NEC

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NEAX® 2000 IVS²
INTEGRATED VOICE SERVER
ISDN Features and Specifications

APRIL, 2000

NEC America, Inc.

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NEAX2000 IVS^2
ISDN Features and Specifications

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SUPPORTED NETWORK SERVICES
(TRUNK PRE-PROVISIONED ONLY)

AT&T

- Software Defined Network
- Global Software Defined Network
- International 800 Service
- International MEGACOM®

Also, AT&T's Alternate Destination Call Redirection fearure is supported by the NEAX2000 IVS^2.

NT

- Incoming **Note**
  -Private
  -Tie
  -WATS
  -800WATS
- Outgoing **Note**
  -DID/DOD

Note: *Services that do not require NSF can be supported by the NEAX2000 IVS^2.*

ISDN NETWORK REQUIREMENTS FOR LAYER ONE (1)

- Interface: T1(1.544 M) only
- Framing: ESF (24 Multiframe) only
- Line Coding: B8ZS only
- D Channel Rate: 64K only
- D Channel: T1 Channel Number 24 (24th channel).

Individual B channels cannot be looped back, local or remote.

TABLE OF FEATURES

FEATURE	X = available → = carried over to next level software	
	1900	2000
CALL-BY-CALL SERVICE SELECTION	X	→
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SUB-ADDRESS—PRESENT	X	→
TRUNK PROVISIONING SERVICE SELECTION	X	→

This page is for your notes.

CALL-BY-CALL SERVICE SELECTION

General Description

Services can be selected on a call-by-call basis to all channels of a single PRI interface according to applications. That is, unlike Trunk Provisioning Service in which services are assigned to specific channels, services may be used on any available channel.

Operating Procedure

No manual operation is required.

Service Conditions

1. The services that can be designated include ACCUNET, MEGACOM, MEGACOM 800, INTERNATIONAL 800, SDN, MULTIQUEST (AT&T), and PRIVATE, INWATS, OUTWATS, FX, TIE (Northern Telecom).
2. Channel selection is possible by the LCR function only.

Note: *During call temination, there is no indication of which service is being used.*

CALLED PARTY RECOGNITION SERVICE (DIRECT-IN TERMINATION (DIT))

General Description

This feature provides an incoming Direct-In Termination (DIT) call via an ISDN trunk to be connected to a pre-determined station. This application can be used for a station or modem.

Operating Procedure

No manual operation is required.

Station Application

All stations.

Service Conditions

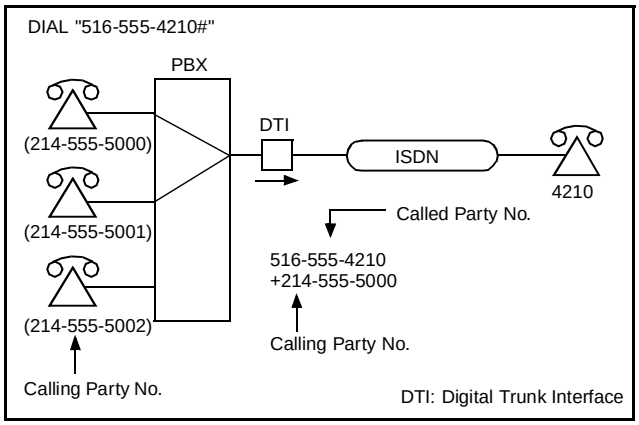
1. For incoming calls in a Primary Rate Interface trunk, this service feature should be used only when DID trunks are not desired.
2. Refer to the Business Features and Specifications manual for details on service conditions.

CPN TO NETWORK–PRESENT

General Description

This feature allows the ISDN network to be informed of the Calling Party Number (CPN) when a call originates from a terminal connected to the System.

For this example, the CPN sent to the network may be 214-555-5000 for every station in the PBX, or each station may present a unique extension number (last four digits) to the ISDN network.



Operating Procedure

No manual operation is required. The calling station number is sent to the ISDN network automatically.

Service Conditions

1. The data provided as the calling station number is assigned via MAT/CAT for each ISDN circuit or station. In addition, if no data has been assigned as the calling station number, the system will not provide any information to the network.
2. A maximum of 16 digits can be assigned as the calling station number.
3. The maximum number of area codes and office code patterns is 15.
4. Transmission of CPN to the ISDN network can be programmed by the Class of Service. Programming is required for each station.
5. The delivery of CPN information is subject to local regulations.

CPN TO TERMINATING USER–DISPLAY

General Description

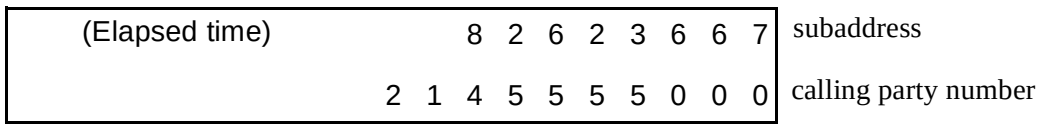
This feature provides a visual display of the originating station's number and subaddress information on a Multiline Terminal for incoming ISDN calls. This provides the terminal user with a quick and accurate way to identify the originating station's number (Calling Number).

Operating Procedure

No manual operation is required. The originating station number is automatically displayed on the Multiline Terminal.

Service Conditions

1. This feature is available on the Multiline Terminal with Display.
2. A maximum of 16 digits forming the originating party's number, including the PBX access code, can be displayed. For subaddress, a maximum of eight digits can be displayed. If the subaddress exceeds eight digits, the first eight are displayed. Below is an example of the display when the originating party's number is 214-555-5000, and the subaddress is 82623667:



3. The CPN will be displayed for six seconds only, followed by date and time.

DID ADDRESSING

General Description

This feature allows incoming ISDN-PRI calls to terminate to stations, ATTCON, Automated Attendant, etc., based on the Called Party number. Direct Inward Dial trunks will be terminated to preprogrammed destinations without Attendant assistance.

Operating Procedure

No manual operation is required.

Station Application

Not applicable.

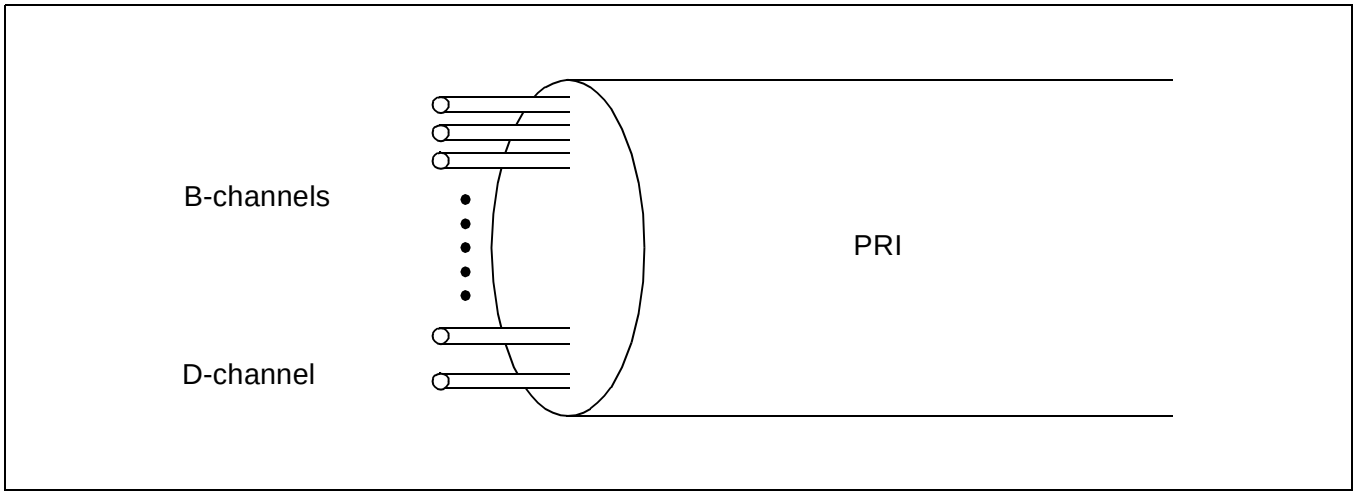
Service Conditions

1. If the network is notified that the destination station for the DID call is busy or a connection-controlled station, the network gives the calling station a Busy Tone. (This depends upon call forwarding services being in service.)
2. If the called station is nonexistent, the DID call can be routed to the Attendant Console, another predesignated station, or to receive Reorder Tone.
3. Refer to the Business Features and Specifications manual for more details of DID service.

DID AND DOD ADDRESSING

General Description

This feature allows the system to use DID and DOD on the same B channels. Trunk Provisioning Service Selection is not required. (B-channels can be used for DID and DOD without separating the trunk routes.)



Operating Procedure

No manual operation is required.

Service Conditions

1. Confirm the DID and DOD selection with the customer's local exchange carrier prior to installation.
2. For more details, refer to "Direct Inward Dialing" and "Direct Outward Dialing" in the Business Features and Specifications manual.
3. The DID/DOD is supported without service provisioning, since no facility indication to the network is required.

EVENT BASED CCIS

General Description

This feature allows a PBX customer that does not have a tie line (or when a customer can not use the tie line due to the busy or fault of the line), to use the various CCIS feature by using the ISDN line as a CCIS virtual tie line, on the 2400 IMX - NEAX2000 IVS^2 connection or the NEAX2000 IVS^2 - NEAX2000 IVS^2 connection.

Operating Procedure

No manual operation is required.

Service Conditions

1. Event Based CCIS is available between NEAX2000 IVS^2 to 2400ICS or NEAX2000 IVS^2 to NEAX2000 IVS^2.
2. The maximum number of virtual tie lines are 16 channels per system. This includes the common signaling channels and voice channels.
3. The ISDN line used for the virtual tie line can also be used as a regular ISDN line.
4. This feature supports voice calls only. (Supported object at PBX transmission side: Single Line Telephone, Multiline Terminal, DID/E&M/Ring Down [analog/T1] tandem calls.)
   The data calls are transmitted via the regular ISDN network.
5. The Peg Count (the number of originating call from the ISDN trunk) is counted when using the ISDN line for the virtual tie line by route basis.
6. Billing information of the virtual tie line using the ISDN line is treated as regular tie line calls.
7. Billing information of the virtual tie line using the ISDN line is treated on tandem calls.
8. The voice channel of the virtual tie line is released at a programmable time after the call finishes.
9. The Common Channel Handler (CCH) card is required for providing Event Based CCIS.
10. The availability of CCIS service features for Event Based CCIS are listed in the following table.
11. For Event Based CCIS using PRI, the following services must be ordered from Telco on the PRI Span:
    a. Each B channel must be capable of making and receiving 64K voice calls.
    b. Each B channel must be capable of making and receiving 64k Unrestricted Digital Data calls.
    c. The ISDN PRI span must be ordered with ISDN Indial (DID) service.
12. The PRI trunks should be ordered with the following components included:
    a. Protocol must be National ISDN-1
    b. Calling and Called Party Sub-Address
    c. NIUF Capability Package S
    d. Two B-channels capable of Voice and Data simultaneously on both B-channels
    e. Two Directory numbers, each with a SPID
13. For any feature that requires a tandem connection (Call-Forward CCIS, etc.), additional Telco BRI circuits are required. More than one BRI trunk is required to allow calls to go back to the PBX that transferred or forwarded a call.

Table 1 CCIS Features Available with Event Based CCIS

SERVICE FEATURE	AVAILABILITY	REMARKS
Attendant Camp-On with Tone Indication-CCIS	X	
Attendant Controlled Conference-CCIS	X	**Note 4**
Brokerage-Hot-Line-CCIS	X	
Busy Verification-CCIS	X	
Call Back-CCIS	X	
Call Forwarding-All Calls-CCIS	X	
Call Forwarding-Busy Line-CCIS	X	
Call Forwarding-Don't Answer-CCIS	X	
Call Forwarding-Intercept-CCIS	X	
Call Forwarding-Override-CCIS	X	
Calling Name Display-CCIS	X	
Calling Number Display-CCIS	X	
Call Transfer-All Calls-CCIS	X	
Centralized Billing-CCIS	X	**Note 2**
Centralized Day/Night Mode Change-CCIS	–	
Consultation Hold-All Calls-CCIS	X	
Deluxe Traveling Class Mark-CCIS	X	
Dial Access to Attendant-CCIS	X	
Direct-in Termination-CCIS	X	
Distinctive Ringing-CCIS	X	
Do Not Disturb-CCIS	X	
Dual Hold-CCIS	X	
Elapsed Time Display-CCIS	X	
Flexible Numbering of Station-CCIS	X	
Hand-Free-Answer Back-CCIS	X	
House-Phone-CCIS	X	
Hot Line-CCIS	X	
Incoming Call Identification-CCIS	X	
Individual Attendant Access-CCIS	X	**Note 5**
LDN Night Connection-CCIS	X	
Link Alarm Display-CCIS	–	
Message Waiting Lamp Setting-Attendant-CCIS	X	**Note 3**

LEGEND
x : Available
– : Not Available

Table 1 CCIS Features Available with Event Based CCIS

SERVICE FEATURE	AVAILABILITY	REMARKS
Message Waiting Lamp Setting-Station-CCIS	X	Note 3
Miscellaneous Trunk Access-CCIS	X	
Miscellaneous Trunk Restriction-CCIS	X	
Multiple Call Forwarding-All Calls-CCIS	X	
Multiple Call Forwarding-Busy Line-CCIS	X	
Multiple Call Forwarding-Don't Answer-CCIS	X	
Night Connection Fixed-CCIS	X	
Night Connection Flexible-CCIS	X	
Outgoing Trunk Queuing-CCIS	–	
Paging Access-CCIS	X	
Restriction from Outgoing Calls-CCIS	X	
Single Digit Station Calling-CCIS	X	
Station Controlled Conference-CCIS	X	Note 4
Station to Station Calling-CCIS	X	
Station to Station Calling-Operator Assistance-CCIS	X	
Toll Restriction-3/6 Digit-CCIS	X	
Trunk Answer from Any Station-CCIS	X	
Trunk to Trunk Restriction-CCIS	X	
Uniformed Numbering Plan-CCIS	X	
Voice Call-CCIS	X	
Voice Mail Integration-CCIS	X	

LEGEND
x : Available
– : Not Available

Note 1: *The voice channel and the common signaling channel stay connected after the calls finish according to the release timer data. Therefore, while the CCIS link is active, the features are available.*

Note 2: *The billing information is sent while the CCH link is active. If the sending of billing information fails, it is sent again when a new CCH link is established by next call.*

Note 3: *As a remote office, this feature is available on NEAX2000 IVS^2.*

Note 4: *An extension of the NEAX2000 IVS^2 cannot be a conference leader.*

Note 5: *This service is available when the Attendant Console is provided at a 2400 IMX office on the network.*

ISDN TERMINAL

General Description

This feature provides the system with an ISDN Terminal or Terminal Adapter (TA). ISDN Terminal to ISDN Terminal, ISDN Terminal to ISDN Trunk, ISDN Trunk to ISDN Terminal, ISDN Terminal to Single Line Telephone, ISDN Terminal to Multiline Terminal, and ISDN Terminal to PS connections are available.

Operating Procedure

No manual operation is required.

Service Conditions

1. The ISDN Line Circuit (ILC) card and the ISDN Channel handler (ICH) card are required.
2. The ISDN Terminal must be locally powered.
3. The following connections are available:
   - Point to Point connection
   - Point to Multipoint connection
   - National ISDN 1
4. The following features are available:
   - Individual Terminal Calling (Point to Multipoint connection)
   - Group Calling (Point to Multipoint connection)
   - Called Party Recognition Service (DIT)
   - DID Addressing
   - DID and DOD Addressing
   - CPN to Network-Present
   - CPN to Terminating User-Display
   - Sub Address-Present
   - Direct Outward Dialing (DOD)
   - Restriction from outgoing call
   - Toll restriction
   - Station to Station Calling
   - Station Hunting
   - Simultaneous voice and data transmission
   - Asynchronous Data Switching
   - Synchronous Data Switching
   - Half/Full Duplex Switchover
5. The ISDN Terminal can provide Voice and data communication via the CCIS network. The CCIS network must be digital.

6. During communication via the CCIS network, the link reconnection is not available.
7. The conditions about station services are as follows:
   - Station Hunting
     When a Single Line Telephone/Multiline Terminal or an ISDN Terminal calls a busy Single Line Telephone/Multiline Terminal, another Single Line Telephone/Multiline Terminal in Station Hunting group is called.
     When a Single Line Telephone/Multiline Terminal or an ISDN Terminal calls a busy ISDN Terminal, another ISDN Terminal in Station Hunting group is called.

   Note: *An ISDN Terminal cannot be included in the same Station Hunting group as Single Line Telephone/ Multiline Terminals.*

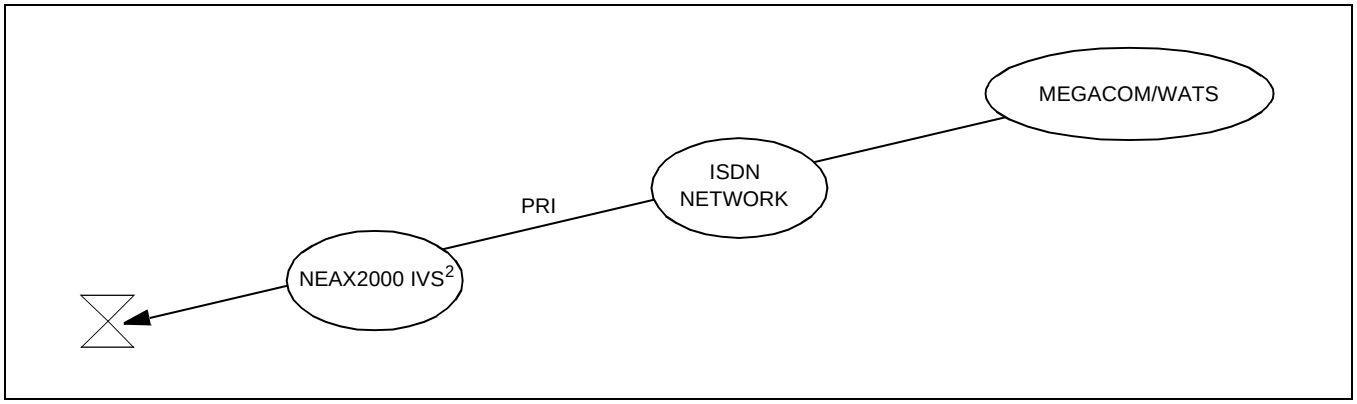
   - Call Forwarding
     An ISDN Terminal cannot set Call Forwarding - All Calls/- Busy Line/-Don't Answer, and cannot be the destination of a Call Forwarding.
     When an ISDN Terminal is a calling station, it can be forwarded to another Single Line Telephone/ Multiline Terminal but cannot be forwarded to central office trunk or tie line trunk.
   - Call Transfer
     A Single Line Telephone/Multiline Terminal cannot transfer a call in progress with an ISDN Terminal to another station.
     In the same way, an ISDN Terminal cannot transfer a call in progress with a Single Line Telephone/ Multiline Terminal to another station.
     While a Single Line Telephone/Multiline Terminal converses with CCIS trunk and ISDN trunk, the Single Line Telephone/Multiline Terminal cannot transfer the call to an ISDN Terminal.
   - Call Pickup, Call Pickup - Designated group
     An ISDN Terminal cannot be assigned to Call Pickup group and cannot pickup a call to another station.
     A Single Line Telephone/Multiline Terminal cannot pickup a call to an ISDN Terminal.
   - Executive Override
     During voice communication between a Single Line Telephone/Multiline Terminal and an ISDN Terminal, another Single Line Telephone/Multiline Terminal can interrupt into only Single Line Telephone/Multiline Terminal. During data communication with an ISDN Terminal, Executive Override is not allowed.
   - Busy Service (Step Call, Call Back)
     When a Single Line Telephone/Multiline Terminal calls a busy ISDN Terminal, busy service such as Step Call and Call Back cannot be provided to the ISDN Terminal.
     It is the same when an ISDN Terminal calls a busy Single Line Telephone/Multiline Terminal.
8. When a Single Line Telephone is calling an ISDN Terminal or an ISDN Terminal is busy, hooking service is not available. Therefore, at this time other services are not available.
9. A Multiline Terminal can call an ISDN Terminal via Primary Extension or Sub Line. And a Multiline Terminal can be called from an ISDN Terminal via Primary Extension or Sub Line.
10. When a Single Line Telephone/Multiline Terminal calls an ISDN Terminal, it can send the calling station number to the ISDN Terminal. At this time, ISDN trunk number and local number are also attached to be sent.
11. Station to Station Calling between an attendant console and an ISDN Terminal is not available.

12. In case of Point to Multipoint connection, a Single Line Telephone/Multiline Terminal must dial ISDN Multipoint station number assigned by CM1B, not the ISDN Terminal number assigned by CM10.
13. When a Multiline Terminal calls an ISDN Terminal or an ISDN Terminal calls a Multiline Terminal, a calling station number is displayed to the calling Multiline Terminal or the ISDN Terminal.
    In case of Point to Multipoint connection, the calling station number displayed is the ISDN station number assigned by CM10.
14. Station to Station Calling between a PS station and an ISDN Terminal is available.
15. Only Preset Dialing can be used from an ISDN Terminal, Overlap dialing is not available.
16. For Event Based CCIS you must have 64K unrestricted digital data connections (circuit mode). The Telephone company cannot overflow these ISDN calls to analog lines.

MEGACOM® ACCESS/WATS

General Description

AT&T's MEGACOM® (WATS) network, as well as WATS from other carriers, can be used.



Operating Procedure

No manual operation is required.

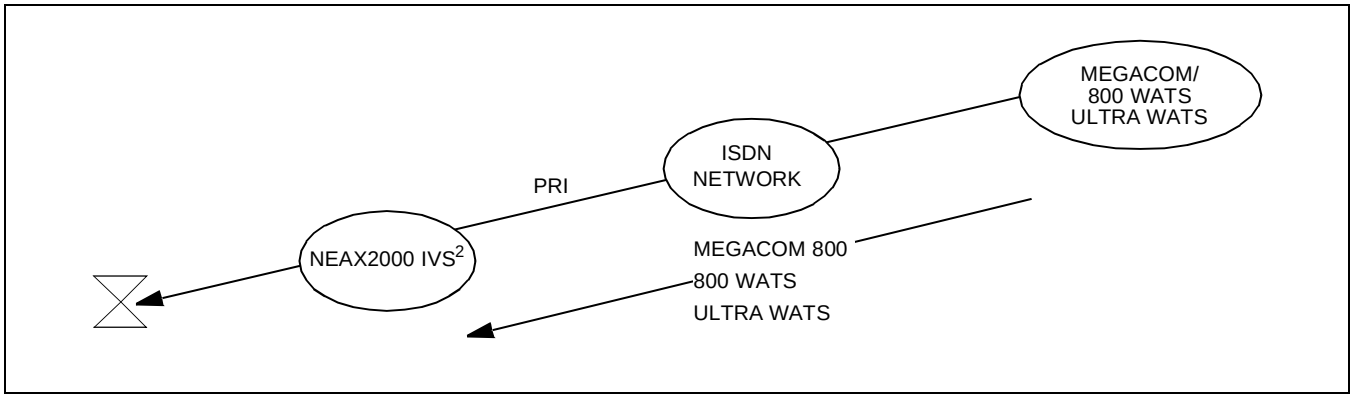
Service Conditions

1. The available WATS service is limited to Maximal Subscribed WATS Band (MSB).
2. No specific band will be indicated to the Network.

MEGACOM® 800 SERVICE/800 WATS ULTRA WATS

General Description

AT&T's MEGACOM® 800 (Inward WATS) network, as well as 800 WATS provided by other carriers, can be used.



Operating Procedure

No manual operation is required.

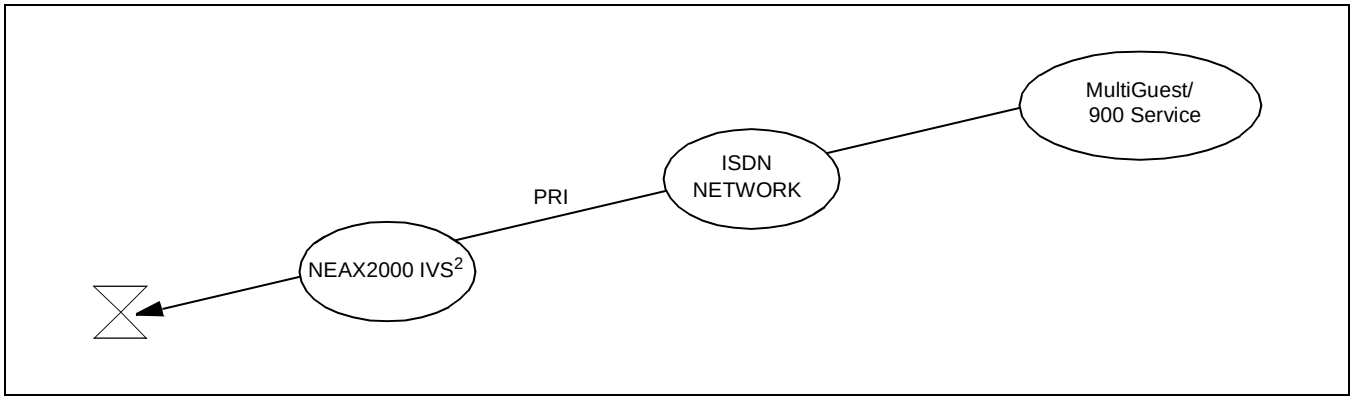
Service Conditions

1. CM76 can be used to convert indialed digits.
2. The Dialed Number Identification Service (DNIS) must match the station numbering plan (CM20).
3. Multiple DNISs are supported.

MULTIQUEST®/900 SERVICE

General Description

AT&T's MultiQuest® service can be used. (It is a "900"-type service.) Also, 900 service provided by other carriers can be used.



Operating Procedure

No manual operation is required.

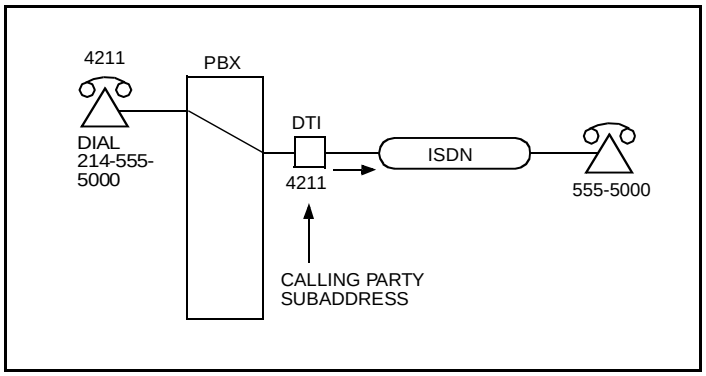
Service Conditions

1. The Dialed Number Identification Service (DNIS) must match the numbering plan (CM20) of the NEAX2000 IVS^2.
2. Multiple DNIS numbers are supported.
3. Command CM76 can be used to convert DNIS digits received from the ISDN Network.

SUBADDRESS–PRESENT

General Description

This feature allows a primary rate interface ISDN trunk to transfer the called party subaddress information to a destination ISDN station when the call is originated by the NEAX2000 IVS^2. Dialing the called party station number and subaddress is required.



Operating Procedure

The calling station dials the ISDN subscriber number (including access code) followed by an asterisk (*), then dials the called party subaddress followed by a pound sign (#). ISDN automatically recognizes the subaddress and transfers the information to the destination party.

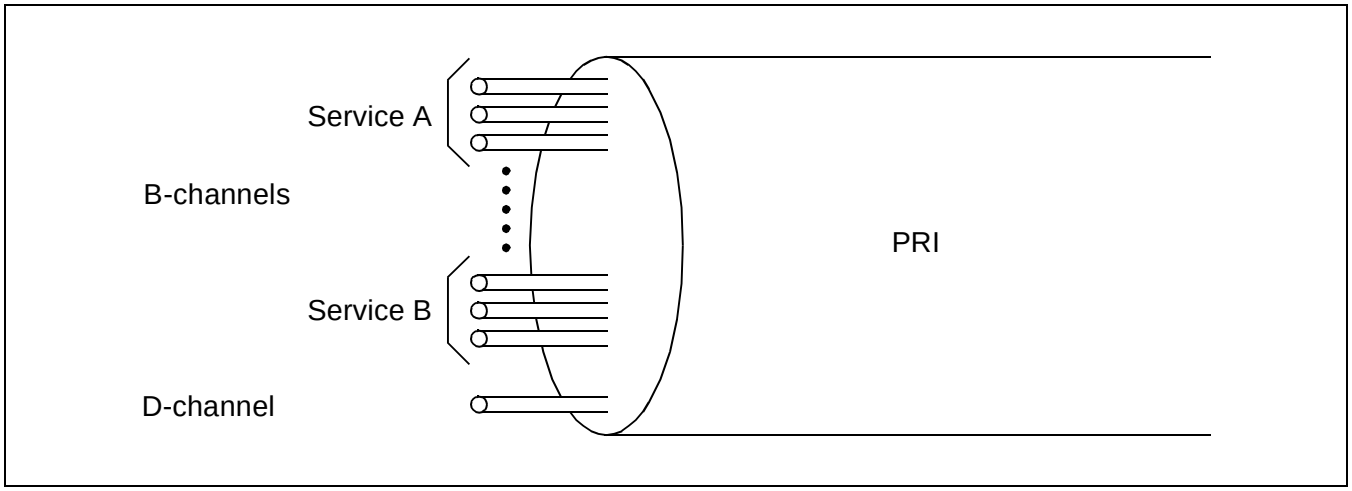
Service Conditions

1. If the calling party fails to dial the called party subaddress, ISDN cannot transfer any called party subaddress information to the destination party.
2. If a calling party does not wish to provide a called party subaddress, the call must terminate with a pound sign (#) (Immediate Start). If a pound sign is not entered, a Timing Start operation begins. The Timing Start uses the interdigit time-out operation.
3. Subaddress dialing is available only on those telephone terminals that can generate push-button (DTMF) signals.
4. The called party subaddress must not exceed eight digits.
5. The called party subaddress can be sent with trunk direct dial access.
6. This feature may cannot be used when a call is originated to ISDN using Speed Calling or Call Forwarding features.

TRUNK PROVISIONING SERVICE SELECTION

General Description

Each channel of a PRI interface can be dedicated to a particular service. Services are designated to specific channels; once designated, a channel can be used only for that service.



Operating Procedure

No manual operation is required.

Service Conditions

- The services that can be designated include MEGACOM®/WATS and MEGACOM® 800/800WATS.
- Arrangement with the carrier at the time of provisioning is needed.

This page is for your notes.

APPENDIX A: D^term FIXED FUNCTION KEYS

Series E	Series III	Description
Answer	ANS	To answer a waiting call
Conf	CNF	To establish three-way conversation
Feature	FNC	To activate terminal setup functions and to program One-Touch Speed Dial/Feature Keys
Hold	HOLD	To place an internal or external call on hold
Recall	LNR/SPD	To terminate established call and re-seize internal dial tone
Redial	RECALL	To active Last Number Call and Speed Calling
Speaker	SPKR	To control the built-in speaker which can be used for Hands Free dialing/monitoring
Transfer	TRF	To transfer established calls to another station, without attendant assistance

APPENDIX B: D^term LCD DISPLAYS

Description	Series E	Series III
Clock/Calendar Display	10:06 PM MON 21 APR 1999	10:06 PM TUE 14
Busy	BUSY XXXX	BUSY XXXX
Restriction	RESTRICT XXXX	RST XXXX
Do Not Disturb	DND XXXX	DND XXXX
Call Forwarding - All Calls	CF ALL XXXX	FDA XXXX
Call Forwarding - Busy Line	CF BUSY XXXX	FDB XXXX
Call Forwarding - No Answer	CF NANS XXXX	FDN XXXX
Call Transfer	TRANSFER XXXX	XFR XXXX
Conference	CONF XXXX XXXX	CNF XXXX XXXX
Non Exclusive Hold	HOLD XXXX	HLD XXXX
Exclusive Hold	E-HOLD XXXX	EHD XXXX
Stack Dial	REDIAL[*/#]/SPEED -1 82625563	RDL[*/#]/SPD -1 82625563