SWITCHING SYSTEMS MANAGEMENT

NO. 5 CROSSBAR (2-WIRE)

TRAFFIC MEASUREMENTS

REGISTER OPERATION AND PROVISION

1. GENERAL

1.01 This section describes the various No. 5 crossbar (2-wire) individual traffic registers operation and provision. It explains in detail the more commonly used 2-wire office traffic registers, including those associated with the traffic usage recorder (TUR).

1.02 When this section is reissued, the reason for reissue will be given in this paragraph.

1.03 References in this section to methods, planning, data requirements, service levels and equipment quantities are based on American Telephone and Telegraph Company recommendations.

1.04 The title of each figure includes a number in parentheses which identifies the paragraph or item number in which the figure is referenced.

A. Equipment Measurement Codes

1.05 The equipment measurement code (EMC) as described in Bell System Practices Section 751-100-700 is the standard common language identification of traffic data input to various traffic measurement mechanization processes. It enables the processes to perform validation tests, summarize related measurements into totals, and perform the calculations required to produce output reports.

1.06 Responsible network personnel will assign the codes to traffic registers as required for traffic measurement mechanization processes such as central office equipment reports (COER). Therefore, an EMC or a span of EMCs has been included with the description of each traffic register. Multiple codes have been provided in many instances because of the type or arrangement of the equipment. For example, wire spring (WS) completing markers (CMs) have a different span of codes than flat spring (FS), and paired (Pr) line link frames (LLFs) are coded differently than nonpaired (N-Pr) LLFs. Also, incoming registers and outgoing senders have been provided with a separate span of codes for slow scan even though fast scan is recommended.

1.07 No. 5 crossbar EMCs consist of five characters as follows:

(a) First—Alpha C through S, and Z (omitting I and O)

(b) Second—Numeric 0 through 9

(c) Third—Numeric 0 through 9

(d) Fourth—Numeric 0 through 9

(e) Fifth—Numeric 0 through 9 or Z

1.08 When possible, EMCs have a meaningful relationship with the equipment components they represent. For example:

Code	Equipment
C0000	LLF 00 2W N-Pr HG0
C0599	LLF 59 2W N-Pr HG9

In the example, the third and fourth characters of the code identify the LLF and the fifth character of the code identifies the horizontal group.

1.09 If the character in the first position of the code (in No. 5 crossbar) is C through S, the size of the span is determined from the second character (first numeric). If the leading character is Z the size of the span is 1. The following table shows the designated span sizes.

LETTER	FIRST NUMERIC	EQUIPMENT	SIZE OF SPAN
C-S*	0, 1	LLF	2000
C-S*	2	TLF, SLU	1000
C-S*	4	IR	1000
C-S*	8	Com. Equip.	100
C-S*	9	Com. Equip.	10
Z	0—9	Misc.	1

* Excluding I and O

1.10 All of like measurements for a given equipment component are assigned within a designation span of 2000, 1000, 100, 10 or 1 codes. Class totals are formed by adding all data values associated with the codes in each span. The highest numbered code in each span is assigned to the total. For example, a No. 5 crossbar office could be equipped with up to six dial tone markers and a particular measurement for these markers is coded as follows:

MEASUREMENT		EMC
Dial tone marker-	Marker 0	C9000
Flat-spring usage	Marker 1	C9001
	Marker 2	C9002
	Marker 3	C9003
	Marker 4	C9004
	Marker 5	C9005
	Total markers 0 to 5	C9009

1.11 Codes in the spans assigned to LLFs and trunk link frames (TLFs) contain either a zero or a two as the first numeric (C0133, D2154). These codes should be arranged for subtotals when register grouping and detector group usage (DGU) are provided. Subtotals are necessary because individual registers may not be provided to measure every LLF and TLF horizontal group (HG) simultaneously. The registers provided may be switched to measure up to four different items. When this is done, DGU registers are provided to measure totals of the classes of equipment involved. Although register grouping is *not* recommended, when it is provided, the following equipment items and codes are involved in register group and DGU arrangements.

EQUIPMENT	INDIVIDUAL CODES	CLASS TOTAL CODES
2-Wire Paired LLF DGU	Z6204—Z6259	—
2-Wire Single and Paired LLF DGU	Z6304—Z6359	—
2-Wire TLF DGU	Z6502—Z6529	—
2-Wire Single LLF	C0000—C0599	C1999
2-Wire Paired LLF	E0000—E0599	E1999
2-Wire TLF	C2000—C2299	C2999
2-Wire Single LLF DGU	Z6104—Z6159	—

For the C and E codes the last three digits show the frame and HG numbers (eg, C2186 is for 2-wire TLF 18, HG 6). For the Z codes the last two digits show the highest numbered frame included in the DGU total (eg, Z6214 is the DGU measurement for paired LLFs. The highest-numbered LLF is 14).

1.12 In order to provide a cross-reference between the C and E codes and the associated DGU measurement, the C and E code for HG 9 of the highest numbered frame associated with each DGU register contains a Z as the last character rather than a 9.

B. Traffic Registers in Partially Paired LLF Configurations

1.13 When some but not all 2-wire LLFs are paired, the nonpaired frames become a separate loading division. With this arrangement, it becomes necessary to measure the paired and nonpaired LLF data separately so as to meet traffic engineering and administration objectives.

1.14 Figure 1 lists the required data along with the traffic register scoring lead for both the paired and the nonpaired (2-wire) loading divisions. Except as noted, when paired frames are in the path of a call, the paired registers only will score. When nonpaired frames are involved, the 2-wire register will score. The exceptions are as follows.

(a) Total originating peg count. This is pegged over the TOPR lead on all calls from paired LLFs (both dial pulse and TOUCH-TONE® calls). Total dial pulse calls from all frames, paired and nonpaired, are pegged over the TOR (2w) lead. Total TOUCH-TONE calls from all frames, paired and nonpaired, are pegged over the TMOR (2w) lead.

(b) In fully or partially paired offices, the office overflow count is scored over the completing marker PTCO lead on all calls that originate from paired frames which the marker routes to overflow. The TCO (2w) office overflow lead will peg all calls which receive overflow whether originated from paired or nonpaired frames.

2. TRAFFIC REGISTER PROVISION AND OPERATION

2.01 In this part, in a 3-column format, each register is described as follows:

(a) *Item Number Column:* An asterisk, if shown adjacent to the item number, indicates that the register may be multipled.

(b) *Register Column:* The title of each register and the primary users of the data are listed first. The users are abbreviated as follows:

Network Design   ND

Network Administration   NA

Network Maintenance   NM

Division of Revenue   DR

No Longer Required   NR

The last two entries in this column are the EMC and the basis for register provision.

(c) *Description Column:* The information listed here consists of the circuit scoring the register, the scoring lead designation, and a description of the recorded data. Where a usage register is described, a slow or fast scan notation is also made.

ITEM NO.	REGISTER	DESCRIPTION

A. Common Control Equipment Registers

Completing or Combined Markers

1* **Completing or Combined Marker Peg Count**

—

ND, NM

—

EMC:
C8700-11 Compl Mkr, FS
C8900-11 Compl Mkr, WS
D8100-11 Comb. Mkr, FS

—

Provide one 5-digit register per marker.

Scored by the completing or combined marker circuit over the TPC lead when the marker is seized for service. On calls using coin, automatic message accounting (AMA), or MR junctors, the register scores twice since two marker seizures are involved. When an originating line identifier is provided or flat spring combined marker operation is utilized, the register will also score on dial tone connections. It will not score again on recycle or route advance.

2 **Originating Class of Service Peg Count**

—

ND, DR

—

EMC: Refer to Figure 2.

—

Provide one register per class of service per marker (maximum of ten classes). Coin class listed separately under coin service.

Scored by the completing or combined marker circuit over the S lead. These registers will count, by class of service, the number of originating calls that the marker establishes to a trunk of any type on a TLF from a line location (not a tandem type trunk) on the LLF.

3 **Partial Dial on Overseas Person-to-Person Calls Peg Count**

—

NA

—

EMC: Z7000

—

Provide one register per marker group when office is arranged for international direct distance dialing (IDDD).

Scored by the completing marker circuit over the POP lead and records the number of person-to-person IDDD calls that reach the marker as partial dials. Does not score the originating register abandoned partial dial peg count register.

4 **Partial Dial on Overseas Station-to-Station Calls Peg Count**

—

NA

—

EMC: Z7001

—

Provide one register per marker group when office is arranged for IDDD.

Scored by the completing marker circuit over the POS lead and records the number of station-to-station IDDD calls that reach the marker as partial dials. Does not score the originating register abandoned partial dial peg count register.

5 **Completing or Combined Marker Total Usage**

—

ND

Scored through the TUR at fast scan over the marker MB lead and measures total marker usage (traffic plus maintenance).

ITEM NO.	REGISTER	DESCRIPTION

—

EMC:
C8800-11 Compl Mkr, FS
D8000-11 Compl Mkr, WS
D8200-11 Comb. Mkr, FS
—
Provide one register per marker.

Note: Since some marker usage is missed because of the point of measurement, it is necessary to adjust the measured usage according to the type of marker installed. Wire spring marker usage should be increased by 0.015 second times the marker peg count. Flat spring marker usage should be increased by 0.025 second times the marker peg count.

6 *Completing or Combined Marker Maintenance Usage*
—
ND
—
EMC:
Z0111 Compl Mkr, FS
Z0112 Compl Mkr, WS
Z0113 Comb. Mkr, FS
—
Provide one register per marker group. When a marker group has mixed wire and flat spring markers, provide one register for each type.

Scored through the TUR at slow scan over the marker MBM lead and measures total maintenance usage.

7 *Local Overload Announcement (LOA) Peg Count*
—
ND, NA
—
EMC: C9370-75 (Same codes used with dial tone markers)
—
Provide one register per combined marker.

Scored by the combined marker circuit over the PCA lead when a channel is set up to a LOA trunk after marker recycle due to all originating registers busy. Scored only when the LOA feature is activated by operation of the AN key. This register does not score when all LOA trunks are busy.

8 *All LOA Trunks Busy—Overflow*
—
ND, NA
—
EMC: C9380-85 (Same span of codes used with dial tone markers)
—
Provide one register per combined marker or as required.

Scored by the combined marker circuit over the BA lead when all LOA trunks are busy. Scored only when LOA feature is activated by operation of the AN key.

9 *Dial Tone Matching Loss*
—
ND, NA
—
EMC: Z0200 (Same code used with dial tone markers)
—
Provide one register per combined marker group.

Scored by the combined marker circuit over the FMP lead and records the second failures to match encountered by a marker in attempting to set up a channel to an originating register or LOA trunk. A particular dial tone request may produce multiple scorings of this register until the customer hangs up or is served. Since each scoring is the second failure to match, the marker holding time (due to

ITEM NO.	REGISTER	DESCRIPTION

recycle) is approximately twice that of a successful attempt. High scoring may indicate excessive line link frame loads, overloaded horizontal groups or both, and may be accompanied by dial tone delay. The dial tone matching loss register is also known as the dial tone marker second failure to match or blocked dial tone register.

Dial Tone Markers

1*   ***Dial Tone Marker Peg Count***

—

ND, NM

—

EMC:
C9500-05 DTM WS 2W
C9510-15 DTM FS
C9520-25 DTM TRFR

—

Provide one register per marker per type of call served. Maximum of two per marker. The KS-16493 5-digit register should be provided for high scoring circuits. Refer to Part 2A of Dial Facilities Management Practices, Division H, Section 5e(1).

Scored by the dial tone marker circuit over the TPC (2w) lead when the marker is seized for service. If the markers serve centrex station dial transfer calls, an additional register is provided and scored over the TPC (TRANS) lead. Total dial tone marker peg count would be the sum of both registers. The register does not score on marker recycles.

Note: Flat spring dial tone markers do not have dial transfer capability.

2   ***LOA Peg Count***

—

ND, NA

—

EMC: C9370-75 (Same codes used with combined markers)

—

Provide one register per marker.

Scored by the dial tone marker circuit over the PCA lead when a channel is set up to a local overload announcement trunk after marker recycle due to all originating registers busy. Scored only when the LOA feature is activated by operation of the AN key. This register does not score when all LOA trunks are busy.

3   ***All LOA Trunks Busy—Overflow***

—

ND, NA

—

EMC: C9380-85 (Same span of codes used with combined markers)

—

Provide one register per marker group or as required.

Scored by the dial tone marker circuit over the BA lead when all LOA trunks are busy. Scored only when the LOA feature is activated by operation of the AN key.

4   ***Dial Tone Matching Loss***

—

ND, NA

—

EMC:
Z0200 2-wire (Same code used with combined

Scored by the dial tone marker circuit over the FMP lead and records the second failures to match encountered by a marker in attempting to set up a channel to an originating register or LOA trunk. A particular dial tone request may produce multiple scorings of this register

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markers)

—

Provide one register per marker group.

until the customer hangs up or is served. Since each scoring is the second failure to match, the marker holding time (due to recycle) is approximately twice that of a successful attempt. High scoring may indicate excessive line link frame loads, overloaded horizontal groups or both, and may be accompanied by dial tone delay. The dial tone matching loss register is also known as the dial tone marker second failure to match or blocked dial tone register.

5 **Dial Tone Marker Total Usage**

—

ND

—

EMC:
C9000-05 DTM FS
C9030-35 DTM WS Com or Single Grp
C9040-45 DTM WS Graded Grp A
C9050-55 DTM WS Graded Grp B

—

Provide one register per marker.

Scored through the TUR at fast scan over the marker MB lead and measures total usage (traffic plus maintenance).

Note: Since some marker usage is missed because of the point of measurement, it is necessary to adjust the measured usage according to the type of marker installed. Wire spring marker usage should be increased by 0.015 second times the marker peg count. Flat spring marker usage should be increased by 0.025 second times the marker peg count.

6 **Dial Tone Marker Maintenance Usage**

—

ND

—

EMC:
Z0109 DTM WS
Z0110 DTM FS

—

Provide one register per marker group. When a marker group has mixed wire and flat spring markers, provide one register for each type.

Scored through the TUR at slow scan over the marker MBM lead and measures total maintenance usage.

Originating Registers

1 **Originating Register Group Peg Count**

—

ND

—

EMC:
C9080-85 TOUCH-TONE Grp
C9120-25 Dial Pulse Grp
C9400-05 Dial Tone First Grp
C9410-15 1st Future Use Grp
C9430-35 2nd Future Use Grp
C9450-55 3rd Future Use Grp

—

Provide one register per originating register

Scored by the dial tone or combined marker circuit over the PCD lead for dial pulse groups, PCMF lead for TOUCH-TONE groups and PCR 0-3 leads when up to six groups are required (not restricted to groups). The marker scores the register when it establishes a channel from a calling line equipment to an originating register for dial tone. It is arranged to count all dial tone attempts including permanent signals, partial dials, false starts, and test calls. When an originating register group serves both dial pulse and TOUCH-TONE customers, the scorings for both types of

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	group per dial tone or combined marker. A maximum of six originating register groups may be provided.	originating register uses will be included on the same peg count register since the marker has no way of determining the type of pulsing.

2   *Originating Register Group Peg Count (Office with Originating Line Identifier)*

—

ND

—

EMC:
Z4080 Dial Pulse Grp
Z4081 TOUCH-TONE Grp
Z4082 Dial Tone First Grp
Z4083 1st Future Grp
Z4084 2nd Future Grp
Z4085 3rd Future Grp

—

Provide one register per originating register group.

Description: Scored by the completing marker circuit over the originating register route relay PC lead and records all attempts to connect a calling line to an originating register. Permanent signals, partial dials, false starts, and test calls are included. When an originating register group serves both dial pulse and TOUCH-TONE customers, the scorings for both types of uses will be included on the same register since the marker has no way of determining the type of pulsing.

Note: The PC register will also score when all originating registers or junctors are busy.

3   *All Originating Registers Busy—Overflow*

—

ND, NA

—

EMC:
C9100-05 TOUCH-TONE Grp
C9140-45 Dial Pulse Grp
C9390-95 Dial Tone First Grp
C9420-25 1st Future Use Grp
C9440-45 2nd Future Use Grp
C9460-65 3rd Future Use Grp

—

Provide one register per originating register group per dial tone or combined marker. A maximum of six originating register groups may be provided.

Description: Scored by the dial tone or combined marker circuit over the BD lead for dial pulse groups, the BMF lead for TOUCH-TONE groups and the BR0-3 leads when up to six groups are required. The register scores when the marker finds all originating registers in a particular group busy. It does not score on test calls.

4   *All Originating Registers Busy—Overflow for Offices with Originating Line Identifier*

—

ND, NA

—

EMC:
Z4090 Dial Pulse Grp
Z4091 TOUCH-TONE Grp
Z4092 Dial Tone First Grp
Z4093 1st Future Grp
Z4094 2nd Future Grp
Z4095 3rd Future Grp

—

Description: Scored by the completing marker circuit over the OR route relay OF lead when the marker finds all originating registers in a particular group busy. The register does not score on test calls.

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Provide one register per originating register group per marker group.

5   ***Abandoned Partial Dial Peg Count***

—

ND, NA, DR

—

EMC:
Z0190 Dial Tone First Grp
Z0191 TOUCH-TONE Grp—Dial Pulse Calls
Z0192 TOUCH-TONE Grp—TOUCH-TONE Calls
Z0194 Dial Pulse Group
Z1200 1st Future Grp
Z1201 2nd Future Grp
Z1202 3rd Future Grp

—

Provide one register per originating register group. Exception: TOUCH-TONE groups are provided with two registers.

Scored by the OR circuit over the APD lead for dial pulse groups and the APPB (TOUCH-TONE calls) or APD (dial pulse calls) leads for TOUCH-TONE groups. Scored when an insufficient number of digits have been dialed and the call is abandoned before the completing marker is called in. To obtain total originating attempts, the abandoned partial dial scorings must be added to the total originating peg count.

6   ***Originating Register Total Usage (WS Originating Registers)***

Note: Total usage (traffic plus maintenance) is measured when all originating registers are wire spring.

ND

—

EMC:
Z0338 DTF Grp
Z0340 TT Grp
Z0346 Dial Pulse Grp
Z4060 1st Future Grp
Z4061 2nd Future Grp
Z4062 3rd Future Grp

—

Provide one register per originating register group (see item 7).

Scored through the TUR at slow scan over the originating register RB lead and measures the total usage of all originating registers by group (dial pulse and/or TOUCH-TONE groups).

7   ***Originating Register TOUCH-TONE Usage (WS Originating Registers)***

—

ND

—

EMC: Z0342

—

Provide one register per TOUCH-TONE group for the TOUCH-TONE usage only.

Scored through the TUR at fast scan over the originating register PBC lead. Measures only the TOUCH-TONE traffic usage within the TOUCH-TONE group. Since the originating register cannot determine if call is originated from a TOUCH-TONE customer until the first digit is received, the TOUCH-TONE usage from originating register seizure to reception of the first TOUCH-TONE usage must be adjusted for the estimated 2.5 seconds per call which is missed. To calculate total

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TOUCH-TONE usage, add the TOUCH-TONE originating peg count to the TOUCH-TONE abandoned partial dial peg count and multiply by 2.5 seconds; add this usage to the measured usage. Dial pulse usage within a TOUCH-TONE group can be derived by subtracting the TOUCH-TONE usage from the total TOUCH-TONE group usage.

8   ***Originating Register Total Traffic Usage (FS or Mixed FS and WS)***

Note: Traffic usage only (does not include maintenance) is measured when the originating registers are flat spring. In mixed flat spring and wire spring offices, an option in the wire spring registers makes it possible to measure only the traffic usage. Thus, only one usage register is usually provided per mixed group. Otherwise, two registers are provided—one for each type.

ND

—

EMC:
Z0328 TT Grp
Z0334 Dial Pulse Grp
Z4063 Dial Tone First Grp
Z4064 1st Future Grp
Z4065 2nd Future Grp
Z4066 3rd Future Grp

—

Provide one register per originating register group (see item 9).

Scored through the TUR at slow scan over the originating register RB lead and measures the total traffic usage of all originating registers by group (dial pulse and/or TOUCH-TONE groups).

9   ***Originating Register TOUCH-TONE Usage (FS or Mixed FS and WS)***

—

ND

—

EMC: Z0330

—

Provide one register per TOUCH-TONE group for the TOUCH-TONE usage only.

Scored through the TUR at fast scan over the originating register PBC lead. Measures only the TOUCH-TONE traffic usage within the TOUCH-TONE group. Since the originating register cannot determine if a call is originated from a TOUCH-TONE customer until the first digit is received, the TOUCH-TONE usage from originating register seizure to reception of the first digit is not measured. Therefore, TOUCH-TONE usage must be adjusted for the estimated 2.5 seconds per call which is missed. To calculate total TOUCH-TONE usage, add the TOUCH-TONE originating peg count to the TOUCH-TONE abandoned partial dial peg count, and multiply by 2.5 seconds; add this usage to the measured usage. Dial pulse usage within a TOUCH-TONE group

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can be derived by subtracting the TOUCH-TONE usage from the total TOUCH-TONE group usage.

10   **_Originating Register Maintenance Usage_**

—

ND

—

EMC: Refer to Figure 3.

—

Provide one register per originating register group in an office with all WS, all FS, or mixed WS and FS arranged to measure traffic usage. Where the WS originating registers in a mixed group measure the total usage, provide one register per originating register group per type of originating register (WS and FS).

Scored through the TUR at slow scan over the originating register RBM lead and measures the maintenance usage by group.

Note: If FS and WS originating registers are mixed in the same group, it may be desirable to measure maintenance usage for each type separately for analysis purposes.

Incoming Registers

1*   **_Incoming Register Group Peg Count_**

—

ND, NA

—

EMC: Refer to Figure 4.

—

Provide one register per incoming register group per associated incoming register marker connector.

Scored from the incoming register marker connector over the PC lead when the incoming register calls for a completing marker after it has received all digits of a call or the incoming register has timed out.

2   **_Incoming Register Total Usage_**

—

ND

—

EMC:
Z0000-14 Fast Scan Group 00-14
Z0015-29 Slow Scan Group 00-14
Z0380-82 Fast Scan Group 15-17
Z0383-85 Slow Scan Group 15-17

—

Provide one register per incoming register group.

Scored through the TUR at fast scan over the incoming register RB lead and measures the total usage (traffic plus maintenance) of the group.

3   **_Incoming Register Maintenance Usage_**

—

ND

—

EMC:
Z0030-44 Group 00-14
Z0386-88 Group 15-17

—

Scored through the TUR at slow scan over the incoming register RBM lead and measures the maintenance usage by group.

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Provide one register per incoming register group.

4   *Incoming Register Group Busy*

—

NR

—

EMC:Z4200-17

—

Provide one register per incoming register group when the office is not equipped with a TUR.

Scored by a group of incoming registers over the GB lead when the last incoming register in the group becomes busy.

Outgoing Senders

1*   *Outgoing Sender Group Peg Count*

—

ND, NA, NM

—

EMC: Refer to Figure 5.

—

Provide one register per group per marker.

Scored by the completing or combined marker circuit over the OSG 0-11 leads when the crosspoints of the outsender link frame have closed, indicating that the sender has been connected to the outgoing trunk. It also scores sender uses on marker pulse conversion calls and test calls.

2   *Outgoing Sender Group Overflow*

—

ND

—

EMC:
Z0118-0129 Group 00-11
Same codes used for AIS with LLP, item 2, and Line Link Pulsing, item 5.

—

Provide one register per sender group.

Scored by the completing or combined marker circuit over the ASB lead each time a marker fails to find an idle sender in an outgoing sender group. This register provides a measurement of the calls denied access to a sender group due to an all sender busy condition. Together with the outgoing sender group peg count registers, it provides a measurement of the grade of service a sender group is giving. The scorings do not always represent the total number of calls blocked due to an all sender busy condition. In some offices the marker will advance to an alternate route served by the same or a different group of senders when an ASB condition is encountered. In this event the call may still be completed even though an overflow register associated with the sender group is scored.

3   *Intersender Time-Out Release Peg Count*

—

NA

—

EMC:
Z0130-41 Group 00-11

—

Provide one register per sender group.

Scored by the outgoing sender circuit over the STR lead and records the number of calls on which senders have timed out and released because of an all incoming register or terminating sender busy condition at the distant end. The time-out interval for senders waiting for an incoming register or terminating sender is shortened when an all sender busy condition is encountered. This register will score each

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time a sender has timed out and released under this condition.

4   *Outgoing Sender Total Usage*

—

ND

—

EMC:
Z0142-53 Fast Scan Grp 00-11
Z0154-65 Slow Scan Grp 00-11
Same codes used for AIS with LLP, item 4, and Line Link Pulsing, item 6.

—

Provide one register per OS group.

Scored through the TUR at fast scan over the sender SB lead and measures the total usage (traffic plus maintenance) by group.

5   *Outgoing Sender Maintenance Usage*

—

ND

—

EMC:
Z0166-77 Group 00-11
Same codes used with AIS with LLP, item 5, and Line Link Pulsing, item 7.

—

Provide one register per outgoing sender group.

Scored through the TUR at slow scan over the sender SBM lead and measures the maintenance usage by group.

B. Link Frame and Channel Registers

Peg Count

1   *Sample Channel Peg Count*

—

ND

—

EMC:
C8500-11 Nonpaired LLF (2w)
J8400-11 Paired LLF (2w)

—

Provide one register per marker per loading division. See Part 1 for partially paired LLFs.

Scored by the completing or combined marker over the PCSC lead when it sets up a channel over the 0 or 5 link between a line appearance on the LLF and a trunk of any type on the TLF. This includes originating, terminating, tandem, and test calls. It does not score on dial tone connections to originating registers. On intraoffice calls and other calls requiring two channels through the LLF and TLF, the register scores twice. The ratio of total channel peg count to sample channel peg count is multiplied by the total sample link usage to obtain the total LLF usage.

2   *Total Channel Peg Count*

—

ND

—

EMC:
C8300-11 Nonpaired LLF (2w)
J8500-11 Paired LLF (2w)

Scored by the completing or combined marker circuit over the TCH lead when it sets up a channel between a line appearance on the LLF and a trunk of any type on the TLF. This includes originating, terminating tandem, and test calls. It does not score on dial tone connections to originating registers. On

ITEM NO.	REGISTER	DESCRIPTION

Provide one register per marker per loading division. For partially paired LLFs, see Part 1.

intraoffice calls and other calls requiring two channels through the LLF and TLF, the register scores twice. The ratio of total channel peg count to sample channel peg count is multiplied by the total sample link usage to obtain the total LLF usage.

3* *Total Originating Peg Count*

—

ND, DR

—

EMC:
D8300-11 Total TT Calls (FS Mkrs) 2w
D8500-11 Total DP Calls (FS Mkrs) 2w
D8700-11 Total TT Calls (WS Mkrs) 2w
D8900-11 Total DP Calls (WS Mkrs) 2w
D8400-11 Total Calls from Paired LLF

—

Provide one 5-digit register per marker. Separate registers are required for dial pulse and TOUCH-TONE calls. For partially paired LLFs, see Part 1.

Scored by the combined or completing marker circuit over the TOR lead for dial pulse calls and the TMOR lead for TOUCH-TONE calls when it establishes a channel between a calling line and trunk of any type on the TLF. It also scores on test calls, calls connected to tone trunks, overflow trunks and permanent signal trunks. It does not score on dial tone connections, on calls switched from line locations of tandem or toll trunks, or abandoned partial dial calls. In order to get a count of total originating calls comparable with other systems, it is necessary to add these scorings to the abandoned partial dial peg count and subtract the permanent signal peg count.

4 *Total Incoming Peg Count*

—

ND

—

EMC:
E8100-11 WS Ofc, Paired LLF (2w)
E8200-11 FS Ofc, Nonpaired LLF (2w)
E8300-11 WS Ofc, Nonpaired LLF (2w)
D8600-11 FS Ofc, Paired LLF (2w)

—

Provide one register per marker per loading division. For partially paired LLF, see Part 1.

Scored by the completing or combined marker circuit over the TIP lead when it establishes a channel to the called line equipment on a terminating class of call. It also scores if the called line is busy or a failure to match occurs. The register is scored regardless of what type of trunk is used on the incoming call (interoffice, intermarker group, tandem, intertoll, toll switching, etc). Intraoffice calls, either completed or encountering line busy or failure to match, will not cause the register to score. Completed through switched calls, either tandem or toll class, will not score the register. Through switched call attempts, either tandem or toll class, will score the register if an all trunk busy or failure to match condition is encountered.

5 *LLF Originating Peg Count*

—

NA

—

EMC: Z4300-59

—

Provide one register per LLF. Not required when TUR is provided.

Scored by the marker through the line, line link and connector circuit (FS) or the line link connector circuit (WS) over the LCB lead when the marker sets up a channel between a calling subscriber line equipment and a trunk of any type on the TLF. Scores on intraoffice calls to busy lines, overflows due to all trunks busy, partial dials, etc. Does not score on dial tone connections. These scorings include calls completed to outgoing trunks from line equipment assigned to tandem

ITEM NO.	REGISTER	DESCRIPTION

and intertoll trunks; ie, calls switched through the No. 5 crossbar office. The register does not score on a tandem call which is not completed to a trunk because of all outgoing trunks busy, failure to match, etc.

6

Total Incoming Calls to Busy Lines Peg Count

—

ND

—

EMC:
J8600-11 Nonpaired LLF (2w)
J8700-11 Paired LLF (2w)

—

Provide one register per marker per loading division. For partially paired LLF, see Part 1.

Scored by the completing or combined marker circuit over the IB lead and records the total number of incoming calls to busy lines, both individual and terminal hunting, with the exception of calls to busy intercept lines and to No. 101 Electronic Switching System (ESS) lines using direct access. On incoming calls to busy lines, the total incoming peg count register is also scored even though there is no attempt to set up a channel. Moreover, since an incoming call to a busy line can never result in a failure to match, the percentage of incoming matching loss and incoming first failure to match measurements is not a valid indication of the probability of blocking on incoming calls unless the calls to busy lines peg count are subtracted from the total incoming peg count. However, this refinement should not be taken into consideration when plotting the load-service relationship until it becomes a system standard recommendation.

7

Incoming Calls to Terminal Hunting Lines Peg Count

—

ND

—

EMC:
G8700-11 Nonpaired LLF (2w)
G8900-11 Paired LLF (2w)

—

Provide one register per marker per loading division. For partially paired LLF, see Part 1.

Scored by the combined or completing marker circuit over the IH lead and records all incoming calls to terminal hunting lines. These data are of value in analyzing differences between incoming matching loss and incoming first failure to match measurements and in determining the incoming call rate to terminal hunting lines. It should be noted that calls to 2-line hunting groups, using tens block screening, or calls to No. 101 ESS lines using direct access, will not score the register.

8

Mate Frame Lock-Out Peg Count

—

NA
EMC: Z0496

—

Provide one register per marker group.

Scored by the combined or completing marker circuit over the MFL lead when a marker is locked out of mate operation. This occurs only during paired LLF operation when a marker attempts to junctor step to the mate frame junctors and finds that another marker has previously junctor stepped within the same pair of LLFs thus gaining control of the mate frame connector.

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Failure to Match and Overflow

1* ***Incoming Matching Loss (IML)—Overflow***
—
ND, NA
—
EMC:
Z0206 Nonpaired LLF (2w)
Z0211 Paired LLF (2w)

—
Provide one register per marker group per loading division. For partially paired LLF, see Part 1.

Scored by the combined or completing marker circuit over the IFM lead and records the incoming calls (total incoming peg count) which are not completed because of matching failures. IML is the principal means by which service may be evaluated with respect to frame loading and by which the actual load carrying capacity of LLFs is determined. The percentage of IML is obtained by dividing the IML scorings by the total incoming peg count and multiplying by 100. The objective for IML is 2 percent ABS.

This register scores when the marker encounters a failure to match while attempting to set up a connection between an incoming (or 2-way) trunk and a called line. It does not score on intraoffice calls. The percentage of IML measurement is a composite measurement of channel matching performance on incoming calls to both individual lines and terminal hunting line groups. The marker makes only one attempt to match a channel to an individual line, whereas if the first attempt to a hunting group fails, the marker will recycle and make a second attempt to a different line. The first attempt to a hunting group is not scored on the IML register. In offices with a large proportion of incoming calls to terminal hunting lines, a very poor level of service on calls to individual lines may be masked by a low percentage of IML on calls to hunting lines. As covered later, a new register is recommended designated incoming first failure to match (IFFM). When it is installed, calls to 2-wire hunting groups using the tens block screening feature and calls to No. 101 ESS lines on a direct access basis will no longer score the IML register on first failures to match. However, second failures to match to such lines will continue to score the IML register.

2 ***IFFM—Overflow***
—
ND, NA
—
EMC:
Z0203 Nonpaired LLF (2w)
Z0205 Paired LLF (2w)
—

Scored by the combined or completing marker circuit over the IFFM lead and records all first attempt failures to find an idle channel on incoming calls to individual and terminal hunting lines. The percentage of IFFM is calculated by dividing the IFFM scorings by the total incoming peg count from which the total incoming calls to busy lines has been

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Provide one register per marker group per loading division. For partially paired LLF, see Part 1.

subtracted and then multiplying the quotient by 100. The resulting measurement will more closely approximate the actual grade of incoming service because the IFFM scorings include the first failures to hunting line groups. The existing IML register should be retained. However, coincident with the installation of the IFFM register the IML measurement will no longer include first failures to match to 2-line hunting groups using the tens block screening feature or to No. 101 ESS lines using the direct access arrangement. Only second failures to such lines will be scored, which is more precise. Therefore, during the interim period, until the service results reports are revised, offices providing these services should exercise caution in LLF loading since the percentage of IML will exhibit a proportional reduction. Also see total incoming calls to busy lines peg count register description.

3

LLF Failure to Match—Overflow

—

NR

—

EMC: Z4400-59

—

Provide one register per line link frame. Not required with a TUR.

Scored by the combined, completing or dial tone marker through the line, line link and connector circuit (FS) or the line link connector circuit (WS) over the OF lead whenever a marker encounters a matching failure when it attempts to set up a channel between a line equipment and any kind of a trunk or originating register on a TLF. This includes dial tone, outgoing, intraoffice (two attempts) and terminating class calls. Due to the recycle features of the marker, scorings do not necessarily indicate call failures and more than one scoring may be obtained on a given call; for example, if a failure to match occurs on both the first and recycle attempt on an outgoing call, the register will score twice. This register operates in exactly the same way and simultaneously with the TLF failure to match register. That is, one LLF register and one TLF register are scored on each matching failure.

4

TLF Failure to Match—Overflow

—

NR

—

EMC: Z4500-59

—

Provide one register per TLF. Not required in offices with a TUR.

Scored by the trunk link and connector circuit over the OF lead simultaneously with the LLF failure to match register. One LLF and one TLF register are scored on each matching failure. Both the LLF and TLF registers are used for load balancing and administration in those offices not yet equipped with a TUR.

ITEM NO.	REGISTER	DESCRIPTION

5   *Originating Matching Loss—Overflow*

—

NA

—

EMC:
Z0208 Nonpaired LLF (2w)
Z0210 Paired LLF (2w)

—

Provide one register per marker group per loading division. For partially paired LLF, see Part 1.

Scored by the combined or completing marker circuit over the FM lead. This register, which is sometimes called the second matching failure register, is scored when the marker fails on a second attempt to obtain a channel between a line equipment and a trunk on other than terminating class calls. It also scores on through switched calls. The register does not score on dial tone attempts.

Matching losses are intended to be a measure of calls denied completion because of blocking in the switching train. Calls to nontalking trunks are those which some other condition has prevented from completion and the customer will receive an overflow signal in any case. Therefore, second failure to match on calls to nontalking trunks will not score this register.

It should be pointed out that in offices where extensive alternate routing occurs, the number of originating matching loss registrations will not necessarily mean lost calls. The reason for this is that if the marker fails to match a second time on an original or first route, it scores the originating matching loss register but the call may still be completed on the alternate route attempt. It should be further noted that the originating matching loss register can score again if no channel is available on the alternate route.

The percentage of originating matching loss is obtained by dividing the originating matching loss register scorings by the total originating peg count plus the total through switched calls peg count and then multiplying by 100.

6*   *Office Overflow*

—

NA

—

EMC:
F8300-11 Total Office Calls (2w)
M8300-11 Paired LLF Calls (2w)

—

Provide one register per marker per loading division. For paired LLF in offices that are either fully or partially paired, see Part 1.

Scored by the combined or completing marker circuit over the TCO (2w) lead on any condition that causes a customer originated call to be given a routing to a combination tone trunk from which an overflow signal will be given. It also scores when all tone and overflow trunks are busy and the originating register returns reorder. When the call originates from a paired LLF, an additional register scores over the PTCO lead.

7   *Subscriber Line Overflow—Nonhunting Number or Nonallotted Hunting Group*

Scored by the marker through the number group and connector circuit over the OF lead

ITEM NO.	REGISTER	DESCRIPTION

—

NA

—

EMC: Z1700-49

—

Provide one or two registers per number group for both nonhunting numbers and nonallotted hunting groups, or as required. When inward wide area telephone service (INWATS) service is offered, KS-16493 (5-digit) registers should be provided as required for each INWATS customer group. Requirements might be significantly higher and should be based on the INWATS growth forecast. Refer to INWATS for a description of peg count.

when the subscriber line under study is called and found busy or all the lines in a nonallotted hunting group are found busy.

8   **Subscriber Line Overflow—Allotted Hunting Group**

—

NA

—

EMC: Z1750-59

—

Provide one register per allotted hunting group (maximum of ten).

Scored by the completing marker circuit over the OVF 0-9 leads when all lines in the allotted group are busy.

Load

1   **LLF Load**

—

NA

—

EMC: Z4600-59

—

Provide one register per LLF. Not required with a TUR.

Scored by the combined or completing marker through the line, line link, and connector circuit (FS) or the line link connector circuit (WS) over the FPL lead. This register, in conjunction with the LLF originating peg count register is used for load balancing purposes.

This register is scored by the marker whenever it attempts to set up a connection between a customer line equipment and an outgoing or intraoffice trunk, and finds that a specified number (or more) of the line links serving the horizontal line group in which the calling line is located are busy.

Experience indicates that arranging the register to operate when five or more links are busy is generally satisfactory.

2   **Horizontal Line Group Load**

—

NA

—

EMC: Z4490-99

Scored by the combined or completing marker through the line, line link, and connector circuit over the PL0-9 leads. Each register is associated with a horizontal line group and is scored by the marker whenever it attempts

ITEM NO.	REGISTER	DESCRIPTION

—

Provide one set of ten registers per marker group

—

These registers may be associated with any LLF by operation of a key. Not required with a TUR.

to set up a connection between a subscriber line equipment and an outgoing or intraoffice trunk and finds that a specified number (or more) of the line links serving the horizontal line group in which the calling line is located are busy. Arranging the registers to operate when five or more links are busy is generally satisfactory.

Usage

1 *LLF Sample Link Usage (DGU)*

—

ND

—

EMC:
Z6100-59 Nonpaired 2W LLF
Z6200-59 Paired 2W LLF
Z6300-59 Mixed 2W LLF

—

Provide one to four No. 14-type or one or two KS-16493 registers per marker group.

Note: A maximum of 300 usage leads may be associated with one 14-type register and 600 usage leads with one KS-16493 register.

Each LLF is connected to the TUR over 20 leads designated L00-09 and L50-59. The TUR scores the registers at slow scan using the DGU feature. The sample link usage of all the LLFs (No. 0 and No. 5 links) is measured on a total office basis.

Note: The total LLF usage is computed by dividing the total channel peg count by the sample channel peg count (total-to-sample ratio) and then multiplying the measured sample link usage by this ratio.

2 *LLF Horizontal Group Sample Link Usage*

—

NA

—

EMC:
C0000-599 Nonpaired LLF
E0000-599 Paired LLF

—

Provide one register per switch (horizontal group) per LLF. Maximum of 600 registers are required for a full 60 LLF office.

Scored through the TUR at slow scan over the L00-09 and L50-59 leads from the LLFs. Each switch is measured separately. On each switch, No. 0 and 5 links only are measured. Used for load balancing horizontal groups on LLFs. The sum of all the horizontal group registers in any loading division should be equal to the associated DGU register(s).

3 *Subscriber Line Usage*

—

NA

—

EMC: Refer to Figure 6.

—

Provide maximum of 118 registers, as required by size of LLFs. Refer to Dial Facilities Management Practices Section 5e(1), Part 4, for detailed discussion.

Scored through the TUR at slow scan over the SL00-117 leads. The usage of every subscriber in the office may be measured individually, two horizontal groups at a time. The SLU registers are associated with subscriber lines on a temporary basis by means of cords and multiple appearances of jacks located on the LLFs. The usage data measured in this manner are used for load balancing.

ITEM NO.	REGISTER	DESCRIPTION

4

TLF Horizontal Group Sample Channel Usage

—

NA

—

EMC: C2000-299

—

Provide one register per switch (horizontal group) per TLF. Maximum of 300 registers are required for a full 30 TLF office.

Scored through the TUR at slow scan over the LL00-09, LL50-59, LR00-09 and LR50-59 leads from the TLFs. The usage of the No. 0 and 5 left and right links are measured (4 out of 20 links on each switch). Used for load balancing.

5

TLF Sample Link Usage (DGU)

—

NA

—

EMC: Z6500-29

—

Provide one to four No. 14-type or one or two KS-16493 registers per marker group.

Scored through the TUR at slow scan over 40 leads per TLF designated LL00-09, LL50-59, LR00-09 and LR50-59. The DGU register(s) totalize sample TLF usage which should be within 2 percent of the LLF DGU register(s). May be used as engineering data if LLF usage is unavailable.

6

Line Insulation Test (LIT) Traffic Usage Feature

—

NR

—

EMC: Z4589-99

—

Provide ten usage registers and one cycle register per marker group. The feature is not recommended and may be considered only when no TUR is provided.

Scored by the LIT test control circuit over the TC0-9 leads. One marker in a marker group (usually a dial tone marker) is specified for LIT. By means of the LIT control circuit, this marker scans line links or trunk links at 3-minute intervals and records the number of busy links on the ten traffic registers. Five types of traffic counts can be made (at different times) using the same traffic registers. The counts are total line link usage by office, frame or horizontal group, and total TLF usage by frame or horizontal group. The cycle register records the number of cycles per test run and is scored over the TCC lead.

C. Special Feature Registers

Automatic Intercept Service (AIS) Without Line Link Pulsing (LLP)

1

Total Offered AIS Calls Peg Count

—

ND, NA

—

EMC: Z3000

—

Provide one register per AIS sender connector.

Scored by the AIS sender connector circuit over the PC lead when a completing marker attempts to seize an AIS sender.

2

All AIS Senders Busy—Overflow

—

ND, NA

—

Scored by the AIS sender connector circuit over the ASB lead when all AIS senders are busy as the marker is attempting to seize one.

ITEM NO.	REGISTER	DESCRIPTION

EMC: Z3003

—

Provide one register per AIS sender connector.

3   **All AIS Line Circuits Busy—Overflow**

—

ND, NA

—

EMC: Z3006

—

Provide one register per AIS sender connector.

Scored by the AIS sender connector circuit over the ALB lead when all trunks are busy as the marker is attempting to route a call to the automatic intercept center (AIC).

4   **AIS Sender Total Usage**

—

ND

—

EMC: Z3010

—

Provide one register per sender group.

Scored through the TUR at fast scan over the sender SB lead and measures the total usage (traffic plus maintenance) of the AIS senders as a group.

5   **AIS Sender Maintenance Usage**

—

ND

—

EMC: Z3013

—

Provide one register per sender group.

Scored through the TUR at slow scan over the sender SBM lead and measures the maintenance usage of the AIS senders as a group.

6   **AIS Line Circuit Usage**

—

ND

—

EMC: Z3016

—

Provide one register per line circuit group.

Scored through the TUR at slow scan over the line circuit TU lead and measures the traffic usage on the AIS line circuits.

AIS With LLP

1   **Outgoing Sender Group Used for AIS Peg Count**

—

ND, NA

—

EMC: Refer to Figure 5.

—

Provide one register per marker per group of multifrequency senders used for AIS.

Scored by the combined or completing marker circuit over one of the OSG 0-11 leads when the sender has been connected to a trunk or line circuit. Sender group may be dedicated to AIS or serve multifrequency interoffice calls as well. In the latter case, the register scores on both types of use.

2   **Outgoing Sender Group Used for AIS—Overflow**

—

ND, NA

Scored by the combined or completing marker circuit over the ASB lead when the marker fails to find an idle sender in the group. Sender group may be dedicated to AIS or

ITEM NO.	REGISTER	DESCRIPTION

—
EMC:
Z0118-29 Group 00-11
Same codes used for Outgoing Senders, item 2, and Line Link Pulsing, item 5.
—
Provide one register per group of multifrequency senders used for AIS.

serve multifrequency interoffice calls as well. In the latter case, the register scores on both types of use.

3 *AIS Line Circuits Busy—Overflow*
—
ND, NA
—
EMC: Z3020
—
Provide one register per marker group.

Scored by the completing marker circuit over the ITB lead when all AIS line circuits to the AIC are busy when the marker is connected to the number group.

4 *Outgoing Sender Group Used for AIS—Usage*
—
ND
—
EMC:
Z0142-53 Fast Scan Grp 00-11
Z0154-65 Normal Scan Grp 00-11
Same codes used for Outgoing Senders, item 4, and Line Link Pulsing, item 6.
—
Provide one rregister per group of multifrequency senders used for AIS.

Scored through the TUR at fast scan over the sender SB lead and measures the total usage (traffic plus maintenance) of the group of multifrequency senders used for AIS. When these senders also serve interoffice trunks, AIS sender usage is included as part of the whole and cannot be segregated.

5 *AIS Outsender Maintenance Usage*
—
ND
—
EMC:
Z0166-77 Group 00-11
Same codes used with Outgoing Senders, item 5, and Line Link Pulsing, item 7.
—
Provide one register per group of multifrequency senders used for AIS.

Scored through the TUR at slow scan over the sender SBM lead and measures the maintenance usage of the sender group. The group may be dedicated to AIS or serve multifrequency interoffice calls as well. In the latter case, the two types of usage cannot be segregated.

6 *AIS Line Circuit Traffic Usage*
—
ND
—
EMC: Z3021-23
—
Provide one register per group of AIS line circuits.

Scored through the TUR at slow scan over the line circuit TU lead and measures the traffic usage on a group of AIS line circuits. Plug busy usage is not measured.

ITEM NO.	REGISTER	DESCRIPTION

AMA—Local Automatic Message Accounting (LAMA) Paper Tape

1* **LAMA Transverter Total Seizure Peg Count**

—

ND

—

EMC: F8100-09
Same span as used with item 2.

—

Provide one register for each LAMA transverter.

Scored by the transverter over the PC lead each time it is seized to make any type of initial entry on a service call. The register is also scored on second trial attempts whether they are completed or result in failure. The register does score on test calls. It does not score on calls routed to overflow or if handled free when the out sender is unable to obtain a transverter within the time-out interval.

2* **Combination Automatic Number Identification (ANI)—LAMA Transverter Total LAMA Seizure Peg Count**

—

ND

—

EMC: F8100-09
Same span as used with item 1.

—

Provide one register per transverter for LAMA seizures.

Scored by the transverter over the PC lead each time it is seized to make any type of initial entry on a LAMA service call. The register is also scored on second trial attempts whether they are completed or result in failure. The register does not score on test calls or on calls routed to overflow or if handled free when the out sender is unable to obtain a transverter within the time-out interval. ANI seizures are scored separately (see ANI).

3 **LAMA Recorder Seizure Peg Count**

—

ND

—

EMC: Z1100-30

—

Provide one register per recorder.

Scored by the recorder circuit over the TPC lead and records each recorder seizure. This includes each initial, answer, or disconnect entry.

4 **LAMA Transverter Total Usage**

—

ND

—

EMC: F8200-09

—

Provide one register per transverter.

Scored through the TUR at fast scan over the transverter TB lead. Measures the total LAMA transverter usage (traffic plus maintenance).

Note: Since some transverter usage is missed because of the point of measurement, it is necessary to adjust the measured usage. It should be increased by 0.020 second times the transverter peg count.

5 **LAMA Transverter Maintenance Usage**

—

ND

—

EMC: Z0105

—

Provide one register per marker group.

Scored through the TUR at slow scan over the transverter TBM lead and measures the total transverter maintenance usage for the group as a whole.

ITEM NO.	REGISTER	DESCRIPTION

6   **LAMA Transverter Connector Usage**

—

ND

—

EMC: Z3070-79

—

Provide one register per transverter connector.

Scored through the TUR at fast scan over the connector TU lead and measures the traffic usage carried by each transverter connector. There is no provision to measure maintenance usage.

7   **AMA Recorder Traffic Usage**

—

ND

—

EMC: Z1150-80

—

Provide one register per recorder.

Scored through the TUR at fast scan over the recorder TU lead and measures the traffic usage of each recorder on separate registers. There is no provision to measure maintenance usage.

AMA—LAMA Magnetic Tape Recording (MTR)

1*   **LAMA Transverter Total Seizure Peg Count**

—

ND

—

EMC:
F8100-09
Same span as used with LAMA Paper Tape, items 1 and 2.

—

Provide one register per transverter.

Scored by the LAMA transverter circuit for magnetic tape over the PC lead and records each seizure to make an initial entry on a service call. It also scores on second trial attempts, but does not score on test calls.

2   **Total Transverter Time-Out Awaiting MTR Peg Count**

—

ND

—

EMC: Z3080-89

—

Provide one register per marker group.

Scored by the transverter circuit over the TVTO lead and records the total time-outs awaiting MTR. Time-out interval is approximately 2 seconds.

3   **Trunk Control Unit (TCU) Peg Count**

—

ND

—

EMC: Z3200-3220

—

Provide one register per TCU (21 maximum).

Scored by the TCU over the TPC lead and records each TCU seizure by either a transverter or a trunk.

4   **Total Trunk Control Unit Time-Outs Awaiting MTR**

—

ND

—

Scored by the TCU over the TCTO lead and records the total time-outs awaiting an MTR. Time-out interval is approximately 2 seconds.

ITEM NO.	REGISTER	DESCRIPTION

EMC: Z3069

—

Provide one register per MTR office.

5 *LAMA Transverter Total Usage*

—

ND

—

EMC:
F8200-09
Same as span used for LAMA Paper Tape,
item 4.

—

Provide one register per transverter.

Scored through the TUR at fast scan over the transverter TB lead and measures the total usage (traffic plus maintenance) on the MTR transverters. Unlike the usage measurement of the paper-tape transverter, no adjustment is necessary due to the point of measurement.

6 *LAMA Transverter Maintenance Usage*

—

ND

—

EMC:
Z0105
Same as code used for LAMA Paper Tape,
item 5.

—

Provide one register per transverter group.

Scored through the TUR at slow scan over the transverter TBM lead and measures the total transverter maintenance usage for the group as a whole.

7 *Transverter Connector Usage*

—

ND

—

EMC:
Z3070-79
Same as span used for LAMA Paper Tape,
item 6.

—

Provide one register per transverter connector.

Scored through the TUR at fast scan over the connector TU lead and measures the traffic usage carried by each transverter connector. There is no provision to measure maintenance usage.

8 *Trunk Control Unit Usage*

—

ND

—

EMC: Z3050-59

—

Provide one register per trunk control unit.

Scored through the TUR at fast scan over the control unit TU lead and measures the traffic usage of each TCU. This includes test calls. It does not measure maintenance usage when service is transferred to the emergency TCU.

9 *MTR Usage*

—

ND

—

EMC: Z3060

—

Provide one register per office.

Scored through the TUR at fast scan over the recorder TU lead and measures the traffic usage on the active recorder. There is no provision to measure maintenance usage.

ITEM NO.	REGISTER	DESCRIPTION
10	**Channel Usage—Total** — ND — EMC: Z3061 — Provide one register per office.	Scored through the TUR at fast scan over the recorder connector TU 0-2 leads (one per channel) and measures the total usage on all recorder connector channels (traffic plus maintenance). A maximum of three channels provide access to the MTR from the transverters and TCU.
11	**Channel Usage—Maintenance** — ND — EMC: Z3062 — Provide one register per office.	Scored through the TUR at slow scan over the recorder connector TUM 0-2 leads and measures the total maintenance usage on all recorder connector channels. A maximum of three channels may be provided.

Automatic Number Identification

1	**ANI Transverter Total Seizure Peg Count** — ND — EMC: C9260-62 Same span used for item 2. — Provide one register per ANI transverter.	Scored by the transverter over the PC lead each time it is seized for identification of the calling customer's directory number on a CAMA-ANI service call. The register is also scored on second trial attempts whether they are completed or result in failure. The register does not score on test calls or calls routed to overflow when the out sender is unable to obtain a transverter within the time-out interval.
2	**Combination ANI-LAMA Transverter Total ANI Seizure Peg Count** — ND — EMC: C9260-62 Same span used for item 1 — Provide one register per transverter for ANI type seizures.	Scored by the combined ANI-LAMA transverter circuit over the APC lead when it is seized to handle an ANI call. A minimum of two such transverters are provided, when required, which process person-to-person collect special (PPCS) calls that are routed to a TSP. LAMA seizures are scored separately (see LAMA Paper Tape).
3	**ANI Transverter Total Usage** — ND — EMC: C9270-72 — Provide one register per transverter.	Scored through the TUR at fast scan over the transverter TB lead and measures the total transverter usage (traffic plus maintenance). *Note:* Since some transverter usage is missed because of the point of measurement, it is necessary to adjust the measured usage as follows: multiply 0.025 second times the transverter peg count to determine the missed usage which is then added to the measured usage.

ITEM NO.	REGISTER	DESCRIPTION

4   *ANI Transverter Maintenance Usage*

—

ND

—

EMC: Z0107

—

Provide one register per marker group.

Scored through the TUR at slow scan over the transverter TBM lead and measures the total transverter maintenance usage for the group as a whole.

5   *ANI Transverter Connector Usage*

—

ND

—

EMC:
Z4880-89

—

Provide one register per transverter connector.

Scored through the TUR at fast scan over the connector TU lead and measures the traffic usage carried by each transverter connector. There is no provision to measure maintenance usage.

Central Office Group Alerting

1   *Central Office Group Alerting Peg Count*

—

NA

—

EMC: Z0242

—

Provide one register per central office group alerting circuit.

Scored by the central office group alerting circuit over the PC lead and records the number of times the circuit is used to signal an alert to special groups of people such as volunteer fireman, etc, over the regular message network.

Centrex

Note: The next eight peg count registers are provided one per customer group (maximum ten groups). They are scored over the indicated leads by the traffic register translator circuit. Refer to Dial Facilities Management Practices Section 5e(1), Part 2.

1   *"Dial 0" Calls*

—

ND, NA

—

EMC: Z0700-09

Scored over the ZA lead and records completing marker attempts to complete a "dial 0" call from any station to an attendant trunk.

2   *Listed Directory Number (LDN) Calls*

—

ND, NA

—

EMC: Z0710-19

Scored over the LDN lead and records completing marker attempts to complete a call from an incoming or intraoffice trunk to the LDN.

3   *Incoming Calls to Customer Group*

—

Scored over the INCG lead and records completing marker attempts to complete a

Page 29

ITEM NO.	REGISTER	DESCRIPTION

ND, NA

—

EMC: Z0720-29

call from an incoming or intraoffice trunk to a station. Does not include LDN calls or intracustomer group calls.

4 *Intracustomer Group Calls*

—

ND, NA

—

EMC: Z0730-39

Scored over the ITCG lead and records completing marker attempts to establish a connection between two stations in the same customer group (normally dialed on a 4- or 5-digit basis).

5 *Originating Calls from Customer Group*

—

ND, NA

—

EMC: Z0740-49

Scored over the ORCG lead and records completing marker attempts to complete an intraoffice or outgoing call originated from the customer group.

6 *Attendant-to-Station Transfer Calls*

—

ND, NA

—

EMC: Z0750-59

Scored over the ADTF lead and records completing marker attempts to complete a transfer call on an incoming or intraoffice trunk from the attendant to a station.

7 *Station-to-Attendant Transfer Calls*

—

ND, NA

—

EMC: Z0760-69

Scored over the TRF lead and records completing marker attempts to complete a station initiated transfer call from an incoming or intraoffice trunk to an attendant trunk.

8 *Station Dial Transfer Calls*

—

ND, NA

—

EMC: Z0770-79

Scored over the DTF lead and records completing marker attempts to complete a station dial transfer call from an incoming or intraoffice trunk. Only the first eight completing markers serve these calls.

Note: The next five peg count registers are provided one per marker group.

9 *Attendant Transfer—Station to Attendant*

—

ND

—

EMC: Z0892

Scored by the completing marker circuit over the TTRF lead when a station initiates a transfer of a call on an incoming or intraoffice trunk to the attendant.

10 *Attendant Transfer—Attendant to Station*

—

ND

—

EMC: Z0893

Scored by the completing marker circuit over the ATT lead when the attendant initiates a transfer of a call on an incoming or intraoffice trunk to a station.

11 *Station Dial Transfer*

—

Scored by the completing marker circuit over the TDTF lead when a station initiates a

ITEM NO.	REGISTER	DESCRIPTION

ND

—

EMC: Z0891

transfer of a call on an incoming or intraoffice trunk to another station. Only the first eight completing markers serve these calls.

12 **Total LDN Calls—Peg Count**

—

ND

—

EMC: Z0890

Scored by the completing marker circuit over the TLDN lead and records the total attempts to complete a call from any incoming or intraoffice trunk to any LDN.

13 **Restricted Incoming Intercept Peg Count**

—

ND

—

EMC: Z0894

Scored by the completing marker circuit over the RIP lead and records the attempts to complete a call from an incoming or intraoffice trunk to a station restricted from receiving incoming calls. Since the call is not allowed to complete, it is routed by the marker to a special announcement trunk group which is common to the marker group.

14 **Dial Tone Marker (DTM) Station Dial Transfer Peg Count**

—

ND, NM

—

EMC: C9520-25

—

Provide one register per marker for the first four markers. The fifth and sixth DTM do not serve the transfer network.

Scored by the dial tone marker circuit over the TPC (TRANS) lead and records the attempts to establish a connection between an incoming or intraoffice trunk appearance on the transfer LLF and a transfer trunk on the transfer TLF. These scorings are not included in the existing DTM peg count over the TPC (2w) lead and must be added to obtain the total DTM peg count. Refer to Dial Tone Markers.

15 **Transfer Register Group Peg Count**

Note: Station dial transfer without a line identifier is a modification of centrex I and II. Station dial transfer with a line identifier is standard in centrex III.

ND

—

EMC:
C9160-63 Grp 0, Mkr Conn 0-3
C9190-91 Grp 0, Ident Conn 0-2
C9170-73 Grp 1, Mkr Conn 0-3
C9200-01 Grp 1, Ident Conn 0-2
C9180-83 Grp 2, Mkr Conn 0-3
C9210-11 Grp 2, Ident Conn 0-2

—

Provide one register per group per associated transfer register marker connector (centrex I, II, and III). Provide an additional register per group per associated transfer register identifier connector (centrex III only).

Centrex I and II: scored by the transfer register marker connector over the PC lead and records the number of times a transfer register seizes a completing marker for processing a transfer call. Each transfer request scores the register once. Centrex III: two peg count registers are required. The first register is scored by the transfer register marker connector circuit over the PC lead. It records each time a transfer register seizes a completing marker for processing a transfer call. On initial transfers this register scores twice and on retransfers it scores either once or twice according to which station is initiating the retransfer. The second register

ITEM NO.	REGISTER	DESCRIPTION

is scored by the transfer register identifier connector circuit over the PC lead and records each time a transfer register seizes the transfer line identifier. On initial transfers this register scores once and on retransfers it will either not score or score once, according to which station is initiating the retransfer. To determine the number of transfer calls reaching the transfer registers, subtract the reading of the second register from the first.

16 **_Transfer Line Identifier Peg Count_**

—

ND

—

EMC: Z3040-41

—

Provide one register per transfer line identifier and connector circuit.

Scored by the transfer line identifier and connector circuit over the PC lead and records each seizure of a transfer line identifier during a station dial transfer type of call.

17 **_Dial Tone Matching Loss (Station Dial Transfer Calls)_**

—

ND, NA

—

EMC: Z0202

—

Provide one register per marker group

Scored by the DTM circuit (wire spring only) over the FMP (TRANS) lead and records the second failures to match encountered by a marker in attempting to set up a channel to a transfer trunk from an incoming or intraoffice trunk through the transfer network. Only the first four DTMs serve station dial transfer requests. A particular request may produce multiple scorings until the customer either hangs up or is served.

18 **_Transfer Line Link Frame (TLLF) Failure to Match_**

—

NA

—

EMC: Z8692-95

—

Provide one register per TLLF.

Scored by the dial tone marker through the transfer line link connector circuit over the OF lead and records matching failures encountered by the DTM attempting to set up a channel between an incoming or intraoffice trunk appearance on the TLLF and a transfer trunk on the transfer trunk link frame. Due to the recycle and second trial features of the DTM, scorings do not necessarily indicate transfer call failures and more than one scoring may be obtained on a single call. May be used as a load balance indicator for the TLLFs.

19 **_Transfer Trunk Link Frame (TTLF) Failure to Match_**

—

NA

—

EMC: Z8696-99

Scored by the DTM through the TTLF circuit over the OF lead in conjunction with the TLLF failure to match register. Total of TTLF and TLLF failure to match registers should be equal.

ITEM NO.	REGISTER	DESCRIPTION

Provide one register per TTLF.

20 *Transfer Registers Total Usage*

ND

EMC: C9240-42

Provide one register per group of transfer registers.

Scored through the TUR at fast scan over the transfer register RB lead and measures the total usage (traffic plus maintenance) of the transfer registers by group.

21 *Transfer Registers Maintenance Usage*

ND

EMC: C9250-52

Provide one register per group of transfer registers.

Scored through the TUR at slow scan over the transfer register RBM lead and measures the maintenance usage of the transfer registers by group.

22 *Transfer Line Identifier Usage*

ND

EMC: Z3065

Provide one register per marker group.

Scored through the TUR at fast scan over the identifier MB lead and measures the traffic usage of the transfer line identifier circuits. There is no provision to measure maintenance usage.

23 *Transfer Trunk Peg Count*

ND, NA

EMC: C9600-05

Provide one register per each of the first four DTMs.

Scored by the DTM circuit (wire spring only) over one of the six originating register group peg count leads (PCD, PCMF or PCR 0-3). The marker regards the group of station dial transfer trunks the same as an originating register group. Only the first four DTMs, however, may be arranged to serve station dial transfer calls. The marker scores the register when it establishes a channel from an incoming or intraoffice trunk to a transfer trunk through the transfer network.

24 *Transfer Trunk Overflow*

ND, NA

EMC: C9610-15

Provide one register per each of the first four DTMs.

Scored by the DTM circuit (wire spring only) over one of the six originating register group overflow leads (BD, BMF or BR0-3). The marker regards the group of station dial transfer trunks the same as an originating register group. Only the first four DTMs, however, may be arranged to serve station dial transfer calls. The marker scores the register when it finds all transfer trunks in the group busy.

ITEM NO.	REGISTER	DESCRIPTION

25   **Transfer Trunk Usage**

—

ND

—

EMC: Z0350

—

Provide one register per marker group.

Scored through the TUR at slow scan over the transfer trunk TU lead and measures the traffic usage of the group (does not include maintenance usage).

26   **Attendant Trunk Usage (Dial 0)—Phase III Centrex**

—

ND

—

EMC: Z0780-89

—

Provide one register per group of phase III centrex dial 0 attendant trunks.

Scored through the TUR at slow scan over the attendant trunk S lead and measures the traffic usage of the group (does not include maintenance usage). Phase III centrex requires a separate group of attendant trunks to serve dial 0 calls.

27   **Attenant Trunk Usage (LDN)—Phase III Centrex**

—

ND

—

EMC: Z0790-99

—

Provide one register per group of phase III centrex LDN attendant trunks.

Scored through the TUR at slow scan over the attendant trunk S lead and measures the traffic usage of the group (does not include maintenance usage). Phase III centrex requires a separate group of attendant trunks to serve LDN and transfer calls.

28   **Attendant Trunk Usage—Phase I and II Centrex**

—

ND

—

EMC: Z4750-59

—

Provide one register per group of phase I or II centrex attendant trunks.

Scored through the TUR at slow scan over the attendant trunk S lead and measures the traffic usage of the group (does not include maintenance usage). Phase I or II centrex attendant trunks serve dial 0, transfer and LDN calls.

29   **Attendant Trunk Maintenance Usage**

—

ND

—

EMC:
Z4770-79 Phase III Dial 0
Z4780-89 Phase III LDN
Z4760-69 Phase I or II

—

Provide one register per trunk group per type attendant trunk.

Scored through the TUR at slow scan over the attendant trunk TU lead and measures the maintenance usage only by group.

ITEM NO.	REGISTER	DESCRIPTION

Coin Service

1   *Machine Announcement Request—Initial Overtime Failures Peg Count*

—

ND

—

EMC: Z4000-04

—

Provide one register per coin supervisory circuit group (maximum three) when machine announcement is provided.

Scored by the coin supervisory circuit over the ANR lead when an overtime announcement is requested.

2   *Retest Failures to Which the Operator Did Not Respond in Time Peg Count*

—

NA

—

EMC: Z4005-09

—

Provide one register per coin supervisory circuit group (maximum three) when machine announcement is provided.

Scored by the coin supervisory circuit over the NOA lead when an operator does not answer a request, following an overtime retest failure, within 2 to 4.1 minutes.

3   *Total Monitoring by Overtime Operator or by Machine Announcements Peg Count*

—

NA

—

EMC: Z4010-14

—

Provide one register per coin supervisory circuit group (maximum three) when machine announcement is provided.

Scored by the coin supervisory circuit over the MON lead and records the total requests for the overtime operator and the machine announcement.

4   *Coin Supervisory Circuit Group Busy (With Timing Trunk)*

—

ND

—

EMC: Z0243

—

Provide one register per marker group. Not provided with TUR.

Scored by the coin supervisory release circuit over the GB lead and records the number of times all coin supervisory circuits become busy.

5   *Coin Supervisory Circuit Group Busy (With Nontiming Trunk)*

—

ND

—

EMC: Z0247-49

Scored by the coin supervisory circuit over the GB lead and records the number of times all coin supervisory circuits in a group become busy.

ITEM NO.	REGISTER	DESCRIPTION

Provide one register per coin supervisory link group. Not provided with TUR.

6   *Initial Coin Zone Calls Connected to an Operator Peg Count*

ND, NA

EMC: Z0252

Provide one register per marker group.

Scored by the coin zone outgoing trunk or junctor circuit over the PCI lead and records the number of times an operator is connected to a coin zone call to request a coin when the switchboard is in the same building.

7   *Overtime Coin Zone Calls Connected to an Operator Peg Count*

ND, NA

EMC: Z0253

Provide one register per marker group.

Scored by the coin zone outgoing trunk or junctor circuit over the PCO lead and records the number of times an operator is summoned to monitor an overtime coin zone call when the switchboard is in the same building.

8   *Coin Zone Calls by Charge Condition Peg Count*

ND, NA

EMC: Z0660-79

Provide one register per charge condition per group of trunks or junctors.

Scored by the combined or completing marker circuit over the DR lead and records the number of times each charge condition is set in the coin zone outgoing trunk or junctor group. Scorings include attempts where all trunks or junctors are busy, or when all senders associated with the group are busy.

9   *Coin Zone Calls When Concentrator is Used—Overflow*

ND, NA

EMC: Z4015-19

Provide one register per group of trunks or junctors associated with one concentrator.

Scored by the coin zone outgoing trunk or junctor circuit over the OF lead and records the number of times all concentrator trunks to a remote switchboard are busy on an initial or overtime call.

10   *Announcement Requests for Coin Deposit Peg Count*

ND

EMC: Z4020-24

Provide one register per marker group.

Scored by the originating register circuit over the PC lead and records the number of times the announcement circuit is used to request a coin deposit. Provided in dial tone first offices when the originating register circuit coin test timing option includes apparatus Figure 7.

ITEM NO.	REGISTER	DESCRIPTION

11 **Originating Class of Service—Coin Peg Count**

—

ND

—

EMC: Refer to Figure 2.

—

Provide one register per marker for coin class of service. Refer to Completing or Combined Markers.

Scored by the combined or completing marker circuit over the S lead and records the number of times a coin station originates a call which is completed to a trunk of any type on a TLF.

12 **Coin Supervisory Circuit Usage**

—

ND

—

EMC: Z0250-51, Z1790

—

Provide one register per group of coin supervisory circuits.

Scored through the TUR at fast scan over the supervisory circuit CS lead. Measures the total usage (traffic plus maintenance) of a group of coin supervisory circuits. There is no provision to measure maintenance usage separately.

Concentrator—Identifier

1 **Line Concentrator Identifier Circuit—Trunk Seizure Peg Count**

—

ND

—

EMC: Z0980-99

—

Provide one register per originating end unit. Not provided with TUR.

Scored by the line concentrator identifier circuit for telephone secretarial service, originating end, over the PC lead and records the number of times a trunk to the terminating end is seized.

2 **Line Concentrator Identifier All Trunks Busy—Group Busy**

—

ND

—

EMC: Z0960-79

—

Provide one register per originating end unit. Not provided with TUR.

Scored by the line concentrator identifier circuit for telephone secretarial service, originating end, over the PB lead and records the number of times all concentrator trunks become busy.

INWATS

1 **Auxiliary Line Circuit Peg Count**

—

ND, NA

—

EMC: Z3100-99

—

Provide one KS-16493 (5-digit) register per auxiliary line circuit. Refer to Failure to

Scored by the auxiliary line circuit over the PC lead for INWATS service. Records the number of calls on each INWATS circuit.

ITEM NO.	REGISTER	DESCRIPTION

Match and Overflow for a description of INWATS overflow.

Line Link Pulsing

1 **LLP Calls Per Line Route Peg Count**

—

ND, NA

—

EMC: H8900-09

—

Provide one register per line route. Older offices may be provided with one register per marker group per ten line routes (A and M only).

Scored by the completing marker circuit over the LPC lead and records the number of calls directed to each line route.

2 **Total LLP Calls Peg Count**

—

ND, NA

—

EMC: H8000-11

—

Provide one register per marker.

Scored by the completing marker circuit over the LLP lead and records the number of LLP calls handled by each marker.

3 **LLP Calls Per Line Route—Overflow**

—

ND, NA

—

EMC: H8800-09

—

Provide one register per line route. Older offices may be provided with one register per marker group per ten line routes (A and M only).

Scored by the completing marker circuit over the LOF lead and records the number of times all lines (trunks) in the line route are busy.

4 **LLP Sender Group Peg Count**

—

ND

—

EMC: Refer to Figure 5.

—

Provide one register per group per marker.

Scored by the completing marker circuit over the OSG lead when an LLP outsender has been seized.

5 **LLP Sender Group—Overflow**

—

ND, NA

—

EMC:
Z0118-29 Group 00-11
Same span used for Outgoing Senders, item 2, and AIS with LLP, item 2

Scored by the completing marker circuit over the ASB lead and records the number of times the marker finds all senders in the group busy.

ITEM NO.	REGISTER	DESCRIPTION

Provide one register per sender group.

---

6   *LLP Sender Group Total Usage*

ND

EMC:
Z0142-53 Fast Scan Grp 00-11
Z0154-65 Normal Scan Grp 00-11
Same codes used for Outgoing Senders, item 4, and AIS with LLP, item 4.

Provide one register per sender group.

Description: Scored through the TUR at fast scan over the sender SB lead. Measures the total usage (traffic plus maintenance) of the sender group.

---

7   *LLP Sender Group Maintenance Usage*

ND

EMC:
Z0166-77 Group 00-11
Same codes used with Outgoing Senders, item 5, and AIS with LLP, item 5.

Provide one register per sender group.

Description: Scored by the TUR at slow scan over the sender SBM lead. Measures the maintenance usage of the sender group.

---

8   *LLP Line Circuit Usage*

ND

EMC: H8700-09

Provide one register per group (line route) of line circuits.

Description: Scored through the TUR at slow scan over the line circuit TU lead. Measures the traffic usage of all the line circuits in a line route. There is no provision to measure maintenance usage.

Line Verification

---

1   *Line Verification Peg Count*

NM

EMC: Z3310-19

Provide one register per line verification circuit.

Description: Scored by the line verification circuit over the PCT lead when the line verification test circuit associated with the master test frame is used by the plant forces to check that number group cross connections are installed correctly. These calls are included in the completing marker usage and peg count data.

ITEM NO.	REGISTER	DESCRIPTION

D. Traffic Management Systems Registers

Answering Time Recorder (ATR) Without Traffic Weighting Applique (Refer to Dial Facilities Management Practices, Division H, Section 5e(1), Part 2.)

1   *Total Calls Peg Count*

—

NA

—

EMC: Z4700-09

—

Provide one register per ATR.

Scored by the ATR circuit over the TC lead when the ATR associates itself with a line or trunk having a lighted lamp signal.

2   *Delayed Answer Peg Count*

—

NA

—

EMC: Z4710-19

—

Provide one register per ATR.

Scored by the ATR circuit over the DA lead and records the number of calls that have an answering time in excess of a predetermined value.

ATR With Traffic Weighting Applique (Refer to Dial Facilities Management Practices, Division H, Section 5e(1), Part 2.)

1   *Delayed Answer Peg Count*

—

NA

—

EMC: Z4720-29

—

Provide one register per ATR.

Scored by the ATR circuit over the D lead and records the number of delayed calls counted on the lines or trunks.

2   *Total Calls Peg Count*

—

NA

—

EMC: Z4730-39

—

Provide one register per ATR.

Scored by the ATR circuit over the N lead and records the total number of calls counted on the lines or trunks.

3   *Calls Timed Peg Count*

—

NA

—

EMC: Z4740-49

—

Provide one register per ATR.

Scored by the ATR circuit over the S lead and records the number of signals actually timed by the ATR.

ITEM NO.	REGISTER	DESCRIPTION

Dial Tone Speed Machine (Refer to Dial Facilities Management Practices, Division H, Section 5e(1), Part 2.)

1*   *Total Number of Trials (T) Peg Count*

—

ND, NA

—

EMC: Refer to Figure 7.

—

Provide one register per loading division. Maximum 10 per machine.

Scored by the dial tone speed register circuit over the 1-10 leads and records the total number of test calls.

2*   *Number of Trials Exceeding Delay Units (D) Peg Count*

—

ND, NA

—

EMC: Refer to Figure 7.

—

Provide one register per loading division. Maximum ten per machine.

Scored by the dial tone speed register circuit over the D1-D10 leads when dial tone is not received within 3 seconds.

Service Observing

1   *Operation of Timed Automatic Cutoff Recycle Key (TAC-RCY).*

—

NA

—

EMC: Z3300-09

—

Provide one register per No. 7, 9, or 12 service observing desk position telephone circuit.

Scored by the position telephone circuit over the TAC lead when the recycle key is operated and released which recycles the timing for automatic cutoff of the observer monitoring the conversation.

Traffic Totalizer KS-15947 (Refer to Dial Facilities Management Practices, Division H, Section 5e(1), Part 2.)

1*   *Totalizer Peg Count*

—

ND, NA

—

EMC: Z4690-99

—

Provide one register per totalizer circuit. A 14-type or 5-digit register may be provided as required.

Scored by the KS-15947 totalizer circuit over the TR lead and records the total peg count generated on a multiplicity of peg count leads. For example, the total peg count of markers or trunks.

ITEM NO.	REGISTER	DESCRIPTION

Traffic Register Frame (Refer to Dial Facilities
Management Practices, Division H, Section 5e(1),
Part 2.)

1   *Elapsed Time (Clock) Register*

—

NA

—

EMC: Z9920-29

—

Provide one register per traffic register cabinet.

Scored by the 10 IPM interrupter circuit over
the M lead. The register scores every 6
seconds.

Traffic Usage Recorder

1   *Cycle Count*

—

ND

—

EMC:
Z9934 Limited Scan
Z9952 Single TUR
Z9949 Paired TUR (B)
Z9953 Paired TUR (A)
Z9993-96 Reg Group 1-4
Z9954 Auxiliary Scanner

—

Provide one cycle count register per camera
field. Additional cycle count registers are
required when used to indicate that register
grouping (maximum of four) and/or limited
scan (one register) are employed. When an
auxiliary scanner is provided, a cycle count
register is required in its camera field.

Scored internally by the TUR and records
the number of cycles included in each period
of usage data taken on the registers of each
camera field. When register grouping is used,
cycle count registers can be arranged to
indicate the register group that is effective
during each TUR run (RG1, RG2, RG3 or
RG4). In the same way a cycle count register
can be arranged to indicate when limited scan
is employed.

E. Trunk Group Registers

Announcement Trunks

1   *No. 3A, 4A, 8A and 9A Announcement
Systems Peg Count*

—

ND, NA

—

EMC: Z0227-31

—

Provide one register per 20 trunks.

Scored by the announcement trunk circuit
over the PC lead and records the number of
calls completed by the group of trunks.

2   *No. 2D Announcement System Peg
Count*

—

ND, NA

—

Scored by the announcement line and alarm
circuit over the PC lead and records the
number of calls completed by each line.

ITEM NO.	REGISTER	DESCRIPTION

EMC: Z4100-99

—

Provide one register per line and alarm circuit.

3   *No. 4A, 8A and 9A Announcement Systems Group Busy*

—

ND, NA

—

EMC: Z0237-41

—

Provide one register per trunk group.

Scored by a group of announcement trunk circuits over the PB lead when the last trunk in the group becomes busy.

4   *Usage*

Note: For information on measuring trunk usage, see Dial Facilities Management Practices Section 5e(1), Part 2.

Incoming Trunks

1   *Peg Count*

Note: These registers are usually not required for traffic engineering or administration. The data for trunk engineering is secured from the originating end of the trunk group since this source considers the calls offered to the group in addition to the carried calls. Common control and administrative data may be obtained from other sources such as the incoming register group, total incoming peg count, etc. There may be a local condition which requires these registers on a particular trunk group; only then are they provided.

ND, NA

—

EMC: Not Applicable

Scored by the incoming trunk circuit over the PCL lead on any incoming call, including completed calls, line busies, and conditions where the incoming trunk is set to overflow.

GROUP SIZE	REGISTERS REQUIRED
1—30	One per trunk group.
31—50	Two per trunk group.
More than 50	One per 20 trunks.

2   *Group Busy*

ITEM NO.	REGISTER	DESCRIPTION

Note: These registers are usually not required since the data for trunk engineering are secured from the originating end of the trunk group. There may be a local condition which requires these registers on a particular trunk group; only then are they provided. When required, provide one register per trunk group.

ND
—
EMC: Not Applicable.

Scored by the incoming trunk circuit (when equipped with a PB lead) and records the number of times all trunks in the group become busy.

3   *Usage*

Note: Usage measurements usually are not required since such data are secured from the originating end of the trunk group. See Dial Facilities Management Practices, Division H, Section 5e(1), Part 2.

Intercept Trunks

1   *Intercept Trunks Peg Count*
—
ND, NA
—
EMC:
Z0564 Regular
Z0565 Machine Announcement
Z0566 PBX Recorded Announcement
Z0567 Trouble
Z0920 Vacant Code
Z0921 Denied Code
—
Provide one register per marker group per type of intercept. These registers are also provided when an AIS is in use (refer to Special Feature Registers).

Scored by the combined or completing marker circuit over the following leads according to the condition encountered by the marker:

(a) RIA lead for regular intercept.

(b) BNA lead for machine announcement.

(c) RIP lead for PBX recorded announcement.

(d) TBI lead for trouble intercept.

(e) DCI lead for denied code intercept.

(f) VCI lead for vacant code intercept.

The following conditions will cause the marker to route a call to intercept.

(a) A blank number is called.

(b) A changed or disconnected number is called.

(c) A temporarily disconnected number is called.

(d) A number associated with the line link appearance of a trunk is called by a customer.

ITEM NO. **REGISTER** **DESCRIPTION**

(e) A number associated with a line link pulsing line circuit is called by a customer.

(f) The physical and theoretical match is not made.

(g) The class-of-service match is not made when the multiple class-of-service match feature is provided for centrex.

By means of marker cross connections, each of the above conditions may be given discretionary intercept treatment according to local practice.

2   *Intercept Trunks—Group Busy*
—
ND, NA
—
EMC:
Z0560-63
Z0568-69
—
Provide one register per group of intercept trunks when usage of the group is not measured by the TUR.

Scored by a group of intercept trunk circuits over the PB lead when the last trunk in the group becomes busy. Only LLF trunks are wired for group busy. No separate scoring for regular, trouble, or announcement is possible when all three types of intercept use the same trunk equipment.

3   *Operating Room Desk Intercepting Peg Count*
—
ND, NA
—
EMC: Z0929
—
Provide one register per marker group for each intercept route (per 100 trunks). Provide when desk is located in same building as the No. 5 crossbar equipment.

Scored by the incoming intercepting trunk circuit over the OR lead for calls routed to an operator, the MR lead for calls routed to an announcement machine and the TOR lead for calls routed to an announcement machine and then transferred to an operator.

4   *Usage*

Note: For information on measuring trunk usage, see Dial Facilities Management Practices, Division H, Section 5e(1), Part 2.

Intermarker Group (IMG) Trunks

1   *Peg Count*
—
ND, NA
—
EMC: Z1000-14

Scored by the combined or completing marker circuit over the route relay PC lead when the marker offers a call to the trunk group. Hence, in addition to completed calls, the scorings include attempts where all trunks or

ITEM NO.	REGISTER	DESCRIPTION

GROUP SIZE	REGISTERS REQUIRED
1—60	One per trunk group.
61—100	Two per trunk group. One each for odd and even numbered markers.
More than 100	One per trunk group per marker.

intermarker group senders are busy. When the group is larger than 60 trunks, the required number of PC registers (see chart) is scored over the marker IPC leads by utilizing one of the marker's ten IPC relays.

2   *Overflow*

—

ND, NA

—

EMC: Z1020-34

—

Provide one register per group of intermarker group trunks.

Scored by the combined or completing marker circuit over the route relay OF lead when it finds all trunks in the group busy.

3   *Usage*

—

ND

—

EMC: Z1040-54

—

Provide one register per trunk group.

Scored through the TUR at slow scan over the intermarker group trunk S lead and measures the traffic usage of all the trunks in the group. No maintenance usage is measured.

Intraoffice (IAO) Trunks

1   *Peg Count*

—

ND, NA

—

EMC: Refer to Figure 8.

Scored by the combined or completing marker circuit over the route relay PC lead when the marker offers a call to the trunk group. If the group is larger than 60 trunks (see chart), additional registers per group are

GROUP SIZE	REGISTERS REQUIRED
1—60	One per trunk group.
61—100	Two per trunk group. One each for odd and even numbered markers.
More than 100	One per trunk group per marker.

ITEM NO.	REGISTER	DESCRIPTION

scored by arranging the marker peg count multiple as necessary. In addition to completed calls, the scorings include attempts where all trunks are busy or the called number is busy. A reverting call also scores this register as well as the reverting call peg count register. For this reason, reverting call peg counts must be subtracted to obtain the true IAO count.

2   *Overflow*

—

ND, NA

—

EMC: Z0500-09

—

Provide one register per trunk group.

Scored by the combined or completing marker circuit over the route relay OF lead when it finds all trunks in the group busy.

3   *Usage*

—

ND

—

EMC: Z0510-19

—

Provide one register per trunk group.

Scored through the TUR at slow scan over the IAO trunk S lead and measures the traffic usage of all the trunks in the group. No maintenance usage is measured.

Outgoing Trunks and Junctors

1*   *Peg Count*

> *Note:* Always provide on final and high usage groups, intermarker groups and intraoffice and reverting groups. Provide for the remaining trunk groups when the office does not have a TUR.

ND, NA

—

EMC:
Z2000-09 Junctors
Not applicable for interbuilding trunks.

Scored by the combined or completing marker circuit over the route relay PC or PCI lead when the marker offers a call to the trunk group. Hence, in addition to completed calls, the scorings include attempts where all trunks or junctors are busy, all senders associated with the group are busy, where the called line is busy on an intraoffice call, or a reverting call is involved. The latter two conditions score the register associated with the intraoffice trunk group. The register does not score on marker pulse conversion calls or on connections to originating registers.

GROUP SIZE	REGISTERS REQUIRED
1—60	One per trunk group
61—100	Two per trunk group. One each for odd and even numbered markers.
More than 100	One per trunk group per marker.

(

2   *Overflow*

> *Note:* Provide on final and high usage groups, intermarker groups, interoffice and reverting groups. Provide on remaining trunk groups when they are not measured by a TUR.

ND, NA
—
EMC:
Z2010-19 Junctors
Not applicable for trunks
—
Provide one register per group.

Scored by the combined or completing marker circuit over the route relay OF lead when it finds all trunks in the group busy while trying to set up a connection from a line equipment (customer or trunk) to a trunk. To obtain the per cent overflow, the overflow registrations for a given trunk group should be divided by the outgoing trunk group peg count and the result multipled by 100.

3   *Usage*

> *Note:* All outgoing groups of interlocal, tandem, intraoffice and intermarker group trunks and junctors should be measured by the TUR.

ND
—
EMC:
Z2020-29 Junctors
Not applicable for trunks
—
Provide one register per group of trunks and junctors.

Scored by the TUR. Most outgoing trunks are presently wired so that only traffic usage is measured (refer to Dial Facilities Management Practices, Division H, Section 5e(1), Part 2). The usage of the entire group is recorded on one register.

4   ***Calls to Tandem by Terminating Office Code and/or Charge Condition—Peg Count***
—
ND, NA
—
EMC: Z4900-39
—
Provide one register per code and/or per charge condition per outgoing trunk group to

Scored by the combined or completing marker circuit over the PCT 00-39 leads and records the number of calls by terminating office code and/or charge condition that is routed to a tandem.

ITEM NO.	REGISTER	DESCRIPTION

tandem (maximum 40 per office for wire spring markers and 20 for flat spring markers).

5   *Code Conversion Calls—Peg Count*

—

ND, NA

—

EMC: Z0900-19

—

Provide one register per code per outgoing trunk group to step-by-step (SXS) tandem (maximum 20).

Scored by the combined or completing marker circuit over the PCV 00-95 leads and records the number of times the marker attempts to establish a connection to a step-by-step tandem using a terminating office code. Although 96 different codes per group(s) may be pegged, a maximum of 20 at any one time is considered sufficient.

6   *Calls Per Transferred Route—Peg Count*

—

ND, NA

—

EMC: Z3350-69

—

Provide one register per marker group per transferred route (maximum 20).

Scored by the completing marker circuit over the PRT 20-39 leads and records the number of calls per route that are transferred when dynamic overload control is in effect.

7   *Marker Pulse Conversion Calls—Peg Count*

—

ND

—

EMC:
Z0198 FS
Z0199 WS

—

Provide one register per marker group.

Scored by the combined or completing marker circuit over the PLSC lead and records the total number of switchboard outgoing multifrequency calls that reach the marker for pulse conversion (dial pulse or revertive pulse). The register will score even if all senders are busy or the call is not completed.

Reverting Call Trunks

1   *Peg Count*

—

ND, NA

—

EMC: Z0490-93

—

Provide one register per trunk group.

Scored by the combined or completing marker circuit over the route relay PC lead when the marker offers a call to the trunk group. The marker first scores the IAO trunk group peg count register, but when it finds the call is a reverting call, the marker route advances to the reverting call trunk group and scores its peg count register. Hence, reverting call counts must be subtracted from the total IAO count. Reverting call counts include attempts where all trunks are busy.

2   *Overflow*

—

ND, NA

—

Scored by the combined or completing marker circuit over the route relay OF lead when it finds all trunks in the group busy.

ITEM NO.	REGISTER	DESCRIPTION

EMC: Z0485-88
—
Provide one register per trunk group.

3   *Usage*
—
ND
—
EMC: Z0480-83
—
Provide one register per trunk group.

Scored through the TUR at slow scan over the reverting call trunk S lead and measures the traffic usage of the group (does not measure maintenance usage).

Tone Trunks

1   *Peg Count*
—
ND, NA
—
EMC:
Z0570 Comb. Tone-Coin
Z0573 Comb. Tone-Noncoin
Z0800 Common Overflow
Z0810-14 Permanent Signal

Scored by the combined or completing marker circuit over the PC lead when the marker offers a call to the trunk group, including attempts when all trunks or associated outsenders are busy. When the group is larger than 60 trunks, the required number of peg count registers (see chart) are scored over the marker IPC leads by utilizing one of the marker's ten IPC relays.

GROUP SIZE	REGISTERS REQUIRED
1—60	One per trunk group.
61—100	Two per trunk group. One each for odd and even numbered markers.
More than 100	One per trunk group per marker.

Note: Expanded permanent signal routing provides a separate peg count for receiver off-hook and trouble conditions. Moreover, overflow link circuits become the final route for both overflow and permanent signal calls. Peg count and overflow registrations may be obtained from the route relays from which route advance is made and from the route relays used to access the appropriate trunks and overflow links.

2   *Overflow*
—
ND, NA
—
EMC:
Z0571 Comb. Tone-Coin

Scored by the combined or completing marker circuit over the OF lead when the marker finds all trunks in a group busy while attempting to complete a call.

ITEM NO.	REGISTER	DESCRIPTION

Z0574 Comb. Tone-Noncoin
Z0802 Common Overflow
Z0815-19 Permanent Signal

—

Provide one register per group.

3   *Usage*

Note: For information on measuring trunk usage, see Dial Facilities Management Practices, Division H, Section 5e(1), Part 2. For EMC codes refer to Figure 9.

F. Specialized Switching Operations Registers

Tandem and Toll Switching

Note: A No. 5 crossbar office may be equipped with features to allow the switching of tandem and/or toll traffic to be superimposed on the local traffic. Both tandem and toll switched traffic may generally be classified as through switched calls, connecting an incoming trunk appearing on the LLF to an outgoing trunk appearing on the TLF. However, a call on an incoming toll trunk may terminate locally and a locally originated call may use an outgoing toll trunk. Only a limited amount of tandem or toll switching data may be segregated from the basic local switching function. In the category of trunking data, however, complete segregation is possible.

1   *Total Through Switched Calls Peg Count*

—

ND

—

EMC:
E8500-11 FS 2-wire calls
E8700-11 WS 2-wire calls
H8600-11 FS Paired LLF calls
E8600-11 WS Paired LLF calls

—

Provide one register per marker. For paired LLF, refer to Dial Facilities Management Practices, Division H, Section 5e(1), Part 1.

Scored by the combined or completing marker circuit over the TOG (2w) lead when a call is handled on a tandem basis. This includes junctor calls as well as tandem and toll switched calls.

2   *Incoming Register Permanent Signal Peg Count*

—

NA, NM

Scored by the dial pulse or multifrequency incoming register circuit over the PS lead when the incoming register is connected to an intertoll trunk and times out without

ITEM NO.	REGISTER	DESCRIPTION

receiving any pulses.

—
EMC:
Z0045-59 Group 00-14
Z0373-75 Group 15-17
—

Provide one register per marker group or as required.

3   *Incoming Register Partial Dial Peg Count*

—

NA, NM

—

EMC:
Z0060-74 Group 00-14
Z0376-78 Group 15-17
Same spans used with CAMA, item 6.

—

Provide one register per marker group or as required.

Scored by the dial pulse or multifrequency incoming register circuit over the PD lead when the incoming register is connected to an intertoll trunk and times out in a partial dial condition. In a dial pulse incoming register, a partial dial occurs when insufficient digits are received to call in a marker. In a multifrequency incoming register, a partial dial occurs when one or more digits are received without a start signal.

4   *Incoming Intertoll Trunk Group Peg Count (One-Way Incoming or 2-Way 2-Wire)*

—

NR

—

EMC: Not Applicable

—

These registers are usually not required for traffic engineering or administration. The data for trunk engineering are secured from the originating end of the trunk group since this source considers the calls offered to the group in addition to the carried calls. Common control and administrative data may be obtained from other sources such as the incoming register group, total incoming peg count, etc. There may be a local condition which requires these registers on a particular trunk group; only then are they provided as follows:

Incoming trunks which handle both terminating and through switched calls each have two peg count leads. One (PC LOC) is associated with a register for counting terminating calls and the other (PC THRU) with a register for counting through switched calls. Scoring over the PC LOC lead includes any completed terminating call and any attempt to complete a through switched call which results in setting the incoming trunk to return overflow. Scoring over the PC THRU lead includes any completed through switched call and any attempt to complete a through switched call which encounters a failure to match or a trouble on either a first or second marker trial. LOC and THRU peg count leads from incoming trunks are cabled to the main distributing frame for strapping and association with the traffic register circuits.

GROUP SIZE	REGISTERS REQUIRED
1—30	One per trunk group.
31—50	Two per trunk group.
More than 50	One per 20 trunks.

ITEM NO.	REGISTER	DESCRIPTION

5 — *Incoming Intertoll Trunk Group Busy (One-Way Incoming or 2-Way 2-Wire)*

—

NR

—

EMC: Not Applicable

—

These registers are usually not required since the data for trunk engineering are secured from the originating end of the trunk group. There may be a local condition which requires these registers on a particular trunk group; only then are they provided. When required, provide one register per trunk group.

Scored by a group of incoming or 2-way trunks over the PB lead when the last trunk in the group becomes busy.

6 — *Outgoing Intertoll Trunk Group Peg Count (One-Way Outgoing or 2-Way 2-Wire)*

—

ND, NA

—

EMC: Not Applicable

GROUP SIZE	REGISTERS REQUIRED
1—60	One per trunk group.
61—100	Two per trunk group. One each for odd and even numbered markers.
More than 100	One per trunk group per marker.

Scored by the combined or completing marker circuit over the specific route relay PC lead when the marker offers a call to the trunk group. The scorings include attempts where all trunks are busy or all senders associated with the group are busy. When the group is larger than 60 trunks, the required number of peg count registers (see chart in the "Register" column) are scored over the marker IPC leads by utilizing one of the marker's ten IPC relays.

7 — *Outgoing Intertoll Trunk Group Overflow (One-Way Outgoing or 2-Way 2-Wire)*

—

ND, NA

—

EMC: Not Applicable

—

Provide one register per trunk group.

Scored by the combined or completing marker circuit over the specific route relay OF lead when it finds all trunks in the group busy while trying to set up a connection from a line equipment (customer or trunk) to a trunk.

8 — *Directional Reservation of 2-Way Intertoll Trunks—Peg Count*

—

NA

—

EMC:
Z0214-18 Group 01-05

—

Scored by the directional reservation (DR) circuit over the PC lead when the DR equipment places a busy condition on a predetermined number of idle trunks in the group to reserve them for inward traffic.

ITEM NO.	REGISTER	DESCRIPTION

Provide one register per trunk group arranged for directional reservation.

9   *Directional Reservation of 2-Way Intertoll Trunks—Group Busy Timing*

—

NA

—

EMC:
Z0219-23 Group 01-05

—

Provide one register per trunk group arranged for directional reservation.

Scored by the DR circuit over the GB lead. The register scores at 6-second intervals during the time that the DR equipment places a busy condition on a predetermined number of trunks.

10   *Usage (One-Way Incoming, One-Way Outgoing, 2-Way 2-Wire)*

—

ND

—

EMC: Not Applicable

—

Provide one register per group of trunks wired to the TUR.

Refer to Dial Facilities Management Practices, Division H, Section 5e(1), Part 2, for a discussion of trunk usage.

Centralized Automatic Message Accounting (CAMA)

Note: A local No. 5 crossbar office may be equipped for CAMA. This feature makes it possible to centralize AMA equipment where it may be used in common by a number of originating offices (usually for charging toll calls). Traffic from the originating offices is routed through the CAMA office on a tandem switching basis.

1   *CAMA Transverters—Reorder Position Signal Peg Count*

—

NA

—

EMC: Z0108

—

Provide one register per marker group.

Scored by the CAMA transverter circuit over the ROP lead. The register will score the number of calls on which the calling office code appears irregular for the following reasons: (1) vacant code, (2) same code as called office code and (3) code is not associated with the recorder handling the calls.

2   *CAMA Sender Time-out—No Position Attached—Peg Count*

—

NM

—

EMC: Z4096

—

Provide one register per marker group.

Scored by the CAMA sender circuit over the NPA lead when the sender times out before a CAMA position is attached.

ITEM NO.	REGISTER	DESCRIPTION
3	**CAMA Position—Calls Connected Peg Count** — ND, NA — EMC: H8100-8197 Pos 1-98 — Provide one register per position.	Scored by the CAMA position link circuit over the PC lead when a call is connected to a CAMA position.
4	**CAMA Position Disconnect Peg Count** — NA — EMC: Z0246 — Provide one register for all CAMA positions.	Scored by the CAMA position link circuit over the PC-PD lead when any position disconnect (PD) key is operated to free a position whose operator is unable to obtain a satisfactory calling number, gets no response when requesting a calling number, or encounters other difficulty.
5*	**CAMA Transverter Total Seizures** — ND — EMC: C9060-63 Transv 00-03 — Provide one register per CAMA transverter.	Scored by the CAMA transverter circuit over the PC lead. This register is scored by the transverter each time it is seized to make any type of initial entry on a service call. The register is also scored on second trial attempts whether they are completed or result in failure. The register does not score on test call, calls routed to overflow, or calls handled free when the CAMA sender is unable to obtain a transverter within the time-out interval.
6	**Dial Pulse Incoming Register—Partial Dial Serving CAMA Calls Peg Count** — NM — EMC: Z0060-74 Group 00-14 Z0376-78 Group 15-17 Same spans used with Tandem and Toll Switching, item 3. — Provide one register per marker group or as required.	Scored by the dial pulse incoming register circuit over the PD-1 lead. This register will score on CAMA calls which time out because of insufficient digits received by the incoming register. This includes those cases in which no digits are received as on permanent signals.
7*	**CAMA Junctor Group and Intermarker Trunk Group Peg Count** — ND, NA — EMC: Z2000-09 Junctor Group 00-09 Z1000-19 IMG Trunk Group 00-19	Scored by the combined or completing marker circuit over the specific route relay PC lead when the marker offers a call to the trunk or junctor group. Hence, in addition to completed calls, the scorings include attempts where all trunks or junctors are busy or all senders associated with the group are busy. When the group is larger than 60 trunks,

ITEM NO.	REGISTER	DESCRIPTION

Same codes used for other types of junctors and IMG trunks.

the required number of peg count registers (see chart in "Register" column) is scored over the marker IPC leads by using one of the marker's ten IPC relays.

GROUP SIZE	REGISTERS REQUIRED
1—60	One per trunk group.
61—100	Two per trunk group. One each for odd and even numbered markers.
More than 100	One per trunk group per marker.

8 *CAMA Transverter Usage*

—

ND

—

EMC: C9070-73

—

Provide one register per CAMA transverter.

Scored through the TUR at fast scan over the TB lead. Measures the total usage (traffic plus maintenance) of each transverter.

Note: Since some transverter usage is missed because of the point of measurement, it is necessary to adjust the measured usage. It should be increased by 0.020 second times the transverter peg count.

9 *CAMA Transverter Maintenance Usage*

—

ND

—

EMC: Z0106

—

Provide one register for all CAMA transverters.

Scored through the TUR at slow scan over the TBM lead. Measures the maintenance usage of all the transverters as a group.

10 *CAMA Transverter Connector Usage*

—

ND

—

EMC: Z4890-99

—

Provide one register per CAMA transverter connector.

Scored through the TUR at fast scan over the connector TU lead and measures the traffic usage carried by each transverter connector. There is no provision to measure maintenance usage.

Common Control Switching Arrangement (CCSA)

Note: CCSA provides for the interconnection of several customer PBX locations by means of private line facilities. Each customer network has its own dedicated access lines and network trunks. The switching is on a shared basis, using No. 5 crossbar offices as switching centers. Traffic register data are available by customer group from the CCSA access lines (including the access group

ITEM NO.	REGISTER	DESCRIPTION

controller) and the network trunks. Data from the shared switching functions are not segregated by customer entity.

1   *Access Group Controller (AGC) Peg Count*

—

ND, NA

—

EMC: Z4800-09

—

Provide one register per access group controller (A and M only).

Scored by the access group controller circuit over the AGC lead each time a controlled subscriber originates or receives a CCSA call.

2   *Access Group Controller Originating Call Attempts*

—

ND, NA

—

EMC: Z4810-19

—

Provide one register per access group controller (maximum of 10) per marker group.

Scored by the completing marker circuit over the OST 0-9 leads and provides a count of all offered originating calls involving the particular AGC circuit.

3   *Access Group Controller Terminating Call Attempts*

—

ND, NA

—

EMC: Z4820-29

—

Provide one register per access group controller (maximum of ten) per marker group.

Scored by the completing marker circuit over the TGT 0-9 leads and provides a count of all offered terminating calls involving the particular AGC circuit.

4   *Access Group Controller Originating Calls Completed*

—

ND, NA

—

EMC: Z4830-39

—

Provide one register per access group controller (maximum of ten) per marker group.

Scored by the completing marker circuit over the OGR 0-9 leads and provides a count of all completed originating calls involving the particular AGC circuit.

5   *Access Group Controller Terminating Calls Completed*

—

ND, NA

—

EMC: Z4840-49

—

Scored by the completing marker circuit over the TGR 0-9 leads and provides a count of all completed terminating calls involving the particular AGC circuit.

ITEM NO.	REGISTER	DESCRIPTION

Provide one register per access group controller (maximum of ten) per marker group.

| 6 | ***Originating Access Group Controller Overflow*** | Scored by the completing marker circuit over the OAB 0-9 leads and provides a count of all originating calls that are blocked due to the particular AGC circuit. |

—

ND, NA

—

EMC: Z4850-59

—

Provide one register per access group controller (maximum of ten) per marker group.

| 7 | ***Terminating Access Group Control Overflow*** | Scored by the completing marker circuit over the TAB 0-9 leads and provides a count of all terminating calls that are blocked due to the particular AGC circuit. |

—

ND, NA

—

EMC: Z4860-69

—

Provide one register per access group controller (maximum of ten) per marker group.

3. REFERENCES

Bell System Practices:

Section 819-005-150—General Outline, Operating And Equipment Features, Equipment Design Requirements, No. 5 Crossbar System.

Section 958-110-100—No. 5 Crossbar System, General Descriptive Information.

Traffic Facilities Practices:

Division D, Section 8m(1)—Dial Facilities, No. 5 Crossbar, Traffic Measurement Facilities, General Description.

Division D, Section 8m(2)—Dial Facilities, No. 5 Crossbar, Traffic Measurement Facilities, Operation and Provision.

TRAFFIC REGISTER	2-WIRE LEAD	PAIRED LEAD
Incoming calls to term hunting lines	IH(2W)	IHP
Incoming matching loss	IFM(2W)	IFMPR
Incoming first failure to match	IFFM(2W)	IFFMP
Office overflow	TCO(2W)	PTCO
Originating matching loss	FM(2W)	FMPR
Sample channel peg count	PCSC(2W)	SCPR
Total channel peg count	TCH(2W)	TCHPR
Total incoming calls to busy lines	IB(2W)	IBP
Total incoming peg count	TIP(2W)	TIPR
Total originating peg count — dial pulse	TOR(2W)	TOPR
Total originating peg count — TOUCH-TONE	TMOR(2W)	
Total through switched calls	TOG(2W)	PTOG

Fig. 1—Traffic Registers Provided Separately for 2-Wire and Paired Line Link Frames (1.14)

EMC FOR 12 MARKERS	CLASS OF SERVICE
F8700-11	01
F8800-11	02
F8900-11	03
G8000-11	04
G8100-11	05
G8200-11	06
G8300-11	07
G8400-11	08
G8500-11	09
G8600-11	10

Fig. 2—EMC Association With Originating Class-of-Service Peg Count (Completing or Combined Markers, Item 2)

EMC	OR GROUP
Z0335	FS Dial Pulse
Z0348	WS Dial Pulse
Z0329	FS TOUCH-TONE
Z0344	WS TOUCH-TONE
Z4067	FS Dial Tone First
Z0339	WS Dial Tone First
Z4068	FS 1st Future Grp
Z4069	WS 1st Future Grp
Z4070	FS 2nd Future Grp
Z4071	WS 2nd Future Grp
Z4072	FS 3rd Future Grp
Z4073	WS 3rd Future Grp

Fig. 3—EMC Association With Originating Register Group Maintenance Usage (Originating Registers, Item 10)

EMC	IR GROUP
C 4000-08	00
D 4000-08	01
E 4000-08	02
F 4000-08	03
G 4000-09	04
H 4000-08	05
J 4000-08	06
K 4000-08	07
L 4000-08	08
M 4000-08	09
N 4000-08	10
P 4000-08	11
Q 4000-08	12
R 4000-08	13
S 4000-08	14
T 4000-08	15
U 4000-08	16
V 4000-08	17

Note: It is recommended that each IR group appear in 2 connectors. The following association of the numeric EMC with each connector allows for complete flexibility and applies to all 18 IR groups.

EMC NUMERIC	IRMC	
	CF	CONN
4000	0	0
4001	0	1
4002	0	2
4003	0	3
4004	1	0
4005	1	1
4006	1	2
4007	1	3
4008	2	0

Fig. 4—EMC Association With Incoming Register Group Peg Count (Incoming Registers, Item 1)

EMC FOR 12 MARKERS	SENDER GROUP
P8000-11	00
P8100-11	01
P8200-11	02
P8300-11	03
P8400-11	04
P8500-11	05
P8600-11	06
P8700-11	07
P8800-11	08
P8900-11	09
Q8000-11	10
Q8100-11	11

Fig. 5—EMC Association With Outgoing Sender Group Peg Count (Originating Registers, Item 1)

EMC	LLF	VG	VF
E2000-04	Odd	00	0-4
E2010-14	Odd	01	0-4
E2020-24	Odd	02	0-4
E2030-34	Odd	03	0-4
E2040-44	Odd	04	0-4
E2050-54	Odd	05	0-4
E2060-64	Odd	06	0-4
E2070-74	Odd	07	0-4
E2080-84	Odd	08	0-4
E2090-94	Odd	09	0-4
E2100-04	Odd	10	0-4
E2110-14	Odd	11	0-4
E2200-04	Even	00	0-4
E2210-14	Even	01	0-4
E2220-24	Even	02	0-4
E2230-34	Even	03	0-4
E2240-44	Even	04	0-4
E2250-54	Even	05	0-4
E2260-64	Even	06	0-4
E2270-74	Even	07	0-4
E2280-84	Even	08	0-4
E2290-94	Even	09	0-4
E2300-04	Even	10	0-4
E2310-14	Even	11	0-4

Fig. 6—EMC Association With Subscriber Line Usage (Usage, Item 3)

EMC	LOADING DIVISIONS FOR DIAL TONE SPEED
	TEST REGISTERS
Z9968	Dial Pulse, 2-wire, class A
Z9969	Dial Pulse, 2-wire, class B & C
Z9960	TOUCH-TONE, 2-wire, class A
Z9961	TOUCH-TONE, 2-wire, class B & C
	DELAY REGISTERS
Z9970	Dial Pulse, 2-wire, class A
Z9971	Dial Pulse, 2-wire, class B & C
Z9962	TOUCH-TONE, 2-wire, class A
Z9963	TOUCH-TONE, 2-wire, class B & C

Fig. 7—EMC Association With Dial Tone Speed Traffic Registers (Dial Tone Speed Machine, Items 1 and 2)

EMC FOR 12 MARKERS	IAO TRK GRP	TYPE MKR
K8200-11	00	Flat Spring
K8300-11	01	
K8400-11	02	
K8500-11	03	
K8600-11	04	
K8700-11	05	
K8800-11	06	
K8900-11	07	
L8000-11	08	
L8100-11	09	
L8200-11	00	Wire Spring
L8300-11	01	
L8400-11	02	
L8500-11	03	
L8600-11	04	
L8700-11	05	
L8800-11	06	
L8900-11	07	
M8000-11	08	
M8100-11	09	

Fig. 8—EMC Association With Intraoffice Trunk Group Peg Count (Intraoffice Trunks—IAO, Item 1)

EMC	TRUNK GROUP
Z0572	Comb Tone-Coin
Z0575	Comb Tone-Non Coin
Z0804	Common Overflow
Z0805	Common Overflow (LOA)
Z0820-24	Permanent Signal (5 Grps)

Fig. 9—EMC Association With Trunk Group Usage (Tone Trunks, Item 3)