

subject: Interconnection - Interface between ACD's and
Customer-Provided Traffic Measuring Equipment



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DO NOT RETURN TO FILE

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Chief Engineers (copies sent to General Plant Managers, General Traffic Managers, Rate Heads, Marketing Heads, Voice Connecting Arrangement Specialists, and Interconnection Representatives)

Mr. Adams

from: Engineering Director - Customer Telephone Systems

synopsis: Provides application information and describes a method of inter-
facing customer-provided traffic measuring equipment with Bell System
2A and 3A ACD's.

* * *

Recent requests by several manufacturers have indicated a need for interface arrangements to permit customer-provided computing equipment to collect real time traffic information from the traffic data output leads of telephone company-provided 2A and 3A Automatic Call Distributors. The attached memorandum describes a simplified interface arrangement which, along with the criteria applied to the customer-provided equipment, will protect the telephone company-provided equipment; protection of the telecommunications network is not an issue.

Each installation will be handled on a special basis and no Uniform Service Order Code (USOC) and associated rate will be developed.

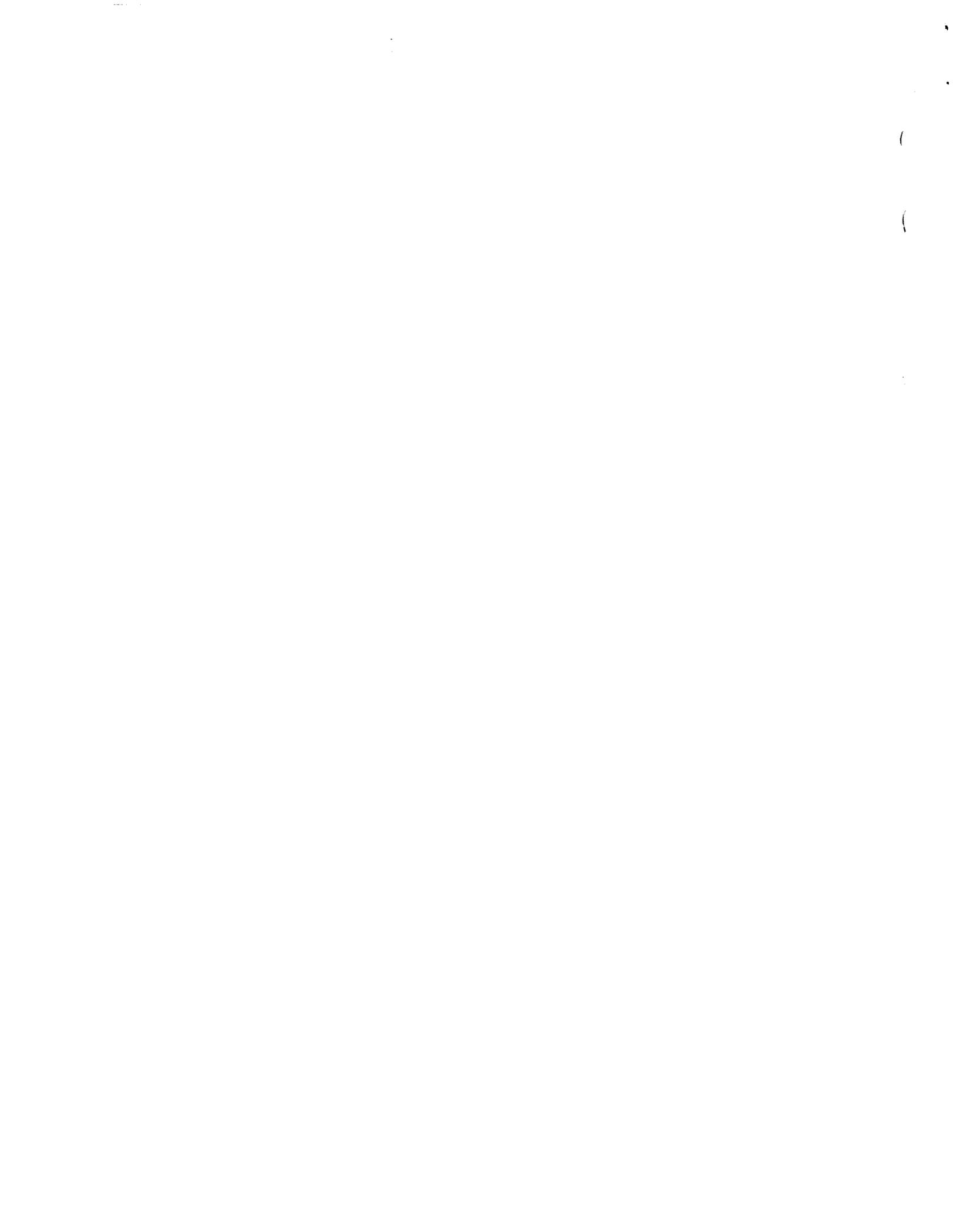
Technical Reference information and Bell System practices are under preparation and will be announced later.

[Signature]

Engineering Director

JLC:KS

Attachment



Interconnection of Customer-Provided Traffic Measuring Equipment with ACD's

Recent requests by several manufacturers have indicated a need for an interface to permit customer-provided equipment to perform certain traffic measuring functions associated with Bell System Automatic Call Distributors (ACD). In most cases, the customer-provided system will be used in lieu of a telephone company-provided Force Administration Data System (FADS). To do this, the customer equipment must scan a large number of traffic measurement leads in the ACD; normally three leads per attendant position and two leads per trunk. In large ACD's, this can total several thousand leads.

The use of relay isolation (e.g. Connecting Arrangement C1Y) is not economically practical for an interface of this type and is not necessary since direct connection to the message network is not involved. It is only necessary that service protection be provided so that the customer equipment can not affect the operation of the ACD. A diode has been incorporated in the interface to provide isolation. The diode is connected so that it will be reverse biased under all conditions except when the contact within the ACD is closed.

The traffic measurement leads of the ACD provide contact closures to ground that are normally scanned by Traffic Usage Recorders (TUR) in the FADS. In the idle state, the lead appears as either an open circuit or as -48 volts through one or more relay coils and perhaps a lamp, depending on the options selected in the ACD equipment (see Figure 1).

The following criteria is applied to the customer-provided equipment:

Minimum internal impedance - 1000 ohms

Maximum open circuit voltage - 0 to -48 volts

The customer's equipment can, therefore, scan the ACD traffic leads for the presence of ground but cannot affect the operation of the ACD.

Table A outlines the traffic leads to be provided and details their functions. All of these leads are available in current ACD's and are shown on equipment drawings. Older ACD's may require modification to make these leads available. In some cases, due to the age of the ACD or other factors, it may not be practical to provide the necessary traffic leads. Traffic measuring by customer-provided equipment should be provided on a "where facilities permit" basis. Each case will have to be examined by appropriate engineering personnel to determine if the traffic leads are, or can be, made available.

A schematic of the interface arrangement is shown in Figure 1. A Western Electric 446F silicon diode is recommended for this application. The diodes can be mounted on any convenient mounting strip. A 260A terminal strip is recommended. A separate interface connecting block should be provided as a demarcation strip for connection to the customer-provided equipment. A standard 66 type connecting block is recommended.

Due to the wide variation in ACD's, the development of a single recommended tariff rate is not practical. Charges should be based on cost and authorized under the special assembly of equipment provisions in Operating Company tariffs.

A Uniform Service Order Code (USOC) designation will not be assigned to this service. Customers requesting the service should specify that they require the special interface for connecting customer-provided traffic measuring equipment to telephone company ACD's. In addition, the customer should specify the traffic leads required by the measuring equipment.

Request by manufacturers or communications consultants for general information on this service should be referred to AT&T. Specific questions on a customer ACD installation should be answered by appropriate Telephone Company personnel.

Demand for this service does not appear sufficient to justify a Western Electric manufactured connecting arrangement. Interface arrangements should be assembled in the field or in the Western Electric Service Center based on local requirements.

Attachment A Accompanying E.L. 1679

TABLE A

Traffic Leads Available for Customer-Provided Traffic Measuring Equipment-
2A ACD

Per Attendant Position

- TUA - Position talk time - Grounded when an attendant is connected to an incoming trunk.
- TUB - Position manned - A ground indicates the position is manned. As an option, ground may be removed when any key in the 3rd row is depressed. Ground will not be returned until the first row IN key is operated.
- TUC - Position busy - Absence of ground on this lead is a measure of the waiting time for a call. (Also called idle time)

Per Incoming Trunk

- TUA - Trunk waiting usage - Grounded when the trunk is seized. Ground is removed when the attendant answers.
- TUB - Trunk usage - Grounded from time of seizure until calling party disconnects.
- LC - Lost call - A momentary ground on this lead indicates that the calling party did not wait for an attendant to become available.

An abandoned call will be indicated even though an announcement has been given.

Trunks arranged for two-way operation

- TU - Outgoing trunk usage ground on outgoing call

Traffic Leads Available for Customer-Provided Traffic Measuring Equipment -
3A ACD

Per Attendant Position - Same as 2A ACD

Per Load Balance Trunk

- TUD - Load Balance trunk usage - A ground on this lead indicates the trunk is in use. Trunks are one-way.

Per Transfer Trunk

- TU - Transfer trunk usage - A ground on this lead indicates the trunk is in use

Attachment A Accompanying E.L. 1679 -2

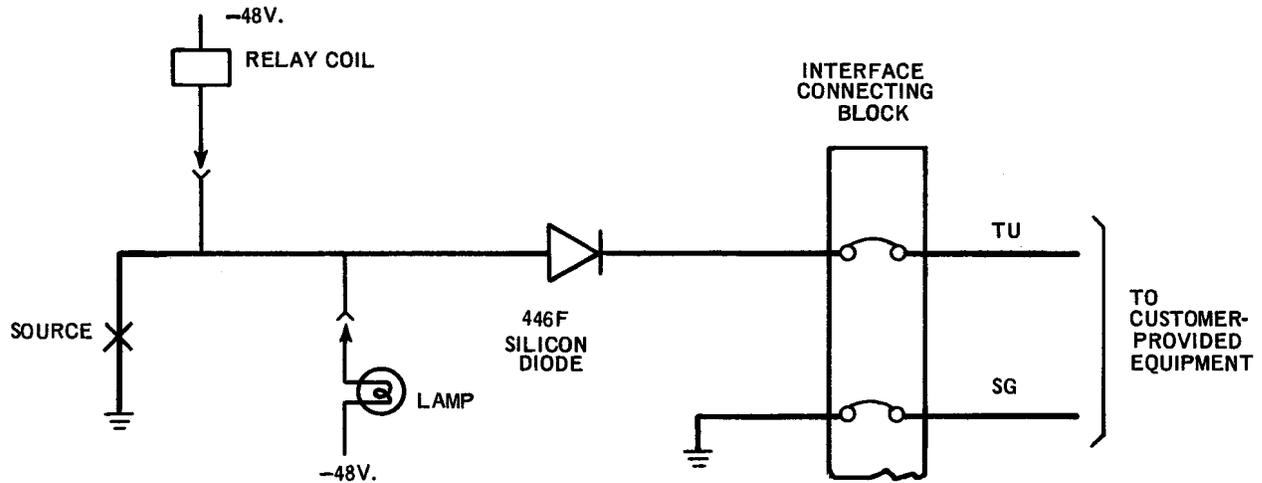
Per Overflow Trunk

TUF - Overflow trunk usage - A ground on this lead indicates the trunk is in use.

Per Incoming Trunk - Same as 2A ACD

Timing diagrams for the traffic data leads are shown in Figure 2 and 5 attached. Figure 5 also indicates some of the traffic data that can be derived from the TU lead information.

Interface for Customer – Provided Traffic Measuring Equipment on Bell System ACD's



Notes

Fig. 1

1. Requirements for customer-provided traffic measuring equipment.
Internal impedance – greater than 1000 ohms.
Permissible open circuit voltage at interface – 0 to –48 volts.
2. Ground in the ACD is applied by a relay contact closure.
All interface diodes will be silicon.
3. At least one Signal Ground will be provided for each interface connecting block.
4. No filtering or signal processing is provided in the Telephone Company Interface. These leads are normally used to operate relay or lamp indicator devices which are relatively insensitive to momentary contact closures or contact bounce. The use of electronic scanning devices in the customer-provided equipment may necessitate the addition of some filtering by the customer to remove such indications and prevent false registration of traffic data. No modification of the ACD will be made to eliminate such problems if they occur.

**TIMING DIAGRAM
ACD TRAFFIC DATA LEADS**

INCOMING TRUNK

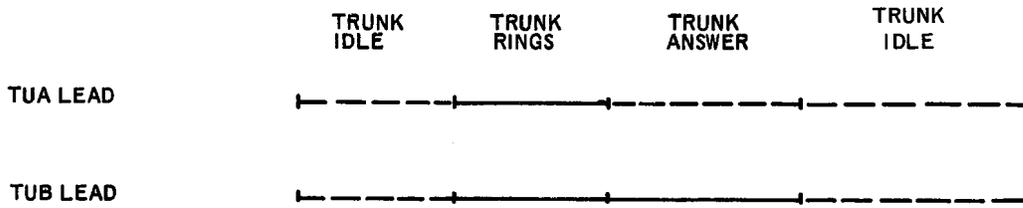


FIG. 2

ATTENDANT POSITION

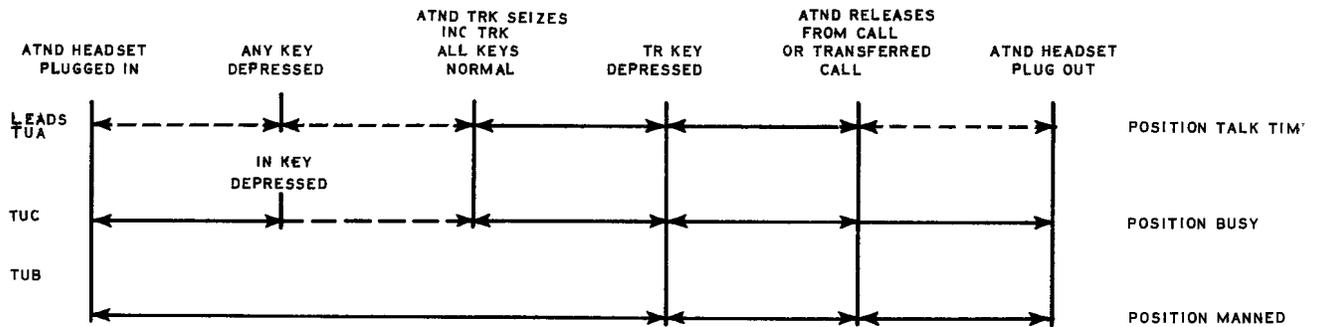


FIG. 3

ATTENDANT POSITION - 3rd Row Arranged for Non-ACD Traffic

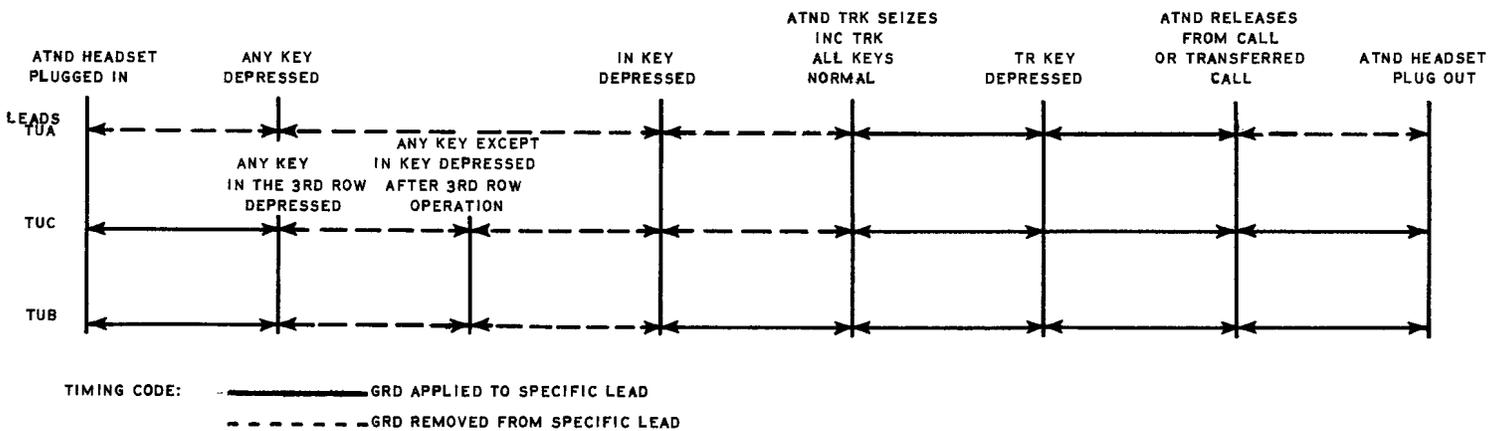
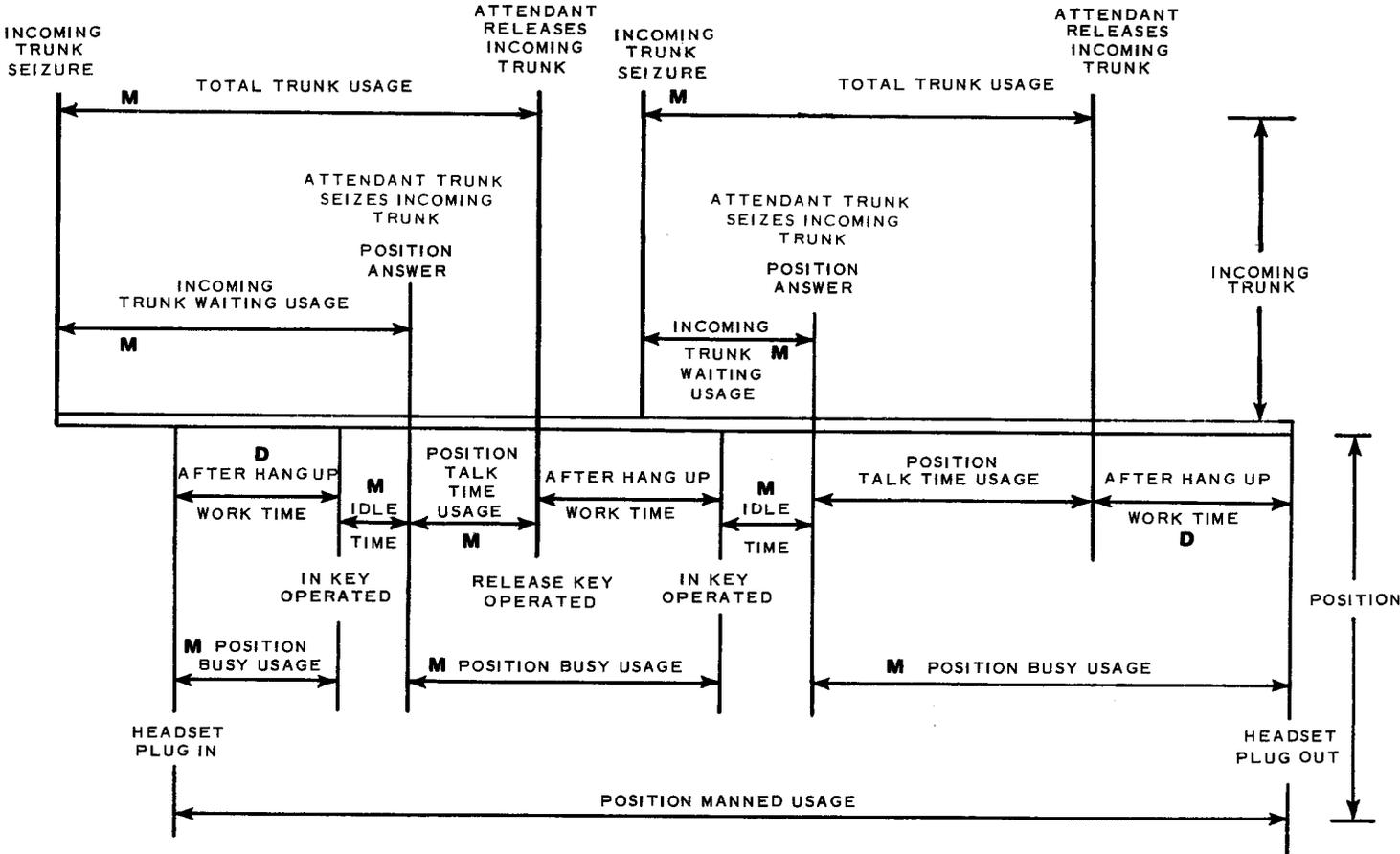


FIG. 4

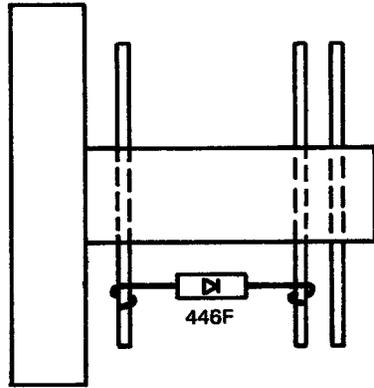


M = MEASURED
D = DERIVED

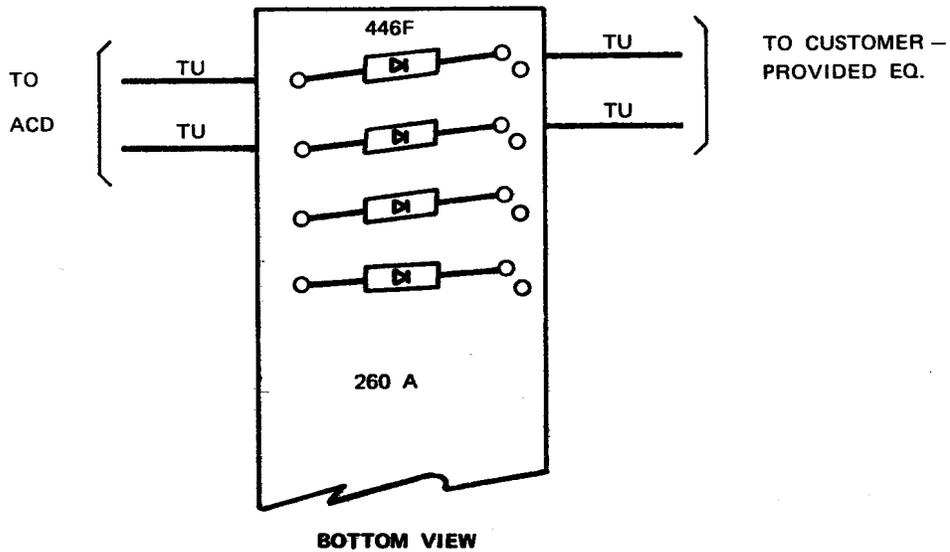
FIG. 5

Diagram of Traffic Data Measured and Derived for an ACD not Equipped With Load Balancing, Overflow, and/or Intraflow

NOTE: FOR 23" RACK
MOUNTING THE
260A TERMINAL
STRIPS CAN BE
VERTICALLY MOUNTED
ON P-41J775
FRAME ASSEMBLY



END VIEW



BOTTOM VIEW

TYPICAL MOUNTING ARRANGEMENT
ACD TRAFFIC INTERFACE

FIG. 6