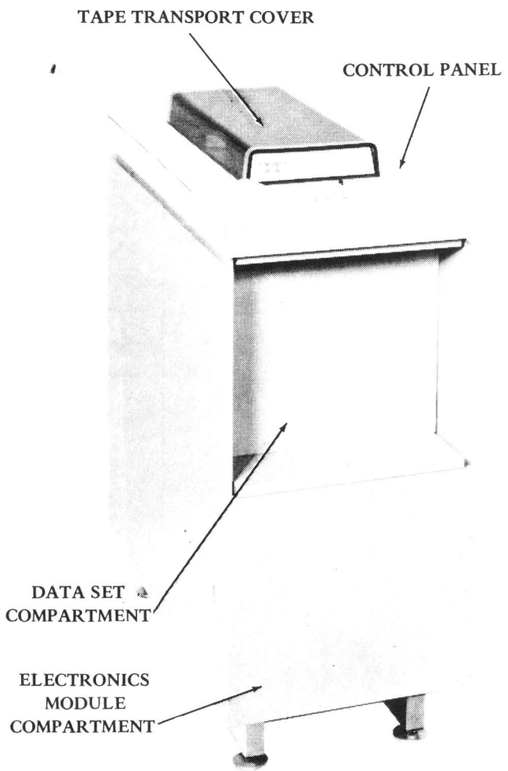


Fig. 4—Series 4200 DATASPEED® Magnetic Tape Terminal

PBC RESIDENT TRUNK RELATED DATA

OTGDATA

CLLI II CHARACTER TRUNK GROUP NAME				
SUFFIX	IDENT			
USG TYPE	TOTAL OUTG TERMINATIONS			
KEY FLG / ADM GR	IA TERM	SPARE	PCOFTL	
SPARE	ITGI/TRI/O	DND FLG		
SPARE	EQUIV 2-WAY INC TRUNKS			
SPARE	EQUIV 2-WAY OUT TRUNKS			
SPARE	TGI			
SPARE	DSCHDL			
SPARE	.OCCHTI	SPARE	ACHTI	
SPARE	ICCHTI	SPARE	PCOFTI	
OTPTGP	RN			

ITGDATA

CLLI II CHARACTER TRUNK GROUP NAME			
SUFFIX	IDENT		
SPARE	TOTAL TERMINATIONS		
• / ADM GR	IA TERM	INC USAGE REG	
TRI FLG / SPARE	TRI/O		
SPARE	EQUIV 2-WAY INC TRKS		
SPARE			
SPARE			
SPARE			
SPARE			
SPARE	ICCHTI	DSCHDL	
OTPTGP	RN		

LTRI

LARGEST ASSIGNED TRI	0

LITGI

LARGEST ASSIGNED ITGI	0

OTGEQI/T

SPARE	TRUNK GROUP - TRI
TRUNK CIRCUIT NUMBER	

ITGXXX

SPARE	TRUNK GROUP - ITGI
TRUNK CIRCUIT NUMBER	

OW-USE

INC USAGE REG	INC USAGE REG

TBUSE

IW	GROUP START	FOF	GROUP END
UASGN TERMS.	TRUNK GROUP - TRI		

TGIDENT

BLANK	BLANK	IST COMB. IST CHAR.
2ND COMB.	2ND CHAR.	2ND COMB. IST CHAR.
3RD - 13TH CHARACTER COMBINATIONS		
14TH COMB.	2ND CHAR.	14TH COMB. IST CHAR.

ANCMTBC

IT MKR=0 FRA AND NCA TBC						
0 0	FRA TBL	0	0 0	NCA TBC	0	
IT MKR 0-9 FORMAT (UNASSIGNED = 0 (100200) TC MKR 0-9 FORMAT						
	FRA TBC+30	0	0	NCA TBC+30	0	
TC MKR = 9 FRA AND NCA TBC						

ANCMTRI

D FLG	SPARE	UCA TRI	0
D FLG	SPARE	MCA TRI	0
SOA, ROA, NCA, VCA, EA1, EA2, LBA AND 3 SPARES LIST TRI ASSIGNMENTS IN SEQUENCE DFLG = 0 FPR ACTOVE EMTROES			
D FLG	SPARE	SPARE	0

TORCNAME

CLLI 12 CHARACTER TRUNK GROUP NAME - SUFFIX
IN REGIONAL OFFICES ONLY, THIS TABLE IS EQUIPPED TO IDENTIFY 12 TORC ROUTES.

TKEQPD

TRUNK TYPE EQUIPPED
TRUNK TYPE WORKING
TRUNK TYPE EQUIPPED
TRUNK TYPE WORKING
52-WORD TABLE LISTING QUANTITIES INSTALLED AND WORKING OF ALL POSSIBLE TRUNK TYPES

(1) OTGDATA (16,000 WORDS), PROVIDING 16 WORDS OF DATA PER OUTGOING TRUNK GROUP PART.
(2) ITGDATA (16,000 WORDS), PROVIDING 16 WORDS OF DATA PER INCOMING TRUNK GROUP.
(3) LTRI/LITGI 1-WORD ENTRIES DEFINING THE LARGEST ASSIGNED TRI AND ITGI. THE TRI AND THE ITGI LOCATE ENTRIES IN THE OTGDATA AND ITGDATA TABLES.
(4) OTGEQI/T (2) 24,000 WORD TABLES, CONTAINING A 2-WORD ENTRY FOR EACH OF 24,000 MAXIMUM OGTI TERMINATIONS.
(5) ITG--- 1 TABLE PER EQUIPPED SLF, PROVIDING A 2-WORD ENTRY PER SLF TERMINATION. (192 MAX.)
(6) OW-USE 3 TABLES, PROVIDING 2304 HALF-WORD ENTRIES EACH, TO ASSOCIATE INCOMING TRUNK OSAGE TERMINALS WITH TRUNK GRP ASSOCIATED ACCUMULATORS.
(7) TBUSE (6) 2-WORD ENTRIES PER TRUNK BLOCK FOR OUTGOING TRK GROUP USAGE MEASUREMENT.
(8) TGIDENT (1) 15-WORD TABLE, LISTING CHARACTER SETS TO IDENTIFY OUTGOING TRK GRPS.
(9) ANCMTBC (1) 20-WORD TABLE IDENTIFYING THE NCA AND FRA TBC DEDICATED TO EACH MARKER.
(10) ANCMTRI (1) 12-WORD TABLE, LISTING THE TRI COMPILED FOR EACH EQUIPPED ANNOUNCEMENT.
(11) TORCNAME SEE TABLE (144-WORDS)
(12) TKEQPD SEE TABLE

ETS RESIDENT TRUNK RELATED DATA

OTKTAB

GB	GB/PSC APPEARANCE		NO. OF CHNGS	RANK	SAT	•
TERMINATING NPA			• • •	LCT CDLC	MKR CLASS	
SPARE	VSK PART	NETC PART	REG PART	TRUNK GROUP TRI		
TRN	TBC	TB		GS	GE	
TRN	TBC	TB		GS	GE	
TRN	TBC	TB		GS	GE	
TRN	TBC	TB		GS	GE	

ITKTAB

TYPE	• •	TPC	• • • •	TSEP	SAT	AO	SCL

TGP

ITGI XXX	ITGI XXX

LTGIND

LARGEST ASSIGNED TGI

LTRIND

LARGEST ASSIGNED TRI

(1) OTKTAB AN ENTRY IS PROVIDED FOR EACH OUTGOING TRUNK GROUP PART, COMPRISED OF A 3-WORD HEADER + 1-WORD PER SUBTROUP. THIS IS A VARIABLE LENGTH, RELOCATABLE DATA TABLE WITH A MAXIMUM LENGTH OF 8,192 WORDS.
(2(A 1-WORD ENTRY IS PROVIDED PER INCOMING TRUNK GROUP. THE MAXIMUM LENGTH FOR THIS VARIABLE LENGTH, RELOCATABLE DATA TABLE IS 1024 WORDS.
(3) TGP- A 50-WORD TGP TABLE IS PROVIDED PER S.L.F. WITH A HALF WORD ENTRY DEDICATED TO EACH TERMINATION ON THE S.L.F.
(4) LTGIND/LTRIND (2) 1-WORD TABLES ARE PROVIDED TO INDICATE THE LARGEST ASSIGNED TGI AND TRI.

NOTE:
THE ITGI IS USED DIRECTLY AS AN INDEX TO THE ITKTAB TABLE; 16 X ITGI IS USED TO INDEX THE PBC ITGDATA TABLE. 16 X TRI IS USED TO INDEX THE PBC OTGDATA TABLE.

Fig. 5—Trunk Related Data

SENDER RELATED DATA (PBC AND ETS)

SDOPID (PBC)

SENDER TYPE, FRAME AND UNIT
1 ST ETS SENDER # 000 ↗
LAST ETS SENDER # 511 ↘
SENDER TYPE, FRAME AND UNIT

SDRFRAMS (PBC)

F	2	M	1
BLANK	4	BLANK	3
0	6	0	5
0	8	0	7
5	10	1	9

CONTAINS MAX OF 15 ENTRIES SIMILAR TO ONE SHOWN ABOVE FOR MF FRAME SPAN 000-015

SGPERCG (PBC)

F	M
BLANK	BLANK
A	–
BLANK	BLANK
BLANK	BLANK
BLANK	BLANK

NUMBER OF TRAFFIC UNITS EQUIPPED
NUMBER OF MAINTENANCE UNITS EQUIPPED
ZEROS
CONTAINS 9 WORD ENTRY PER CONTROLLER GROUP-CONTROLLER GROUP SHOWN ABOVE CONTAINS MF-A SENDER GRP

SOGASSCN (PBC)

ETS # 003			ETS # 000
ETS # 007			ETS # 004
CONTAINS A DEDICATED 4-BIT SLOT PER ETS SENDER, IDENTIFYING ASSOCIATED INCOMING SNDR GRP			
ETS # 507			ETS # 504
ETS # 511			ETS # 508

SOGNAME (PBC)

A	C
A	M
B	–

NUMBER OF TRAFFIC UNITS EQUIPPED
NUMBER OF MAINTENANCE UNITS EQUIPPED
ZEROS
CONTAINS G-WORD ENTRY FOR EACH OF 19 INC/OUTG SNDR GRP EQUIPPED CAMA-B GROUP ILLUSTRATED ABOVE

SLFHED (PBC)

ADDRESS OF A SLF--ITGEQP TABLE
ALLOWS FOR MAXIMUM OF 100 FRAMES EACH OF CAMA, OUS, DP; AND 192 FRAMES OF MF. THESE CANNOT ALL POSSIBLY BE EQUIPPED SIMULTANEOUSLY.

SDRGRPTY (PBC)

TYPE # FOR SENDER GRP 1	TYPE # FOR SENDER GRP 0
3	2
17	16
19	18

SDRID (ETS)

	SNDR FRAME AND UNIT
1ST ETS SENDER # 000	
LAST ETS SENDER # 479	
SNDR FRAME AND UNIT	

SLF-- (ETS)

ADDRESS OF A SLF-- TGP-TABLE
MISC INFORMATION
1 TABLE PER CONTROLLER GROUP WITH A MAXIMUM OF 31 2-WORD ENTRIES.

DCTAB (ETS)

DECODER CONNECTOR CHARACTERISTICS
DECODER CONNECTOR CHARACTERISTICS
1-WORD PER DEC CONNECTOR (100 MAXIMUM)

GP--KF (ETS)

STORE INDEX	STORE INDEX
LOCATES STORE TABLE LOCATION DEDICATED TO EACH SENDER IN A PARTICULAR GROUPING OF 40	
STORE INDEX	STORE INDEX

GRPINI (ETS)

CG # A	MISC INFO
CG # A	ADDRESS OF SLF--TABLE
CG # M	MISC INFO
CG # M	ADDRESS OF SLF--TABLE

GRPIN2 (ETS)

CONTROLLER GROUP-A GP--KF ADDRESS
INTERMEDIATE ADDRESSES
CONTROLLER GROUP-M GP--KF ADDRESS

DCMAX (ETS)

HIGHEST NUMBERED EQUIPPED D.C.

CONTIN (ETS)

PERIPHERAL SCANNER INFO-FOR A0
PSC INFORMATION FOR INTERMEDIATE CONTROLLERS
PERIPHERAL SCANNER INFO-FOR M3

(1) SDOPID/SDRID (512/256 WORDS) TABLES IDENTIFY ETS SENDER NUMBERS IN SENDER FRAME AND UNIT EQUIVALENTS.

(2) DCMAX (1 WORD) IDENTIFIES HIGHEST NUMBERED DECODER CONNECTOR EQUIPPED.

(3) SDRFRAMS (75 WORDS) CONTAINS 15 5-WORD ENTRIES, IDENTIFYING SENDER TYPE GROUPINGS OF 48 BY FRAME SPANS, FOR WHICH INEFFECTIVE ATTEMPTS WILL BE REPORTED.

(4) SGPERCG (108 WORDS) CONTAINS 12 9-WORD ENTRIES, IDENTIFYING MAXIMUM OF 2 SENDER GROUPS ASSOCIATED WITH EACH OF 12 CONTROLLER GROUPS AND ADDITIONAL INFO.

(5) SOGASSCN (128 WORDS) IDENTIFIES WHICH OF 15 MAXIMUM INCOMING SENDER GROUPS, EACH OF 512 MAXIMUM ETS SENDERS IS ASSOCIATED WITH.

(6) SOGNAME (114 WORDS) IDENTIFIES BY NAME EACH OF 15 INCOMING AND 4 OUTGOING SENDER GROUPS EQUIPPED (MAXIMUM) PER OFFICE AND ADDITIONAL INFO.

(7) SLFHED (492 WORDS) CONTAINS ADDRESSES, LOCATING THE ITGEQP TABLE FOR EVERY POSSIBLE EQUIPPED S.L.F.

(8) SLF-- 2-WORD ENTRY PER EQUIPPED SLF, LOCATING TGP TABLE PER SLF AND LOCATING SENDER GROUPING ARRANGEMENT.

(9) DCTAB 1-WORD PER EQUIPPED DECODER CONNECTOR CONTAINING CONNECTOR CHARACTERISTICS AND SCRATCH TABLE INDEXES.

(10) CONTIN 60-WORD TABLE, ASSOCIATING PSC TERMINALS WITH CONTROLLERS.

(11) GP--KF 20 WORDS PER SIMPLIFIED CONTROLLER GROUP (MORE IN OTHER CASES) TO ASSOCIATE SENDER SLF TERMINATIONS WITH A SCRATCH TABLE (STORE) INDEX.

(12) GRPIN1 2-WORD ENTRY PER CONTROLLER GROUP TO LOCATE PARTICULAR SLF--TABLE AND MISC INFORMATION.

(13) GRPIN2 1-WORD ENTRY PER CONTROLLER GROUP, LOCATING GROUPS GP--KF TABLE.

(14) SDRGRPTY (10 WORDS) 20 HALF WORD ENTRIES PER OFFICE DEFINE THE SEQUENCE AND SENDER TYPES IN THE OFFICE.

Fig. 6—Sender Related Data

MISCELLANEOUS PBC DATA

RGNFLG

REGIONAL OFFICE YES/NO

DATERMEQ

DATA TEPMINALS EQUIPPED
DATA SETS EQUIPPED

DTERMALT

DT# 21 ALTERNATE	DT# 20 ALTERNATE
DT# 23 ALTERNATE	DT# 22 ALTERNATE
DT# 25 ALTERNATE	DT# 24 ALTERNATE
DT# 27 ALTERNATE	DT# 26 ALTERNATE

NAMTB

OWN OFFICE MANE 11 CHARACTER CLLI	
CAMA EQUIPPED	

CAMAIRL

IRL# 01	IRL# 00
15-WORD TABLE, INDICATING CAMA, NON-CAMA, OR UNEQUIPPED FOR EACH OF A MAXIMUM OF 30 IRL'S	
IRL# 29	IRL# 28

CCEQPD

INDICATES FOR EACH TYPE OF COMMON CONTROL EQUI PMENT THE QUANTITY EQUIPPED FOR TRAFFIC AND FOR MAINTENANCE, AND THE ENGINEERED CCS CAPACITY FOR EACH.

CCUSE

ASSOCIATE A MAXIMUM OF 410 PBC REGISTERS WITH A MAXIMUM OF 2304 USAGC SCANNER INPUTS. TOTAL AND MAINTENANCE USAGE, VIA A 10 SECOND SCAN, IS MEASURED ON MARKERS, DECODER CHANNELS, CONTROLLERS, IN AND OUT SENDER GROUPS, IRL FRAMES, TRANSVERTERS, AND PRETRANSLATORS. TOTAL USAGE IS MEASURED ON RECORDERS, CAMA POSITIONS AND DRE. A TOTAL OF 32 REGISTERS ARE RESERVED FOR MISCELLANEOUS CUSTOMIZED TELCO REQUIREMENTS. THIS DATA IS INITIALLY COMPILED DIRECTLY FROM WECO FORM CODE INPUT.

TDCREG

ASSOCIATES A MAXIMUM OF 1024 PBC REGISTERS WI TH A MAXIMUM OF 1024 TDC INPUT TERMINALS. MEASUREMENTS ARE TAKEN, AS REQUIRED FOR SADR; DRE; IN, OUT AND OVS SENDER IA CATEGORIES BY FRAME-TYPE GROUPINGS; IRL PC AND IA; PC FOR OUTGOING SENDER AND CONTROLLERS; MARKER, DCH AND LINK CONTROLLER TROUBLE RECORDS; IRL TROUBLE RECORDS, PC AND TROUBLE RECORDS FOR ALL CAMA EQUIPMENT. 76 PBC REGISTERS AND TDC INPUT TERMINALS ARE RESERVED FOR MISC CUSTOMIZED TELCO REQUIREMENTS. DATA IS INITIALLY COMPILED FROM WECO FORM CODE INPUT.

CAMAITK

9 WORD TABLE INDICATING SPANS OF T.U.I. AND S.T.U.I. INPUTS ASSOCIATED WITH CAMA AND NON-CAMA TRUNKS

CORESZ

PBC CORE QUANTITY EQUIPPED

FOFTAB

OFFICE NUMER	CBA SPAN SIZE

RNTRI

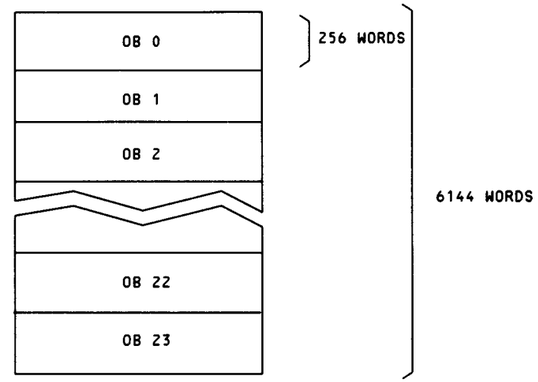
ASSOCIATES A MAXIMUM OF 1024 ROUTE NUMBER (RN) WITH TRI/ITGI

TDCEQP

HIGHEST TDC INPUT TERMINAL ASSIGNMENT

(1) RGNFLG SELF EXPLANATORY (1 WORD)
(2) DATERMEQ (2-WORDS), INDICATES WHICH OF 7 POSSIBLE DATA TERMINALS HAVE BEEN EQUIPPED AND WHICH ARE ASSOCIATED WITH DATA SETS.
(3) DTERMALT A (4 WORD TABLE) PREDEFINED (BTL) ALTERNATE IS SPECIFIED FOR EACH EQUIPPED DATA TERMINAL, DEPENDENT ON THE COMBINATION EQUIPPED.
(4) NAMTB A (6 WORD TABLE) INDICATES THE OFFICE CLLI AND WHETHER OR NOT CAMA IS EQUIPPED.
(5) CAMAIRL A (15 WORD TABLE) INDICATES WHICH OF A MAXIMUM OF 30 IRL'S ARE EQUIPPED AND WHAT TYPE THEY ARE.
(6) CCEQPD SELF EXPLANATORY. DATA MUST BE UPDATED WITH OFFICE ADDITIONS.
(7) CCUSE FOUR BASIC TYPES OF USAGE ARE MEASURED IN AN OFFICE: INCOMING USAGE BY TRUNK GROUP, OUTGOING AND 2-WAY USAGE BY OUTGOING TRUNK GROUP, IN AND OUT LINK FRAME SAMPLE AND COMMON CONTROL. THE 1ST 2 TYPES ARE DESCRIBED IN THE TRUNK RELATED DATA, THE LINK FRAME USAGE IS STANDARD IN ALL OFFICES, AND ALL OTHER USAGE IS MEASURED VIA THIS TABLE AND ASSOCIATED CABLING.
(8) TDCREG ALL NON-USAGE TYPE COUNTS, FORMERLY MEASURED ON ELECTROMECHANICAL REGISTERS, AND NOT AVAILABLE DIRECTLY TO THE ETS ARE MEASURED VIA THIS DATA TABLE AND IT'S ASSOCIATED CABLING.
(9) CAMITK SELF EXPLANATORY
(10) CORESZ (1 WORD) INDICATES THE AMOUNT OF CORE TYPE MEMORY EQUIPPED FOR THE PBC.
(11) FOFTAB (1 WORD) INDICATES THE CALL BUSY ANNOUNCEMENT (CBA) SPAN, WIRED IN THE MARKERS. THE CBA CIRCUIT IS USED IN FOLLOW WITH OVER FLOW ROUTING (FOF).
(12) RNTRI (1024 WORDS) SELF EXPLANATORY
(13) TDCEQP (1 WORD) IDENTIFY THE HIGHEST TDC CIRCUIT PACK EQUIPPED WHICH CONTAINS AN ASSIGNED TDC INPUT TERMINAL.

Fig. 7—Miscellaneous PBC Data



NOTE:
EACH ORDER USES A MINIMUM OF 1 ORDER BUFFER.
THE MAXIMUM NUMBER OF ORDERS STORED FOR
FUTURE ACTIVATION IS 24.

Fig. 8—PBC Order Buffer

RECENT CHANGE ORDER FOR _____ OFFICE

ORDER TYPE _____	ORDER NO. _____
TYPE FORM CODES ATTACHED _____	REPLACES ORDER NO. _____
DUE DATE _____	COORDINATE WITH ORDER NOS. _____
REPLACED BY ORDER NO. _____	PAGE___OF___

DESCRIPTION OF CHANGE:

TELETYPE CODE MESSAGE

ETS BASIC RECORDS		BY	DATE
QUESTIONNAIRE FORM	ROUTING		
CODE COMPLETED	ASSIGNMENT		
COMPILER LIST UP DATED			
QUEST. FORM CODE FILED			

RECENT CHANGE ORDER	BY	DATE
TELETYPE CODING		
INPUT TAPE CUT		
LOADED AND TESTED		
ACTIVATED		

Fig. 9—Sample Change Message Transmittal Form