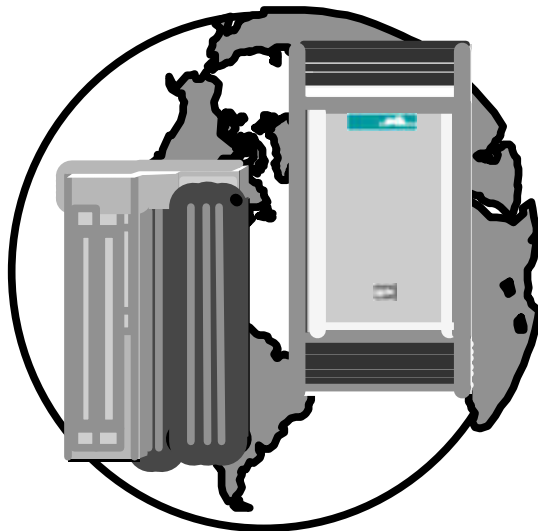


Norstar
Compact ICS and Modular ICS
Release 2.0
Channel Introduction Package



Issue 2.0
July 14, 1997

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i. **Other Related Documents**

This Channel Introduction Package was compiled using information from a variety of sources. The following is a list of other related documents for reference purposes:

- Small Business Solutions, A Guide to DMS-100 MDC Features for Small Business
- DMS Feature Planning Guide
- Understanding Data Communications, Howard W. Sams & Company

The following general ISDN Resources may be accessed via the Internet:

- Dan Kegel's ISDN Page: <http://alumni.caltech.edu/~dank/isdn/>
- North American ISDN Users' Forum (NIUF): <http://www.niuf.nist.gov/misc/nuif.html>

The following service providers offer ISDN specific information which may be accessed via the Internet or 1-800 number:

USA

• Ameritech

www.ameritech.com/products/data/isdn/index.html

Ameritech Team Data Support Center 1-800-TEAM-DATA

• Bell Atlantic

www.bell-atl.com/isdn/sbs

Bell Atlantic ISDN Sales & Technology Center 1-800-570-ISDN

• BellSouth

bsonline.bellsouth.net/cgi-bin/WebObjects/ISDN

BellSouth Data Customer Support Center 1-800-858-9413

• GTE

www.gte.com/isdn/isdn.html

GTE ISDN Help Desk 1-800-GTE-4WCN

• Nynex

www.nynex.com/isdn/isdn.html

Nynex ISDN Hotline 1-800-GET-ISDN

• Pacific Bell

www.pacbell.com/products/business/fastrak/networking/isdn/index.html

Pacific Bell ISDN 1-800-4PB-ISDN

- Southwestern Bell

www.swbell.com/cgi-bin/page.exe?File=ProdOverview.html&PRODUCT_CODE_EQ=ISD

ISDN Information 1-800-SWB-ISDN

- Sprint

www.sprint.com/bizpark/products_services/wan/network_service_enablers/isdn

- US West

www.uswest.com/com/atwork/interprise/ps_isdn_index.html

Small Business ISDN 1-800-246-5226

Canada

- Stentor

Glen Duxbury (Stentor ISDN Product Marketing Manager) 1-403-944-8130

- BCTel

www.bcteladvanced.com/html/5/call6-4.html

- Telus

www.telus.com/14.4vers/ps/office/a/hbmicrolink.html

- Sasktel

Small Business Information 1-888-226-7788

- MTS

Small Business Information 1-800-205-7770

- Bell Canada

www.bell.ca/bell/eng/products/biz/isdn/default.htm

ISDN in Ontario 1-888-999-ISDN

ISDN in Quebec 1-888-999-RNIS

- NBTel

Small Business Information 1-800-561-6283

- MT&T

www.mtt.ca/InBusiness/BusinessCustomers/ProductsPackages/DataTransferServices.html

- NewTel

www.newtel.com/communications/default.htm

ii. Revision History

<u>Issue</u>	<u>Comments</u>
1.0	- First issue of the CICS 2.0 Chip
2.0	- First issue of the CICS / MICS 2.0 Chip

iii. Amendments to the Chip Version 1.0

Amendments to the 1.0 Version of this Chip have been highlighted by placing a left border next to the paragraph containing the amended text.

1.0 Channel Introduction Package Overview

This Channel Introduction Package is designed to allow authorized distribution channels to standardize on the Compact ICS and Modular ICS 2.0 product offerings. It provides an overview of the product portfolio and includes all information required to introduce the product.

This Channel Introduction Package answers the following questions:

- **Product Positioning** - How is the product positioned in the marketplace?
- **Description** - What is the product? What features does it have?
- **Documentation** - What documentation comes with CICS / MICS 2.0?
- **Ordering Information** - What are the appropriate ordering codes?
- **Training** - What type of technical training and sales training is available?
- **Service** - What are the warranty and repair procedures?
- **Contact List** - Who can I contact if I need further information?

1.1 Introduction

The advent of the information age has placed increasing demands on the communications requirements of the Small Business customer. More than ever before, small business owners depend on their communications system as an access device for intelligent voice, data and video conference connections to customers, suppliers, and information resources.

Nortel is committed to the continual evolution of the Norstar product portfolio to meet these needs. This commitment is exemplified by the many new application features and enhancements offered with the Norstar ICS Release 2.0 software. The cornerstone of this development is the provision of high speed digital connectivity across the public telephone network through ISDN Basic Rate Interface.

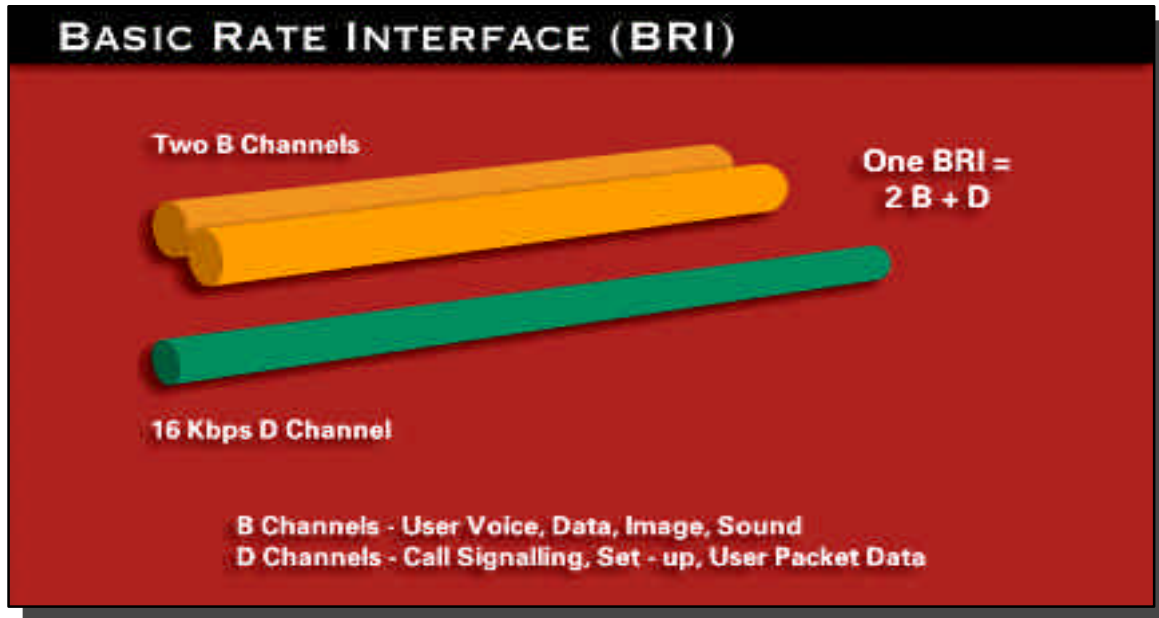
1.1.1 What Is ISDN?

“ISDN” is the acronym for **I**ntegrated **S**ervices **D**igital **N**etwork. The ITU-T, which is largely responsible for the development of ISDN standards has defined ISDN as:

“...a network...that provides end-to-end digital connectivity to support a wide range of services, including voice and non-voice services, to which users have access by a limited set of standard multi-purpose user-network interfaces”

As such, ISDN is a standards based service that allows users to achieve the benefits of a completely digital switched circuit between two points. ISDN is available in two access interfaces: Basic Rate Interface (BRI) and Primary Rate Interface (PRI). BRI provides two 64 Kbps channels (“B” or Bearer channels) for the transfer of voice, data, or video and one 16 Kbps channel (“D” or Data channel) for carrying signaling information between the user and the network. The D channel may also be used to carry data packets.

PRI provides twenty-three 64 Kbps B channels and one 64 Kbps D channel over a T1 facility. The CICS / MICS 2.0 program will deliver BRI to the Norstar portfolio with PRI expected on the Modular ICS in 1998. The remainder of this Channel Introduction Package will be devoted to ISDN BRI only.



1.1.2 A Brief History

The public switched telephone network was initially designed to carry analog voice transmissions. In the 1960's, to meet the needs of increasing demands for data connectivity the telephone companies began replacing their electro-mechanical switches in the central offices (CO's) with digital switching equipment, and by the early 1980's several communications carriers offered end-to-end digital transmission services. Although the telephone system satisfied that basic need to transmit analog voice, its design required the conversion of digital signals from our computers and terminals into an analog format for transmission over the public network. This conversion was both awkward and expensive. By the mid 1980's most telephone companies had incorporated a large amount of digital technology into their plant equipment so that a majority of the connections between telcos were digital. Speech, however, continued to be carried in an analog format from the customer to the telco.

Even though ISDN is not a new technology and has been around for several years, there was no real ISDN *standard*. This hampered the availability of ISDN because there was no guarantee of interoperability of equipment from different manufacturers. Standards Based National ISDN is a set of specifications for a standards-based, interoperable ISDN in North America. Nortel joins ISDN service providers, equipment suppliers, and end users in endorsing National ISDN. Connecting equipment to National ISDN services simplifies implementation since you do not need to worry about which type of equipment to order and how to configure it properly. National ISDN simplifies provisioning through National ISDN Ordering Codes. In addition, due to the industry support, prices of services and equipment have dropped substantially and continue to do so.

Nortel has actively participated in the National ISDN definition and implementation. This is a multi-stage plan to standardize ISDN service. NI-1 (National ISDN-1) was announced in 1991

and enables terminal and switching equipment from different vendors to work together. The next step was NI-2 which builds on the foundation established by NI-1, resolving additional interoperability issues and expanding functionality. National ISDN standards continue to evolve adding new functionality. The latest versions, however, are renamed to be based on the year of issue, for example, phase 3 is now called NI96.

1.1.3 ISDN Overview

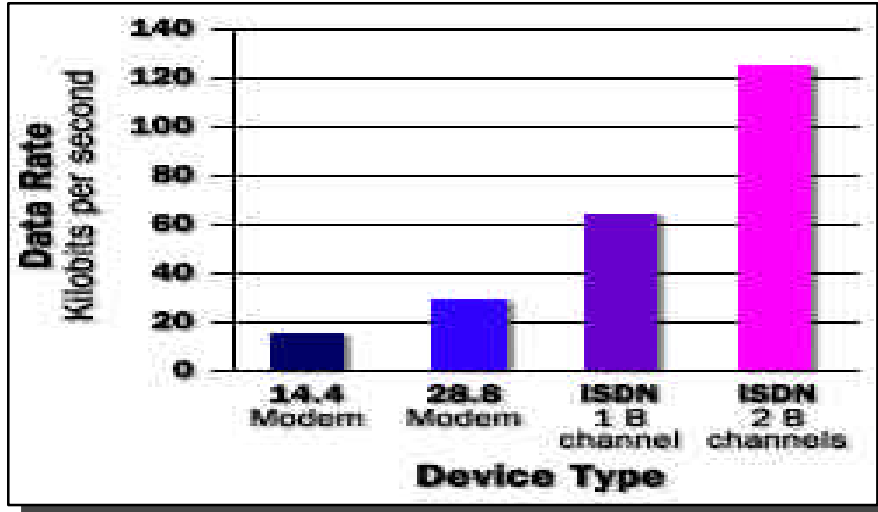
ISDN is changing the way we live, learn and work. ISDN brings affordable high speed data connections to fields as diverse as education, advertising, publishing, finance, health care, retail, engineering and manufacturing. ISDN applications such as internet access and telecommuting enable businesses to improve employee productivity while reducing operating costs. Furthermore, reductions in business and residential ISDN tariffs make ISDN a cost effective alternative to analog lines in many areas of North American. Market dynamics, the variety of ISDN applications, and Norstar ICS's commitment to building effective communications solutions for small businesses mean the future for ISDN is NOW!

1.1.4 Why ISDN?

By replacing existing analog lines with digital ISDN lines, businesses can take advantage of the powerful benefits of BRI. For example:

More Bandwidth: Industry trends indicate that end users are becoming more data sophisticated. Data applications are not only crucial for day to day operations, but also require more bandwidth than ever before. Basic Rate Interface ISDN addresses this growing demand and replaces today's analog modem technology with transmission speeds up to 128 kbps. This bandwidth allows use of applications such as:

Desktop Video Conferencing
 LAN Bridging
 High Speed Internet Access
 Telecommuting



Simultaneous Voice & Data: Voice and data can be transmitted simultaneously over the same wire, eliminating the need for a second analog line.

Greater Speed, Accuracy and Stability: BRI ISDN lines have a transmission speed that is four times faster than a 28.8 Modem. And unlike analog lines, digital connections are virtually error free. This ensures that data is transferred efficiently and correctly the first time around, saving time and money.

Clearer, Quieter Voice: Digital connections greatly increase voice clarity and background quietness over analog connections.

Variety of Information and Services: Voice, data, image and video can all be transmitted through the same BRI connections, allowing businesses greater line efficiencies and eliminating the need for dedicated lines.

Faster Connect Time: Call setup times appear instantaneous to users. Digital voice connection times are generally 2 to 5 seconds, while analog data connections can take up to 30 seconds. ISDN substantially increases the efficiency of the customer's communication system, especially for businesses with high call volumes.

Dialable: Like the traditional voice network, users can simply dial up to transport data, images and video. This allows digital connections to be established to numerous locations on a call by call basis without the use of dedicated lines.

Interworking with Existing Packet Data Network: ISDN allows users to connect to the enormous installed base of the worldwide X.25 packet data network. This simple link opens up a host of applications including nationwide point of sale credit card verifications.

2.0 Market Positioning

The following section outlines the market needs for ISDN BRI in North America, summarizes the end user and distributor value propositions, and highlights the key target ISDN applications and markets.

2.1 Market Need

Today's market is rapidly changing from basic telephony requirements to enhanced, integrated desktop needs. The abundance of multimedia PCs has increased users' expectations about the kind of information they can receive and transmit over data links. Businesses want to increase the efficiency of their communications systems by both controlling their costs and increasing the effectiveness of their voice and data services. After more than a decade as a rarely used technology, ISDN is finding its niche thanks to wide availability, standardization of services and equipment, and implementation of bandwidth hungry applications. ISDN is making its way to small businesses where applications such as telecommuting, remote LAN access and high speed internet access are driving its success.

In 1994, fewer than 50% of total access lines in the U.S. were ISDN capable. By 1995, ISDN capable lines were available to 85% of telephone subscribers. Strong growth in BRI is expected to continue over the next few years. IDC/Link has produced the following BRI line forecast.

U.S. BRI ISDN Line Forecast (Thousands of Lines)

	1996	1997	1998	1999	2000	2001	CAGR
BRI lines	730,395	1,095,593	1,588,610	2,224,054	3,002,472	3,903,214	40%
Growth (%)		50	45	40	35	30	

Furthermore, IDC/Link predicts that the Residential and Small Business segments will be the fastest growing implementors of BRI.

U.S. BRI ISDN Line Segmentation, by Market (Thousands of Lines)

	1996	1997	1998	1999	2000	2001	CAGR
Residential	109,559	186,251	317,722	524,877	825,680	1,209,996	62%
Small business	182,599	306,766	492,469	733,938	1,020,841	1,350,512	49%
Med - Lrg business	438,237	602,576	778,419	965,239	1,155,952	1,342,706	25%
Total BRI lines	730,395	1,095,593	1,588,610	2,224,054	3,002,472	3,903,214	40%

While no specific forecasts are available for BRI implementation in Canada, Canadian market research firms agree that demand for ISDN in Canada is experiencing extraordinary growth. Bell Canada has approximately 12,000 ISDN lines presently installed and has announced plans to install an additional 800,000 connections before the year 2000 (Computing Canada, March 14/96). Across Canada, Stentor estimates that ISDN connectivity is available to 70% of the population.

It must be remembered that ISDN is only a technology and its implementation is driven by the market need for the enhanced applications it allows. Applications such as internet access, LAN connectivity, telecommuting, videoconferencing, point of sale transactions and voice services are driving the demand for ISDN services. Each of these key applications will be discussed in greater detail in Section 2.3. These applications require the speed, bandwidth, and accuracy BRI provides over analog lines.

Across all of these applications, customers are demanding a flexible, scaleable communications system that integrates ISDN BRI connectivity to the network, low cost easy to use internet access, and the ability to expand in the future. The Compact and Modular ICS Release 2.0 provide all of these benefits with the same simplicity and reliability that has made Norstar the world's best selling small business communications system.

2.2 End User Value Proposition

In addition to the values provided with the current releases of the Compact and Modular ICS, additional end user benefits are realized with the introduction of Release 2.0. These values are common to all Norstar end users regardless of the specific application implemented. Values associated with specific applications are discussed in Section 2.3 Target Applications / Markets.

Configuration, Flexibility and Growth: The two universal slots in the Compact ICS can now each be populated with a 2 port U-Interface card, a 4 port U-Interface card, or a 4 port S/T-Interface card. In addition, the Compact ICS allows ISDN cards to be mixed with the existing Loop Start or CLASS/CMS trunk cards. This provides a customization capability unprecedented for small system users.

The two universal slots in the Modular ICS Core unit and the 6 slots in the first two Fiber Trunk Modules connected to the Core unit can now be populated with any combination of 2 port U-Interface cards, 4 port U-Interface cards or 4 port S/T-Interface cards. In addition, the Modular ICS allows ISDN cards to be mixed with the existing T1 Digital Trunk Interfaces, Loop Start, CLASS/CMS, DID, and E&M trunk cards. Again, this provides a customization capability unprecedented for small system users.

The 2 port and 4 port U and the 4 port S/T BRI interface cards may be configured on a port by port basis for either trunk or station side connectivity. For example, a 2 port U card can be configured to use one port for the network BRI connection and the other port for connection to a desktop video application.

The Compact ICS Release 2.0 can now grow to 16 lines and 24 stations when fully populated with ISDN BRI trunk cartridges. The Modular ICS total port capacity also increases from 272 ports to 292 ports.

This flexibility provides the small business with an Integrated Desktop Solution allowing increased employee efficiency while containing costs.

Common Components in the ICS Platform: The Compact ICS utilizes the same 2 and 4 port U-Interface cards, 4 port S/T-Interface card, and CTA 500 dm device as the Modular ICS. Additionally, Compact and Modular ICS use the same Loop Start and CLASS/CMS trunk cartridges. These common components provide investment protection in the event that the business grows in size and migrates to the Modular ICS. When a business migrates to the Modular ICS, 80% of their initial investment is protected (i.e. reused).

Competitively Priced: The Compact and Modular ICS provide a high feature to price value ratio, today and in the future.

Optional Remote Administration: The Compact ICS has an internal Remote Access Device which can be activated to allow remote maintenance of the system. For Modular ICS installations, the external Remote Access Device may be added to provide the same functionality. This equates to greater efficiency and faster response time when adds, moves or

changes are required. With Norstar Release 2.0, enhancements to Norstar Remote Utilities will include off line programming, back up and restore capabilities, and tree browsers. The IRAD on the Compact ICS Release 2.0 and the new external Fastrad will support on-line access speed of 14.4 kbps.

For a complete description of the capabilities of Norstar Remote Utilities 4, please see the forthcoming NRU 4 Channel Introduction Package.

2.3 ISDN Target Applications and Markets

The Norstar ICS platform has been designed to address existing market requirements while also offering the flexibility and scalability necessary to meet the market requirements of the future. The Compact ICS addresses the small systems markets from 4 lines by 8 stations to 16 lines (with BRI) by 24 stations. The Modular ICS addresses the market from 8 lines by 32 stations to a full 192 stations (or 292 ports).

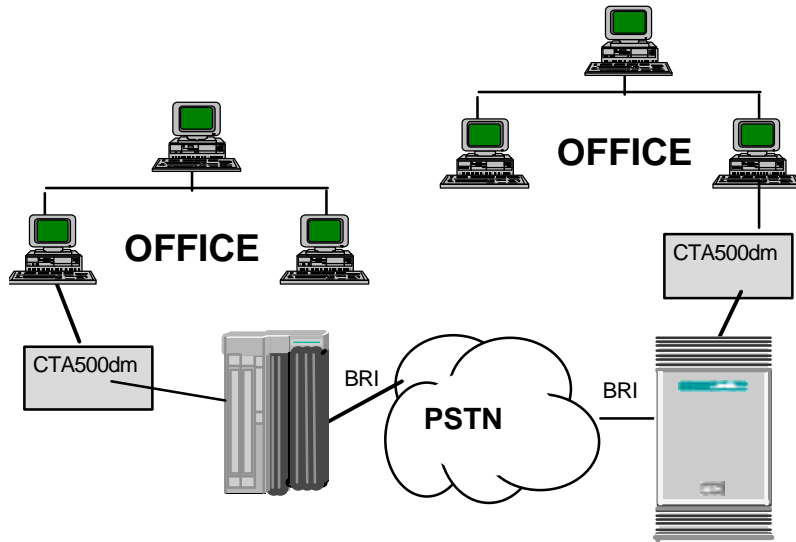
Wherever there is a customer with need for high speed information access or transfer, an opportunity exists to position the Compact or Modular ICS. Target markets for BRI on Norstar include small businesses who:

- have employees who telecommute and need access to company databases, network, e-mail, etc.
- have employees who frequently travel to attend meetings
- collaborate with geographically dispersed people
- use multiple analog lines for telephone, fax and modem
- require data transfer or sharing of databases between multiple locations
- send and receive large data files, images/video, or sound files
- depend on voice communications via the telephone for conducting their business
- make regular connections to the internet or other dial-up services

The remainder of this section discusses in more detail target applications for ISDN BRI on Norstar ICS and the value to the customer for implementing these solutions.

2.3.1 LAN Access

LAN connectivity is one of the primary data applications driving the ISDN market. This includes LAN-to-LAN, LAN-to-host, and remote LAN connectivity. This application is particularly important to small businesses with lower volume LAN connectivity requirements. The dial-up nature of a BRI connection means the user only pays for actual transmission times rather than incurring the expense of having a dedicated digital circuit for limited data requirements.



The Norstar ICS products with BRI bring digital connectivity to the desktop and allow employees high speed access to remote LAN's on an as needed basis. This application facilitates access to centralized database information, business wide on-line applications and file transfers for operations management.

Values and Benefits:

- Reduces costs - eliminates need for dedicated data lines
- Reduces costs - improves transmission time for large file transfers such as images, graphics, x-rays, etc.
- Reduces costs - savings on inter-office couriers and employee inter-office travel time
- Improves employee productivity - employees no longer have to wait on couriers, slow analog modems, etc. to obtain the information they need from other locations
- Improves employee efficiency - easy access to records and resources

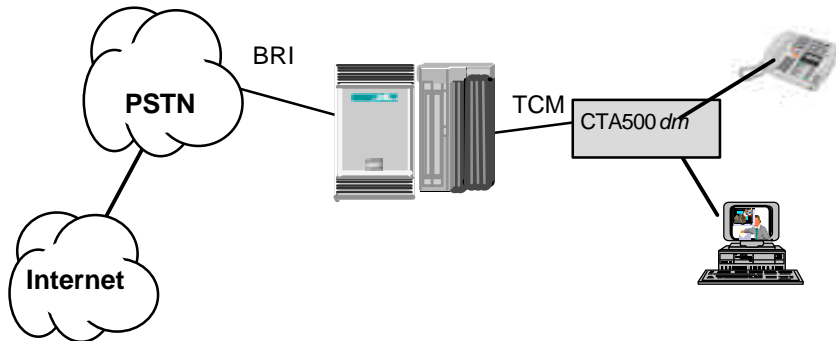
Potential Target Markets:

- Hospitals and Medical Clinics
- Corporate and Branch Offices
- Government Agencies
- Publishing
- Remote Sales Forces
- Call Centers
- Lawyers

2.3.2 Internet Access

Anyone who has spent any time surfing the internet knows how frustrating it can be to wait for graphics-intensive Web sites to download. The large data sizes of today's graphics, sound, animation and video intensive Web pages are making analog modems obsolete. Internet access is turning out to be the "killer" application for ISDN (Dataquest, 1997).

ISDN is attractive to a large number of businesses because one third of all businesses currently use analog dial-up services for internet access (IDC/Link, 1996). These business users are looking for an affordable way to increase interaction speeds and reduce download time and ISDN provides them with a solution.



High speed internet access is easily obtained by utilizing the Norstar Computer Telephony Adapter 500 dm (CTA 500 dm) in conjunction with a U-Interface card. The CTA 500 dm is connected to a normal station loop and makes use of standard Norstar wiring to provide connectivity to both a Norstar station set and the user's PC.

Values and Benefits:

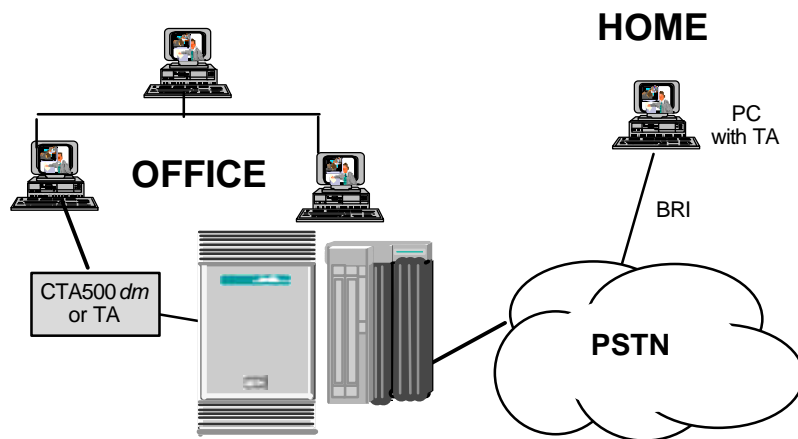
- Improved employee productivity - less time spent waiting for pages to load
- Reduced costs - faster transmission speeds
- Increase revenues - internet commerce

Potential Target Markets:

- Knowledge Workers
- Businesses with Dial Up Internet Access
- Schools and Libraries
- Researchers

2.3.3 Telecommuting

Telecommuting is an exploding business phenomenon across North America. There were an estimated 10 million telecommuters in the U.S. in 1996 and this number is expected to double by the year 2000 (NBI, 1996). Teleworkers include part-time home workers, full-time telecommuters and workers working from home after hours. These workers require access to corporate LANs for applications, database access and e-mail. Additionally, the telecommuter may make use of internet access and desktop videoconferencing.



With BRI and a Norstar ICS in the main office, telecommuting is now a real possibility for small businesses.

Values and Benefits:

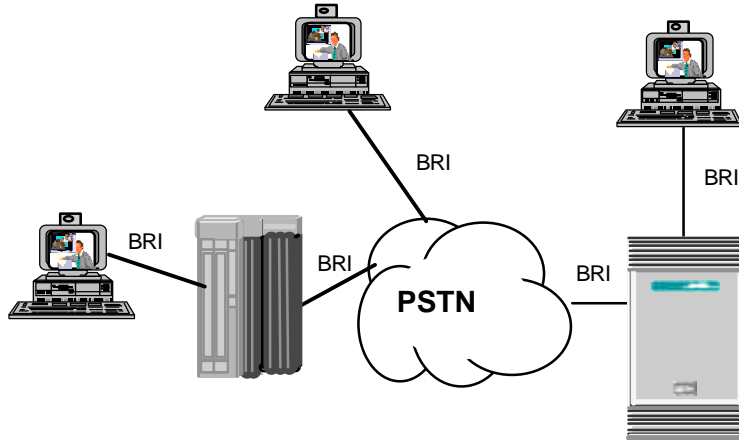
- Increases employee productivity - less time spent commuting, more time actually spent working
- Increases employee satisfaction - better balance between work and home responsibilities, lower stress
- Reduces workplace costs - less office space required, reduced turnover and hiring expenses

Potential Target Markets:

- Remote Call Center Agents
- Knowledge Workers
- Graphic Artists

2.3.4 Videoconferencing

While video applications presently account for only a very small percentage of ISDN lines, ISDN is becoming the connection of choice for a growing number of video and screen share applications used for local, transcontinental and international meetings.



Norstar ICS's flexible configuration allows the customer to equip several employees with desktop video and screen share applications or, alternatively, to provide a highly cost effective video conference facility in a single shared cubicle.

Values and Benefits:

- Reduces travel time and expenses
- Increases employee productivity - less time in cars and on planes = less down time, more work time
- Reduces costs - dedicated videoconferencing lines no longer required
- Improves communications

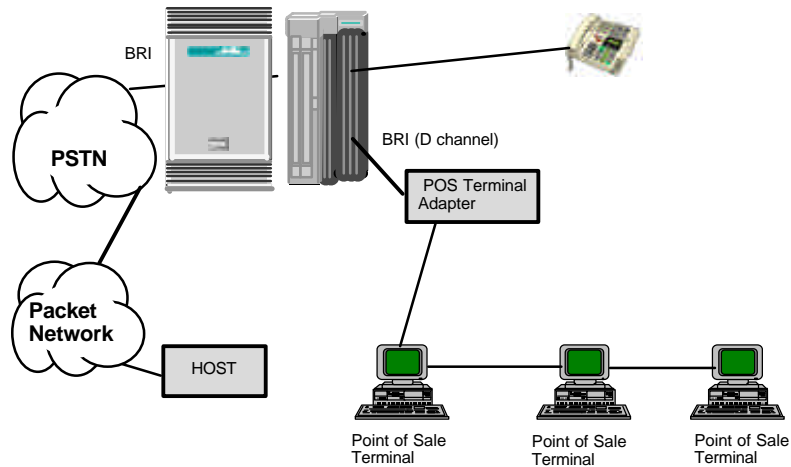
Potential Target Markets:

- Multi-site corporations
- Companies that have a lot of Remote Meetings
- Companies engaged in Collaborative Projects with Remote Work Teams
- Training Organizations
- Remote Classrooms

2.3.5 Point of Sale

Plastic, magnetically striped cards have dramatically changed our purchasing / transaction processes. The need for timely, inexpensive credit and debit card authorization is a major requirement for small businesses. Up until now, retail merchants either had to incur the expense of dedicated analog links to the card service center or endure the delays of dialing the center and establishing a link through analog phone lines.

These plastic cards are also being used for health insurance cards, employee identification, student identification, etc. that require verification from a centralized computer.



The Compact and Modular ICS with BRI offer near instantaneous connection to the worldwide X.25 packet network and credit authorization services. This service is more cost effective than dedicated analog lines and an ISDN dial up transaction can be completed (i.e. call setup and call teardown) in 2 to 4 seconds compared to 20 to 50 seconds for analog dial up transaction. Furthermore, each BRI connection can service up to eight POS devices simultaneously.

Values and Benefits:

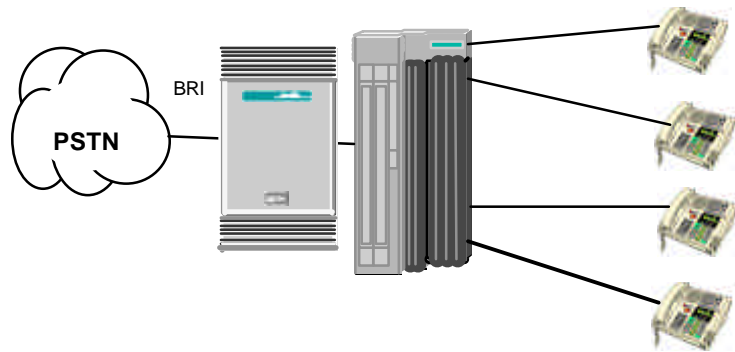
- Increases customer satisfaction - wait time for a credit approval is nearly eliminated
- Increases employee productivity - serve more customers in less time
- Reduces costs - eliminates dedicated lines

Potential Target Markets:

- Retail stores
- Restaurants
- Hospitals
- Hotel/Motel
- Ticket Offices

2.3.6 Voice Over BRI

Approximately half of the ISDN lines installed today are at least partially used for basic voice communications (IDC/Link, 1997)



The faster call set up and tear down associated with ISDN can provide significant efficiencies to businesses, particularly in call center applications. In addition, ISDN BRI network services provide a number of features that can enhance the usefulness of the Norstar system. These include such features as network call forward and calling number delivery.

Values and Benefits:

- Improves employee efficiency - faster call setup and tear down shortens call durations
- Improves customer satisfaction - CLID delivery lets you know who is calling before you answer
- Improves communications - ISDN offers enhanced reliability and clarity

Potential Target Markets:

- Any business which relies heavily on their phone system for conducting daily business

2.3.7 Vertical Market Targets

The Norstar ICS products with BRI addresses a number of different applications in a variety of vertical markets. The following table provides a sample of vertical markets and the potential applications:

	Calling Line ID	EDI	File Transfer	FAX and Image	Internet Access	LAN to LAN	Point of Sale	Remote LAN	Screen Share	Telecommuting	Video Conference
Air Freight		--	--		--	--	--				
Airlines	--		--		--		--				
Cable TV Co.	--				--		--				
Credit Approval Co.	--		--			--					
Distribution Co.	--	--	--		--	--	--				
Fin'l/Banks/Cr. Unions	--	--	--		--	--	--	--	--	--	--
Gov't Info. Agencies		--	--		--	--	--			--	--
Health Care	--	--	--	--	--	--	--			--	--
Hotels/Motels					--	--	--			--	
Insurance Co.	--	--	--	--	--	--	--	--	--	--	
Manufacturers		--	--	--	--	--			--		--
Newspapers	--		--	--	--		--	--	--	--	
Public Transit					--	--	--				
Public Utilities	--				--						
Railroads		--	--		--	--					
Retail		--	--		--	--	--				
Telemarketing Co.	--		--		--		--	--		--	
Ticket Offices	--				--		--	--		--	
Travel Agencies	--	--			--		--	--		--	
Universities		--	--	--	--	--	--	--	--	--	--

2.4 Distribution Channel Value Proposition

Configuration, Flexibility, and Growth--The two universal slots in the Compact ICS can now each be populated with a 2 port U-Interface card, a 4 port U-Interface card, or a 4 port S/T-Interface card. In addition, the Compact ICS allows ISDN cards to be mixed with the existing Loop start or CLASS/CMS trunk cards.

The two universal slots in the Modular ICS Core unit, and the 6 slots in the first two Fiber Trunk Modules connected to the Core unit, can now be populated with any combination of 2 port U-Interface cards, a 4 port U-Interface cards, or a 4 port S/T-Interface cards. In addition, the Modular ICS allows ISDN cards to be mixed with the existing T1 Digital Trunk Interfaces, Loop start, CLASS/CMS, DID and E&M trunk cards. Again, this provides a customization capability unprecedented for small system users.

The 2 port and 4 port U BRI interface cards may be configured on a port by port basis for either trunk or station side connectivity. For example, on a 2 port U card, port one could be used for the network BRI connection, and port 2 could be connected to a desktop video application.

The Compact ICS Release 2.0 can now grow to 16 lines by 24 stations when fully populated with ISDN BRI trunk cartridges. The Modular ICS total port capacity also increases: from 272 ports to 292 ports.

On new system sales, this means the distributor can:

- confidently position the Compact ICS as a solution to customers up to a 16x24 sized system, with 80% investment protection should they need to expand beyond this level into the Modular ICS
- confidently position the Modular ICS as a solution to customers with station requirements up to 150 wired stations, with the option to configure their Norstar with T1, BRI, DID, CLASS, E&M, or Loop start trunking, as well as add up to 60 COMPANION wireless portables.
- meet the customer price point by matching current requirements, while permitting future growth
- position both, entry level and expanded ISDN solutions within the same platform

Network Services Pull-through--The Norstar portfolio allows distributors to position complete voice and data communications solutions for their customers. These can include:

- ISDN voice and data
- Internet access and service provision
- Calling Line ID and CTI applications

Revenue, and revenue sharing, opportunities can now be exploited among strategic business partners.

Installed Base Opportunity--The installed base of Norstar systems can be upgraded to take advantage of the added features, functionality, and expandability of the new Norstar ICS Release 2.0. All existing station sets and most peripheral equipment currently operating on Norstar core systems will work on Release 2.0 (see Peripheral Compatibility Matrix, section 5.2).

In addition, the current and future installed base of Norstar ICS systems with analog trunking can be easily upgraded to ISDN functionality at a minimal cost.

Common Components--The ISDN trunk interface cartridges delivered with the Release 2.0 program and the CTA 500 dm may be used with either the Compact ICS or Modular ICS. This provides reduced support costs in inventory, training, and provisioning.

Competitively Priced--The Norstar ICS provides a differentiated high feature to price value ratio both today and in the future.

Optional Remote Administration--The Compact ICS is equipped with an optional internal Remote Access Device and the Modular ICS may be equipped with an external Remote Access Device both of which have a modem speed of 14.4kbps. These Remote Access Devices can be activated to allow remote maintenance of the system without the need for a site visit. This equates into more efficient and faster response times on remote administration, and provides a cost effective method of administering service contract requirements increasing customer satisfaction.

With Norstar ICS Release 2.0, enhancements to Norstar Remote Utilities will include:

- Back up and restore capabilities,
- On-Line Access Speed of 14.4kbs with Fastrad and the new Compact ICS IRAD, and
- Off line programming
- Tree Browser Tool

The Tree Browser tool provides a single screen view of the KSU programming, and is an alternate method of programming system parameters. Where the Remote Set allows viewing and programming via the 2-line display, the Tree Browser presents a split-screen view of the system parameters much the same way as the Windows 95 Explorer.

For a complete description of the capabilities of Norstar Remote Utilities 4, please see the forthcoming NRU 4 Channel Introduction Package.

Reduced Installation and Programming Time--The Compact ICS Release 1.0 programming structure was designed to reduce the installation, programming, trouble shooting and repair cost compared to the Compact 6x16. Release 2.0 for the Modular ICS software stream will adopt this same programming strategy. In addition, programming for Release 2.0 on both the Compact and Modular ICS have been enhanced to include a "find" feature which will allow the programmer to move through programming prompts more easily eliminating key strokes. This provides the similar reduced operational costs.

High Reliability--Norstar leads the industry in reliability and provides the distributors with the reduced operational costs to maintain the installed base of systems. This equates to increased profit margins which can then be reinvested in the company.

3.0 Product Description

The following section provides a detailed description of the Compact and Modular ICS products and the new parts associated with Release 2.0. For clarity, the information concerning the new common parts has been repeated in both the Compact and Modular ICS sections.

3.0.1 ISDN Terminology

As mentioned in section 1.1.2, National ISDN Standards have been jointly developed by switch manufacturers, Regional Operating Companies and Bellcore to enable ISDN equipment to operate in a multi-vendor, multi-carrier environment. National ISDN Standards 1 (NI-1) was defined at the end of 1990. NI-2 is currently in progress to further develop NI-1; for example, support of common supplementary services such as flexible calling, call forwarding and conferencing. Norstar is compatible with both the NI-1 and NI-2 standards.

The following section will clarify some of the terminology used when working with the Norstar ICS Release 2.0 products.

3.0.2 Definitions of Device and Reference Point Protocols

STANDARDS: Standards are technical specifications which establish uniformity in hardware and software.

PROTOCOLS: Protocols are rules which define how the different pieces of the network work together.

There are two different types of Protocols in the ISDN Network:

Functional Device Protocols--are rules which define the types of devices used within the network. For example, NT-1, NT-2, TA, TE-1, TE-2.

Reference Point Protocols--(also referred to as *Interface Protocols*) are rules which define the communication between devices. For example, U Interface, T Interface, S Interface, R Interface.

An **NT** is a Network Termination Device. There are two types:

NT1: BRI circuits are delivered by the Local Exchange Carrier (LEC) to the customer premise demarcation point where they must then be connected to an NT1 device. An NT1 converts the BRI circuits from a two wire connection to a four wire connection. [Norstar ISDN "U" interface cards include NT1 functionality].

NT2: NT2 devices provide customer premises switching, multiplexing and/or concentration functions. In general, NT2 devices distribute ISDN services to other devices within a CPE environment. [The Norstar Compact ICS and Modular ICS Release 2.0 products are NT2 devices].

A **TE** is a Terminal Equipment device. There are two types:

TE1: A Terminal Equipment 1 devices are ISDN devices - they utilize ISDN protocols and support ISDN services.

TE2: A Terminal Equipment 2 devices are non-ISDN devices such as existing analog Fax machines.

A TA or Terminal Adapter is an TE1 device that allows a non-ISDN device (TE2) to be connected to a ISDN Network Termination (NT1 or NT2)

There are four (4) common ISDN Reference Point Protocols and are also referred to as Interface points.

U Reference Point: The U Reference point lies between the network service provider and the customer premises in the form of the NT1 device.

T Reference Point: The T Reference point lies between an NT1 device and an NT2 device. In the case of the Norstar Release 2.0 products, this reference point is internal to the KSU.

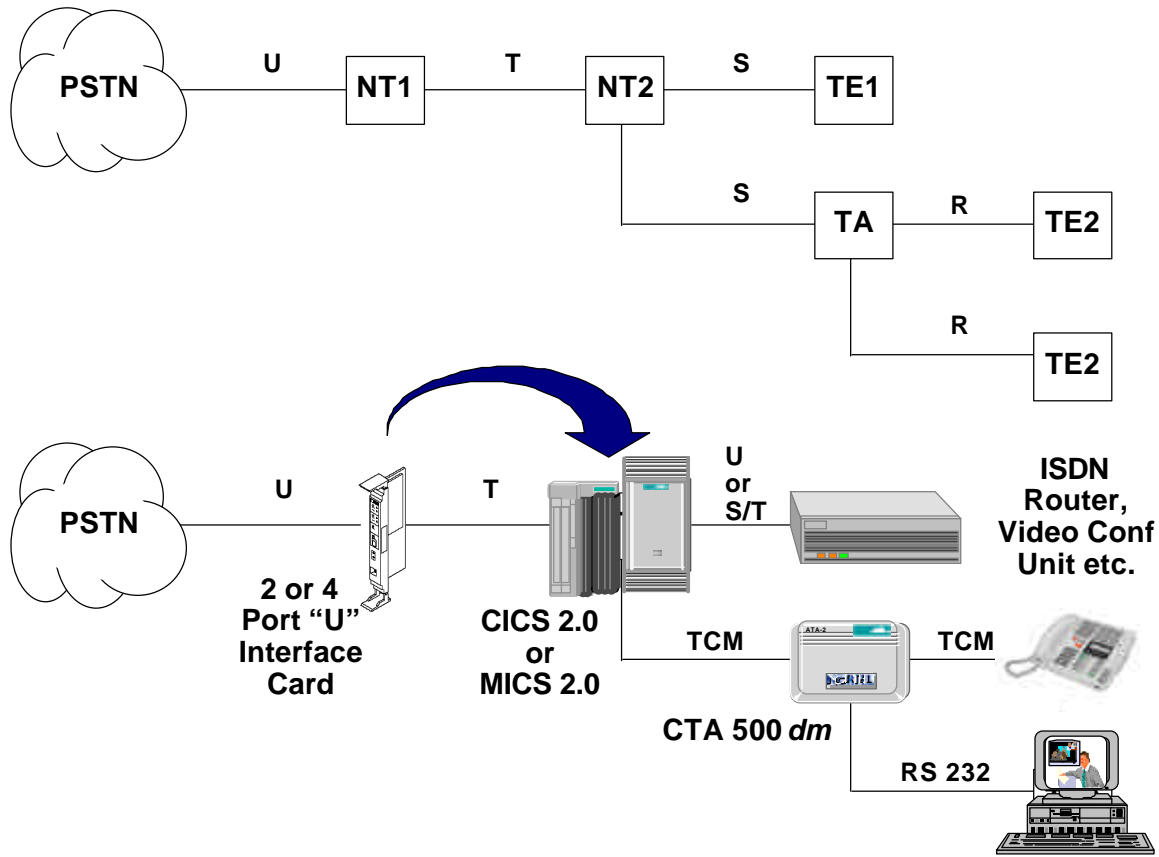
S Reference Point: The S Reference point lies between a Network Termination Device (NT1 or NT2) and an ISDN device (TE1 or a Terminal Adaptor).

R Reference Point: The R Reference point lies between a Terminal Adaptor (TA) and a TE2 (non-ISDN) device.

Bellcore Order Codes use letters of the Alphabet to describe different combinations of ISDN services. Prior to the standardized Bellcore Codes, ISDN services were ordered individually, a complicated and time consuming process. There are many order codes available each with distinct features available. Some will be standard features available when ordering a particular order code and others will be optional. Norstar recommend and supports Bellcore Order Codes M (voice and data) and P (voice, data, & packet switching).

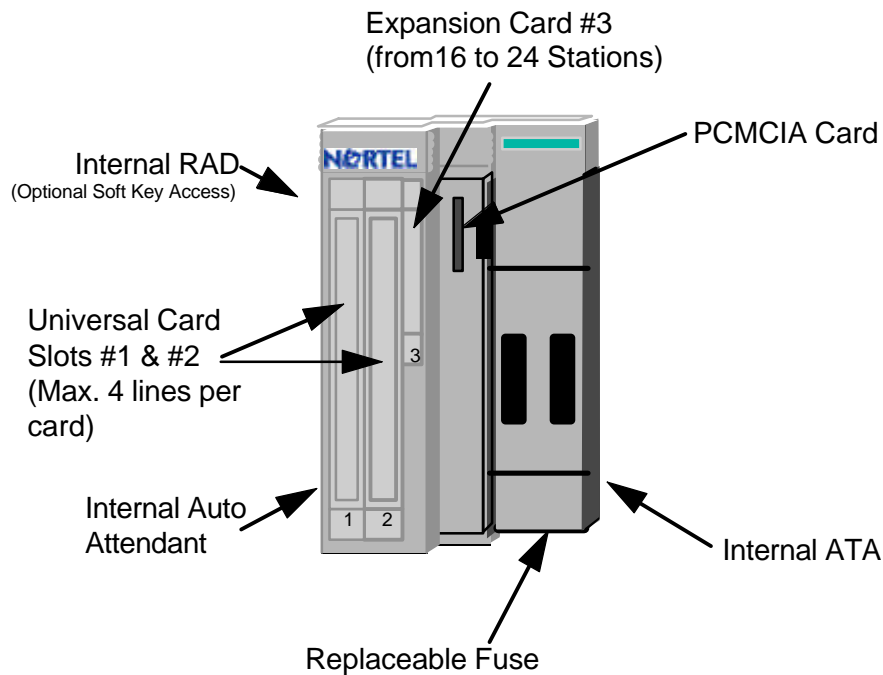
The following diagram illustrates the relationship of the terms described above and provides an analogy for the Norstar 2.0 product portfolio.

ISDN Definitions and Norstar-PLUS



3.1 Compact ICS Control Unit

The Compact ICS was introduced to North America (August 5, 1996) as an enhanced system with flexibility on both line and station size. The core system has the capability to interface to 8 analog C.O. lines, or 8 ISDN circuits, and 24 Norstar M7000 series terminals. The Compact ICS supports connections to auxiliary analog interfaces such as music on hold, paging and auxiliary ringer, and is equipped with a built-in Auto Attendant, internal ATA and optional internal Remote Access. There are two Universal Slots so that trunk cartridges can be mixed/matched between analog, CLASS, and ISDN, and a slot for the Combination Cartridge (8 port TCM expansion and Clock Control); or the Services Cartridge (Clock Control only). The PCMCIA feature cartridge is removable simplifying upgrades and is protected by the ICS Control Unit cover.



3.1.1 Compact ICS Capacity

The Compact ICS, with two (2) Universal slots, can support up to 8 BRI connections (16, 64Kbp B-channels and 8 16kbp D-channels) for voice, data, video, or image transfer applications; up to 8 Analog (LS/DS or CLID); or a combination of both. In addition, Compact ICS supports up to 24 Norstar Station sets, up to 10 CTA 500 dm's and includes an integrated one port Analog Terminal Adapter.

3.1.2 Universal Card Slots

The Compact ICS control Unit contains 2 universal card slots which accept the existing analog loop start and CLASS/CMS trunk cartridges. In addition, with Release 2.0 software the following ISDN Interface cards are supported.

3.1.2.1 Norstar 2-port U Interface Card (A0652049)

The following is a summary of the 2-port U Interface attributes:

- Includes an integrated Network Termination Type 1 (NT1)
- Two BRI Interfaces per card
- Two BRI U interfaces, each individually configurable to be a network interface, or a station side equipment interface, or D-channel packet interface
- Performs ISDN network synchronization in conjunction with Compact ICS Services Cartridge, or Compact ICS Combination Services Cartridge
- Downloadable firmware to facilitate future applications

For each interface, an LED is used for loop status (activate or deactivated) visual indication. The 2-Port U Interface Cartridge is entirely powered by the card slot connector.

3.1.2.2 Norstar 4-port U Interface Card (A0652051)

The following is a summary of the 4-port U Interface attributes:

- Includes an integrated Network Termination Type 1 (NT1)
- Four BRI Interfaces per card
- Four BRI U interfaces, each individually configurable to be a network interface, or a station side equipment interface
- Performs ISDN network synchronization in conjunction with Compact ICS Services Cartridge, or Compact ICS Combination Services Cartridge
- Downloadable firmware to facilitate future applications

For each interface, an LED is used for loop status (activate or deactivated) visual indication. The 4-Port U Interface Cartridge is entirely powered by the card slot connector.

3.1.2.3 Norstar 4-port S/T Interface Card (A0633567)

The following is a summary of the 4-port S/T Interface attributes:

- Four BRI S/T interfaces per cartridge
- Four BRI S/T interfaces, each individually configurable to be a network interface, or a station side equipment interface, or D-channel packet interface
- Performs ISDN network synchronization in conjunction with Compact ICS Services Cartridge, or Compact ICS Combination Services Cartridge
- Downloadable firmware to facilitate future applications

For each interface, an LED is used for loop status (activate or deactivated) visual indication. The 4-Port S/T Interface Cartridge is entirely powered by the card slot connector.

3.1.3 Expansion Slot

An expansion cartridge slot is provided on the Control Unit for expansion of the system capabilities. Two cartridges are compatible with this slot. They are the Compact ICS Services Cartridge, and the Compact ICS Combination Services Cartridge (described below). In ISDN applications, either the Compact ICS Services Cartridge or the Compact ICS Combination Services Cartridge must be utilized.

3.1.3.1 Compact ICS Services Cartridge (A0652074)

This cartridge provides hardware support for synchronization to network timing on the Compact ICS. It supports ISDN configurations up to 16 station ports. For configurations requiring ISDN and more than 16 station ports, the Compact ICS Combination Services Cartridge would be required.

3.1.3.2 Compact ICS Combination Services Cartridge (A0652072)

This cartridge provides hardware support for synchronization to network timing, and system expansion from 16 to 24 stations (TCM ports) on the Compact ICS. It supports ISDN configurations up to 24 station ports. **NOTE:** *This will replace the current 8 port TCM expansion cartridge, A0629599.*

3.1.4 Software Feature Cartridge

The Software Feature Cartridge used in the Compact ICS, is a memory cartridge conforming to the PCMCIA standard and will replace the current Compact ICS Release 1.0.

3.1.4.1 C-ICS Rel. 2.0, Restricted SW Feature Cartridge with Docs (A0655694)

English

The Compact ICS Restricted Software Feature Cartridge supports the use of one universal card slot and up to 8 TCM digital station ports. The second universal card slot, the expansion card slot, and the other 8 TCM digital station ports on the controller are disabled and require the **Restricted to Standard SW Key Code Upgrade** for activation.

The first universal card slot can support an analog loop start trunk cartridge, a CLASS/CMS trunk cartridge, or a 2-port U ISDN interface cartridge. With an analog loop start trunk cartridge, a CLASS/CMS trunk cartridge, or a 2-port U ISDN interface cartridge, this software supports a maximum 4x8 configuration.

The software cartridge is trilingual English, French, or Spanish, and is for use in Canada and the United States.

Package Contents:

<u>Qty.</u>	<u>Part Number</u>	<u>Description</u>
1	AO655693/NT7B64AD	PCMCIA SW Feature Cartridge
1	AO655682/NTAB1914	Doc Kit Installer - Installation Guide & Program Record, English
1	AO655681/NTAB1913	Doc Kit Cust - System Coordinator Guide & Feature Cards, English

3.1.4.1.1 C-ICS, Rel. 2.0, Restricted SW Feature Cartridge with French Docs (A0655695)

The Compact ICS Restricted Software Feature Cartridge supports the use of one universal card slot and up to 8 TCM digital station ports. The second universal card slot, the expansion card slot, and the other 8 TCM digital station ports on the controller are disabled and require the **Restricted to Standard SW Key Code Upgrade** for activation.

The software cartridge is trilingual English, French, or Spanish, and is for use in Canada only.

Package Contents:

<u>Qty.</u>	<u>Part Number</u>	<u>Description</u>
1	AO655693/NT7B64AD	PCMCIA SW Feature Cartridge
1	AO655685/NTAB1916	Doc Kit Installer - Installation Guide & Program Record, French
1	AO655684/NTAB1915	Doc Kit Cust - System Coordinator Guide & Feature Cards, French

3.1.4.2 C-ICS, Rel. 2.0, Restricted SW Feature Cartridge with Internal Remote Access Device Enabled, with English Docs (A0672474)

The Compact ICS Restricted Software Feature Cartridge supports the use of one universal card slot and up to 8 TCM digital station ports. The second universal card slot, the expansion card slot, and the other 8 TCM digital station ports on the controller are disabled and require the **Restricted to Standard SW Key Code Upgrade** for activation.

The first universal card slot can support an analog loop start trunk cartridge, a CLASS/CMS trunk cartridge, or a 2-port U ISDN interface cartridge. With an analog loop start trunk cartridge, a CLASS/CMS trunk cartridge, or a 2-port U ISDN interface cartridge, this software supports a maximum 4x8 configuration.

The software cartridge is trilingual English, French, or Spanish, but may be ordered with either English or French documentation only. Spanish Telephone Feature Cards are available as a separately orderable item.

This software comes with the Internal Remote Access Device enabled, and when used in conjunction with Norstar Remote Utilities permits remote administration and programming of the Compact ICS.

The software cartridge is trilingual English, French, or Spanish, and is for use in Canada and the United States.

Package Contents:

<u>Qty.</u>	<u>Part Number</u>	<u>Description</u>
1	AO674765/NT7B64AJ	PCMCIA SW Feature Cartridge
1	AO655682/NTAB1914	Doc Kit Installer - Installation Guide & Program Record, English
1	AO655681/NTAB1913	Doc Kit Cust - System Coordinator Guide & Feature Cards, English

3.1.4.2.1 C-ICS, Rel. 2.0, Restricted SW Feature Cartridge with Internal Remote Access Device Enabled, with French Docs (A0672479)

The Compact ICS Restricted Software Feature Cartridge supports the use of one universal card slot and up to 8 TCM digital station ports. The second universal card slot, the expansion card slot, and the other 8 TCM digital station ports on the controller are disabled and require the **Restricted to Standard SW Key Code Upgrade** for activation.

The first universal card slot can support an analog loop start trunk cartridge, a CLASS/CMS trunk cartridge, or a 2-port U ISDN interface cartridge. With an analog loop start trunk cartridge, a CLASS/CMS trunk cartridge, or a 2-port U ISDN interface cartridge, this software supports a maximum 4x8 configuration.

The software cartridge is trilingual English, French, or Spanish, but may be ordered with either English or French documentation only. Spanish Telephone Feature Cards are available as a separately orderable item.

This software comes with the Internal Remote Access Device enabled, and when used in conjunction with Norstar Remote Utilities permits remote administration and programming of the Compact ICS.

The software cartridge is trilingual English, French, or Spanish, and is for use in Canada only.

Package Contents:

<u>Qty.</u>	<u>Part Number</u>	<u>Description</u>
1	AO674765/NT7B64AJ	PCMCIA SW Feature Cartridge
1	AO655685/NTAB1916	Doc Kit Installer - Installation Guide & Program Record, French
1	AO655684/NTAB1915	Doc Kit Cust - System Coordinator Guide & Feature Cards, French

3.1.4.3 C-ICS, Rel. 2.0, Standard SW Feature Cartridge with English Docs (A0654690)

The Compact ICS Standard Software Feature Cartridge supports the use of both universal card slots and up to 24 TCM digital station ports.

Each universal card slot can support an analog loop start trunk cartridge, a CLASS/CMS trunk cartridge, a 2-port U ISDN interface cartridge, a 4-port U ISDN interface cartridge, or a 4-port S/T ISDN interface cartridge. This software supports a maximum configuration of 16x24 when using two 4-port U ISDN interface cartridges.

The software cartridge is trilingual English, French, or Spanish, and is for use in Canada and the United States.

Package Contents:

<u>Qty.</u>	<u>Part Number</u>	<u>Description</u>
1	AO655679/NT7B64AC	PCMCIA SW Feature Cartridge
1	AO655682/NTAB1914	Doc Kit Installer - Installation Guide & Program Record, English
1	AO655681/NTAB1913	Doc Kit Cust - System Coordinator Guide & Feature Cards, English

3.1.4.3.1 C-ICS, Rel. 2.0, Standard SW Feature Cartridge with French Docs (A0655683)

The Compact ICS Standard Software Feature Cartridge supports the use of both universal card slots and up to 24 TCM digital station ports.

Each universal card slot can support an analog loop start trunk cartridge, a CLASS/CMS trunk cartridge, a 2-port U ISDN interface cartridge, a 4-port U ISDN interface cartridge, or a 4-port S/T ISDN interface cartridge. This software supports a maximum configuration of 16x24 when using two 4-port U ISDN interface cartridges.

The software cartridge is trilingual English, French, or Spanish, and is for use in Canada only.

Package Contents:

<u>Qty.</u>	<u>Part Number</u>	<u>Description</u>
1	AO655679/NT7B64AC	PCMCIA SW Feature Cartridge
1	AO655685/NTAB1916	Doc Kit Installer - Installation Guide & Program Record, French
1	AO655684/NTAB1915	Doc Kit Cust - System Coordinator Guide & Feature Cards, French

3.1.4.4 C-ICS, Rel. 2.0, Standard SW Feature Cartridge with Internal Remote Access Device Enabled, with English Docs (A0672468)

The Compact ICS Standard Software Feature Cartridge supports the use of both universal card slots and up to 24 TCM digital station ports.

Each universal card slot can support an analog loop start trunk cartridge, a CLASS/CMS trunk cartridge, a 2-port U ISDN interface cartridge, a 4-port U ISDN interface cartridge, or a 4-port S/T ISDN interface cartridge. This software supports a maximum configuration of 16x24 when using two 4-port U ISDN interface cartridges.

The software cartridge is trilingual English, French, or Spanish, but may be ordered with either English or French documentation only. Spanish Telephone Feature Cards are available as a separately orderable item.

This software comes with the Internal Remote Access Device enabled, and when used in conjunction with Norstar Remote Utilities permits remote administration and programming of the Compact ICS.

The software cartridge is trilingual English, French, or Spanish, and is for use in Canada and the United States.

Package Contents:

<u>Qty.</u>	<u>Part Number</u>	<u>Description</u>
1	AO674764/NT7B64AH	PCMCIA SW Feature Cartridge
1	AO655682/NTAB1914	Doc Kit Installer - Installation Guide & Program Record, English
1	AO655681/NTAB1913	Doc Kit Cust - System Coordinator Guide & Feature Cards, English

3.1.4.4.1 C-ICS, Rel. 2.0, Standard SW Feature Cartridge with Internal Remote Access Device Enabled, with French Docs (A0672472)

The Compact ICS Standard Software Feature Cartridge supports the use of both universal card slots and up to 24 TCM digital station ports.

Each universal card slot can support an analog loop start trunk cartridge, a CLASS/CMS trunk cartridge, a 2-port U ISDN interface cartridge, a 4-port U ISDN interface cartridge, or a 4-port S/T ISDN interface cartridge. This software supports a maximum configuration of 16x24 when using two 4-port U ISDN interface cartridges.

The software cartridge is trilingual English, French, or Spanish, but may be ordered with either English or French documentation only. Spanish Telephone Feature Cards are available as a separately orderable item.

This software comes with the Internal Remote Access Device enabled, and when used in conjunction with Norstar Remote Utilities permits remote administration and programming of the Compact ICS.

The software cartridge is trilingual English, French, or Spanish, and is for use in Canada only.

Package Contents:

<u>Qty.</u>	<u>Part Number</u>	<u>Description</u>
1	AO674764/NT7B64AH	PCMCIA SW Feature Cartridge
1	AO655685/NTAB1916	Doc Kit Installer - Installation Guide & Program Record, French
1	AO655684/NTAB1915	Doc Kit Cust - System Coordinator Guide & Feature Cards, French

3.1.5 Compact ICS System Configuration

The table below outlines the possible configurations for the CICS Release 2.0.

Software	Universal Slot 1	Universal Slot 2	Expansion Slot	Maximum Configuration³
Restricted	ATC ¹	-	-	4x8
Restricted	2-port U ISDN	-	-	4x8
Standard	ATC ¹	-	-	4x16
Standard	ATC ¹	-	-	4x16
Standard	2-port U ISDN	-	-	4x16
Standard	4-port U ISDN	-	-	8x16
Standard	ATC ¹	ATC ¹	-	8x16
Standard	ATC ¹	ATC ¹	8 port TCM	8x24
Standard	ATC ¹	2-port U ISDN	C-ICS Services Cartridge	8x16
Standard	ATC ¹	2-port U ISDN	C-ICS Combo Svcs Ctrdg	8x24
Standard	ATC ¹	4-port U ISDN	C-ICS Services Cartridge	12x16
Standard	ATC ¹	4-port U ISDN	C-ICS Combo Svcs Ctrdg	12x24
Standard	ATC ¹	4-port S/T ISDN	C-ICS Services Cartridge	4x20 (16 TCM/4 ST ISDN)
Standard	ATC ¹	4-port S/T ISDN	C-ICS Combo Svcs Ctrdg	4x28 (24 TCM/4 ST ISDN)
Standard	2-port U ISDN	2-port U ISDN	C-ICS Services Cartridge	8x16
Standard	2-port U ISDN	2-port U ISDN	C-ICS Combo Svcs Ctrdg	8x24

Standard	2-port U ISDN	4-port U ISDN	C-ICS Services Cartridge	12x16
Standard	2-port U ISDN	4-port U ISDN	C-ICS Combo Svcs Ctrdg	12x24
Standard	2-port U ISDN	4-port S/T ISDN	C-ICS Services Cartridge	4x20 (16 TCM/4 ST ISDN)
Standard	2-port U ISDN	4-port S/T ISDN	C-ICS Combo Svcs Ctrdg	4x28 (24 TCM/4 ST ISDN)
Standard	4-port U ISDN	4-port U ISDN	C-ICS Services Cartridge	16x16
Standard	4-port U ISDN	4-port U ISDN	C-ICS Combo Svcs Ctrdg	16x24
Standard	4-port U ISDN	4-port S/T ISDN	C-ICS Services Cartridge	8x20 (16 TCM/4 ST ISDN)
Standard	4-port U ISDN	4-port S/T ISDN	C-ICS Combo Svcs Ctrdg	8x28 (24 TCM/4 ST ISDN)

Note 1: Either Analog trunk cartridge or Analog CLASS/CMS trunk cartridge

Note 2: The above table assumes, for all configurations listed, trunk cartridges may be inserted into either slot.

Note 3: The above table assumes the use of all U-interfaces as network side connections, and the use of all S/T interfaces as station side connections. The U interfaces may be configured for station side connection and S/T interfaces may be used for network side connections (Use of an S/T interface on the network side requires a customer supplied NT1 interface device.)

3.1.6 Software Key Code Upgrades

The software key code upgrades used with Compact ICS Release 1.0 will not change and should continue to be used with Release 2.0 and are as follows:

3.1.6.1 Internal Remote Access Device Key Code Upgrade **(A0659208)**

The Compact ICS may be purchased with the Internal Remote Access Device enabled, or the customer may purchase a software key code upgrade to activate the I-RAD at a later date. The process to enable the Internal RAD is as follows and can be done from a remote location or from the customer site:

NOTE: Compact ICS Default Line Filters must be changed during installation to permit Internal RAD activation and use from a remote site.

- Purchase *Compact ICS Internal Remote Access Device Upgrade* **A0659208**

You will receive a small booklet, approximately 4 to 5 pages, that will provide you with:

- Instructions
- A Record Form
- Unique Authorization Code

- Step 1) Installer or CSR will then call into the Compact ICS Control Unit (if activating from a remote location) and retrieve the System ID number
- Step 2) Installer or CSR will then call into the Northern Telecom IVR System where they will be prompted until they reach the menu for RAD upgrade
- Step 3) They will be asked to input the Unique Authorization Number, the System ID Number and other information that will help Northern Telecom track usage
- Step 4) The IVR system will then give the caller a 24 digit key code--three (3) groups of eight (8) numbers
- Step 5) Once the key codes have been obtained, the Installer or CSR can dial back into the ICS Control Unit (if activating from a remote location) to enter the key codes following the instructions and prompts
- Step 6) Once these Key Codes are entered the Remote Access Device will be operational.

Enabling the RAD gives you the capability to utilize Remote Set Software . Remote Set Software will provide Windows™ based capabilities for configuring, administering and maintaining the ICS Control Unit and peripherals via simulated extension types including the M7310 & M7324. It provides you with the facilities to store "profiles" of RAD connections and desired extension type information on the PC hard drive. Remote Set Software works through a series of screens and menus which allow you to navigate through the different areas of the application and easily enter information and programming. For example, you can create and change programming data; perform back-up and restore functions; program voice mail; remotely administer the internal RAD; access to Feature **DEBUG sessions and copying of extensions and lines within a system. The Compact ICS has also been enhanced to include an "Auto Answer After "n" rings" to access the Internal RAD after the business has closed.

For a complete description of the capabilities of Norstar Remote Utilities 4, please see the forthcoming NRU 4 Channel Introduction Package.

3.1.6.2 Compact ICS Rel. 2.0, Restricted to Standard Software Key Code Upgrade (A0659207)

When the Compact ICS is initially purchased with Restricted Software and expansion is required, the customer may purchase a software key code to upgrade the Restricted Software to the Standard version.

- Purchase the *Compact ICS Restricted to Standard Upgrade A0659207*

You will receive a small booklet, approximately 4 to 5 pages, that will provide you with:

Instructions
A Record Form
Unique Authorization Code

- Step 1) Installer or CSR will then call into the Compact ICS Control Unit (if upgrading from a remote location) and retrieve the System ID number
- Step 2) Installer or CSR will then call into the Northern Telecom IVR System where they will be prompted until they reach the menu for the 4x8 upgrade
- Step 3) The system will then ask them to input the Unique Authorization Number, the System ID Number and other information that will help Northern Telecom track usage
- Step 4) The IVR system will then give the caller a 24 digit key code--three (3) groups of eight (8) numbers
- Step 5) Once the key codes have been obtained, the Installer or CSR can dial back into the Control Unit to enter the key codes following the instructions and prompts
- Step 6) Once these Key Codes are entered the system will undergo a warm start and when finished, will be identical to the Standard version of software.

3.2 Modular ICS Control Unit

The Norstar Modular ICS is a module and cartridge based system offering easy installation, maintenance, expansion and customization. It supports T1, Loop start, CLASS/CMS, DID, E&M, and now ISDN BRI trunking. All trunks are supported through Trunk Cartridges plugged into either the core Modular ICS or Trunk Modules. Cartridge slots in the core are provided for: a one piece software feature cartridge, a services cartridge for T1 or ISDN clock control, fiber or copper expansion cartridges, combination expansion and services cartridges, and trunk cartridges. The Modular ICS is equipped with a removable power supply that eliminates the need to send the entire Modular ICS unit in for repair if the power supply fails.

Modular ICS customers who are looking for hybrid system growth or integrated COMPANION wireless will make use of the capability of the Modular ICS with XC software. This permits growth up to 292 ports, and 192 stations with 60 additional COMPANION handsets.

3.2.1 Modular ICS Capacity

The Modular ICS can support up to 20 CO trunk interface cartridges which may be populated with up to two (2) T1 Connections, 32 BRI connections (64, 64 kbp B-channels and 32, 16kbp D-channels) for voice, data, video, or image transfer applications; up to 80 Analog (LS/Ds, CLID, DID, or E&M); or a combination of these. In addition, Modular ICS supports up to 192 Norstar station sets; up to 60 Companion Wireless sets; and up to 10 CTA 500 dm's. Please see Section 3.2.6 for a detailed description of the Modular ICS system configuration.

3.2.2 Universal Card Slots

The Modular ICS control Unit contains 2 universal card slots which accept the existing Digital Trunk Interface for T1 trunking, analog loop start and CLASS/CMS trunk cartridges. In addition, with Release 2.0 software the following ISDN Interface cards are supported:

3.2.2.1 Norstar 2-port U Interface Card (A0652049)

The following is a summary of the 2-port U Interface attributes:

- Includes an integrated Network Termination Type 1 (NT1)
- Two BRI Interfaces per card
- Two BRI U interfaces, each individually configurable to be a network interface, or a station side equipment interface, or D-channel packet interface
- Performs ISDN network synchronization in conjunction with Modular ICS Services Cartridge, or Modular ICS Combination Services Cartridge.
- Downloadable firmware to facilitate future applications
- Two BRI Interfaces per card

For each interface, an LED is used for loop status (activate or deactivated) visual indication. The 2-Port U Interface Cartridge is entirely powered by the card slot connector.

3.2.2.2 Norstar 4-port U Interface Card (A0652051)

The following is a summary of the 4-port U Interface attributes:

- Includes an integrated Network Termination Type 1 (NT1)
- Four BRI Interfaces per card
- Four BRI U interfaces, each individually configurable to be a network interface, or a station side equipment interface
- Performs ISDN network synchronization in conjunction with Modular ICS Services Cartridge, or Modular ICS Combination Services Cartridge.
- Downloadable firmware to facilitate future applications

For each interface, an LED is used for loop status (activate or deactivated) visual indication. The 4-Port U Interface Cartridge is entirely powered by the card slot connector.

3.2.2.3 Norstar 4-port S/T Interface Card (A0633567)

The following is a summary of the 4-port S/T Interface attributes:

- Four BRI S/T interfaces per cartridge
- Four BRI S/T interfaces, each individually configurable to be a network interface, or a station side equipment interface, or D-channel packet interface
- Performs ISDN network synchronization in conjunction with Modular ICS Services Cartridge, or Modular ICS Combination Services Cartridge.
- Downloadable firmware to facilitate future applications

For each interface, an LED is used for loop status (activate or deactivated) visual indication. The 4-Port S/T Interface Cartridge is entirely powered by the card slot connector.

3.2.3 Fiber Trunk Module Compatibility

The Modular ICS Fiber Trunk Modules contain 3 card slots which accept the existing DID, E&M, analog loop start and CLASS/CMS trunk cartridges. In addition, with Release 2.0 software the ISDN Interface cards outlined above will be supported on the first two Fiber Trunk Modules of an expanded system. While it is required that any ISDN Interface cards be placed in the first two trunk modules, there are no configuration rules that restrict the mix of ISDN cards with other trunk cartridges within these modules.

3.2.4. Modular ICS ISDN Network Clocking Cards

Clocking cards are required to support ISDN BRI on the Modular ICS. The following existing cards currently used for clock control for T1 application may also be used for ISDN BRI.

3.2.4.1 Modular ICS Services Cartridge (A0404139)

This cartridge provides hardware support for synchronization to network timing on the Modular ICS for both T1 and ISDN.

3.2.4.2 Modular ICS Combination Fiber 6-port Services Cartridge (A0632426)

This cartridge provides hardware support for synchronization to network timing on the Modular ICS for both T1 and ISDN. In addition, it provides 6-ports of expansion capability for Fiber Trunk and Station Modules.

3.2.5 Software Feature Cartridge

The Software Feature Cartridges used in the Modular ICS, are one piece memory cartridges conforming to the current Modular ICS standard and will replace the current Modular ICS Release 1.1 and XC 1.1 software cartridges.

3.2.5.1 NA-MICS 2.0 Software Feature Cartridge (English Doc (A0660966) Kit)

The Modular ICS 2.0 Software Feature Cartridge supports all the features contained in the Modular ICS 1.1 Features Cartridge and adds the capability to support ISDN BRI on the Modular ICS. For use in Canada and the United States.

Package Contents:

<u>QTY</u>	<u>Part Number</u>	<u>Description</u>
1	A0660967 / NT7B72FG-93	MICS ROM Cart Assy - Trilingual
1	A0655455 / NTAB1907	Modular ICS Distribution Kit - English
1	A0661191 / NTAB2016	NA MICS DR 2.0 Doc Kit - English

3.2.5.2 NA-MICS 2.0 Software Feature Cartridge (French Doc (A0660968) Kit)

The Modular ICS 2.0 Software Feature Cartridge supports all the features contained in the Modular ICS 1.1 Features Cartridge and adds the capability to support ISDN BRI on the Modular ICS. For use in Canada only.

Package Contents:

<u>QTY</u>	<u>Part Number</u>	<u>Description</u>
1	A0660967 / NT7B72FG-93	MICS ROM Cart Assy - Trilingual
1	A0655451 / NTAB1910	Modular ICS Distribution Kit - French
1	A0661194 / NTAB2018	NA MICS DR 2.0 Doc Kit - French

3.2.5.3 NA-MICS 2.0 Software Feature Cartridge (Spanish Doc (A0660969) Kit)

The Modular ICS 2.0 Software Feature Cartridge supports all the features contained in the Modular ICS 1.1 Features Cartridge and adds the capability to support ISDN BRI on the Modular ICS. For use in the United States only.

Package Contents:

<u>QTY</u>	<u>Part Number</u>	<u>Description</u>
1	A0660967 / NT7B72FG-93	MICS ROM Cart Assy - Trilingual
1	A0642280 / NTAB1673	Modular ICS Distribution Kit - Spanish
1	A0661191 / NTAB2016	NA MICS DR 2.0 Doc Kit - English

3.2.5.4 CAN-MICS-XC 2.0 Software Feature Cartridge (English) Doc Kit) (A0660970)

The Modular ICS 2.0 Software Feature Cartridge supports all the features contained in the Modular ICS XC 1.1 Features Cartridge and adds the capability to support ISDN BRI on the Modular ICS. For use in Canada only.

Package Contents:

<u>QTY</u>	<u>Part Number</u>	<u>Description</u>
1	A0660972 / NT7B72FE-93	CDA-MICS-XC 2.0 ROM Cart Assy
1	A0655455 / NTAB1907	Modular ICS Distribution Kit - English
1	A0661191 / NTAB2016	NA MICS DR 2.0 Doc Kit - English
1	A0661196 / NTAB2020	Norstar / Companion Doc Kit - English

3.2.5.5 CAN-MICS-XC 2.0 Software Feature Cartridge (French) Doc Kit) (A0660971)

The Modular ICS 2.0 Software Feature Cartridge supports all the features contained in the Modular ICS XC 1.1 Features Cartridge and adds the capability to support ISDN BRI on the Modular ICS. For use in Canada only.

Package Contents:

<u>QTY</u>	<u>Part Number</u>	<u>Description</u>
1	A0660972 / NT7B72FE-93	CDA-MICS-XC 2.0 ROM Cart Assy
1	A0655451 / NTAB1910	Modular ICS Distribution Kit - French
1	A0661194 / NTAB2018	NA MICS DR 2.0 Doc Kit - French
1	A0661197 / NTAB2021	Norstar / Companion Doc Kit - French

3.2.5.6 USA-MICS-XC 2.0 Software Feature Cartridge (English) Doc Kit) (A0660973)

The Modular ICS 2.0 Software Feature Cartridge supports all the features contained in the Modular ICS XC 1.1 Features Cartridge and adds the capability to support ISDN BRI on the Modular ICS. For use in the United States only.

Package Contents:

<u>QTY</u>	<u>Part Number</u>	<u>Description</u>
1	A0660975 / NT7B72FF-93	USA-MICS-XC 2.0 ROM Cart Assy
1	A0655455 / NTAB1907	Modular ICS Distribution Kit - English
1	A0661191 / NTAB2016	NA MICS DR 2.0 Doc Kit - English
1	A0661196 / NTAB2020	Norstar / Companion Doc Kit - English

3.2.5.7 USA-MICS-XC 2.0 Software Feature Cartridge (Spanish) Doc Kit) (A0660974)

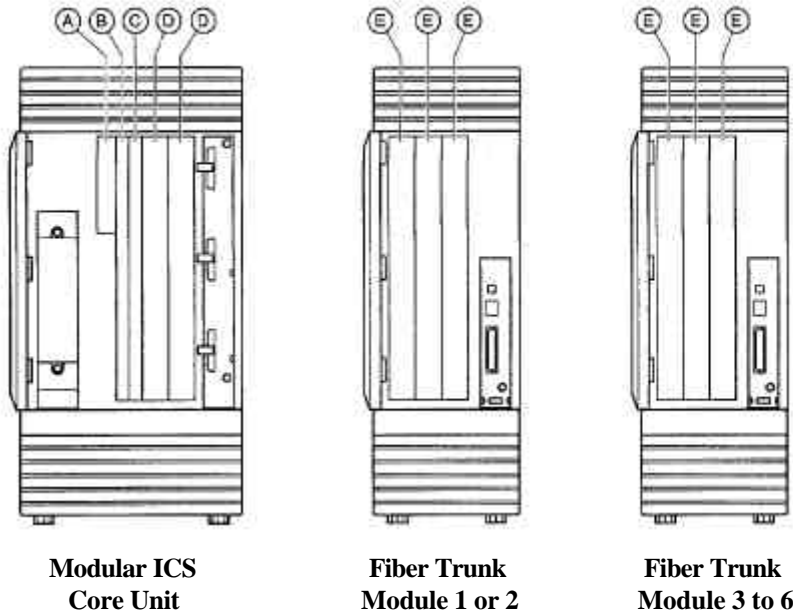
The Modular ICS 2.0 Software Feature Cartridge supports all the features contained in the Modular ICS XC 1.1 Features Cartridge and adds the capability to support ISDN BRI on the Modular ICS. For use in the United States only.

Package Contents:

<u>QTY</u>	<u>Part Number</u>	<u>Description</u>
1	A0660975 / NT7B72FF-93	USA-MICS-XC 2.0 ROM Cart Assy
1	A0642280 / NTAB1673	Modular ICS Distribution Kit - Spanish
1	A0661191 / NTAB2016	NA MICS DR 2.0 Doc Kit - English
1	A0661196 / NTAB2020	Norstar / Companion Doc Kit - English

3.2.6 Modular ICS System Configuration

For configuration purposes, the diagram and tables below outline which cartridges may be installed in the slots of the Modular ICS Core unit and the Fiber Trunk Modules of an expanded system.



Modular ICS Core Unit	Cartridge Type
Slot A	<ul style="list-style-type: none"> • Release 2.0 Software Feature Cartridge; or • Release 2.0 XC Software Feature Cartridge
Slot B	<ul style="list-style-type: none"> • Clock Services Cartridge; or • Combination Fiber 6-Port Services Cartridge
Slot C	<ul style="list-style-type: none"> • 2 Port Fiber Expansion Cartridge; or • 6 Port Fiber Expansion Cartridge; or • Combination Fiber 6-Port Services Cartridge
Slot D	<ul style="list-style-type: none"> • 2 Port U Interface Card; or • 4 Port U Interface Card; or • 4 Port S/T Interface Card; or • Digital Trunk Interface; or • Loop Start Trunk Cartridge; or • CI Trunk Cartridge
Fiber Trunk Module 1 or 2	Cartridge Type

Slot E	<ul style="list-style-type: none"> • 2 Port U Interface Card; or • 4 Port U Interface Card; or • 4 Port S/T Interface Card; or • Loop Start Trunk Cartridge; or • CI Trunk Cartridge; or • DID Trunk Cartridge; or • E&M Trunk Cartridge
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Fiber Trunk Module 3 to 6	Cartridge Type
Slot E	<ul style="list-style-type: none"> • Loop Start Trunk Cartridge; or • CI Trunk Cartridge; or • DID Trunk Cartridge; or • E&M Trunk Cartridge

Notes:

1. XC software is required for systems with more than one Fiber expansion card or for customers wishing to use COMPANION wireless; and
2. While ISDN Interface cards are located in Fiber Trunk Modules, the individual ports on each card may be configured to support either network terminations, or station side ISDN devices.

3.3 Norstar ICS Environmental Requirements

The Compact ICS and Modular ICS are intended as CPE for business environments and as such the product is intended to withstand the environments encountered during use, shipping, and installation. The applicable environmental requirements specifications are:

- I.E.C. 68-2
- Bellcore TR-TRW-000063

The table below summarizes the installation environment requirements.

Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating humidity range	5% to 95% (non condensing)
Location	Clean, dry, well ventilated, and at least 4 m (13.1 ft) from equipment such as copiers, electrical motors, and other equipment that can produce electromagnetic, radio frequency, and electrostatic interference.
Power source location	AC Outlet located not more than 1.5 m (4.9 ft) from the control unit.

3.4 Norstar ICS Line Power/Emergency Line Transfer

Unlike traditional analog lines which are powered by the central office, BRI circuits are powered by the customer equipment. This means that during a power outage BRI circuits will not be operable unless a battery back-up system has been installed.

Emergency line transfer, as we are familiar with it in the analog world, does not apply with digital technology. A Universal Power System is recommended for use with systems that are totally digital. With Norstar systems that are using both analog and digital technology, the traditional Emergency Line Transfer function will be operable.

4.0 Norstar Release 2.0 Features

The following section provides a review of the new and enhanced core and COMPANION features being delivered with Release 2.0 as well as a detailed description of feature compatibility and support.

4.1 New Norstar Core Features

4.1.1 ISDN Access, Call Control & Signaling (Basic Call)

A basic call allows a loop to be called by dialing a DN. All terminals on that loop can respond to the call attempt provided the terminal is configured with the Called DN. Per call Terminal Service Profile checking is supported for incoming and outgoing calls.

4.1.2 Calling Number Identification Services (CNIS)

This feature allows the network to deliver Calling number or User provided calling number identification services. Norstar delivers Caller Line Identification to all Norstar telephone sets with a ringing line appearance. This feature can be used in conjunction with CTI (TAPI) products.

4.1.3 Sub-Addressing

Norstar supports sub-addressing for ISDN devices. If your device supports sub-addressing, you can have one ISDN DN shared by devices with different sub-addresses.

Once the ISDN device is installed, the device itself should be programmed to recognize the sub-addressing number assigned to it.

4.1.4 Static Time and Date

This modification allows users the option of clearing the "Message(s) for You" display in favor of the current time and date information. The message display button (softkey) is still presented to retrieve messages. This feature is only available on M7310 and M7324 telephone sets.

4.2 Enhanced Norstar Core Features

4.2.1 Access Control to the Link Feature, LNR, SNR

Previously all users could access the Link or Hook switch Flash Feature 71. Since this feature can be used to obtain a second dial tone from the central office, and then originate another call without Norstar call restrictions being applied, the enhancement request was to default the feature ON for all sets, but allow the system administrator to remove access to this feature on a Set by Set basis. (Default is allowed.)

4.2.2 Call Park Round Robin

This feature has been enhanced to give users the option to choose either Linear or Round Robin call park codes. With Linear Call Park, when assigning call park codes, the system assigns the first free call park code for the call. This means that the first few call park codes are always being used and reused. For some customers this creates confusion when these parked calls hang up. The Call Park feature has been modified, to include Round Robin, which will assign call park codes sequentially until the maximum number of call park codes is reached (currently 25) before starting again at the first call park code. This helps to prevent users from picking up parked calls on a code which was intended for them, but has since been answered and reused for a new and different call.

4.2.3 Enhanced Administration & Configuration

This feature provides FIND soft keys within the administration programming trees to reduce number of key presses required to traverse to a new DN or line number. Release 2.0 for the Modular ICS software stream will adopt this same programming strategy.

4.3 Enhanced Norstar COMPANION Features

4.3.1 Call Park and Page from a COMPANION portable

This feature allows incoming calls to be parked and the internal page feature to be accessed from the C3020 and C3050 COMPANION wireless portable.

4.3.2 Wireless Dial-By-Name

This feature allows the Dial-By-Name feature resident on Norstar Voice Mail to be accessed from the C3020 and C3050 COMPANION wireless portable. This feature requires Norstar Voice Mail 3.0

4.3.3 C3050 Integrated Voice Mail Support (Canada)

This feature allows the C3050 COMPANION portable to access the full display and softkey feature support associated with Norstar Voice Mail on the Canadian versions of XC software (previously available in the US).

4.3.4 USA-MICS-XC Software Documentation Change

Release 2.0 of the USA-MICS-XC Software and Documentation Kits (English A0660973 and Spanish A0660974) will now include the Norstar / Companion Doc Kit in English. Previously, this Doc kit was ordered as a separate item. This change will standardize the contents of the software and documentation kits across North America. The Norstar / Companion Doc Kit will also remain a separately orderable item for spares purposes.

4.4 Norstar Release 2.0 Compatibility and Support

The following tables establish compatibility for Trunk Support, Peripheral Support, and a Feature List which indicates existing and new features with the Compact ICS and Modular ICS Release 2.0.

4.4.1 Trunk Support

Please refer to the following table for trunk cartridge compatibility.

Trunk Support	Compact ICS Release 2.0	Modular ICS Release 2.0
Mixed Analog and Digital Trunks	Yes	Yes
ISDN Trunks	Yes	Yes
- S/T BRIC Interface	Yes	Yes
- U BRIC Interface	Yes	Yes
- NT-1 protocol	Yes	Yes
- NT-2 protocol	Yes	Yes
- NI-95 protocol	Yes	Yes
- NI-96 protocol	Yes	Yes
Analog Trunks	Yes	Yes
- Disconnect Supv Analog Trunk Crtg	Yes	Yes
Gain and Balance adjustment	Yes	Yes
1A2	No	Yes
T1 Trunks	No	Yes
DID Trunk Cartridge	No	Yes
E&M Trunk Cartridge (version for on-core trk slots)	No	Yes
CLASS Loop Start Cartridge	Yes	Yes
- Dialing Mode: Tone, Pulse	Yes	Yes
- Manual Answer	Yes	Yes
- Automatic Answer	Yes	Yes
- Tandem Point	Yes	Yes
- Trunk Mode: Supervised, Unsupervised	Yes	Yes
- CII Capability	Yes	Yes

4.4.2 Compact ICS Peripheral Compatibility

Please refer to the following table for peripheral compatibility and application compatibility with the Compact ICS Release 2.0.

Peripheral Support/Applications Compatibility	Compact ICS Rls2.0	Delta
M7100 (Basic)	Yes	
M7208 (Square)	Yes	
M7310 (Featured)	Yes	
M7324 (Expanded)	Yes	
M7900 (Touchset-mfr discontinued)	No	
CAP (Central Answering Position)	Yes	
BLF (Busy Lamp Field)	Yes	
PCI-B	Yes	
PCI-D	No	
ATA (Analog Terminal Adapter)		
- with administratable tone & mode	No	
- old North American ATA	No	
- new North American E-ATA	Yes	
- ATA/2	Yes	New
Analog Station Module	No ¹	
Compact or Modular Caller Identification interface	No	
RAD stand alone unit (Remote Access Device)	No ²	
M7410 Cordless Telephone	Yes	New
CTA 500 dm (Computer Telephony Adapter)	Yes	
Norlink/Teledapter	Yes	
StarTalk Mini	No	
StarTalk-all version	No	
Norstar Voice Mail-Rel. 2.1 up	Yes	
StarTalk Flash-Rel. 1.3 up	Yes	
Voice Mail Interface	Yes	
Doorphone	Yes	
Prelude & Cinphony ACD	Yes	New
SMDR 5 (station message detailed reporting)	Yes	New

Note 1: Modular ICS only

Note 2: Integrated into core software

*Norstar Voice Mail 2.0 systems with 1.x or 2.x will require reprogramming when upgrading the Control Unit to the new C-ICS/M-ICS Release 2.0 software. Voice Mail 2.0 systems that will be upgraded simultaneously to Release 3.0 software will receive a "line renumbering utility" diskette to automatically renumber mailboxes. Contact your Nortel representative for information on upgrade process.

4.4.3 Modular ICS Peripheral Compatibility

Please refer to the following table for peripheral compatibility and application compatibility with the Modular ICS Release 2.0.

Peripheral Support/Applications Compatibility	Modular ICS RIs 2.0	Delta
M7100 (Basic)	Yes	
M7208 (Square)	Yes	
M7310 (Featured)	Yes	
M7324 (Expanded)	Yes	
M7900 (Touchset-mfr discontinued)	No	
COMPANION Wireless C3020 Handset	Yes	
COMPANION Wireless C3050 Handset	Yes	Yes (1)
CAP (Central Answering Position)	Yes	
BLF (Busy Lamp Field)	Yes	
PCI-B	Yes	
PCI-D	No	
ATA (Analog Terminal Adapter)		
- with administratable tone & mode	No	
- old North American ATA	No	
- new North American E-ATA	Yes	
- ATA/2	Yes	New
Analog Station Module	Yes	
Compact or Modular Caller Identification interface	No	
RAD stand alone unit (Remote Access Device)	Yes	
M7410 Cordless Telephone	Yes	New
CTA 500 dm (Computer Telephony Adapter)	Yes	
Norlink/Teledapter	Yes	
StarTalk Mini	No	
StarTalk-all version	No	
Norstar Voice Mail-Rel. 2.1 up	Yes	
StarTalk Flash-Rel. 1.3 up	Yes	
Voice Mail Interface	Yes	
Doorphone	Yes	
Prelude & Cinphony ACD	Yes	New
SMDR 5 (station message detailed reporting)	Yes	New

Note 1: USA -XC Software loads currently support Norstar Voice Mail feature access on the C3050 Handset. With Release 2.0, Canadian versions of XC software will now also support Norstar Voice Mail feature access.

*Norstar Voice Mail 2.0 systems with 1.x or 2.x will require reprogramming when upgrading the Control Unit to the new

C-ICS/M-ICS Release 2.0 software. Voice Mail 2.0 systems that will be upgraded simultaneously to Release 3.0 software will receive a "line renumbering utility" diskette to automatically renumber mailboxes. Contact your Nortel representative for information on upgrade process.

4.4.4 Release 2.0 Feature List

This is a Feature List which summarizes what is new or changed relative to the previous software releases on the Compact ICS and Modular ICS products. All features marked as new or changed will be described in the section that follows.

Feature List	Release 2.0	DELTA	BRI Trunk
Access Control to Link, LNR, SNR	Yes	New	N/A
Accidental Disconnect protection	Yes		N/A
Administration & Configuration tree (new programming)	Yes		Yes
Answer Groups	Yes		Yes
Automated Attendant	Yes		Yes
-Custom Call Routing	Yes		Yes
-System Answer	Yes		Yes
Auto dial Keys (max 24 digits)	Yes		N/A
Automatic Line Selection	Yes		Yes
Automatic Set Relocation	Yes		N/A
Auxiliary Ringing			
-through auxiliary ringer port	Yes		Yes
Background Music	Yes		N/A
Busy Lamp Indication			
-on add-on BLF for M7310	Yes		Yes
-on M7324 DSS key lamps	Yes		Yes
Button Inquiry	Yes		N/A
Call Capture	Yes		Yes
Call Display When Busy	Yes		No
Call Duration Timer	Yes		N/A
Call Forward			
-Call forward all calls	Yes		N/A
-Busy no answer	Yes		N/A
-No answer	Yes		N/A
-Override	Yes		N/A
Call Identification			
-Internal Calls	Yes		N/A
-External (PSTN) calls-Voice over B Channel	Yes	New	Yes
-Calling Line Identification	Yes	New	Yes
Call Park	Yes		
-with callback	Yes		N/A
-with callback timer admin	Yes		N/A
-with prefix administratable (including = nil)	Yes		N/A
-call park retrieve	Yes		N/A
-call park round robin code assignment		Enhanced	N/A
Call Pickup Directed	Yes		Yes
Call Pickup Group	Yes		Yes
Call Queuing	Yes		Yes
Call Retention	Yes		Yes
Camp-on	Yes		Yes
-with callback	Yes		Yes
Central Answering Position (CAP)			
-CAP modules support when attached to M7324	Yes		N/A

Feature List	Release 2.0	DELTA	BRI Trunk
Class of Service			
-dialing abilities	Yes		Yes
-line pool access	Yes		Yes
-feature access	Yes		Yes
-COS change via DISA or via COS password (f68)	Yes		Yes
Conference			
-3 party	Yes		Yes
-consultation	Yes		Yes
-force release a conference party	Yes		Yes
-hold conference	Yes		Yes
-split conference	Yes		Yes
-transfer via conference, 1 party internal	Yes		Yes
-transfer via conference, 2 external parties	Yes		Yes
Contrast Adjustment	Yes		N/A
Copy Set Data	Yes		N/A
-copy to a range of DN's	Yes		N/A
Delayed Ring Transfer to Prime	Yes		Yes
Dial Attendant Set			
-administrable digit access	Yes		N/A
-external network DN	Yes		N/A
Dial External-Outgoing Line Identification	Yes		Yes
Dial Mode for lines - Pulse/Tone	Yes		N/A
Dial Pad Feedback	Yes		N/A
Dialtone Detection	Yes		No
-wait for dialtone, F804	Yes		No
Computer Telephony Adapter Features			
-Incoming and Outgoing Data Calls	Yes	New	Yes
-Call Logging	Yes	New	Yes
-Restrictions	Yes	New	Yes
Direct Station Select Buttons	Yes		N/A
DISA (Direct Inward System Access)	Yes		Yes
Discriminating Ringing at Set (admin)	Yes		N/A
Distinctive Ringing Cadence (internal/external)	Yes		Yes
-administrable external cadence	No		No
Do Not Disturb	Yes		N/A
Do Not Disturb on Busy	Yes		Yes
Emergency Power Fail Transfer	Yes		No
End-to-End Signaling			
-short tones internal	Yes		N/A
-short tones external	Yes		Yes
-long tones internal	Yes		N/A
-long tones external	Yes		Yes
-long tones on external paging port	Yes		N/A
Enhanced Restrictions and Overrides	Yes		Yes
-system speed dial restrictions override	Yes		Yes
-dialing filters	Yes		Yes
-alternate toll restrictions	Yes		Yes
External Line Access Code	Yes		N/A
External Speaker	Yes		
Feature Access Key	Yes		N/A

Feature List	Release 2.0	DELTA	BRI Trunk
Flexible Numbering Plan	Yes		
-adminable individual dn's	Yes		N/A
-adminable line pool codes	Yes		N/A
-adminable call park prefix code	Yes		N/A
-adminable "dial-x" code	Yes		N/A
-only data calls dropped during change	Yes		No
-changing DN lengths	Yes		N/A
-outgoing translation table	Yes		N/A
Group Listening	Yes		N/A
Handsfree			N/A
-answerback	Yes		N/A
-automatic	Yes		N/A
-with mute capability	Yes		N/A
Headset	Yes		N/A
Hearing Aid Compatibility	Yes		N/A
Hold	Yes		N/A
-automatic normal hold	Yes		N/A
-exclusive hold	Yes		N/A
-held line reminder with line name	Yes		N/A
Hot Line	Yes		Yes
Incoming Line Group	Yes		Yes
Installer Password	Yes		Yes
Integrated ATA (analog terminal adapter)	Yes		N/A
Integrated RAD (remote access device)	Yes		N/A
Intercom Key Assignment	Yes		N/A
Language Choice	Yes		N/A
Last Number Redial	Yes		N/A
Line Button Relocation	Yes		N/A
Line Pool BLF (outgoing)	Yes		Yes
Line Pool(s)	Yes		Yes
-designation by letter	Yes		
Line Types			
-pool	Yes		Yes
-public	Yes		Yes
-private	Yes		Yes
Listen on Hold	Yes		N/A
Manual Line Selection	Yes		Yes
Messages	Yes		
-send message	Yes		N/A
Static Time & Date	Yes	New	N/A
Multiple Line Appearances	Yes		Yes
On Hold Treatment (music, silence, tones)	Yes		Yes
On Hook Dialing	Yes		N/A
-predial	Yes		N/A
-standard dial	Yes		N/A
-automatic dial	Yes		N/A
Paging	Yes		N/A
-internal multiple zones	Yes		N/A
-external speaker	Yes		N/A
-programmable page time-out	Yes		N/A
-programmable page tone on/off	Yes		N/A

Feature List	Release 2.0	DELTA	BRI Trunk
PBX Reach Through	Yes		

-with feature code compression	Yes		No
-link, programmed release, pause	No		No
-run/stop	Yes		No
-programmed wait for dialtone	Yes		No
Pre-Selection/Call Screening	Yes		Yes
Prime Line	Yes		Yes
Prime Set	Yes		N/A
-call forward transfer to prime set	Yes		N/A
-callback extension to prime	Yes		N/A
-default ringing	Yes		N/A
delayed ring transfer	Yes		N/A
-DND selective call forward	Yes		N/A
-DND transfer to prime set	Yes		N/A
-HLR extension to prime set	Yes		N/A
-overflow call routing	Yes		N/A
Priority Call	Yes		N/A
Privacy on Lines	Yes		Yes
Privacy Control	Yes		N/A
Pulse to Tone Conversion	Yes		N/A
Release	Yes		Yes
Remote Access DN's	Yes		Yes
-target line DN's	Yes		Yes
-DISA DN's	Yes		Yes
-auto DN's	Yes		Yes
-change target line DN length	Yes		Yes
Remote Access Features	Yes		
-page feature	Yes		Yes
-dial target lines	Yes		Yes
-line pool access	Yes		Yes
-integrated RAD	Yes		Yes
-remote monitoring	Yes		Yes
Ring Again	Yes		N/A
Ringing Call	Yes		Yes
-external call presentation on intercom keys	Yes		Yes
-second call busy treatment on intercom keys	Yes		Yes
Ringing Line Preference	Yes		Yes
Saved Number Redial	Yes		N/A
Selective Line Redirection	Yes		Yes
-redirect to network DN	Yes		
-redirect to private network	Yes		
-with busy route extend to prime set	Yes		
-with "Drop Call" through key inquiry	Yes		
Service Modes	Yes		Yes
Set Names	Yes		N/A
Set Speed Dial	Yes		N/A
-facility designation	Yes		N/A
Software Keys	Yes		N/A
Feature List	Release 2.0	DELTA	BRI Trunk
System Speed Dial	Yes		N/A
-facility designation	Yes		N/A
-restriction override capability	Yes		N/A
-naming outgoing digits	Yes		
Startup Templates			
-Centrex	No		No
-DID	No		No

-Hybrid	Yes		Yes
-PBX	Yes		Yes
-Square	Yes		Yes
-Specify starting DN on startup	Yes		Yes
Station Set Test	Yes		N/A
Target Lines	Yes		Yes
Telephone Admin Lock	Yes		Yes
Time of Day Route Selection	Yes		Yes
Time/Date Display	Yes		N/A
-Auto Daylight Savings Time	Yes		N/A
Transfer			
-immediate	Yes		Yes
-with announcement	Yes		Yes
-with callback	Yes		Yes
-via conference	Yes		Yes
-via hold	Yes		Yes
Trunk Answer From Any Station	Yes		Yes
Upgrade (automatic)			
-from one C-ICS to another	Yes		Yes
User Preferences	Yes		
User Programmable Feature Keys	Yes		N/A
Voice Call			
Voice Call Deny	Yes		N/A
Volume Control	Yes		N/A
CLASS Features			
-calling line identification	Yes		No
-calling name identification	Yes		No
-call log	Yes		No
Message Waiting Indicator	Yes		No
Dialable DN (as delivered from network)	Yes		No
ISDN FEATURES			
Basic Call	Yes	New	Yes
-D-Packet (Point of Sale Terminals)	Yes	New	Yes
Calling Number Identification Services	Yes	New	Yes
Sub-addressing	Yes	New	Yes
Maintenance	Yes		
Alarms	Yes		Yes
System version	Yes		Yes
Port/DN status	Yes		Yes
Module status	Yes		Yes
Diagnostics	Yes		No
Bit Error Rate Test	Yes		No
System Test Logs	Yes		Yes
System Admin Logs	Yes		Yes
Feature List	Release 2.0	DELTA	BRI Trunk
Network Log	Yes		Yes
Link Quality	Yes		Yes
Provisioning	Yes		
-port	Yes		Yes
-Loop	Yes	New	Yes
TEI Status	Yes	New	Yes
Remote Administration	Yes		
-backup and restore (See Norstar Remote Utilities Channel Introduction Package)	Yes	New	Yes
-alarm reporting	Yes	New	Yes

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5.0 ISDN Network Services and Ordering Codes

The following section defines the ISDN network services that are supported by Release 2.0 as well as the recommended Bellcore service package codes for the Compact and Modular ICS products.

5.1. Ordering ISDN Service in Canada

In Canada, order Microlink™ service, the trade name for standard BRI service. Ask for D-packet service to be enabled if you will be using a point-of-sale terminal adapter(POSTA).

5.2 Ordering ISDN Service in the U.S.

In the U.S., order ISDN services using the following packages as a guideline. Contact your service provider for more information about the capability packages it offers.

5.2.1 Bellcore / National ISDN Users Forum Package Codes

Once you have determined a configuration of ISDN trunk and terminal connections for your Norstar ICS, order the appropriate ISDN capability package from your service provider. You will be provided with the service profile identifiers (SPIDs), network directory numbers (DN's), terminal endpoint identifiers (TEI's), and other information as required to program your Norstar ICS, TA's and other ISDN equipment.

The following are examples of Bellcore/National ISDN Users Forum (NIUF) order code packages which are supported by Norstar Release 2.0.

Package	Capability	Feature set	A la carte features
D	Voice on one D channel D-channel packet	Basic D Channel Packet	
G	Voice on one B-channel Circuit switched data on one B-channel		
K	Voice or circuit-switched data on one B-channel Circuit-switched data only on the other B-channel		Calling line identification
M	Voice or circuit-switched data on both B channels		Calling line identification
P	Voice or circuit switched data on both B channels	(See Section 5.2 for ISDN Network Services Support) Basic D Channel Packet	(See Section 5.2 for ISDN Network Services Support) Calling line identification

Compact ICS does not support EKTS (Electronic Key Telephone System), CACH (Call Appearance Call Handling), or Calling Name Display.

Multi-Line Hunt may be ordered with your package. When a telephone number (the Network DN) in the group of numbers assigned by your service provider is busy, the Multi-Line Hunt feature connects the call to another telephone number in the group.

For maximum flexibility, you should order package **M** or **P**, which gives you the option of using your connections for voice or data as needed.

Norstar ICS does not support any package with EKTS (Electronic Key Telephone System) or CACH (Call Answer and Call Hold). Contact your service provider for more information about the capability packages they offer.

5.3 ISDN Network Services and Features

The Compact ICS and Modular ICS Release 2.0 products will support a variety of ISDN network features. These features are dependent on the type of Central Office facility serving the customer's location, as well as the service provider who may or may not offer the network features described below.

In many cases the features provided by the network have been designed with a residential (i.e. single BRI) installation in mind. As a result, the use of these features in a line-concentrated KTS environment must be clearly understood by the customer to avoid unexpected results.

5.3.1 Network Call Forward

This feature allows the customer to forward all in-coming calls on a line to an external number. This feature is *line specific* and requires the customer to depress the appropriate line key prior to invoking the feature. Once this feature has been invoked, the line will be available for outgoing calls only on the Norstar system.

5.3.2 Network Auto Redial

This feature allows a customer to automatically redial the last incoming number whether or not the call was answered. This feature is *line specific* and requires the customer to depress the appropriate line key prior to invoking the feature.

Alternatively, the customer may make use of the Norstar Feature "Call Log" (F812) which, based on calling line identification, provides the sequence number of the caller, caller's number, long distance indication, indication of whether or not the call was answered, time and date of the call, number of repeated calls from the same source and the name of the line the call came in on. Call Log also supports one touch redial using softkeys on the M7310 and M7234 sets.

5.3.3 Automatic Call Back

This feature allows a caller, who has been unable to reach a busy subscriber, to be notified when the subscriber goes on-hook. When the called line becomes idle, the calling line will ring. This feature is *line specific* and requires the customer to depress the appropriate line key prior to invoking the feature. If another user selects the line and is on a call when the call back event occurs, the call back function will be dropped from the line and the customer will not receive another call back notification.

5.3.4 Calling Number Delivery

This feature provides the number of the calling party on the display of any of the Norstar station sets. This network capability comes with nearly all BRI services at no additional charge. Calling number delivery on ISDN is received immediately by the customer, unlike analog calling line identification which is provided between the first and second rings of the telephone. All the features and benefits currently available on Norstar for CLID will be supported on calling number delivery.

5.3.5 Calling Number Delivery Blocking

This feature allows the customer to block the transfer of their number to the called party on a call-by-call basis.

5.3.6 Customer Originated Trace

This feature allows the recipient of obscene or harassing calls to request a trace of the last call received by their service provider. This feature is *line specific* and requires the customer to depress the appropriate line key prior to invoking the feature.

5.3.7 Unidentified Call Rejection

This feature allows the customer to reject incoming calls from parties who have a privacy feature that prevents the delivery of the calling number. This feature is *line specific* and requires the customer to depress the appropriate line key prior to invoking the feature.

5.3.8 Network Speed Dial

This feature allows the customer to store frequently called numbers for speed dialing. This feature is *line specific* and requires the customer to depress the appropriate line key prior to invoking the feature. Alternatively, the customer may make use of keys on their Norstar sets or use the Norstar speed dial capability.

5.3.9 Multi-Line Hunt Groups

This feature allows calls made on the customer’s prime DN to hunt to the next available line or BRI circuit if the prime DN is busy.

5.3.10 Packet Data Services

The Norstar Release 2.0 products support the transmission of X.25 packet data over the “D” channel. Transmission of packet data over the “B” channel is not supported.

5.3.11 Other Network Features

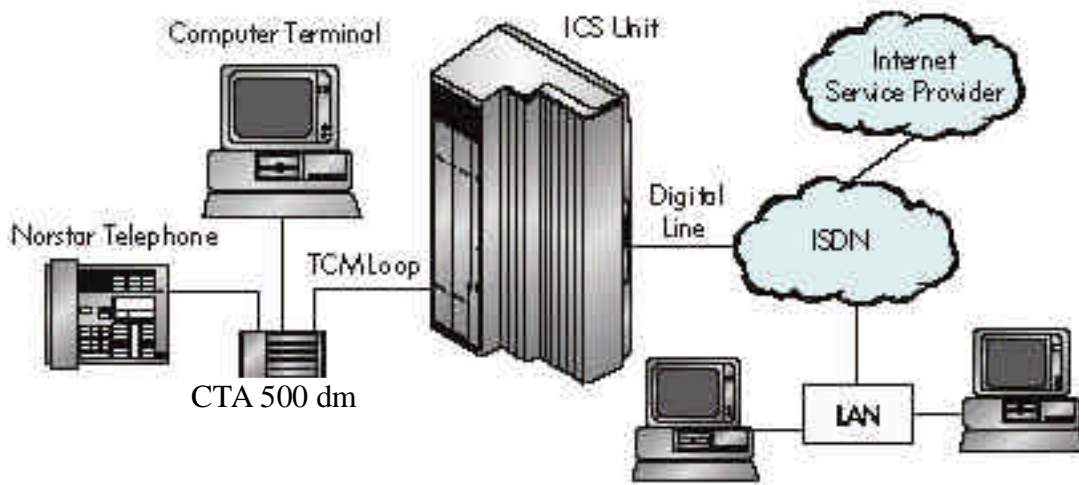
Other network features that are not listed in Section 5.2 are not supported by ICS Release 2.0 software. Network Call Transfer/Call Conference and Message Waiting Indication from a Central Office (C.O.) based voice mail system are features that are currently not supported in Release 2.0. These features are in development for a future software release. Please contact your Nortel representative for more information.

5.4 ISDN Standards Compatibility

Norstar ISDN equipment supports National ISDN standards for basic call and calling line identification services.

network and customer premise equipment (CPE)	NI-1, NI-2, NI-95, NI-96
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6.0 Computer Telephony Adapter 500 dm (CTA 500 dm)



The Computer Telephony Adapter (CTA 500 dm) is an optional device for use with the Norstar Integrated Communication Systems (ICS). With Compact ICS Release 2.0 the CTA 500 dm provides an **Integrated Desktop Solution** for the voice, data and Computer-Telephony Integration (CTI) services required for today's office environment

The CTA 500 dm serves as a terminal adapter (TA) and provides reliable high speed end to end digital connectivity between your computer and a remote data server, through the Norstar ICS and the public ISDN network. The CTA 500 dm supports Point-to-Point protocol (PPP) and Multi-link PPP (MP), which are widely used in applications such as Internet access and remote LAN access.

A Norstar telephone can also be connected to the CTA 500 dm to access Norstar voice services. You can simultaneously carry on a conversation while your computer is connected to the Internet or remote LAN, with no loss of ICS features. The CTA 500 dm connects to the ICS using standard telephone cabling.

MP works with intelligent bandwidth management software (in the ICS) to provide dynamic bandwidth allocation. When the attached Norstar telephone is not in use, excess bandwidth can be reallocated for data traffic (up to 128 kbps). If you use the telephone, 64 kbps service is automatically reallocated for the conversation and the data connection continues at 64 kbps. When you hang up the telephone the extra bandwidth is automatically reallocated to the data connection.

In addition, some of the ICS resources (such as network access lines and calling line features) normally used for voice applications can be used for data traffic. Network access lines can be shared between CTA 500 dm's and the other traffic within the system. Features such as call logging, call restriction and routing based on time of day can be applied to data traffic for facility utilization and management.

CTA 500 dm feature summary

- Modem replacement using PPP/MP
- High speed network rate (56, 64, 112, 128 kbps)
- High speed serial port (maximum 115.2 kbps)
- Integrated desktop solutions (Norstar set, PPP/MP data version, CTI)
- Bonding of two 56/64 kbps channels using MP
- Dynamic bandwidth allocation between voice and data sessions
- Data transfer via 3.4 khz audio call type in ISDN
- Password authentication protocol support
- Hayes command dialing
- Delivery of calling line identification
- In-field software upgrade for feature enhancement
- The CTA 500 dm includes:
 - Norstar TAPI service provider
 - Personal Call Manager
 - Adobe Acrobat Reader
 - Documentation on Softcopy
 - Installation Wizard for Windows '95

6.1 CTA 500 dm Applications

The CTA 500 dm can be used for any application that requires dial-up capability and uses Point-to-Point Protocol (PPP) or Multilink Protocol (MP). These applications include:

- Internet access
- remote LAN access (dial-up networking)
- high-speed modem replacement (data to data transfers)
- computer-telephony integration

Using the CTA 500 dm with PPP allows you to get up to 64 Kbps/s on each channel of an ISDN link. The CTA 500 dm also supports Multilink PPP(MP) to enable the dial-up connections to use two channels of an ISDN link. The CTA 500 dm provides a unique ability to deliver simultaneous access to voice, data, and CTI by dynamically allocating bandwidth to the appropriate application.

The following scenario highlights the capabilities of this simultaneous access:

- A Norstar user equipped with a CTA 500 dm at the desk top is in the process of accessing the Internet using his ISDN BRI at 115 kbps.
 - The Norstar user receives a call to his Norstar telephone.
 - The Norstar set rings and his CTI screen pop application presents the callers file information based on the incoming callers number; Internet access is unaffected and continues at 115 kbps.
 - The Norstar user answers his telephone. 64 kbps is allocated to his voice call, and Internet access continues at 64 kbps.
 - The Norstar user hangs-up. Internet access automatically returns to 115 kbps.

Internet Access

The CTA 500 dm allows Norstar customers to access Internet service providers (ISP) on the Compact ICS through an ISDN interface. The user connects to an ISP through the public switched digital network (PSDN) using regular dial-up methods. **This requires the ISP to have ISDN access capabilities.** Access may be conducted at 56 Kbps, 64 Kbps, 112 Kbps, or 115.2 Kbps.

Dial Up Networking / Telecommuting

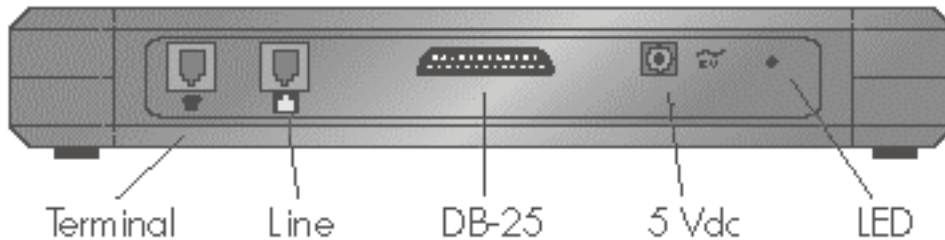
The CTA 500 dm can be used for remote LAN access applications when PPP/MP is used when dialing-in to the remote LAN. This does not require DID lines at the CTA 500 dm - it can be preprogrammed to answer data calls from your home DN. Note that the CTA 500 dm can determine if in-coming calls are voice or data. The CTA 500 dm has the intelligence to answer only data calls.

Data to Data Transfers

Any two computers with attached ISDN Terminal Adapters, such as a CTA 500 dm, can communicate with each other. The two computers can be connected to the same ICS through their own CTA 500 dm units, or they can be connected through the network. Using the CTA 500 dm connection allows the replacement of analog modems with higher speed digital connections.

Computer-Telephony Integration

The CTA 500 dm provides both access to ISDN and CTI applications resident on the users PC. As a fully compliant TAPI device, the user will be able to use the CTA 500 dm for ISDN access, CTI access or both simultaneously.



6.2 CTA 500 dm Installation

The CTA 500 dm can either be desk or wall mounted. The CTA 500 dm has four jacks for connecting to the ICS, your computer, the power supply and a Norstar set.

The line jack is for connection to the ICS. Connect the line jack on the CTA 500 dm to a wall plug using the included with RJ11 connectorized cable. Depending on ICS software release, there may be restrictions on the maximum number of ports and the physical ports to which the CTA 500 dm can be connected.

Connect the DB-25 connector on the CTA 500 dm to the serial port on the PC. A 25 pin to 9 pin cable will be included with unit.

Connect the supplied power adapter (5 Vdc, 600 mA) to the CTA 500 dm. Plug the adapter into a standard three prong AC outlet.

Connecting a Norstar Set

A Meridian Norstar telephone can be connected to the Terminal jack. Use the telephone cable included with the Norstar set.

Setting up the ICS

Program the ICS for the CTA 500 dm the same way that you program the ICS for a Norstar set. You can program line access, line code, and restrictions to apply to outgoing calls. The CTA 500 dm must be assigned to a digital line (or to a digital line pool). It will have two DN's, one for the CTA 500 dm and one for the Norstar telephone set.

7.0 Norstar Release 2.0 Training Materials

7.1 Sales Training Materials

Objective

The objective of the Norstar Release 2.0 Sales Training is to give participants the knowledge required to successfully present and sell Norstar ICS-BRI. The basis of the training will be a Leader Led course designed to provide participants with training on Norstar ICS-BRI positioning and product components, customer scenarios and market opportunities.

The goal of the Leader Led course is to ensure that students are competent in the product, its features and benefits to customers, with building profiles for potential Norstar ICS-BRI customers and determining their needs, and with using appropriate sales tools to prepare and provide a sales solution for the customer.

The Leader Led course will be supplemented with the following sales tools:

- an ISDN Overview scripted presentation
- a series of ISDN applications examples, in FAXable format
- an audio tape discussing "Ten Good Reasons to Buy Norstar ICS BRI"
- a package of quick reference materials on "How to Order ISDN"
- a supplement for the Norstar Handbook

Pre-Requisite

Participants in the Leader Led course should have a basic working and sales knowledge of both Norstar and Norstar. *Basic telephony and ISDN knowledge is highly recommended.*

The following pre-course materials will be available for those who wish to acquire Norstar knowledge: Norstar 101, a scripted presentation overview of the Norstar product line; and the Norstar Handbook, a quick reference guide for Norstar. A number of excellent ISDN seminars and publications are also available. At a minimum, participants should read the first four Chapters of ISDN for Dummies by David Angell.

Audience and Length

Sales Representatives, Sales Associates, and Telemarketing Representatives.

Total Leader Led course length including introduction, wrap up and breaks is estimated at 4 hours.

Course Content

The Leader Led course will contain the following content:

Introduce Norstar-BRI

Market Drivers

Norstar-BRI Overview

Positioning within the product portfolio

Describe Norstar ICS-BRI

Architecture

Hardware

Software

Models

Upgrades

Describe Norstar ICS-BRI Features

Describe the selling features of Norstar ICS-BRI

Determine customer applications

Explore Norstar ICS-BRI Sales Solutions

Work with sample customer scenarios

Ordering the Norstar ICS Release 2.0

7.2 Technical Training Courses

ITAS will provide technical training courses for the Norstar ICS Release 2.0 products as follows:

7.2.1 Compact ICS-ISDN Technical Training (Course 114)

The following listing provides the contents of the Compact ICS-ISDN Technical Training - Course 114. This course replaces the current Compact ICS Introductory course.

Part 1: An Introduction

Part 2: Installing the Hardware

Part 3: Programming

Part 4: Auto Attendant

Part 5: Installing ISDN Hardware

Part 6: Provisioning and programming BRI Cards

Part 7: Troubleshooting and Maintenance

Part 8: Computer Telephony Adapter 500 dm

7.2.2 7.2.2 Technical Training

As with other Norstar products, Technical Training for ICS will be offered in the US via Nortel Product Training and Documentation and in Canada via Calgary ITAS organization. Course registration is by existing procedures as outlined in the current Norstar North American Technical Training Course Catalog.

The ICS courses are designed for System Administrators and/or I&R Technicians who are responsible for installing, administering and maintaining ICS systems and applications.

Important Information on Prerequisite Training and Technician Certification

Norstar ICS Technical Training will be one of the first introduced with Technician Certification capability. Additional certification requirements will be communicated under separate cover for future product release initiatives (Norstar VoiceMail 3.0, etc.). The course will conclude in an exam which will test the students' knowledge of the product. Those who successfully write the exam will be provided with a Certificate of Product Knowledge for Norstar ICS. Taking of the exam is optional, but attaining Technician Certification becomes important in cases where the student has a PIN number for direct support calls to ITAS. Technicians who do not have certification on a specific product (like Norstar ICS) will be subject to current billable rates prior to assistance from ITAS. These rates are currently published in the Norstar Product Catalogue, section xxx. A grace period of 3 months from General Availability is provided for scheduling appropriate training. Equivalency testing will also be offered for those who have other training options available to them.

As with all Norstar Technical Training, it is important that students registering in the ICS course have the required prerequisite training and/or experience. The students who will be attending this course are expected to have already completed basic ISDN training. In addition, students should have acquired background knowledge in the subject areas of PC troubleshooting/maintenance in order to be comfortable with the concepts that will be covered in the ICS course. These concepts will include installation & maintenance of the CTA (Computer Telephony Adapter) and associated software.

The covered content of a background skills training course should include:

- TCP/IP Applications and Services
 - Domain Name Servers and their function
 - Connecting to the public internet (dial up and dedicated connections)
 - Proxy servers and their role
 - TCP/IP applications (ping, telnet, ftp, smtp)
- Related Applications and Services on other transport protocols
- Troubleshooting approaches, troubleshooting tools (Basic PC skills)
- Windows Desk Top Skills
 - Applications Software Installation and Set Up
 - Desk Top Program Navigation and Properties Management

Please contact ITAS Technical Training for additional information regarding background training options.

(403) 291-7251

ITAS

ITAS Support Number - 24 hours/365 days

(800) 661-4827
(800) 321-2649
Fax (403) 291-7197
(615) 734-5177

7.2.3 Self-Paced Training Bulletins

In addition to the training courses listed above, ITAS will provide self-paced training bulletins for use by trained field service personal. To order these bulletins or obtain further information about ITAS courses, please contact either:

- Lisa Bjornson, ITAS Training Project Manager, (403) 291-7180; or
- Richardson Training Center 1-800-775-6835

8.0 Norstar Release 2.0 Marketing Support

The following is the marketing support plan for Norstar ICS Release 2.0:

8.1 Marketing Promotion

End User Programs

Release 2.0 becomes part of **PowerBuyer III Program NA**

Designed to incent Multi-site customers to pull business forward and buy in larger quantities.

End user cash or equipment rebate based on purchase levels CLP point based.

Contact: Judson Randolph (615-734-5903)

Release 2.0 is on the **Meridian Display Vehicles**

Contact: Angela Burnette for reservations (615-367-5213)

Release 2.0 becomes part of **Customer Satisfaction Guarantee**

90 Day money back guarantee of Norstar Equipment

Contact: Lisa Heaton (615-734-5811)

Release 2.0 becomes part of **Registered Consultant Liaison Program**

15% rebate to CLP

Contact: Lisa Heaton (615-734-5811)

Education/Awareness

Release 2.0 will be part of ISLUA presentation (week of June 23rd). Norstar Academy module on Release 2.0 to be distributed to Norstar Connection participants 11/96.

Sales Incentives

Release 2.0 will be part of **Norstar Connections** as core product

8.2 Sales Collateral

At the present time we are planning to produce the following sales collateral for each of the Compact ICS and Modular ICS:

- A four-color, bi-fold brochure using the Norstar "look and feel"
- A two-color, technical specification sheet.

9.0 Norstar Release 2.0 Competitive Overview

9.1 Lucent Technologies

Partner: Lucent announced availability of ISDN connectivity on Partner for December 1996. Partner's BRI solution provides very little value or integration over stand alone ISDN network access into a small business environment. The digital BRI connections bypass the Partner KSU and an Ascent Pipeline 25 is required for each ISDN station. This configuration is not "true ISDN connectivity".

Positioning Norstar against Partner:

When positioning Norstar against Partner, salespeople should highlight the following Norstar benefits:

- True BRI integration which allows BRI channels to be used for both voice and data applications as required;
- Choice of ISDN BRI Interfaces which allows customers to attach equipment with U or S/T requirements to the Norstar system;
- The integrated desktop benefits provided by the CTA 500 dm which supports high speed data connectivity as well as TAPI applications;
- Access to both ISDN network features and standard Norstar features;
- Investment protection when moving from the Compact ICS to the Modular ICS;
- The ISDN benefits of digital station to station access in terms of clear voice and reliability;
- The fact that no rewiring is required for new or installed base upgrades to BRI

Legend: Lucent offers an 8 port U interface BRI card for Merlin Legend and a 7500B UDM Terminal Adapter. End user prices for the BRI card is approximately \$2000. Lucent is pushing BRI for high speed internet access and cheap dialtone.

Positioning Norstar against Legend:

When positioning Norstar against Legend, salespeople should highlight the following Norstar benefits:

- The opportunity to access BRI at very low line sizes (2 ports) verses the expense of Legends 8 port card;

- Choice of ISDN BRI Interfaces which allows customers to attach equipment with U or S/T requirements to the Norstar system;
- The integrated desktop benefits provided by the CTA 500 dm which supports high speed data connectivity as well as TAPI applications;
- Access to both ISDN network features and standard Norstar features;
- Investment protection when moving from the Compact ICS to the Modular ICS;
- The ISDN benefits of digital station to station access in terms of clear voice and reliability;
- The fact that no rewiring is required for new or installed base upgrades to BRI

9.2 Nitsuko

Nitsuko plans to introduce BRI on their 124i and 384i key systems in 1997. Nitsuko will offer a 2 port ST interface card called the BRI Interface PCB. The 384i will accommodate a maximum of 16 BRI Interface PCB, equivalent to 32 BRI ports or 64 BRI "B" channels.

Additional information will be provided once the product has been launched.

9.3 Siemens Rolm Office Point

The Siemens Rolm Office Point system is a BRI ISDN phone switch. The system's maximum capacity is 3 BRI lines (i.e. 6 channels) and 24 extensions (max. 16 digital stations). The system has built-in NT-1s and is targeted toward small businesses. Siemens Rolm is promoting imaging applications, videoconferencing, data transmission, internet access and remote LAN access as key small business applications. Office Point is available in Canada and the U.S., however, Siemens Rolm has little market presence in North American. In 1996 they held less than 1% market share.

Positioning Norstar against Office Point:

When positioning Norstar against Office Point, salespeople should highlight the following Norstar benefits:

- Norstar supports mixed analog and BRI trunking giving the customer the flexibility they need for any solution. Office Point supports only BRI;
- Choice of ISDN BRI Interfaces which allows customers to attach equipment with U or S/T requirements to the Norstar system;
- The integrated desktop benefits provided by the CTA 500 dm which supports high speed data connectivity as well as TAPI applications;
- Access to both ISDN network features and standard Norstar features;
- Investment protection when moving from the Compact ICS to the Modular ICS;
- The ISDN benefits of digital station to station access in terms of clear voice and reliability;
- The fact that no rewiring is required for new or installed base upgrades to BRI;
- The capacity to grow well beyond the limits of Office Points 3 BRIs and 16 stations.

9.4 Other Competitors

The following competitive systems do not presently support BRI ISDN:

- Toshiba DK8
- Toshiba DK16e
- Toshiba DK280
- Inter-Tel Axxent
- Inter-Tel Axxess
- Comdial DigiTech
- Comdial DXP and DXP Plus
- Panasonic KX-TD
- Panasonic DBS
- Executone IDS
- Vodavi Starplus

10.0 Components and Ordering Codes

The following North American products will be introduced to replace current named products. **Please note that NEW ordering codes are shown in BOLD type**, with the products to be replaced (where applicable) listed in plain text.

10.1 Compact ICS and Modular ICS Common Hardware

Description	CPC	PEC
2-Port U Interface BRI Cartridge	A0652049	NT7B86GA93
4-Port U Interface BRI Cartridge	A0652051	NT7B87GA93
4-Port S/T Interface BRI Cartridge	A0633567	NT7B76AA93
Computer Telephony Adpater 500 dm	A0652062	NTBB33GA93

10.2 Compact ICS Specific Hardware

Description	CPC	PEC
C-ICS Control Unit, equipped with one 2-Port U Interface Cartridge	A0655689	NT7B58AC93
C-ICS Control Unit, equipped with one 4-Port U Interface Cartridge	A0655691	NT7B58AD93
C-ICS Combination Services Cartridge 8-Port TCM Expansion Cartridge	A0652072 A0629599	NTBB04GC93 NTBB04GA93
C-ICS Services Cartridge, Clock Control	A0652074	NTBB04GD93

10.3 Compact ICS Specific Software

Description	CPC	PEC
C-ICS Rel. 2.0 Restricted SW Feature Cartridge, with English Docs	A0655694	NT7B65AD
C-ICS Rel. 1.0 4x8 SW Feature Cartridge with English Docs NA-CICS (4x8) DR 1.0/Eng Docs	A0655988	NT7B65AE
C-ICS Rel. 2.0 Restricted SW Feature Cartridge w/French Docs (4x8)	A0655695	NT7B65BC
C-ICS Rel. 1.0 4x8 SW Feature Cartridge, with French Docs NA CICS (4x8) DR 1.0 S/W	A0655989	NT7B65BD
C-ICS Rel. 2.0 Standard SW Feature Cartridge with English Docs	A0654690	NT7B65AB
C-ICS Rel. 1.0 Expanded SW Feature Cartridge with English Docs	A0629600	NT7B65AA
C-ICS Rel. 2.0 Standard SW Feature Cartridge with French Docs	A0655683	NT7B65BB

C-ICS Rel. 1.0 Expanded SW Feature Cartridge with French Docs	A0629601	NT7B65BA
C-ICS Rel. 2.0 Restricted SW Feature Cartridge w/I-RAD enabled, with English Docs	A0672474	NT7B65AG
C-ICS Rel. 2.0 Restricted SW Feature Cartridge w/I-RAD enabled, with French Docs	A0672479	NT7B65BF
C-ICS Rel. 2.0 Standard SW Feature Cartridge with I-RAD enabled, with English Docs	A0672468	NT7B65AF
C-ICS Rel. 2.0 Standard SW Feature Cartridge with I-RAD enabled, with French Docs	A0672472	NT7B65BE

10.4 Compact ICS Specific Documentation

Description	CPC	PEC
Documentation, Customer: System Coordinator Guide Rel. 2, & Feature Cards, English	A0655681	NTAB1913
Documentation, Customer: System Coordinator Guide Rel. 1, & Feature Cards, English	A0629931	NTAB1457
Documentation, Customer: System Coordinator Guide Rel. 2, & Feature Cards, French	A0655684	NTAB1915
Documentation, Customer: System Coordinator Guide Rel. 2, & Feature Cards, French	A0629932	NTAB1458
Documentation, Installer: Installation Guide, Rel. 2, & Programming Record, English	A0655682	NTAB1914
Documentation, Installer: Installation Guide, Rel. 2, & Programming Record, English	A0648317	NTAB1799
Documentation, Installer: Installation Guide, Rel. 2, & Programming Record, French	A0655685	NTAB1916
Documentation, Installer: Installation Guide, Rel. 2, & Programming Record, French	A0648318	NTAB1830
System Coordinator Guide, Rel. 2, English	P0847826	N/A
System Coordinator Guide, Rel. 1, English	P0820425	N/A
System Coordinator Guide, Rel. 2, French	P0847827	N/A
System Coordinator Guide, Rel. 1, French	P0820432	N/A
Installation Guide, Rel. 2, English	P0847816	N/A
Installation Guide, Rel.1, English	P0820430	N/A
Installation Guide, Rel. 2, French	P0847817	N/A
Installation Guide, Rel. 1, French	P0820439	N/A
Programming Record, Rel. 2, English	P0847818	N/A
Programming Record, Rel. 1, English	P0820426	N/A
Programming Record, Rel. 2, French	P0847819	N/A
Programming Record, Rel. 1, French	P0820433	N/A
Feature Cards Rel. 2, (Qty 25), English	A0687064	NTAB2330
Feature Cards, (Qty 25), English	A0659210	NTAB2002
Feature Cards, Rel. 2, (Qty 25), French	A0687067	NTAB2331
Feature Cards, (Qty 25), French	A0659211	NTAB2003

Feature Cards, Rel. 2, (Qty 25), Spanish
 Feature Cards, (Qty 25), Spanish

A0687068
 A0659213

NTAB2332
 NTAB2004

10.5 Modular ICS Specific Software

Description	CPC	PEC
NA-MICS 2.0 Software Feature Cartridge (English Doc Kit)	A0660966	NT7B83AL93
NA-MICS 1.1 Software Feature Cartridge (English Doc Kit)	A0642274	NT7B83AE93
NA-MICS 2.0 Software Feature Cartridge (French Doc Kit)	A0660968	NT7B83BG93
NA-MICS 1.1 Software Feature Cartridge (French Doc Kit)	A0642275	NT7B83BD93
NA-MICS 2.0 Software Feature Cartridge (Spanish Doc Kit)	A0660969	NT7B83DE93
NA-MICS 1.1 Software Feature Cartridge (Spanish Doc Kit)	A0642276	NT7B83DC93
CAN-MICS-XC 2.0 Software Feature Cartridge (English Doc Kit)	A0660970	NT7B83AK93
CAN-MICS-XC 1.1 Software Feature Cartridge (English Doc Kit)	A0649683	NT7B83AF93
CAN-MICS-XC 2.0 Software Feature Cartridge (French Doc Kit)	A0660971	NT7B83BF93
CAN-MICS-XC 1.1 Software Feature Cartridge (French Doc Kit)	A0649684	NT7B83BE93
USA-MICS-XC 2.0 Software Feature Cartridge (English Doc Kit)	A0660973	NT7B83AJ93
USA-MICS-XC 1.1 Software Feature Cartridge (English Doc Kit)	A0649681	NT7B83AG93
USA-MICS-XC 2.0 Software Feature Cartridge (Spanish Doc Kit)	A0660974	NT7B83DD93
USA-MICS-XC 1.1 Software Feature Cartridge (Spanish Doc Kit)	A0649682	NT7B83AH93

10.6 Modular ICS Specific Documentation

Description	CPC	PEC
NA MICS 2.0 Documentation Kit (English) NA MICS 1.1 Documentation Kit (English)	A0661191 A0642278	NTAB2016 NTAB1671
NA MICS 2.0 Documentation Kit (French) NA MICS 1.1 Documentation Kit (French)	A0661194 A0652279	NTAB2018 NTAB1672
NA MICS 2.0 Installer Guide (English) NA MICS 1.1 Installer Guide (English)	P0857840 P0838262	N/A N/A
NA MICS 2.0 Installer Guide (French) NA MICS 1.1 Installer Guide (French)	P0857852 P0838268	N/A N/A
NA MICS 2.0 System Coordinator Guide (English) NA MICS 1.1 System Coordinator Guide (English)	P0857846 P0838263	N/A N/A
NA MICS 2.0 System Coordinator Guide (French) NA MICS 1.1 System Coordinator Guide (French)	P0857855 P0838269	N/A N/A
NA MICS 2.0 Programming Record (English) NA MICS 1.1 Programming Record (English)	P0857845 P0838264	N/A N/A
NA MICS 2.0 Programming Record (French) NA MICS 1.1 Programming Record (French)	P0857854 P0838270	N/A N/A
NA MICS XC 2.0 Programming Record (English) NA MICS XC 1.1 Programming Record (English)	P0857841 P0838265	N/A N/A
NA MICS XC 2.0 Programming Record (French) NA MICS XC 1.1 Programming Record (French)	P0857853 P0838272	N/A N/A
Norstar / Companion 2.0 Documentation Kit (English) Norstar / Companion 1.1 Documentation Kit (English)	A0661196 A0655456	NTAB2020 NTAB1908
Norstar / Companion 2.0 Documentation Kit (French) Norstar / Companion 1.1 Documentation Kit (French)	A0661197 A0655542	NTAB2021 NTAB1911
Norstar / Companion Installer Guide (English) Norstar / Companion Installer Guide (English)	P0857848 P0838267	N/A N/A
Norstar / Companion Installer Guide (French) Norstar / Companion Installer Guide (French)	P0857869 P0838274	N/A N/A

Norstar / Companion System Coordinator Guide (English)	P0857847	N/A
Norstar / Companion System Coordinator Guide (English)	P0838266	N/A
Norstar / Companion System Coordinator Guide (French)	P0857868	N/A
Norstar / Companion System Coordinator Guide (French)	P0838273	N/A

10.7 Miscellaneous

Description	CPC	PEC
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NOTE: The following products and order codes remain available and unchanged.

C-ICS equipped with LS/DS Analog Trunk Cartridge	A0652667	NT7B58AA93
C-ICS equipped with Caller ID Trunk Cartridge	A0652668	NT7B58AB93
C-ICS Rel. 2.0, Restricted to Standard S/W Upgrade	A0659207	NTAB2000
C-ICS Rel. 2.0, Internal Remote Access Device Upgrade	A0659208	NTAB2001
LS/DS Analog Trunk Cartridge	A0405799	NT7B75GA93
Caller Identification Trunk Cartridge	A0393277	NT5B41GA93
Modular ICS Services Cartridge	A0404139	NTBB24GA93
Combination Fiber 6-Port Services Cartridge	A0632426	NTBB25GA93

11.0 Warranty and Repair

The following is the Multimedia Communications Systems Division Warranty Policy and Procedure for Warranty application and the repair process for Norstar Key System components.

11.1 Warranty

The following warranty is in lieu of all other warranties and conditions whether statutory, expressed or implied, including any warranty as to merchantability or fitness for purpose, and shall constitute the sole remedy and Northern Telecom's sole liability for breach of warranty.

Northern Telecom warrants Norstar System components against mechanical or electrical failure attributable to defects in Northern Telecom's workmanship or materials for a period of 18 months from date of manufacture.

Northern Telecom will, at no charge and at its option, repair or replace a defective Norstar Key System component with a new or rebuilt unit during the warranty period. Repaired or replaced units shall be warranted for 90 days or the balance of the original warranty period whichever is longer.

11.2 Warranty Exclusions and Limitations

This warranty does not apply to damage or failures resulting from:

- negligence, abuse, misuse or accident

- repair by unauthorized persons
- failure to comply with warranty service procedures (outlined below)
 - improper installation
 - modifications to equipment or software or attachments of equipment or peripherals except as specifically authorized by Northern Telecom.
 - units for which the warranty period (18 months) has expired.

Equipment returned to Northern Telecom under these circumstances will be handled as regular, chargeable repairs.

In addition, any expenses related to the removal and/or replacement of " custom brandlining" will be charged to the sending telephone company or distributor.

Northern Telecom shall be the sole arbiter in applying and interpreting the above exclusions and limitations.

11.3 Repair Advance Replacement

Repair advance replacement equipment is available only for out-of-service equipment, and updates/upgrades. Lead-time for advance replacement equipment is 24 hours. *Please consult the General Policy section of your Norstar Product Catalog for procedures.

11.4 Repair Pricing

Two levels of service are available for all Norstar Digital Key System components.

1. Level 1 encompasses full electrical, mechanical, and cosmetic repair of the key system component.
2. Level 2 encompasses only system testing procedures and cosmetic appearance repair. This service, whether in- or out-of-warranty, is always chargeable.

11.5 Repair Procedure

All units must be shipped prepaid directly from the sending telephone company or distributor to the repair location. The original or equivalent packaging should be used to avoid in-transit damage.

All units must be individually tagged indicating the telephone company/distributor name, the order number the unit was sent under, and a brief description of the suspected fault. If specifically requested, the repair location will affix this tag to the outer packaging of the unit after it is repaired. Units received untagged will incur at least the minimum level 2 charge.

Once received, Repair will undertake a warranty validation process on each unit using the aforementioned "Exclusions and Limitations" as a guideline and perform an up-front functional test on each unit. These processes will result in various classifications on return of the units as follows:

A. In-Warranty

1. Units which pass the validation process and indicate a fault during the system test will be repaired functionally as required, will be cosmetically upgraded to "like-new " appearance, and will be returned prepaid with no repair charges.

2. Units which pass the validation process and show no detectable faults during the system test process will incur the minimum level 2 charge (i.e., Customer will pay for No Fault Found). Units returned in this category will be in cosmetic like-new condition and will have been fully operationally tested.

B. Out-of-Warranty

1. Those units which have a specific request for level 2 service only, but after the system test show a detectable fault, will be fully repaired and charged at the level 1 rate.

2. Units not passing the validation process and not specifically requesting level 2 service will automatically be considered as "out of warranty" and will incur the full level 1 repair charge. Units showing obvious abuse may incur a higher charge which will be quoted prior to performing repairs.

3. Invoices which follow the return of the repaired units will reflect the number of units total per the above categories per order.

11.6 Turn-Around Time

The original product will be repaired or a replacement product will be shipped within four weeks after receipt of defective materials at the repair depot.

11.7 D.O.A. Policy

Defective-on-Arrival products include out-of-box failures and installation failures. Product installed for more than 48 hours will be treated as a repair return and not a valid D.O.A.

11.8 D.O.A. Exclusions and Limitations

The following limitations apply to all valid D.O.A.'s:

- The product must not appear used or blemished.
- The product must be returned in the original packaging with all original components intact including Designation Cards, Booklets, Line Cords, Cabling, etc.
- A brief description of the fault must be placed in the box.

12.0 Mean Time Between Failure Rates

The following reliability predictions may be used for planning purposes:

CICS TCM Expansion Card	685 years
CICS Clock Control Card	2664 years
BRI 2 and 4 Port U Interface Card	212 years
BRI 4 Port S/T Interface Card	275 years
CTA 500 dm	9 years

13.0 Technical Support

The Norstar ITAS team will be responsible for assisting trained distributor personnel through installation and maintenance activity of the ICS. Assistance beyond external interface points and/or non-certified applications will be the responsibility of the distributor. Additionally, calls to the ITAS team from distributor personnel who have not received ICS product certification will be subject to current billing rates prior to assistance. The current rates are published in the Norstar Product Catalog, Chapter 1: Order Policies/Procedures.

In all cases, all CSR/PR's will be managed and closed with the originating Distributor by the ITAS group once satisfactory resolution has been achieved.

In Canada dial 1-800-661-4827

In US dial 1-800-321-2649

The ITAS normal business hours of operation 8:00 AM to 8:00 PM EST.

13.1 Installation & Maintenance

Standard tools will be sufficient for basic ICS installation and maintenance. Available support documentation as outlined in section 6.0 should be on hand for I&M personnel.

In order to ensure optimum product installation and support, ICS installation and support personnel should be knowledgeable in the installation, operation and maintenance of the Meridian Norstar telephone systems.

The following installation and warranty time standards are provided to assist in resource planning/scheduling and service pricing. All times assume support personnel have completed the required training and possess the necessary skills.

13.1.1 Installation Times Detail Norstar ICS

ACTIVITY	TIME
Pull and terminate Station cable (both ends)	1 hr. per station (assumes 132 ft. run)
Unpack and mount KSU	30 min.
Unpack and mount trunk or station module	15 min. each
Unpack and install trunk cartridge	5 min. each
Run, dress and terminate 25 pair cable	10 min. each
Mount quick connect blocks	2 min. each
Run cross connects (trunk /station)	1 min. per pair
Place, designate and test set	5 min. per station
Place, connect and program CTA	30 min. per unit
Program entire system (lines, sets, restrictions, overrides, etc.)	5 min. per station
End user time (training and programming sheet)	10 min. per station

Based on an average system size, these times equate to about 1.4 hours per station installed.

The time required to upgrade the system software to ICS is estimated at three minutes per station. This includes additional end user time and programming new features. Additional time should be added for hardware replacement when applicable.

The installation times will vary depending on system size and configuration. These times are intended only as a guideline.

No change to existing warranty procedures is expected.

Warranty labor hours may be estimated by using a call rate of two calls per 100 stations per month.

These support activities will require personnel with extended skill sets to perform within satisfaction guidelines. These extended skill sets are discussed in more detail in the training section of this plan.

If the distributor elects not to invest in the extended skill sets training, installation and maintenance of these activities may be subcontracted to a local vendor specializing in these areas. Our analysis indicates the margin opportunities for distributors who invest in the external skills training are better by as much as 30% on each system over those who choose to subcontract these areas.

Maintenance will consist of replacing top level components as outlined in System Installer Guide.

13.2 Maintenance

No change to existing maintenance practices is expected for the ICS systems and peripherals.

Fault isolation may be extended to include proper operation and verification of analog and/or digital trunks.

A standard telephone lineman's test set or a single line telephone and a multimeter may be required for manual verification of these features at the demarcation point.

For proper testing of ISDN/digital trunks, an ISDN test set or T-1 test set should be available to the technician.

Should technical support for problem solving become necessary, direct offices and authorized distributors may call the Northern Telecom Support Center at 800-321-2649. Every effort should be made to resolve problems at the local level as standard support rates may apply.

APPENDIX A