SWITCHED MAINTENANCE ACCESS SYSTEM (SMAS)
ACCESS POINT INFORMATION

CONTENTS PAGE

1. GENERAL

1.01 This section presents guidelines for locating, assigning, and cross-connecting access points for Switched Maintenance Access Systems (SMAS). This section also gives the format of the access point data appearing on the circuit layout record (CLR). Correct access point data is imperative to take full advantage of the remote trouble sectionalization capabilities of the Switched Access Remote Test System 1A (SARTS 1A).

1.02 This section is reissued to include information relating to SMAS 5B, new configuration code additions, and a requirement for a 5-digit SMAS address number for SMAS 5. Also included is a general clarification and emphasis on explanation of codes for access point testing data. Since this is a general revision, change arrows have been omitted.

1.03 Switched Maintenance Access Systems have been developed to replace test jacks. These systems allow a tester to obtain access to many circuits from a centralized location. Each system uses access relays physically located in the circuit at the desired access point. On command, an access point is switched through a concentration stage(s) to a centralized test location. The tester then proceeds with verification and testing of the accessed circuit.

1.04 Correct circuit testing requires accurate records of cross-connections between circuits and SMAS access points. The type and format of available cross-connect information will depend on local practices. Note that some unitized facility terminal equipment is available with built-in SMAS access points. These access points are provided by maintenance connectors (see Section 667-000-002 for SMAS maintenance connector information.) The access point information described in this section is applicable to all types of SMAS access points regardless of implementation (see Part 3).

1.05 Unitized facility terminal (UFT) equipment includes analog facility terminals (AFT), digital facility terminals (DFT), and metallic facility terminals (MFT). The use of built-in SMAS access points in UFT equipment introduces some new access point configurations. SARTS access and testing of these new configurations require definition of additional configuration codes for the SARTS access point data. These new codes are defined in this section.

1.06 Figure 1 is a schematic representation of 4-wire (or two 2-wire) and 6-wire access points with their main frame lead designations (when terminal on the main frame) and reference transmission directions.

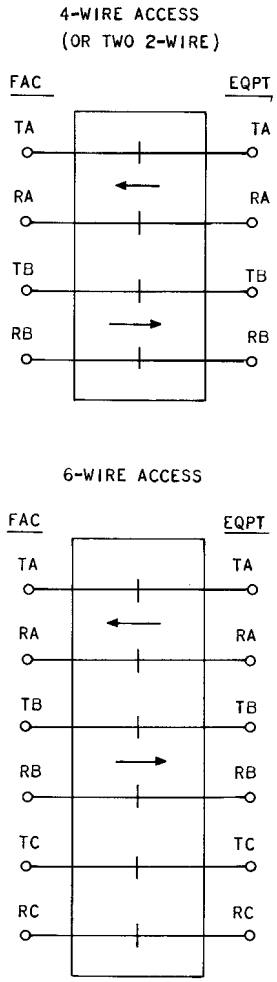


Fig. 1—Schematic Representation of Access Points

2. LOCATION OF SMAS ACCESS POINTS

A. SMAS Interfaces

2.01 The access point location plan gives ***guidelines*** for placement of a ***minimum*** set of access points on circuits to be able to ***sectionalize*** troubles with SARTS. The final goal of any access point location plan must be to at least satisfy guidelines given in this section. However, when initial funding does not allow deployment of a

sufficient number of access points to follow the guidelines, the first choice is to provide an access point on each circuit at every metallic customer loop interface. When trouble ***isolation*** is desired, and when economic analysis can support it, more than the minimum set of access points may be used. To achieve trouble isolation, access points must be provided at all interfaces between individual equipments and facilities, except within unitized equipment bays.

2.02 The fundamental access point location plan objectives are to provide a minimum of ***one access point per building and to ensure at least one access point per facility.*** To satisfy these objectives the following interfaces are considered for access point placement:

- Metallic customer loop interfaces
- Carrier facility interfaces
- Bridge interfaces
- Metallic trunk facility to metallic trunk facility interfaces
- Metallic trunk facilities to central office (CO) equipment interfaces
- Switch interfaces (equivalent of no-test trunk access)
- Interfaces with non-SMAS environments.

B. Definition of Terms

Metallic Customer Loop

2.03 A metallic customer loop is all metallic facilities, either 2-wire or 4-wire, extending from the last central office distribution frame to the customer. This includes all station equipment and dc control channels extended to the customer.

Central Office Equipment

2.04 Central office equipment is any equipment, or tandem interconnection of equipment, common to one circuit and appearing within one wire center or building. This includes all equipment required to provide transmission and signaling functions for a single customer service or circuit. Bridges require special consideration and are discussed in paragraphs 2.07 and 2.08.

Metallic Trunk Facilities

2.05 A metallic trunk facility is the wire pair(s) extending from the last frame appearance in one building to the first frame appearance in the next building and carrying all signals associated with a single service or circuit. These facilities include 2- and 4-wire facilities and any associated dc control channels.

Carrier Facility

2.06 A carrier facility is the segment of a circuit extending from the last accessible voice-frequency (VF) point in a carrier system to the next accessible VF point (equivalent of the VF patch points).

Bridges

2.07 Bridges require special consideration in the access point location plan. Two categories of bridges must be considered. The first, a direct bridge, is used primarily to provide extensions on switched special service circuits. A direct bridge consists of a direct connection of a 2-wire pair to another 2-wire pair. Because a direct bridge disrupts impedance, some means is normally used to remove all bridged legs from the circuit except the leg using the circuit. This is usually accomplished with relay circuits or saturable inductors, both of which are called *bridge lifters.*

2.08 The second category includes all other bridges and will be referred to simply as *bridges.* This includes series interconnections used for alarm circuits and specific units of equipment designed for multipoint service on private line circuits.

C. Access Point Placement Guidelines

Metallic Customer Loop Interfaces

2.09 An access point is required at the central office end of a metallic customer loop (Fig. 2).

Carrier Facility Interfaces

2.10 Access points are required on both ends of a carrier facility segment. In carrier systems

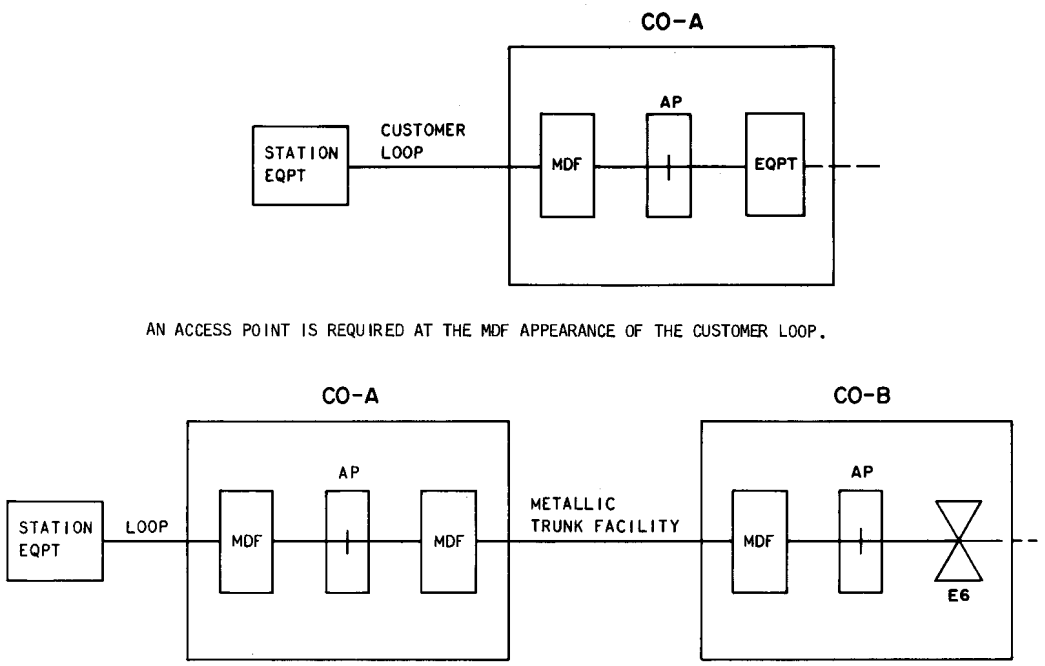


Fig. 2—Metallic Customer Loop Interfaces

with E&M signaling leads (out-of-band signaling, T-carrier E&M channel units, etc) the E&M leads must be included in the access point (Fig. 3A). Where back-to-back carrier systems are used without signaling conversion equipment, only a single access point is required at the interface of the two systems (Fig. 3B).

Bridge Interfaces

2.11 Access points on direct bridges should be located on each circuit leg which leaves the office in the direction of a station. The access point should be located at the equivalent of the last frame in the office. An access point can be located on the switched side of the direct bridge depending on whether or not an access point is located on the other end of the connecting metallic facility (Fig. 4A).

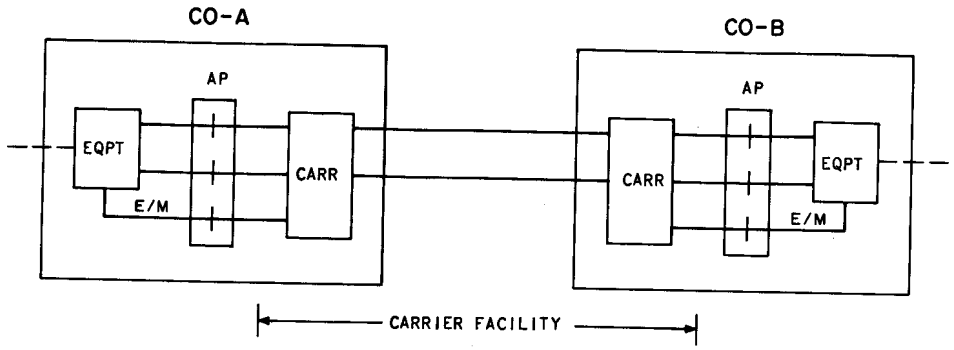
2.12 Access points on multipoint private line circuits should be located on each circuit leg at the point where the leg leaves the office. Thus any central office equipment associated with the leg will be between the access point and the bridge. Note that all of these access points will include access to any signaling, dc or VF, associated with the circuit operation (Fig. 4B).

Metallic Trunk Facility to Metallic Trunk Facility

2.13 An access point is required at the interface of a metallic trunk facility with another metallic trunk facility (Fig. 5).

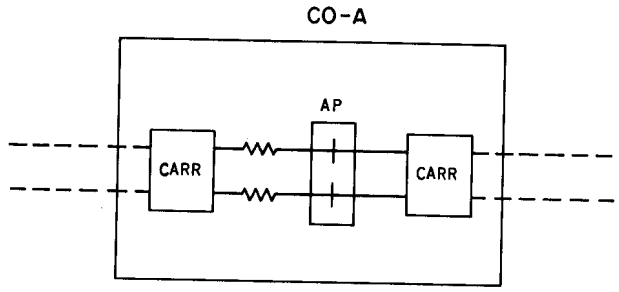
Metallic Trunk Facility to Central Office Equipment Interface

2.14 At metallic trunk facility to central office equipment interfaces, when access points are required according to the plan objective, they should be placed on the side of equipment away from the talk battery source or the side(s) supplying talk battery (eg, private line automatic ringdown equipment will need an access point on both sides). On dry-loop circuits, access points may be placed on either side of the equipment. In either case,



ACCESS POINTS ARE REQUIRED ON BOTH ENDS OF A CARRIER FACILITY SEGMENT. EXTERNAL SIGNALING LEADS INTO THE CARRIER SYSTEM MUST BE INCLUDED.

A



A SINGLE ACCESS POINT IS REQUIRED AT THE INTERFACE OF BACK-TO-BACK CARRIER SEGMENTS.

B

Fig. 3—Carrier Facility Interfaces

access points are to be placed at these interfaces to ensure at least one access point per facility and at least one access point per building (Fig. 6).

Switch Interfaces (Equivalent of No-Test Access)

2.15 SMAS systems can gain access to switched customer lines through access points placed on standard test trunks with no-test capabilities (eg, SD-26136-01: Crossbar System No. 5 incoming test trunk from local test desk No. 14 or local test cabinet No. 3 or office test frame test circuit, dial or multifrequency pulsing, or SD-1A186-01: Electronic Switching System No. 1 incoming trunk circuit from local test desk No. 14 or local test cabinet No. 3 sleeve lead supervision). The test trunk on which an access point is placed must be dedicated to the SMAS (ie, it cannot be shared). The access capability provided by this access point is the same as provided to a local test desk. If this type of access is not used, an access point should be located on the customer side of the switch (Fig. 7).

Interfaces With Non-SMAS Environments

2.16 Considerations must be given to circuits with portions that are not accessible by SMAS. The following procedures should be used:

(a) For the portion of the circuit that is accessible by SMAS, access points should be assigned according to the preceding guidelines.

(b) For the portion of the circuit that is ***not*** accessible by SMAS, an access point should be placed at the last available point in the circuit before the circuit is no longer accessible by SMAS. This will allow the maximum capability of sectionalizing a circuit using SMAS.

3. ACCESS POINT IMPLEMENTATION

3.01 There are various methods of providing for access points. First, some facility terminals (FT) are available with built-in SMAS access;

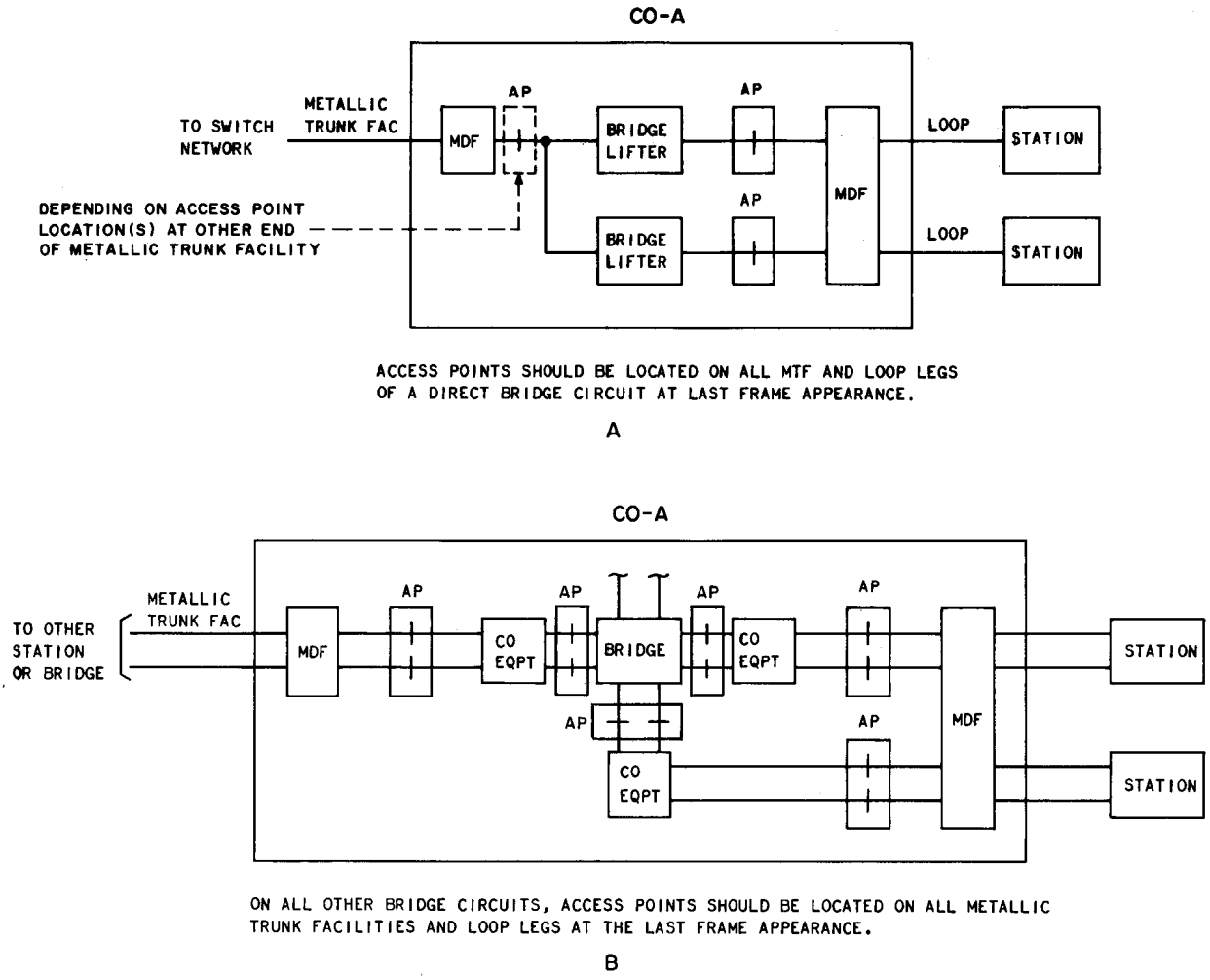


Fig. 4—Bridge Interfaces

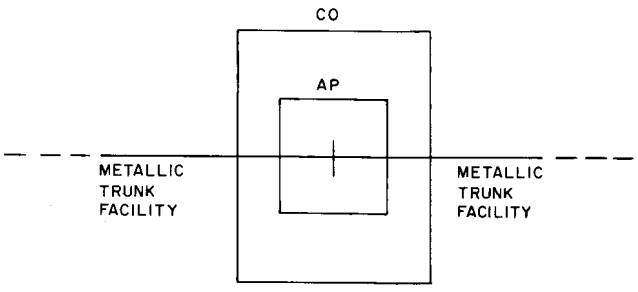


Fig. 5—Metallic Trunk Facility to Metallic Trunk Facility Interfaces

second, access points may be provided within tie pairs; and finally, access points may be terminated on a distributing frame (DF) and be cross-connected, as required, or hard-wired into assemblies of various types of nonfacility terminal equipment.

Facility Terminals

3.02 MFTs, AFTs, and DFTs are available with built-in access points. The use of built-in SMAS/SARTS access points provides significant reductions in DF appearances and cross-connections.

3.03 The use of FTs with built-in SMAS access reduces cost in administration and installation. Each plug-in location within the FT has associated with it an access point (or points) with a fixed address within the SMAS System. This access point(s) is compatible with the function of any plug-in unit in the FT. Therefore, when special

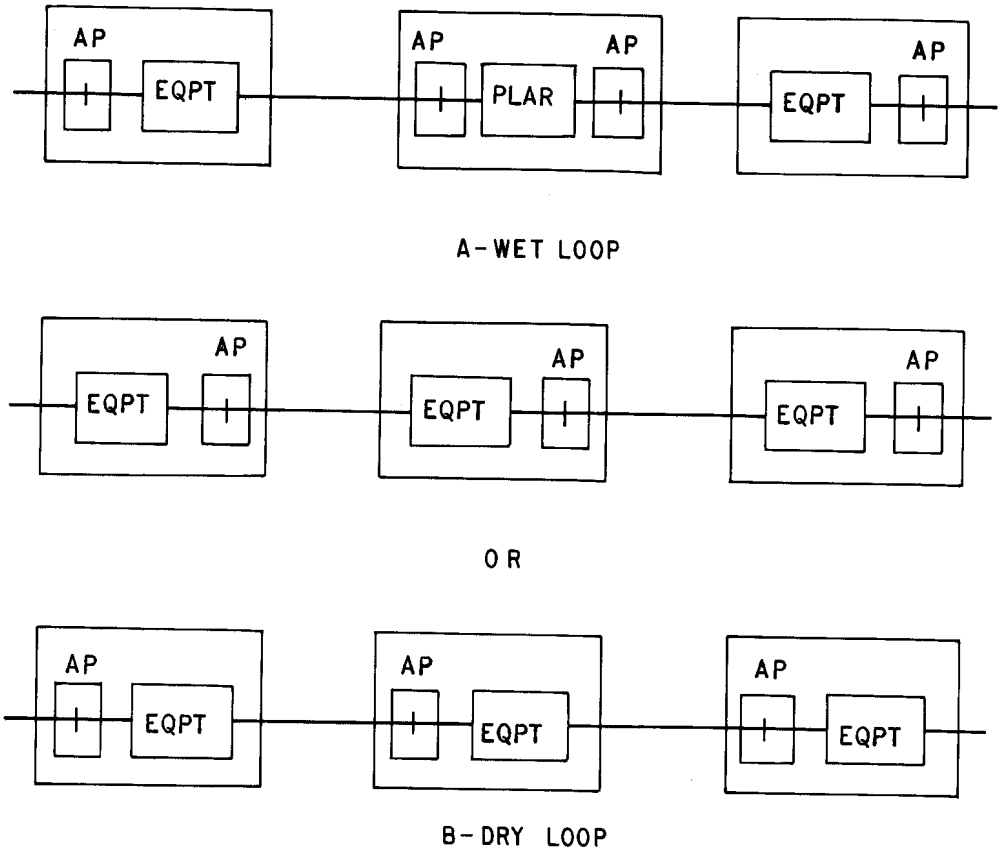


Fig. 6—Metallic Trunk Facility to Central Office Equipment Interfaces

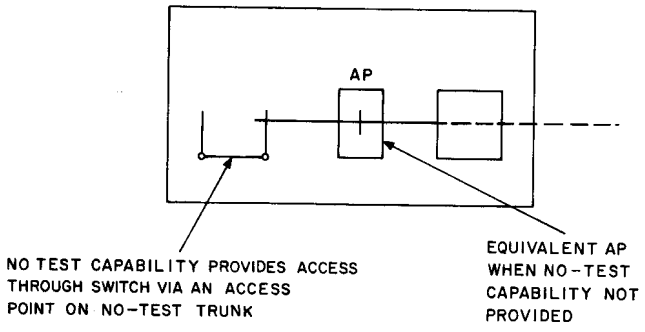


Fig. 7—Switch Interfaces (Equivalent of No-Test Access)

service circuits change, there is no need to cross-connect new access points.

Tie Pairs

3.04 The number of access point appearances and cross-connections at distributing frames may be sharply reduced by including access points in tie pairs. A fixed pattern of assignment of facility (F) and equipment (E) sides of the access point termination should be employed to simplify administration and observe current restrictions on COSMIC frame terminations. This pattern requires that the facility side of the access point be terminated

on the subscriber main distributing frame (SMDF) and the equipment side be terminated on the trunk main distributing frame (TMDF) or intermediate distributing frame (IDF). The equipment side also terminates on the TMDF for IDF-to-TMDF access point tie pairs. Preferential assignment of access point tie pairs at the SMDF will be provided by TIRKS in version 12 and later issues. Due to the variations normally encountered in special services circuits and the fixed pattern assignment of access point tie pairs, the equipment/facility orientation may not always correspond to the guidelines established for direct-wired or built-in access points or access points where both sides are terminated at the same DF. (See paragraph 5.02.)

Distributing Frames

3.05 Only if the two preceding methods of SMAS/SARTS access point implementation cannot be employed should the use of DF terminated access points or hard-wired access points in old equipment assemblies be considered. If access points are to be terminated on a DF, ideally they should be terminated in close proximity to the equipment with which they are to be used. In this manner, the required cross-connections between equipment and access points can be kept short, minimizing the growth of long DF cross-connections. An alternative to DF termination is to hard wire the access points into assemblies of old equipment. This approach limits the future usage of the equipment. This method is not recommended unless forecasts of the use of the hard-wired assemblies have been made and are fairly certain. Standard methods are being developed for direct wiring SMAS access points to existing D3 and D4 channel banks and MFT frames.

4. ACCESS POINT DATA AND CIRCUIT LAYOUT RECORD ENTRY FORMAT

4.01 This part of the section defines the access point data codes and gives the format for entering information on the CLR.

4.02 Access point data is the information about an access point required by the SARTS to perform the following functions:

(a) Test control

(1) Far-end hardware control

(2) Individual tests

(3) Automated test sequences

(4) Uniformity of operation for all access systems

(b) Screening

(1) Prevention of circuit damage or test equipment damage

(2) Prevention of service interruption or service degradation

(c) Test result computation

(d) Human machine interface

(e) Compatibility with future circuit maintenance systems.

4.03 Access point data consists of two parts: identification data and testing data. The identification data is used for circuit access, test status verification, and cathode-ray tube (CRT) terminal display configurations. The testing data is used for automated test sequences, control of far-end hardware, test result computation, and protection against circuit degradation or damage.

4.04 Identification and testing data are provided on two consecutive lines of the CLR at the location of each access point in the sequential listing of circuit elements (Fig. 8). Access point data should not be used as a replacement for other circuit information that may normally be on the CLR (such as frame coordinates, cross-connect information, equipment location, etc); rather, it is additional information required by SARTS in a standardized format for computer usage.

4.05 The following information defines codes for the identification and testing data entries. A CLR entry format is also defined. The character *A* is alphabetic, *N* is numeric, *X* is either alphabetic or numeric. The circled letters on Fig. 8 are keyed to the lettered subheadings that follow and should be referred to during the discussion about the identification and testing data entries.

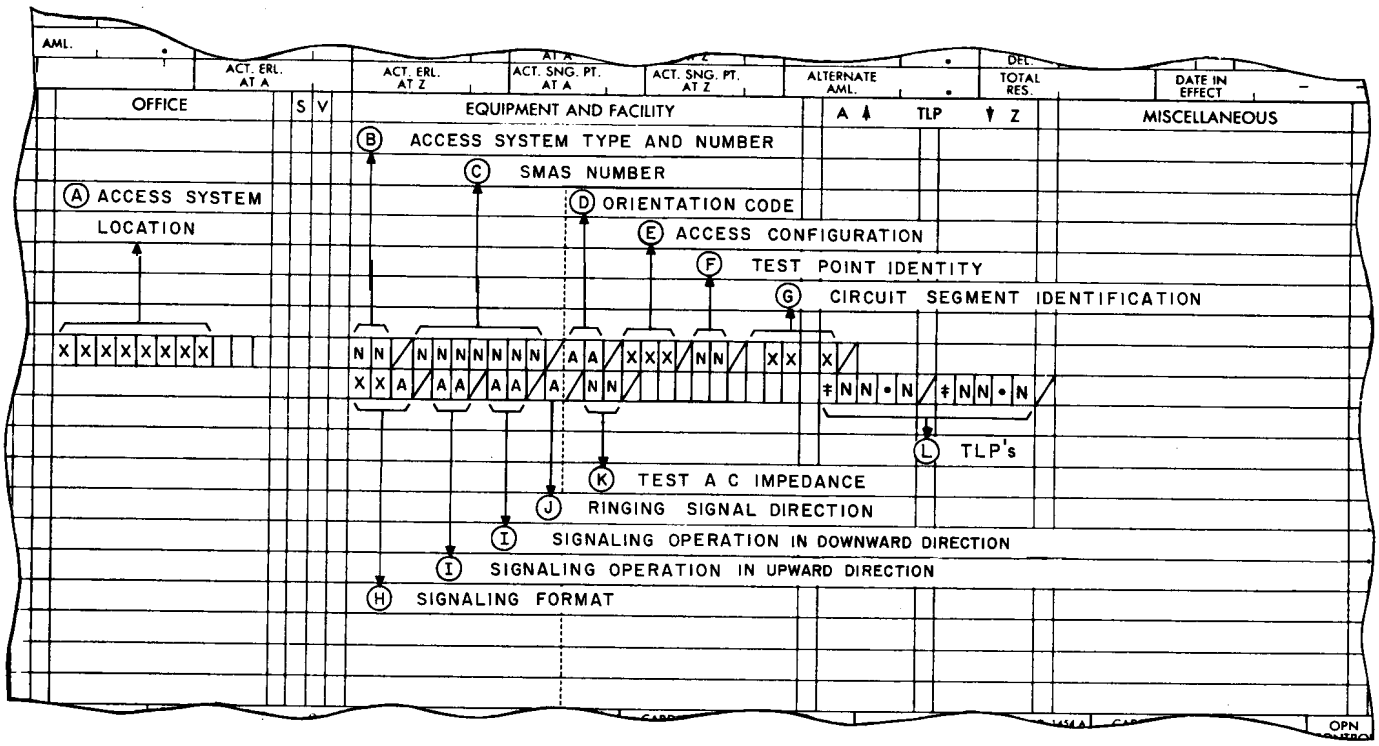


Fig. 8—Example of CLR Entry Format

IDENTIFICATION DATA

A. Access System Location

Characters: 8

Code: common language location identity (CLLI) place, state, and building code (Section 795-100-100)

B. Remote Test System Identity

Characters: 2

Code: NN

4.06 The first number of the code usually identifies the access system type (eg, 4 = SMAS 4, 5 = SMAS 5, etc); however, its meaning is determined by the TELCO for reference purposes or other uses. This makes it unnecessary to change records when converting a SMAS 4A to a SMAS 5B. The second number of the code identifies the Remote Test System (RTS) (regardless of type) within the building (eg, 1 = first RTS, 2 = second RTS, etc). The CLLI code together with the RTS identity is used by the SARTS 1A process controller 1A to set up data links and communication links to the proper RTS.

C. SMAS Number

Characters: 7 (maximum)

Code: -NNNNN- (SMAS 4, 5)

4.07 The SMAS number is the address of the access point used to gain access to the circuit through the SMAS. A 5-digit SMAS number is required for remote testing, the first digits 0-3 denote the connector group network, the first digits 5-8 denote the maintenance connector network.

Note: Starting with Generic 1A and later generics, the 5-digit SMAS numbers are required to be inputted to the PC 1A to obtain remote access.

D. Orientation Code

Characters: 2

Code: EF or FE

Special case = FO for access points on distributing frame test trunks (2-wire or 4-wire)

4.08 The orientation code describes the placement of the access point in a circuit. The code EF means the EQPT side of the point is wired to the circuit element **above** the access point on the CLR and that the FAC side of the point is wired to the circuit element **below** the access point. The FE code indicates the reverse wiring. The orientation code is determined by application of guidelines found in Part 5. For the special case of access points on distributing frame test trunks, the code FO is used to indicate that the FAC side of the access point is connected to the **outward** or vertical side of the distributing frame when a test shoe(s) connects to the test trunk.

E. Access Configuration Codes

4.09 Access configuration information (Table A) is required for proper test status verification and for testing control. The access configuration codes for 4-wire or 6-wire access points also provide transmission direction information. (The second and third characters of the configuration code refer to the upward and downward transmission directions, respectively, eg, 4BA - B↑ A↓ and 4AB - A↑ B↓.)

4.10 The 22A, 22B, 24A, 24B, 42A and 42B codes are MFT 2-wire configuration codes. See Part 8 for MFT access point information.

4.11 The 26X code is an AFT 2-wire configuration code, the 46X code is an AFT 4-wire configuration code. See Part 9 for AFT access point information.

4.12 Connections to the special service circuit transmission and signaling leads and the transmission direction for each access configuration code are shown in Table A. A summary of access point lead usage is given in Fig. 9.

Note: For access points which use unitized configurations but are cross-connected at the MDF, the orientation ***must*** be identified to that which would result if the access points were in a unitized arrangement.

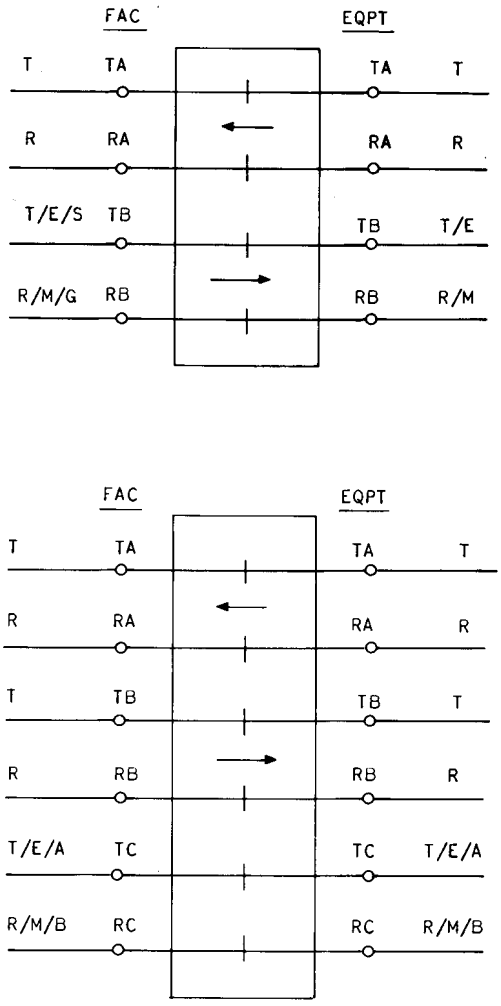


Fig. 9—Summary of Lead Usage

F. Test Point Identity

Characters: 2

Code: NN

4.13 Test points are numbered sequentially from the A to the Z end of the circuit or of the circuit segment (each segment is numbered independently of other segments). The numbers need not be consecutive; this allows omitting numbers when additional access points are to be installed at a later time.

Note: Special case = 00 or 99 for no-test trunk access points depending on location of switch on CLR (00 = A end, 99 = Z end).

G. Circuit Segment Identification

Characters: 3

Codes: NNN (section segments)
Codes: AAA (leg segments)

4.14 Circuit segment identification is used to identify individual 2-point segments that make up a circuit. Segmentation is primarily intended for multipoint circuits, but may be used to subdivide complex 2-point circuits. For information on circuit segmenting standards, Section 682-400-011 should be used.

TESTING DATA

H. Signaling Format

4.15 The signaling format defines the ***electrical method*** of passing (Table B) signaling information at the **access point**. The signaling operation (see major heading I) defines the ***signaling sequence*** used within each format at the **access point**. For example, ground-start operation signals appear as SF tones at an access point with SFC signaling format.

4.16 In ringdown applications, access points may appear on a dry circuit (no dc voltage) where only 20-Hz ringing is used for signaling. In these cases an appropriate L( )( ) code should be used rather than a 7( )( ) code.

4.17 Signaling format codes are listed and illustrated in Table B.

4.18 Three types of E&M signaling interface circuits exist and are referred to as types 1, 2, and 3 (Fig. 10). The type 1 circuit is the most common and is used in all types of electromechanical switching systems [Fig. 10(a)]. Types 2 and 3 are used in electronic switching system circuits [Fig. 10(b) and 10(c)]. Signaling codes SMF, SME, EMF, or EME can be used for access points on circuits with type 1, 2, or 3 E&M signaling. The only exception in using these signaling codes is for access points on *back-to-back* trunk circuits or *back-to-back* signaling circuits with type 2 E&M signaling [Fig. 10(d) and 10(e)]. Signaling format codes SMF, SME, EMF, or EME can be used for any circuit with types 2 or 3 E&M signaling circuit which is interfaced to a type 1 E&M signaling circuit through an interface circuit [Fig. 10(f), 10(g), and 10(h)].

4.19 A flowchart that can be used to determine the signaling format code of an access point is shown in Fig. 11.

I. Signaling Operation in Each Direction

4.20 The signaling operation is specified for each direction at an access point, upward from the E or F side (first field in Fig. 8) and downward from the F or E side, consistent with the orientation code (second field in Fig. 8). Generally, the code for the signaling operation is the same in both directions. However, in the case of PBX tie trunks, combinations of operation are used in different directions. It is in these tie trunk applications where the signaling operation code may be different for each direction of the circuit.

Characters: 2

Code	Operation
LN	Loop-start normal

The LN code applies to access points on circuits where the station starts a call by a loop closure followed by address information in the form of TOUCH-TONE® or dial pulsing, and where an alerting signal is passed to the station by applying 20-Hz ringing across the tip and ring conductors. This operation is usually associated with station loop signaling. (The signals need not be the metallic types described above; they may appear as corresponding signals in the signaling format at the access point.) The LN code generally applies to both directions of the circuit at any access point on the circuit so long as the loop-start operational sequence applies. (See exception under LR.)

LR	Loop-start inverted (reversed)

The LR code applies specifically to loop-start operation in the EM() or DX() format. The LR code is used if the M-lead (or the DX-extended M-lead) is at battery when idle and at ground when a ringing signal is present.

The LN code applies if the M-lead is at ground when idle and at battery for ringing. The LR code generally applies to both directions of the circuit.

GS Ground-start

The GS code applies to access points on circuits where the station starts by applying ground to the ring conductor followed by a loop closure and address information. A call is started from the CO (station end is alerted) by applying ground to the tip conductor, followed by application of 20-Hz ringing between tip and ring (as for loop-start operation). This operation is usually associated with PBX-CO trunks or ACDs. The signals need not be of the metallic type described, but may appear as signals in the signaling format at the access point. The GS code generally applies to both directions of the circuit.

HL High-low

The HL code applies to access points on circuits where a seizure signal consists of applying battery and ground at the calling end, and where the called end idle condition is a high resistance (usually over 30K ohms), which changes to a low resistance when the called end answers. The HL code usually applies to both directions of the circuit. However, in some PBR tie trunks, HL may apply in only one direction.

RB Reverse battery

The RB code applies to access points on circuits where the calling end seizure signal is indicated by closure of the circuit conductors and where an answer signal from the called end is a reversal of the battery condition at the called end. The RB code usually applies to both directions of the circuit. However, in some PBX tie trunks, RB may apply in only one direction.

BG Battery-ground

The BG code applies to access points on circuits where the calling end seizure signal is an application of a battery and ground condition which is series-aiding the polarity of the voltage applied at the called end. The called end answers by reversing its voltage polarity which in turn causes a battery reversal at the calling end to hold the connection. Pulsing from the calling end is battery-ground pulsing. The BG code generally applies to both directions of the circuit.

RD Ringdown

The RD code applies to access points on circuits where the alerting signal is the application of 20-Hz ringing. The RD code can be associated with PBX tie trunks where it may apply to only one direction of the tie trunk. Since the definitions of the LN and GS codes include methods of alerting, the RD code should not be used for the operation code in the direction of the station on circuits with LN or GS operation.

AU Private line automatic ringdown

The AU code applies to access points on circuits where a seizure signal in one direction is a loop closure (automatically causing 20-Hz ringing to be applied to the called end by intermediate equipment), and where a seizure signal in the other direction is an application of 20-Hz ringing voltage. The AU code usually applies to both directions of the circuit.

DR Dial repeating trunk

The DR code applies to access points on PBX tie trunks where dial selection is made by the called station on incoming calls. The DR code need not apply to both directions of the circuit.

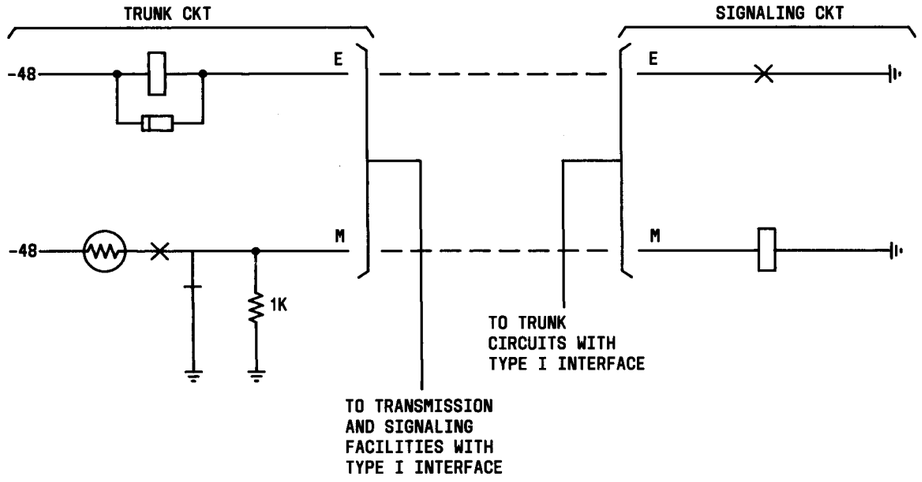
OT Other

The OT code applies for access points on circuits whose signaling operation does not allow use of any other signaling operation code.

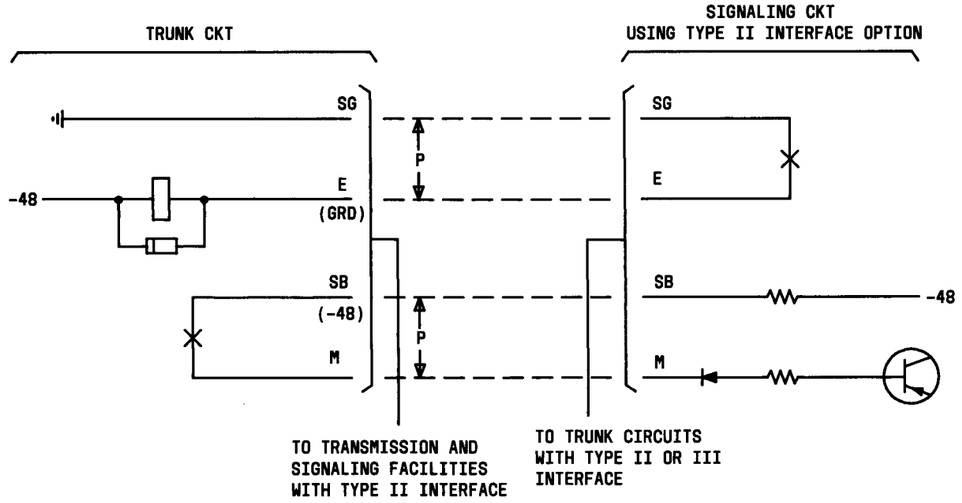
J. Ringing Signal Direction

Characters: 1

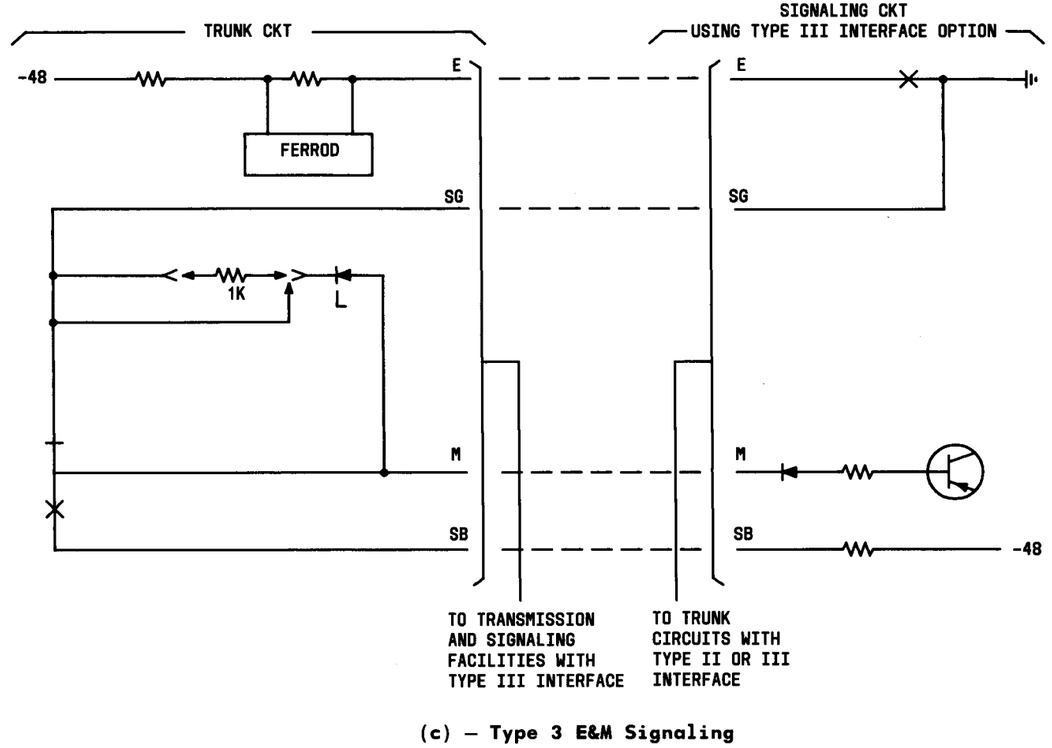
4.21 The ringing signal direction code specifies the direction (relative to the access point) in which a ringing signal is sent during normal



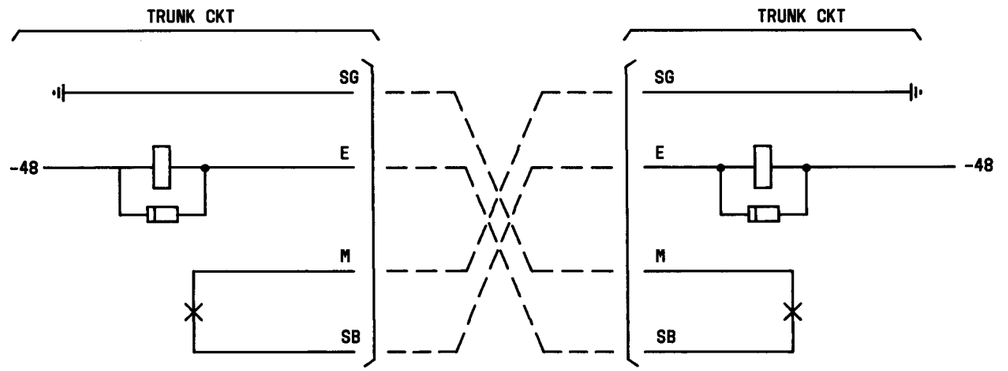
(a) – Type 1 E&M Signaling



(b) – Type 2 E&M Signaling

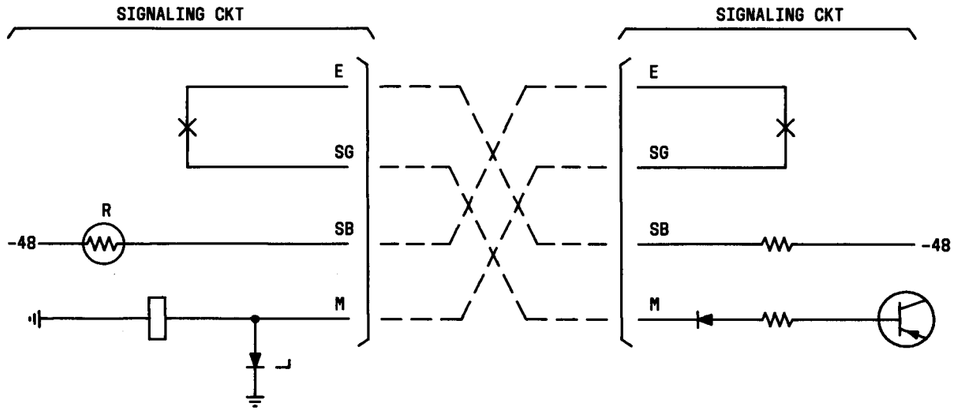


(c) – Type 3 E&M Signaling

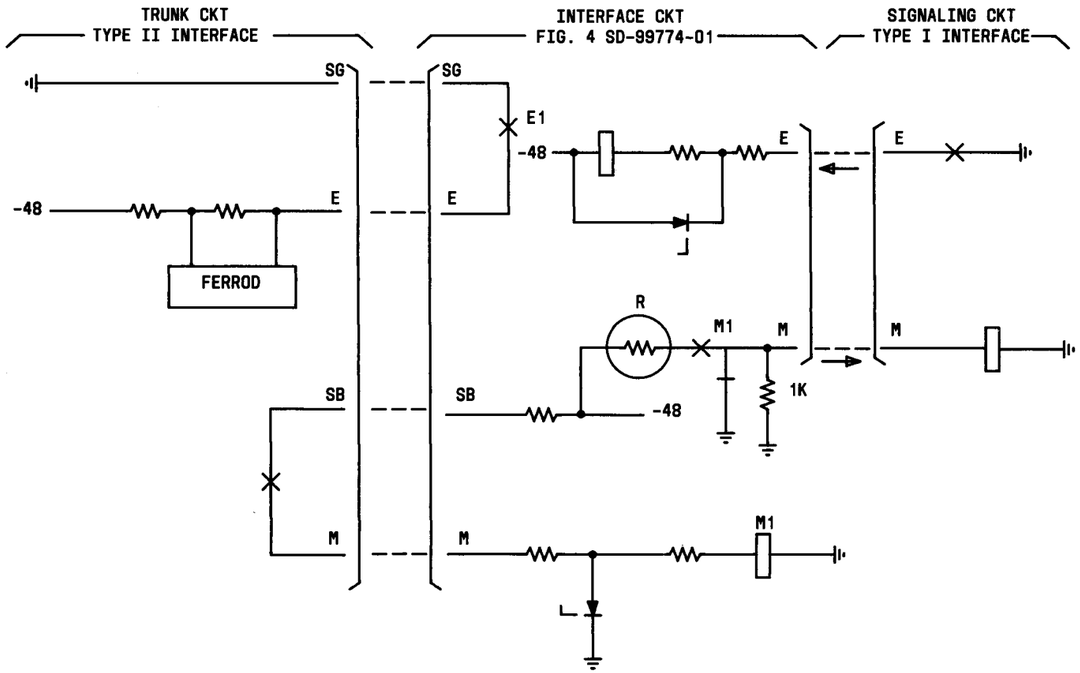


(d) – Type 2 Back-to-Back Trunk Circuits

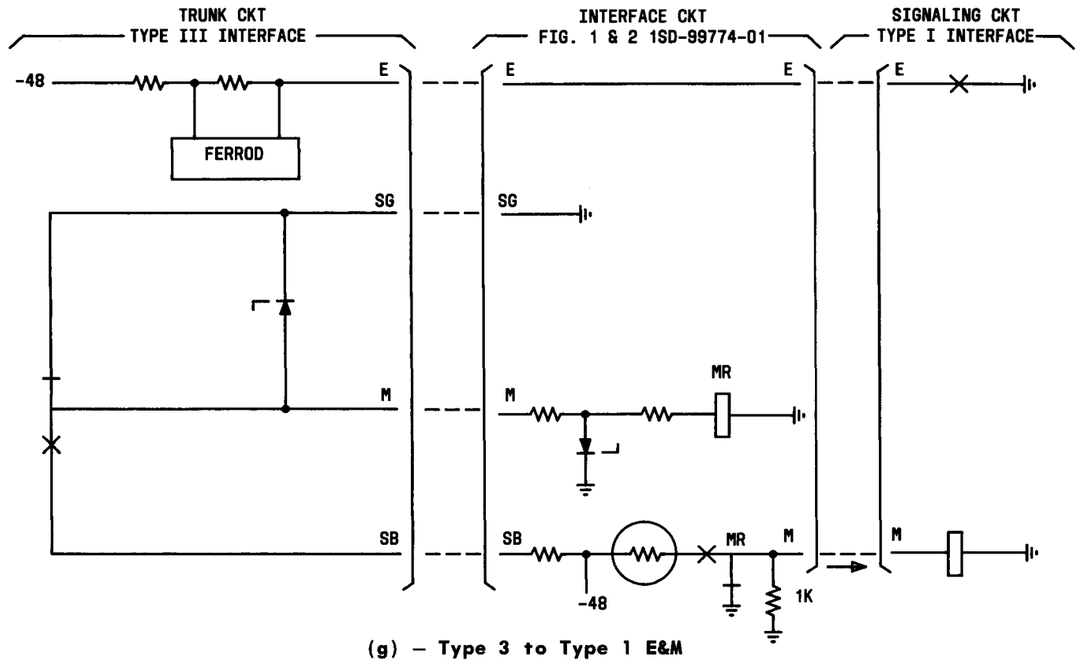
Fig. 10—E&M Signaling Interface Circuits (Sheet 1 of 2)



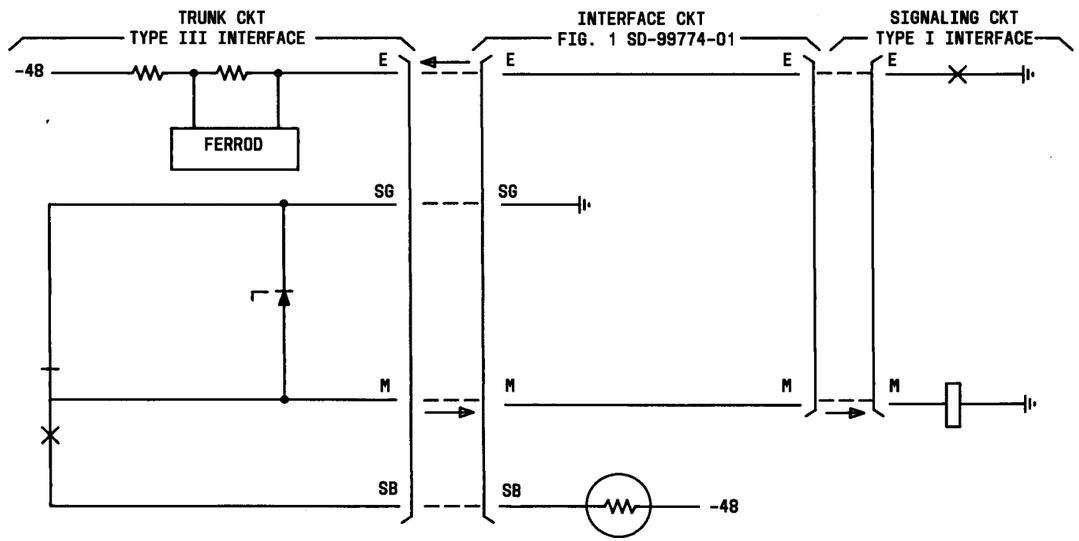
(e) – Type 2 Back-to-Back Signaling Circuits



(f) – Type 2 to Type 1 E&M



(g) – Type 3 to Type 1 E&M



(h) – Type 3 to Type E&M

Fig. 10—E&M Signaling Interface Circuits (Sheet 2 of 2)

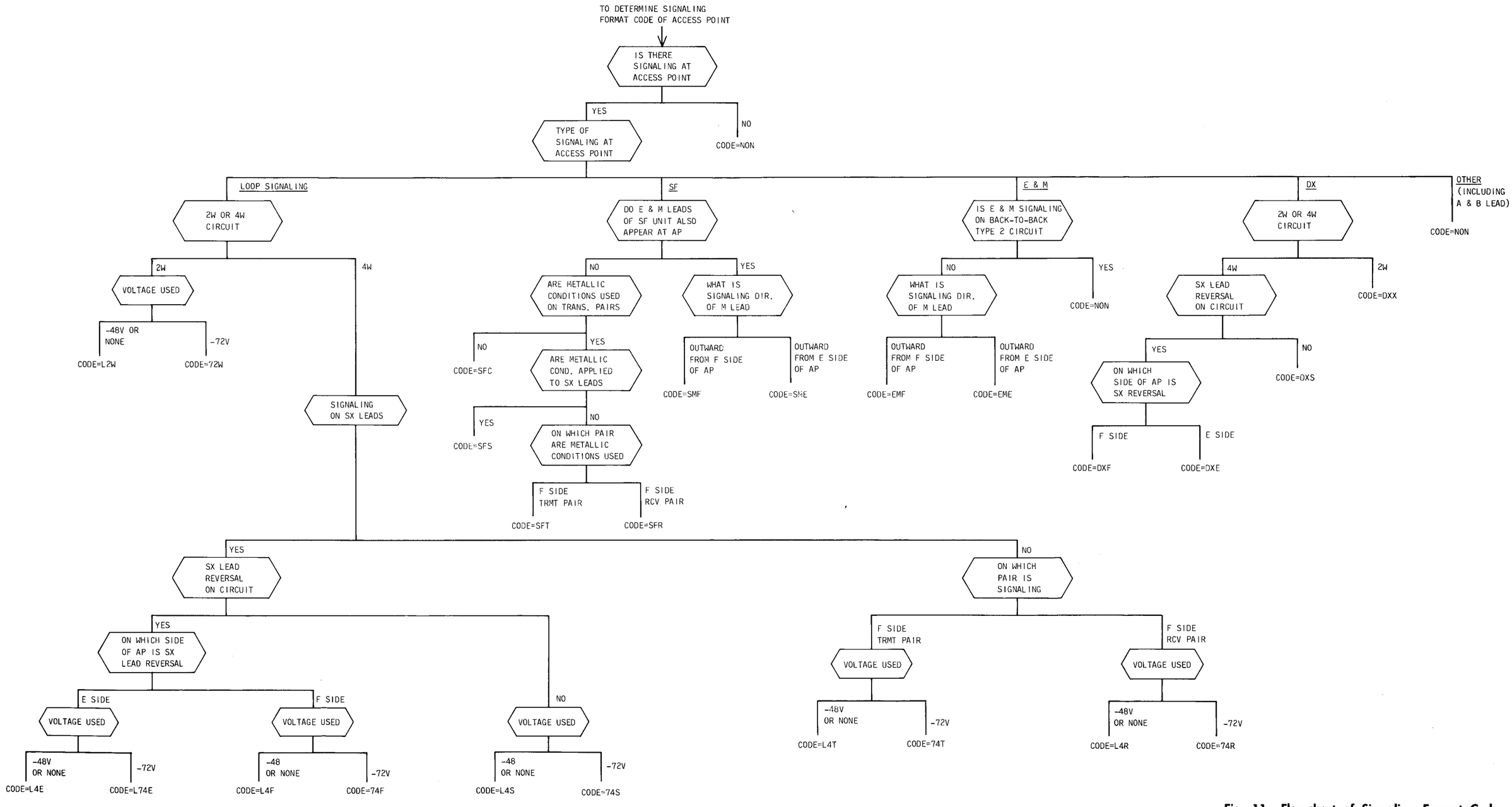


Fig. 11—Flowchart of Signaling Format Code

circuit operation. Note that the ringing signal appears in the signaling format of the circuit found at the access point (eg, a ringing signal in the SF signaling format appears as an SF tone signal).

Code	Direction
F	Ringing signal (station) outward from F
E	Ringing signal (station) outward from E
B	Ringing signal (station) outward from both F and E
N	No ringing signal.

4.22 The ringing signal direction data is required for screening functions and ringdown private line testing. In the case of an access point on a private line automatic ringdown (PLAR) circuit, a ringing signal is considered to be sent in only one direction even though a loop closure in the opposite direction results in a ringing signal applied to the opposite station by intermediate equipment (Fig. 12).

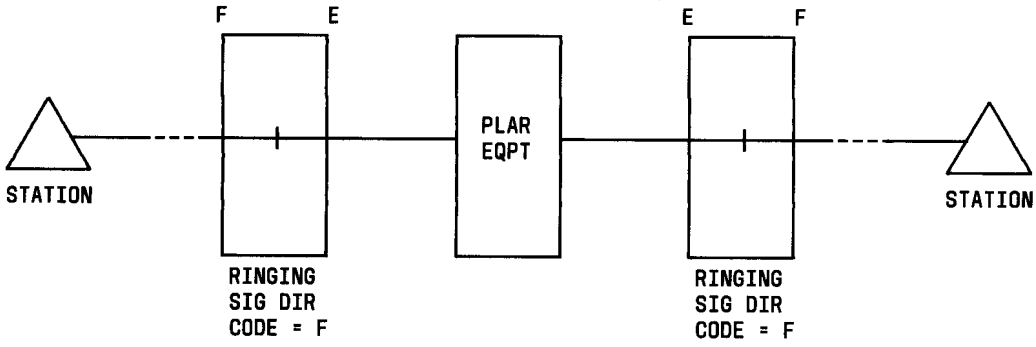


Fig. 12—Example of Ringing Signal Codes for PLAR Circuit

K. Test AC Impedance

Characters: 2

TEST IMPEDANCE	TEST IMPEDANCE IDENTITY CODE	CLR CODE
150 Ohms	1	11
600 Ohms	2	22
900 Ohms	3	33
1200 Ohms	4	44

4.23 The 2-character impedance code anticipates future, specialized terminating networks. The future networks will be alphabetically coded, and the information for application will be by the positional sequence of the impedance code corresponding to the EF or FE orientation code. Until the networks are available, the SARTS operates with the same impedance level in both circuit directions.

Example: CLR = 22

(Orientation code = EF)

Test ac impedance = 600-ohm test impedance in E direction; 600-ohm test impedance in F direction.

L. Transmission Level Points (TLPs)

Characters: 5

Code: ±NN.N

4.24 The TLP information at each access point is standard TLP information. For more information, refer to Section 682-000-011. The SARTS tester requires both a TLPA and a TLPZ at a 2-wire access point to send tones and talk in either direction at the access point.

5. ORIENTATION GUIDELINES

5.01 This part presents guidelines for orienting access point connectors when installed in a circuit.

Note: These guidelines are referred to as rules 1 through 7 when access point locations are shown on standard design documentation per Section 851-XXX-YYY.

5.02 As a general guideline, access connector orientation should usually be consistent with the EQPT/FAC identification of access points. Therefore, if possible, the connector should be oriented in a circuit with the FAC side facing the facility at each access point. Table C illustrates special situations to which corollary guidelines are applied.

5.03 Table D summarizes the orientation information. The table indicates the orientation code as a function of the circuit elements above or below the access point on a CLR. Also indicated in the lower right corner are the applicable guidelines used to determine the orientation code.

6. ACCESS POINT INFORMATION UNIQUE TO SMAS 4A

A. Information Used For Cross-Connecting

6.01 Connection of SMAS 4A access points must be made by using the following information. Also refer to paragraph 4.05.

SMAS 4A Number and A- or B-Half Assignment

6.02 The assigned access point is identified by its SMAS 4A number and by assignment to either the A- or B-half of the SMAS 4A number (when the circuit is 2-wire). The A- or B-half assignment is indicated by the access configuration code, for example, 2WA or DFA for an A-half assignment and 2WB or DFB for a B-half assignment. The main frame location of the assigned SMAS point is designated by front terminal strip stamping of the first three digits of the SMAS 4A number (connector group and control number) as well as other stamping normally provided by local practices.

Access Point Orientation

6.03 See paragraph 4.08 for access point orientation information.

Transmission and Signaling Lead Designations and Reference Transmission Directions

6.04 Refer to Table A for connections to the special service circuit transmission and signaling leads and the transmission direction for each access configuration code.

B. Marking of SMAS 4A Access Points

6.05 Each access point is equipped with a VA lead for marking access points according to the following rules:

(a) If the full access point (A and B halves) is unassigned, the VA lead is left open (Fig. 13).

(b) If only the A- or B-half of an access point is assigned, the entire access point is considered assigned and ground is to be placed on the VA lead, except for access points on circuits considered special types [see paragraph (c)].

Note: As the practices of designating special type circuits and their indication on the CLR will vary, individual company policies should be followed.

(c) If the circuit assigned to an access point is considered a special type, -48V battery is supplied through an 11C resistance lamp (SD-90232-01 is typical) or a 13A resistance lamp is connected to the VA lead.

(d) If either the A- or B-half of an access point is assigned to a special type circuit, the VA lead is connected to battery, and *both* 2-wire circuits are considered to be special types.

C. SMAS 4A Connector Group Assignment Guidelines

6.06 Each SMAS 4A access point is assigned a 5-digit SMAS 4A number. The SMAS 4A number identifies an access point for either two 2-wire circuits, one 4-wire circuit, or one 6-wire circuit. The access points are available in connector groups of 100 4-wire (200 2-wire) or 100 6-wire points. The test selection of an access point in a

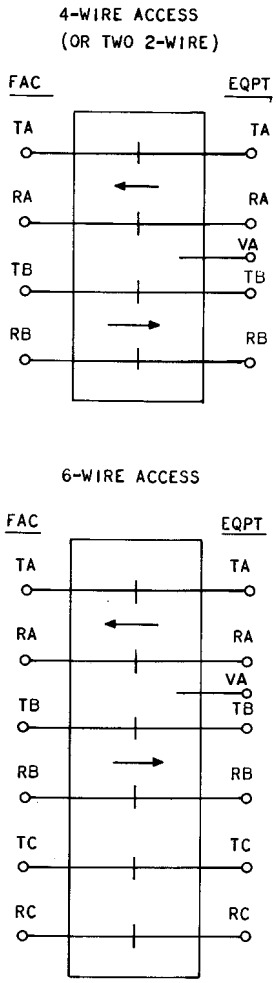


Fig. 13—Schematic Representation of Access Points with VA Lead

connector group prevents the test selection of any of the other 99 4-wire (199 2-wire) or 99 6-wire points in that group. The following guidelines are to be used for assignment of access points to connector groups:

(a) Access points that are to be used simultaneously should not be assigned to the same connector group. Exceptions to this rule occur when connector group access points are applied to circuits in the same configurations and orientation as those used in unitized equipment arrangements as described in Parts 8, 9, and 10. (In these cases, the orientation of the access points ***must*** be consistent with the unitized arrangements.)

(b) A 2-wire access point on a special circuit should not be assigned a SMAS 4A number already assigned to a 2-wire access point on a regular circuit. A special type circuit is one that, when accessed, gives a special indication, eg, a red lamp (SPL CKT 0/1) lights in the local access test port (LATP) or the jack-ended test port (JETP). Since both 2-wire circuits assigned to a 4-wire access point will be simultaneously accessible at a test port, companies may elect to assign only one 2-wire special circuit to a 4-wire access point to guard against inadvertent service interruption of the special type circuits. As the method of designating special type circuits will vary, individual company policies should be followed.

(c) The 00 access point in each 4-wire connector group may be optionally equipped with automatic disconnect features for no-test trunks and is, in this case, reserved exclusively for use with no-test access trunks. If, in this case, the 00 point is not used for no-test trunk access, it remains unassigned.

(d) SMAS 4A numbers 00099 and 00199 are not to be assigned to circuits because they are reserved for SMAS 4A and SARTS 1A maintenance (Sections 667-302-510 and 666-610-500).

(e) Connector groups should be evenly loaded as circuits are added to the system. *Loading* refers to connector group activity load rather than simply the number of circuits assigned to a group. (See paragraph 6.07 for connector group fill.) Circuits with high maintenance activity should not be assigned to the same connector group but should be dispersed among low-activity groups or groups with a low fill.

6.07 Circuit access blockage has not posed a problem in early SMAS 4A installations. Data gathered on the initial SMAS 4A installations indicate negligible blockage on connector groups which were filled to as much as 86 percent of capacity. Unless unique local conditions exist, connector group fill need not be limited.

7. ACCESS POINT INFORMATION UNIQUE TO SMAS 5A/5B

7.01 The need for special class markings is indicated on the CLR by entries in space allotted for priority classification or it is indicated by local practices. These circuits are referred to as *special* types in this section. Circuits so designated are marked as *special* on the maintenance connector

by proper placement of a diode. (See SD drawings for type 2 maintenance connector [SD-1C454-01] and type 3 maintenance connector [SD-1C605-02] for additional information.)

SMAS 5A Assignment Guidelines

7.02 Each SMAS 5A access point is assigned a 5-digit SMAS 5A number. The SMAS 5A number identifies an access point for either two 2-wire circuits, one 4-wire circuit, or one 6-wire circuit. Access points are available in maintenance connectors with 24 4-wire (48 2-wire) or 24 6-wire points (type 3 and type 2 maintenance connectors). The following guidelines are to be used for assigning access points to maintenance connectors.

(a) Access points that are to be used simultaneously should not be assigned to the same maintenance connector except in unitized access point configurations as described in Parts 8, 9, and 10.

(b) A 2-wire access point on a special type circuit should not be assigned a SMAS 5A number already assigned to a 2-wire access point on a regular circuit. A special type circuit is one that, when accessed, gives a special indication, eg, a red lamp (SPL) lights in the local test port (LTP). Since both 2-wire circuits assigned to a 4-wire access point will be simultaneously accessible by the local port, companies may elect to assign only one 2-wire priority circuit to a 4-wire access point to guard against inadvertent service interruption of special circuits.

7.03 The assigned access point is identified by its SMAS 5A number and by assignment to either the A- or B-half of the SMAS 5A number (when the circuit is 2-wire). The A- or B-half assignment is indicated by the access configuration code, eg, 2WA or DFA for an A-half assignment and 2WB or DFB for a B-half assignment.

7.04 Refer to Table A for connections to the special service circuit transmission and signaling leads and the transmission direction for each access configuration code.

Access Point Information Unique to SMAS 5B

7.05 Each SMAS 5B access point is assigned a 5-digit SMAS 5B number. The SMAS 5B number identifies an access point for either two 2-wire circuits, one 4-wire circuit, or one 6-wire circuit. Two types of access points are available in the SMAS 5B: (1) in connector groups (first digit 0, 1, 2, or 3) with 100 4-wire (200 2-wire) or 100 6-wire points, and (2) in maintenance connectors (first digit 5, 6, 7, or 8) with 24 4-wire (48 2-wire) or 24 6-wire points (type 3 and type 2 maintenance connectors, respectively). The following guidelines are used for assigning access points in the SMAS 5B:

(a) Access points that are to be used simultaneously should not be assigned to the same maintenance connector or connector group except in unitized access point configurations as described in Parts 8, 9, and 10.

(b) A 2-wire access point on a special type circuit should not be assigned a SMAS 5B number already assigned to a 2-wire access point on a regular circuit. A special type circuit is one that, when accessed, gives a special indication, eg, a red lamp (SPL) lights in the LTP. See paragraph 7.08 for special class marking. Since both 2-wire circuits assigned to a 4-wire access point will be locally, simultaneously accessible, companies may elect to assign only one 2-wire priority circuit to a 4-wire access point to guard against inadvertent service interruption of special type circuits.

7.06 The assigned access point is identified by its SMAS 5B number and by assignment to either the A- or B-half of the SMAS 5B number (when the circuit is 2-wire). The A- or B-half assignment is indicated by the access configuration code, eg, 2WA or DFA for an A-half assignment and 2WB or DFB for a B-half assignment.

7.07 Refer to Table A for connections to the special service circuit transmission and signaling leads and the transmission direction for each access configuration code.

7.08 The need for special class markings is indicated on the CLR by entries in space allotted for priority classification or it is indicated by local practices. These circuits are referred to as special types in this section. Circuits so designated are marked as special on maintenance connectors by proper placement of a diode. (See SD drawings for type 2 maintenance connector [SD-1C454-01] and type 3 maintenance connector [SD-1C605-02] for additional information.) Each connector group

access point is equipped with a VA lead for marking access points according to the following rules:

(a) If the full access point (A and B halves) is not considered special, the VA lead is left open (Fig. 13).

(b) If the circuit assigned to an access point is considered a special type, -48V battery is supplied through an 11C resistance lamp (SD-90232-01 is typical) or a 13A resistance lamp is connected to the VA lead.

(c) If either the A- or B-half of an access point is assigned to a special type circuit, the VA lead is connected to battery, and *both* 2-wire circuits are considered to be special types.

8. ACCESS POINT INFORMATION UNIQUE TO METALLIC FACILITY TERMINALS (MFT)

8.01 MFTs have been designed to provide built-in SMAS access points using the type 3 maintenance connector. The type 3 maintenance connector contains 24 4-wire access points which are similar to MDF-connected SMAS 4A access points, but which in some applications may be configured differently from previous uses of SMAS 4 access points, and which are assigned differently because they are built-in. Refer to Section 332-910-180 for more information on MFTs. One type 3 maintenance connector is required for each set of 24 4-wire (or up to 48 2-wire) MFT circuits.

A. MFT Access Point Configuration

8.02 Table A shows access point configurations of the MFT as a function of the type of MFT plug-in transmission unit. Configurations which are different from those previously used in SMAS 4A are noted by an asterisk (*). These configurations have two new features: (1) a single 4-wire access point may be used to provide two 2-wire access points at different locations on the ***same*** circuit (22A and 22B codes), and (2) a single 4-wire access point may be used to provide a 2-wire access point plus half of a 4-wire access point on the same circuit (24A or 24B and 42A or 42B codes). Table E lists the applicable configuration codes for MFT plug-in units with built-in SMAS access.

8.03 SARTS access and testing of these arrangements require definition of additional configuration codes for the SARTS access point data. These new configuration codes will be used by the SARTS process controller (PC 1A) to control the testing and displays for the new arrangements. Each half of a 4-wire access point connected to different locations on the same circuit will be tested as if they were independent access points, but they will be ***temporarily*** restricted to being ***remotely*** tested only one point at a time, eg, only one 2-wire point of an MFT 22A or 22B configuration on the same SMAS number will be testable at the 52A test position at one time. If one point is accessed, a SMAS busy will occur when access is attempted at the other point. Local test ports ***will*** be able to simultaneously test these configurations.

8.04 For MFT access point configurations which are the same as for existing MDF-connected configurations, the access point data is the same as previously defined in Part 4.

B. MFT Access Point Assignment

8.05 Because MFT access points are built-in, their assignment becomes part of the circuit equipment assignment: the assignment of the MFT mounting determines the SMAS number, and the assignment of the MFT plug-in units determines the configuration and placement of the access points in the circuit. The access point data is located and formatted on the CLR in the same way as for MDF-connected access points.

8.06 Each operating telephone company must develop an assignment plan for the SMAS numbers according to their practice of numbering plug-in mountings and their assignment of maintenance connectors to the SMAS distribution networks. The plan should consider frames which may not be fully equipped with maintenance connectors. SMAS numbers should be reserved for the unequipped portions of the frames to achieve a viable and consistent plan. The following guidelines may be used:

(a) A record must be kept of the SMAS numbers associated with plug-in mountings and/or miscellaneously mounted maintenance connector access points.

(b) Even loading of maintenance connectors is not required because of the anticipated low access blockage probability (1 out of 24 within the connectors).

(c) Special type circuits (SSP, SSM, or others) are marked in the maintenance connector by plug-in diodes.

(d) No special SMAS numbers need be reserved for system installation and maintenance. Other means are provided for these functions outside of the normal SMAS numbering range.

(e) Special access points are not reserved for use on no-test trunks because special connectors similar to the SMAS 4 phantom groups are available for use on no-test trunks.

9. ACCESS POINT INFORMATION UNIQUE TO ANALOG FACILITY TERMINALS (AFT)

9.01 Analog facility terminals (AFT) have been designed to provide built-in SMAS access points using the type 2 maintenance connector. The type 2 maintenance connector contains 24 6-wire access points. See Section 667-000-002 for type 2 maintenance connector information.

A. AFT Access Point Configuration

9.02 The transmission leads (T, R, T1, R1) are accessed at the carrier and signaling interface. The other access point is used for the signaling leads (E&M, A&B, SX&SX1) or 2-wire leads (T,R) on special services extensions. One advantage of this arrangement is that a single SMAS number gives the tester access to the carrier side and the metallic extension side of a 2-wire special services signaling unit (see paragraph 9.06).

9.03 The 4-wire transmission leads may be bridged or split. In the split mode, access measurements can be made in either direction, but only one direction at a time. The signaling access point can also be bridged or split. When the signaling leads are split, both directions are available simultaneously for looping through or splitting.

9.04 Codes MAB or MBA, 46X, and 6AB or 6BA in Table A are examples of AFT access configurations. These examples are representative of A5, A6, N2, and N3 carrier systems.

9.05 The 26X and 46X codes are new configurations which were not previously used in SMAS 4A. The new configurations exist when the C pair is connected to a 2-wire point (T, R) on a circuit and the A and B pairs are connected to a 4-wire point (T, R, T1, R1) ***on the same circuit*** (Fig. 14).

9.06 The 4- and 2-wire portions of the circuit shown in Fig. 14 are tested as if they were independent access points, but remote testing will be ***temporarily*** restricted to testing at only one point at a time, eg, only the 2-wire point (26X code) or the 4-wire point (46X code) on the same SMAS number will be testable at one time. If one point is accessed, a SMAS busy will occur when access is attempted at the other point.

9.07 The configuration in Fig. 14 is not restricted to AFT. It may also be used with MDF-connected SMAS 4A access points or access points in miscellaneously mounted type 2 maintenance

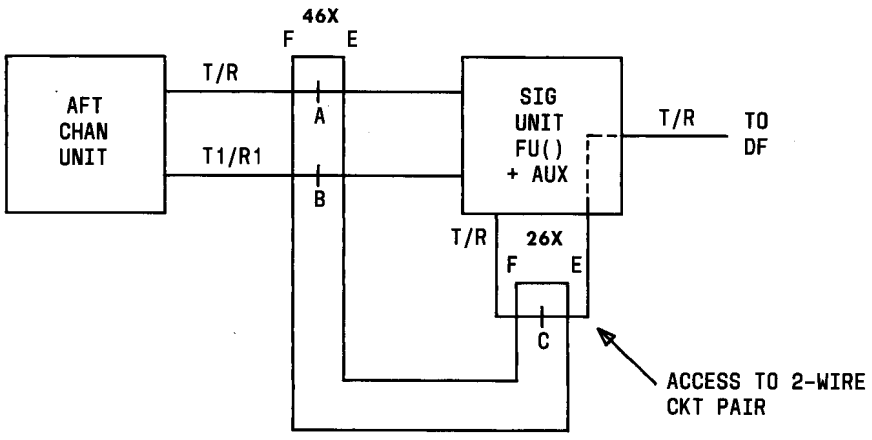


Fig. 14—Example of a 2-Wire AFT Access Configuration

connectors. In these cases the orientation of the access points must be consistent with the orientation of the unitized configurations.

Miscellaneously Mounted Type 2 Maintenance Connectors

9.08 The circuit configurations on miscellaneously mounted type 2 connectors should be limited to those 6-wire configurations shown in Table A (26X, 46X, MAB, MBA, CAB, CBA, 6AB and 6BA codes).

B. AFT Access Point Assignment

9.09 Because AFT access points are built-in, their assignment becomes part of the circuit equipment assignment: the connection of the maintenance connector to the SMAS network and the assignment of the AFT mounting determine the SMAS number, and the assignment of the AFT plug-in units determines the configuration and placement of the access points in the circuit. The access point data is located and formatted on the CLR in the same way as for MDF-connected access points.

9.10 Each operating telephone company must develop an assignment plan for the SMAS numbers according to their practice of numbering plug-in mountings and their assignment of maintenance connectors to the SMAS distribution networks. The plan should consider frames which may not be fully equipped with maintenance connectors. SMAS numbers should be reserved for the unequipped portions of the frames to achieve a viable and consistent plan. The following guidelines may be used:

(a) A record must be kept of the SMAS numbers associated with plug-in mountings and/or miscellaneously mounted maintenance connector access points.

(b) Even loading of maintenance connectors is not required because of the anticipated low access blockage probability (1 out of 24 within the connectors).

(c) Special type circuits (SSP, SSM, or others) are marked in the maintenance connector by plug-in diodes.

(d) No special SMAS numbers need be reserved for system installation and maintenance. Other means are provided for these functions outside of the normal SMAS numbering range.

(e) Special access points are not reserved for use on no-test trunks because phantom maintenance connectors similar to the SMAS 4 phantom groups are available for use for no-test trunk access points.

10. ACCESS POINT INFORMATION UNIQUE TO DIGITAL FACILITY TERMINALS (DFT)

10.01 Digital facility terminals (DFT) have been designed to provide built-in SMAS access points using the type 2 maintenance connector. The type 2 maintenance connector contains 24 6-wire access points. See Section 667-000-002 for type 2 maintenance connector information.

A. DFT Access Point Configuration

10.02 Figure 15 is an example of a DFT access configuration. This example is representative of D3 carrier systems.

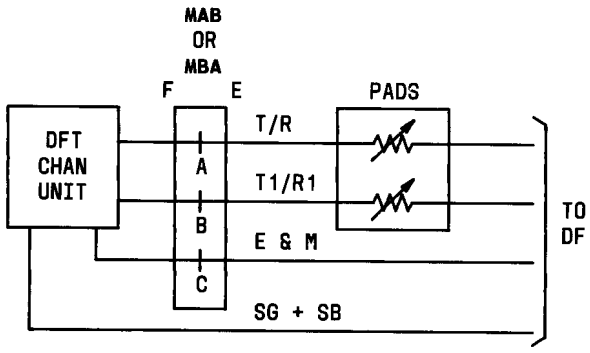
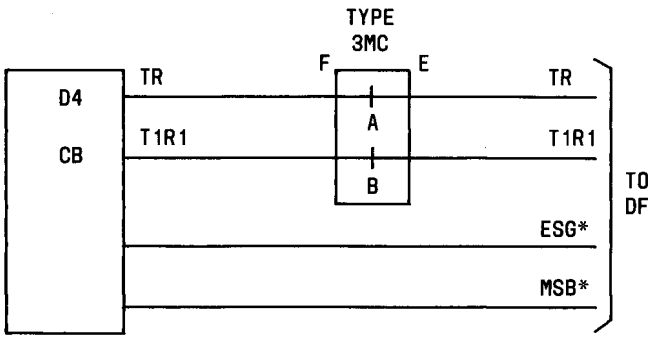


Fig. 15—Example of a 4-Wire E&M DFT Access Configuration

10.03 New DFTs are available with both the type 2 and type 3 maintenance connectors. These designs use the D4 channel banks. Access point information for these new terminals is shown in Fig. 16 and 17.

B. DFT Access Point Assignment

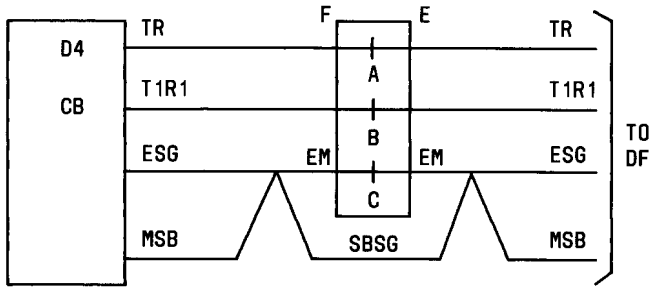
10.04 Because DFT access points are built-in, their assignment becomes part of the circuit equipment assignment: the connection of the



* E AND M LEADS ARE NOT USED

THE D4 UFT DOES NOT INCLUDE ATTENUATORS AS PROVIDED IN THE D3 UFT. THEREFORE THE D4 UFT IS NOT A DIRECT REPLACEMENT FOR THE D3 UFT.

Fig. 16—DFT Access Points



THE D4 UFT DOES NOT INCLUDE ATTENUATORS AS PROVIDED IN THE D3 UFT. THEREFORE THE D4 UFT IS NOT A DIRECT REPLACEMENT FOR THE D3 UFT.

Fig. 17—DFT Access Points

maintenance connectors to the SMAS network and the assignment of the DFT mounting determine the SMAS number, and the assignment of the DFT plug-in units determines the configuration and placement of the access points in the circuit. The access point data is located and formatted on the CLR in the same way as for MDF-connected access points.

10.05 Each operating telephone company must develop an assignment plan for the SMAS numbers according to their practice of numbering plug-in mountings and their assignment of maintenance connectors to the SMAS distribution networks. The plan should consider frames which may not be fully equipped with maintenance connectors. SMAS numbers should be reserved for the unequipped portions of the frames to achieve a viable and consistent plan. The following guidelines may be used:

(a) A record must be kept of the SMAS numbers associated with plug-in mountings and/or miscellaneously mounted maintenance connector access points.

(b) Even loading of maintenance connectors is not required because of the anticipated low access blockage probability (1 out of 24 within the connectors).

(c) Special type circuits (SSP, SSM, or others) are marked in the maintenance connector by plug-in diodes.

(d) No special SMAS numbers need be reserved for system installation and maintenance. Other means are provided for these functions outside of the normal SMAS numbering range.

(e) Special access points are not reserved for use on no-test trunks because special phantom maintenance connectors similar to the SMAS 4 phantom groups are available for use for no-test trunk access points.

11. IDENTIFICATION AND TESTING DATA APPLICATION

11.01 Figures 18 and 19 illustrate a comparison of circuit layout record identification and testing data to a circuit layout.

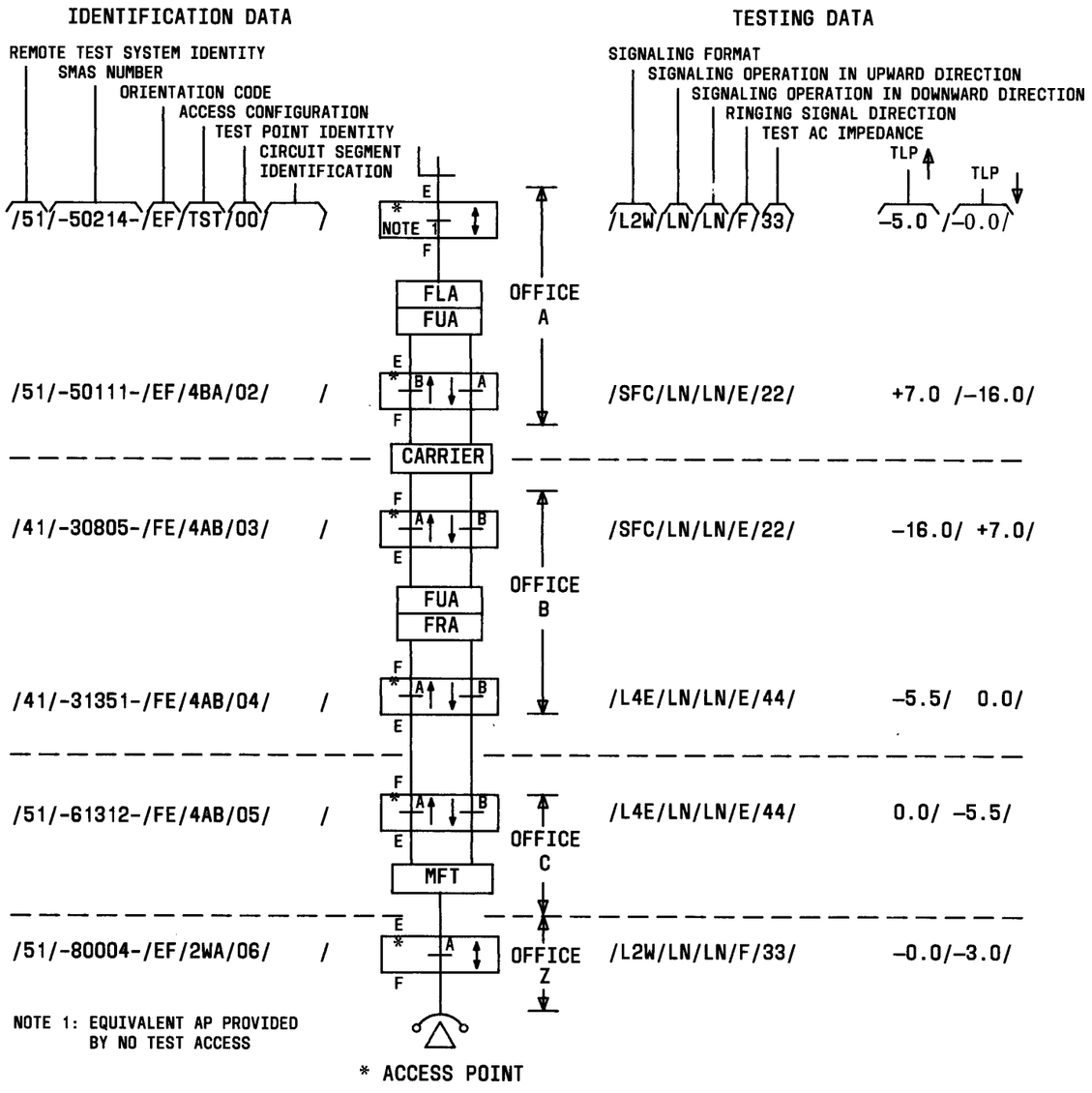


Fig. 18—Example of Identification Testing Data

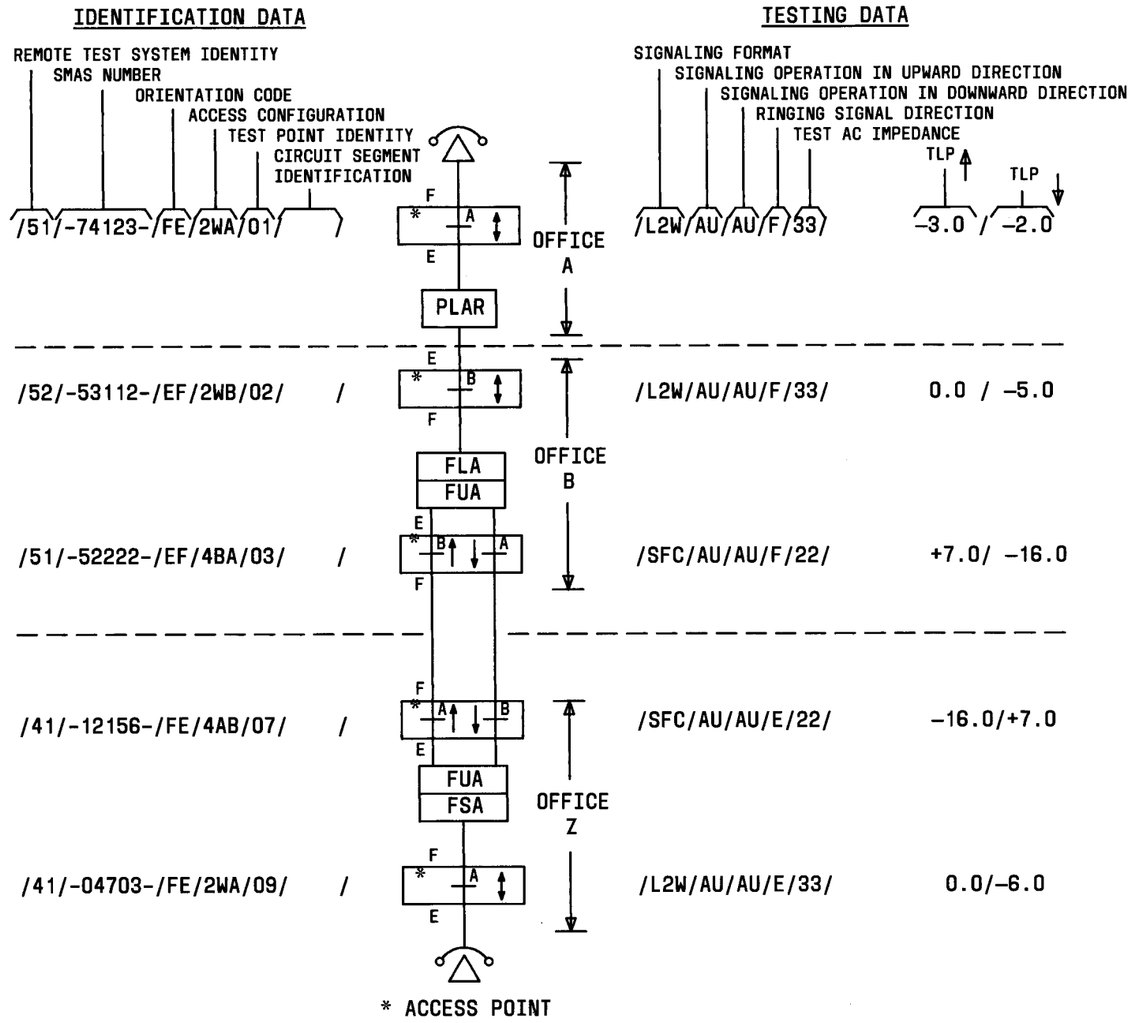
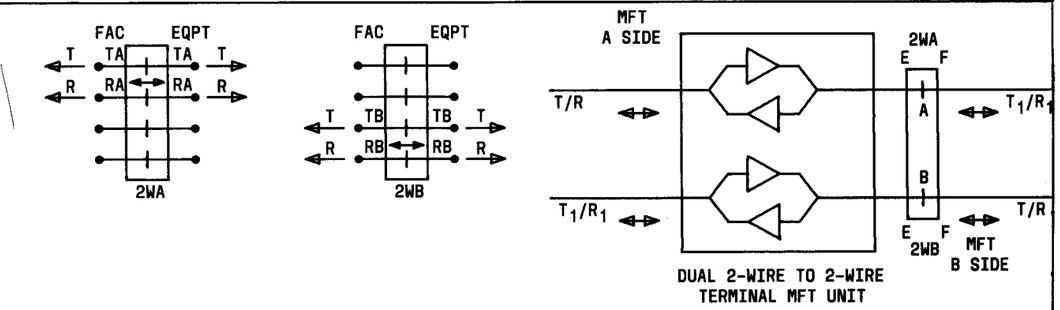
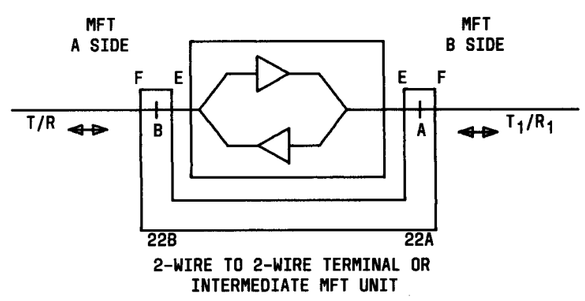


Fig. 19—Example of Identification Testing Data

TABLE A
ACCESS CONFIGURATION CODES

CODE	ACCESS CONFIGURATION
	1 WIRE TYPES
1TA	SINGLE WIRE, TIP, ON A-HALF OF ACCESS CONNECTOR
1RA	SINGLE WIRE, RING, ON A-HALF OF ACCESS CONNECTOR
1TB	SINGLE WIRE, TIP, ON B-HALF OF ACCESS CONNECTOR
1RB	SINGLE WIRE, RING, ON B-HALF OF ACCESS CONNECTOR
	2 WIRE TYPES
2WA	2-WIRE ON A-HALF OF ACCESS CONNECTOR
2WB	2-WIRE ON B-HALF OF ACCESS CONNECTOR
22A	THE A-HALF OF A 4-WIRE ACCESS CONNECTOR WHEN THE 4-WIRE ACCESS CONNECTOR IS ASSIGNED TO TWO 2-WIRE POINTS ON THE SAME CIRCUIT.
22B	THE B-HALF OF A 4-WIRE ACCESS CONNECTOR WHEN THE 4-WIRE ACCESS CONNECTOR IS ASSIGNED TO TWO 2-WIRE POINTS ON THE SAME CIRCUIT.
24A	THE A-HALF OF A 4-WIRE ACCESS CONNECTOR WHEN THE 4-WIRE ACCESS CONNECTOR IS ASSIGNED TO A 2-WIRE POINT AND HALF OF A 4-WIRE POINT ON THE SAME CIRCUIT. THE A-HALF OF THE ACCESS CONNECTOR MUST BE ASSIGNED TO THE TRANSMIT PAIR OF THE 4-WIRE POINT ON THE CIRCUIT (TRANSMISSION DIRECTION E TO F).
24B	THE B-HALF OF A 4-WIRE ACCESS CONNECTOR WHEN THE 4-WIRE ACCESS CONNECTOR IS ASSIGNED TO A 2-WIRE POINT AND HALF OF A 4-WIRE POINT ON THE SAME CIRCUIT. THE B-HALF OF THE ACCESS CONNECTOR MUST BE ASSIGNED TO THE 2-WIRE POINT ON THE CIRCUIT.





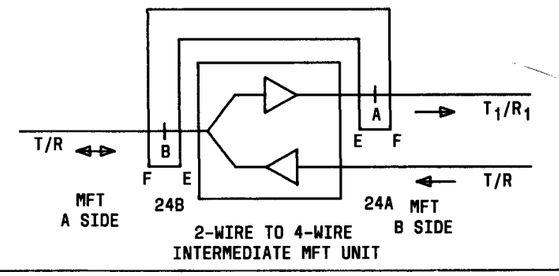


TABLE A (Contd)
ACCESS CONFIGURATION CODES

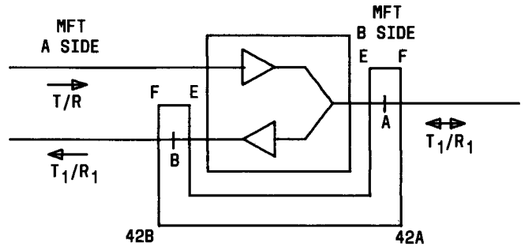
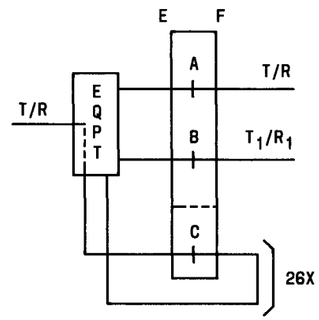
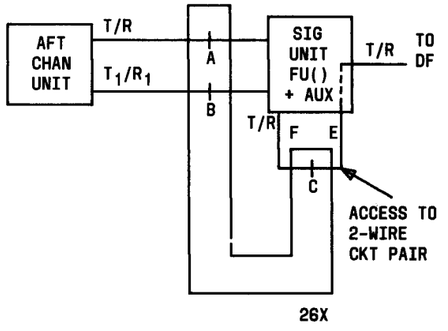
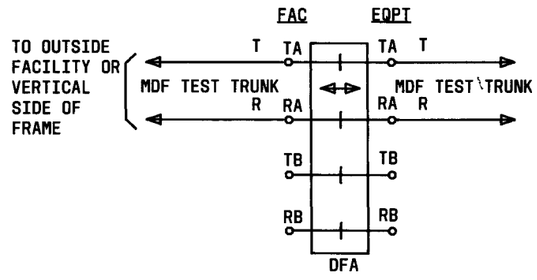
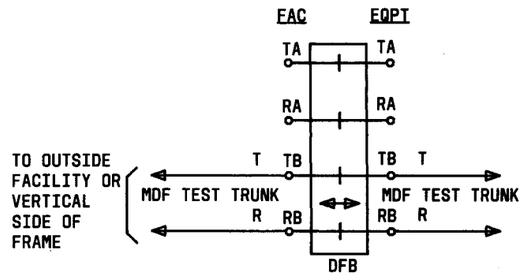
CODE	ACCESS CONFIGURATION
	2-WIRE TYPES (CONTD)
42A	THE A-HALF OF A 4-WIRE ACCESS CONNECTOR WHEN THE 4-WIRE ACCESS CONNECTOR IS ASSIGNED TO A 2-WIRE POINT AND HALF OF A 4-WIRE POINT ON THE SAME CIRCUIT. THE A-HALF OF THE ACCESS CONNECTOR MUST BE ASSIGNED TO THE 2-WIRE POINT ON THE CIRCUIT.
42B	THE B-HALF OF A 4-WIRE ACCESS CONNECTOR WHEN THE 4-WIRE ACCESS CONNECTOR IS ASSIGNED TO A 2-WIRE POINT AND HALF OF A 4-WIRE POINT ON THE SAME CIRCUIT. THE B-HALF OF THE ACCESS CONNECTOR MUST BE ASSIGNED TO THE TRANSMIT PAIR OF THE 4-WIRE POINT ON THE CIRCUIT (TRANSMISSION DIRECTION E TO F).
	 4-WIRE TO 2-WIRE TERMINAL OR INTERMEDIATE MFT UNIT
26X	THE C PAIR OF A 6-WIRE ACCESS CONNECTOR WHEN THE C PAIR IS LOCATED AT A 2-WIRE POINT ON A CIRCUIT AND THE A AND B PAIRS OF THE ACCESS CONNECTOR ARE LOCATED AT A 4-WIRE POINT ON THE SAME CIRCUIT.
	 
DFA	DISTRIBUTING FRAME TEST TRUNK ON A-HALF OF ACCESS CONNECTOR
DFB	DISTRIBUTING FRAME TEST TRUNK ON B-HALF OF ACCESS CONNECTOR
	 

TABLE A (Contd)
ACCESS CONFIGURATION CODES

CODE	ACCESS CONFIGURATION
4AB 4BA	4-WIRE TYPES 4-WIRE WITH FE ORIENTATION CODE 4-WIRE WITH EF ORIENTATION CODE 4-WIRE CIRCUIT PAIRS TOWARD TOP OF CLR 4-WIRE CIRCUIT PAIRS TOWARD BOTTOM OF CLR 4AB 4-WIRE CIRCUIT PAIRS TOWARD BOTTOM OF CLR 4-WIRE CIRCUIT PAIRS TOWARD TOP OF CLR 4BA MFT A SIDE T/R T_1/R_1 T/R MFT B SIDE 4AB OR 4BA 2-WIRE TO 4-WIRE TERMINAL MFT UNIT
2EM 2CC	2-WIRE WITH E&M LEADS 2-WIRE WITH CONTROL CHANNEL 2-WIRE CKT PAIR CKT E AND M LEADS 2EM 2-WIRE CKT PAIR CKT CONTROL CHANNEL PAIR 2CC
DF4 46X	4-WIRE DISTRIBUTING FRAME TEST TRUNK (TWO 2-WIRE TRUNKS TO BE USED AS 4-WIRE). THE A AND B PAIRS OF A 6-WIRE ACCESS CONNECTOR WHEN THE A AND B PAIRS OF THE ACCESS CONNECTOR ARE LOCATED AT A 4-WIRE POINT ON A CIRCUIT AND THE C PAIR OF THE CONNECTOR IS LOCATED AT A 2-WIRE POINT ON THE SAME CIRCUIT. TWO 2-WIRE MDF TEST TRUNKS (TO BE USED AS 4-WIRE) TOWARD OUTSIDE FACILITY OR VERTICAL SIDE OF FRAME DF4 TWO 2-WIRE MDF TEST TRUNKS T/R EQPT T_1/R_1 46X AFT CHAN UNIT SIG UNIT FU() + AUX TO DF ACCESS TO 2-WIRE CKT PAIR
DAB DBA	4-WIRE ACCESS POINT WITH FE ORIENTATION CODE AT THE DSOA LEVEL OF A DDS CIRCUIT. (THIS TYPE OF ACCESS POINT REQUIRES THE USE OF A TYPE 3 MAINTENANCE CONNECTOR WITH A OPTION.) 4-WIRE ACCESS POINT WITH EF ORIENTATION CODE AT THE DSOA LEVEL OF A DDS CIRCUIT. (THIS TYPE OF ACCESS POINT REQUIRES THE USE OF A TYPE 3 MAINTENANCE CONNECTOR WITH A OPTION.) SRDM DAB DSX-0A TO OCU CUSTOMER LOCAL LOOP DBA

Table A (Contd)

TABLE A (Contd)
ACCESS CONFIGURATION CODES

CODE	ACCESS CONFIGURATION
MAB MBA	6-WIRE TYPES 4-WIRE E&M WITH FE ORIENTATION CODE. 4-WIRE E&M WITH EF ORIENTATION CODE.
CAB CBA	4-WIRE WITH CONTROL CHANNEL, FE ORIENTATION CODE. 4-WIRE WITH CONTROL CHANNEL, EF ORIENTATION CODE.
6AB 6BA	4-WIRE A&B WITH FE ORIENTATION CODE. 4-WIRE A&B WITH EF ORIENTATION CODE.
TST	SPECIAL TYPE ACCESS POINT ON NO-TEST TRUNK

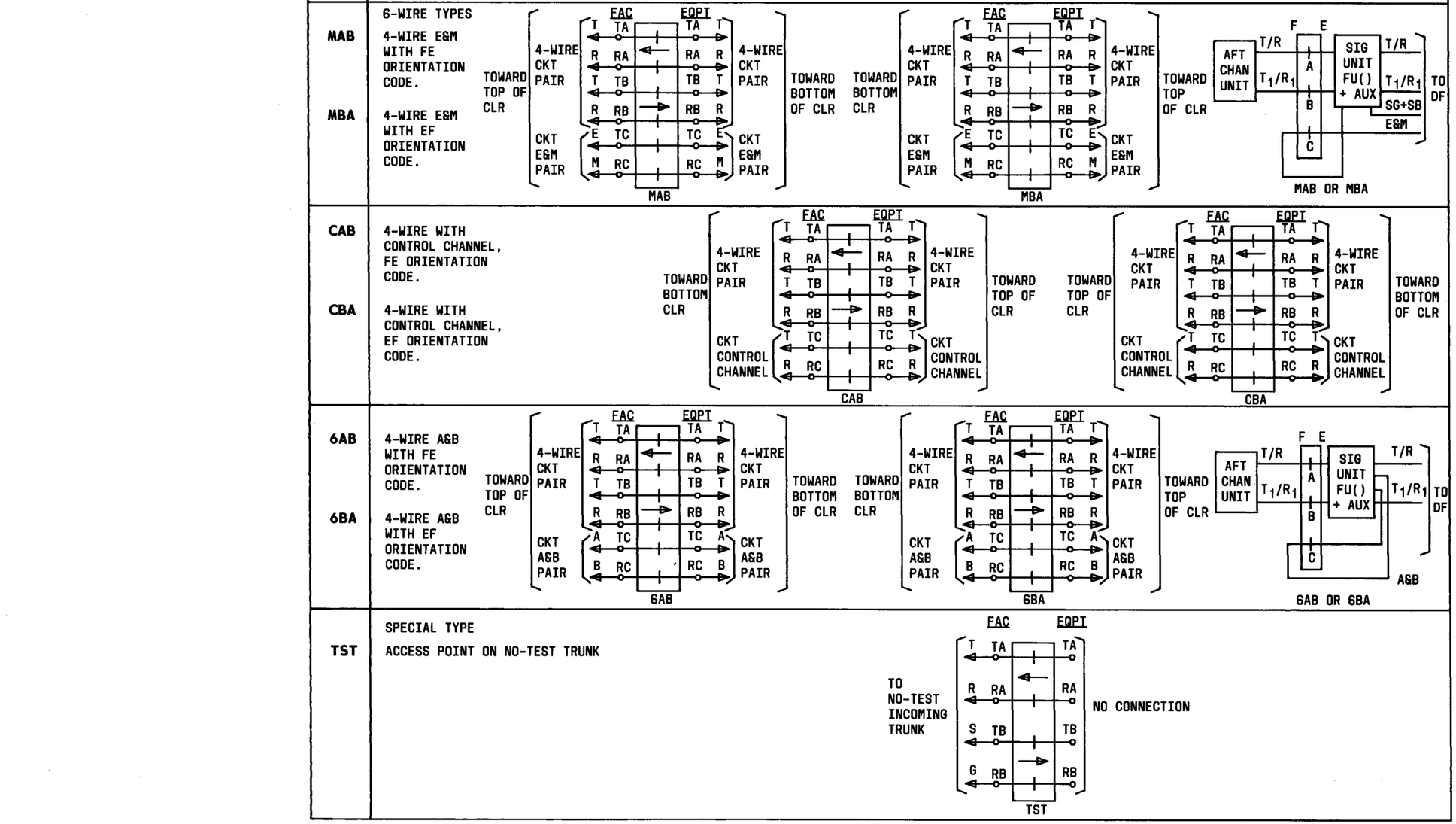


TABLE B
SIGNALING FORMAT

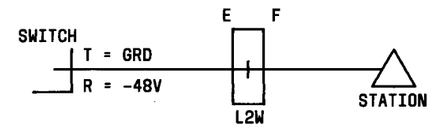
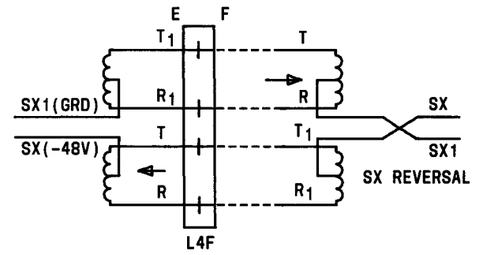
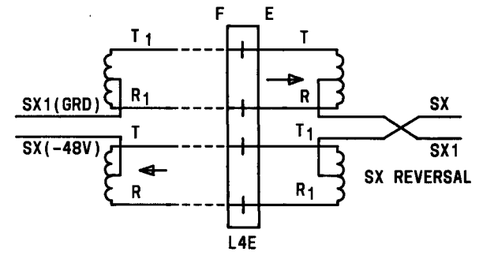
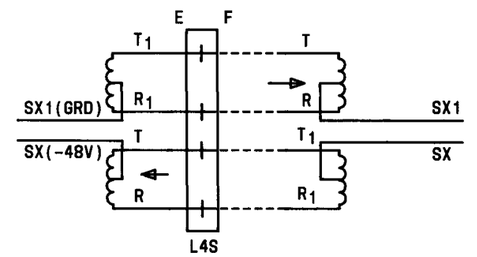
CODE	FORMAT
L2W	A 2-WIRE CIRCUIT USING -48 VDC BATTERY FOR TALKING AND SIGNALING AND/OR 20-HZ AC VOLTAGE FOR RINGING. SIGNALING IS DONE BY OPENINGS AND CLOSINGS OF THE CIRCUIT CONDUCTORS. 
L4F	A 4-WIRE CIRCUIT USING SIMPLEXED -48 VDC BATTERY FOR TALKING AND SIGNALING AND/OR 20-HZ AC VOLTAGE FOR RINGING. A SIMPLEX LEAD REVERSAL EXISTS ON THE CIRCUIT BETWEEN THE FACILITY (F) SIDE OF THE ACCESS POINT AND THE CIRCUIT TERMINATION. 
L4E	A 4-WIRE CIRCUIT USING SIMPLEXED -48 VDC BATTERY FOR TALKING AND SIGNALING AND/OR 20-HZ AC VOLTAGE FOR RINGING. A SIMPLEX LEAD REVERSAL EXISTS ON THE CIRCUIT BETWEEN THE EQUIPMENT (E) SIDE OF THE ACCESS POINT AND THE CIRCUIT TERMINATION. 
L4S	A 4-WIRE CIRCUIT USING SIMPLEXED -48 VDC BATTERY FOR TALKING AND SIGNALING AND/OR 20-HZ AC VOLTAGE FOR RINGING. NO SIMPLEX LEAD REVERSALS EXIST AT ANY POINT ON THE CIRCUIT. 

TABLE B (Contd)
SIGNALING FORMAT

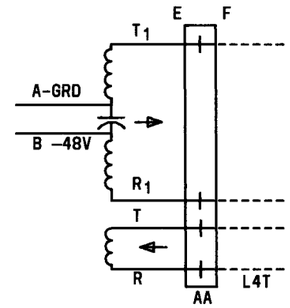
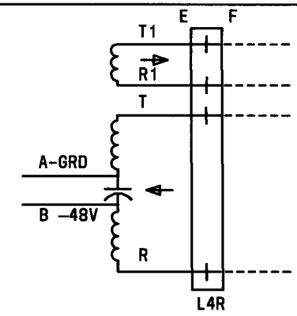
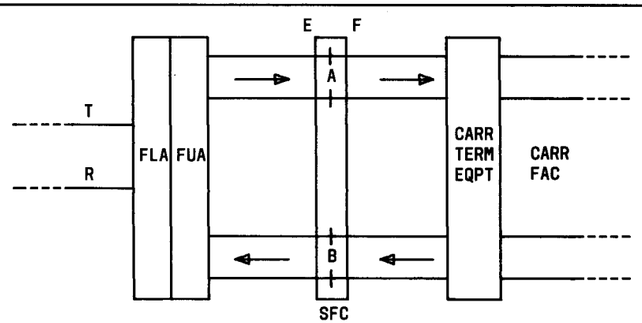
CODE	FORMAT
L4T	A 4-WIRE CIRCUIT USING –48 VDC BATTERY AND/OR 20-HZ AC VOLTAGE FOR RINGING ON THE CIRCUIT PAIR WHOSE TRANSMISSION DIRECTION IS OUTWARD FROM THE F SIDE OF THE ACCESS POINT. 
L4R	A 4-WIRE CIRCUIT USING –48 VDC BATTERY AND/OR 20-HZ AC VOLTAGE FOR RINGING ON THE CIRCUIT PAIR WHOSE TRANSMISSION DIRECTION IS INWARD FROM THE F SIDE OF THE ACCESS POINT. 
72W	THE SAME AS L2W EXCEPT USING –72 VDC.
74F	THE SAME AS L4F EXCEPT USING –72 VDC.
74E	THE SAME AS L4E EXCEPT USING –72 VDC.
74S	THE SAME AS L4S EXCEPT USING –72 VDC.
74T	THE SAME AS L4T EXCEPT USING –72 VDC.
74R	THE SAME AS L4R EXCEPT USING –72 VDC.
SFC	A 4-WIRE CIRCUIT AT A CARRIER SYSTEM INTERFACE USING SINGLE FREQUENCY (SF) SIGNALING AT THE ACCESS POINT. NEITHER DC NOR LOOP CONDITIONS ARE USED ON THE CIRCUIT TRANSMISSION PAIRS AND THE ACCESS POINT IS NOT AT AN INTERFACE WITH METALLIC FACILITIES (SEE SFD CODE FOR METALLIC FACILITIES INTERFACE). THE ACCESS POINT COULD BE BETWEEN THE CARRIER SYSTEM AND ITS SIGNAL EQUIPMENT OR BETWEEN TWO BACK-TO-BACK CARRIER SYSTEMS. 

TABLE B (Contd)
SIGNALING FORMAT

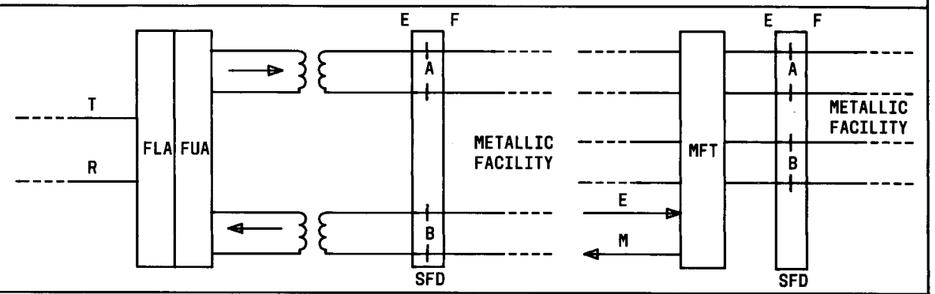
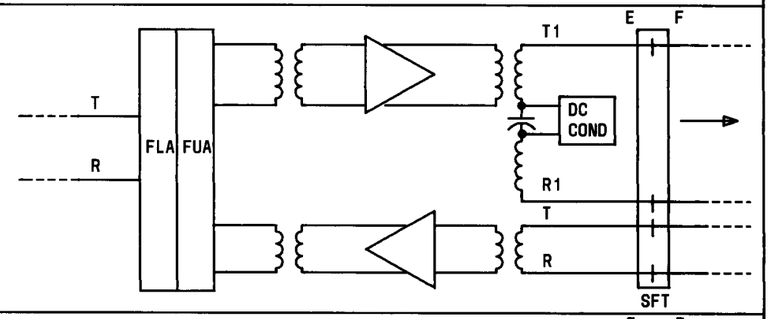
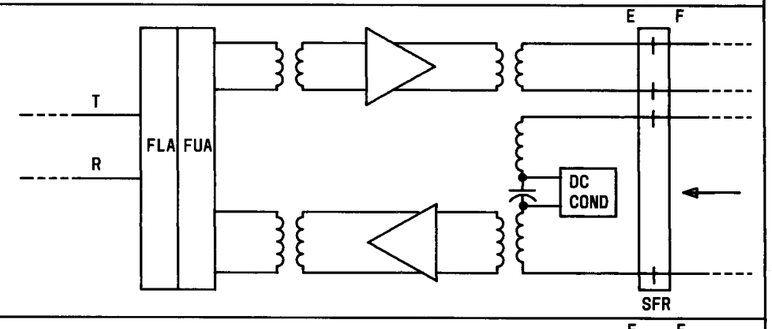
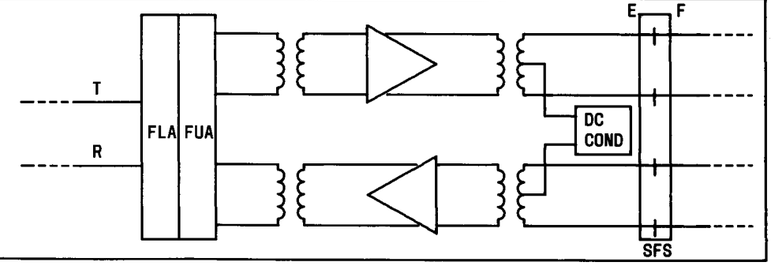
CODE	FORMAT
SFD	A 4-WIRE METALLIC CIRCUIT USING SF SIGNALING WITH NEITHER DC NOR LOOP CONDITIONS USED ON THE TRANSMISSION PAIRS. 
SFT	A 4-WIRE METALLIC CIRCUIT USING SF SIGNALING AND WITH DC OR LOOP CONDITIONS ON THE CIRCUIT PAIR WHOSE TRANSMISSION DIRECTION IS OUTWARD FROM THE F SIDE OF THE ACCESS POINT (A PAIR). THE METALLIC CIRCUIT CONDITIONS MAY BE USED FOR CONTROLLING LOOP AROUND OR OTHER FUNCTIONS. 
SFR	A 4-WIRE METALLIC CIRCUIT USING SF SIGNALING AND WITH DC OR LOOP CONDITIONS ON THE CIRCUIT PAIR WHOSE TRANSMISSION DIRECTION IS INWARD ON THE F-SIDE OF THE ACCESS POINT (B PAIR). 
SFS	A 4-WIRE METALLIC CIRCUIT USING SF SIGNALING AND WITH SIMPLEXED METALLIC CONDITIONS ON THE CIRCUIT PAIRS. 

TABLE B (Contd)
SIGNALING FORMAT

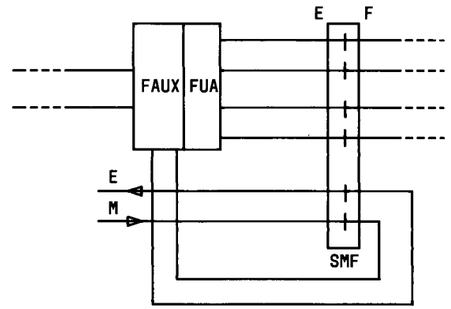
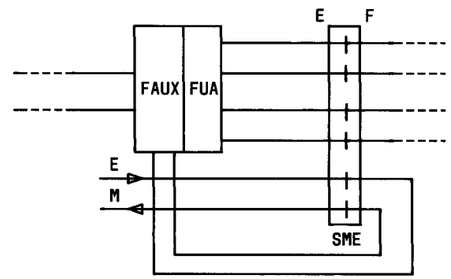
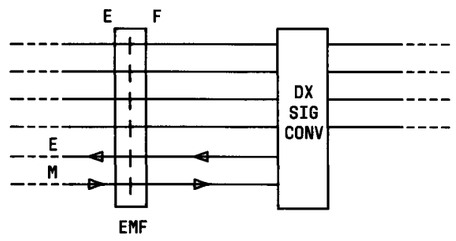
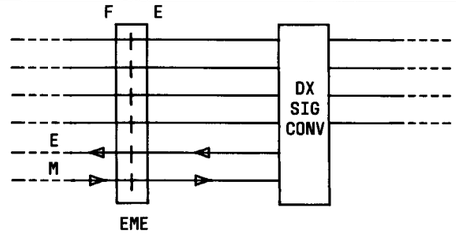
CODE	FORMAT	
SMF	A CIRCUIT WITH BOTH SF SIGNALING AND E&M SIGNALING APPEARING AT THE ACCESS POINT. THE M-LEAD SIGNALING DIRECTION IS OUTWARD FROM THE FACILITY (F) SIDE OF THE ACCESS POINT.	
SME	A CIRCUIT WITH BOTH SF SIGNALING AND E&M SIGNALING APPEARING AT THE ACCESS POINT. THE M-LEAD SIGNALING DIRECTION IS OUTWARD FROM THE EQUIPMENT (E) SIDE OF THE ACCESS POINT.	
EMF	A CIRCUIT USING E&M SIGNALING AT THE ACCESS POINT. THE M-LEAD SIGNALING DIRECTION IS OUTWARD FROM THE F SIDE OF THE ACCESS POINT.	
EME	A CIRCUIT USING E&M SIGNALING AT THE ACCESS POINT. THE M-LEAD SIGNALING DIRECTION IS OUTWARD FROM THE E SIDE OF THE ACCESS POINT.	

TABLE B (Contd)
SIGNALING FORMAT

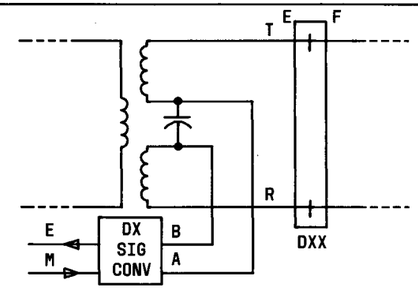
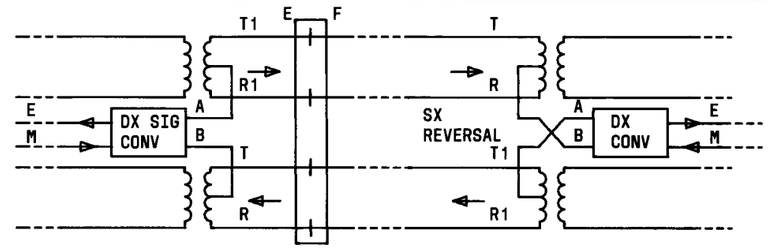
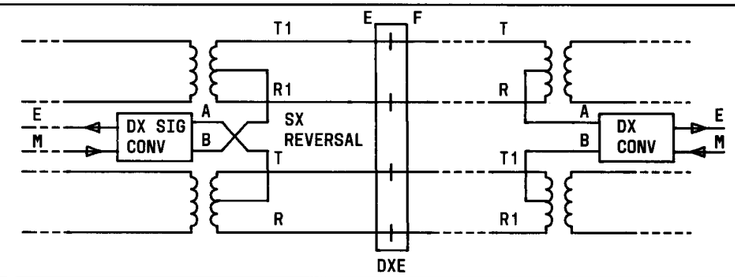
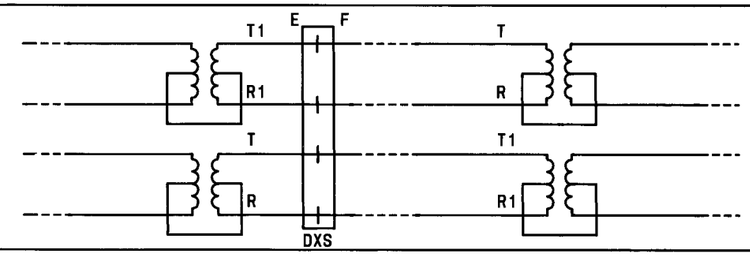
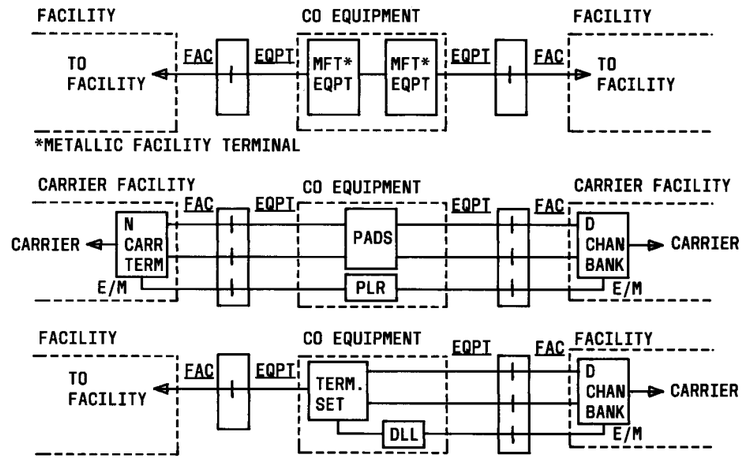
CODE	FORMAT
DXX	A 2-WIRE CIRCUIT USING DX SIGNALING AT THE ACCESS POINT. 
DXF	A 4-WIRE CIRCUIT USING SIMPLEXED DX SIGNALING AT THE ACCESS POINT. A SIMPLEX LEAD REVERSAL EXITS ON THE CIRCUIT BETWEEN THE FACILITY (F) SIDE OF THE ACCESS POINT AND THE CIRCUIT TERMINATION. 
DXE	A 4-WIRE CIRCUIT USING SIMPLEXED DX SIGNALING AT THE ACCESS POINT. A SIMPLEX LEAD REVERSAL EXISTS ON THE CIRCUIT BETWEEN THE EQUIPMENT (E) SIDE OF THE ACCESS POINT AND THE CIRCUIT TERMINATION. 
DXS	A 4-WIRE CIRCUIT USING SIMPLEXED DX SIGNALING AT THE ACCESS POINT. THERE ARE NO SIMPLEX REVERSALS AT ANY POINT ON THE CIRCUIT. 
NON	ANY CIRCUIT ON WHICH NO SIGNALING APPEARS, OR A CIRCUIT TO WHICH NO OTHER CODE APPLIES. AN EXAMPLE OF A CASE FOR WHICH NO EXISTING CODE APPLIES IS A CIRCUIT WITH TYPE 2 E&M SIGNALING BETWEEN BACK-TO-BACK TRUNK CIRCUITS OR BACK-TO-BACK SIGNALING CIRCUITS.

TABLE C
GUIDELINES FOR ORIENTING ACCESS POINTS

GUIDELINE	ORIENTATION GUIDELINES
1	AT INTERFACES OF FACILITIES WITH CENTRAL OFFICE EQUIPMENT, THE FAC SIDE SHOULD FACE THE FACILITY EXCEPT AS NOTED IN RULES 2-7.
2	ACCESS POINTS AT SINGLE-FREQUENCY (SF) EQUIPMENT INTERFACES ARE PROVIDED AS FOLLOWS: (A) ON THE FACILITY (LINE) SIDE OF SF EQUIPMENT, FAC SHOULD FACE AWAY FROM THE SF EQUIPMENT. (B) ON THE EQUIPMENT (DROP) SIDE OF SF EQUIPMENT FAC SHOULD FACE TOWARD THE SF EQUIPMENT EXCEPT WHEN DIRECTLY INTERFACING A DROP SIDE CARRIER FACILITY; IN THAT CASE FAC SHOULD FACE THE CARRIER

GUIDELINE 1 = CO EQPT - FAC INTERFACES



GUIDLINE 2 - SF EQUIPMENT

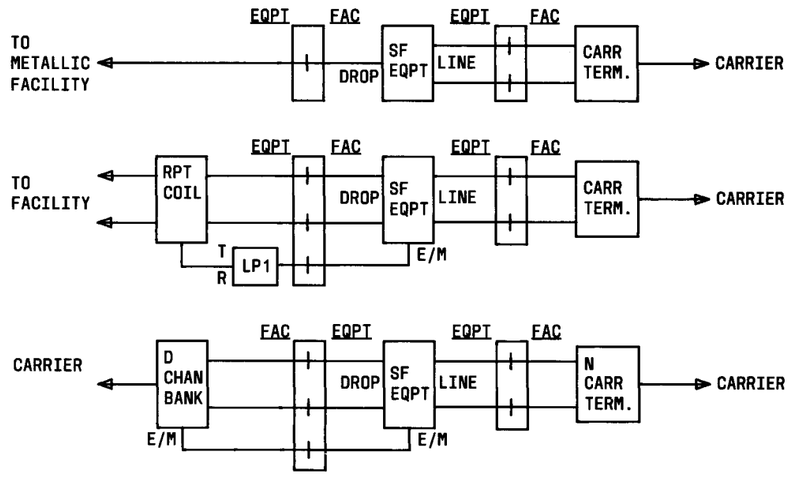
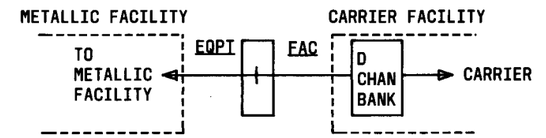


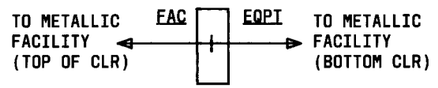
TABLE C (Contd)
GUIDELINES FOR ORIENTING ACCESS POINTS

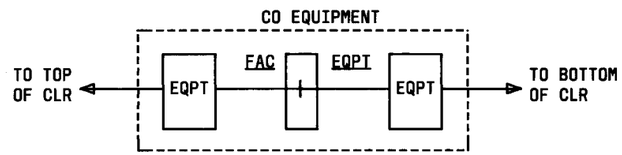
GUIDELINE	ORIENTATION GUIDELINES
3	AT INTERFACES OF CARRIER FACILITIES AND METALLIC FACILITIES, FAC SHOULD FACE THE CARRIER FACILITY
4	AT ALL OTHER INTERFACES OF FACILITIES OR AT TANDEM INTERCONNECTIONS OF EQUIPMENT (EXCEPT SF AS NOTED IN RULE 2), THE FAC SIDE OF THE CONNECTOR SHOULD FACE THE A CIRCUIT END (TOP OF CLR).

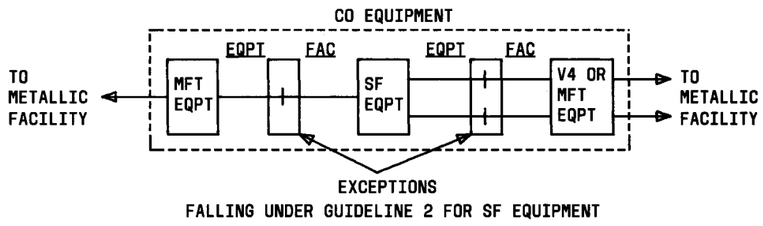
GUIDELINE 3 - DIRECT CARRIER -METALLIC FACILITY INTERFACE



GUIDELINE 4 - FACILITY-TANDEM INTERFACES







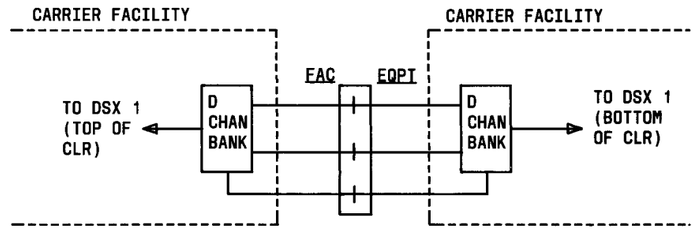


TABLE C (Contd)
GUIDELINES FOR ORIENTING ACCESS POINTS

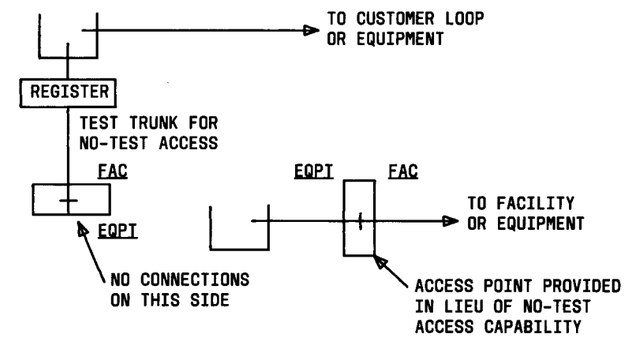
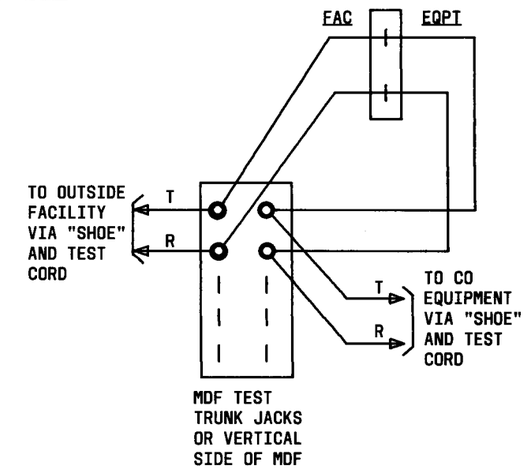
GUIDELINE	ORIENTATION GUIDELINES
5	ACCESS POINTS PROVIDED ON TEST TRUNKS FOR NO-TEST ACCESS CAPABILITY TO SWITCHED CUSTOMER LINES MUST HAVE THE FAC SIDE OF THE CONNECTOR FACING THE TEST TRUNK REGISTER BECAUSE OF SPECIAL ARRANGEMENTS IN THE SMAS AND SARTS. ACCESS POINTS LOCATED AT THE SWITCH INTERFACE IN LIEU OF NO-TEST ACCESS CAPABILITY SHOULD HAVE FAC FACING AWAY FROM THE SWITCH. GUIDELINE 5 
6	ACCESS POINTS ON DISTRIBUTING FRAME TEST TRUNKS SHOULD HAVE FAC FACING OUT, IE, TOWARD THE OUTSIDE FACILITY OR THE VERTICAL SIDE OF THE FRAME. GUIDELINE 6 
7	WHEN FRAME APPEARANCES OF SMAS CONNECTORS DO NOT ALLOW OBSERVANCE OF GUIDELINES 1-6, SUCH AS FOR APPLICATIONS WITHIN TIE PAIRS (PGH 3.04), THE PREVAILING CONDITIONS DETERMINE THE CONNECTOR ORIENTATION. ORIENTATIONS OF ACCESS POINT CONFIGURATIONS WHICH DUPLICATE THOSE FOUND IN UNITIZED FACILITY TERMINALS SHALL BE IDENTICAL TO THE UNITIZED EQUIPMENT ORIENTATIONS.

Table D

SUMMARY OF ACCESS CONNECTOR ORIENTATION INFORMATION

Equipment or Facility *ABOVE* Access Point on CLR

CARRIER FACILITY	METALLIC FACILITY	EQUIPMENT	S F EQPT (line side)	S F EQPT (drop side)	SWITCH	
FE 4	EF 3	EF 1	EF 2a	EF 2b	EF 5	CARRIER FACILITY
FE 3	FE 4	EF 1	EF 2a	FE 2b	EF 5	METALLIC FACILITY
FE 1	FE 1	FE 4	EF 2a	FE 2b	EF 5	EQUIPMENT
FE 2a	FE 2a	FE 2a				S F EQPT (line side)
FE 2b	EF 2b	EF 2b		FE 2b	EF 5	S F EQPT (drop side)
FE 5	FE 5	FE 5		FE 5		SWITCH

SWITCH AT TOP OF CLR, ORIENTATION CODE = EF

NO-TEST ACCESS TRUNK-

SWITCH AT BOTTOM OF CLR, ORIENTATION CODE = FE 5

M D F TEST TRUNK ORIENTATION CODE = FO (O for OUT) 6

Note: EF = Equipment — Facility
FE = Facility — Equipment
Numbers in lower right corner indicate applicable COROLLARY GUIDELINES

Equipment or Facility *BELOW* Access Point on CLR

Table E

MFT UNITS WITH BUILT-IN SMAS ACCESS

MFT UNIT TYPE	J99343 CODE	CONFIG MFT A	CODE MFT B
2-wire to 2-wire terminal repeater	PA (MD) PG, PB	22B	22A
2-wire to 2-wire intermediate repeater	PC (MD) PH, PD, PE (MD) PJ, PF (MD) PK	22B	22A
Dual 2-wire to 2-wire terminal repeater	PL		2WA (T1, R1) 2WB (T, R)
4-wire to 4-wire terminal repeater	SA		4AB or 4BA
4-wire to 4-wire intermediate repeater	SB		4AB or 4BA
2-wire to 4-wire terminal repeater	RA		4AB or 4BA
2-wire to 4-wire (PRE-EQL) terminal repeater	RF		4AB or 4BA
2-wire to 4-wire intermediate repeater	RD (MD) RH, RE	24B	24A
4-wire to 2-wire terminal repeater	RB (MD) RG, RC	42B	42A
4-wire to 2-wire intermediate repeater	RB (MD) RG, RC	42B	42A

Note: Example-PA (MD) PG means PA is manufactured, discontinued, and replaced by PG.