

SWITCHING SYSTEMS MANAGEMENT
NO. 4A/4M CROSSBAR TANDEM
TRAFFIC MEASUREMENTS - DIAL ADMINISTRATION

CONTENTS	PAGE
1. GENERAL	1
2. PERIPHERAL BUS COMPUTER COMPONENTS	1
3. DATA TABLES	2
4. DATA AVAILABILITY AND SCHEDULING	3
5. DATA SCHEDULES	3
6. THRESHOLD VALUES	4
7. DESCRIPTION OF DATA REPORTS . . .	6
8. AUTOMATIC OUTPUT	6
9. EXCEPTION REPORTS	10
10. SCHEDULED REPORTS	12
11. DEMAND REPORTS	16
12. SCORING OF PEG COUNTS	17
13. UPDATE AND INPUT PROCEDURES . .	17

1. GENERAL

1.01 One of the major responsibilities of a dial administrator is the timely scheduling, collecting and validating of office data. This is done primarily to:

- (a) Ensure the proper functioning of all components of the switching system and its associated network

- (b) Balance the traffic load on the various switching system components
- (c) Ensure that a proper level and quality of service is maintained
- (d) Provide statistical data for machine and trunking growth.

1.02 Numerous devices have been employed for this purpose, the most sophisticated of them being the peripheral bus computer (PBC). The main purposes for the development of the PBC were to:

- (a) Provide near-real-time performance data on the switching system
- (b) Eliminate the high cost of engineering, installing, and maintaining the electromechanical collection devices
- (c) Eliminate the high cost for manual clerical effort to collect, tabulate, and analyze administrative data.

1.03 The purpose of these instructions is to define the dial administrative functions and procedures relating to an office equipped with a PBC.

2. PERIPHERAL BUS COMPUTER COMPONENTS

2.01 The hardware of the PBC System is built around a PDP 11/45 computer and peripheral manufactured by Digital Equipment Corporation (DEC) and is contained in three DEC cabinets. It is ordered as part of a 4-cabinet unit from the Western Electric Company. The Western Electric cabinet comes equipped with the required interface units of Bell Laboratories' design to be integrated

This material is prepared for Bell System purposes and is for the use of Bell System employees only. Its distribution is in no sense a publication. Neither the material nor any portion thereof is to be reproduced in any form by others without the written permission of the American Telephone and Telegraph Company.

SECTION 13e(4)

with the Electronic Translation System (ETS) and 4A equipment. In addition to the four cabinets, a traffic usage interface (TUI) frame is also required to obtain usage measurements of incoming and outgoing trunk circuits, in and out link frames, and common control equipment.

2.02 ETS makes use of a Stored Program Control (SPC) System which has both protected and unprotected memory areas that are derived by wiring techniques. However, the PBC System allows for complete memory intermixing with the software design responsible for protecting required data.

2.03 It is estimated that the PBC may average a half-dozen outages a year, ranging from a few hours to a day or two. However, it should be noted that in no way will this affect the call processing of the SPC. Only register data will be aborted or lost and will affect the associated reports. The largest areas of concern are ineffective machine attempts data and "reorder trap" information.

2.04 The PBC System receives or collects data from the ETS and the No. 4 System via three interface units. Figure 1 shows details on cabling sources of data and related form codes.

(a) The AC bus repeater and bus-to-bus access circuits are the interface between the SPC and the PBC over which per-call peg count and ineffective attempt data are sent from the SPC. A complete listing with PBC register number is shown in Figure 2.

(b) A traffic data converter (TDC) access circuit and the TDC collect peg count data not available to the ETS (see Fig. 2).

(c) The scan/distributor circuits and TUI frame provide equipment usage measurements on common control, incoming and outgoing link frames, and incoming and outgoing trunk groups. A complete listing with terminal numbers is shown in Figure 3.

2.05 Communications with the PBC processor is effected via DATASPEED 40[®] terminals. Up to seven of these devices can be utilized for input/output purposes. Three are required for the standard installation with the remaining four as optional equipment. (See Figure 4 for block diagram.) The model KDP40 terminals used by

PBC are cathode ray tube (CRT), keyboard, high-speed impact line printers. Messages are inputted a complete line at a time.

2.06 The PBC System requires its own generic program (PG 68500) and its own data base which must be compiled jointly with the ETS data base. This is accomplished by completing ETS questionnaire form codes which are then submitted to Western Electric Company. Every 4A/ETS equipped with PBC will require two program tapes, two data tapes, and two data compiler listings. One set is for the ETS and one is for the PBC.

2.07 The dial administrator should be aware of the following engineering considerations.

(a) Offices converting from card translator to ETS operation should complete the conversion prior to implementing PBC.

(b) The PBC System (PDP 11/45 and interface units) must be located within 300 cable feet of the SPC processor.

(c) Data sets will be required on any data terminals which will be located more than 50 cable feet from the PDP 11/45.

3. DATA TABLES

3.01 The PBC System does not use variable length Western Electric compiled data tables. All data tables are of fixed length and are provided on a one-per-office basis with the exception of one table. That table, ITGXXX (incoming trunk group equipment), is variable depending on the number of sender link frames equipped at a given location. A block of memory has been reserved for a maximum of 192 ITGXXX tables per office.

3.02 Complete details of all data tables are covered in Bell Laboratories Program Description (PD) 68502 and it is recommended that a current copy be readily available to the dial administrator at all times.

3.03 Figure 5 shows the data table name and form code from which the data is compiled and the number of data words required in memory.

4. DATA AVAILABILITY AND SCHEDULING

4.01 Data outputs in the PBC System are selectively channeled to separate DATASPEED 40 terminals or channels. Figure 6 shows the channel number and the descriptive title for each teletypewriter.

4.02 It is realized that in many locations one individual will function as both the dial administrator and the network manager. However, PBC data outputs have been assigned so that network management data will be received on channel 22 and dial administration data will be received on channel 23. Only channel 23 outputs will be described in detail in this section. Network management data is covered in Section 13e(3).

4.03 Data outputs can be broadly classified into four major categories.

- (a) Automatic outputs—printed as programmed in the generic program. Not subject to scheduling by the user except for the setting of system time.
- (b) Exception data output—reports printed when thresholds set by the user are exceeded.
- (c) Scheduled outputs—reports printed as scheduled by the respective user.
- (d) Demand outputs—reports which may be demanded even though available by one of the other methods.

The dial administrator has designated outputs in each of the above categories as do the network manager and plant personnel. A summary of dial administration data available on channel 23 is shown in Figure 7.

5. DATA SCHEDULES

5.01 To initially enable an office to print out requested data, the steps given in 5.02 are required.

5.02 Schedule Listing (SKED, SCHEP):

- (a) This schedule allows the dial administrator to select half-hour time slots on a dual schedule for any or all of seven of the eight data reports available on a scheduled basis.

(b) Each scheduled report will contain one hour of data beginning on the hour or half-hour so designated.

(c) The dual schedule called "odd" and "even" allows for reduced collection schedules on a weekend versus the normal business day.

(d) Seven data reports available on a scheduled basis are:

(1) ***DTKOT (Outgoing Trunk Group Report):***
Outgoing trunk group data (PC, OFL, and CCS) organized by administrative grouping as assigned by the dial administrator on form code 04B.

(2) ***DIMAH (Ineffective Machine Attempts Hourly Report):*** Ineffective machine attempt data plus other related items.

(3) ***DTSEP (Traffic Separations Report):***
An 8 by 8 matrix showing the number of calls completed by incoming and outgoing traffic separation class marks plus the percentage of total calls by each category. Class marks are assigned by the dial administrator on form codes 01B and 05.

(4) ***DTBPC (Trunk Block Connector Peg Count Report):*** Individual TBC peg count information by connector.

(5) ***DMLSS (Machine Load Service Summary):***
Engineering and load data on all common control components.

(6) ***DOWIN (Incoming Trunk Group Usage):***
Incoming usage (CCS) on up to 249 trunk groups as assigned by the dial administrator on form codes 01B.

(7) ***DTELM (TELCO Miscellaneous Registers):***
Data for items assigned by the dial administrator to 80 peg count registers and 32 usage registers. More details on these will be found in "Types of Reports".

(e) "Week Schedule" shows Sunday through Saturday with one of the following indicators beside each day.

E = Collect using *even* schedule

SECTION 13e(4)

O = Collect using *odd* schedule

N = No collection requested.

It should be noted that only E (even) or O (odd) can be in effect at one time for all reports for any one day.

(f) "Admin Grps Selected" relates to the administrative groupings assigned by the dial administrator for the outgoing trunk group report. The "position" column determines the printout order for the given administrative grouping number shown under "value". An example of the use of this feature is:

Position	Value
0	0
1	4
2	2
3	1
4	5
5	N
6	N
7	N

If assigned in this manner, when the outgoing trunk group report starts to print:

- Position 0 (first part of report) will show all trunk groups assigned to administrative group *0*.
- Position 1 (second part of report) will show all trunk groups assigned to administrative group *4*.
- Position 2 (third part of report) will show all trunk groups assigned to administrative group *2*.

Those shown with a value of *N* mean "no additional groups."

(g) "Month Schedule" shows five important items relating to the entire schedule listing:

- (1) Days of the month for the schedule to be effective. Shows 01 to 31.
- (2) Odd and even month. Allows for current and future month scheduling.

Jan	Month 1	Odd	Feb	Month 2	Even
March	Month 3	Odd	April	Month 4	Even
May	Month 5	Odd	June	Month 6	Even
July	Month 7	Odd	Aug	Month 8	Even
Sept	Month 9	Odd	Oct	Month 10	Even
Nov	Month 11	Odd	Dec	Month 12	Even

Therefore, if a month ended on a Saturday or Sunday, proper scheduling would allow data reports to be programmed in advance.

(3) Busy hour must be shown according to local practices to indicate the end of the busy hour. Other automatic reports are dependent upon this time being shown.

(4) **Start Report Day:** Normal start time is 0000 or 12:00 midnight. However, due to local operating company practices this figure will shift depending on location and time of year. Only two reports are affected by this item: traffic separation and ineffective machine attempt.

(5) **Start Report Month:** This figure is used for those reports that accumulate a total month's data.

6. THRESHOLD VALUES

6.01 Dial Administration Threshold Values (SKED, DATPT):

(a) This schedule, shown in Figure 8, allows the dial administrator to set thresholds for trunk groups and ineffective machine attempt (IMA) components. If selected properly, the dial administrator will be alerted to trouble conditions as they occur as well as directed to the proper data report for more thorough analysis.

(b) **Trunk Group Thresholds:** This category is divided into eight classes corresponding to administrative groupings assigned on form code 04B. Opposite each class is entered a percentage of overflow figure from 0 to 101. In this manner, selective groupings can be programmed to print on an exception basis when they exceed a given percentage of overflow. For example:

- (1) Threshold value of 0 percent will make all trunk groups in that administrative grouping print every hour.
- (2) Threshold value of 1 percent to 100 percent will make all trunk groups in that administrative grouping which equal or exceed the percentage of overflow to print on an hourly basis.
- (3) Threshold value of 101 percent will prevent any trunk group in that administrative grouping from printing an exception report.

(c) **IMA Thresholds:** There are 39 separate categories to which whole or fractional parts of a percent are to be assigned for activating an IMA exception report. These exceptions will be printed on a 15-minute basis, alerting the dial administrator of equipment malfunctions or service degradation. Affected items will show an asterisk for that particular item on the hourly IMA printout for ease of identification.

(d) The 39 categories are as follows:

Type	Designation
TIN	Total ineffective attempts
ROA	Reorder - total
PST	Permanent signals total
PDT	Partial digits total
PER	Pulsing error
PMD	Mutilated digits
FAT	Final attempt trouble recording
ML2	Matching loss 2nd trial
M2F	Marker 2nd trial failure

D2F	Decoder channel 2nd trial failure
T2F	Transverter 2nd trial failure
CAO	CAMA other
MSC	Miscellaneous
SOA	Sender overload connc
FRM	FRA minus annc overflow
TNC	Total NCA + EA1 + EA2
AFR	Announcement overflow to FRA
FRO	FRA overflow
VCA	Vacant code announcement
IFA	IT FST/ATB
ICF	IT CFST
I1L	Matching loss first trial - IT
TFA	TC - FST/ATB
TCF	TC - CFST
T1L	Matching loss first trial - TC
UCA	Unauthorized CAMA
MCA	Misrouted CAMA
MCH	Match check
WCC	Wrong calling code
PDC	Position disconnect
NPA	No position available or attached
CPS	Permanent signals - CAMA
CPD	Partial digits - CAMA
SMF	Sender delay - multifrequency
SDP	Sender delay - dial pulse
SCA	Sender delay - CAMA

SECTION 13e(4)

SOV Sender delay - overseas
SOR Sender delay - out revertive
SOD Sender delay - out dial pulse

6.02 Procedures for altering these thresholds will be covered in Part 13, "Update and Input Procedures".

7. DESCRIPTION OF DATA REPORTS

7.01 Data reports can be broadly placed into four major categories: automatic, exception, scheduled, and demand. All traffic-related data is accessible through scheduled reports for selected hours and days of the week. During periods when no report is scheduled, the dial administrator will be alerted to impending service problems by means of exception reports. The usefulness of exception reports depends upon planning and implementation of threshold values on key indicators.

(a) It is expected that the dial administrator will normally schedule data around busy hour periods. However, the capability to demand an hour's data is available on a rolling 24-hour basis. This feature is of value should an exception report be printed when there was no schedule report output. A demand report can be initiated to give the dial administrator a total picture on service conditions.

7.02 Several data items, not related to trouble conditions, are necessary to the dial administrator on a continuing basis. These items have been arranged to have automatic printout capabilities.

7.03 All data reports will have similar general heading information.

(a) The first line will give the report name in computer language. For example:

REPT:DIMAD

REPT = Report

DIMAD = *D*ial *A*dministration *I*neffective
*M*achine *A*ttempts *D*aily

It should be noted that not all report names will be as easily identified.

(b) The second line will give the English-language name of the report. The title "Dial Administration" will not be printed.

(c) The third line will show the office name in common language location identification (CLLI) format as provided for in the ETS questionnaire, form code 22. The date and time will also be shown.

(d) The remaining lines are formatted for each individual report. It should be noted that any invalid figures will be shown as dollar signs (\$). An invalid figure can be a negative quantity or a number which exceeds the given field range.

8. AUTOMATIC OUTPUT

8.01 *Marker Peg Counts 3OREPT, MKRPC, OOREPT, MKRPC:*

(a) Every half hour the marker peg count will be printed to show the count by train and total for the preceeding clock hour. Figure 9 shows examples of a typical printout. This data will be useful to the dial administrator in determining the machine busy hours and carried load. It will also act as a guide to when scheduled printouts would be desirable.

8.02 *Traffic Separations 3OREPT, DTSEP, OOREPT, DTSEP:*

(a) The dial administrator will be required to specify on the schedule listing (covered in 5.02) the time of day that this report is to be printed. This report will then be automatically printed once every 24 hours and show a complete 24-hour accumulation of traffic separation (TSEP) data.

(b) Data for this report is generated by the assignment of incoming and outgoing traffic separation class marks. This procedure is covered in Section 13c(3).

(c) In addition to providing Division of Revenue information, this data will be useful to the dial administrator and network manager in determining the calling patterns through the machine, where calls are coming from, and where calls are going.

(d) The traffic separations printout will reflect completed calls minus announcement-routed traffic and will be printed on an 8 by 8 matrix. Traffic separations are scored on initial route intended for all calls not falling into the following categories:

- (1) Second trial
- (2) Sender retrieval
- (3) Test calls
- (4) ROA, SOA, VCA, UCA, MCA.

However, it should be noted that calls routed to NCA, EA1 or EA2 will score TSEP based on the initial routing pattern. In reality, there are seven incoming classes (one through seven) and seven outgoing classes (A through G) but an "N" (not assigned) has been included for both incoming and outgoing giving a total of 8 times 8 or 64 possible separations. Scorings in the N category should be resolved if they are appreciable since calls cannot be classified for Division of Revenue purposes unless identified.

(e) This report (24-hour), although automatic, may also be selected on a scheduled basis on the schedule listing. The data printed will reflect one clock hour and will not distort the 24-hour data. This data will prove helpful to both dial administration and network management during busy hours and peak days. Up to 48 of these reports could be requested in a given 24-hour period.

8.03 Ineffective Machine Attempt Report (REPT, DIMAD):

(a) This report will be automatically printed once every 24 hours based on the time specified to start report day in the schedule listing. It will show a complete 24-hour accumulation of ineffective machine attempt data and other related peg counts. The various categories of the ineffective machine attempt report will be described as well as the computations involved.

(b) Marker Peg Count, Trunk Link Frame Peg Count, and Trunk Link Frame Usage:

These counts show individual train total plus total office counts. In trunk link frame (ITLF)

peg count (PC) is used as the base figure for most calculations.

(c) **Sender Delay Information:** Six types of sender groupings can be recorded for an office. Total SADR attempts by group are shown under "Base"; total delays by group are shown under "Delay" and the percentage of delay by group is shown under "% Delay".

(d) **Total Ineffective:** This figure (PC) will reflect an arithmetic addition of the four components—ROA, SOA, FRA minus announcement overflow, and NCA + EA1 + EA2. The percentage in effect for the period is the total ineffective PC divided by the ITLF PC for the same period and multiplied by 100. The result is shown under "% ITLF".

(e) **ROA (Reorder Announcement):** A total reorder peg count is shown plus the percentage of this component related to ITLF PC. Under ROA DETAIL are 11 separate components which, when added together, should equal ROA PC.

- PERM SIGNAL—Permanent signals as recorded for all incoming sender types except OVS.
- PART DIGITS—Partial digits as recorded for all incoming sender types except OVS.
- PULS ERROR—Pulsing errors as recorded for all incoming sender types except OVS.
- MUT DIGIT—Mutilated digits as recorded for all incoming sender types except OVS.
- FATR—Final attempt trouble recordings as recorded for all incoming sender types except OVS.
- MATCH LOSS 2nd TRL—Second trial matching loss or ITLF overflow. No channel available after two attempts.
- MKR 2nd TRL FAIL—Second trial marker failures which result in ROA routing.
- DCH 2nd TRL FAIL—Second trial decoder channel failures which result in ROA routing.
- TRNSV 2nd TRL FAIL—Second trial transverter failures which result in ROA routing.

SECTION 13e(4)

- **CAMA OTHER**—Total number of match check, wrong calling code, position disconnect, and no position available. See ONI TRNSV for individual details.
 - **MISCELLANEOUS**—All other ineffective attempts not covered by the previous categories.
- (f) **SOA (Sender Overload Announcement):**
A total SOA PC is shown plus the percentage of this component related to ITLF PC. Scoring in this category occurs when a call using a sender in an incoming sender group which is in short sender timing (all senders busy) is unable to secure a sender at a distant office.
- (g) **FRA MINUS ANN OFL (Final Reorder Announcement):** The total FRA PC minus announcement overflow is shown plus the percentage of this component related to ITLF PC. Scores of this register indicate overflows on test calls or special applications. FRO routing is not to be used on final message trunk groups.
- (h) **FRA TOTAL PC (Final Reorder Announcement):** The total FRA PC is shown plus the percentage of this component related to ITLF PC. This figure shows the total of all announcement, test call, and special application overflows.
- (i) **ANN OFL TO FRA (Announcement Overflow):** The total overflow of all announcement trunks is shown plus the percentage of this component related to ITLF PC.
- (j) **FRA OFL (Final Reorder Announcement Overflow):** All calls directed to FRA and finding all trunks busy score this register. The total is shown and the percentage of this component related to ITLF PC. Scorings of this register indicate that the call was left high and dry - no termination.
- (k) **NCA + EA1 + EA2 (No Circuit Announcement Plus Emergency Announcements 1 and 2):** The total number of calls directed to each of the three groups is shown plus the percentage of each component related to ITLF PC. For analysis purposes, four other areas of this report should be examined.

(1) **No Circuit Breakdown** - This shows the individual scorings for NCA, EA1, and EA2.

(2) **NCA-NM (No Circuit Announcement Due to Network Management Activity)**—This is the number of calls routed to NCA because of controls implemented by the network management forces. This also includes cancel—follow with second trial (CFST) when activated by dynamic overload control (DOC) controls.

(3) **Outgoing IT PC** - This shows the number of calls destined for an outgoing intertoll trunk. This is the sum of the through peg count (TPC) types designated **outgoing** and **through**.

Note: This **does not** relate to the intertoll train. Listed below is a total of no circuit intertoll (NCIT) scorings showing the total plus those caused by network management controls.

(4) **Outgoing TC PC** - This shows the number of calls destined for an outgoing toll completing trunk. This is the sum of TPC types designated **incoming** and **nonthrough**.

Note: This **does not** relate to the toll completing train. Listed below this category is the total of no circuit toll completing (NCTC) scorings showing the total plus those caused by network management controls.

In items (3) and (4) above, the total of outgoing IT PC and outgoing TC PC will not necessarily equal the marker or trunk link frame (TLF) PC due to announcement routings and test calls. Percentages shown for NCIT and NCTC are derived from the outgoing IT or TC PC, respectively, and not on the total ITLF PC.

(l) **Sender Retrials:** The total number of sender retrials is shown plus the percentage of this component related to ITLF PC. Five separate categories are available for analysis purposes.

(1) **Integrity CHK Fail** - Integrity check failures or calls encountering open signaling leads.

- (2) No Sender Ahead - No sender attached at distant end on the first trial.
- (3) Unexpected Stop - Unexpected stop received while outpulsing on first trial.
- (4) Dial Pulse Delay - Start dial signal delayed on first trial.
- (5) Miscellaneous - All other trouble conditions causing sender retrial on first trial.

If the same or different condition is encountered on the retrial call, an FATR registration will result.

(m) **VCA (Vacant Code Announcement):** The total number of calls directed to vacant code is shown plus the percentage of this component related to ITLF PC. For analysis purposes, the item under "INWATS Not Routed" is added to total VCA. This item is not counted as an ineffective attempt for reporting purposes.

(n) **Line Busy:** This is an announcement trunk group to be used at locations where a 60-ipm signal is desired. Overflow of INWATS and PBX customer lines served directly from the 4A machine route to the 60-ipm tone. The total of such routings will be shown plus the percentage of this component related to ITLF PC. However, it should be noted that these scorings are not counted as an ineffective attempt for report purposes.

(o) **INWATS Total:** This listing will show the total number of INWATS calls handled and breakdowns as follows:

Originating — All 800-type calls

Through — All 08X-type calls

Terminating — All 1NX-type calls

Terminating will be further subdivided to show "routed" and "not-routed". As mentioned previously, calls not routed are sent to VCA. However, it should be known that only those terminating calls which exceed the zonal option will be scored as not-routed. Any terminating call with an invalid "tens block" will score the terminating but will not show as not-routed. These calls will be handled as a regular vacant

code. All categories of INWATS will show a percentage figure based on the INWATS total.

(p) **Marker IT PC:** The intertoll marker peg count will be shown and listed below are four categories to be used for analysis purposes.

(1) FST-ATB IT—Number of times an all-trunks-busy condition was encountered and the marker had follow-with-second-trial routing instructions. If this figure is large, it may indicate a falsely grounded GB lead.

(2) CFST-IT—Number of calls routed to NCA by intertoll markers because cancel—follow with-second-trial was activated manually or by dynamic overload controls in the network management center. These are included under NCA-NM.

(3) ML 1TR IT—Number of calls for which the intertoll markers are unable to find an idle A, B, and C link on a first trial.

(4) ML 2TR IT—Number of calls for which the intertoll markers are unable to find an idle A, B, and C link on a second trial. These scorings will be reflected under "ROA Detail as Match Loss 2nd Trl".

Percentage figures relate to total marker PC for the train.

(q) **Marker TC PC:** This item is the same as shown for the IT markers but relates to TC markers only.

(r) **TPC Total (Through Peg Count):** This figure shows the total number of calls using intertoll-type trunks. For analysis purposes it is divided into four categories.

(1) Through—TPC class mark was indicated on both form code 01B for the incoming trunk and on form code 05 for the outgoing trunk. Both trunks were intertoll-type.

(2) Incoming—TPC class mark was indicated on form code 01B for the incoming intertoll trunk but not on the form code 05 for the outgoing trunk.

(3) Outgoing—TPC class mark was not indicated on form code 01B for the incoming trunk

SECTION 13e(4)

but was indicated on form code 05 for the outgoing intertoll trunk.

(4) Nonthrough—TPC class mark was not indicated on either the incoming or outgoing trunk (local call).

For comparison purposes:

TPC Through + TPC Outgoing = Outgoing IT PC

TPC Incoming + TPC Nonthrough = Outgoing TC PC

(s) **CAMA SDR (for non-CAMA equipped offices, none of this information will be shown):** This figure shows the total number of CAMA sender PCs. Listed below is the CAMA announcement data.

UCA PC — Unauthorized CAMA announcement

UCA OFL — Overflow of UCA announcement group

MCA PC — Misrouted CAMA announcement

MCA OFL — Overflow of MCA announcement group.

Percentage figures shown are based on total CAMA sender PC.

(t) **ONI TRNSV:** This figure shows the total number of operator number identifications performed. Listed below are four trouble categories.

(1) MATCH CHECK—Number of times the CAMA customer gives the operator the called number instead of the calling number for billing purposes.

(2) WRG CLL CODE—Number of times the wrong calling code is given by the customer. The NNX code given is either nonexistent or not in the recorder group.

(3) POS DISC—Number of times the CAMA operator depresses the disconnect key to clear the operator position.

(4) No POS AVAIL—Number of calls failing to attach to the CAMA operator position.

All of the above conditions route to ROA and are reflected as "CAMA Other" under "ROA Detail". Percentages shown are based on total ONI transverter PC.

(u) **CAMA DP:** This shows the total number of calls using dial pulse registers to originate a CAMA call. Listed below are four indicators for analysis and troubleshooting.

(1) SERV CODE—Number of service code seizures handled.

(2) PERM SIGNAL—Number of steady seizures detected by dial pulse register.

(3) PART DIGITS—Number of calls with insufficient digits detected by dial pulse registers.

(4) IRL TR—Number of calls failing to connect to a dial pulse register.

Percentages shown will be based on total dial pulse register PCs.

(v) In addition to the 24-hour automatic report, the following IMA reports are also automatic:

- ABD—previous month total
- ABD—current month total
- Busy hour—previous month total
- Busy hour, current month, accumulative

9. EXCEPTION REPORTS

9.01 Ineffective Machine Attempts (REPT, IMHEX): Ineffective machine attempts and sender delay information should be monitored by the dial administrator on a continual basis. To assist in this effort, 39 separate indicators have been provided to allow the dial administrator to set threshold levels. These items are listed in Part 6. If, while data is being collected and calculated, any of the 39 thresholds are equalled or exceeded, a 15-minute exception report will be printed.

(a) Whenever any exception occurs, the following total office counts will be shown at the top of the IMA reports.

- Marker PC
- Trunk link frame PC
- Trunk link frame usage
- SADR attempts and delays

(b) Items which equal or exceed their threshold values will be printed with their raw data counts. If several items exceed threshold values, supporting data will also be printed and an asterisk printed beside the exception items. For example, if total ineffective is exceeded, the following items will also print:

ROA, SOA, FRA minus announcement overflow and NCA + EA1 + EA2.

If total ROA is exceeded, the following items will also print:

PERM SIGNAL, PART DIGITS, PULS ERROR, MUT DIGIT, FATR, etc.

9.02 Machine Load Service Summary (REPT, MLSEX): Machine load service summaries (MLSSs), though designed for engineering purposes, provide the dial administrator with information on the load on the various switching system components. Details of this report are covered in Part 10, "Scheduled Reports." MLSS exception reports are triggered by two separate threshold requirements:

- Holding time per attempt
- Peg count ratios

Reports are printed on an hourly basis.

(a) Holding time per attempt thresholds are provided for the following 12 categories.

- (1) Incoming TLFs
- (2) Markers
- (3) Decoder channels
- (4) Link controllers

- (5) Transverters (CAMA only)
- (6) MF senders
- (7) DP senders
- (8) CAMA senders
- (9) OVS senders
- (10) Revertive senders
- (11) DP outsenders
- (12) Incoming DP registers (CAMA or non-CAMA)

The threshold value set is arbitrarily based on nominal office values. Adjustment of threshold values will be made by the dial administrator. Holding time thresholds should be specified to two decimal places.

(b) PC ratio thresholds are being provided for six categories.

- (1) Controller PC to sender PC
- (2) Decoder channel PC to marker PC
- (3) Marker PC to ITLF PC
- (4) CAMA sender PC to transverter PC
- (5) INWATS PC to ITLF PC
- (6) ONI PC to transverter PC.

Again, the actual value set will be arbitrary, based on nominal office values and, as required, the dial administrator will make adjustments to these thresholds.

(c) Exception reports indicate that abnormal load conditions exist or an excessive number of first trial failures are occurring. The printout will show the raw data used for the calculation and, when a scheduled or demand MLSS is printed, an asterisk will be placed beside the exception items.

9.03 Trunk Group Exception (REPT, OUTFX):

An hourly percentage of overflow exception report is provided to keep the dial administrator

SECTION 13e(4)

aware of service problems in the trunking network. This report reflects all one-way outgoing and 2-way trunk groups which equal or exceed percentage of overflow thresholds specified by the dial administrator. Details of this report will be covered in Part 10, "Scheduled Reports."

- (a) The exception report is printed half-hourly. It contains the following information:
 - (1) Administrative grouping as assigned by dial administrator.
 - (a) Trunk group name by CLLI nomenclature
 - (b) Number of one-way trunks—outgoing
 - (c) Number of 2-way trunks
 - (d) Equivalent number of 2-way trunks
 - (e) PC
 - (f) Overflow
 - (g) Percentage of overflow
 - (h) Attempts per circuit per hour (ACH)
 - (i) Connections per circuit per hour (CCH)
 - (j) One-way outgoing CCS
 - (k) 2-way/combined CCS
 - (l) Percentage of occupancy
 - (2) All exceptions will be printed in the same order as on the scheduled trunk group report.

10. SCHEDULED REPORTS

10.01 The machine administrator may schedule eight separate reports. Each report has its own independent schedule capability. Hourly reports may be scheduled on the hour or the half-hour with a maximum of 48 reports daily. It is expected that scheduled reports will be required for only a few hours each day and that the dial administrator will rely on exception reports to determine if more data is required. Data can be recalled for up to 24 hours on a rolling basis, regardless of whether or not it had been scheduled.

10.02 The eight scheduled reports are listed below. A brief description is given for those reports not previously discussed.

- (1) Ineffective machine attempts
- (2) Machine load service summary
- (3) Outgoing trunk group data
- (4) Incoming trunk group usage
- (5) Trunk block connector peg count
- (6) Special TELCO assignable registers
- (7) Traffic separation data
- (8) Link frame sample usage

10.03 *Ineffective Machine Attempts:* This report gives a detailed account of the service provided by the system as measured by the number of calls routed to announcement trunks. Sender delay information is included in this report also. Individual items are covered in detail in 8.03. As with all scheduled reports, up to 48 reports may be scheduled within a 24-hour period, each reflecting a full hour's data.

10.04 *Machine Load Service Summary:*

- (a) This report summarizes the load on the switching machine components and provides individual data for common control equipment. The report consists of up to four pages of data. The basic report can be subdivided into seven main categories:
 - (1) Trunk link frame load and common control data
 - (2) Controller and sender group data
 - (3) Incoming dial pulse register data
 - (4) Individual equipment data
 - (5) Individual controller data
 - (6) Types of trunk equipment installed and working
 - (7) Miscellaneous data.

Some of the information provided on the MLSS is reference data supplied by the dial administrator on form codes 23 and 24, "Trunks Equipped and Common Control Equipped." An association of sender group to controller group is made on form code 25, "Sender Group Number/Name Assignment." Instructions for these input forms are covered in Section 13c(3).

(b) **Link Frame Load Data:**

- (1) INC TLF IT, TC, TOTAL—This data shows CCS and PC for the ITLF loading on a per-train and total-office basis. Holding time per attempt (HT/A) will vary with individual office characteristics but nominal values are 180 to 200 seconds. "Percent of Total" shows train balance. Balance should be as nearly equal as possible with nominal values ranging from 48 to 52 percent.
- (2) THRU TRAFFIC—This shows the number of calls switched with a TPC class mark on both the incoming and outgoing trunks. Class marks are assigned on ETS form codes 01B and 05.
- (3) INC TRAFFIC—This shows the number of calls with a TPC class mark on the incoming trunk only and measures the number of intertoll calls completing within the switching system's toll center area.
- (4) OUT TRAFFIC—This shows the number of calls with a TPC class mark on the outgoing trunk only. This is a measure of locally originated traffic which used an outgoing intertoll trunk.
- (5) NON THRU TRAFIC—This is a count of the number of local calls—originated and completed within the switching system's toll center area. No TPC class marks were indicated on the incoming or on the outgoing trunk.

For each of these five categories, the percent of total TPC is indicated.

- (c) **Common Control Data:** Data will be shown for each type of common control equipment installed. Individual breakdowns are given later in this report.

(1) CONTROLLERS — Total data for up to 12 controller groups. Holding time per attempt may vary with individual offices but nominal values are 0.5 to 0.7 seconds. Sender peg count data is compared with both TLF total and sender group total. CONT PC should be 100 to 103 percent of ITLF. CONT PC should be 100 to 103 percent of sender group PC.

(2) SENDERS—Data by incoming sender type, MF, DP, CAMA, OVS, and offices total. Holding times will vary greatly depending on sender type.

Nominal Values

MF—4.5 to 7.5 seconds

DP—10.0 to 16.0 seconds

CAMA—9.0 to 13.0 seconds

OVS—7.0 to 11.0 seconds

Total incoming sender PC should be 100 to 103 percent of ITLF PC.

(3) RETRL—A subheading under "Incoming Senders" to show the total sender retrieval calls.

(4) OUTSENDERS DP, RP—Data by outgoing sender type, DP, and out revertive. Nominal values for holding time should be 10.0 to 16.0 seconds for both types.

(5) N-CAMA DP REG—Data will be shown only for those offices using DP registers. CAMA, DP registers are shown separately. Nominal holding times are 12.0 to 20.0 seconds.

(6) DECODER CHAN—Data for up to ten decoder channels. Nominal holding times should be 0.11 to 0.20 seconds. PC comparisons can be made to ITLF and marker:

Decoder channel PC should equal marker PC.

Decoder channel PC should be 100 to 103 percent of ITLF PC.

SECTION 13e(4)

- (7) 2ND TRIAL—All decoder channel second trial attempts.
- (8) IN HLD RTG—Number of first trial calls where the initial route selected is non-scannable (no GB relay) and additional routes are available in the event that the selected subgroup is found busy. All second trial calls choosing other than the final subgroup of a final route will score this register whether or not the route is scannable.
- (9) SUB NHLD RTG—On first trial calls this is scored when an initial hold (IH) routing finds all trunks busy and the subsequent route selected is either scannable or a final subgroup.
- (10) SUB HLD RTG—On second trial calls this is scored when an IH routing finds all trunks busy and the subsequent route selected is other than the final subgroup in a routing pattern.
- (11) MARKERS IT, TC, TOTAL—Total data for markers by train and total office. Nominal holding times should be 0.36 to 0.45 seconds. PC comparisons can be made with decoder channel and ITLF PC:

Marker PC should equal decoder channel PC.

Marker PC should be 100 to 103 percent of ITLF PC.
- (12) TRANSVERTERS—Total number of attempts handled by transverters. Nominal holding time ranges from 1.20 to 1.50 seconds. PC comparison can be made with CAMA sender PC:

CAMA sender PC should be 100 to 105 percent of transverter PC.
- (13) ANI—Total number of CAMA calls employing automatic number identification.
- (14) ONI TOTAL—Total number of CAMA calls being handled by the operator for calling number identification.
- (15) ANF—Total number of automatic number identification failures.

- (16) AIF—Total number of automatic office identification failures.
- (17) 2ND TRIAL—Total number of transverter second trial attempts.
- (18) BLK BIL FREE—The total number of bulk billed calls handled free.
- (19) RECORDERS—The number of times a recorder is attached on CAMA calls.
- (20) CAMA POSITION—Total number of calls handled by CAMA operators.
- (21) CAMA DP REG—Total number of DP CAMA attempts handled.
- (22) SERV CODE PC—Total number of service code seizures (11 +) handled.

(d) *Miscellaneous Data (Page One):*

- (1) The first part of this item shows the total number of test calls handled by four automatic test frames.

DMT = Decoder marker test frame

SDT = Incoming sender test frame

OGT = Outgoing trunk test frame

ITT = Incoming trunk test frame

- (2) DRE RTE—Identity of each directional reservation of equipment (DRE) unit equipped.
- (3) ACT PC—Number of times the DRE unit triggered.
- (4) % ACT USE—Number of times the DRE timer scored.
- (5) RERTD CALLS—Number of calls rerouted due to network management controls.
- (6) The remaining items on this line are sample link PC and usage, by train. These are used in a ratio to compute total link frame usage plus per train link frame usage.

(e) **Controller and Sender Group Data:**

Information on a maximum of 12 controller groups and up to 19 sender groups (15 incoming and 4 outgoing) can be obtained. Detail is given on each individual group and on its relationship to the office total.

(f) **Incoming Dial Pulse Register Data:** A maximum of 30 register link frames can be printed with their associated register data.

(g) **Individual Equipment Data:** Separate data for decoder channels, markers, transverters, and recorders will be shown. Detail is given on each component and on its relationship to the office total.

(h) **Individual Controller Data:** Data on each controller of its own pot can be analyzed and compared to the total shown on page one of the MLSS.

(i) **Trunk Equipment Installed/Working:**

Form code 23 provides the input data for this information and updates are required to be made by the dial administrator on a continuing basis. This information is useful to the traffic engineer and the circuit engineer.

10.05 Outgoing Trunk Group Data:

(a) The data on this report can be scheduled in its entirety or by administrative grouping (ADMGRP). It should be noted that all data is collected on a half-hourly basis by administrative groupings even if not requested. Therefore, by resetting the schedule, any back hours of data, up to 24 hours, can be demanded for any administrative grouping. Data on this report consists of:

- (1) Common language location identification plus a 2-character suffix if provided to show 2W, 1W, CF, IF, HU, etc. This is useful where more than one trunk group exists to a given location.
- (2) Peg count and overflow
- (3) One-way usage (if applicable)
- (4) 2-way usage (if applicable)

(b) The grouping of trunk groups on this report will be as preplanned by the dial administrator with Administration Group Assignments on form code 04B. The following is an agreed-to format:

- Administration Group 0 Final Associated Co
- Administration Group 1 High Usage Associated Co
- Administration Group 2 Toll Completing Associated Co
- Administration Group 3 Miscellaneous Associated Co
- Administration Group 4 Final Long Lines
- Administration Group 5 High Usage Long Lines
- Administration Group 6 Overseas Long Lines
- Administration Group 7 Miscellaneous Long Lines

The sequence of printing is covered in 5.02, "Schedule Listing." Within each group, trunk groups will be printed numerically by TRI.

10.06 Incoming Trunk Group Usage:

(a) The 4A-ETS equipped with PBC has the capability of providing incoming usage on a maximum of 249 trunk groups or 6912 trunk equipments. In reality, there is a maximum of 249 trunk groups plus one validity count for authenticating the data collected. If downstream data collection is not required, this maximum trunk group total can be stretched to 255 trunk groups with one validity terminal.

(b) Trunk groups selected on form code 01B will be printed manually by the incoming usage register (IUR).

(c) Normally, incoming usage will only be taken on groups where usage data cannot be collected at the originating end or a special study is required.

10.07 Trunk Block Connector PC Report: This data will be the offered PC to each individual TBC. There is provision for up to 30 TBCs on each train. A sample report is shown in Figure 10.

SECTION 13e(4)

10.08 TELCO Miscellaneous Registers:

(a) Data is brought into the PBC via three methods: SPC interface, TUI interface, and TDC interface. All traffic data collected by these means is shown in at least one of the scheduled reports; however, there may be a requirement for traffic measurements taken in some offices for which no provision has been made or special studies may be desired. For this purpose, 80 spare TDC terminals are provided for assignment by the dial administrator. It should be noted that multiple scoring devices cannot be assigned to one TDC terminal because of design. However, the output of a totalizer can be fed to one TDC terminal.

(b) In addition to the peg count terminals, 32 usage terminals are provided on the common control TUI grouping (10-second scan). These terminals can be used for any usage item desired. Recent change technique is required to assign these points.

(c) Application of these items will depend upon office requirements and the dial administrator's ingenuity. Note that this printout will not have any CLLI-type identification, so an overlay must be made locally.

10.09 Traffic Separations Data: Details of this report were covered in 8.02.

10.10 Trunk Link Frame Load Balance Report:

(a) To effectively balance the traffic load on the incoming and outgoing TLFs, the dial administrator has the capability for collecting sample usage by switch for both incoming and outgoing TLFs. There is no practice to show the number of hours of data required for a statistical sample. Therefore, the dial administrator should select one, two, or three hours of the day for data collection and then determine the number of consecutive days that this data will be required. When this scheduled period is completed, the average hourly TLF CCS by switch will be reported.

(b) Load balance data is not needed on a real-time basis, so printing of this report can be scheduled for late night hours.

11. DEMAND REPORTS

11.01 All of the reports covered in Part 10, "Scheduled Reports," with the exception of the TLF load balance, may be demanded for any of the 48 hourly report periods for the preceding 24 hours. This applies whether or not a report was actually scheduled to print. This is especially beneficial when an exception report prints out at a time when no scheduled data was requested. The format of a demand report will be the same as that of the scheduled report.

11.02 Ineffective Machine Attempts: More variations are available for this report than for any other in the system. Demand printouts can be requested for:

- (a) Preceding 15-minute period
- (b) Month to date—total day
- (c) Month to date—busy hour
- (d) Last month—total day
- (e) Last month—busy hour
- (f) Current day to last clock hour
- (g) Last day

The data included in all of the above must have been shown on the schedule listing as being collected. If any days or hours are shown as not required, it will not be included in the total.

11.03 Machine Load Service Summary: This report can be demanded for any hourly period starting on the hour or half-hour for the preceding 24 hours.

11.04 Outgoing Trunk Group Data: Same as MLSS.

11.05 Incoming Trunk Group Usage: Same as MLSS.

11.06 Trunk Block Connector Peg Count: Same as MLSS.

11.07 TELCO Miscellaneous Registers: Same as MLSS.

11.08 Traffic Separations Data: Same as MLSS.

12. SCORING OF PEG COUNTS

12.01 There are four main stages in ETS call processing in which per-call data is distributed to the PBC for register administration. The following will describe these stages in general terms plus directions to flow charts for identification.

12.02 Link Controller State (Fig. 11): The sender link controller identity is distributed to the PBC when the ETS stores the trunk-sender association while the 4A is in the process of connecting the incoming trunk to the incoming sender. The PBC peg count register for the identified controller is immediately incremented. The controller does not bid for the ETS until it has determined that a sender and associated linkage are available to the incoming trunk. SADR bids and line hits will result in controller PCs only, since these bids do not progress far enough for the PBC to score any other registers.

12.03 Trunk Selection Stage (Fig. 12): Following receipt of digits, or a time-out, the incoming sender selects a decoder channel which in turn bids for an ETS translation. The ETS call processing programs then search the routing patterns for an idle route. Information pertaining to routes found busy and to the selected route is distributed to the PBC during this stage of processing. Such reports are designated trunk selection reports (TSRs).

12.04 Marker Selection Stage (Fig. 13): Following distribution of the translation results by the ETS, the decoder channel selects a marker and initiates a decoder channel release request to the ETS, following which the decoder channel is released and made available for another call. The ETS distributes the identity of the selected marker to the PBC at which time all traffic data which had been previously associated with the decoder channel is reassociated with the selected marker. Data distributions made to the PBC during this stage are designated as marker selection reports (MSRs).

12.05 Marker Distribution Stage: After the marker has determined that a trunk and cross-office paths are available it reports to the ETS via a set of four ferroids, one of ten possible dispositions of the call. This information is distributed

to the PBC for appropriate completion of register administration. Reports distributed to the PBC during this stage are designated as marker disposition reports (MDRs) (Fig. 15).

12.06 Call Processing Guide: By utilizing the call processing guide (Fig. 16), all types of calls can be followed through assuming the user is familiar with 4A-ETS call processing. Figures 12, 13, 14, and 15 show that when in the call process the various registers are incremented in the PBC.

- (a) Figure 17 shows the abbreviations used on the flow charts and their equivalent English-language names.
- (b) The dial administrator should ensure that register data truly reflects the performance of the machine and that all wiring and cabling which affect register data are installed properly. Figure 18 can be duplicated for local use and actual readings entered for validation purposes.

13. UPDATE AND INPUT PROCEDURES

13.01 Each switching system location will require a current copy of the input and output manuals for PBC operation. These Bell Laboratories documents are labeled as follows:

- IM-68500 (Input Manual)
- OM-68500 (Output Manual)

13.02 The dial administrator should maintain at least a partial copy of these documents for local use. Each page will show printed in the lower right-hand corner which data terminal can implement the associated input message. Sheets marked as "All channels" or "Channel 23" should be maintained by the dial administrator.

13.03 The following paragraphs will show key input messages and their intent, as described in IM-68500, Issue 2.

13.04 Schedule Listing:

- (a) To request a current schedule listing showing seven of the eight possible reports and their time intervals, the following input message should be typed:

SKED:SCHEP

SECTION 13e(4)

(b) The seven reports DTKOT, DIMAH, DTSEP, DTBPC, DMLSS, DOWIN, and DTELM, can be set to be inactive or not selected by the input of the following messages:

UPD:UPDTE:DAYOD = (CLEAR)

UPD:UPDTE:DAYEV = (CLEAR)

These messages would deactivate all scheduled requests of the seven reports for odd (DAYOD) and even (DAYEV) schedules.

(1) To reactivate any hourly slot, the following input message is required:

UPD:UPDTE:DAYOD or DAYEV = (NNNN, XXXX)

NNNN = Central Standard Time as used by network management 0000 to 2300. The last two digits must be either 00 or 30.

(2) When all required time slots are activated, an input message of SKED:SCHEP will provide a printout of the entire schedule listing showing the reports scheduled and the associated time slots required.

(c) Data collection of the seven reports is further defined by days of the week and the choice of either an odd or even schedule or no schedule. One message is used to activate all seven days as follows:

UPD:UPDTE:WKSCH = (A, A, A, A, A, A, A)

See Figure 19 for examples.

(d) For the DTKOT data report (outgoing trunk group data), the administrative grouping, zero to seven can be selected for sequence of printout.

Input message:

UPD:UPDTE:ADGRP = (N, N, N, N, N,
N, N, N)

N = 0 to 7

If not included, that group will not print. See Figure 20 for example.

(e) "Month Schedule" always shows a full 31 days with both an odd and even month for selection purposes. The setting of selected days is accomplished in two steps. First, an input message of

UPD:UPDTE:MOSOD = (RESET) for odd month, or

UPD:UPDTE:MOSEV = (RESET) for even month

will include all 31 days of the month for data accumulation. Note that this field of the schedule does not affect scheduled data outputs or demand and exception printouts. The days shown as active will determine which data will be added to the accumulated totals for a given month's report period. An example would be:

IMA busy hour, month to date
IMA total day, month to date.

A second message is required to deactivate days not required in the report period. Normally, Saturdays, Sundays, and certain holidays occurring during the business week will be excluded. The input message would be:

UPD:UPDTE:MOSOD = (N, N) for odd month days, or

UPD:UPDTE:MOSEV = (N, N) for even month days.

NN = 01 to 31

See Figure 21 for example.

(f) Busy hour selection is made by the dial administrator for use in the Ineffective Machine Attempt Report. The start time of the busy hour should be inputted using the following:

UPD:UPDTE:BHOUR = (HH mm)

HH = 00 to 23

mm = 00 or 30 only

See Figure 22 for example.

(g) Two additional items are required to accumulate date, "Start Report Day" and "Start Report Month". If the office data day is from midnight to midnight or 9:00 am to 9:00 pm it should be so indicated in local machine time using the following:

UPD:UPDTE:STDAY = (hh oo)
 hh = 00 to 23

The following input is required to select the start day of the study month:

UPD:UPDTE:STMON = (dd)
 dd = 01 to 28

13.05 Dial Administration Threshold Values:

(a) This listing contains all thresholds for outgoing trunk groups and ineffective machine attempts. To request a current printout, the input message is:

SKED:DATPT

(b) The first grouping printed is trunk group thresholds. The eight classes listed, CL0 through CL7, are exception classes for assigning overflow threshold levels. As the dial administrator assigns outgoing trunk group data on form code 04B, two related tables are built.

- (a) OTKTAB in the ETS.
- (b) OTGDATA in the PBC.

The OTGDATA table has a separate and distinct exception class for each outgoing trunk group and the outgoing portion of all 2-way groups.

(c) When an office is first cut over to PBC, all exception classes are preset to a 1-percent overflow value. In addition, every outgoing trunk group is associated with exception class

0. The dial administrator, by using the following messages, can alter and refine the percent overflow threshold level (PCOFTL) to the desired setting.

Step 1—Input message UPD:THUPD:(CLa, xxx.x)

Where: CLa = exception class 0 to 7

xxx.x = percentage overflow value desired. Can range from 0.0 to 101.0

When selecting overflow values consider that if the set value is equalled or exceeded, an exception report will be printed. A value of 101.0 naturally will never print.

The dial administrator should assign values to each exception class as needed.

Examples:

- CL0 = 1%—Could be used for Associated Co IT finals
- CL1 = 25%—Could be used for Associated Co IT high usage
- CL2 = 1%—Could be used for Associated Co TC finals
- CL3 = 40%—Could be used for Associated Co misc groups
- CL4 = 1%—Long Lines IT finals
- CL5 = 25%—Long Lines high usage
- CL6 = 101%—New pending groups—not in service
- CL7 = 50%—Under-engineered groups pending augments.

Step 2—A gross initialization technique can now be used that will set each trunk group's percent overflow threshold level to the trunk group's administrative group number; ie, 0 through 7.

UPD:CLUPD:RESET

SECTION 13e(4)

Example:

ADM GRP	EXC CLASS	PCOFTL
0 Associated Co Finals	0	1%
1 Associated Co High Usage	1	25%
2 Associated Co Toll Completing	2	1%
3 Associated Co Miscellaneous	3	40%
4 Long Lines Finals	4	1%
5 Long Lines High Usage	5	25%
6 Pending New Groups	6	101%
7 Under Engineered Groups	7	50%

Step 3—Message to identify all trunk groups to their own specific:

- (a) CLLI code
- (b) Exception class number (0 through 7)
- (c) Register number (as assigned by network manager)

SKED:TGEXC

Step 4—When a trunk group is known to exceed the PCOFTL and no further exception reports are desired, the following message will reassign the exception class of that trunk group:

UPD:CLUPD:(nnn, c)

where nnn = 3-digit register number taken from printout on

SKED:TGEXC. For single- and double-number registers leading zeroes must be inserted. Example: 001 to 099

c = Exception class number, 0 through 7.

- (d) Thresholds for IMA are set by using

UPD:THUPD:aaa = mmm.mm

where aaa = any one of the 39 possible exceptions

mmm.mm = any percent figure from 0.00 to 101.00

An initial set of values will be automatically "plugged" into the schedule but the dial administrator should reevaluate and reassign as necessary.

13.06 Demand Reports:

(a) Any of the seven scheduled reports can be demanded for any of the 47 hourly reports registered over the preceding 23-1/2 hour period. The format of the report will be identical to a normally scheduled report.

(b) **Outgoing Trunk Group Report—DTKOT:**
An input message of REPT:DTKOT:hh mm will produce a one-hour data report starting at the time designated.

hh = the hour 00 to 23

mm = either 00 or 30

(c) **Ineffective Machine Attempts—DIMAH, DIMAD:** Up to six separate reports can be demanded using the following input message:

REPT:DIMAD:aaaa

aaaa = CDAY — Current report day

LDAY — Last report day

CMON — Current report month

LMBN — Last report month

CBYH — Current busy hour for month

LBYH — Last busy hour for month

REPT:DIMAH:nnnn

nnnn — Military time indicating start of requested hour

L15M — Last completed 15-minute interval.

(d) **Traffic Separation Report—DTSEP:** Two separate reports are available on a demand basis. An individual hour may be selected such as a busy hour or the last day's data may be requested. Input message

REPT:DTSEP:LDAY

will print the last day's total traffic separations.

REPT:DTSEP:HHnn

will print the selected hour's data.

HHnn = The start of the report period where HH is the hour from 00 to 23 and nn is either 00 or 30.

(e) **Trunk Block Connector Peg Count—DTBPC:**
Any selected hour's data can be demanded by using input message

REPT:DTBPC:HHmm

where HH = any hour from 00 to 23

and mm = either 00 or 30.

The hour selected will be the starting point.

(f) **Machine Load Service Summary—DMLSS:**
Any of 48 hourly reports may be demanded by using input message

REPT:DMLSS:HHmm

where HH = any hour from 00 to 23

and mm = either 00 or 30

The hour selected will be the starting point.

(g) **One-way Incoming Trunk Group Usage—DOWIN:** Any of 48 hourly reports may be demanded by using input message

REPT:DOWIN:HHmm

where HH = any hour from 00 to 23

and mm = either 00 or 30

The hour selected will be the starting point.

(h) **Telephone Company Miscellaneous—DTELM:**
Any of 48 hourly reports may be demanded by using input message

REPT:DTELM:HHmm

where HH = any hour from 00 to 23

and mm = either 00 or 30

The hour selected will be the starting point.

SECTION 13e(4)

13.07 Following major failures of the PBC, normally in excess of 10 minutes, a message will be printed called **SYSERR** with an identification number. These messages are to be referred to the PECC center in Columbus, Ohio. No means of identification has been supplied to the field.

- (a) It should be noted that short-term failures result in no lost data. The system will update all registers on a 5-minute sample basis.

13.08 All schedules and threshold values assigned by the dial administrator are stored in unprotected memory. It is suggested that when schedules and thresholds are acceptable, the following input message be used:

COPY:FSAVE

This will transfer into protected memory a record of schedules and thresholds. In the event of a PBC failure, these values will be reinserted automatically.

13.09 All data tables, program tables, and schedule/threshold values can be "copied" on magnetic tape by the maintenance forces in

the form of a program dump. The following messages should be used for this purpose.

- (a) DUMP:MEMRY:AL—This will copy thresholds, schedules, program data and all questionnaire-generated office data.
- (b) DUMP:MEMRY:OD—This will copy questionnaire-generated office data only.
- (c) DUMP:MEMRY:SO—Copies thresholds, schedules, and questionnaire-generated office data.

These program dumps are for PBC data only.

13.10 As a safety precaution, the PBC does not use paper-tape inputs for recent changes; therefore, it is advisable when taking a memory dump that two dumps be made. This will provide two tapes and possibly eliminate the need for manual inputs to update the system after a memory loss.

13.11 For complete information and other reports, refer to the Input Manual—IM 68500.

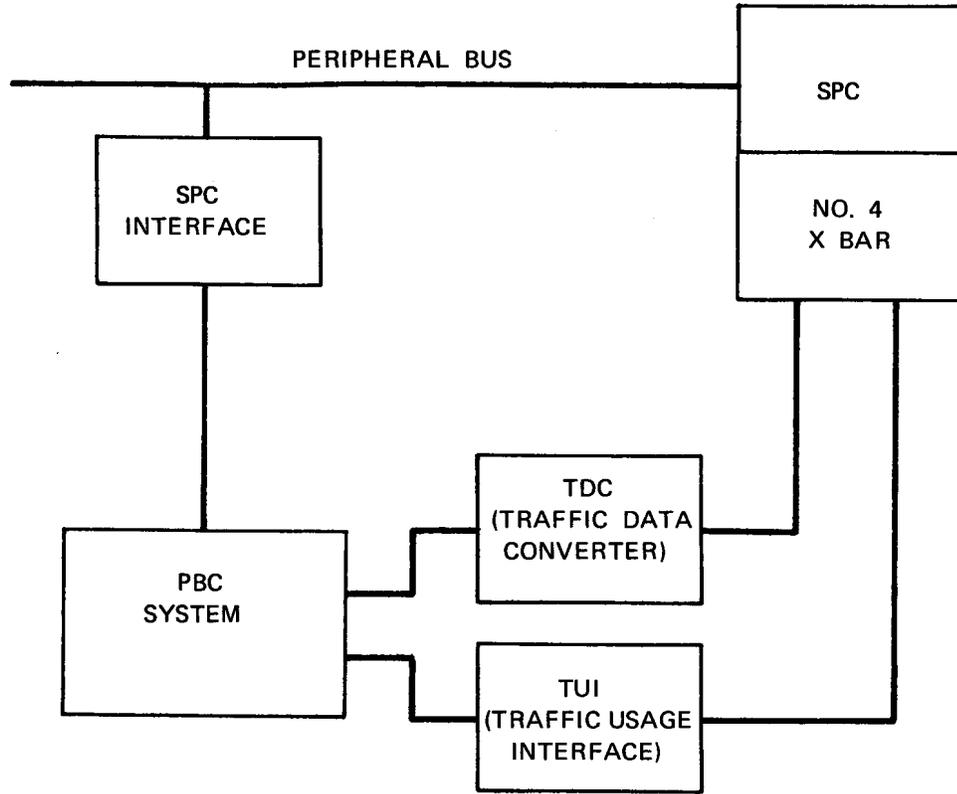


Fig. 1—4A Peripheral Bus Computer (Sheet 1 of 2)

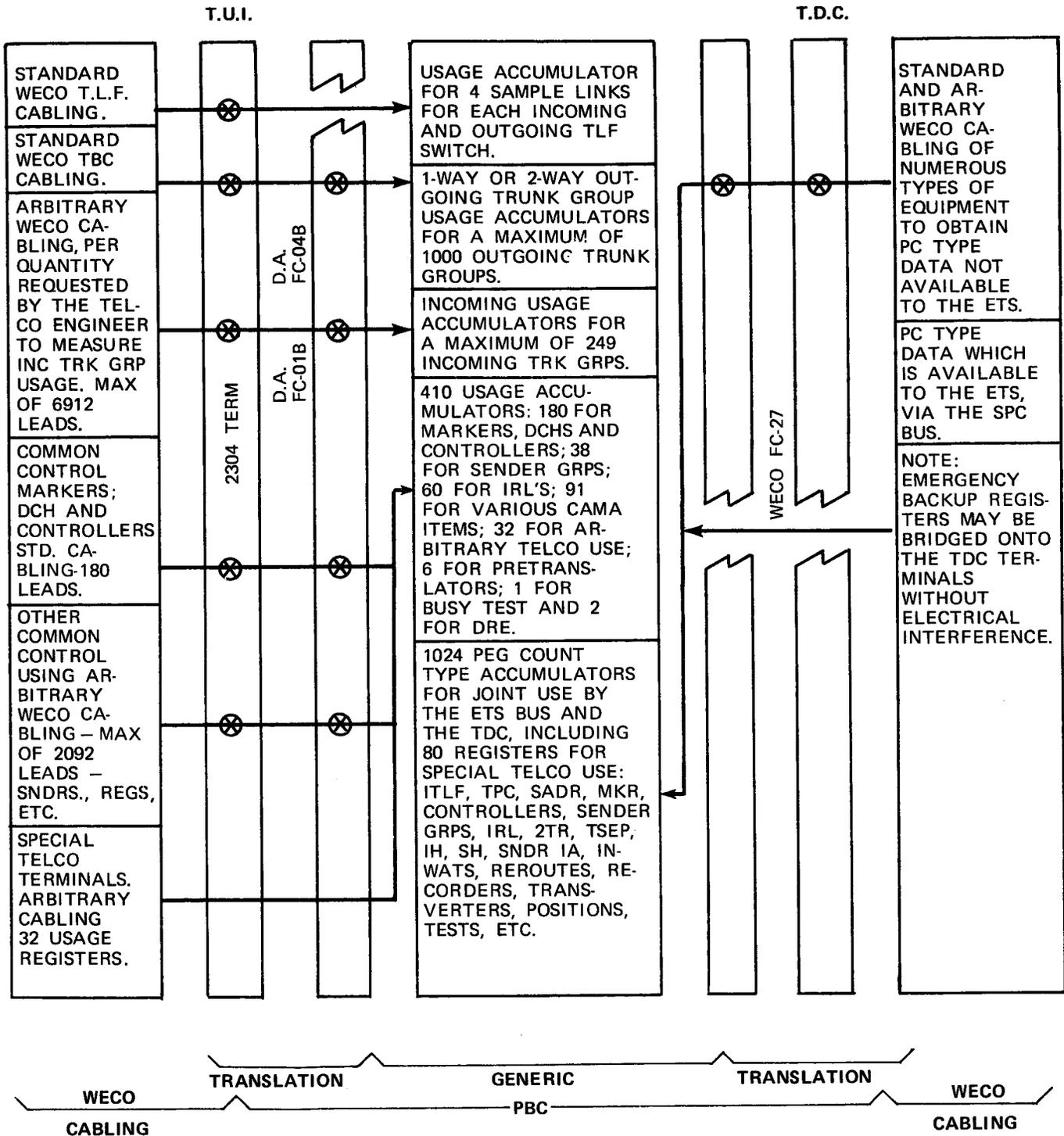


Fig. 1—4A Peripheral Bus Computer (Sheet 2 of 2)

PBC REG #	NO. OF REGS	SOURCE	NAME	TDC INPUT NUMBER NOTES
0-3	2	ETS	ITLF-PC	NOT APPLICABLE
4-11	4	▼	TPC	
12-30	19	TDC	SADRBC	260, 262, 264, 266, - - - - 282 (12 TDC INPUTS ARE RESERVED FOR 12 INCOMING SENDER GROUPS)
31-49	19	▼	SADRDC	261, 263, 265, 267, - - - - 283 (12 TDC INPUTS ARE RESERVED FOR 12 INCOMING SENDER GROUPS)
50-69	20	ETS	MKR-PC	NOT APPLICABLE (ETS)
70-71	2		PC FRA OFL	
72-73	2		FSTATB	
74-75	2		CFST	
76-77	2		NC IT TC	
78-79	2		NCNM IT TC	
80	1		NCA-PC	
81	1		SNDRET	
82-84	3		INWTYP	
85-86	2		R INW NR	
87	1	▼	REROUTE	▼
88-89	2	TDC	DRE	(1 TDC POINT PER DRE GROUP – MAX OF 2)
90-111	22	ETS	TORC	NOT APPLICABLE (ETS)
112-126	15	TDC	ISFATR	95,106,117,128, - - - - 249 (15 GROUPINGS)
127-141	15		ISNSDR	100, 111, 122, 133, - - - - 254 (15 GROUPINGS)
142-156	15		ISPS	104, 115, 126, 137, - - - - 258 (15 GROUPINGS)
157-171	15		ISIKF	102, 113, 124, 135, - - - - 256 (15 GROUPINGS)
172-186	15		ISDPD	98, 109, 120, 131, - - - - 252 (15 GROUPINGS)
187-216	30		IRLPS	(1 TDC POINT PER IRL FRAME)
217-221	5		OVSCLSF	(1 TDC POINT PER EACH OF THE FOLLOWING: OSO, IOR, IOT, IOC, ISO)
222	1	▼	OVSNSDR-O	(1 TDC POINT PER OFFICE)
223	1	TDC	OVSFATR-O	(1 TDC POINT PER OFFICE)
224	1		OVSEB	(1 TDC POINT PER OFFICE)
225	1		OVSIOS	(1 TDC POINT PER OFFICE)
226	1		OVSUXS-O	(1 TDC POINT PER OFFICE)
227-241	15		ISPD	105, 116, 127, 138, - - - - 259 (15 GROUPINGS)
242-256	15		ISPE	96, 107, 118, 129, - - - - 250 (15 GROUPINGS)
257-271	15		ISMD	97,108,119,130, - - - - 251 (15 GROUPINGS)
272-286	15		ISUXS	99, 110, 121, 132, - - - - 253 (15 GROUPINGS)
287-301	15		ISMRE	101, 112, 123, 134, - - - - 255 (15 GROUPINGS)
302-331	30		IRLPD	(1 TDC POINT PER IRL FRAME)
332-346	15		ISLO	103, 114, 125, 136, - - - - (15 GROUPINGS)
347-350	4		OSPD	(1 TDC POINT PER 10 OUTGOING SENDERS)
351-366	16		OSSS	(1 TDC POINT PER 10 OUTGOING SENDERS)
367-396	30	▼	IRLSR	(1 TDC POINT PER IRL FRAME)
397-456	60	ETS	TBC	NOT APPLICABLE (ETS)
457-516	60	ETS/TDC	LC-PC	(1 TDC POINT PER LINK CONTROLLER, SERVING OUT SENDERS – MAX OF 16 PER OFFICE)

Fig. 2—Peg Count Data Available Via PBC (Sheet 1 of 4)

SECTION 13e(4)

PBC REG #	NO. OF REGS	SOURCE	NAME	TDC INPUT NUMBER NOTES
517-526	10	ETS	DCH-PC	NOT APPLICABLE (ETS)
527-528	2		ITLF SMPLE-PC	
529-532	4		COF	
533-534	2		IH, SH	
535	1		SNH	
536	1		DCH2TR	
537-552	16	↓	ISPC	
553-556	4	TDC	OSPC	(1 TDC POINT PER 10 OUTGOING SENDERS)
557-586	30	↓	IRLPC	(1 TDC POINT PER 10 REGISTERS – MAX OF 60)
587-590	4	ETS	TESTS	NOT APPLICABLE (ETS)
591-592	2	TDC	MKRTR2	12 (IT), 23 (TC)
593	1		DCHTR2	34
594-613	20		MKRTR1	2-11 (ITO-9), 13-22 (TCO-9)
614-623	10		DCHTR1	24-33 (DCHO-9)
624-683	60		LC-TR	35-94 (LINK CONTROLLERS AO-M3)
684	1		IRLTR	(1 TDC POINT PER OFFICE FOR NON-CAMA REG)
685-764	80	↓	TELCO SPECIAL	(TDC POINTS 284-363 RESERVED)
765	1	ETS	TESTS	364 (RESERVED FOR PBC DIAGNOSTICS)
				CAMA
800	1	TDC	IRLTRC	(1 TDC POINT PER OFFICE FOR CAMA REG)
801-842	42		RCDRTR	(AO-A19, EMA, BO-B19, EMB) MAX OF 42
843-846	4		MTTR	(AE, AO, BE, BO) MAX OF 4 TDC POINTS
847-862	16		PCTR	(OA-7A, OB-7B – MAX OF 16)
863-886	24		TVTR1	(AO-A11, BO-B11 – 1 POINT PER TRANSVERTER)
887-888	2		TVTR2	(A, B – 1 TDC POINT PER TRANSVERTER GRP)
889-892	4		CAO	(1 TDC POINT PER CAMA SNDR GRP – MAX OF 4)
893	1		IF	(1 TDC POINT PER OFFICE)
894	1		ANF	(1 TDC POINT PER OFFICE)
895-924	30		IRLCSC	(1 TDC POINT PER 10 REGISTERS – MAX OF 60)
925-948	24		TVONI	(AO-A11, BO-B11 – 1 POINT PER TRANSVERTER)
949-972	24		TVANI	(AO-A11, BO-B11 – 1 POINT PER TRANSVERTER)
973-974	2		TVMC	(A, B – 1 TDC POINT PER TRANSVERTER GRP)
975-976	2	↓	TVBRR	(A, B – 1 TDC POINT PER TRANSVERTER GRP)
977-978	2	TDC	TVWCC	(1 TDC POINT PER TRANSVERTER GRP – MAX OF 2)
979-1020	42		RCDR-PC	(1 TDC POINT PER RECORDER – MAX OF 42)
1021	1		POSDISC	(1 TDC POINT PER OFFICE)
1022	1		NPA	(1 TDC POINT PER OFFICE)
1023	1	↓	POS-PC	(1 TDC POINT PER CAMA POSITION – MAX OF 100)
	2048	ETS		OUTGOING PC/OFL FOR 1024 TRUNK GROUPS
	1024			INCOMING PC FOR 1024 TRUNK GROUPS
	1024			SOA PER OUTGOING TRUNK GROUP
	64	↓		TSEP COMBINATIONS

Fig. 2—Peg Count Data Available Via PBC (Sheet 2 of 4)

PBC REG#	NO. OF REGS	SOURCE	NAME	TDC INPUT NUMBER NOTES
587-590	4	ETS	TESTS	NOT APPLICABLE (ETS)
591-592	2	TDC	MKRTR2	12 (IT), 23 (TC)
593	1		DCHTR2	34
594-613	20		MKRTR1	2-11 (ITO-9, 13-22 (TOC-9)
614-623	10		DCHTR1	24-33 (DCHO-9)
624-683	60		LC-TR	35-94 (LINK CONTROLLERS AO-M3)
684	1		IRLTR	(1 TDC POINT PER OFFICE FOR NON-CAMA REG)
685-764	80	↓	TELCO SPECIAL	(TDC POINTS 284-363 RESERVED)
765	1	ETS	TESTS	364 (RESERVED FOR PBC DIAGNOSTICS)

CAMA

800	1	TDC	IRLTRC	(1 TDC POINT PER OFFICE FOR CAMA REG)
801-842	42		RCDRTR	(AO-A19, EMA, BO-B19, EMB) MAX OF 42
843-846	4		MTTR	(AE, AO, BE, BO) MAX OF 4 TDC POINTS
847-862	16		PCTR	(OA-7A, OB-7B – MAX OF 16)
863-886	24		TVTR1	(AO-A11, BO-B11 – 1 POINT PER TRANSVERTER)
887-888	2		TVTR2	(A,B – 1 TDC POINT PER TRANSVERTER GRP)
889-892	4		CA ϕ	(1 TDC POINT PER CAMA SNDR GRP – MAX OF 4)
893	1		IF	(1 TDC POINT PER OFFICE)
894	1		ANF	(1 TDC POINT PER OFFICE)
895-924	30		IRLCSC	(1TDC POINT PER 10 REGISTERS – MAX OF 60)
925-948	24		TV ϕ NI	(AO-A11, BO-B11 – 1 POINT PER TRANSVERTER)
949-972	24		TVANI	(AO-A11, BO-B11 – 1 POINT PER TRANSVERTER)
973-974	2		TVMC	(A, B – 1 TDC POINT PER TRANSVERTER GRP)
975-976	2	↓	TVBBF	(A, B – 1 TDC POINT PER TRANSVERTER GRP)

Fig. 2—Peg Count Data Available Via PBC (Sheet 3 of 4)

Item		Maximum No. Registers
Incoming & Outgoing Link Frame Usage		1,600
Outgoing Trunk Group Usage		1,000
Incoming Trunk Group Usage		249
Common Control Usage		
Marker IT	Total/MNCE	20
TC	Total/MNCE	20
DEC CHAN	Total/MNCE	20
CONTR GRP	Total/MNCE	20
TELCO Misc		32
Test Busy		1
Sender Groups	Total/MNCE	38
IRL	Total/MNCE	60
Transverters	Total/MNCE	48
Recorders	Total	42
CAMA Pos	Total	1
Pretranslators	Total/MNCE	6
DRE	Total	2

Fig. 3—Usage Data Available Via PBC

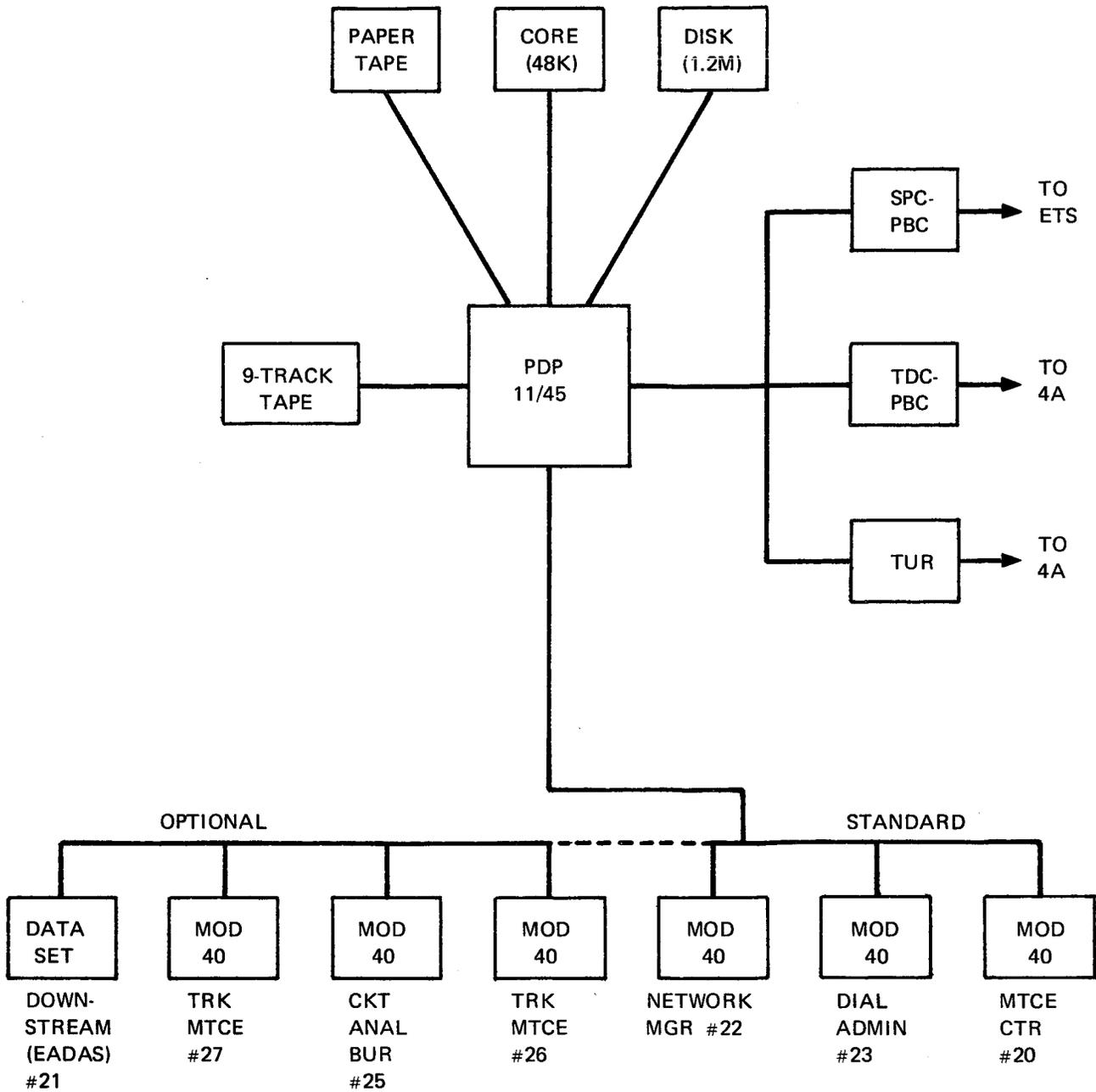


Fig. 4—Peripheral Bus Computer Data Arrangement

NAME		FORM CODE	DATA REQ	WORDS PROV
ANCMTBC	Announcement Trunk Block Connector	18	20	20
ANCMTRI	Announcement Traffic Register Index	07	12	12
CAMAIRL	CAMA Incoming Register Link Frame	27	15	15
CCEQPD	Common Control Equipped	24	212	256
CCUSE	Common Control Usage	28	2,304	2,304
DATERMEQ	Data Terminal Equipped	10	2	2
DERMALT	Data Terminal Alternat	10	4	4
FOFTAB	FOF Table – (Office CBA Span Size)	11	1	1
HCITGDAT	Head Call for Incoming Trunk Group Data	01B	224	256
HCOTGDAT	Head Call for Outgoing Trunk Group Data	04B	224	256
ITGDATA	Incoming Trunk Group Data	01B	16,384	16,384
ITGXXX	Incoming Trunk Group Equipment	01B	38,400	49,152
LITGI	Largest Incoming Trunk Group Index	01B	1	1
LTRI	Largest Traffic Register Index	04B	1	1
NAMTB	Name Table	22	6	6
OTGDATA	Outgoing Trunk Group Data	04B	16,384	16,384
OTGEQI	Outgoing Trunk Group Equipment – IT Book	19	24,000	24,064
OTGEQT	Outgoing Trunk Group Equipment – TC Book	19	24,000	24,064
OWAUSE	One-Way Incoming Usage – Group A	01B	1,152	1,280
OWBUSE	One-Way Incoming Usage – Group B	01B	1,152	1,280
OWCUSE	One-Way Incoming Usage – Group C	01B	1,152	1,280
RGNFLG	Regional Flag	11	1	1
SDOPID	Sender/Outpulser Identity	21	512	512
SDRFRAMS	Sender Frames	26	75	256
SGPERCG	Sender Group per Controller Group	25	108	256
SLFHED	Sender Link Frame Head Call Table	01B	492	512
SOGASSN	Sender/Outpulser Group Association	21	128	128
SOGNAME	Sender/Outpulser Group Name	25	114	256
TBUSE	Trunk Block Usage	048	7,200	7,680
TDCREG	Traffic Data Converter Registers	27	1,024	1,024
TGIDENT	Trunk Group Identity	01B & 04B	15	15
TKEQPD	Trunks Equipped	23	220	256
TORCNAME	TORC Identity	17	144	256
CAMAITK	CAMA Incoming Trunks	29	9	9
CORESΖ	Core Quantity Equipped	11	1	1
LCITGI	Largest Compiled ITGI	–	1	1
LCTRI	Largest Compiled TRI	–	1	1
RNTRI		–	1,024	1,024
SDRGRPTY	Sender Group Parity	25	10	10
TDCEQP	TDC Equipped	27	1	1
PBC DATA TABLES				

Fig. 5—PBC Data Tables

<u>INPUT/OUTPUT FACILITY</u>	<u>REQUIRED OR OPTIONAL</u>	<u>DATASPEED MODEL 40 CHANNEL NUMBER</u>
4A SWITCHING MAINTENANCE CENTER	REQUIRED	20
NETWORK MANAGEMENT	REQUIRED	22
DIAL ADMINISTRATION	REQUIRED	23
REMOTE 11/45 CPU	OPTIONAL	21
CENTRAL ANALYSIS BUREAU	OPTIONAL	25
TRUNK MAINTENANCE	OPTIONAL	26
TRUNK MAINTENANCE	OPTIONAL	27

Fig. 6—4A Peripheral Bus Computer Data Output Arrangements

AUTOMATIC: Every half-hour the total marker peg count and the per-train peg count for the preceding hour will be printed. Traffic separation data and an ineffective attempt report will be printed once every 24 hours for a 24-hour period scheduled by the Dial Administrator. Once a day month-to-date and busy hour for month-to-date IMA will be printed. Once a month busy hour and busy day totals will be printed, for ineffective attempts, for particular days of a 30-day period specified by the Dial Administrator. (Para. 5.04)

EXCEPTION: Based on variable thresholds set by the Dial Administrator, exception reports will be printed for 39 types of ineffective attempts on a 15-minute basis; for 12 types of common control equipment (minimum holding time, maximum holding time, deviation holding time, etc.) on an hourly basis; and for individual outgoing trunk group percent overflow on an hourly basis. Hourly exceptions are reported 48 times per day. (Para. 5.05)

SCHEDULE: Hourly reports may be scheduled, on the hour or the half-hour (maximum of 48 daily), for the following 8 items: (Para. 5.06)

- 1) Ineffective Machine Attempts (IMA)
- 2) Machine Load and Service Summary (MLSS)
- 3) Outgoing Trunk Group Data
- 4) Incoming Trunk Group Usage
- 5) Trunk Block Connector Peg Count
- 6) Special TELCØ Assignable Registers (80 TDC + 32 TUI)
- 7) Traffic Separation Data
- 8) Link Frame Sample Usage by Switch (cannot be scheduled for adjacent or overlapping hours)

DEMAND: schedular items 1-7, whether actually scheduled or not, may be demanded for any of the 48 hourly reports registered over the preceding 24-hour period.

IMA may be demanded for:

- preceding 15-minute period
- month-to-date for scheduled days
- previous month's scheduled days
- busy hour for month-to-date scheduled days
- previous month's busy hour for scheduled days
- current day
- previous day

Traffic Separation may be demanded for the previous day's total.

All reference data and any demandable Network Management data of the reference-or current-type may be demanded. Demand-schedule type Network Management data are not available. (Para. 5.07)

Fig. 7—Example of Dial Administration Data for Data Terminal Number 23

SECTION 13e(4)

SKED: DATPT
 DIAL ADMINISTRATION THRESHOLD VALUES
 OFFICE NAME DATE 05/07/74 TIME 0000

TRUNK CLASS	GRP	THRESHOLDS THRESHOLD
CL0		5
CL1		2
CL2		10
CL3		101
CL4		5
CL5		5
CL6		5
CL7		5

IMA TYPE	THRESHOLD
TIN	1.00
ROA	.60
PST	.20
PDT	.10
PER	.01
PMD	.01
FAT	.02
ML2	.01
M2F	1.35
D2F	.50
T2F	1.60
CAO	.01
MSC	.01
SOA	.01
FRM	.20
TNC	.10
AFR	.06
FRO	.01
VCA	.80
IFA	10.50
ICF	.01
I1L	1.50
TFA	10.50
TCF	.01
T1L	1.50
UCA	.30
MCA	.60
MCH	.50
WCC	.60
PDC	.30
NPA	.03
CPS	.20
CPD	.10
SMF	.01
SDP	.01
SCA	.01
SOV	.01
SOR	.01
SOD	.01

END DATPT

Fig. 8—Dial Administration Threshold Values

```

H 30REPT:MKRPC
MARKER PEGCOUNT REPORT
OFFICE PHLA PA SL41T DATE 05/21/74 PERIOD 1030-1130
MKRS IT 4012 MKRS TC 4326 MKRS TOT 8338
END MKRPC

H 60REPT:MKRPC
MARKER PEGCOUNT REPORT
OFFICE PHLA PA SL41T DATE 05/20/74 PERIOD 1100-1200
MKRS IT 5915 MKRS TC 4771 MKRS TOT 10686
END MKRPC
    
```

Fig. 9—Example of Marker Peg Count Report

```

H 12REPT:DTBPC

TRUNK BLOCK CONNECTOR PEGCOUNT REPORT
OFFICE PHLA PA SL41T DATE 05/20/74 PERIOD 0800/0900
    
```

		<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>
IT	0-9	330	552	521	535	303	490	625	493	192	108
	10-19	413	196	265	354	446	439	418	502	0	0
	20-29	0	0	0	0	0	0	0	0	0	0
TC	0-9	457	341	244	681	633	691	197	220	524	205
	10-19	201	245	354	424	363	193	445	625	0	0
	20-29	0	0	0	0	0	0	0	0	0	0

```

END DTBPC
    
```

Fig. 10—Example of Trunk Block Connector Peg Count Report

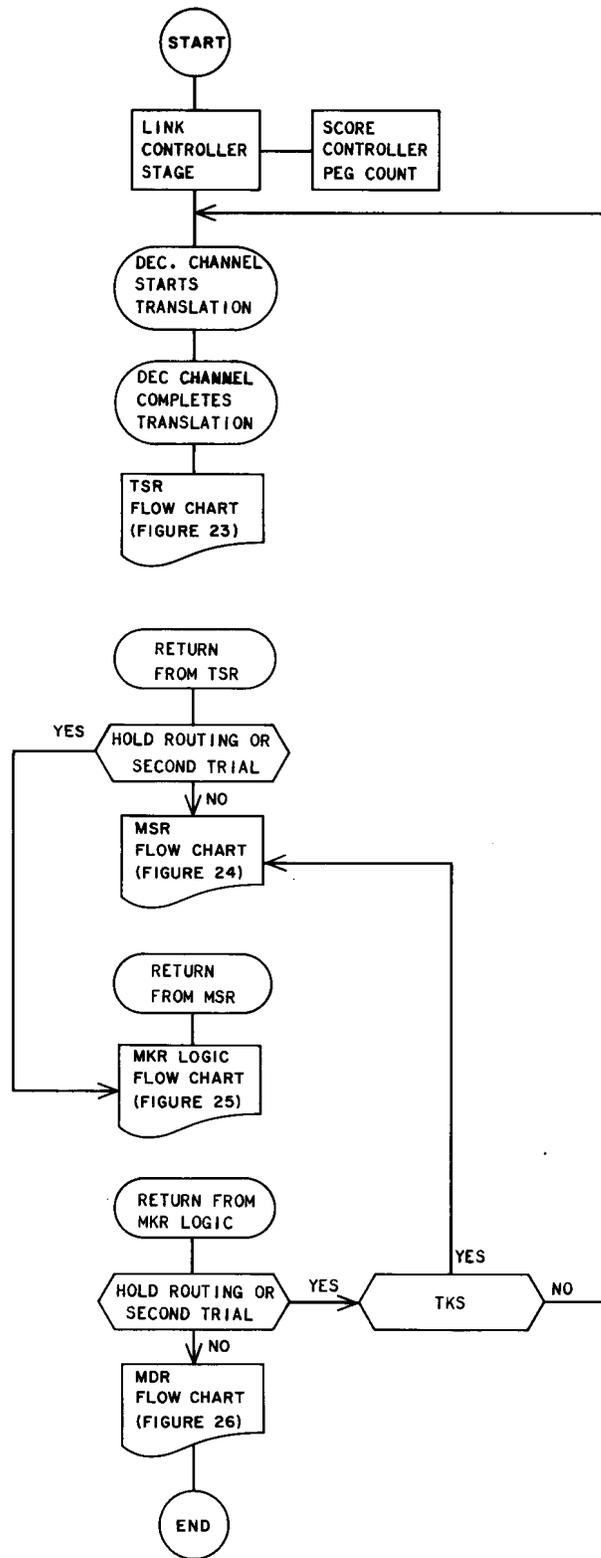


Fig. 11—Call Processing Guide

TRUNK SELECTION REPORT PROCESSING, FOLLOWING
 DECODER CHANNEL TRANSLATION DISTRIBUTION AND
 ASSOCIATED PBC 6-LINE DISTRIBUTION --

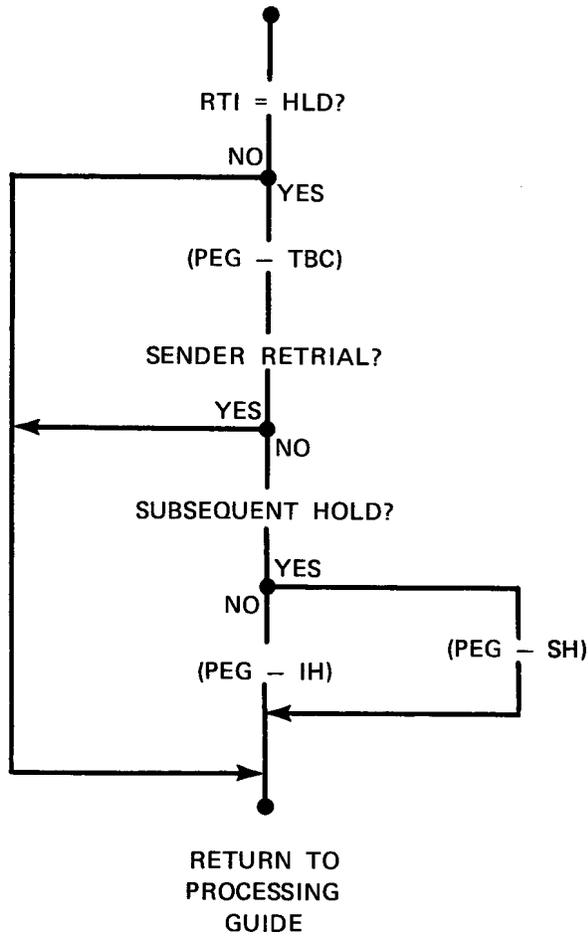


Fig. 12—Trunk Selector Report

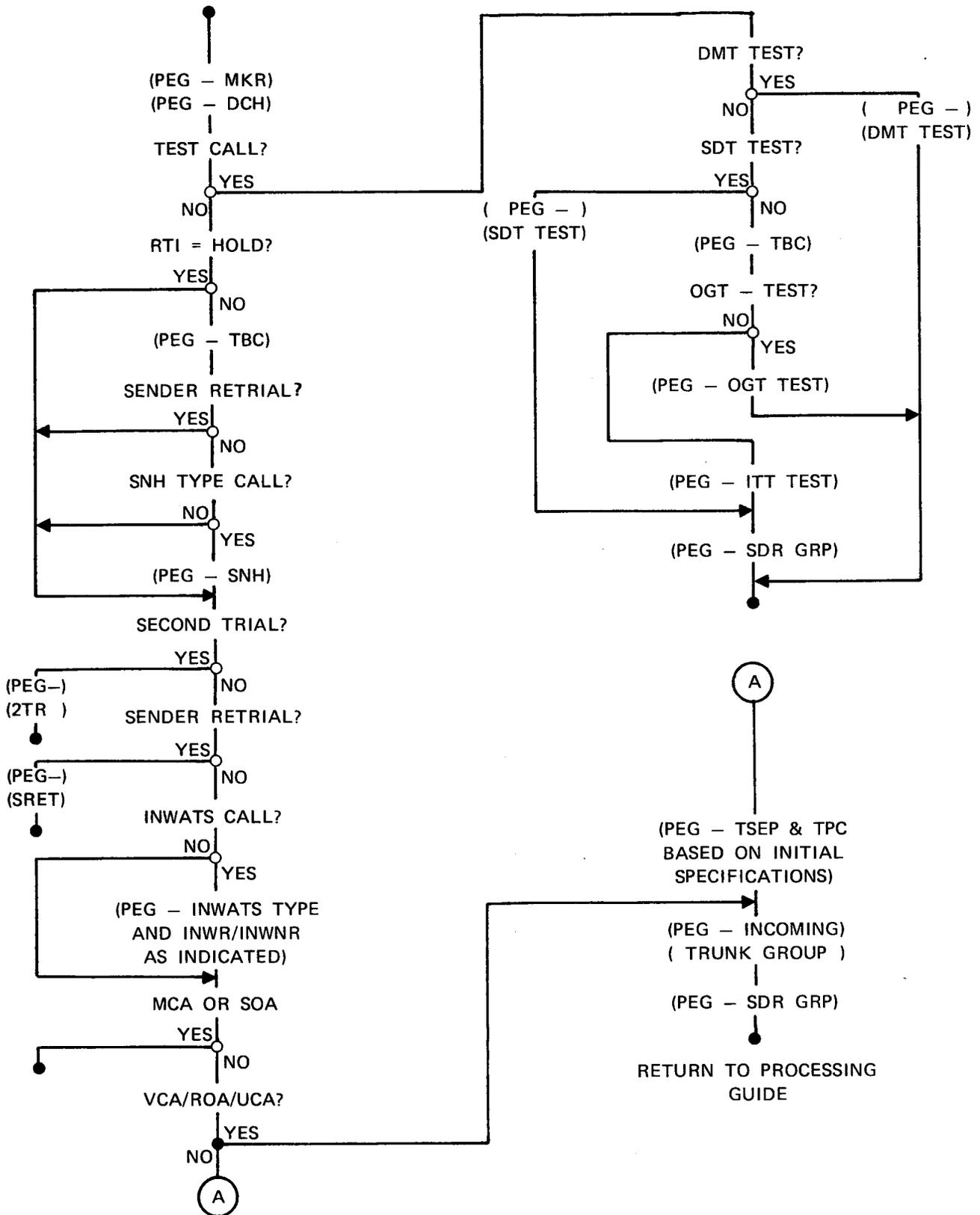


Fig. 13—Marker Selection Report (Decoder Channel Release)

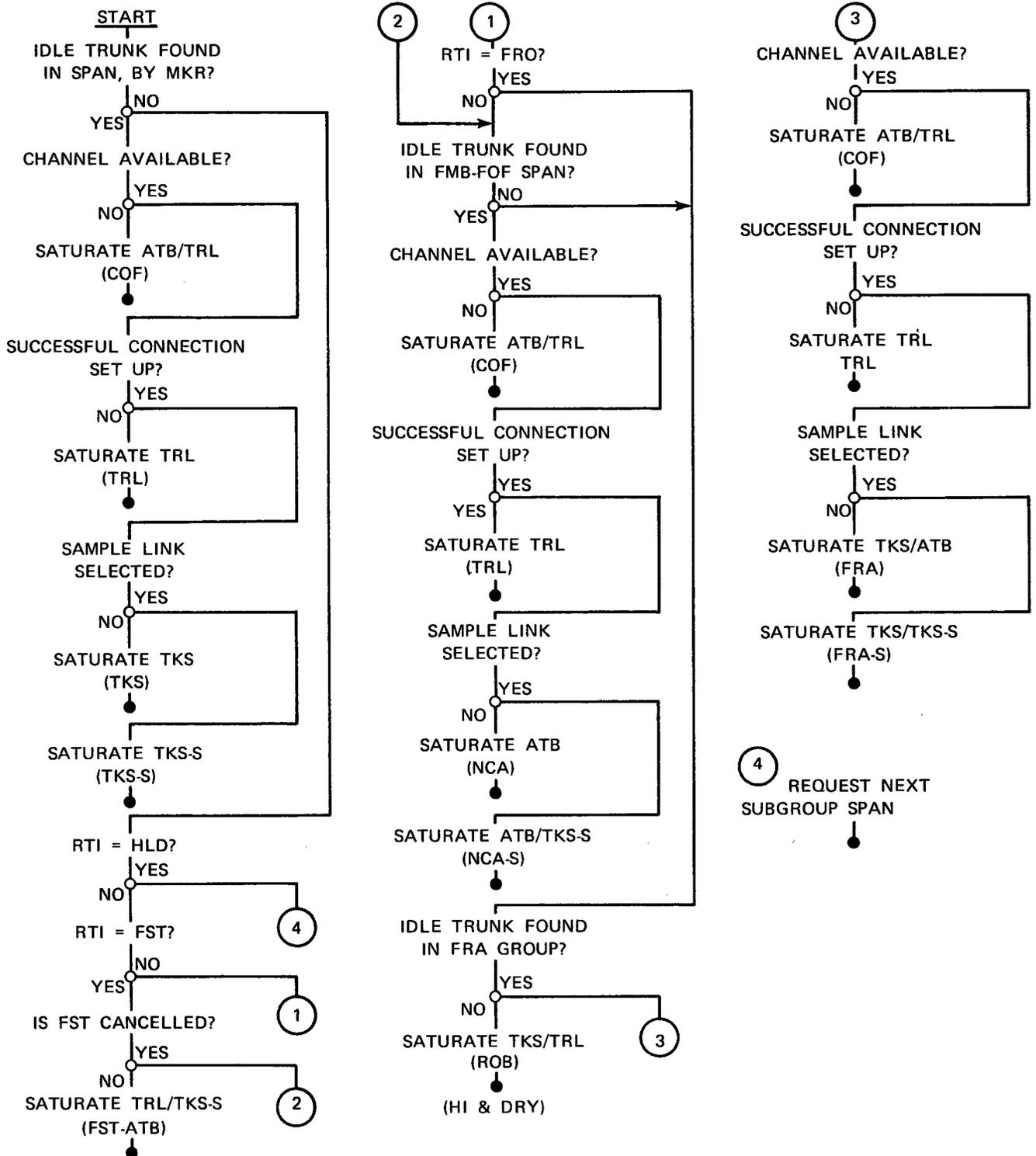


Fig. 14—Marker Logic

SECTION 13e(4)

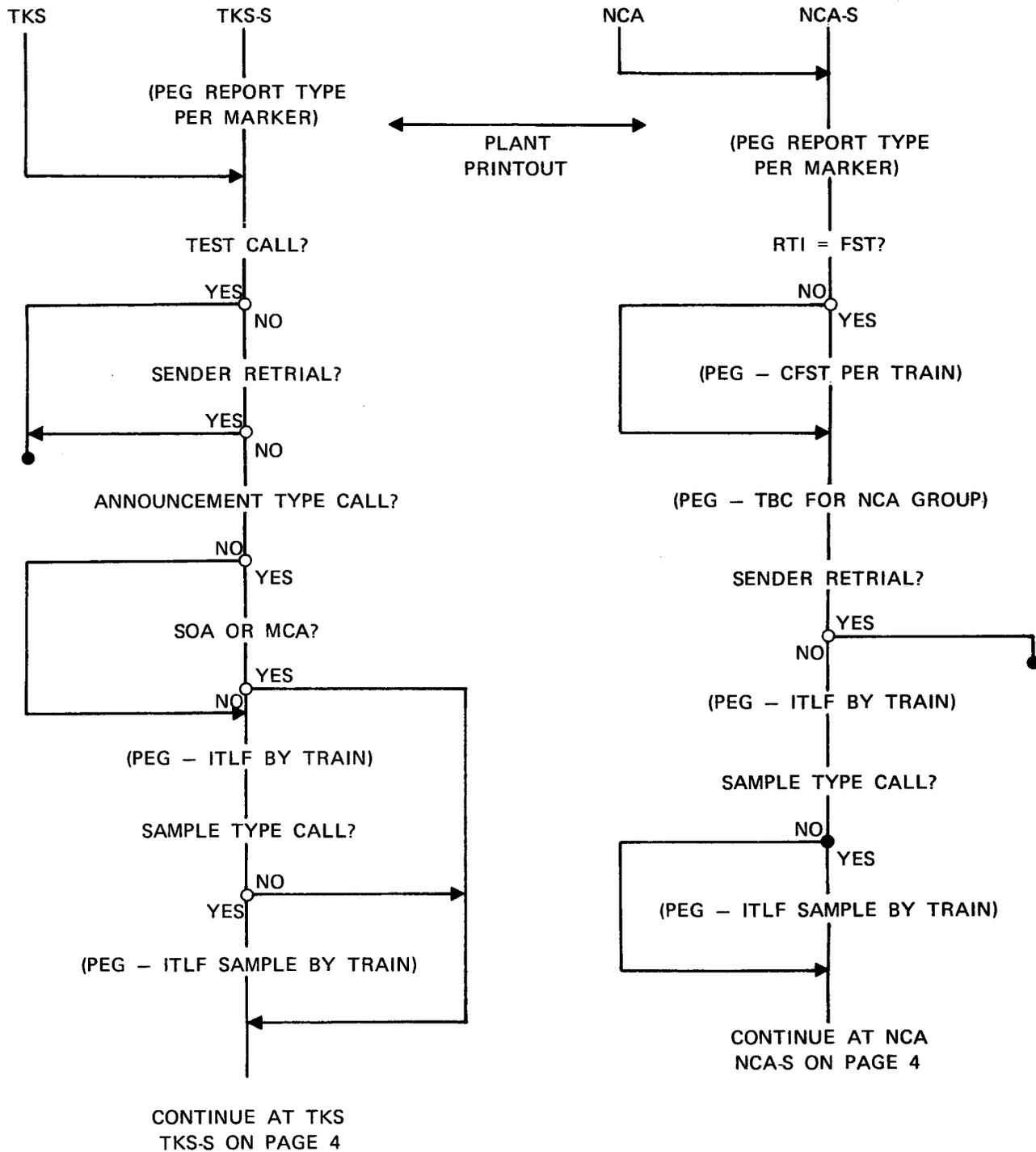


Fig. 15—Marker Disposition Report (Sheet 1 of 4)

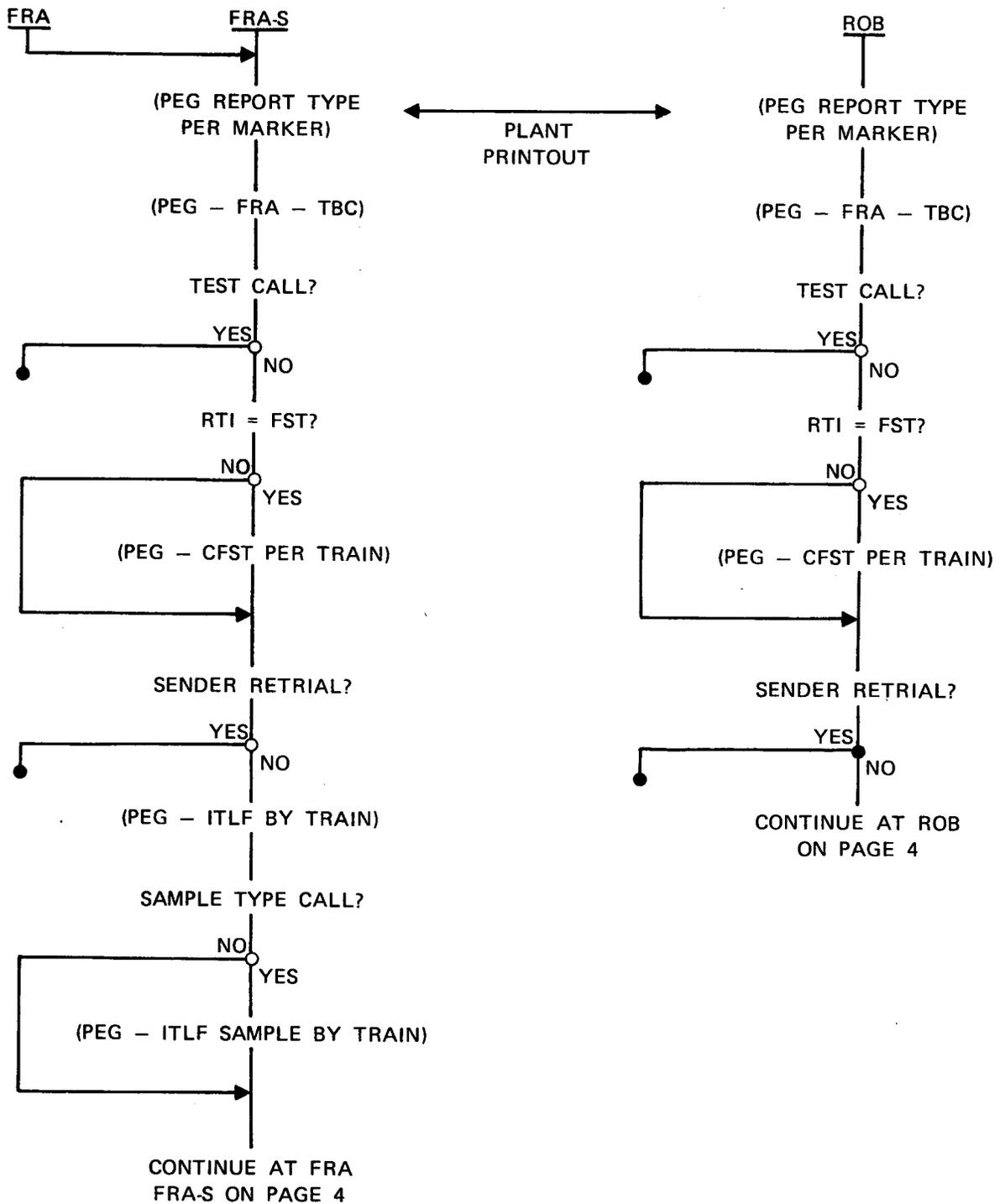


Fig. 15—Marker Disposition Report (Sheet 2 of 4)

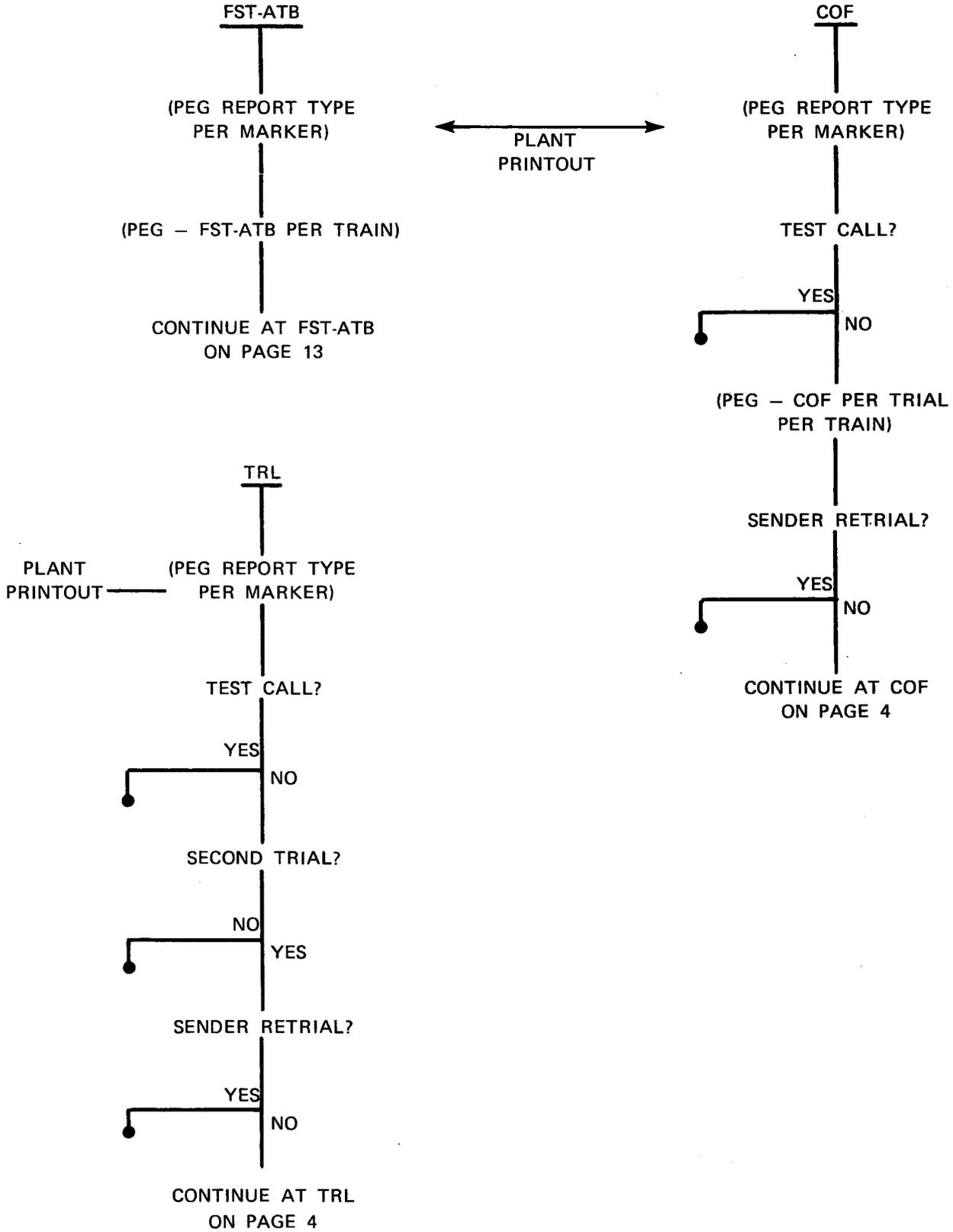


Fig. 15—Marker Disposition Report (Sheet 3 of 4)

SECTION 13e(4)

- A) The 4 call stage abbreviations represent:
- LCS = Link Controller Stage
 - TSR = Trunk Selection Report (Translation)
 - MSR = Marker Selection Report (DCH Release)
 - MDR = Marker Disposition Report (MKR Release)
- B) The MDR "report types" are as follows:
- TKS = Trunk Switched
 - TKS-S = Trunk Switched with sample link
 - NCA = Marker Routed to NCA
 - NCA-S = Marker Routed to NCA with sample link
 - FRA = Marker routed to FRA
 - FRA-S = Marker routed to FRA with sample link
 - COF = Channel Overflow (matching loss, fail to match)
 - TRL = Marker Trouble Release
 - ROB = Reorder Busy (FRA Trunk group busy) (High and Dry)
 - FSTB = Follow with 2 TR – all trunks busy
 - / = or
- C) Register abbreviations are as follows:
- MKR = Marker
 - DCH = Decoder Channel
 - TBC = Trunk Block Connector
 - TSEP = Traffic Separation
 - TPC = Through Peg Count (in/out/thru/tandem)
 - ITG = Incoming Trunk Group
 - SGP = Sender Group
 - ITLF = Incoming Trunk Link Frame
 - IH = Initial Hold
 - SH = Subsequent Hold
 - SNH = Subsequent Non-Hold
 - NCIT = No Circuit Intertoll
 - NCTC = No Circuit Toll Completing
 - SRET = Sender Retrial
 - FATR = Final Attempt Trouble Record
 - 2TR = Decoder Channel 2nd Trial
 - COF1 = Channel Overflow on 1st Trial
 - COF2 = Channel Overflow on 2nd Trial
 - (SVC) = Service Route
- D) Miscellaneous
- * = Hardware Register
 - ML = Matching Loss
 - FL = Fail to Match

Fig. 16—Glossary of Terms Used in PBC Peg Counts

$$\begin{aligned}
 \text{DCHPC} &= \text{CPC} + \text{DCH2TR} + \text{SRET} + \text{FATR \&} + \text{MCA} + \text{SOA} + \text{OGT} + \text{DMT} + \text{SDT} - \text{HITS \&} - \text{SADR} \\
 (\quad) &= (\quad) + (\quad) - (\quad) \\
 \text{MKRPC} &= \text{DCHPC} - \text{DTRL} - \text{MK-01} \\
 (\quad) &= (\quad) - (\quad) - (\quad)
 \end{aligned}$$

$$\begin{aligned}
 \text{SGPPC} &= \text{DCHPC} - \text{DCH2TR} - \text{SRET} - \text{OGT} - \text{DMT} - \text{MCA} - \text{SOA} \\
 (\quad) &= (\quad) - (\quad)
 \end{aligned}$$

$$\begin{aligned}
 \text{TBCPC} &= \text{MKRPC} + \text{FRA} + \text{NCA}^* \text{MD} + \text{SH} + \text{SNH} - \text{DMT} - \text{SDT} \\
 (\quad) &= (\quad) + (\quad) + (\quad) + (\quad) + (\quad) - (\quad) - (\quad)
 \end{aligned}$$

$$\begin{aligned}
 \text{ITLFPC} &= \text{MKRPC} - \text{TEST} - \text{SRET} - \text{ROB}^* \text{MD} - \text{FSTATB}^* \text{MD} - \text{TRL}^* \text{MD} - \text{ML}^* \text{MD} \\
 (\quad) &= (\quad) - (\quad)
 \end{aligned}$$

$$\begin{aligned}
 \text{TPC/TSEP} &= \text{DCHPC} - \text{TESTS} - \text{SRET} - \text{MCA} - \text{UCA} - \text{SOA} - \text{ROA} - \text{VCA} + \text{ML2TR} \\
 (\quad) &= (\quad) - (\quad) + (\quad)
 \end{aligned}$$

MOST OF THE ABOVE READINGS ARE OBTAINABLE DIRECTLY FROM DIAL ADMINISTRATION PRINTOUT REPORTS. ITEMS INDICATED (*) TYPE MARKER DISPOSITION REPORT CAN BE OBTAINED FROM THE HOURLY PLANT PRINTOUT (TERM #20). HITS MUST BE ESTIMATED.

Fig. 17—PBC Register Validation

SECTION 13e(4)

Week Schedules — UPD: UPDTE: WKSCH = (Sun., Mon., Tue., Wed., Thu., Fri., Sat.)

Examples:

1. If data is required on Monday to Friday only, the input message will be —

UPD: UPDTE: WKSCH = (N, O, O, O, O, O, N)

- O = odd schedule
- E = even schedule
- N = no schedule

2. If data is required on Monday to Friday with reduced data for Saturday and Sunday, both odd and even can be selected as follows:

UPD: UPDTE: WKSCH = (E, O, O, O, O, O, E)

3. Any variation is possible but all seven days must be assigned at one time.

Input message SKED: SCHEP would show under "Week Schedule".

WEEK SCHEDULE	
SUN	E
MON	O
TUE	O
WED	O
THU	O
FRI	O
SAT	E

Fig. 18—Example of Selection of Days of Week for Reports

Example —

1. Input Message — UPD: UPDTE: ADMGRP = (0,4,N,N,N,N,N,N)

Request a — SKED: SCHEP

and under ADMEN — GRPS SELECTED the following should be shown:

ADMEN—GRPS SELECTED	
POSITION	VALUE
0	0
1	4
2	N
3	N
4	N
5	N
6	N
7	N

Fig. 19—Example of Administrative Groups Selection

Month Schedule — Examples

1. Input messages — UPD: UPDTE: MOSOD = (RESET)
 UPD: UPDTE: MOSEV = (RESET)

2. Request new schedule listing — SKED: SCHEP and the following should be shown under "Month Schedule".

MONTH SCHEDULE

DAY	O	O	O	O	O	O	O	O	O	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	3	3
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1
ODD	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
EVEN	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

3. Assume this month starts on Wednesday and Saturdays and Sundays will be deactivated on the odd month.

Input messages — UPD: UPDTE: MOSOD = (04)
 " " " (05)
 " " " (11)
 " " " (12)
 " " " (18)
 " " " (19)
 " " " (25)
 " " " (26)

4. Request new schedule listing — SKED: SCHEP and the following should be shown under "Month Schedule".

MONTH SCHEDULE

DAY	O	O	O	O	O	O	O	O	O	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	3	3
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1
ODD	Y	Y	Y	-	-	Y	Y	Y	Y	Y	-	-	Y	Y	Y	Y	Y	-	-	Y	Y	Y	Y	Y	-	Y	Y	Y	Y	Y	
EVEN	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Fig. 20—Example of Selection of Days in Month for Accumulated Data

SECTION 13e(4)

Busy Hour Examples

Machine busy hour is 10:00 AM to 11:00 AM
Central Standard Time.

1. Input message —
 UPD: UPDTE: B HOUR = (1000)
2. Requesting a new schedule Listing would show
 the following:

BUSY HOUR 1000

Fig. 21—Example of Busy Hour Selection

Assume the monthly results will start on the 23rd of the month at 0200 Central Standard Time. Following input messages will be required:

- (a) UPD: UPDTE: STDAY = (0200)
- (b) UPD: UPDTE: STMON = (23)

By requesting a new schedule listing, the following information should be shown:

START REPORT DAY 0200
START REPORT MONTH 23
END SCHEP

Fig. 22—Example of Start Report Month and Day