

**Interface Document
BID-0003
June 1990**

**ISDN Basic Rate Access
Terminal-to-Network Interface**

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DOCUMENT HISTORY

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1.0 SERVICE DESCRIPTION

This specification describes the Bell Canada **ISDN BRA** network interface. The interface will apply in customer trials scheduled for the second half of 1990.

The scope of this document is limited to **ISDN BRA** as it relates to Bell Canada's Centrex III telecommunications environment.

Bell Canada's **ISDN BRA** trials will be based on the Northern Telecom DMS-100 Central Office switch. The interface requirements are defined in relevant portions of the following Northern Telecom publications, and the clarifications contained in this document:

1. NIS S208-5, Issue 1.0 "ISDN Basic Rate Access Interface Specification"
2. NIS D302-1, "T-link Protocol for Rate Adaptation Over a 64 kbps Channel"

These Northern Telecom publications were developed to include markets in addition to Bell Canada, and thus contain information which is not applicable within Bell Canada.

They may be obtained from:

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This document specifies technical requirements at the **ISDN BRA** interface which are necessary to access the identified basic call, and supplementary service capabilities.

2.0 FEATURE DESCRIPTION

Bell Canada's **ISDN BRA** service capabilities are based on **ISDN BRA** standards.

The circuit-mode digital switching systems operate at a fundamental rate of 64 kbps and the transmission capability is provided in the same units (i.e., 64 kbps). In the Bell Canada network, existing facilities may limit the information transfer rate to 56 kbps, therefore, it is essential that customer premise equipment continue to support information transfer at 56 kbps.

The **ISDN BRA** interface provides two 64 kbps B channels and one 16 kbps D channel for user access and call control.

For basic call service capabilities with bearer capability of circuit-switched data or voice, each B channel is switched independently by the network. Some B channels may be permanently connected, e.g., for dedicated access to packet-mode switching services.

The D channel is used for call control and optionally for packet-mode data transfer.

The technical interface specification is categorized, for the purpose of this disclosure document, in the following manner:

- Physical Layer
- Data Link Layer
- Network Layer

2.1 Physical Layer

The physical layer is as specified in NIS S208-5, Issue 1.0, Section B, with the following clarifications:

1. The physical point of connection to the **ISDN BRA** interface is a jack as specified in Sub-section 4.2.2.
2. The interface will be the 2B1Q μ interface as described in Sub-section 2.

The U interface physical layer specification is based on the CAN/CSA T541 draft standard.

2.2 Data Link Layer

The data link layer supports both static and dynamic TEI assignment and is as specified in NIS S208-5, Issue 1.0, Section C. This layer is based on the CAN/CSA T542 draft standard.

The D channel packet-mode data service capability will be supported with a SAPI 16 end point at the Data Link Layer, as specified in NIS S208-5, Issue 1.0, Section F, Sub-section 3.2. For the trial, this optional packet-mode capability will be supported only with the pre-assigned (e.g., static) type of TEI.

2.3 Network Layer

Two alternative signalling mechanisms are available at the network layer. The first of these signalling alternatives utilizes functional call control and is referred to, in this document, as network layer - functional. The second alternative is referred to here as network layer - stimulus, which provides access to the complete set of Centrex III voice service capabilities. The service capabilities accessible over the **ISDN BRA** interface fall into two categories, namely the basic call, and supplementary service capabilities.

Basic call capabilities for "network layer - functional" are referred to here as either circuit-switched voice or circuit-switched data. Circuit-switched voice is either a speech or a 3.1 kHz audio bearer capability. The 64 kbps unrestricted, the 64 kbps unrestricted rate adapted from 56 kbps, and the 64 kbps restricted bearer capabilities are circuit-switched data.

2.3.1 Network Layer - Functional

Basic Call Service Capabilities

The network layer specification for functional call control on the **ISDN BRA** is as defined in Section D of NIS S208-5, Issue 1.0, with the following clarifications:

1. The **ISDN BRA** interface will not support carrier or transit network selection.
2. The network will select the appropriate facilities to match the bearer capabilities requested by the user.

3. The **ISDN BRA** service capabilities normally provided are circuit-switched voice and data. The "nailed-up" (dedicated) B channel, and the packet-mode data service capabilities are optional. They may be requested at subscription time.
4. The packet-mode service capabilities are as specified in Section F of NIS S208-5, Issue 1.0, with the exception that SDLC services will not be supported. Access to packet-mode services is supported in the B and D channel in accordance with CAN/CSA T544 standard except the packet-mode bearer capability is not supported in SETUP messages at this time. HDLC flag stuffing is required when using a dedicated B channel connection to the public packet switched network (DataPac). DataPac network addressing conforms to CCITT Recommendation X.121. The address format requires a 1 prefix to distinguish local and international calls.
5. Circuit-switched B channel can be used to access public packet-switched services. T-Link rate adaptation is required as specified in NIS D302-1.

The network layer specification is based on the dpANS T1.607 standard for circuit-mode and on the dpANS T1.608 standard for packet mode.

Supplementary Service Capabilities

Firm standards for supplementary service protocols are not currently available from CCITT, T1S1, or CSA. Bell Canada does not plan to support supplementary services using Network Layer - Functional procedures prior to their standardization by these committees.

2.3.2 Network Layer - Stimulus

Basic Call and Supplementary Service Capabilities

The network layer specification for stimulus signalling is as defined in NIS S208-5, Issue 1.0, Section I, and is known as Meridian Feature Transparency (MFT).

This signalling mechanism supports all of the Centrex III voice service capabilities that are accessible from Bell Canada's Centrex III business sets.

APPENDIX A

Draft Canadian Standards

1. CAN/CSA T544 "Minimal Set of Bearer Services for the Basic Rate Access Interface".
2. CAN/CSA T542 "Integrated Services Digital Network - Data Link Signalling Specification for Application at the User-Network Interface".
3. CAN/CSA T541 "Integrated Services Digital Network - Basic Access Interface for Use on Metallic Loops for Application on the Network Side of the NT (Layer 1 Specification)".

dpANS Standards (in T1 ballot process)

1. dpANS T1.607 "Digital Subscriber System No. 1 (DSS1) - Layer 3 Signalling Specification for Circuit Switched Bearer Service".
2. dpANS T1.608 "Digital Subscriber System No. 1 (DSS1) - Layer 3 Signalling Specification for X.25 Packet-Switched Bearer Service".
3. dpANS T1.610 "ISDN - Generic Procedures for the Control of the ISDN Supplementary Services".

APPENDIX B

kbps:	kilobits per second
BRA:	Basic Rate Access
CCITT:	The International Telephone and Telegraph Consultative Committee
CSA:	Canadian Standards Association
dpANS:	draft proposed American National Standard
HDLC:	High Level Data Link Control
ISDN:	Integrated Services Digital Network
MFT:	Meridian Feature Transparency
NIS:	Network Interface Specification
T1:	Committee T1 of the Exchange Carrier Standards Association
T1S1:	Technical Sub-Committee S1 of Committee T1
TEI:	Terminal Endpoint Identifier
SAPI:	Service Access Point Identifier
SDLC:	Synchronous Data Link Control
2B1Q:	Two Binary One Quaternary