TRAFFIC AND PLANT MEASUREMENTS
SOFTWARE SUBSYSTEM DESCRIPTION
NO. 3 ELECTRONIC SWITCHING SYSTEM

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1. GENERAL

1.01 This section provides a functional description of the software required to perform the traffic and plant measurements in No. 3 Electronic Switching System (ESS) offices.

1.02 When this section is reissued, the reason(s) for reissue will be listed in this paragraph.

1.03 Part 5 contains a glossary of terms, abbreviations, and definitions necessary for comprehension of the information contained in this document.

1.04 The following Bell System Practices provide background information related to No. 3 ESS traffic and plant measurements:

SECTION	TITLE
233-151-105	Call Processing Software Sub-System Description, No. 3 ESS
233-152-120	Teletypewriter Software Sub-System Description, No. 3 ESS
233-152-125	System Control Software Sub-System Description, No. 3 ESS
233-152-130	Tape Operations Software Sub-System Description, No. 3 ESS
233-190-033	Autoconnect Arrangements, No. 3 ESS

1.05 The following programs provide additional information relative to the section.

(a) Common Base Level Monitor Program (CBLM), PR-1C950, is the focal point of the base level system and determines the sequencing of all programs.

(b) Application Portion of the Base Level Monitor Program (BLMMA), PR-3H004, performs two basic functions:

(1) BLMMA provides tables that are used by CBLM.

(2) BLMMA invokes routines that are executed once per base level loop.

(c) Traffic and Plant Measurements Program (TRAFIC), PR-3H008, is used to perform the traffic and plant measurements in a No. 3 ESS office.

(d) Traffic Subroutines Program (TRSUBS), PR-3H017, is a collection of resident subroutines accessed by the TRAFIC program in performing the traffic and plant measurements.

(e) Traffic Program—Nonresident Portion (NRTRAF), PR-3H086, is a collection of nonresident subroutines accessed by the TRAFIC program in performing the traffic and plant measurements.

(f) Input Monitor Program (INPUT), PR-3H160, is the input supervision distributor and contains the associated subroutines. The function of the input monitor is to distribute service requests and supervisory state changes to the appropriate processing routines and to control the scanning for these requests and state changes.

(g) Application Temporary Store Definition, Call Store, (ATSD), PR-3H011, defines symbols which may be used to reference individual words or blocks of words in the application portion of call store. It also defines the clearing level, identifies which program to reference, and gives more information of individual block contents.

(h) Common Temporary Store Definition (CTSD), PR-1C959, consists of a series of block allocations of temporary store.

(i) Common Tape Handler Program (CTAPH), PR-1C957, performs various tape operations requested by client programs. These operations include such functions as opening and closing files, read and write operations, and positioning of the tape. The tape handler is resident and portions are executed at base level, while other portions are executed at interrupt level.

(j) Application Teletype Compatibility Program (TTYAPP), PR-3H015, implements the various teletypewriter operations requested by the client programs. These operations include such functions as processing the various output message calls used by the No. 3 ESS common system progams, removing and restoring messages, and generating the standard office identification text which includes the current data and time.

1.06 The procedure designated "traffic and plant measurements" is the process of automatically obtaining and summarizing traffic usage and call count information on originating, outgoing, and terminating traffic processed by a central office.

1.07 The traffic counts in a No. 3 ESS office are incremented by various software programs while performing not only the processing of a call through the office but also while performing the administrative functions of the office.

1.08 The TRAFIC program analyzes this traffic information and extracts the necessary information at different scheduled times for the printing of traffic reports by the teletypewriter or for updating a tape.

1.09 The network administration and maintenance measurements are described in Part 4. An index of the network administration measurements is provided in Table A, and an index of the network maintenance measurements is provided in Table B.

1.10 The traffic (TRAFIC) program is in two main sections, traffic monitor and traffic measurements. The traffic monitor section determines which traffic tasks should be continued or begun at a certain system time. The traffic measurements section actually increments the traffic counters. The TRAFIC program (Fig. 1) is entered at TRAFMON each base level loop from the base level maintenance monitor (BLMMA) program and continues to the input monitor when its tasks are completed.

1.11 The traffic control block (TRAFBLK), Fig. 2, is a 16-word block in memory which stores information for use in the administration of traffic functions.

1.12 As traffic and plant measurements are being performed, information is stored in the TRAFBLK (Fig. 2) to indicate the progress of these measurements. Some of these measurements require more time to complete than can be allowed in one base level loop. When a measurement is being performed that takes longer to complete than is allowed in one base level loop, a real-time break is taken, and on the next base level loop control is returned to this measurement at the location where it was left (as indicated by the progress mark in the TRAFBLK). This procedure is repeated as many times as necessary to complete the measurement.

1.13 The base level loop (Fig. 3) is a major software loop of nontime-critical programs which include all functions not performed during interrupt level. It includes most call processing programs and those maintenance tasks which can be deferred.

2. SOFTWARE STRUCTURE

TRAFFIC MONITOR ROUTINE

2.01 The traffic monitor is divided into two parts. The first part, usage monitor (USEMON) routine (Fig. 4 through 13), controls the 10- and 100-second usage measurements. The second part, daily, busy, and quarter hour traffic monitor (DBQMON) routine (Fig. 14 through 32), controls all the other traffic tasks. Each part is entered every other time the TRAFIC program is called by BLMMA. If the USEMON routine does not use all the time allocated to traffic routines, the DBQMON routine is entered in that same base level loop to use the available time remaining.

2.02 The purpose behind separating usage tasks from other traffic tasks is to allow the types of tasks to be performed almost simultaneously: for example, the 10-second usage measurements and the daily printout. The daily printout may take minutes to prepare while the 10-second usage measurements are performed in different base level loops and do not have to wait until the daily printout is completed. If the daily printout is being performed, the quarter-hour printout will not be performed.

A. USEMON

2.03 The USEMON routine (Fig. 4 through 13) first sets the MONA bit in the traffic control block (TRAFBLK). This causes the traffic monitor to invoke the DBQMON routine the next base level loop the TRAFIC program is entered.

2.04 The USEMON routine then decides if the 100-second usage measurements should be started, and in the event they should be started, it sets the S100 bit in the TRAFBLK (Fig. 2). Therefore, if the 10-second usage measurements should also be continued (or started), the 100-second measurements will not be skipped because of a time charge. Next, the USEMON routine decides whether to continue or begin 10-second usage measurements. In the event the 10-second usage measurements are not continued or begun, it decides whether to continue 100-second usage measurements. If not, it finally examines S100 to see if 100-second usage measurements should be started.

B. DBQMON

2.05 In the DBQMON routine (Fig. 14 through 32), the MONA bit in the TRAFBLK is reset first. This permits the USEMON routine to be invoked the next time BLMMA calls in the TRAFIC program.

2.06 The DBQMON routine then processes TRAFPM3, the lowest level traffic progress mark. If it is not zero, the TRAFIC program is performing some output action, (such as a teletypewriter printout or writing on a tape) and the program branches to continue this action. If TRAFPM3 is zero, TRAFTASK is processed. It is used to identify the traffic task currently in process. If TRAFTASK is zero, there is no further action required and the program begins the timing routine.

TRAFFIC MEASUREMENTS

2.07 There are two main sections of usage measurements performed, the 10-second usage measurements (Fig. 5) and the 100-second usage measurements (Fig. 6 through 13). These measurements are invoked by the USEMON subroutine with the 10-second usage measurements having priority over the 100-second usage measurements. The group's 10- and 100-second measurements cannot be completed in one base level loop. These measurements are continued whenever the USEMON subroutine receives control. Ten-second usage measurements may interrupt 100-second usage measurements. When the 10-second usage measurements are completed, the 100-second usage measurements will continue.

2.08 There are also two other measurements which are invoked by call processing; class of service measurements and the incoming and intraoffice intercept measurements.

A. 10-Second Usage

2.09 The 10-second usage measurements (Fig. 5) include only service circuit usage. This measurement is performed on a per-group basis. The maintenance-busy counts are not included in this measurement.

B. 100-Second Usage

2.10 Every 100 seconds, all stable calls in the office are identified by type:

(a) Intraoffice

(b) Revertive

(c) Outgoing

(d) Tandem.

There are four stable usage registers pegged corresponding to these four types of calls.

2.11 Next, the A-link usage measurements (Fig. 7) are performed. There is one A-link usage register per concentrator beginning with concentrator group 1, concentrator 0. This subroutine counts the number of active bits (by concentrator) and adds the result to an A-link usage traffic register. Maintenance-busy A-links are also included in this measurement.

2.12 Once the A-link usage measurements are complete, the B-link usage measurements (Fig. 8) are performed. There is one B-link usage register per network. This subroutine counts the number of active bits (by network) and adds the result to a B-link usage traffic register. Maintenance-busy B-links are also included in this measurement.

2.13 Terminal usage measurements (Fig. 9) are performed on the TEN's or group and member numbers specified in the list of the MTI. This subroutine checks each entry in the list to determine whether it is a line, trunk, or service circuit and finds the current status of that terminal. If a line is normal-busy or a trunk is active-busy or high-and-wet, it causes the register associated with that terminal to be pegged (incremented by 1).

2.14 The 100-second usage measurements also perform call forwarding register usage measurements (Fig. 10) and the out-of-service maintenance usage measurements (Fig. 11).

2.15 The trunk and PBX group usage measurements are the last measurements performed. The trunks are separated into two sections (group numbers 128 through 191 and group numbers 192 through 255). The PBXs are left in one section. Maintenance-busy circuits are included in these measurements.

C. Class-Of-Service

2.16 These are four major class originating registers and one terminating register. There are 31 possible classes of service. To measure the number of originating or terminating calls to a particular class of service, the class may be assigned to one or more traffic registers. The class-of-service measurements subroutine in this program is invoked by call processing for all originating and terminating calls. This verifies whether the major class of the calling or called party has been assigned to a traffic register and if so, pegs the register.

D. Incoming and Intraoffice Intercept

2.17 To direct a call to a particular treatment, No. 3 ESS uses a route index. The route index is assiged in translation to point to a final destination such as announcement, reorder, etc. To count the number of calls processed by a specific route index, there are three intraoffice and three incoming intercept registers. Any route index may be assigned to a register. Call processing invokes the subroutine in this program to verify whether route index is assigned to a register and to peg the register.

TIMING ROUTINES

2.18 The timing routine (Fig. 16 through 21) determines which traffic tasks, if any, should be started at the current system time. There are four types of timed tasks:

(a) Quarter-hour tasks

(b) Busy-hour, C-schedule, and weekly tasks

(c) Daily tasks

(d) Blocked dial tone and translation error tasks.

2.19 Quarter- and busy-hour and daily tasks may be scheduled for the same time. If scheduled for the same time, the quarter- and busy-hour tasks are performed first. Dial tone blockage and translation error tasks are skipped if it is time to perform the others and will not be invoked again until the others are completed.

2.20 The quarter-hour tasks are invoked if the current system time in minutes equals 59, 14, 29, or 44. The busy-hour tasks are invoked if the current system time in minutes equals 00 or 30. The daily tasks are invoked if the current system time matches the daily print-out time. If neither the quarter-hour, busy-hour, or daily tasks are invoked and the current system time in seconds equals 00 or 30, the blocked dial tone and translation error tasks are invoked.

TRAFFIC ACTIONS

2.21 The traffic actions take the traffic measurement sections in memory and the group measurement sections and may either write them onto tape, print them on a teletypewriter, or clear them. These actions are invoked by the scheduled task routines at the end of scheduling periods, such as a busy hour (H-task).

2.22 Only one traffic action may be performed at one time, ie, traffic data may not be printed on a teletypewriter and written on a tape at the same time, nor may traffic data be printed over more than one teletypewriter channel at the same time except the quarter hour data.

A. Register-to-Teletypewriter Printing

2.23 The REG_TO_TTY routine has three functions. It prints out traffic registers on a teletypewriter, clears traffic registers, and controls the printing out of weekly subtotals along with the daily schedule. It handles all measurements except group measurements.

2.24 This routine is invoked to print quarter-hour, busy-hour, continuous nonbusy-hour, daily, and weekly data on either a dedicated traffic teletypewriter or a partially dedicated teletypewriter or a nondedicated teletypewriter when the dedicated bit of traffic is set at the end of any traffic measurement period. While printing is in process, the TRAFIC program does not use any time allotted to DBQMON in the base level loop; it continues to the input monitor. After a line or section has been completely printed, the teletypewriter output routines return control to designated spots in the REG_TO_TTY routine and are assigned a new section to print at that time.

2.25 This routine is used to clear traffic registers at the beginning of a traffic measurement period, after a section has been printed, at the end of a weekly period, or when printing has been aborted. It does not take a real-time break between clearing the measurement sections.

2.26 After the measurements on the daily schedule have been printed, REG_TO_TTY routine prints the current subtotals of the registers assigned to the weekly schedule. These registers are not cleared after they are printed unless it is Sunday.

B. Register-to-Tape Writing

2.27 The REG_TO_TAPE routine is invoked at the beginning and end of a busy hour if the No. 3 ESS office has either a nondedicated teletypewriter, or a partially dedicated teletypewriter, or a dedicated teletypwriter when the dedicated bit of traffic is not set but zero. At the beginning of a busy hour it clears the traffic registers, and at the end it writes the traffic registers onto the cartridge tape.

2.28 This routine examines each section of traffic measurements and handles all except the group data. If the section is assigned to the current schedule, it is moved into the tape buffer. Once the buffer is full, it is written onto the tape. The write causes the only real-time break in this routine. If a write is aborted, the sections assigned to the current schedule are cleared only from then on. There is no need to take a real-time break simulating a write since there should be very few writes per busy hour and each write is very fast.

C. Group-to-Teletypewriter Printing

2.29 The GRP_TO_TTY routine prints and clears or just clears the group data. It is invoked by the REG_TO_TTY routines to handle the group data only.

2.30 This subroutine examines the translation data for each group. Once two groups assigned to the current schedule have been found, it either prints and clears the group measurements or clears the groups only and then continues to examine more groups.

2.31 The GRP_TO_TTY routine is called by the teletypewriter printing programs as a subroutine; therefore, it may not take real-time breaks. The group data is examined until two groups assigned to the current schedule are found. Their traffic registers are passed to the teletypewriter printing programs, and a real-time break occurs as a line of data is printed. The length of this real-time break is the printing time. If a print is aborted or the registers are being cleared only by choice, this real-time break is simulated. After every other group assigned to the current schedule, this subroutine waits the estimated printing time before it examines another group. This prevents uneven skew in the data printed.

D. Group-to-Tape Writing

2.32 If the group data is being written on tape, the GRP_TO_TAPE routine takes a one base level loop break after 16 groups have been examined. It also takes a one base level loop break between the group sections. This is done to prevent the program from using up too much time in one base level loop as it examines group data. Each group, whether assigned to the current schedule or not, requires several time-consuming translations. This method spreads the time consumed over several base level loops.

2.33 This routine writes and clears or just clears the data group. It is invoked by the REG_TO_TAPE routine to handle the group data only.

STORING AND PRINTING THE TRAFFIC MEASUREMENTS

2.34 The busy-hour traffic measurements may be stored after each busy hour on the cartridge tape device associated with each No. 3 ESS office. There is one printout each day on the remote traffic teletype of the data for the busy hours of that day. Network administration may schedule the printout between 10 pm and 6 am depending on the size of the office and the number of offices sent to one remote teletypewriter. It must be taken into consideration that diagnostics will immediately run after the printout. In a large office where the diagnostics will take a long time, this might run into the early morning busy hours. In this way the report times for different offices may be staggered so one remote traffic teletypewriter may monitor several No. 3 ESS offices. Also, the most time-consuming traffic task can be performed at night and not interfere with other users of the miscellaneous channel. If the miscellaneous channel should be in use at the report time preventing the establishment of a connection to the traffic teletypewriter, the printout program waits up to 10 minutes for the channnel to be free. If it does not become free, the traffic reports are printed via the maintenance channel to ensure that data is not lost. The data to the maintenance channel has been delayed already and may be delayed some more, therefore, there is skew on the data.

2.35 Traffic measurements on the daily schedule are not saved on the cartridge tape. The end of the daily schedule is the same as the report time assigned to the busy-hour schedule. The daily counts are accumulated up to that time and printed along with the busy-hour reports. After being printed, the daily registers are cleared to begin a new daily period.

2.36 The weekly traffic measurements are not made continuously; therefore, they do not need to be stored on the cartridge tape. They are made only for the half-hours specified by network administration and accumulated for one week beginning after the scheduled printout Sunday night. Each night the printout includes the current total of the traffic registers assigned to the weekly schedule. The registers are cleared only after the Sunday night printout.

2.37 The dial administrator cannot access the traffic data during the day. Each day there is only one printout of all the traffic data for the office. Critical service measurements are provided on the Q-schedule which may be requested at any time.

NETWORK ADMINISTRATION TELETYPEWRITER

2.38 Network administration data is printed on a teletypewriter designated as the network administration teletypewriter. The No. 3 ESS may be connected to the network administration teletypewriter by a dedicated link. In this case, one teletypewriter would be required for each No. 3 ESS served.

2.39 A No. 3 ESS office has the possibility of various teletypewriter and traffic configurations. Each configuration has advantages and disadvantages over the other configurations and are defined in Table C.

2.40 However, No. 3 ESS offices also can be arranged to share one teletypewriter. This arrangement is possible due to the ***autoconnect*** feature of the No. 3 ESS.

2.41 Autoconnect is an arrangement in which the No. 3 ESS automatically dials a telephone number assigned to the network administration teletypewriter at a time predetermined by the network administrator. The teletypewriter answers the call and the No. 3 ESS prints the scheduled data. When printing is complete, the No. 3 ESS disconnects and the link between the ESS and the teletypewriter is taken down.

2.42 When the network administrator wishes to input teletypewriter messages to the No. 3 ESS under the autoconnect arrangement, the administrator dials a telephone number assigned to the No. 3 ESS. Upon completion of the call, the ESS returns a tone and the administrator disconnects. This procedure causes the ESS to dial the number of the network administration teletypewriter. Upon answer by the teletypewriter, a link is established between the ESS and the teletypewriter.

2.43 Under the autoconnect arrangement, network administration data is usually stored on magnetic tape at the No. 3 ESS. The ESS calls the network administrator teletypewriter at a scheduled time and prints all data accumulated during the previous collection interval. The network administrator may schedule the time at which each ESS calls the teletypewriter to print data. This schedule enables several ESSs which share the teletypewriter to report data without interfering with each other.

2.44 Under the autoconnect arrangement, service order and test bureau personnel may share the same teletypewriter channel with network administration. If the teletypewriter channel is shared, only one group at a time can have access to the channel.

2.45 If teletypewriter channels are dedicated or arranged in the partially dedicated autoconnect option, data may not be stored on magnetic tape but rather is printed at the end of a collection period. Also, the service order and test bureau personnel do not share the channel with network administration.

2.46 For more information on the autoconnect arrangements, refer to Section 233-190-033, Autoconnect Arrangements, No. 3 Electronic Switching System or Section 233-020-254, Teletypewriter Arrangements, No. 3 Electronic Switching System.

3. TRAFFIC AND PLANT MEASUREMENTS

MEASUREMENT SCHEDULE TASKS

3.01 Network administration and maintenance measurements in the No. 3 ESS can be assigned to five different measurement schedule tasks. A specific measurement can be assigned to only one task at a time. The tasks are the quarter-hour (Q), the busy-hour (H), the continuous nonbusy-hours (C), the daily (D), and the weekly (W). The dial tone blockage and translation error (DTB) tasks are run every 30 seconds; therefore, they are not scheduled and only print to the maintenance channel.

3.02 These tasks are invoked by the timing routine to interpret the traffic control block (TRAFBLK), Fig. 2, and act accordingly. The task routines shift data, clear traffic registers, invoke output routines, and begin and end traffic measurement periods.

3.03 These measurement schedule tasks can be affected by a real-time break taken by an output routine. Before an output routine is invoked, TRAFTASK in the TRAFBLK (Fig. 2) is set to a progress mask which indicates the next processing step. At the completion of an output action, TRAFTASK is used to return to the next step of a task routine. These tasks also set TRAFSKED (2.06) in the TRAFBLK to the traffic schedule in process as a reference to the output subroutines.

3.04 The following describes each measurement schedule task.

A. Quarter-Hour Tasks (Q-Tasks)

3.05 The quarter-hour routine (Fig. 17) adds the current quarter-hour data to the busy-hour totals, shifts the past quarter-hour data, and determines if the current quarter-hour data should be printed and the channel on which it should be printed. It then invokes the printing subroutine.

3.06 The measurements assigned to the Q-tasks represent data for a 15-minute period. If the network administration teletypewriter is partially dedicated autoconnect or dedicated, the network administrator may elect to have Q-task reports automatically generated every 15 minutes on the network administration teletypewriter. If the teletypewriter is in the nondedicated autoconnect mode, the reports cannot be generated automatically. In either case, the network administrator can manually request a printout of Q-task reports at any time. If a printout is requested, the totals since the last 15-minute collection period and the totals for the past three 15-minute collection periods are reported. Q-task data is normally printed every 15 minutes on the maintenance teletypewriter, but the maintenance force may inhibit this printout by the use of a teletypewriter input message.

B. Busy-Hour Tasks (H-Tasks)

3.07 At the end of a busy hour, the TRAFIC program (Fig. 18) determines whether to write the measurements on tape, or print them out on a traffic teletypewriter, and invokes the appropriate output routine. At the beginning of a busy hour, the TRAFIC program clears the traffic registers on this schedule.

3.08 The measurements assigned to the H-task represent data for a one-hour period. At the beginning of an H-task collection period, all registers assigned to the H-task are cleared. If the network administration teletypewriter is dedicated or partially dedicated autoconnect and traffic is dedicated, registers are read and printed at the end of the collection. If the teletypewriter is nondedicated autoconnect or partially dedicated autoconnect and traffic is nondedicated, registers are read and readings are transferred to magnetic tape at the No. 3 ESS. The autoconnect feature enables the No. 3 ESS to call the network administration teletypewriter at a scheduled time and to print all H-task data collected during the previous collection interval on magnetic tape. All H-task data collected on magnetic tape will be printed beginning at the time specified as the end of the D-task collection (3.11). The network administrator may schedule up to 23 one-hour collection periods for H-task data. If the autoconnect method is utilized, there is no limitation on the number of collection periods per day as long as it does not exceed 23. Each collection period may be consecutive but can not overlap with another H-task collection period.

C. Continuous Nonbusy-Hour Tasks (C-Tasks)

3.09 The measurements assigned to the C-task (Fig. 18) represent data which can be collected for one or more hours. This task should be used for trunk measurements required outside of normal H-task collection periods. At the beginning of the C-task collection period, all registers assigned to the C-task are cleared. At the end of the collection period, the registers are read and the data is printed on the network administration teletypewriter. ***The C-task is available only when a partially dedicated autoconnect or dedicated network administration teletypewriter and dedicated traffic are used.*** When nondedicated autoconnect or partially dedicated autoconnect and traffic not dedicated is used, measurements normally assigned to the C-task must be assigned to other tasks.

D. Daily Tasks (D-Tasks)

3.10 The daily routine (Fig. 20) determines whether the daily data should be printed directly from the traffic registers to a dedicated teletypewriter or retrieved from tape and printed on a nondedicated teletypewriter. The correct output routine is then invoked. The daily routine also determines if it is Sunday and recycles the registers on the weekly tasks.

3.11 The measurements assigned to the D-task represent data collected for 24 hours. The network administrator may begin one collection period and end another at any time between 10 pm and 6 am. If an autoconnect teletypewriter arrangement is used, the No. 3 ESS will call the network administration teletypewriter and print the D-task report upon the completion of the scheduled collection period. During this connection, all data stored on magnetic tape will also be printed. The operation of the D-task routine is the same for dedicated and autoconnect teletypewriter arrangements.

E. Weekly Tasks (W-Tasks)

3.12 Every half-hour, the TRAFIC program (Fig. 19) checks for the beginning or end of a weekly period, and turns the weekly measurements on or off, accordingly.

3.13 The measurements assigned to the W-task represent data collected for any number of half-hour periods per day. The network administrator assigns the half-hour periods collected. The periods must be the same for each day of the week. The registers on the W-task are read, printed on the network administration teletypewriter, and cleared once a week on Sunday night. Each night, the W-task registers are read and printed. This printout represents totals from the last Sunday night to the day of the printout. The operation of the W-task routine is the same for dedicated and autoconnect teletypewriter arrangements.

F. Dial Tone Blockage And Translation Error Tasks (DBT Tasks)

3.14 The dial tone blockage and translation error tasks (Fig. 21) are performed every 30 seconds except when the Q, C, D, or W tasks are being performed.

3.15 The dial tone blockage task is performed first. The dial tone blockage holding registers are examined, and if not empty, the contents are printed on the maintenance teletypewriter. The translation error block is then examined. If it is not empty, its contents are printed on the maintenance teletypewriter.

3.16 Data on the H-, C-, and W-tasks can be collected beginning on any clock hour or half-hour. For example, a collection could begin at 4 pm or 4:30 pm, but could not begin at any time in between.

3.17 If the half-hour tasks (H-, C-, and W-tasks) begin or end at the same time, then the order in which the registers are zeroed and the tasks are printed is the H-task first, followed by the C-task, and then the W-task.

3.18 As mentioned in 3.06, Q-task reports can be requested by the network administrator at any time, whether they have been scheduled to print automatically or not. However, no other reports can be requested by the network administrator. The other reports are printed only at their scheduled times.

4. OFFICE TOTALIZING MEASUREMENTS

OFFICE TOTALS (OFT)

4.01 The office total measurements provide data on valid and invalid call attempts processed by No. 3 ESS. Traffic measurements are made on originating and terminating calls as well as the four basic call types; intraoffice, outgoing, incoming, and tandem calls. The custom calling features, affect several of these measurements.

4.02 The office totals also include the network matching loss measurements and a series of custom calling measurements. Ineffective call attempts are separated by the basic call types and by the stage of call processing. All of the office total measurements are peg counts except for those specified as usage measurements.

4.03 Office total measurements can be assigned to either the H-schedule or the C-schedule. It is recommended that these measurements be assigned to the H-schedule. The first sixteen measurements (OFT01 through OFT16) also appear on the Q-schedule where they represent 15 minutes of data collection. The Q-schedule registers are added to the H-schedule register every 15 minutes. These registers on the H-schedule represent the sum of the Q-schedule collections for the period of the H-schedule.

OFT01—Average Dial Pulse Dial Tone Delay

4.04 This count is a computation of the total dial tone delay for dial pulse originations on lines marked dial pulse divided by total dial pulse originations and expressed in units of seconds times ten. Total dial tone delay for dial pulse originations is a sum of the dial tone delay for each attempt originated from a dial pulse line. ***In No. 3 ESS, a dial tone speed test is performed on every originating call.***

4.05 When a line goes off-hook and is first recognized by the line scanning subroutine, a service request entry is placed in the input hopper and the call is time stamped (time of origination is noted). On the next base level loop, the line is rescanned. If it is no longer off-hook, it is considered a hit, is removed from the hopper, and is not counted in any dial tone speed measurements. If it is not a hit, the call is assigned to a transient call record (TCR) and a customer dial pulse receiver (CDPR-DP).

4.06 A path to the CDPR-DP is established. Before dial tone is issued, however, a continuity test is performed to find if the line has abandoned. If this line has abandoned, the dial tone speed test ends. If the line has not abandoned, the dial tone speed test ends one base level loop after the order is given to issue dial tone.

4.07 Dial tone delay is calculated to be the time of the end of the dial tone speed test minus the time of the original time stamp plus a ***line scanning delay factor***. The line scanning delay factor is used to account for service request entries placed in the input hopper sometime after the line went off-hook. Every time the line scanning subroutine begins scanning at the top of scanner number 1, the delay factor is recalculated. The delay factor is equal to one-half the length of time from the beginning of the line scanning period to the beginning of the next one.

OFT02—Percentage of Dial Pulse Dial Tone Delays Over Three Seconds

4.08 This count represents the percentage of originations from dial pulse lines which experience a dial tone delay greater than three seconds. This count is calculated by dividing the number of dial pulse dial tone delays over three seconds (OFT04) by the total number of originations from dial pulse lines (OFT03).

OFT03—Dial Pulse Originations

4.09 This count is pegged each time a line marked dial pulse goes off-hook, remains off-hook for two consecutive line scans, and is assigned to a TCR and a CDPR-DP. Hits (lines off-hook for only one line scan) are not included.

OFT04—Number of Dial Pulse Dial Tone Delays Over Three Seconds

4.10 This count is pegged each time a dial tone speed test for a dial pulse line exceeds three seconds.

OFT05—Average TOUCH-TONE® Dial Tone Delay

4.11 This count is the same as OFT01, except that delay for lines marked TOUCH-TONE is measured.

OFT06—Percentage of TOUCH-TONE Dial Tone Delays Over Three Seconds

4.12 This count is the same as OFT02 except that delay for lines marked TOUCH-TONE is measured.

OFT07—TOUCH-TONE Originations

4.13 This count is the same as OFT03, except that it represents lines marked TOUCH-TONE originations.

OFT08—Number of TOUCH-TONE Dial Tone Delays Over Three Seconds

4.14 This count is pegged each time a dial tone speed test for a line marked TOUCH-TONE exceeds three seconds.

OFT09—Average Multifrequency (MF) Receiver Attachment Delay

4.15 This count is a computation of the total delay for attachment of MF receivers to calls on incoming MF trunks divided by the total incoming MF trunk attempts and expressed in units of seconds times ten. Total delay for attachment of MF receivers is a sum of the MF receiver attachment delay for each bid from an incoming MF trunk.

4.16 The receiver attachment delay test begins when an off-hook trunk is first recognized by the trunk scanning subroutine. At this time, a service request entry is placed in the input hopper and the call is time stamped. On the next base level loop, the trunk is rescanned. If it is no longer off-hook, it is considered to be a hit or a flash, is removed from the hopper, and is not included in any receiver attachment delay measurements. If it is not a hit or a flash, a check is made to determine if the trunk is dial pulse or MF. If the trunk is MF, an MF receiver is selected and a path to it is reserved.

4.17 After a path between the trunk and the MF receiver is established, a start-dial signal is sent to the other office and the receiver attachment delay test ends. The No. 3 ESS does not recognize abandons after the input hopper entry has been deleted and before the receiver attachment delay measurements are made. Therefore, these abandons are included in receiver attachment delay measurements.

4.18 MF receiver attachment delay is calculated to be the time of the end of the receiver attachment delay test minus the time of the original time stamp plus a ***trunk scanning delay factor.*** The trunk scanning delay factor is used in the same manner as the line scanning delay factor discussed in 4.07. ***Receiver attachment delay tests are executed for every incoming trunk bid.***

OFT10—Percentage of MF Receiver Attachment Delays Over Three Seconds

4.19 This count represents the percentage of incoming calls over MF trunks which experience a receiver attachment delay greater than three seconds. This count is calculated by dividing the number of MF receiver attachment delays over three seconds (OFT12) by the total numbe of bids for an MF receiver (OFT11).

OFT11—Total Number of Bids for an MF Receiver

4.20 This count is pegged each time an incoming trunk goes off-hook, remains off-hook for two consecutive line scans, and is determined to be an MF trunk. Hits and flashes (trunks off-hook for only one line scan) are not included.

OFT12—Number of MF Receiver Attachment Delays Over Three Seconds

4.21 This count is pegged each time a receiver attachment delay test exceeds three seconds.

OFT13—Longest Base Level Loop

4.22 This count gives the longest base level loop during the measurement period in milliseconds times ten.

OFT14—Base Level Loops Over 150 Milliseconds

4.23 This count is pegged once for each base level loop which exceeds 150 milliseconds in duration.

OFT15—Interrupts Deferred

4.24 This count is pegged once each time an interrupt is deferred.

OFT16—Dynamic Service Protection Usage

4.25 This count is pegged once each 100 seconds when conditions are such that dynamic service protection would deny service. ***This count is made whether or not dynamic service protection is in the allowed mode.***

OFT17—Total Originating Calls

4.26 This count includes all calls where at least one digit has been received and are all hot-line calls. It excludes manual line calls and lines denied origination. The count is made when the first digit dialed is examined for a 0, 1, or special character; for hot-line calls, it is made after the correct digits have been placed in the TCR by the appropriate call program.

OFT18—Dial Pulse Abandoned Bids for Dial Tone

4.27 This count is pegged if the originating party abandons before a CDPR-DP can be accessed. After a party goes off-hook, the line scan program places an entry in the input hopper. The line is rescanned for hit protection. If the line is still off-hook, the entry is considered a valid origination and the No. 3 ESS selects a TCR and attempts to select a CDPR-DP. If a CDPR-DP is not available, the TCR is released; but the entry is left in the input hopper until the next base level loop. At that time, the line is rescanned. If it is no longer off-hook, the entry is considered an abandoned bid for dial tone and a counter is pegged. If the line is still off-hook, another attempt is made to select a CDR-DP. This procedure continues until a CDR-DP is successfully selected or the calling party abandons.

OFT19—TOUCH-TONE Abandoned Bids for Dial Tone

4.28 This count is the same as OFT18, except that it counts abandons while attempting to seize a customer TOUCH-TONE receiver (CDPR-TT).

OFT20—Permanent Signal Time-Outs

4.29 Once a customer is connected to a CDPR-DP or a CDPR-TT, a permanent signal time-out occurs if the customer does not dial any digits within 30 seconds under normal traffic or within 10 seconds if short timing has been initiated. The permanent signal counter is pegged; then the call is routed to permanent signal treatment.

OFT21—Partial Dial Time-Outs

4.30 A partial dial time-out occurs after at least one digit has been dialed. The customer then has 15 seconds to dial the next digit in normal traffic and 8 seconds if short timing has been initiated. If another digit is not received, (a) a partial dial time-out occurs, (b) the partial dial counter is pegged, and (c) the call is sent to partial dial treatment.

OFT22—False Starts

4.31 This count is pegged when an originating line, connected to a CDPR-DP or a CDPR-TT, disconnects before any digits have been dialed.

OFT23—Partial Dial Abandons

4.32 This count is pegged when an originating line, connected to a CDPR-DP or a CDPR-TT, disconnects after dialing a number of digits which are insufficient to route the call.

OFT24—Total Terminating Calls

4.33 This measurement counts all incoming and intraoffice calls which terminate in the office. It includes revertive calls and calls to an out-of-service line on the plug-up list, but does not include calls which are routed out of the office because of shared office codes or calls intercepted and routed to an announcement, a tone, or an operator. The counter is incremented after all the digits have been received and the terminating (4-digit) translation has indicated a number served by the office.

OFT25—Intraoffice (IAO) Call Attempts

4.34 An intraoffice call is one which originates in the office and terminates to a line in the office. This measurement includes normal intraoffice call attempts, intraoffice calls to an out-of-service line on the plug-up list, and revertive call attempts. It does not include possible IAO calls which are intercepted and routed to announcements, tones, or intercept operators. An attempt is counted after a digit receiver has been connected, all the digits have been received, and the terminating translation has indicated a number served by the office.

OFT26—IAO Calls to Busy Lines

4.35 After the terminating translation has indicated a number served by the office, a busy test is made on the called line. If it is busy and the calling party is also a line in the office, this count is pegged.

OFT27—Stable IAO Usage

4.36 This count measures the CCS usage generated during a talking connection by all IAO calls during the measurement period. This measurement is made on all stable intraoffice calls. It includes revertive calls, but does not include intraoffice calls which have been intercepted and routed to a tone, an announcement, or an operator. Every 100 seconds the stable terminal memory records (TMRs) in which both parties are a line are counted and added to this register.

OFT28—Stable Revertive Call Usage

4.37 This count measures the CCS usage generated during a talking connection by all revertive calls during the measurement period. This count is made on all stable revertive calls. Every 100 seconds, the stable TMRs in which both parties have the same terminal equipment number are counted and added to this register.

OFT29, OFT30, and OFT31—IAO Intercepts

4.38 After all digits have been received from the customer, the No. 3 ESS makes a terminating translation on the number dialed. The translation may indicate (a) that the dialed number is a blank (unassigned) number or (b) that the call is to be intercepted for another reason, such as a disconnected or changed number. Blank numbers are all assigned the same route index. However, intercepted numbers may also be routed to tones, announcements, operators, etc, as dictated by local network administration practices by use of different route indexes. To count all intraoffice calls which are routed to an intercept treatment not in the No. 3 ESS office, the No. 3 ESS provides three traffic registers which may be assigned to any three route indexes. Calls with denied service or special routing having routing indexes can also be counted. Before a call is routed to an intercept treatment or for denied service or for special routing, the route index is examined. If the route index has been assigned to a traffic register, the register is pegged. A register may be pegged only once per call.

OFT32—Outgoing Call Attempts

4.39 This count includes all normal outgoing calls from a line in the office to a trunk, as well as intraoffice calls which have been intercepted and routed to an operator. The register is incremented after a seizure signal has been sent to another office and a start signal has been received. If the outgoing trunk is MF, all of the digits have been received. If the trunk is dial pulse and the trunk's outpulsing is overlapped with dialing, all of the digits may not have been received. If the calling party abandons in this case, the call is still included in the peg count.

OFT33—Transmitter Time-Outs

4.40 After a transmitter has been selected and a seizure has been sent to another office, the system waits for a signal from the other office. If this signal is not received within a specified period of time, a transmitter time-out occurs and this traffic register is pegged.

OFT34—Incoming Call Attempts

4.41 This count is pegged after the appropriate number of digits have been received from an incoming call. This measurement includes normal incoming calls from a trunk to a line in the office, tandem calls, incoming calls to an out-of-service line on the plug-up list, and incoming calls routed to announcements or tones.

OFT35—Incoming Partial Dial Time-Outs

4.42 This count is pegged (a) when an incoming trunk is seized, (b) when one or more digits are received, and (c) when the receiver times out.

OFT36—Incoming Partial Dial Abandons

4.43 This count is pegged (a) when an incoming trunk is seized, (b) when one or more digits are received, and (c) when the incoming trunk disconnects before the receiver times out.

OFT37—DP Bylink and Nonbylink Incoming Calls

4.44 This measurement is a count of all incoming dial pulse calls. It does not include partial dial abandons or time-outs, but does include incoming calls to an out-of-service line on the plug-up list and incoming calls routed to announcements or tones. This count is pegged after the appropriate number of digits have been received.

OFT38—MF Incoming Calls

4.45 This count is pegged under the same conditions as OFT37, except that the incoming call uses MF signaling.

OFT39, OFT40, and OFT41—Incoming Intercepts

4.46 These counts represent calls to three different route indexes. They are pegged under the same conditions as OFT29, OFT30, and OFT31, except that the call is incoming rather than IAO.

OFT42—Tandem Call Attempts

4.47 Tandem call attempts include normal tandem calls and incoming calls which are routed to another office or operator, AIS, or 6A machine for treatment. The measurement includes calls where no transmitter is available, where no path between the transmitter and the trunk is available, and where the transmitter fails or times out. The register is incremented after all the digits have been received and a program check has indicated a tandem call.

OFT43—First Attempt to Match

4.48 This count is pegged on the first attempt by the No. 3 ESS to find a talk path on an outgoing call, an incoming call, a tandem call, an intraoffice call, and a call routed to an announcement or tone. Revertive calls and connections to service circuits are not included.

OFT44—First Failure to Match

4.49 This count is pegged when the first attempt as measured by OFT43 fails.

> ***Note:** The percentage of network matching loss is equal to (OFT44 ÷OFT43) X 100.*

OFT45—One-Digit Speed Calls

4.50 This count is pegged when a call is originated using a one-digit speed calling list.

OFT46—Two-Digit Speed Calls

4.51 This count is pegged when a call is originated using a 2-digit speed calling list.

OFT47—Three-Way Calls

4.52 This count is pegged when a customer who has 3-way calling is part of a stable talking connection and flashes to attempt to add a third party.

OFT48—Call Forwarding Activation Attempts

4.53 This count is pegged when a customer with the call forwarding feature dials the call forwarding activation code.

OFT49—Call Forwarding Register Usage

4.54 This count is pegged once for each call forwarding register in use during a 100-second usage count.

OFT50—Calls Forwarded

4.55 This count is pegged each time a call is directed to a line and the line is found to have calls forwarded to another number.

OFT51—Call Waiting Calls

4.56 This count is pegged each time an attempt is made to complete a call to a busy line which has the call waiting feature.

OFT52—Ineffective Originating Signaling

4.57 This count is pegged when an originating call cannot be completed due to a partial dial time-out, mutilated digits, or a vacant code dialed by the customer.

OFT53—Ineffective Incoming Terminating Signaling

4.58 This count is pegged when an incoming call cannot be terminated due to a ringing failure. A ringing failure is a condition in which ringing cannot be supplied to a line for a reason other than network blockage.

OFT54—Ineffective IAO Terminating Signaling

4.59 This count is pegged when an intraoffice call cannot be terminated due to a ringing failure.

OFT55—No Path—Tandem

4.60 This count is pegged when a tandem call cannot be completed due to no talk path or transmitter path being available.

OFT56—No Path—Incoming Terminating

4.61 This count is pegged when an incoming call cannot be completed to a line in the office due to either no talk path or ringing path being available.

OFT57—No Path—Outgoing and IAO

4.62 This count is pegged when either an outgoing or an IAO call cannot be completed due to either a talk path not being available or, in the case of an outgoing call, no transmitter being available.

OFT58—No Service Circuit—Tandem

4.63 This count is pegged when a tandem call cannot be completed due to no transmitter being available on the final try.

OFT59—No Service Circuit—Incoming

4.64 This count is pegged when an incoming call cannot be completed due to no ringing circuit being available on the final try.

OFT60—No Service Circuit—Outgoing and IAO

4.65 This count is pegged when either (a) an outgoing call cannot be completed due to no available transmitter on the final try or (b) an IAO call cannot be completed due to no ringing circuit being available on the final try.

OFT61—No Trunk—Tandem

4.66 This count is pegged if no trunk is available on the final selection attempt for a tandem call.

OFT62—No Trunk—Outgoing

4.67 This count is pegged if no trunk is available on the final selection attempt for an outgoing call.

OFT63—Connecting Troubles—Tandem

4.68 This count is pegged if a peripheral error is encountered in processing a tandem call. A peripheral error is the failure to establish or to take down a network path through the office after necessary translations are complete.

OFT64—Connecting Troubles—Incoming

4.69 This count is pegged if a peripheral error is encountered in processing an incoming call. Peripheral errors include errors in establishing a path to an MF receiver as well as failures (a) to disconnect a path to the MF receiver, (b) to establish or disconnect a talk path, or (c) to establish or disconnect a ringing path.

OFT65—Connecting Troubles—Outgoing and IAO

4.70 This count is pegged if a peripheral error is encountered in processing either an outgoing or an IAO call. Peripheral errors on originating outgoing paths include errors in (a) disconnecting a path to a CDPR, (b) establishing or disconnecting a talk path, or (c) establishing or disconnecting a path to a transmitter. Peripheral errors on intraoffice paths include errors in (a) disconnecting a CDPR path, (b) establishing or disconnecting a talk path, or (c) establishing or disconnecting a ringing path.

OFT66—Ineffective Tandem Signaling

4.71 This count is pegged if an outpulsing failure occurs during the processing of a tandem call. An outpulsing failure is when a transmitter fails to outpulse digits properly to another office.

OFT67—Ineffective Outgoing Signaling

4.72 This count is pegged if an outpulsing failure occurs during the processing of an outgoing call. (See 4.71 for a description of outpulsing failures.)

OFT68—Ineffective Incoming Signaling

4.73 This count is pegged after a receiver has been attached to an incoming trunk, and digit reception is unsuccessful due to an incoming permanent signal, an incoming false start, or mutilated digits. Once the No. 3 ESS office is ready to receive digits from an incoming trunk, an incoming permanent signal occurs if no digits are received in a specified time. An incoming false start occurs if the incoming trunk goes on-hook before any digits have been received. Mutilated digits are signals which the No. 3 ESS cannot associate with any established digit code.

OFT69—Incoming Calls to Busy Lines

4.74 After the terminating translation has indicated a number served by the office, call processing makes a busy test on the called line. If it is busy and the calling party is a trunk, this count is pegged.

OFT70—Abandons—Tandem

4.75 There are two types of tandem call situations which affect this measurement: (a) calls which overlap outpulsing with digit reception and (b) calls which wait until all digits have been received before outpulsing begins. In (a), an abandon occurring during outpulsing is considered a partial dial abandon; the No. 3 ESS office cannot determine how many digits were intended. The incoming partial dial abandons register (OFT36) is incremented. The ESS does not recognize an abandon after outpulsing is complete until the call is made stable. Thus, this register is not incremented for calls which overlap outpulsing and digit reception. Miscellaneous abandons are recognized for calls in (b). The counter is incremented if an abandon occurs after all digits have been received until the call is made stable. This register is pegged after the call has been routed to the disconnect subroutine, but before any paths have been disconnected.

OFT71—Abandons—Incoming

4.76 This count is pegged after an incoming call is determined to terminate to a line in the office, and the incoming call abandons before the call is made stable.

OFT72—Abandons—Outgoing and IAO

4.77 This count is pegged when all digits have been received for either an outgoing or an IAO call, and the originating party abandons before the call is made stable.

OFT73—Translation Errors

4.78 This count is pegged for each tandem, incoming terminating, originating outgoing, IAO call which cannot be completed because the No. 3 ESS is unable (for any reason) to successfully complete the translation routine.

OFT74—Dial Tone Blockage

4.79 This count is pegged once when a path between an originating line and a CDPR cannot be found on the second attempt. Once a TCR has been selected for a service request entry in the input hopper, a CDPR is selected and a path from the line to the CDPR is reserved. If the path hunt fails, a new CDPR is selected and a second attempt is made to reserve a path. If the second path hunt fails, this count is pegged and the identification of the line is placed in the dial tone blockage and matching loss report.

4.80 The procedure for a service request at this point is to idle the CDPR, move the entry into the TCR, and time the entry for three seconds. During this timing period, the No. 3 ESS does not recognize an abandon by the originating line. At the elapse of three seconds, the line origination program adds three seconds to the total dial tone delay measurement, increments the dial tone blockage (OFT74) once again, and increments the number of dial pulse dial tone delays over three seconds count (OFT04) or the number of TOUCH-TONE dial tone delays over three seconds count (OFT08).

4.81 The service request entry is then placed back into the input hopper and the line origination program again attempts to obtain a CDPR and a path to it. The No. 3 ESS continues to repeat the procedure of making two attempts to find a path to a CDPR, removing and timing for three seconds, and incrementing appropriate counts until either the originating line abandons or receives dial tone.

DIVISION OF REVENUE (DOR)

4.82 Division of revenue measurements are permanently assigned to the D-schedule.

DOR01—Total Originating Calls

4.83 This count includes all calls where at least one digit has been dialed. It does not include manual line calls or calls from lines denied origination. Call forwarded calls and code converted calls are counted only once. The count is made after the first digit has been received.

DOR02—Through-Switched Calls

4.84 This count includes tandem calls, incoming calls intercepted and routed to an operator, AIS, or 6A machine, and incoming calls forwarded to another office. This count is pegged after all digits have been received and the call is determined to be a through-switched call.

DOR03—Stable Through-Switched Usage

4.85 This counts measures the usage in CCS generated during the measurement period by all through-switched calls. The measurement is made every 100 seconds by counting the stable TMRs in which both parties are a trunk, that is, stable tandem calls. A tandem call is made stable after the talk path between the two trunks has been established and all service circuits have been idled and disconnected. This measurement includes the time that the calling party waits for the called party to answer.

DOR04—Stable Outgoing Usage

4.86 This count measures the usage in CCS generated during the measurement period by all outgoing calls. It includes all normal outgoing traffic, intraoffice calls which have been intercepted and routed out of the office, and intraoffice calls forwarded out of the office. The measurement is made every 100 seconds by counting the stable TMRs in which the calling party is a line and the called party is a trunk. An outgoing call is made stable after the talk path between the line and the trunk has been established and all service circuits have been disconnected. This measurement includes the time that the calling party waits for the called party to answer.

TRUNK GROUP MEASUREMENTS (TRK)

4.87 Trunk group measurements can be assigned to either the H, C, or D schedule. It is recommended that these measurements be assigned to the C schedule if there is a dedicated Network Administration teletypewriter and to the H schedule if there is not. During certain division of revenue studies these measurements may be placed on the D schedule.

4.88 Measurements for a particular trunk group can be assigned to any one of the three schedules in 4.87. A trunk group can appear on only one schedule at a time. All trunk groups do not have to be assigned to the same schedule. If any trunk group measurements are assigned to a particular schedule, the measurements will be designated on reports with the ***TRK*** abbreviation to the left. Group will not appear unless the trunk group has been assigned to a schedule.

4.89 There are two data fields for trunk group measurements. Both are idenfified by the abbreviation TRK to the left of the data field. The trunk group number (TGN) of a trunk group assigned to a schedule will determine which data field will contain the measurements for the trunk group. The first field appearing on a report will contain measurements for TGN 128 through TGN 191; the second, measurements for TGN 192 through TGN 255. (If no trunk group is assigned with a TGN within one of the above ranges, that data field will not appear.)

TRK01—Trunk Group Number

4.90 This count identifies the TGN of the trunk group for which the next four measurements in the data field were taken. The trunk group defined in this field may be outgoing, incoming, or 2-way.

TRK02—Peg Count

4.91 This count is pegged on one-way incoming trunks when the No. 3 ESS recognizes a seizure by the originating end. On one-way outgoing trunks and on outgoing attempts on 2-way trunks, the ESS makes one attempt to select an outgoing trunk. The group peg count register is incremented regardless of whether a trunk is successfully selected.

TRK03—Usage

4.92 This count is pegged once for each trunk found to be busy during a 100-second usage count. It represents the CCS usage of a trunk group during the measurement period. A trunk is considered to be busy if it is serving a call, is maintenance busy, or is in a permanent signal state.

> ***Caution: If spare trunks exist in a trunk group (a spare trunk is a vacant member of a trunk group which does not have an associated physical trunk circuit), usage***

measurements made on that trunk group may be too low after an emergency action of level 4 or above.

4.93 Normally, all busy trunks and spares are marked in busy/idle bit by a 1. Idle trunks are marked by a 0. During a 100-second count, the No. 3 ESS counts the number of bits which are 1 and subtracts the number of spare trunks to determine busy trunks. The spare member bits for trunks are set every night. During an emergency action level 4 or higher, all bits are set to 0. The ESS must attempt to select a spare trunk for use before it will discover that it is spare and set the bit to a 1. Therefore, until all spare trunk bits are set to a 1, too few actual busy trunks will be recorded.

TRK04—Overflow/Through Switched

4.94 For one-way outgoing and 2-way trunk groups, this count represents ***overflow*** and is pegged each time the No. 3 ESS attempts to seize a trunk in the trunk group but finds that all are busy.

4.95 For one-way incoming trunk groups, this count represents ***through-switched*** calls and is pegged each time a call comes into the office over the trunk group and is routed out of the office. When associated with an incoming trunk group, the difference between TRK02 and TRK04 would be the number of attempts to terminate in the office.

TRK05—Maintenance Busy

4.96 This count measures the number of trunks in the group which are found to be maintenance busy at the end of the measurement period.

4.97 The above five counts are printed for each trunk group assigned to a schedule. The TGNs appear in numerical order.

SERVICE CIRCUITS (SVC)

4.98 Service circuit measurements can be assigned to either the H, C, or D schedule. It is recommended that these measurements be assigned to the H schedule.

4.99 Measurements for a particular service circuit group can be assigned to any one of the three schedules above. A service ciruit group can appear on only one schedule at a time. If any service circuit measurements are assigned to a particular schedule, the measurements will be designated on reports with the ***SVC*** abbreviation to the left of the measurements. Measurements for a service circuit group will not appear unless the group has been assigned to a schedule.

SVC01—Service Circuit Group Number

4.100 This count identifies the group number of the series circuit group for which the next four measurements were taken. In the No. 3 ESS, group numbers 064 through 127 are reserved to define circuit groups.

SVC02—Peg Count

4.101 This count is pegged when an attempt is made to seize a member of a service circuit group. ***This count may be pegged twice during the processing of one call.*** The register is pegged once when an initial attempt is made to seize a particular type of service circuit, whether a circuit is available or not. If one or more repeated attempts are made to find an idle circuit, the register is pegged again when an attempt is successful.

4.102 The No. 3 ESS has three different routines in accessing service circuits if a circuit is not available on an initial attempt. For ***customer digit receivers and incoming receivers,*** the ESS will continue making repeated attempts to find an idle circuit until either a circuit is found or the party abandons. For ***ringing, transmitter, and coin control circuits,*** only a second attempt is made. For ***tone and announcement circuits,*** only an initial attempt is made.

SVC03—Usage

4.103 This count is pegged once for each service circuit found to be busy during a 10-second usage count. It represents the CCS usage of a service circuit group during the measurement period times 10. A service circuit is considered to be busy if it is serving a call. It ***is not*** considered to be busy if it is in a maintenance busy state.

Caution: If spare service circuits exist in a service circuit group (a spare service circuit is a vacant

member of a service circuit group which does not have an associated physical service circuit), usage measurements made on that service circuit group may be too high (negative) after an emergency action of level 4 or above.

SVC04—Overflow

4.104 This count is pegged if all circuits in the service circuit group are found to be busy. It is pegged once if the first attempt to find an idle circuit fails. If one or more subsequent attempts to find an idle circuit fail, the count is not pegged again.

SVC05—Maintenance Busy

4.105 This count measures the number of service circuits in the group which are found to be maintenance busy at the end of the measurement period.

MULTILINE HUNT GROUPS (MLH)

4.106 Multiline hunt group measurements can be assigned to either the H-, C-, or D-schedule. It is recommended that these measurements be assigned to the H-schedule.

4.107 Measurements for a particular MLH group can appear on only one schedule at a time. If any MLH group measurements are assigned to a particular schedule, the measurements will be designated on reports with the ***MLH*** abbreviation to the left of the measurements. Measurements for an MLH group will not appear unless the group has been assigned to a schedule.

MLH01—MLH Group Number

4.108 This count identifies the MLH group number of the MLH group for which the next four measurements were taken. In the No. 3 ESS, MLH group numbers may be in the range of from 00 to 63.

MLH02—Peg Count

4.109 This count is pegged for both originating and terminating calls. For originating calls, it is pegged when the originating translation program sets the status bit in the status block. For terminating calls, the center is pegged after 4-digit translations and includes overflows. A status bit is a bit assigned to each line of an MLH group and is used to mark the busy/idle status of the line by use of a 0 or a 1.

MLH03—Usage

4.110 This count is pegged once for each status bit in the MLH group status block found to be marked busy during a 100-second usage count. It represents the total CCS usage of the lines in the MLH group during the measurement period. In Generic Issue 4 or later, spare members in the group will be set to busy (1) on a daily basis to prevent high usage counts on the groups.

MLH04—Overflow

4.111 This count is pegged if an attempt is made to complete a call to a member of the MLH group and all members are found to be busy.

MLH05—Not Assigned

4.112 This register is not assigned and will always print all zeros.

PREROUTE PEG COUNTS (PRE)

4.113 Preroute peg count measurements can be assigned to either the H-, C-, or D-schedule. It is recommended that these measurements be assigned to the H-schedule. All preroute peg counts must appear on the same schedule.

PRE01, PRE02, PRE03, PRE04—Peg Count

4.114 Each of these registers may be assigned to any 3-digit or 6-digit code on the No. 3 ESS When a customer within the office dials the assigned code or when a tandem call is routed to it, the associated register is pegged. The customer may not have completed dialing; therefore, some partial dial abandons may be included in the count. Speed calls are included in the count.

CLASS-OF-SERVICE PEG COUNTS (CLS)

4.115 Class-of-service peg counts can be assigned to either the H-, C-, or D-schedule. It is recommended that these measurements be assigned to the D-schedule. All class-of-service peg counts appear on the same schedule.

CLS01, CLS02, CLS03, CLS04—Originating Peg Count

4.116 Each of these registers may be assigned to one or more of the originating major class codes available in the No. 3 ESS. Each time a call is originated by a line with an originating major class code assigned to one of these registers, that register is pegged.

CLS05—Terminating Peg Count

4.117 This register may be assigned to one or more of the terminating major class codes available in the No. 3 ESS. This count is pegged each time a 4-digit translation is performed on a line with a terminating major class code assigned to this register. When a terminating line class code is assigned to CLS05, all calls ***originated*** by lines with the line class code assigned to CLS05 will be pegged on CLS04. Therefore, it is important to clear any assignments from CLS04 before assigning CLS05 and visa versa.

4.118 Major class code 06 is reserved for use in studying individual usage on a single-party line. The network administrator may assign an individual line originating and terminating major class code 06 and assign major class code 06 to CLS05 (after clearing any previous assignments from CLS04). Calls terminating to the line will be pegged on CLS05 and calls originating from the line will be pegged on CLS04.

A-LINK USAGE (ALK)

4.119 A-link usage counts can be assigned to either the H-, C-, D-, or W-schedule. It is recommended that these measurements be assigned to the W-schedule. All A-link usage counts appear on the same schedule.

ALK01—A-Links Out of Service

4.120 This count is pegged for each A-link in the office which is found to be out of service at the end of the measurement period. Not more than 16 A-links and wire B-links may be out of service at one time.

ALK02 Through ALK31—Usage

4.121 Each register represents the usage generated by one particular concentrator in the office. There is a maximum of 30 concentrators which can be provided in a No. 3 ESS office and 30 registers will always print. The registers which represent concentrators which do not exist in the office will be all zeros. This count is pegged for each A-link in a concentrator which is found to be busy during a 100-second usage count. Two A-links are counted for each trunk-to-line, line-to-line, line-to-trunk, or trunk-to-trunk connection, each of which requires a full path through the network. Revertive calls and calls routed to reorder only require a half path and only one A-link counted for these calls. These measurement includes maintenance usage.

B-LINK USAGE (BLK)

4.122 B-link usage counts can be assigned to either the H-, C-, D-, or W-schedule. It is recommended that these measurements be assigned to the W-schedule. All B-link usage counts appear on the same schedule.

BLK01—B-Links Out of Service

4.123 This count is pegged for each B-link in the office which is found to be out of service at the end of the measurement period. Not more than 16 A-links and wire B-links may be out of service at one time.

BLK02 and BLK03—Usage

4.124 These two registers represent the usage generated by the B-links in the two control frames which are possible in the No. 3 ESS office. If only one control frame is provided in the office, it will be represented by BLK02, and BLK03 will print all zeros. This count is pegged for each circuit B-link in the network which is found to be busy during a 100-second usage count. This measurement includes maintenance usage and reserve path usage.

TRUNK AND LINE USAGE (TLU)

4.125 Trunk and line usage counts can be assigned to either the H-, C-, or W-schedule. It is recommended that these measurements be assigned to the W-schedule.

TLU01 Through TLU16—Usage

4.126 Each of these counts can be assigned to a specific trunk, line, or service circuit. This count is pegged once each time a terminal assigned to the register is found busy during a 100-second usage count. If the terminal is a line, it is counted if it is in the busy state, which includes the state in which the line is being rung. If the terminal is a trunk or a service circuit, it is counted if it is busy, high and wet, or maintenance busy. If a spare trunk is assigned to a register, it will always appear to be busy.

NETWORK MAINTENANCE MEASUREMENTS (PLT)

4.127 Network Maintenance measurements appear on the maintenance teletypewriter channel and are printed as a function of the D-schedule. All measurements are preassigned.

PLT01—CU Automatic Removals

4.128 This count is pegged each time a control unit (CU) is marked out of service. Manual removals are not counted.

PLT02—TDC Automatic Removals

4.129 This count is pegged each time a tape data controller (TDC) is removed from service. Manual removals are not counted.

PLT03—Tape 0 Files Opened

4.130 This count is pegged each time a file is opened on tape 0.

PLT04—Tape 1 Files Opened

4.131 This count is pegged each time a file is opened on tape 1.

PLT05—Tape 0 Transient Errors

4.132 This count is pegged each time a read or write on tape 0 fails and a retry of the read or write passes.

PLT06—Tape 1 Transient Errors

4.133 This count is pegged each time a read or write on tape 1 fails and a retry of the read or write passes.

PLT07—Tape 0 Fatal Reads

4.134 This count is pegged when a block of data on tape 0 in unreadable. A block of data on a tape is considered to be unreadable when three retries to read the block fail.

PLT08—Tape 1 Fatal Reads

4.135 This count is pegged when a block of data on tape 1 is unreadable. A block of data on a tape is considered to be unreadable when three retries to read the block fail.

PLT09—Tape 0 Fatal Writes

4.136 This count is pegged when tape 0 is unwritable. A tape is considered to be unwritable when a fatal read error occurs, the block is rewritten, and another fatal read error occurs.

PLT10—Tape 1 Fatal Writes

4.137 This count is pegged when tape 1 is unwritable. A tape is considered to be unwritable when a fatal read error occurs, the block is written, and another fatal read error occurs.

PLT11—SYC Out of Service Duration

4.138 This count is pegged during each 100-second usage count that a system controller (SYC) is found to be out of service or unavailable.

PLT12—Transient Errors on Scanners

4.139 This count is pegged each time a transient error occurs in a scanner. A transient error is when an order fails, is retried, and passes.

PLT13—Transient Errors on Network Controllers

4.140 This count is pegged each time a transient error occurs in a network controller. See 4.139.

PLT14—Transient Errors on Peripheral Pulse Distributors

4.141 This count is pegged each time a transient error counts in a peripheral pulse distributor (PPD). See 4.139.

PLT15—Known Fault Entries on Scan Matrices

4.142 This count is pegged each time a scanner is placed on the known fault list. This count can be incremented from any one of two types of entries: (a) scanner column faults or (b) scanner row faults. A scanner column fault is entered whenever a new column failure is detected by the ***all zeros*** order sent to each scan matrix every base level loop. A scanner row fault is entered whenever a scan order fails, is retried and fails, an SYC switch is performed, and the scanner order fails again using the mate scanner controller.

PLT16—Known Fault Entries on PD Points

4.143 This count is pegged each time a peripheral decoder (PD) point entry is placed on the known fault list. A PD fault is entered whenever a PD order fails, is retried and fails, an SYC switch is performed, and the PD order fails again using the mate PPD.

PLT17—Service Removals, Scanner Controller

4.144 This count is pegged when a scanner controller is marked out of service by an automatic action. Manual removals are not counted.

PLT18—Service Removals, Network Controller

4.145 This count is the same as PLT17 except that it is for network controllers.

PLT19—Service Removals, Peripheral Pulse Distributor

4.146 This count is the same as PLT17 except that it is for peripheral pulse distributors.

PLT20—Service Removals, Ringing, and Tone

4.147 This count is the same as PLT17 except that it is for ringing and tone frames.

PLT21—MRF Count Cleared

4.148 This count is pegged each time the maintenance reset function (MRF) counter is cleared.

PLT22—Initialization Count 1

4.149 This count is pegged each time an emergency action (EA) of level 1 occurs.

PLT23—Initialization Count 2

4.150 This count is pegged each time an EA of level 2 occurs.

PLT24—Initialization Count 3

4.151 This count is pegged each time an EA of level 3 occurs.

PLT25—Initialization Count 4

4.152 This count is pegged each time an EA of level 4 occurs.

PLT26—Initialization Count 5

4.153 This count is pegged each time an EA of level 5 occurs.

PLT27—Spare

4.154 This register is a spare and will print all zeros.

PLT28—Spare

4.155 This register is a spare and will print all zeros.

PLT29—Manual Initializations

4.156 This count is pegged each time an EA is manually invoked.

PLT30—Call Audit Failures

4.157 This count is pegged each time one of the following audits performs a corrective action:

(a) Stable TMR Audit

(b) Transient Call Audit

(c) Busy Line Audit

(d) Busy Service Circuit Audit

(e) Busy Trunk Audit

(f) Test Vertical Audit

(g) Routine Network Audit.

PLT31—Main Store Audit Failures

4.158 This count is pegged each time the main store audit control performs a corrective action.

PLT32—Power Alarm Activations

4.159 This count is pegged each time a power alarm is reported.

PLT33—Other Alarm Activations

4.160 This count is pegged each time a building or carrier group alarm is reported.

PLT34—Quick-Check Entries

4.161 This count is pegged each time there is an attempt to add a new entry to the quick-check table.

PLT35—Quick-Check Overflow

4.162 This count is pegged each time an entry cannot be made to the quick-check table because of a full table.

PLT36—Error Analysis Entries

4.163 This count is pegged each time a new entry is added to the error analysis table.

PLT37—Error Analysis Table Pushoffs

4.164 This count is pegged each time an entry is pushed out of the error analysis table due to the list being full.

PLT38—CDPR-DP Removal Attempts

4.165 This count is pegged each time there is an automatic removal attempt (be error analysis or quick-check) of a CDPR-DP. Attempts are measured because the maximum allowable number of CDPR-DPs may have been removed already.

PLT39—CDR-TT Removal Attempts

4.166 This count is the same as PLT38 except that it is for CDPR-TT.

PLT40—Regular Ringing Removal Attempts

4.167 This count is the same as PLT38 except that it is for regular ringing circuits.

PLT41—Superimposed Ringing Removal Attempts

4.168 This count is the same as PLT38 except that it is for superimposed ringing circuits.

PLT42—Coin Circuit Removal Attempts

4.169 This count is the same as PLT38 except that it is for coin circuits.

PLT43—DP Transmitter Removal Attempts

4.170 This count is the same as PLT38 except that it is for DP transmitters.

PLT44—MF Transmitter Removal Attempts

4.171 This count is the same as PLT38 except that it is for MF transmitters.

PLT45—MF Receiver Removal Attempts

4.172 This count is the same as PLT38 except that it is for MF receivers.

PLT46—Miscellaneous Service Circuit Removal Attempts

4.173 This count is pegged when an automatic attempt is made to remove a service circuit which is not measured in PLT38 through PLT45 from service.

PLT47—Junctor Removal Attempts

4.174 This count is the same as PLT38 except that it is for junctors.

PLT48—Trunk Removal Attempts

4.175 This count is the same as PLT38 except that it is for trunks (not including service circuits).

PLT49—Continuity Test Failures

4.176 This count is pegged each time a continuity test failure or a ringing continuity test failure is reported to error analysis.

PLT50—False Cross and Ground Failures

4.177 This count is pegged each time a false cross and ground test failure is reported to error analysis.

PLT51—Power Cross Failures

4.178 This count is pegged each time a power cross test failure is reported to error analysis.

PLT52—Restore/Verify Failures

4.179 This count is pegged each time a restore/verify test failure is reported to error analysis.

PLT53—Line Trouble Reports

4.180 This count is pegged each time there is an automatic trouble report of a line.

PLT54—A-Link and B-Link Removal Attempts

4.181 This count is pegged each time there is an automatic attempt to remove an A-link or a B-link from service.

PLT55—Trunk Progression Test Failures

4.182 This count is pegged each time a trunk progression test fails.

PLT56—Service Circuit Progression Test Failures

4.183 This count is pegged each time a service circuit progression test fails.

PLT57—Junctor Progression Test Failures

4.184 This count is pegged each time a junctor progression test fails.

PLT58—Trunk Circuit Out-of-Service Duration

4.185 This count is pegged for each trunk found to be out of service during a 100-second usage count.

PLT59—Service Circuit Out-of-Service Duration

4.186 This count is pegged for each service circuit found to be out of service during a 100-second usage count.

PLT60—Total Restorals of Trunks and Service Circuit

4.187 This count is pegged for each trunk or service circuit that is restored to service.

PLT61—Total Line Originations

4.188 This count represents the total number of line originations during the measurement period.

PLT62—Maintenance Busy Overflows

4.189 This count is pegged when an overflow is experienced in a trunk or service circuit group in which one or more members have been made maintenance busy.

PLT63—Total Outgoing and Incoming Call Attempts

4.190 This count is pegged for each outgoing and incoming call attempt made during the measurement period.

5. REGISTER LAYOUT

5.01 This part gives examples of the register layout of each of the five measurement schedules available in the No. 3 ESS. The examples show a C-schedule and therefore represent an office with a dedicated network administration teletypewriter. Some data fields may be assigned to different schedules; however, the examples follow the assignment recommendations outlined in Part 4.

5.02 The Q-schedule is as follows:

REPT TRF Date Time Office Identification

Q SCHEDULE EA Counter

OFT	OFT01	OFT02	OFT03	OFT04	OFT05	OFT06	OFT07	OFT08	OFT09	OFT10
	OFT11	OFT12	OFT13	OFT14	OFT15	OFT16				

5.03 The H-schedule is as follows:

REPT TRF Date Time Office Identification

H SCHEDULE EA Counter

CYC	CYC01									
OFT	OFT01	OFT02	OFT03	OFT04	OFT05	OFT06	OFT07	OFT08	OFT09	OFT10
	OFT11	OFT12	OFT13	OFT14	OFT15	OFT16	OFT17	OFT18	OFT19	OFT20
	OFT21	OFT22	OFT23	OFT24	OFT25	OFT26	OFT27	OFT28	OFT29	OFT30
	OFT31	OFT32	OFT33	OFT34	OFT35	OFT36	OFT37	OFT38	OFT39	OFT40
	OFT41	OFT42	OFT43	OFT44	OFT45	OFT46	OFT47	OFT48	OFT49	OFT50
	OFT51	OFT52	OFT53	OFT54	OFT55	OFT56	OFT57	OFT58	OFT59	OFT60
	OFT61	OFT62	OFT63	OFT64	OFT65	OFT66	OFT67	OFT68	OFT69	OFT70
	OFT71	OFT72	OFT73							
*SVC	SVC01	SVC02	SVC03	SVC04	SVC05	SVC01	SVC02	SVC03	SVC04	SVC05
	SVC01	SVC02	SVC03	SVC04	SVC05	SVC01	SVC02	SVC03	SVC04	SVC05
	SVC01	SVC02	SVC03	SVC04	SVC05					
*MLH	MLH01	MLH02	MLH03	MLH04	MLH05	MLH01	MLH02	MLH03	MLH04	MLH05
	MLH01	MLH02	MLH03	MLH04	MLH05	MLH01	MLH02	MLH03	MLH04	MLH05
PRE	PRE01	PRE02	PRE03	PRE04						

*The size of these fields will vary, depending on the number of service circuit groups or multiline hunt groups assigned to the schedule.

5.04 The C-schedule is as follows:

REPT TRF Date Time Office Identification

C SCHEDULE EA Counter

```
CYC   CYC01

*TRK  TRK01  TRK02  TRK03  TRK04  TRK05  TRK01  TRK02  TRK03  TRK04  TRK05
      TRK01  TRK02  TRK03  TRK04  TRK05  TRK01  TRK02  TRK03  TRK04  TRK05
      TRK01  TRK02  TRK03  TRK04  TRK05  TRK01  TRK02  TRK03  TRK04  TRK05

      ---------------------
      ---------------------

      TRK01  TRK02  TRK03  TRK04  TRK05
```

*The size of this field will vary, depending on the number of trunk groups assigned to the schedule.

5.05 The D-schedule is as follows:

REPT TRF Date Time Office Identification

D SCHEDULE EA Counter

```
CYC   CYC01

DOR   DOR01  DOR02  DOR03  DOR04

CLS   CLS01  CLS02  CLS03  CLS04  CLS05

PLT   PLT01  PLT02  PLT03  PLT04  PLT05  PLT06  PLT07  PLT08  PLT09  PLT10
      PLT11  PLT12  PLT13  PLT14  PLT15  PLT16  PLT17  PLT18  PLT19  PLT20
      PLT21  PLT22  PLT23  PLT24  PLT25  PLT26  PLT27  PLT28  PLT29  PLT30
      PLT31  PLT32  PLT33  PLT34  PLT35  PLT36  PLT37  PLT38  PLT39  PLT40
      PLT41  PLT42  PLT43  PLT44  PLT45  PLT46  PLT47  PLT48  PLT49  PLT50
      PLT51  PLT52  PLT53  PLT54  PLT55  PLT56  PLT57  PLT58  PLT59  PLT60
      PLT61  PLT62  PLT63
```

5.06 The W-schedule is as follows:

REPT TRF Date Time Office Identification

W SCHEDULE EA Counter

```
CYC   CYC01

ALK   ALK01  ALK02  ALK03  ALK04  ALK05  ALK06  ALK07  ALK08  ALK09  ALK10
      ALK11  ALK12  ALK13  ALK14  ALK15  ALK16  ALK17  ALK18  ALK19  ALK20
      ALK21  ALK22  ALK23  ALK24  ALK25  ALK26  ALK27  ALK28  ALK29  ALK30
      ALK31

BLK   BLK01  BLK02  BLK03
```

6. GLOSSARY

6.01 The following terms and definitions are used frequently in this section:

A-Link—One of the 2-wire network paths between the first and second stages of switching in the network.

B-Link—One of the 2-wire network paths between the second and third stages of switching in the network that does not contain a junctor circuit. Also referred to as a wire B-link.

Base Level Loop—Major software loop including all functions not performed during interrupt level.

Concentrator Group—One concentrator has 192 terminals. A concentrator group is made up of two concentrators for a total of 384 terminals which comprise the first two stages of switching.

Interoffice Call—A call switched between different central offices.

Intraoffice Call—A call from one subscriber assigned to a central office to another subscriber within the same office.

Line—Anything that connects to a network terminal that is not classified as a trunk or service circuit. Usually a pair of wires that serves to connect a customer telephone to a terminal on the network.

Nonresident Programs—Those programs housed outside the main store and called into memory by the system when needed. These programs are stored on the tape cartridge.

Outgoing Calls—Calls originating in an office and terminating in another office.

Peg Count—A cumulative count of the number of times a given event occurs during a fixed time interval.

Resident Programs—Programs contained in main store.

Revertive Call—A call between two stations on the same party line.

Service Circuit—A circuit that connects to a network terminal and provides one of several specialized functions such as digit reception and transmission, alerting, coin control, and others. A service circuit communicates with the system control via scan points and peripheral decoders.

Tandem Call—Trunk-to-trunk call.

Trunk—A channel connecting switching centers or exchanges. An interface circuit for transmission purposes.

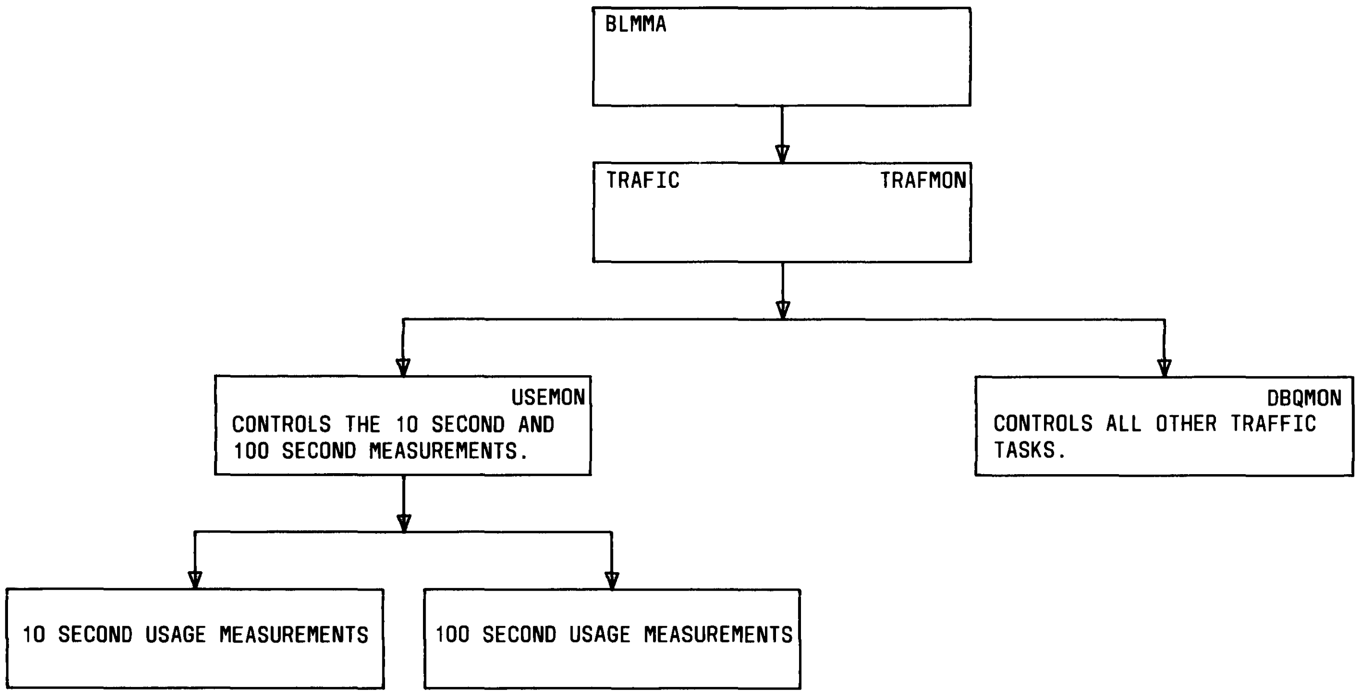

Fig. 1—TRAFIC Program

TRAFBLK

<table>
<tr><td>00</td><td>TRKH</td><td>HDR</td><td>PASS</td><td>BLKOK</td><td>TATTY</td><td>CLR</td><td></td><td>MONA</td><td>WEEKLY</td><td>C10</td><td>C100</td><td>S100</td><td>DAISY</td><td></td><td></td><td></td></tr>
<tr><td>01</td><td>TRKT</td><td colspan="11"></td><td>XWORK</td><td>DWORK</td><td>HWORK</td><td>QWORK</td></tr>
<tr><td>02</td><td colspan="16">SVC_GRP</td></tr>
<tr><td>03</td><td colspan="16">GRP_NO</td></tr>
<tr><td>04</td><td colspan="16">NS_GRP</td></tr>
<tr><td>05</td><td colspan="8">TRAFMIN</td><td colspan="8">TRAFSEC</td></tr>
<tr><td>06</td><td colspan="16">TRAFSKED</td></tr>
<tr><td>07</td><td colspan="16">TRAFTASK</td></tr>
<tr><td>08</td><td colspan="16">TRAFPM2</td></tr>
<tr><td>09</td><td colspan="16">TRAFPM3</td></tr>
<tr><td>10</td><td colspan="16">MSFPROG</td></tr>
<tr><td>11</td><td colspan="16">CHAN</td></tr>
<tr><td>12</td><td colspan="16">BUFF_NDX</td></tr>
<tr><td>13</td><td colspan="16">TAPE</td></tr>
<tr><td>14</td><td colspan="16">TIMER</td></tr>
<tr><td>15</td><td colspan="16">GRPSTART</td></tr>
<tr><td></td><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr>
</table>

NOTE:
SEE SHEET 2 OF THIS FIGURE FOR THE LEGEND

Fig. 2—Traffic Control Block (TRAFBLK) (Sheet 1 of 2)

LEGEND

DAISY	DAISY CHAIN IN PROGRESS
S100	= 1 START 100 SECOND USAGE MEASUREMENTS
C100	= 1 CONTINUE 100 SECOND USAGE MEASUREMENTS
C10	= 1 CONTINUE 10 SECOND USAGE MEASUREMENTS
WEEKLY	= 1 WEEKLY HALF HOUR IN PROGRESS
MONA	= 1 USAGE MEASUREMENTS = 0 OTHER TRAFFIC TASKS
CLR	= 1 CLEAR TRAFFIC REGISTERS
TATTY	= 1 GROUP MEASUREMENTS TO TAPE = 0 GROUP MEASUREMENTS TO TTY
BLKOK	= 1 BLOCK COUNTER IS CORRECT
PASS	DECIDES WHICH REGISTERS TO STORE GROUP DATA IN
HDR	GRP_TO_TTY = 1 HEADER SHOULD BE PRINTED ON THIS LINE TO_TAPE = 0 SECTIONS OF DATA ARE BEING PROCESSED = 1 GROUPS ARE BEING PROCESSED
TRKH	= 1 100 SECOND USAGE MEASUREMENTS ON A TRUNK
QWORK	QUARTER HOURLY WORK
HWORK	H, C, W WORK
DWORK	DAILY WORK
XWORK	DTB AND XLA WORK
TRKT	= 0 10 SECOND USAGE MEASUREMENTS ON A SERVICE CIRCUIT
SVC_GRP	SERVICE CIRCUIT GROUP NUMBER
GRP_NO	TRUNK OR PBX GROUP NUMBER
NS_GRP	FIRST GROUP NUMBER OF NEXT 100 SECOND SECTION
TRAFSEC	LAST TIME TIMING WAS STARTED - SECONDS
TRAFMIN	LAST TIME TIMING WAS STARTED - MINUTES
TRAFSKED	TRAFFIC PROGRESS MARK - SCHEDULE
TRAFTASK	TRAFFIC PROGRESS MARK - TASK
TRAFPM2	TRAFFIC PROGRESS MARK - INDEX
TRAFPM3	TRAFFIC PROGRESS MARK - ACTION
MSFPROG	DAISY CHAIN PROGRESS MARK
CHAN	CHANNEL THE TRAFFIC REPORT IS PRINTNG ON
BUFF_NDX	INDEX OUTPUT BUFFER INDEX
TAPE	TAPE ACTION PROGRESS MARK
TIMER	TIMER WORD
GRPSTART	GROUP DATA WORD - NAME AND FIRST GROUP NUMBER IN A SECTION

Fig. 2—Traffic Control Block (TRAFBLK) (Sheet 2 of 2)

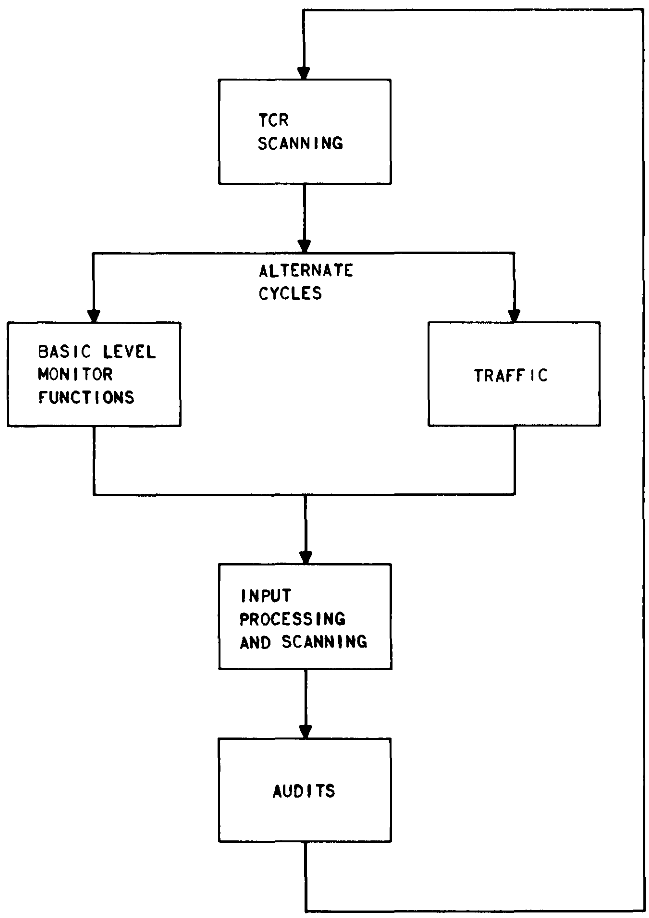

Fig. 3—Base Level Loop

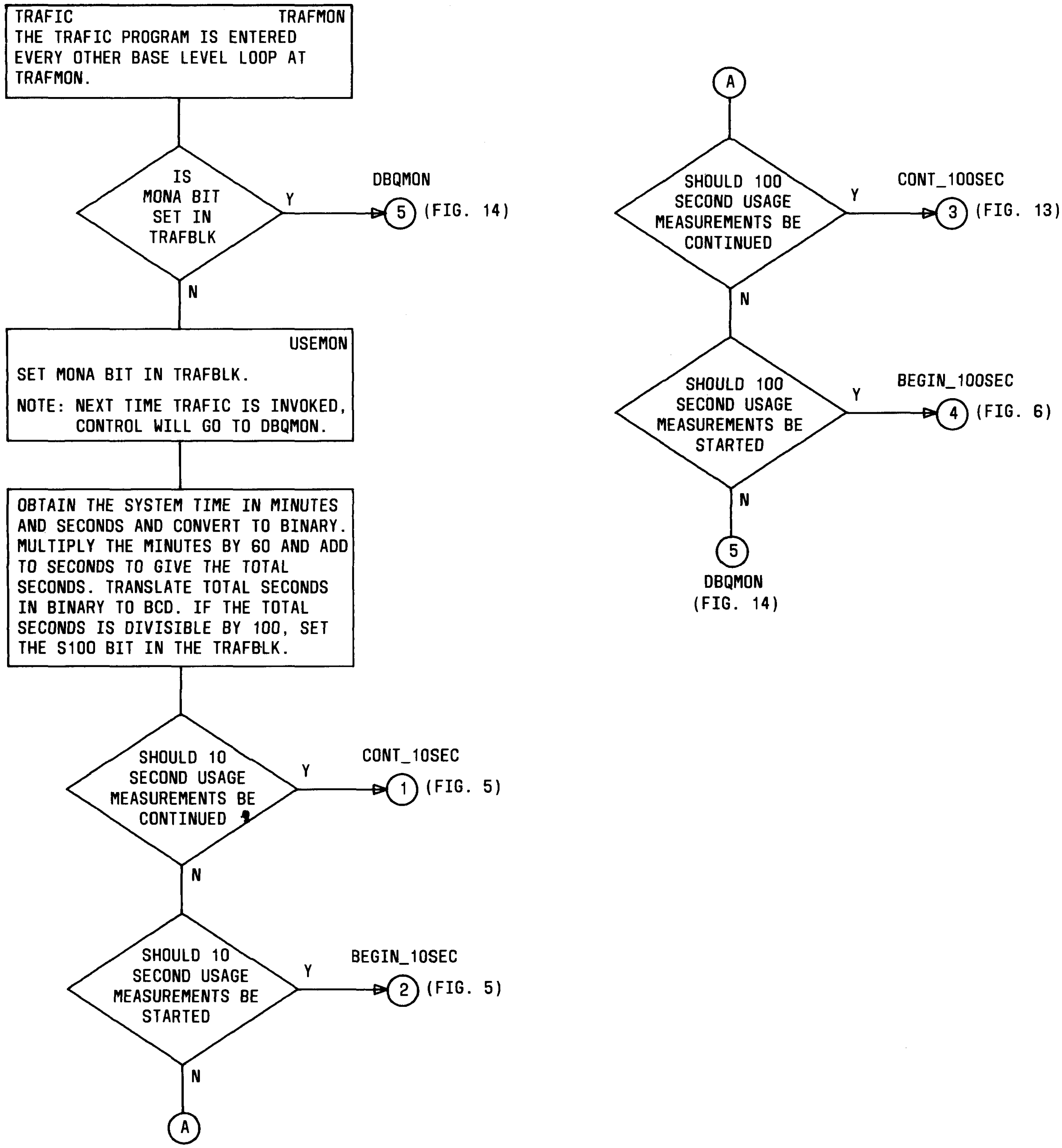

Fig. 4—TRAFIC Program Flow

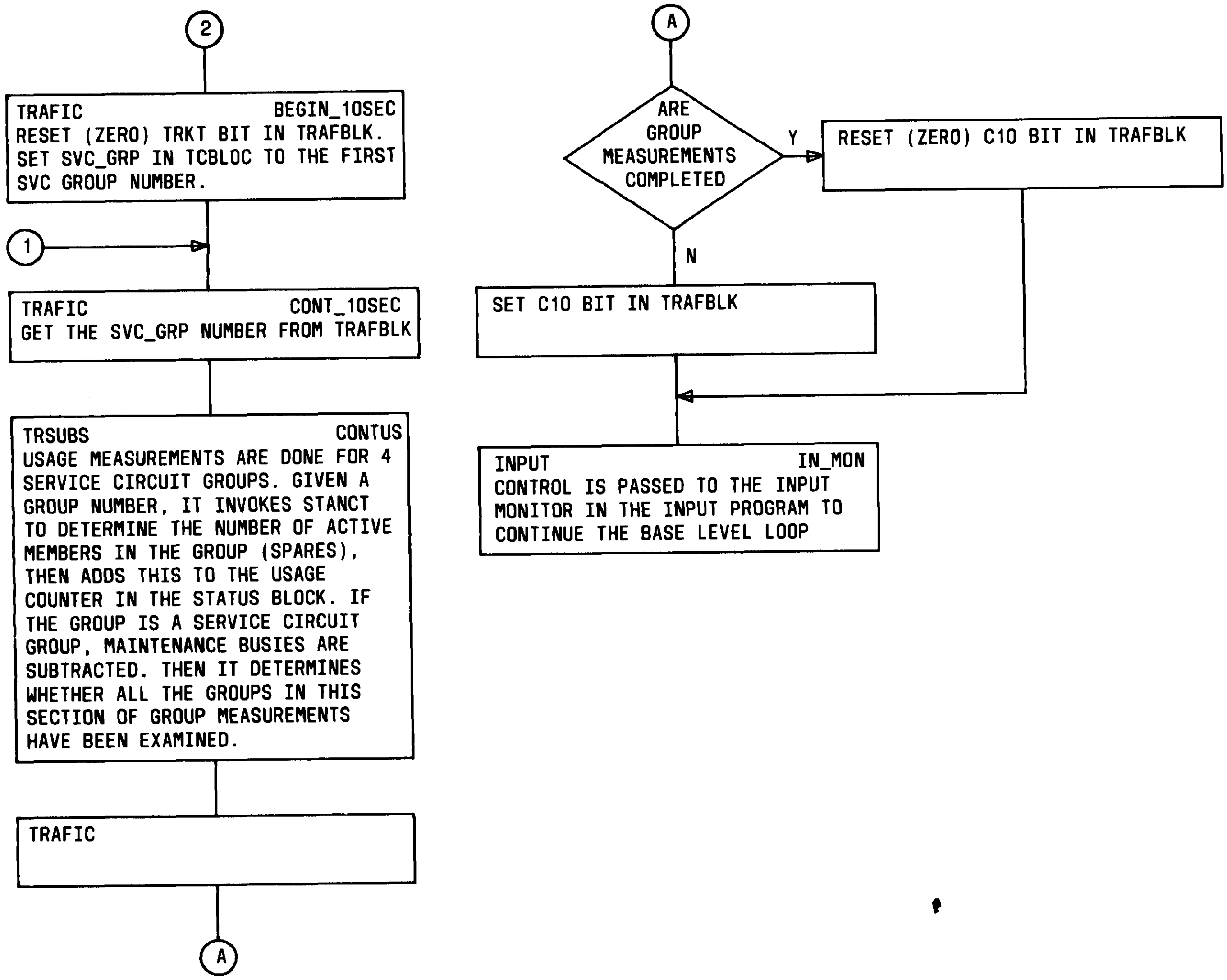

Fig. 5—10-Second Usage Measurements

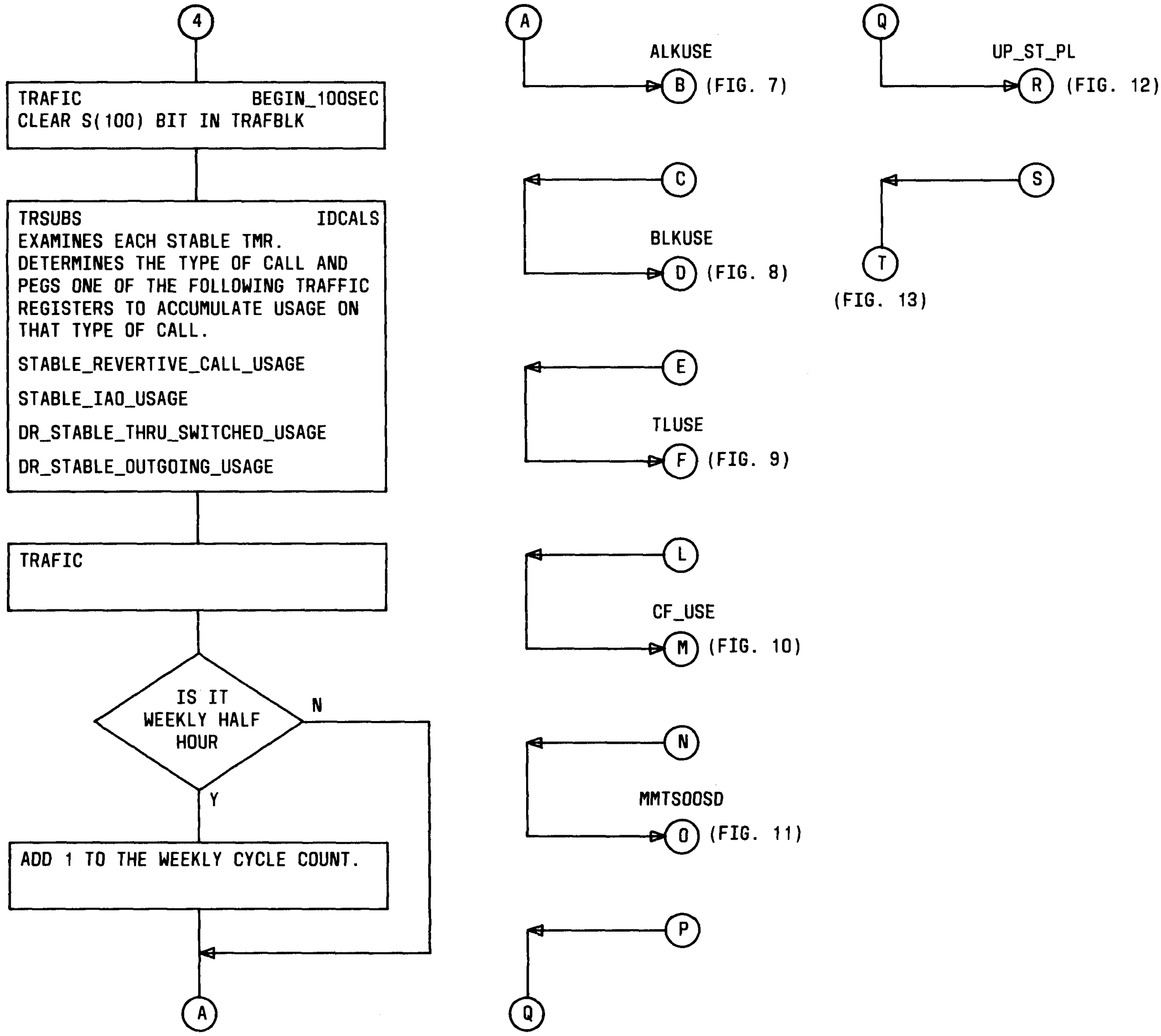

Fig. 6—100-Second Usage Measurements

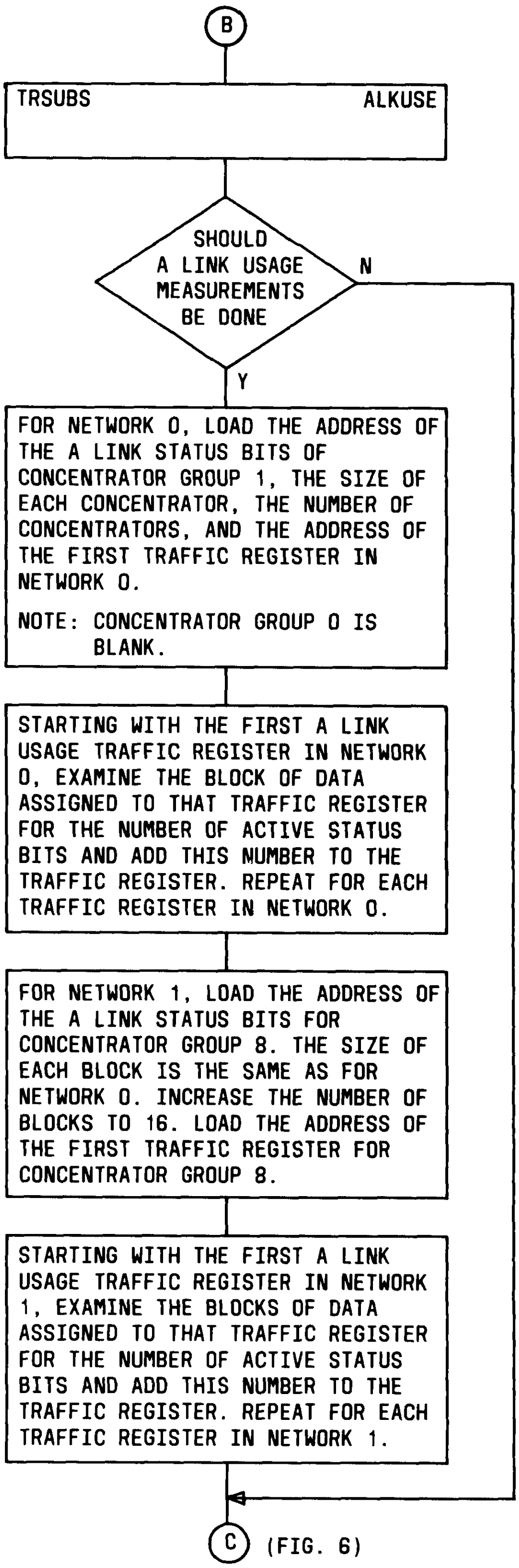

Fig. 7—A-Link Usage Measurements

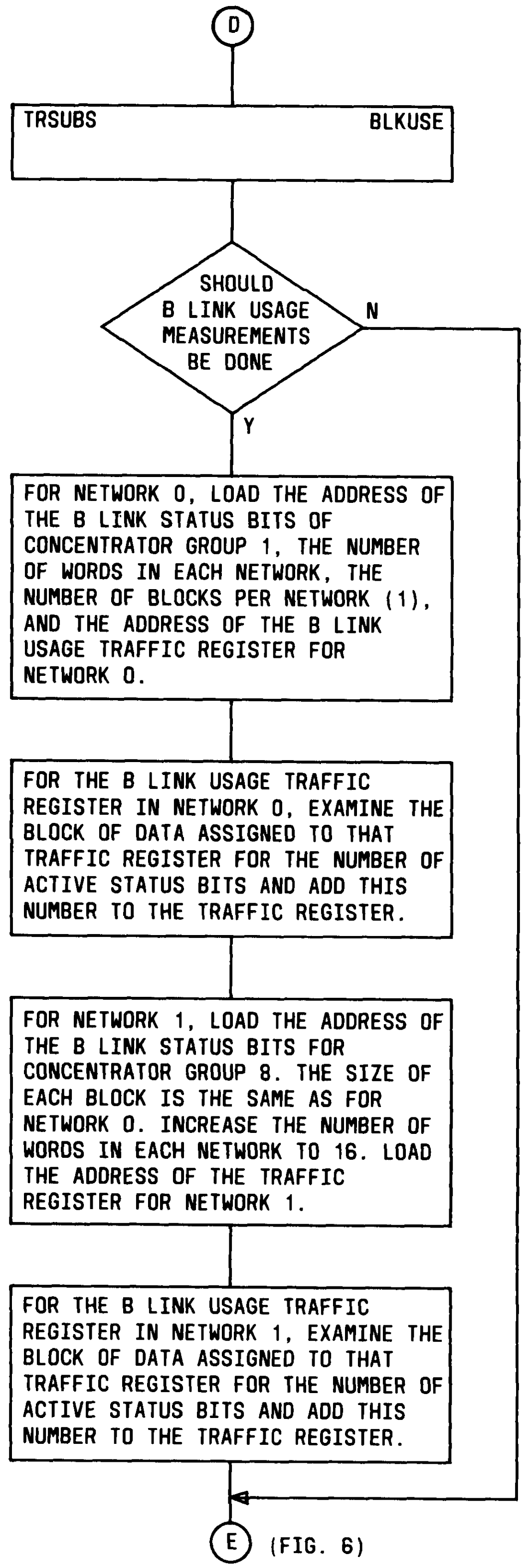

Fig. 8—B-Link Usage Measurements

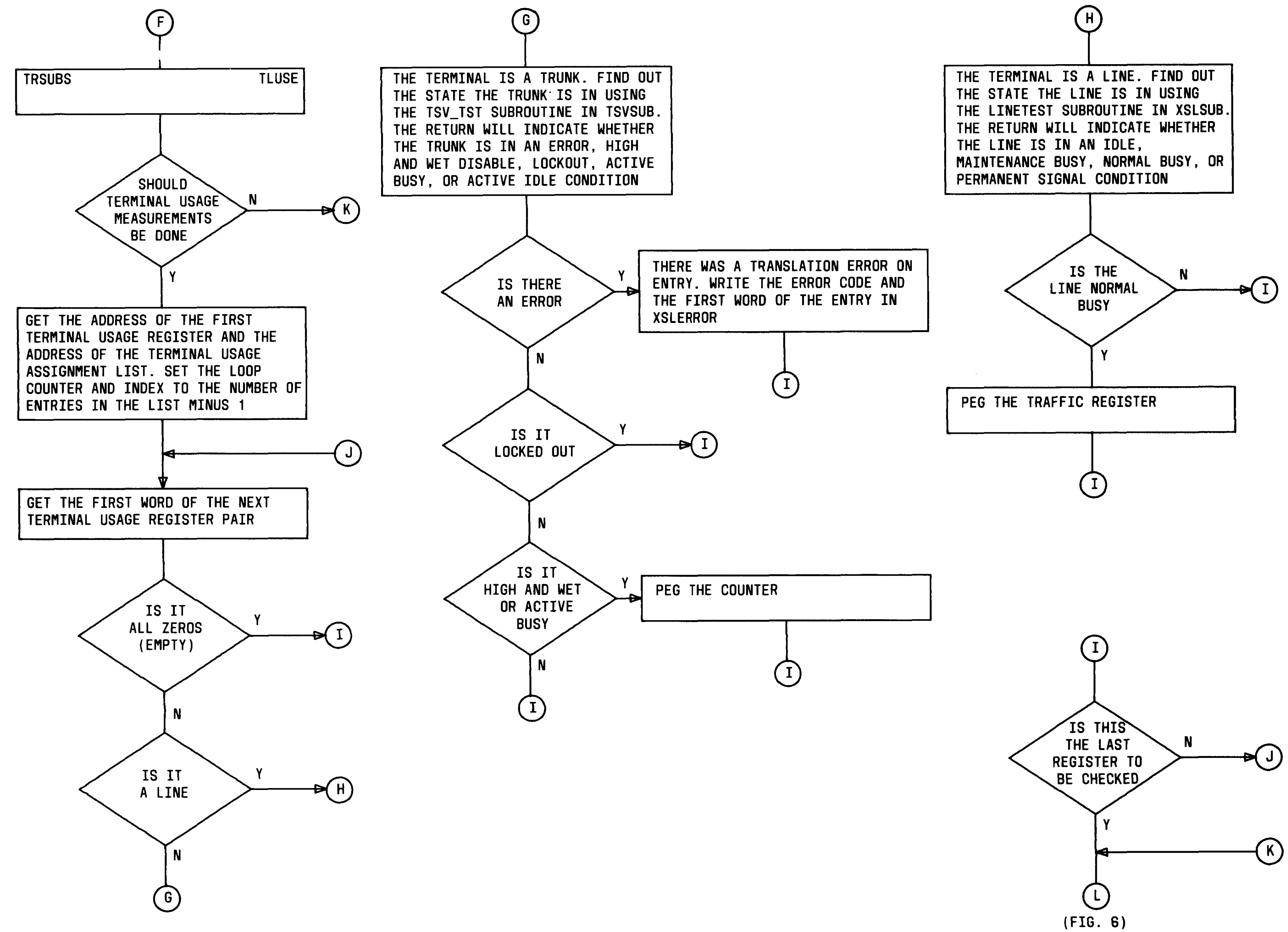

Fig. 9—Terminal Usage Measurements

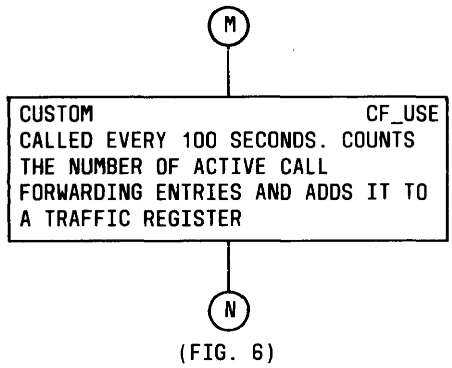

Fig. 10—Call Forwarding Registers Usage Measurements

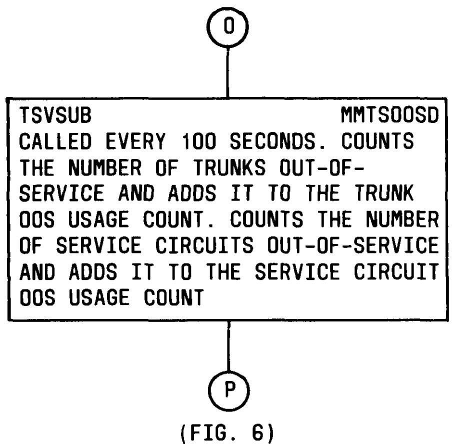

Fig. 11—Maintenance Usage Measurements

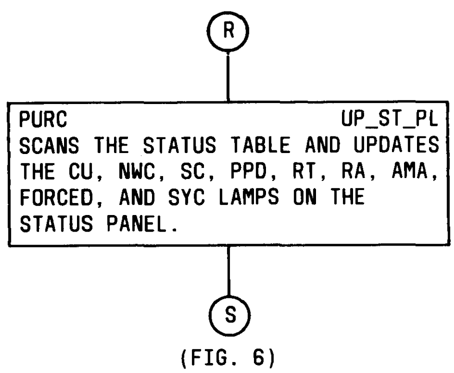

Fig. 12—Update Status Panel Lamps

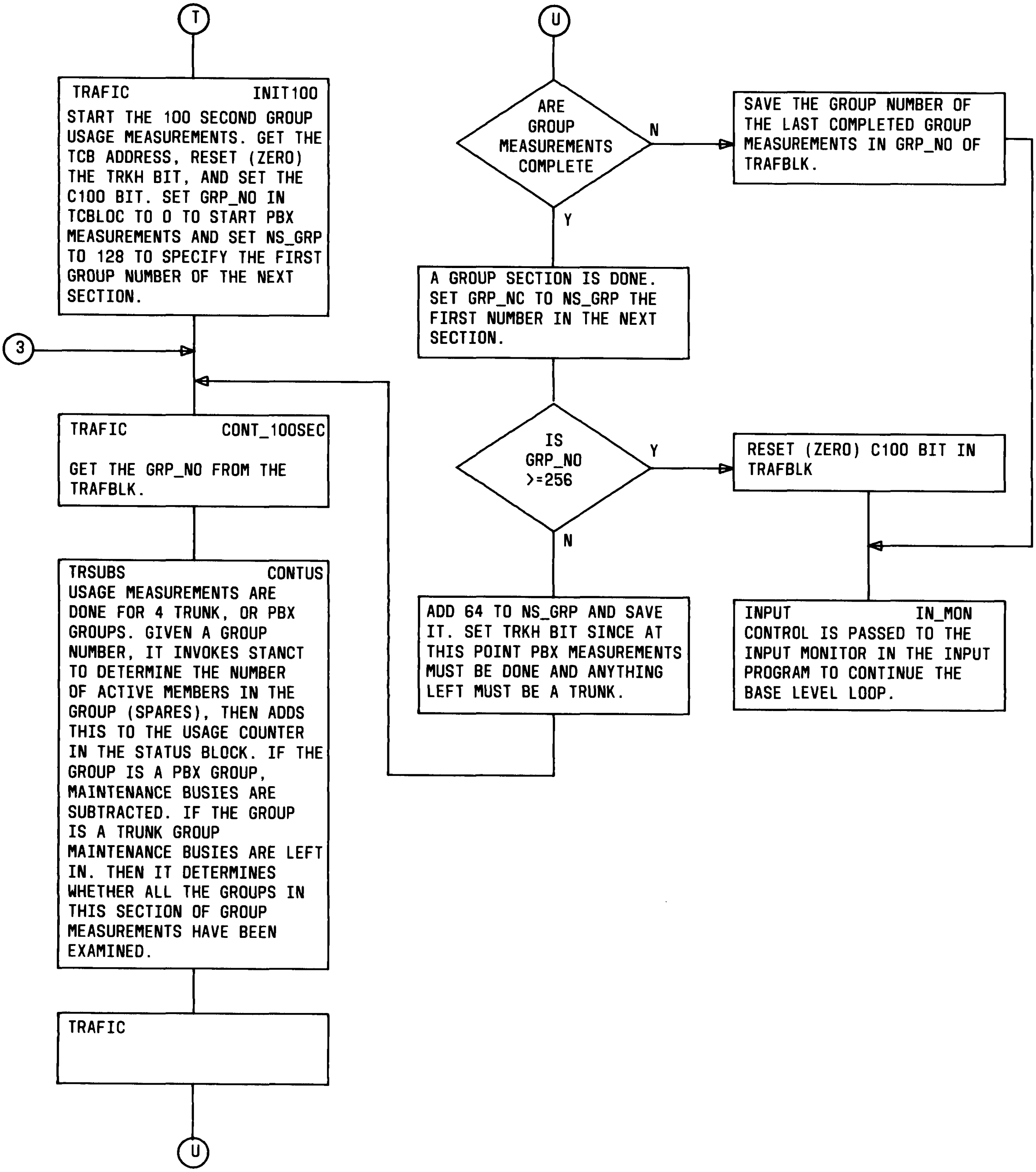

Fig. 13—100-Second Group Usage Measurements

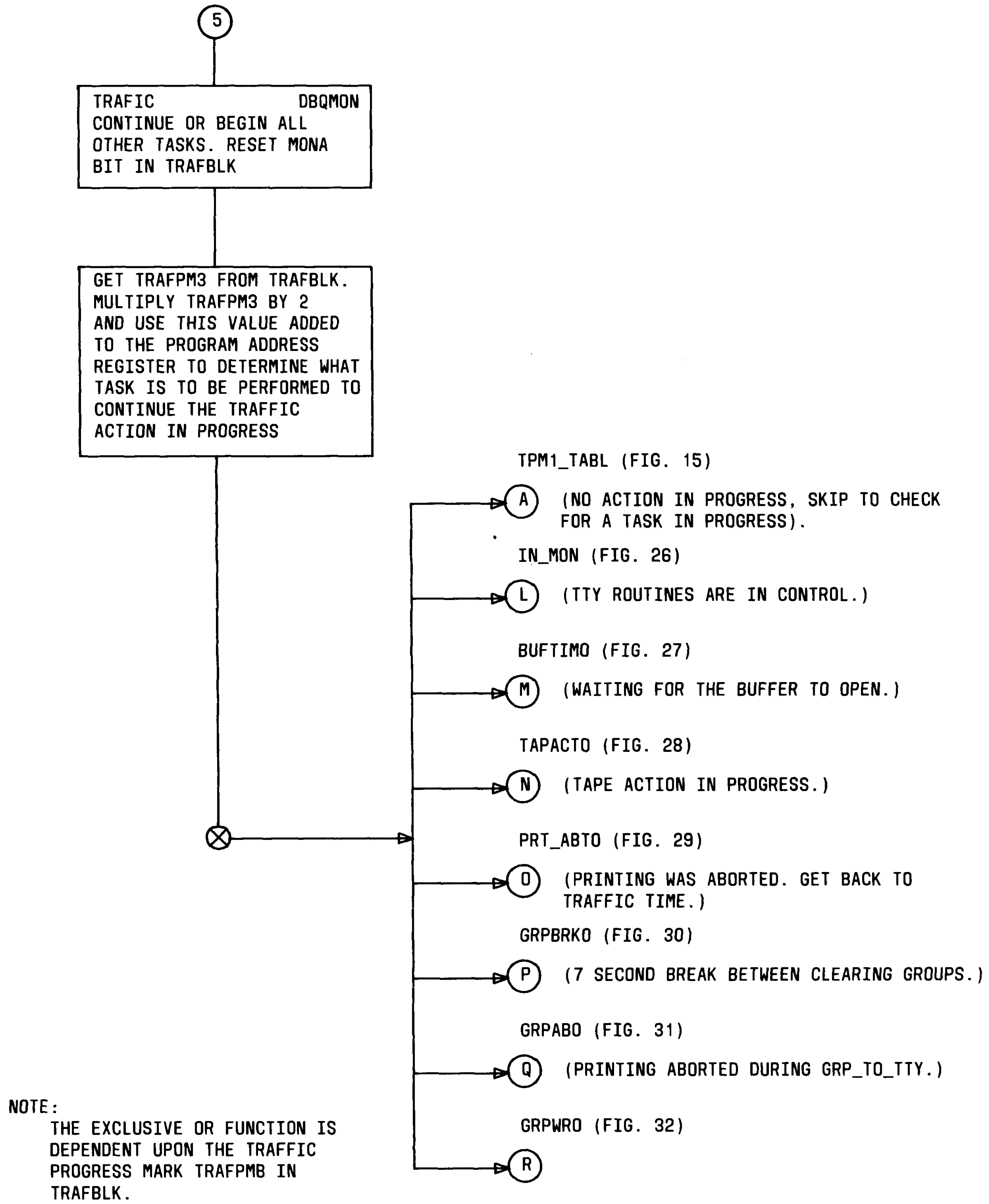

Fig. 14—DBQMON Routine Entry Flow

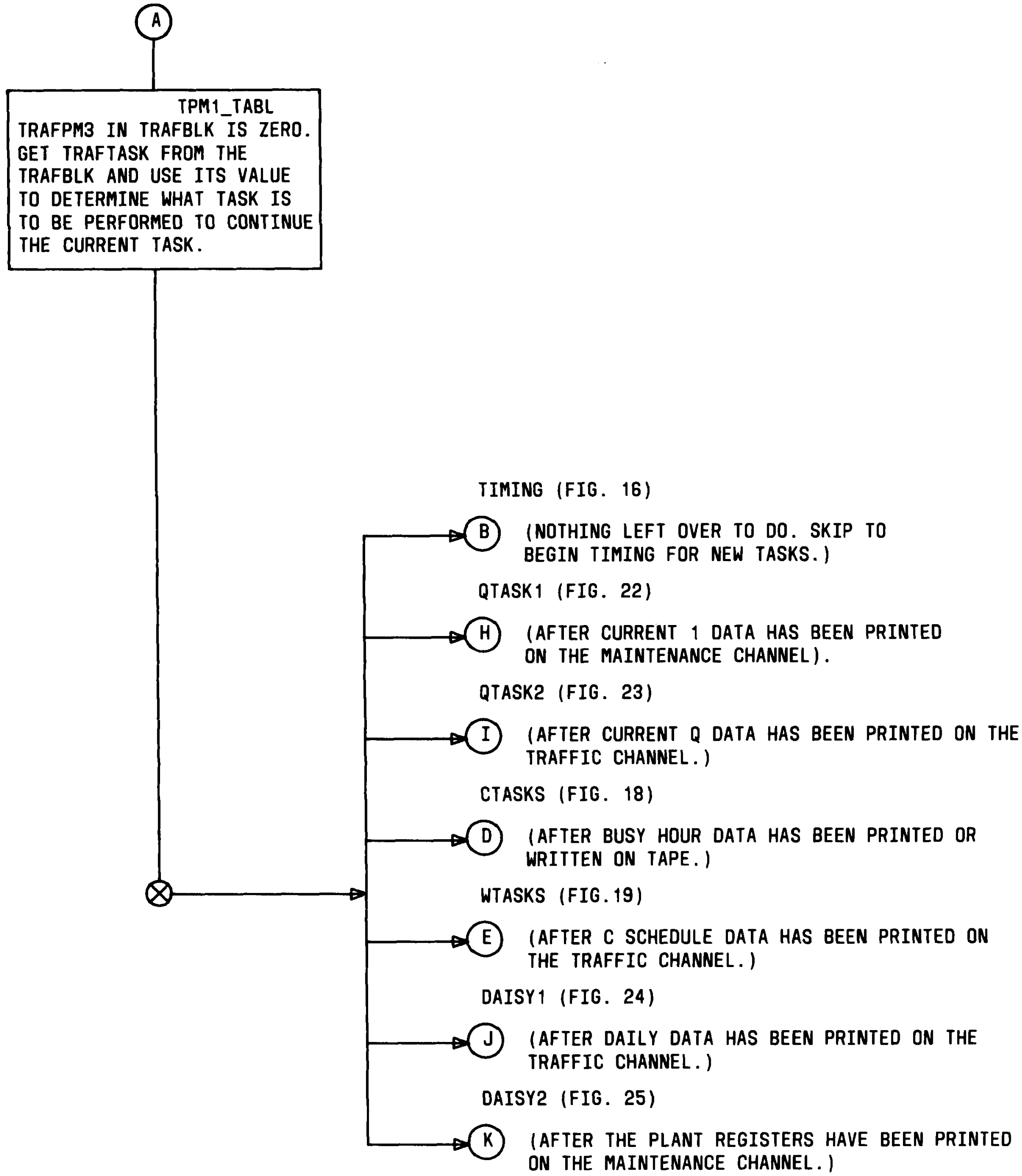

Fig. 15—Traffic Progress Mark Table Flow

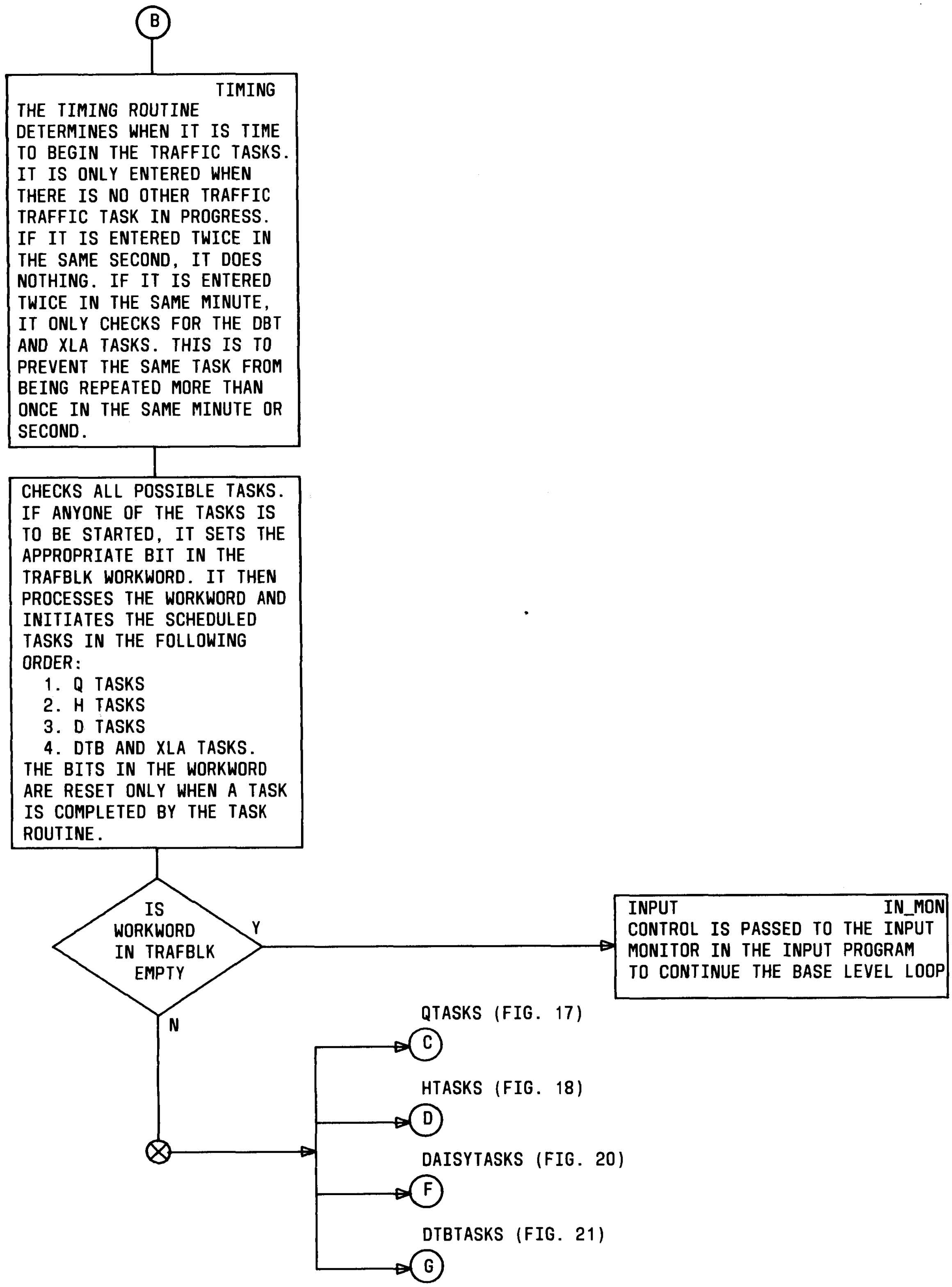

Fig. 16—TIMING Flow

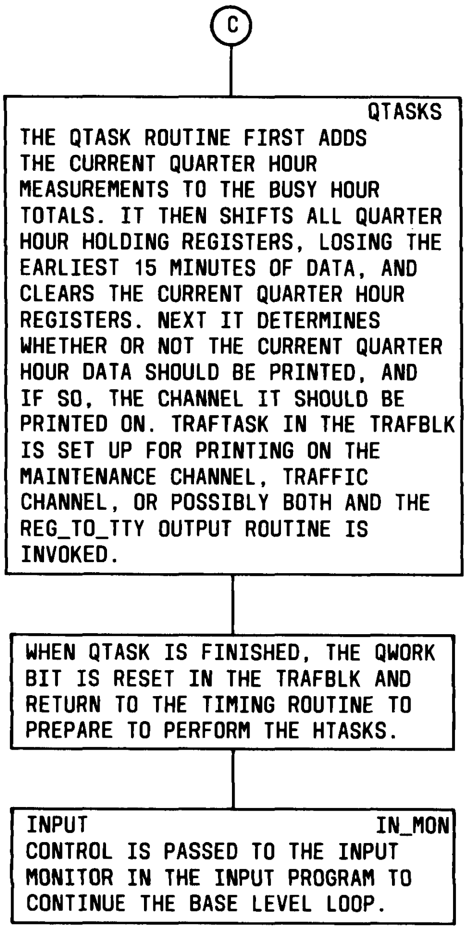

Fig. 17—Quarter Hour Tasks Flow

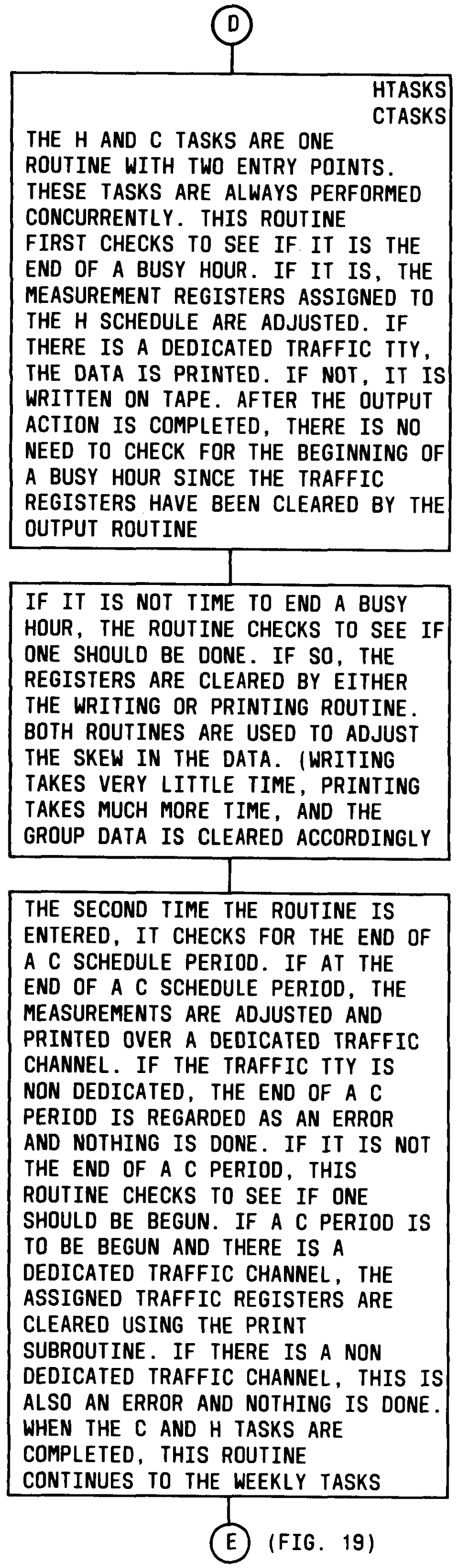

Fig. 18—Busy Hour Tasks and Continuous NonBusy Hour Tasks Flow

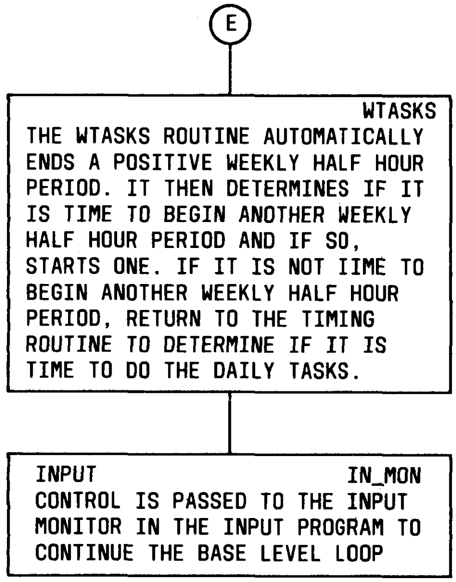

Fig. 19—Weekly Tasks Flow

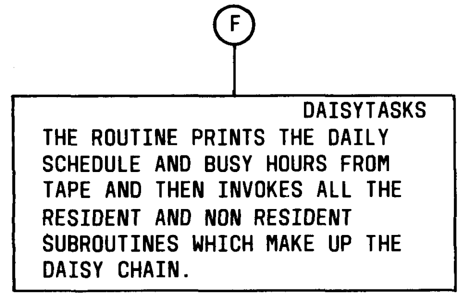

Fig. 20—Daisy Chain Task Flow

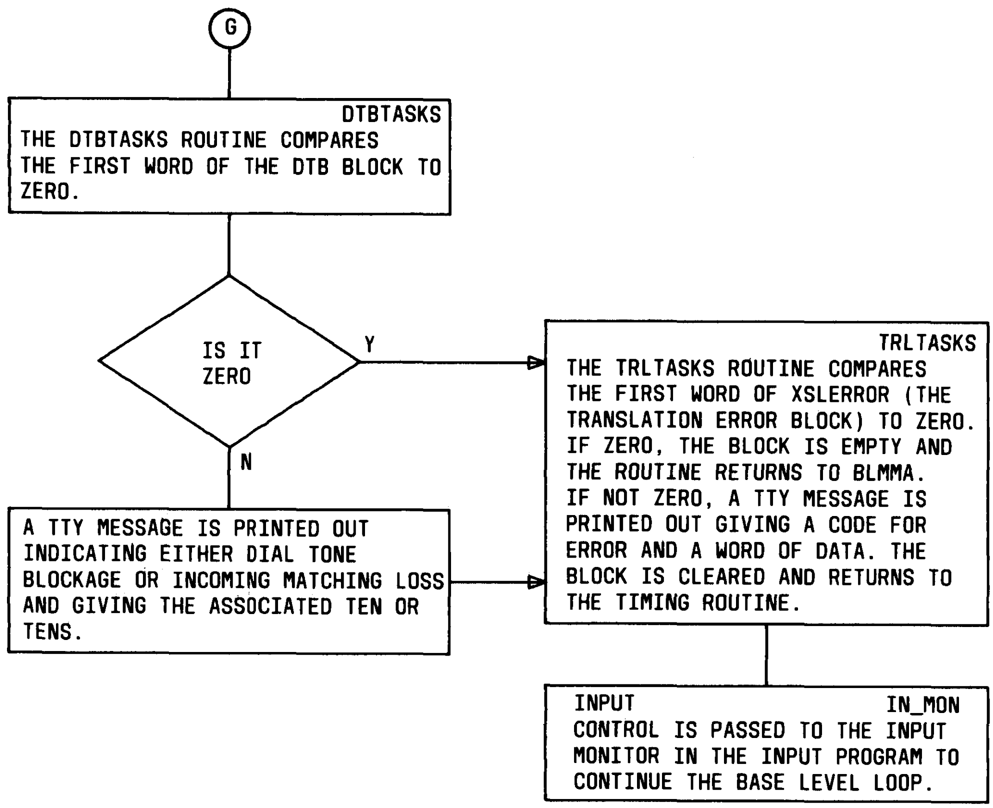

Fig. 21—Dial Tone Blockage and Translation Error Tasks Flow

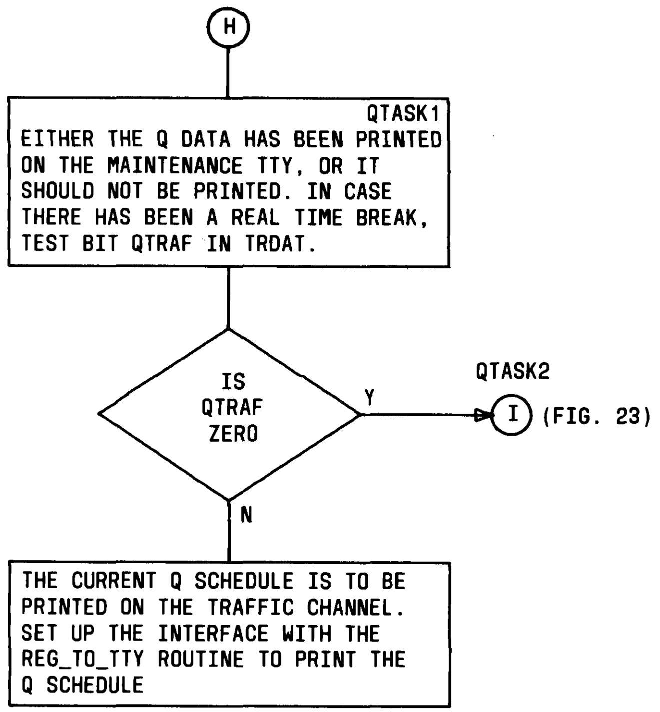

Fig. 22—QTASK1 Flow

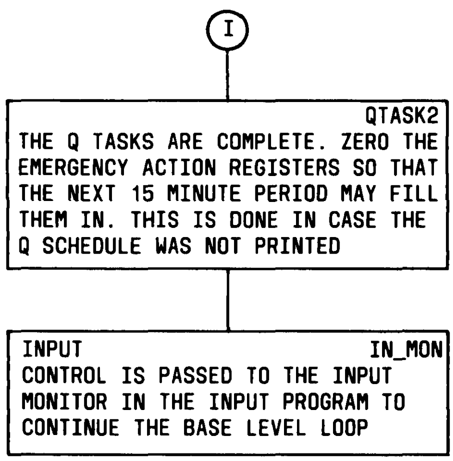

Fig. 23—QTASK2 Flow

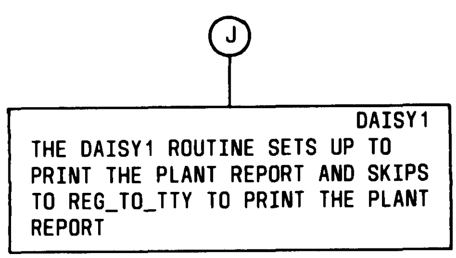

Fig. 24—DAISY1 Flow

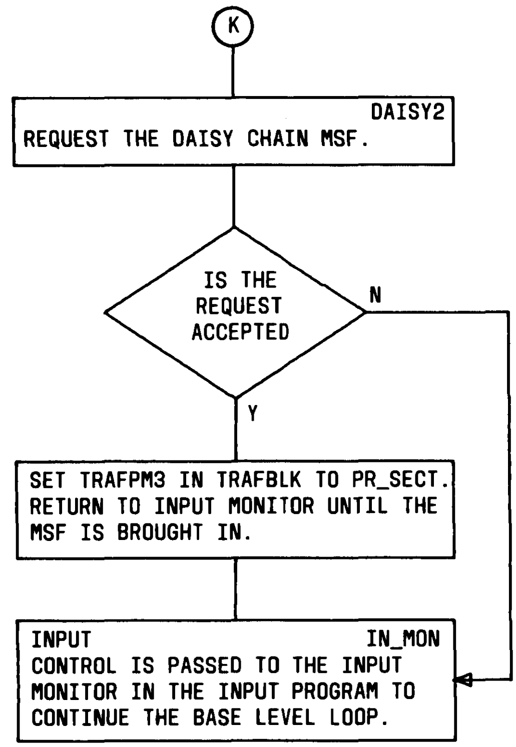

Fig. 25—DAISY2 Flow

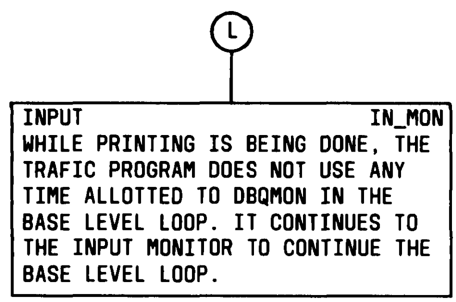

Fig. 26—Input Monitor

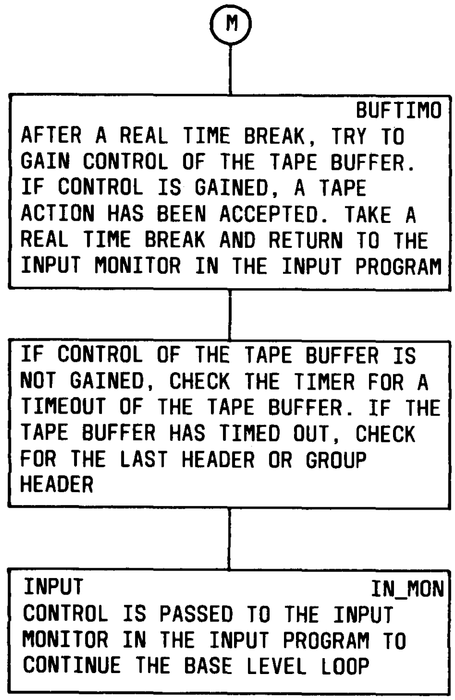

Fig. 27—Buffer Time Flow

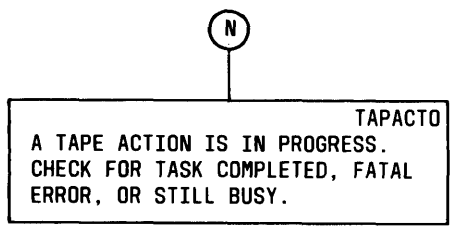

Fig. 28—Tape Action Flow

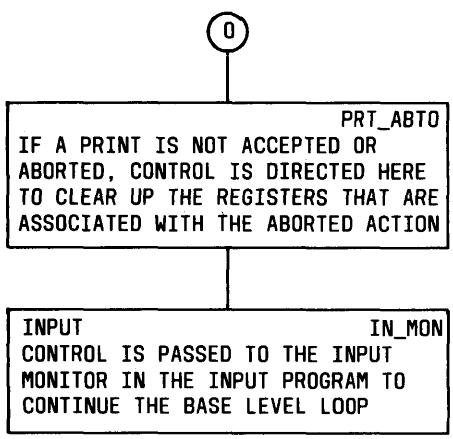

Fig. 29—Print Abort Flow

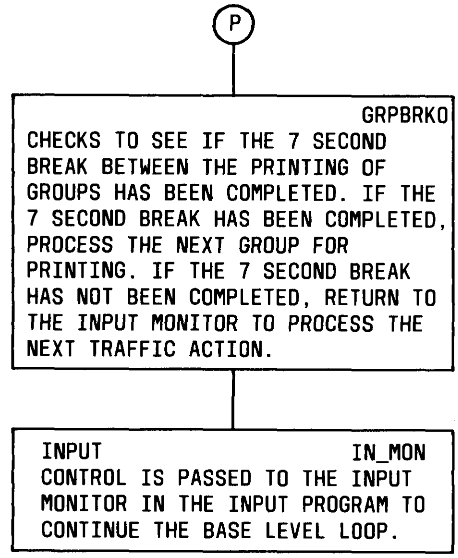

Fig. 30—7-Second Group Break Flow

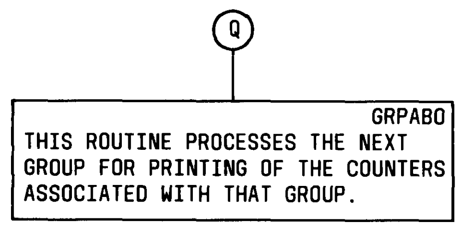

Fig. 31—Group Abort Flow

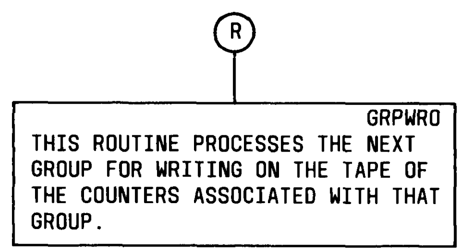

Fig. 32—Group Write Flow

TABLE A

INDEX OF NETWORK ADMINISTRATION MEASUREMENTS NO. 3 ESS

MEASUREMENT	NUMBER	PARAGRAPH
A-Links Out of Service	ALK01	4.120
Abandons - Incoming	OFT71	4.76
Abandons - Outgoing & IAO	OFT72	4.77
Abandons - Tandem	OFT70	4.75
Average Dial Pulse Dial Tone Delay	OFT01	4.04
Average TOUCH-TONE Dial Tone Delay	OFT05	4.11
Average MF Receiver Attachment Delay	OFT09	4.15
Base Level Loops Over 150 Milliseconds	OFT14	4.23
B-Links Out of Service	BLK01	4.123
B-Link Usage	BLK02, BLK03	4.124
Call Forwarding Activation Attempts	OFT48	4.53
Call Forwarding Register Usage	OFT49	4.54
Calls Forwarded	OFT50	4.55
Call Waiting Calls	OFT51	4.56
Class of Service Originating Peg Count	CLS01—CLS04	4.116
Class of Service Terminating Peg Count	CLS05	4.117
Connecting Troubles — Incoming	OFT64	4.69
Connecting Troubles — Outgoing & IAO	OFT65	4.70
Connecting Troubles — Tandem	OFT63	4.68
Dial Pulse Abandoned Bids for Dial Tone	OFT18	4.27
Dial Pulse Bylink and Nonbylink Incoming Calls	OFT37	4.44
Dial Pulse Originations	OFT03	4.09
Dial Tone Blockage	OFT74	4.79
Dynamic Service Protection Usage	OFT16	4.25
False Starts	OFT22	4.31
First Attempt to Match	OFT43	4.48
First Failure to Match	OFT44	4.49
Incoming Call Attempts	OFT34	4.41
Incoming Calls to Busy Lines	OFT69	4.74
Incoming Intercepts	OFT39, OFT40, OFT41	4.46
Incoming Partial Dial Abandons	OFT36	4.43
Incoming Partial Dial Time-Outs	OFT35	4.42
Ineffective Incoming Signaling	OFT68	4.73
Ineffective Incoming Terminating Signaling	OFT53	4.58
Ineffective Intraoffice Terminating Signaling	OFT54	4.59
Ineffective Originating Signaling	OFT52	4.57
Ineffective Outgoing Signaling	OFT67	4.72
Ineffective Tandem Signaling	OFT66	4.71
Interrupts Deferred	OFT15	4.24
Intraoffice Call Attempts	OFT25	4.34
Intraoffice Calls to Busy Lines	OFT26	4.35
Intraoffice Intercepts	OFT29, OFT30, OFT31	4.38

TABLE A (Contd)

INDEX OF NETWORK ADMINISTRATION MEASUREMENTS
NO. 3 ESS

MEASUREMENT	NUMBER	PARAGRAPH
Longest Base Level Loop	OFT13	4.22
Maintenance Busy	TRK05	4.96
	SVC05	4.105
MF Incoming Calls	OFT38	4.45
Multiline Hunt Group Number	MLH01	4.108
No Path - Incoming Terminating	OFT56	4.61
No Path - Outgoing and IAO	OFT57	4.62
No Path - Tandem	OFT55	4.60
No Service Circuit - Incoming	OFT59	4.64
No Service Circuit - Outgoing and IAO	OFT60	4.65
No Service Circuit - Tandem	OFT58	4.63
No Trunk - Outgoing	OFT62	4.67
No Trunk - Tandem	OFT61	4.66
Number of Dial Pulse Dial Tone Delays Over Three Seconds	OFT04	4.10
Number of TOUCH-TONE Dial Tone Delays Over Three Seconds	OFT08	4.14
Number of MF Receiver Attachment Delays Over Three Seconds	OFT12	4.21
One-Digit Speed Calls	OFT45	4.50
Outgoing Call Attempts	OFT32	4.39
Overflow	TRK04	4.95
	SVC04	4.104
	MLH04	4.111
Partial Dial Abandons	OFT23	4.32
Partial Dial Time-Outs	OFT21	4.30
Peg Count	TRK02	4.91
	SVC02	4.101
	MLH02	4.109
Percentage of Dial Pulse Dial Tone Delays Over Three Seconds	OFT02	4.08
Percentage of TOUCH-TONE Dial Tone Delays Over Three Seconds	OFT06	4.12
Percentage of MF Receiver Attachment Delays Over Three Seconds	OFT10	4.19
Permanent Signal Time-Outs	OFT20	4.29
Preroute Peg Count	PRE01 — PRE04	4.114
Stable Intraoffice Usage	OFT27	4.36
Stable Outgoing Usage	DOR04	4.86
Stable Revertive Call Usage	OFT28	4.37
Stable Through-Switch Usage	DOR03	4.85

TABLE A (Contd)

INDEX OF NETWORK ADMINISTRATION MEASUREMENTS
NO. 3 ESS

MEASUREMENT	NUMBER	PARAGRAPH
Tandem Call Attempts	OFT42	4.47
Threeway Calls	OFT47	4.52
Total Number of Bids for an MF Receiver	OFT11	4.20
Total Originating Calls	OFT17	4.26
	DOR01	4.83
Total Terminating Calls	OFT24	4.33
TOUCH-TONE Abandon Bids for Dial Tone	OFT19	4.28
TOUCH-TONE Originations	OFT07	4.13
Translation Errors	OFT73	4.78
Transmitter Time-Outs	OFT33	4.40
Trunk and Line Usage	TLU01-TLU16	4.125
Trunk Group Number	TRK01	4.90
	SVC01	4.100
Two-Digit Speed Calls	OFT46	4.51

TABLE B

INDEX OF MAINTENANCE MEASUREMENTS
NO. 3 ESS

MEASUREMENT	NUMBER	PARAGRAPH
A-Link and B-Link Removal Attempt	PLT54	4.181
Call Audit Failures	PLT30	4.157
CDR-DP Removal Attempts	PLT38	4.165
CDR-TT Removal Attempts	PLT39	4.166
Coin Circuit Removal Attempts	PLT42	4.169
Continuity Test Failures	PLT49	4.176
CU Automatic Removals	PLT01	4.128
DP Transmitter Removal Attempts	PLT43	4.170
Error Analysis Entries	PLT36	4.163
Error Analysis Table Pushoffs	PLT37	4.164
False Cross and Ground Failures	PLT50	4.177
Initialization Count 1	PLT22	4.149
Initialization Count 2	PLT23	4.150
Initialization Count 3	PLT24	4.151
Initialization Count 4	PLT25	4.152
Initialization Count 5	PLT26	4.153
Junctor Progression Test Failures	PLT57	4.184
Junctor Removal Attempts	PLT47	4.174
Known Fault Entries on PD Points	PLT16	4.143
Known Fault Entries on Scan Matrices	PLT15	4.142
Line Trouble Reports	PLT53	4.180
Main Store Audit Failures	PLT31	4.158
Maintenance Busy Overflows	PLT62	4.189
Manual Initializations	PLT29	4.156
Miscellaneous Service Circuit Removal Attempts	PLT46	4.173
MF Receiver Removal Attempts	PLT45	4.172
MF Transmitter Removal Attempts	PLT44	4.171
MRF Count Cleared	PLT21	4.148
Other Alarm Activations	PLT33	4.160
Power Alarm Activations	PLT32	4.159
Power Cross Failures	PLT51	4.178
Quick-Check Entries	PLT34	4.161
Quick-Check Overflow	PLT35	4.162
Regular Ringing Removal Attempts	PLT40	4.167
Restore/Verify Failures	PLT52	4.179
Service Circuit Out-of-Service Duration	PLT59	4.186
Service Circuit Progression Test Failures	PLT56	4.183
Service Removals, Network Controller	PLT18	4.145
Service Removals, Peripheral Pulse Distributor	PLT19	4.146
Service Removals, Ringing and Tone	PLT20	4.147

TABLE B (Contd)

INDEX OF MAINTENANCE MEASUREMENTS
NO. 3 ESS

MEASUREMENT	NUMBER	PARAGRAPH
Service Removals, Scanner Controller	PLT17	4.144
Superimposed Ringing Removal Attempts	PLT41	4.168
SYC Out-of-Service Duration	PLT11	4.138
Tape 0 Fatal Reads	PLT07	4.134
Tape 1 Fatal Reads	PLT08	4.135
Tape 0 Fatal Writes	PLT09	4.136
Tape 1 Fatal Writes	PLT10	4.137
Tape 0 Files Opened	PLT03	4.130
Tape 1 Files Opened	PLT04	4.131
Tape 0 Transient Errors	PLT05	4.132
Tape 1 Transient Errors	PLT06	4.133
TDC Automatic Removals	PLT02	4.129
Total Line Originations	PLT61	4.188
Total Outgoing and Incoming Call Attempts	PLT63	4.190
Total Restorals of Trunks and Service Circuits	PLT60	4.187
Transient Errors on Network Controllers	PLT13	4.140
Transient Errors on Peripheral Pulse Distributors	PLT14	4.141
Transient Errors on Scanners	PLT12	4.139
Trunk Circuit Out-of-Service Duration	PLT58	4.185
Trunk Progression Test Failures	PLT55	4.182
Trunk Removal Attempts	PLT48	4.175

TABLE C

TELETYPEWRITER AND TRAFFIC CONFIGURATIONS

TELETYPEWRITER

TRAFFIC	NONDEDICATED	PARTIALLY DEDICATED	DEDICATED
NONDEDICATED	No C Schedule Busy hours to tape Autoconnect for daisy chain over TTYC1	No C schedule Busy hours to tape Autoconnect daisy chain over dedicated Controller for traffic	No C schedule Busy hours to tape No autoconnect Must print busy hours during daisy chain
DEDICATED	C schedule allowed Busy hours not on tape Busy hour out hourly via autoconnect Autoconnect for daisy chain When busy hour for auto-connect goes out hourly it ties up TTYC1	C schedule allowed Busy hours not on tape Busy hours out hourly via autoconnect Autoconnect hourly and daisy chain tie up the dedicated controller not TTYC1	C schedule allowed Busy hours not on tape Busy hours out hourly No autoconnect Only use traffic dedicated controller all prints direct

Note: The following indicates which configurations are suitable:

Nondedicated traffic nondedicated teletypewriter — OK
Dedicated traffic nondedicated teletypewriter — NO GOOD
Nondedicated traffic partially dedicated teletypewriter — BETTER
Dedicated traffic partially dedicated teletypewriter — GOOD
Nondedicated traffic dedicated teletypewriter — NOT LIKELY
Dedicated traffic dedicated teletypewriter — BEST