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Ameritech Supplement Common Channel Signaling (CCS) Network Interface Specification

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1. INTRODUCTION

1.1. General

The reissue of this document includes the addition of the following information:

Issue 3 changes:

- Sections to supplement *Common Channel Signaling (CCS) Network Interface Specification*, TR-TSV-000905, Issue 2, December 1992.
- Sections to supplement *Common Channel Signaling (CCS) Network Interface Specification Supporting Switched DS1/Switched Fractional DS1 Service Capability*, TA-NWT-001357, Issue 1, April 1993.
- Change in the Translation Type Number used by the Ameritech Message Signal Interface - Expansion service.
- The addition of Latching and Loopback testing capabilities.

The Bellcore Technical Reference specifies the required interfaces between out-of-band CCS architectures using Signaling System Number Seven (SS7) protocol deployed by the Bellcore Client Company (BCC) networks and other Interconnecting Networks (ICNs). ICNs include Interexchange Carriers (IXCs), International Carriers (INCs), Exchange Carriers (ECs), Independent Telephone Companies (ITCs), Alternative Local Providers, Cellular Providers and Enhanced Service Providers (ESPs).

The information in this document relates to call control applications. This document will be updated periodically on an as needed basis.

1.2. Purpose

The *Ameritech Supplement Common Channel Signaling (CCS) Network Interface Specification* with TR-TSV-000905 and TA-NWT-001357, provides ICNs with compatibility information required for interconnecting with the Ameritech CCS network. This document contains the specifications for interconnecting to the Ameritech CCS network that are not included in TR-TSV-000905, and TA-NWT-001357 or are considered optional or negotiable between a BCC and the ICN. The intent of this document is to complement TR-TSV-000905 and TA-NWT-001357.

1.3. Organization of the Document

This document is organized into eight sections. Where appropriate, sections of this document are numbered similarly to the corresponding sections in TR-TSV-000905 and TA-NWT-001357. The specific sections are:

- Section 1 provides the introduction, which includes the purpose, scope, organization of the document and related documents.
- Section 2 describes the Network Architecture. This includes the interface architecture, interconnection architecture, point code assignment, types of access, signaling link requirements, and CCS conditions of interconnection (SPOI, service intervals).
- Section 3 describes the Interface Protocol and Messages. This section discusses dual seizure (glare).
- Section 4 describes the Capabilities Supported - Internetwork Call Control. This section identifies the parameters associated *Common Channel Signaling (CCS) Network Interface Specification*, which includes the following parameters: calling party number, charge number, originating line information, carrier selection. In addition, this section also identifies the parameters associated *Common Channel Signaling (CCS) Network Interface Specification supporting Integrated Services Digital Network* such as the generic address, access transport, as well as tones and announcements.
- Section 5 describes the Capability Related Protocol. This includes the ISDN User Part internetwork call control protocol, and the following messages: continuity check, suspend and resume, call progress, confusion, initial address and the user service information parameter.
- Section 6 describes the Physical Level Specifications. This section discusses diverse physical facility paths, and defines diversity.
- Section 7 will discuss Performance.
- Section 8 describes Maintenance and Testing guidelines.

1.4. Related Documents

This document, in conjunction will Bellcore TR-TSV-000905 and TA-NWT-001357, will provide ICNs with compatibility information required for interconnecting with the Ameritech CCS net-

work. In addition to conforming to the document specified above, the ICN must conform to the specifications in the Bell Communications Research Specification of Signaling System Number 7, TR-NPL-000246.

This document is fully consistent with TR-TSV-00905, and is also fully consistent will the Bellcore Technical References (TRs) listed in Section 1.4 of TR-TSV-000905.

2. NETWORK ARCHITECTURE

2.1. Interface Architecture

The ICN is to be net via quad D links (BCC STP to ICN STP architecture); by a combined link set of A (Access) links (BCC STP to ICN Signaling Point (SP) architecture) or by E (Extended) links (BCC STP to ICN SP), at the Signaling Point of Interface (see Section 2.6.1).

2.2. CCS Network Interconnection Architecture

2.2.1. STP to ICN STP (see Figure 1)

The architecture with Ameritech STPs connected to ICN STPs requires three-way physical diversity of CCS link facilities. Ameritech will maintain this physical three-way diversity from the ICN's geographically separate Signaling Points of Interface (SPOIs) to the Ameritech STP pair. The ICN is also required to maintain physical three-way diversity between its geographically separate SPOIs (see Section 6.1).

2.2.2. STP to ICN SP (see Figure 2)

The architecture with Ameritech STPs connected to ICN SPs requires two-way physical diversity of CCS link facilities. Ameritech will maintain this physical two-way diversity from the ICN's geographically separate Signaling Points of Interface (SPOIs) to the Ameritech STP pair.

2.3. Point Code Assignment

An ICN will use its own point code assignment in its own network. SS7 network IDs and "small small" network IDs can be obtained from the Bellcore North American Numbering Plan Administrator. An ITC which plans to interconnect to the Ameritech CCS Network and plans to use 5 or less point codes and does not contain an STP or an A Link Concentrator (ALC), may request to use Ameritech designated point codes.

2.3.1. Point Code Sharing

An ICN interconnecting to the Ameritech Network is required to be a member of the Local Exchange Routing Guide (LERG) and to adhere to its established guidelines.

2.3.2. Point Code Distribution

Point code information required for ICN interconnection to the Ameritech CCS network will be provided in accordance with signed non-disclosure agreements.

2.4. Types of Access

SS7 signaling will be provided on FGD service and terminating FGB service. SS7 signaling will support the following service arrangements:

- SS7 direct end office routed
- SS7 routed via access tandem:

  end to end SS7 signaling

  interworking between MF/SS7 and SS7/MF (see Appendix A)
- SS7 tandem overflow

2.5. Signaling Link Requirements

Ameritech will provide tariffed Signal Transfer Point (STP) Access service to allow ICN customers to interconnect with the Ameritech CCS network. STP Access has two primary components, a Dedicated Network Access Link (DNAL) and an STP port. The DNAL facility connects the Ameritech STP to the ICN's designated premises. The STP requires signaling data in the DS0A format. The DS0A channel must be delivered in a DS1 bit stream to the ICN's SPOI according to the requirements in TR-TSV-000905. The ICN customer can use a channel of a High Capacity or Custom High Capacity service it has previously purchased. STP Access will be provisioned, engineered and designed with a Switched Access circuit ID. Ameritech will follow Switched Access message trunk (e.g., ASR) ordering procedures. These CCS facilities must meet the diversity requirements described in Section 6.1.1 of TR-TSV-000905.

2.6. CCS Conditions of Interconnection

Interconnection agreements must be signed before interconnection with the Ameritech CCS network is allowed.

2.6.1. Signaling Point of Interface (SPOI)

Ameritech will interconnect with ICNs at an ICN selected point or points within LATAs for access to data base services (e.g., LIDB, 800). This interconnection will be at the Regional STP associated with the Service Control Point (SCP) supporting that application(s).

ICN interconnection for trunk signaling services (e.g., CCSAC) only will be at the Local STP associated with the SP where voice or data interconnection is desired.

ICN interconnection for trunk access to both data base services and trunk signaling services can be (at the discretion of Ameritech) at the Local 2.6.2 Service Intervals.

ICN requests for service interconnection will be handled in the order the service request are received. Service intervals will be negotiated with the ICN after the ICN's request (ASR) has been reviewed by Ameritech.

2.7. A Link Concentrators (ALCs)

In recent T1A1.3 standards meetings, it has been determined that some ALCs are in fact STPs. This determination is based on the standards definition identifying STPs as nodes that support Layers 2 and 3 of the Message Transport Part (MTP) via A Link Concentrators, assuming the ALC supports MTP Level 2 & 3 and satisfactorily completes testing as specified in Section 8 of TR-TSV-000905, Interconnection to Ameritech's network with ICNs will be as identified in Section 2.1.

2.8. Independent Telephone Companies Interconnection

Interconnection to Ameritech's network by ITCs is consistent with the interconnection guidelines to any other ICN. Ameritech's policy is to treat all ICNs equally with no preferential treatment to any one ICN. That is, an ITC will be required to follow the requirements outlined in TR-TSV-000905 and to the information contained in this document.

3. INTERFACE PROTOCOL AND MESSAGES

3.1. ISDN User Part Non-Capability Related Messages

3.1.1. Dual Seizure (Glare) Description

It is possible for the switches at both ends of a 2-way SS7 trunk to simultaneously seize a trunk. This condition is detected by a switch receiving an Initial Address Message (IAM) for a circuit it has already sent an IAM or a Circuit Reservation Message (CRM).

Glare is a problem that exists today in the MF environment. A "glare master"/slave relationship must be designated so that one side of the trunk is always in control in the event of glare. Since the ICN is paying access charges to the LEC, it is customary that the ICN has glare control (e.g., overriding assignment of all calls).

Tables controlling glare can be set in the SP.

Any other exceptions must be negotiated and mutually agreed upon by Ameritech and the ICN.

4. CAPABILITIES SUPPORTED - INTERNETWORK CALL CONTROL

4.1. Originating Access Additional Parameters

The following text provides information concerning the additional parameters that are available in the call setup messages traversing the CCS Interface. It should be noted that, as Ameritech's network supports new capabilities and parameters, they will be added to this section.

In this issue, Calling Party Number, Charge Number, Originating Line Information and Carrier Selection parameters are discussed.

In addition, TR-TSV-000905 contains that following additional parameters: Generic Address and Access Transport. When the optional parameter is sent, it is included in the Initial Address Message. The Access Transport parameter may also be included in the Address Complete, Answer, and Call Progress messages as described in TR-NWT-000444, Issue 2, November 1990.

In the future, as additional parameters are added to TR-TSY-000394 or TR-NWT-000444 information regarding their inclusion will be contained in TR-TSV-000905 and TA-NWF-001357, respectively.

It is expected that the ICN will pass all mandatory and optional parameters unchanged to the terminating interface as received from the originating interface. The structure of the mandatory and optional parameters are defined in Appendix A of TR-TSV-000905 and TA-NWF-001357.

4.2. Common Channel Signaling (CCS) Network Interface Specification

4.2.1. Calling Party Number (CPN) Description

The Calling Party Number (CPN) is used to identify the specific station set originating a call. The CPN also contains a presentation bit, which denotes whether the information has been marked presentation allowed or restricted by the end user.

Ameritech will include CPN in all SS7 setup messages, originating either direct from the end office or when delivered to the ICN via the access tandem when no interworking occurs.

4.2.2. Charge Number Description

The charge number parameter is the equivalent of the "ANI" information available today with MF Feature Group D. This parameter is contained in the Initial Address Message and the Originating Line Information Parameter (OLIP). Ameritech is capable of including the charge number

in all SS7 setup messages, originating either direct from the end office or when delivered to the ICN via the access tandem when no interworking occurs.

4.2.3. Originating Line Information Parameter Description

The Originating Line Information Parameter (OLIP) is the binary equivalent of the "II" information digits available today with MF Feature Group D. This information reveals the originating line class of service. The OLIP is sent to the ICN with the charge number.

Ameritech is capable of including the originating line information parameter in all SS7 setup messages, originating either direct from the end office or when delivered to the ICN via the access tandem when no interworking occurs.

4.2.4. Carrier Selection Indicator Description

The carrier selection indicator provides information concerning the Interexchange Carrier selection desires of the end users. In addition, this parameter describe whether the IXC selected was pre-subscribed, or whether the calling end user input the selected carrier information in the dialing sequence.

Ameritech will include the carrier selection indicator in all SS7 setup messages, originating either direct from the end office or when delivered to the ICN via the access tandem when no interworking occurs.

For additional information, these "optional" parameters are described in Switching System Requirements for Interexchange Carrier Interconnection Using the Integrated Services Digital Network User Part, TR-TSY-000394.

4.3. Additional Parameters Supporting Integrated Services Digital Network (ISDN)

4.3.1. Generic Address Parameter (GAP) Description

The Generic Address Parameter (GAP) is similar to that of the Calling Party Number (CPN) parameter but includes additional fields for "types of address." The four (4) types of possible combinations of numbers for transport are: Network Provided (NP) number only; User Provided, Passed network Screening (UPPS) number only; User Provided, Failed network Screening (UPFS) number and an NP; User Provided, Not Screened (UPNS) and an NP. The GAP is used to transport the user provided (UP) number.

The Ameritech network does not support the GAP nor the transport of user provided number at this time.

4.3.2. Access Transport Description

The SS7 Access Transport Parameter (ATP) is used to carry information elements received from an originating ISDN access transparently through the SS7 network to the terminating Stored Program Control Switching System (SPCS) STP. The following information elements should be included in the SS7 ATP if delivered to the SS7 network from the originating ISDN access and the selected IXC, if any, is allowed to receive the ATP: Called Party Subaddress, Calling Party Subaddress, Low Layer compatibility, High Layer Compatibility, and Progress Indicator.

Ameritech will included the Access Transport Parameter in the call setup message if an ISDN user provides any elements that is contained in the ATP. The ATP may also be included in the Address Complete, Answer and Call Progress messages. It is expected that the ATP is transparently transported through the SS7 network when provided.

For additional information, these “optional” parameters are described in switching Systems Requirements Supporting ISDN Access Using the ISDN User Part, TR-NWT-000444, Issue 2, November 1990.

4.4. Tones And Announcements Description

When inband signaling is used, Tones and Announcements are generally furnished by the end office or tandem switch which encounters the blocking situation. The switch may be on the terminating, intermediate, or the originating segment of the call. When SS7 is used to establish an end to end connection, the terminating switch has the ability to release some connections (e.g., busy condition) back toward the originating end of the call. The originating switch can then provide the appropriate tone or announcement, allowing the trunks to be used for subsequent revenue producing calls.

When a call connection is established using both CCS and inband signaling (interworking), and if the switch recognizing the blocking condition has SS7, the tone and announcement can be furnished by the SS7 equipped switch or the call can be released backward toward the last switch with SS7. Appendix C identifies Ameritech release back treatment for all SS7 calls and interworked calls.

Ameritech will provide a release with cause to enable the originating end of the call to provide the appropriate response for the specific cause.

Ameritech is cooperatively working with the industry in the Ordering & Billing Forum (OBF), Network Operations Forum (NOF), and T1S1.3 Standards to resolve issues associated with Tones and Announcements. If industry agreements require a change to the Ameritech position, Appendix C of the document will be updated.

5. CAPABILITY RELATED PROTOCOL

5.1. ISDN User Part Internetwork Call Control Protocol

This section describes the internetwork call control portion of ISDN User Part protocol. Ameritech intends to be fully compliant in TR-TSV-000905 and TA-NWF-001357.

Ameritech's switch manufacturers are working to adhere to these switch specifications. Appendix A details variations that exist between the procedures contained in the Switching System Requirements for Call Control Using the Integrated Services Digital Network User Part, TR-TSY-000317, switch specification TR-TSY-000394 and TR-NWT-000444, and vendor products used within Ameritech's network. Ameritech does not consider these variations to be significant enough to preclude or delay CCS network interconnection.

It is expected that the ICN will pass all unrecognized parameters unchanged to the terminating interface as received from the originating interface.

5.1.1. Continuity Check

Ameritech's call setup requirements state that a switch should be able to perform continuity checks on 1 out of 'n' calls, where n is an integer between one and sixteen. Ameritech switches are able to support integer values of one, eight and sixteen. Therefore continuity test initiation can be performed on a none, every, each eighth and each sixteenth call frequency basis.

Ameritech plans to configure switches to perform continuity testing 100% of the time on all analog trunks and on a one of eight frequency for digital trunks. This is consistent with NOF agreements.

Ameritech does not require that a circuit continuity check test be performed for SWF-DS1 calls.

5.1.2. Resume Message

Origination

Ameritech supports the usage of these procedures as it is consistent with the end users understanding of call control procedures. This message will be presented to the interface toward the ICN for those situations when an end user has reconnected to a call after a Suspend message has been sent, and before the expiration of timer TSUS,r. This message will be originated when the Ameritech switch is the terminating switch in the call connection.

Subsequent Signaling

It is expected that the ICN will support these procedures and pass the resume message unchanged when delivered to the interface. This message will be sent in the backward direction toward to originating switch. The resume message should be coded as described in TR-TSV-000905.

5.1.3. Suspend Message

Origination

Ameritech supports the usage of these procedures as it is consistent with the end users understanding of call control procedures. This message will be presented to the interface toward the ICN for those situations when an end user has disconnected from a call before a release message has been received for this circuit. This message will be originated when the Ameritech switch is the terminating switch in the call connection.

Subsequent Signaling

It is expected that the ICN will support these procedures and pass the suspend message unchanged when delivered to the interface. This message will be sent in the backward direction toward the originating switch. The suspend message should be coded as described in TR-TSV-000905.

5.1.4. Call Progress Message

The Call Progress (CPG) Message is sent in the backward direction from the terminating exchange to indicate call progress information for a call terminating to an ISDN access subscriber. Once the CPG has been received, the set of possible messages includes the Answer and the Release message. The cause indicator parameter is included in the CPG if the CPG is sent because the call is cleared at the terminating ISDN interface after an in-band tone has been generated. The cause indicator parameter contains information on why the call was cleared at the terminating ISDN interface.

5.1.5. Confusion Message

The Confusion Message (CFN) may be sent in either direction to inform the adjacent switch in a call connection that an unrecognized SS7 message has been received (from the adjacent switch) for the call. Ameritech will be prepared to receive a CFN from an ICN, but whether an ICN sends a CFN to Ameritech is the option of the ICN. Whether Ameritech sends a CFN to an ICN will be based on bilateral agreement between Ameritech and the ICN.

5.2. Initial Address Message

5.2.1. User Service Information Parameter

To support ISDN access, the Initial Address Message (IAM) will contain a new parameter, the access transport parameter. The user service information parameter coding that may be used is speech, 3.1 kHz audio, 64 kbps unrestricted digital information, or unrestricted digital information rate adapted from 56 kbps as described in TR-TSV-000905. In addition, the user service parameter coding may be 384 kbs, 1536 kbps, or multirate (64 kbps base rate) as described in TA-NWF-001357.

5.2.2. Call from ICN to BCC Network (Network of Origination Unknown)

It is expected that the ICN will pass all additional parameters, unchanged to the terminating interface as received from the originating interface.

5.3. Transaction Capability Application Protocol (TCAP)

This section describes the services that Ameritech offers or intends to offer and the associated Translation Type Number (TTN) value. The Transaction Capability Application Protocol (TCAP) layer of the protocol is used to pass the TTN values of the services supported by Ameritech's network to the ICNs that it is interconnected with. Appendix B lists the services and TTN values supported by the Ameritech network.

5.3.1. Calling Name Delivery

CNAM is an optional central office that allows a subscriber to identify the point of origin, based on the associated name, from which the call is being made. The name associated with the calling number is sent to the subscriber to be displayed on their equipment. CNAM may be activated, or deactivated. CNAM is a companion service to Caller ID which delivers the calling number, as opposed to the calling name. The CNAM service can be utilized only when both the originating and terminating lines are within the CCS/SS7 signaling area and the terminating central office is equipped with the CNAM feature. Bellcore TR-NWT-001188 describes the CNAM features and Bellcore Communications Research (Bellcore) TR-TSY-000030 describes the CNAM network interface.

ICNs that interconnect to Ameritech's network for the purpose of validating queries in support of Calling Name services are required to use the TTN value of 005.

5.3.2. Ameritech Message Signaling Interface - Expansion

The Ameritech Message Signaling Interface - Expansion is a feature that will use the Common Channel Signaling (CCS) network to pass parameters from the subscriber's office to the Message Storage System (MSS) service providers network. These services are currently defined in ANSI standards as Message Waiting Indicator Control and Notification for ISDN access and Voice Messaging Waiting Indication Control for analog access. The parameters are sent with call set-up messages from the subscriber to the MSS. The Ameritech Message Signaling Interface - Expansion service are applications that also will use the Transaction Capabilities Applications Part (TCAP) layer of the protocol. The TCAP layer is used to pass parameters from the MSS to the subscriber's office to activate/deactivate an indicator on the status of the subscriber's message waiting indicator. Global Title Translations (GTTs) are done at one or more STPs to identify the network node that serves the subscriber's Called Party Address (NPA-NXX). For further, information on the AMSI-E Interface please see AM-TR-OAT-000065 Ameritech Message Signaling Interface (AMSI) and Ameritech Message Signaling Interface - Expansion (AMSI-E).

ICNs that interconnect to Ameritech's network for the purpose of sending queries in support of AMSI-E services are required to use the TTN value of 7.

5.3.3. Advanced Custom Calling Service

Features known at Ameritech as advanced Custom Calling Services (aCCS) have been developed by Bellcore (known as Custom Local Area Signaling Services [CLASS]) for residence and small business customers. In 1989, Ameritech began deploying aCCS features. The aCCS features Automatic Callback, Repeat Dialing, Caller ID, Call Screening and Distinctive Ringing are deployed in Ameritech. The Bellcore Communications Research (Bellcore) TR's that describe the Ameritech aCCS features are (Bellcore name shown in parenthesis): Automatic Callback (Automatic Recall, TR-TSY-000227); Repeat Dialing (Automatic Callback, TR-TSY-000215); Caller ID) Calling Number Delivery, TR-TSY-00003); Call Screening (Selective Call Rejection, TR-TSY-000218); Distinctive Ringing (Distinctive Ringing/Call Waiting, TR-TSY-000219).

ICNs that interconnect to Ameritech's network for the purpose of validating queries in support of aCCS services are required to use the TTN value of 251.

5.3.4. Alternate Billing Service

Alternate Billing Service (ABS) provides real time billing validation for customers placing intraLATA calls billed to a telephone calling card, billed to a third number, or placed collect. This validation was accomplished by integrating the Operator Services Systems (OSS) into the Ameritech signaling network. Ameritech first developed its Line Information Data Base (LIDB)

in March 1989, and completed the transition from AT&T's Billing Validation Database (BVA) for intraLATA billing validation of Ameritech billing data within the region in August, 1989.

ICNs that interconnect to Ameritech's network for the purpose of validating telephone calling cards are required to use the TTN value of 253.

5.3.5. 800 Data Base

800 Data Base Service is a service in which the treatment of a call depends on the end user dialed number with the Service Access Code of 800. Ameritech will then translate the dialed 800 number to determine either the ICN or the actual POTS number to which the call should be routed.

ICNs that interconnect to Ameritech's network for the purpose of accessing Ameritech's 800 Data Base to translate an 800 Service Access Code to an dialable telephone number are required to use the TTN value of 254.

5.4. Nx64

Ameritech network protocol messages and protocol procedures for the nxDS0 (n is from 2 to 24) multi-rate connections will be consistent with Common Channel Signaling (CCS) Network Interface Specification Supporting Switched DS1/Switched Fractional DS1 Service Capability, TA-NWT-001357, which complements TR-TSV-000905.

6. PHYSICAL LEVEL SPECIFICATIONS

6.1. Diverse Physical Facility Paths

Physical CCS link diversity is necessary to achieve the SP to SP availability objective specified in Section 7 of TR-TSV-000905.

6.1.1. Diversity Definition

Physical diversity of CCS link facilities requires the link to be diverse both inside the central office and outside the central office. Diversity for the signaling link inside the central office means electronic diversity with exception for power (battery) and timing (synchronization) devices.

Diversity for the signaling link outside the central office means physical and electronic diversity. This means that two links are physically diverse outside the office if they do not share ducts, conduits or trench in addition to being electronically diverse as described above. Furthermore, no two links can share the same fiber route and still be considered on physically diverse routes.

Three-way physical diversity is defined as no more than two links share the same ducts, conduits, fiber or trench.

The exception to this guideline may apply to building entrances, circuit distribution frames, power plants and some signaling points.

7. PERFORMANCE

It is Ameritech's objective to be compliant with the 10 minute downtime objective as described in Section 7 of TR-TSY-000905. Furthermore, Ameritech expects each ICN interconnecting to its network to have the same objectives and to be pro-actively working to meet these objectives.

8. MAINTENANCE & TESTING

Guidelines for testing SS7 are being established and documented in the Common Channel Signaling Interconnection Operations Guidelines, TA-TAP-001004. These guidelines have been agreed upon by the industry in the Network Operations Forum.

8.1. Ameritech Position - Testing Procedures

Ameritech will adhere to the testing guidelines established in Section 8 of TR-TSV-000905 Supplement 1, June 1991. Ameritech also will consider performing tests not included in Section 8 or eliminating some of the suggested tests. The determination of what tests to be performed should be negotiated between the two companies at a joint planning session held prior to initial interconnection. Ameritech and the industry supports and encourages the use of these planning sessions to formulate an interconnection process.

8.2. Channel Service Unit (CSU) - No DSOA Interface

The ability of the CSU to provide a loop back on a link will provide substantial assistance to the technician in sectionalizing a trouble. The appropriate CSU should be installed at both ends of the interconnecting links except where a DS0A interface is available (see Section 8.3). To support this testing capability, ICNs connected to the Ameritech network are required to support the Latching and Loopback testing capabilities.

8.3. DSOA Interface

The DS0A interface is available on some STP and SP architectures. The DS0A allows a loop back for trouble sectionalization and will eliminate the need for a CSU at that end of the link.

9. ACRONYM LIST

ABS - Alternate Billing Service

aCCS - advanced Custom Calling Services

ALC - A Link Concentrator

AMSI-E - Ameritech Message Signaling Interface - Expansion

ANI - Automatic Number Identification

ASR - Access Service Request

AT - Access Tandem

ATP - Access Transport Parameter

BCC - Bellcore Client Company

Bellcore - Bell Communication Research

CCITT - Consultative Committee International Telephone and Telegraph

CCS - Common Channel Signaling

CFN - Confusion Message

CLASS - Custom Local Area Signaling Services

CNAM - Calling Name Delivery

CPG - Call Progress Message

CPN - Calling Party Number

CRM - Circuit Reservation Message

CSU - Channel Service Unit

DNAL - Dedicated Network Access Link

DS0A - Digital Signal Level 0A (64 kbps)

DS1 - Digital Signal Level 1 (1.544 Mbps)

EC - Exchange Carrier

EO - End Office

ESP - Enhanced Service Provider

FGB - Feature Group “B”

FGD - Feature Group “D”

GAP - Generic Address Parameter

IAM - Initial Address Message

IXC - Interexchange Carrier

ICN - Interconnecting Network

INC - International Carrier

INTER - MF-SS7 Interworking

ISDN - Integrated Services Digital Network

ITC - Independent Telephone Company

LATA - Local Access and Transport Area

LEC - Local Exchange Carrier

LERG - Local Exchange Routing Guide

LIDB - Line Information Data Base

MF - Multifrequency

NOF - Network Operations Forum

NP - Network Provided Number

OBF - Ordering and Billing Forum

OLIP - Originating Line Information Parameter

ORIG - Announcement Played at the Originating End of the call

OSS - Operator Services Systems

POTS - Plain Old Telephone Service

RBOCS - Regional Bell Operating Companies

SCP - Service Control Point

SP - Signaling Point

SPCS - Stored Program Control Switching System

SPOI - Signaling Point of Interface

SS7 - Signaling System Number Seven

STP - Signal Transfer Point

SWF-DS1 - Switched DS1/Switched Fractional DS1 Service

TCAP - Transaction Capability Application Protocol

TERM - Announcement Played at the Termination End of the call

TTN - Translation Type Number

UPFS - User Provided Failed Network Screening Number

UPNS - User Provided Not Screened Number

UPPS - User Provided Passed Network Screening Number

10. REFERENCES

1. Common Channel Signaling (CCS) Network Interface Specification, TR-TSV-00095, Issue 2, December 1992.

2. Bell Communications Research Specification of Signaling System Number 7, TR-NPL-000246, Issue 2, 1992.

3. Switching System Requirements for Call Control Using the Integrated. Services Digital Network User Part (ISDNUP), TR-TSY-000317, Issue 2, November 1990.

4. Switching System Requirements for Interexchange Carrier Interconnection Using the Integrated Services Digital Network User Part (ISDNUP), TR-TSY-000394, Issue 2, November 1990.

5. Switching System Requirements Supporting ISDN Access Using the ISDN User Part, TR-NWT-000444, Issue 2, November 1990.

6. Common Channel Signaling (CCS) Interconnection Guidelines (Section 8 of TR-TSV-000905), TA-TAP-001004, Issue 1, June 30, 1989.

7. Common Channel Signaling (CCS) Network Interface Specification Supporting Integrated Services Digital Network (ISDN), TR-TSV-000962, Issue 1, September 1990.

8. Common Channel Signaling (CCS) Network Interface Specification Supporting Switched DS1/Switched Fractional DS1 Service Capability (SWF-DS1), TA-NWT-001357, Issue 1, April 1993.

Any questions regarding this document, please contact the APEx Help Desk at 847-248-4328.

APPENDIX A - APPENDIX A

Exception A: 4ESS and 5ESS

When an IXC hands a call off to a LEC at the terminating LATA boundary, and the called party address fails screening in the LEC switch, neither a circuit group indicator nor the received coding of the “ISDN-UP Indicator” bit is used to determine whether a Release Message should be returned to an IXC, or a tone/announcement should be provided by the LEC switch. If the call fails screening, the call is released back to the IXC.

Exception B: 4ESS and 5ESS

Unrecognized optional parameters are discarded and spare bits are recoded to “0”. Network specific messages and parameters are discarded at gateway switches and network specific codes within parameters are recoded.

Exception C: 4ESS

FGB/950 calls and cut-through calls can not be interworked between EAMF and SS7 at a 4ESS AT. Under interworking these calls require the ST’, ST” or ST’” MF signals be either received at the switch if the incoming trunk is EAMF, or sent if the outgoing trunk is EAMF. when EMAF is used on both the incoming trunk and the outgoing trunk, the 4ESS switch serving as an AT can support these calls because these signals are present in the second inband sequence which passes transparently through the AT. They pass transparently because the incoming trunk is cut through to the outgoing trunk and thus the 4ESS switch does not process these signals. To interwork these calls between EAMF and SS7, the switch would need to receive or send these signals. The current hardware and firmware is not capable of sending or receiving these signals.

Exception D: 4ESS

When interworking SS7 to inband signaling to a Feature Group B carrier, the AT should wait for the IXC to return a wink before sending an Address Complete Message (ACM) to the end office. A 4ESS AT switch does not wait for the wink before returning the ACM.

Exception E: 4ESS and 5ESS

The Charge Number Parameter and Calling Party Number Parameter (CPN) are both sent even when CPN and ANI are the same. However, it serving as an AT, they will accept CPN and OLIP and use CPN as ANI, per TR-TSY-000394, if the call is interworked to EAMF.

Exception F: 1AESS

Only 10 digits will be sent for Calling Party Number. If 10 digits are not available, then CPN will not be sent. However, serving as an AT, 1AESS switches will pass a CPN parameter containing 10, 6, or 3 digits.

Exception G: 1AESS

Since Feature Group B calls to FGB carriers are not supported by the 1AESS switch, there has been no provision made for FGB on SS7. A form of 950-WXXX calls are supported for FGD carriers.

Exception H: 1AESS, 4ESS, 5ESS

Timers “Texm” and “Tcrm” are specified to be recent changeable, with ”Texm” able to range from 3-5 seconds and “Tcrm” able to range from 3-4 seconds. Timer “Texm” is the time to wait at an end office, after sending an IAM to an AT, for an Exit Message or other appropriate signal. Timer “Tcrm” is the time to wait at an AT for a Circuit Reservation Acknowledge Message, after sending a Circuit Reservation Message. for the 1AESS switch, timers “Texm” and “Tcrm” are fixed to 4 seconds and 3 seconds, respectively. The 5ESS switch does not use the “Texm” timer and sets the “Tcrm” timer to 3 seconds. The guard that the 5ESS switch uses instead of “Texm” for lost or missing signals is timer “Tiam”. The 4ESS switch is not an end office and thus should not provide timer “Texm”; if fixes timer “Tcrm” to 3 seconds.

Exception I: 4ESS and 5ESS

At an AT, timer Texm,d should be started after sending an IAM to the IXC. When either this timer times out or an ACM, ANM, or REL message is received in response to the IAM, the AT should formulate and send an EXM message to the SS7 EAEO. These switches will not implement Texm.d. Upon Sending the IAM, the EXM message is sent back to the end office.

Exception J: 1AESS, 4ESS and 5ESS

The count of IAMs received from an IXC with a message priority other than 01 is not made.

Exception K: 1AESS, 4ESS and 5ESS

The Carrier Selection Parameter is not supported. Presubscription is not supported, and the protocol to support it is not supported, either in the equal access MF protocol, or the SS7 protocol. However, a CCS7 based feature without MF operation or the interworking of MF and CCS7, will be developed.

Exception L: 4ESS and 5ESS

Recording of CPN is not provided in the originating LATA. Recording of charge number and CPN is not provided in the terminating LATA.

Exception M: 4ESS

The called party number nature of address indicator designated “950+ call from local exchange carrier public station or hotel/motel line or non EAEO”, should be coded 1110110. The 4ESS switch as an access tandem will accept this code but will recode it to “subscriber number” (0000001).

Exception N: DMS100

The Northern Telecom DMS100 is capable of handling the receipt of the confusion message but will not generate this message.

APPENDIX B - APPENDIX B

TTN Number	Ameritech Service Name
005	Calling Name Delivery (planned)
007	Ameritech Message Signal Interface – Expansion
251	advanced Custom Calling Services
253	Ameritech Alternate Billing Service
254	800 Data Base

APPENDIX C - APPENDIX C

To reach consistency within the industry, Ameritech has agreed with the other Regional Bell Operating Companies (RBOCs) to provide a unified treatment of released back calls. Recognizing that the RBOCx are a subset of the industry, the agreement provides an interim plan until the industry agrees to a long term plan. The following matrix identifies the Ameritech treatment for Tones and Announcements that will be released back toward the originating end of the call for the interim and the long term plan:

	INTERIM@		LONG TERM*		CAUSE
EVENT	SS7	INTER	SS7	INTER	VALUE
Unallocated Number	Term	Term	Term	Term	1
No Route to Destination	Term	Term	Orig	Orig	3
User Busy	Term	Term	Orig	Orig	17
Number Changed	Term	Term	Term	Term	22
Destination Out of Order	Term	Term	Term	Term	27
No Circuit Available	Term	Term	Orig	Orig	34
Temporary Failure	Term	Term	Orig	Orig	41
Switching Equipment Congestion	Term	Term	Term	Term	42
Resource Unavailable Unspecified	Term	Term	Orig	Orig	47

@ Will be implemented by 1/31/93

- Will be deployed 3 years port Industry Agreement at NOF

Term - Treatment is provided by the Terminating Network
Orig - Treatment is provided by the Originating Network