Meridian 1

Option 11C

Customer Configuration Backup and Restore Guide

Document Number: 553-3011-330
Document Release: Standard 5.10
Date: October 1997

Revision history

October 1997

Issue 5.10, Standard

July 1996

Issue 5.0, Standard

December 1995

Issue 4.0, Standard

July 1995

Issue 3.0, Standard.

December 1994

Issue 2.0, Standard.

December 1992

Issue 1.0, Standard.

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About this guide

This guide describes the Customer Configuration Backup and Restore (CCBR) feature. It contains information about Option 11 and computer equipment requirements and includes instructions on how to operate and use the feature from a remote location and on-site.

Note: The term Option 11 used in this guide refers to both Option 11E and Option 11C unless stated otherwise.

Chapter 1 — An overview

Introduction

This chapter gives a general overview of the Customer Configuration Backup and Restore (CCBR) feature. It describes the operations it performs and the various components that are part of this feature.

References to Option 11

The Option 11 series of systems is generally referred to as Option 11 in this guide. Most operations and functions described in this guide apply to all Option 11 systems. However, some are different when used with Option 11C systems. These differences are explained where appropriate throughout the guide.

Overview

The CCBR feature provides you with the ability to store the configuration database of Option 11 systems on a floppy disk or hard drive using a personal computer (such as an IBM-type PC or a Macintosh computer).

The stored information is used to restore the Option 11 configuration database in the unlikely event of an Option 11 system failure, or to update the configuration database on an existing Option 11.

File transfer time

Depending on the number of records in the Option 11 configuration database, it can take over 30 minutes to back-up or restore data at a rate of 1200 baud.

Note: The number of records in an Option 11 is displayed when performing a data dump (EDD) using LD 43.

The approximate time required to transfer the data can be calculated as follows:

At 1200 bps, time to transfer = ([Number of records X 1024] + 1132) ÷ 90.

> *Note:* If a second SDI port on the Option 11 is performing maintenance operations, the time required to transfer data may be significantly increased.

Operations performed

The following operations can be performed either remotely or on-site.

- Back up the configuration database of one or more Option 11 systems to a hard disk or to a floppy disk

- Restore the configuration database after an Option 11 system failure using the information previously stored on disk

- Bypass the login procedure on an Option 11 that is in continuous SYSLOAD or INI mode

- Install configuration database in a new Option 11

Procedures for performing the various operations are described in this guide in the chapter titled *How to use this feature*.

Configuration database storage system

Option 11E

The Option 11E configuration database is stored in the software cartridge attached to the NTBK45 System Core circuit card. A programmable Read Only Memory (primary Flash ROM) is used for this purpose (referred to as Cartridge Flash ROM). A secondary Flash ROM (referred to as System Core Flash ROM), also located on the System Core circuit card, serves as a backup for the information contained in the Cartridge Flash ROM. The NTBK45 System Core circuit card also contains the Random Access Memory (RAM) for the Option 11.

The Option 11 configuration database can be copied from RAM to the cartridge and System Core Flash ROMs by performing a data dump (EDD) using overlay program 43. With the CCBR feature, the configuration database stored in the System Core Flash ROM can be copied (backed up) from the System Core Flash ROM to a computer's hard disk or floppy disk. Service is not interrupted while performing an EDD or a backup procedure.

> *Note:* The Option 11 automatically backs up the configuration database when the midnight routines run. Backups done during the midnight routines write only to the cartridge Flash ROM.

When an Option 11E system reload occurs (SYSLOAD), the data stored on the cartridge Flash ROM (or System Core Flash ROM if the cartridge Flash ROM is not available) is copied into the Option 11 memory (RAM). If, in the unlikely event that data on both the cartridge and System Core Flash ROMs are corrupted, it can be restored by using information previously stored (backed-up) on floppy disks or a computer's hard disk.

> *Note:* The Option 11 software is an integral part of the software cartridge and cannot be copied. The data stored on disk consists only of data that can be created or altered using the overlay programs.

Option 11C

The Option 11C configuration database is stored on the Primary Flash ROM located on the NTDK20 System Core card. A second Flash ROM, also located on the System Core card serves as a Backup Flash ROM for the information contained on the Primary Flash ROM.

The Option 11C configuration database can be copied from RAM to the System Core card Flash ROMs by performing a data dump (EDD) using overlay program 43 (LD 43). With the CCBR feature, the configuration database can be copied (backed up) from the System Core Flash ROM to a computer's hard disk or floppy disk. Service is not interrupted while performing an EDD or a backup procedure.

The Option 11 automatically backs up the configuration database when the midnight routines run. Backups done during the midnight routines write only to the Backup Flash ROM.

Security and the re-load (SYSLOAD) process

Before the Option 11 loads data from either of the Flash ROMs, it performs a security check to make sure that the ISM (Incremental Software Management) parameters have not been changed. If the security check fails, the Option 11 still loads but will not operate (calls will not be processed) until the problem is corrected using LD 97. Security check failure is indicated by a sysload message (SYS4342, SYS4393 or SYS4399). Refer to the *X11 Software Guides* supplied with the Option 11 for a description of LD 97 and ISM parameters, and for a description of SYS messages.

Equipment requirements

Option 11 software cartridge

Some existing versions of the Option 11 software cartridges are not designed to allow the CCBR feature to operate. The cartridge may have to be replaced with a later version. To replace the data cartridge, see the *Installation Guide* supplied with the Option 11.

Note: The software used in all Option 11C systems allows the CCBR feature to operate. Option 11C systems are not equipped with software cartridges.

Remote computer access

Computer access to the Option 11 is established by connecting SDI port 0, 1, or 2, located on the NTBK45 or NTDK20 System Core card, to a dial-up line through an on-site modem. This allows the computer to dial directly into the Option 11 from a remote location.

On-site computer access

A computer can be connected on-site to the Option 11 by connecting a computer directly to SDI port 0, 1, or 2 on the System Core card.

Note: A modem is only needed when remote access is a requirement.

Major components

The major components consist of:

•   a computer that supports XModem CRC communications protocol

•   modems for accessing the Option 11 from a remote location

•   telephone line for accessing the Option 11 from a remote location

- NTBK48 3-port cable to connect the modem or computer to the SDI port (supplied with the Option 11)

- modem eliminator when connecting a computer on-site directly to the Option 11

    Note: Two modem eliminators are normally supplied with the Option 11. One is equipped with a female-to-female connector; the other is equipped with a female-to-male connector.

The following illustration (Figure 1) shows the various components required to access the Option 11 remotely with a computer.

Figure 1
CCBR feature —Components for remote access

SDI Port 0, 1 or 2 in the Option 11

Modem

Any computer capable of running a communications application which supports Xmodem — CRC protocol

Modem

Compatible modems and protocols

Most modems capable of supporting XModem CRC protocol can be used with this feature. The protocol specifications are given in this guide in the chapter titled *Protocol specifications*. The information is intended to assist those who wish to create a personal communications software package that is compatible with the protocols used by the SDI port in the Option 11.

Compatible communications software

The CCBR feature is designed to operate with most communications software packages that support XModem CRC file transfer protocol. Refer to the chapter titled *Protocol specifications* in this guide for more information.

Note: Ensure that your communications package complies to the protocol specifications outlined in the chapter titled Protocol specifications in this guide. Not all XModem CRC protocols are identical. Some may not operate properly with the CCBR feature.

Chapter 2 — How to set up

Introduction

This chapter describes how to set up the equipment needed at the Option 11 site to use the Customer Configuration Backup and Restore (CCBR) feature.

How to prepare the SDI port and modem

SDI port

Note: A modem is only needed when remote computer access to the Option 11 is a requirement.

There are several circuit cards that provide SDI port connections in the Option 11. However, only SDI port 0, 1, or 2 located on the NTBK45 or NTDK20 System Core card can be used to access the Option 11 for the Configuration Data Backup and Restore feature.

SDI port settings on the System Core Card

Table 1
SDI port settings

TTY Number	Port	DTE	DCE	RS232	RS422	Use	Configuration (see Note)
0	0	Yes	No	Yes	No	MTC/SCH/BUG	9600/8/1/NONE
1	1	Yes	No	Yes	No	MTC/SCH/BUG	9600/8/1/NONE
2	2	Yes	No	Yes	No	CTY	9600/8/1/NONE
Note: Any baud rate up to 9600 baud is supported.							

Cable connections and adapters

An NTBK48 three-port 9 to 25 pin converter cable is supplied with the Option 11. The cable can be used to connect SDI port 0, 1 or 2, directly to most types of modems.   However, some modems may require a connector adapter to make the connection. For more information, refer to the modem manufacturer's instructions provided with the modem.

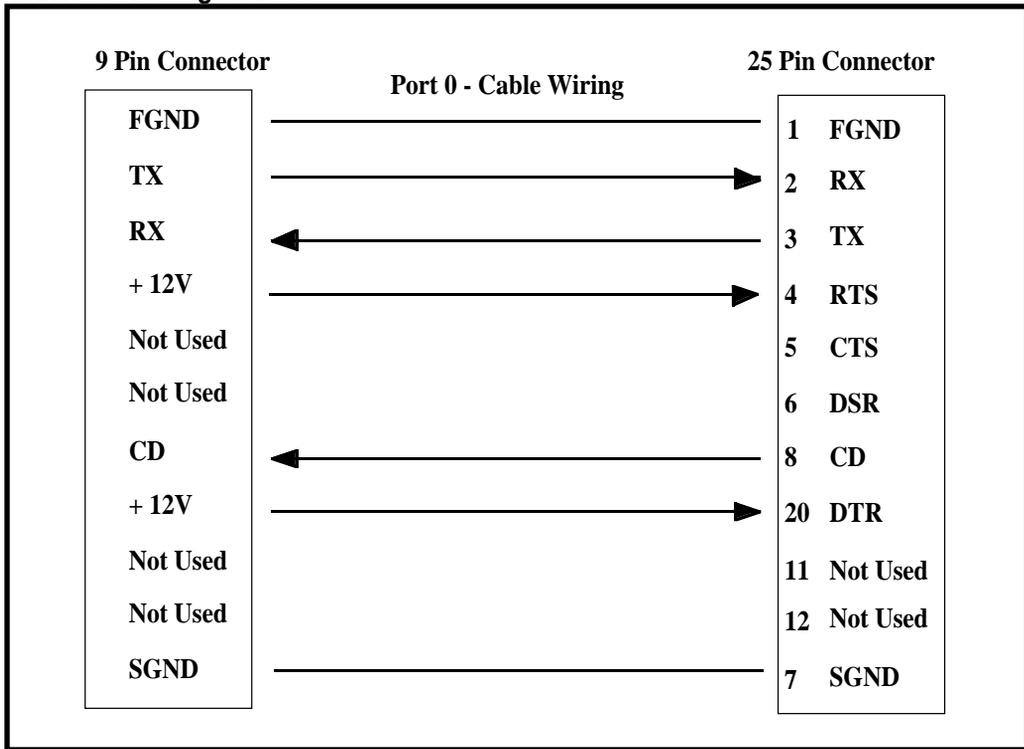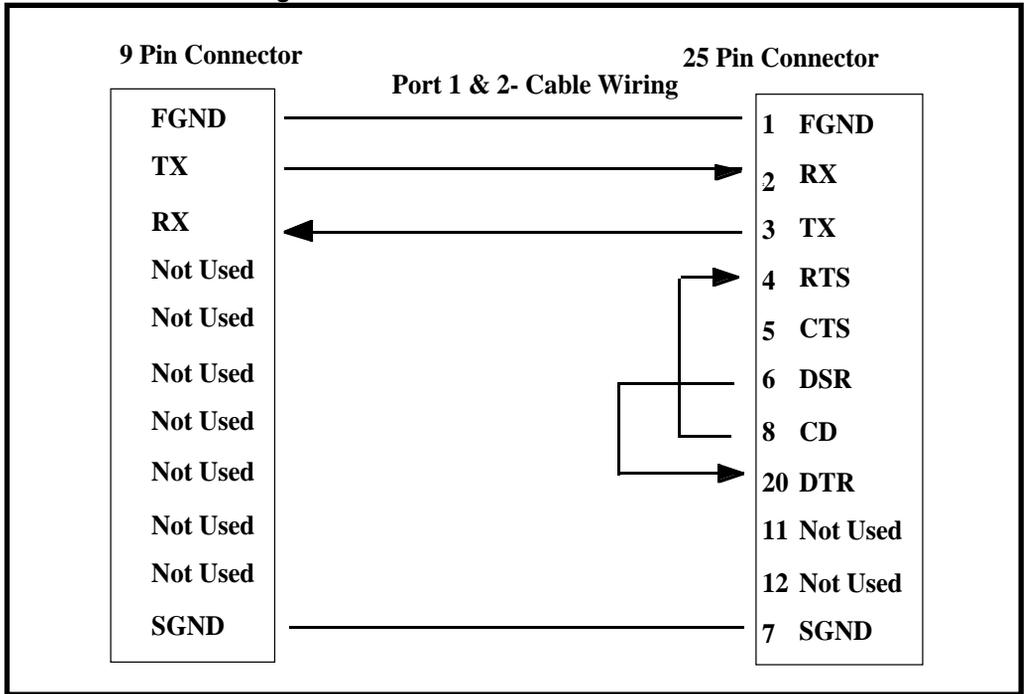The signals carried by each lead in the NTBK48 3-port cable are shown in Figures 2 and 3.

Figure 2
NTBK48 Port 0 Signal Leads

Figure 3
NTBK48 Ports 1 and 2 Signal Leads

A modem eliminator is required when a computer is connected on-site. Two are supplied with the Option 11. One is equipped with a female-to-female connector; the other is equipped with a female-to-male connector. Refer to the manufacturer's instructions provided with your computer to determine which type is required.

Figure 4 shows the modem eliminator's internal connections and lead designations.

Figure 4
Modem Eliminator Connections and Designations
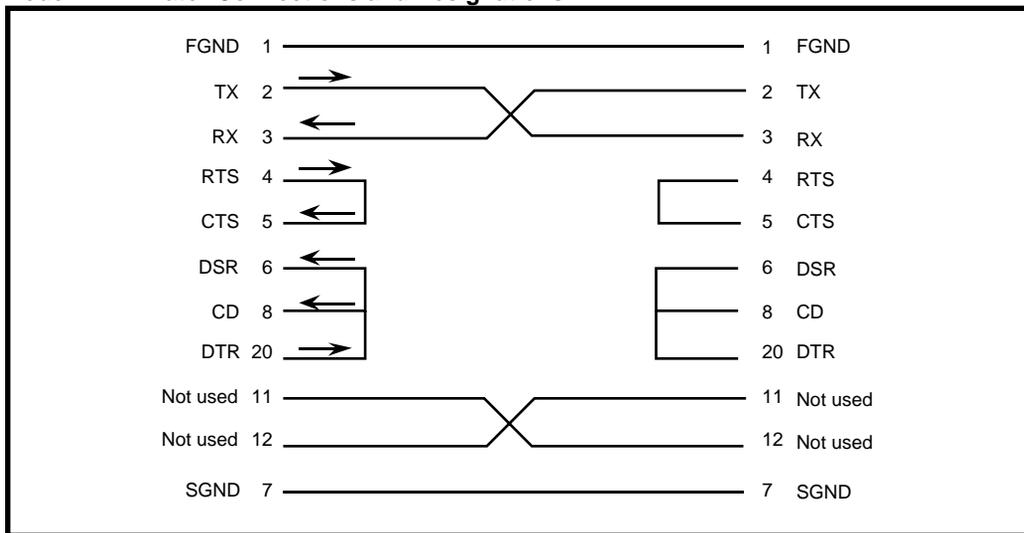
Modem

Settings

Modems connected to Option 11 should be set as follows:

- CD (Carrier Detect): Active if carrier detected on incoming call

- CTS (Clear to Send): Normal operation or forced active

- Hardware and software Disabled flow control:

The SDI port on Option 11 will be disabled if a device connected to it generates excessive erroneous (garbage) characters. To prevent the port from being disabled due to garbage, modems connected to it should be set to the "dumb" mode. Setting the modem to "dumb" mode results in the following modem functions being disabled:

- Loopback

- Auto Echo

- Self Test

Refer to the manufacturer's instructions provided with the modem for information about how to alter the settings.

Installing and connecting the SDI port and modem

The CCBR feature uses SDI port 0, 1 or 2, located on the System Core card in the main cabinet.

The following procedure describes how to connect a modem to SDI port 0, 1, or 2 at the Option 11 when remote computer access is a requirement. Refer to the computer manufacturer's instructions for connecting the computer to a modem.

Note: Refer to for information about on-site computer access to the Option 11.

Installation procedure

Refer to Procedure 1 for installation instructions.

Figure 5
Installing the Modem
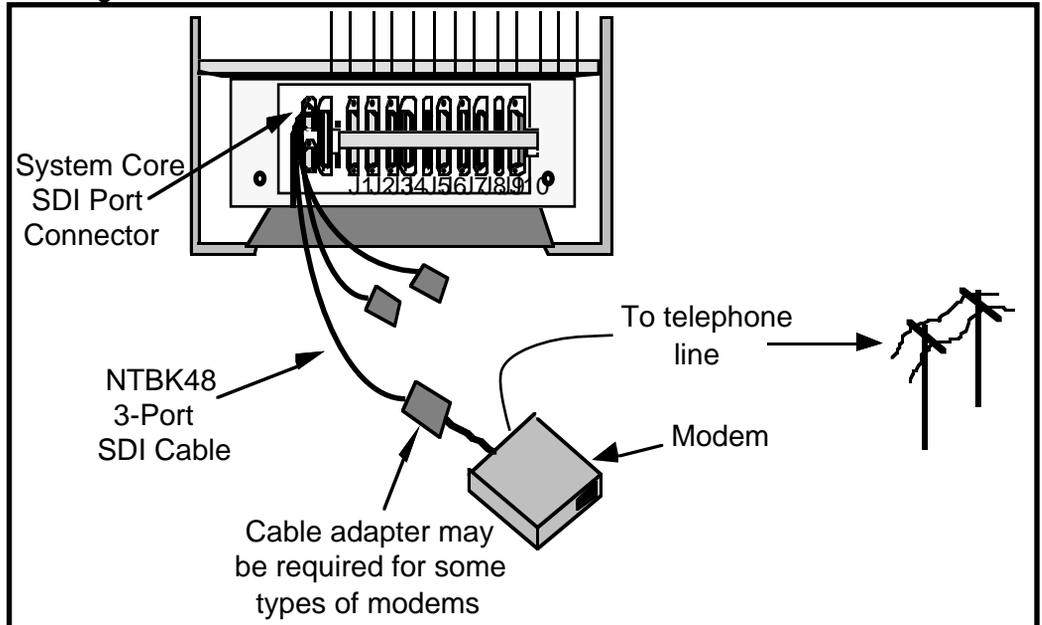
Procedure 1
Installing SDI port and modem

Refer to <u>Figure 5</u> while following the steps in this procedure.

1   Connect a NTBK48 3-Port SDI cable to the connector associated with the System Core card.

The connector is located in the main cabinet to the left of the cable connectors as shown in the illustration.

2   If Port 0 is used, check the baud rate setting on the front of the NTBK45 or NTDK20 System Core card located in slot 0 of the main cabinet. If Port 1 or 2 is used, the baud rate is configured in the Option 11 system software (LD 17).

Make sure that the rate is compatible with the modem.

3   Check modem settings and make sure they are correct.

Modem settings are described earlier in this chapter.   Refer to the instructions supplied with the modem to implement the settings.

4   Connect one of the three ends of the cable to the modem. (The CCBR feature works on all ports.)

A cable adapter may be required depending on the type of modem being installed. Refer to the instructions supplied with the modem.

5   Connect the modem to a working telephone line.

A telephone line cord is normally supplied with the modem. Some modems are equipped with two identical jacks (one for the telephone line and one for an optional telephone set). When connecting the line cord, make sure that it is in the correct jack on the modem.

Note the telephone number assigned to the modem (telephone line).

6   Test the modem for proper operation once you have started up the Option 11.

Call the telephone number assigned to the modem.	The modem should respond.

The Option 11 can now be accessed from a remote location by a computer equipped with a modem.

Note: The settings for the computer communications software package and associated modem are described earlier in this chapter. Follow the instructions supplied with the computer and its modem for setup implementation.

———————————— *End of Procedure* ————————————

Chapter 3 — How to use this feature

Introduction

This chapter describes how to perform the various operations provided by the Customer Configuration Backup and Restore (CCBR) feature. It describes:

- How to access an Option 11 remotely ()

- How to access an Option 11 on-site ()

- How to back up the configuration database ()

- How to restore or update the configuration database on an operating Option 11 ()

- How to restore or update the configuration database on a non-operating Option 11 ().

Operating procedures

The following procedures describe how to use the CCBR feature.

How to access an Option 11 remotely

This procedure describes how to access an Option 11 from a remote location.

Procedure 2
Accessing remotely

1   Open the communications package on the computer.

Use XModem CRC file transfer mode.

Make sure that parameters in the communications package you are using are properly set. Refer to the instructions provided with your computer for information regarding parameter settings. Some of the parameters may be preset. All values must be set as follows to ensure proper operation:

8 Bits, 1 Stop, No Parity, Full Duplex, (See Note) bps.

No Strip, Block Size 128 bytes

Note: The baud rate (bps) depends on the type of modem used and should correspond to the settings at the Option 11. The only settings that can be used are 300 bps, 600 bps, 1200 bps, 2400 bps, 4800 bps, 9600 bps and 19200 bps.

2   From the communications package on the computer, dial the telephone number assigned to the Option 11 modem.

The modem will answer the call and connect to SDI port 0, 1, or 2 on the Option 11.

3   Press the <CR> (carriage return) key.

The Option 11 displays its present activity.

Example:

OVL111 44 IDLE

4   Set the CAPS LOCK key on your keyboard to the caps lock setting.

Type LOGI and press the <CR> key.

The Option 11 responds with **PASS?**

Example:

LOGI
PASS?

5   Type the four-digit password assigned to the Option 11 accessed and press the <CR> key.

The Option 11 responds with a period (.) and a caret (>).

Example:

.
>

6   The Option 11 is accessed and is ready to continue.

Refer to the appropriate procedure in this chapter for the operation being performed and continue.

————————————— *End of Procedure* —————————————

How to access an Option 11 on-site

This procedure describes how to access an Option 11 on-site.

Figure 6 shows the on-site connections.

Figure 6
Option 11 site connections
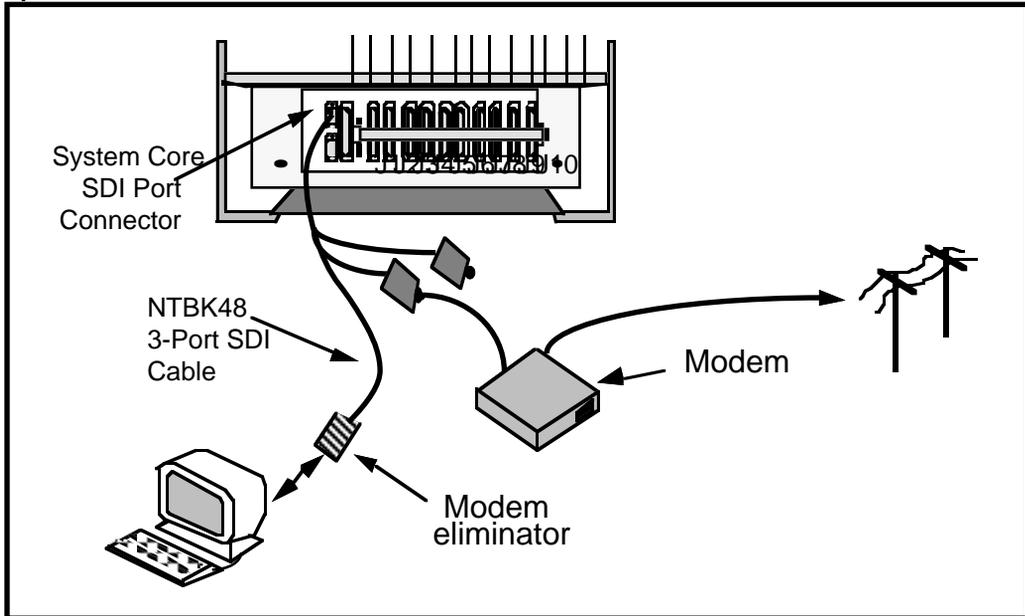
Procedure 3
Accessing from on-site

Refer to Figure 6 while performing this procedure.

1   Connect the computer to one of the three ports on the NTBK48 SDI
cable.

A modem eliminator compatible with the computer is required on the
cable. Refer to the instructions supplied with the computer for
information about modem eliminators.

2   Open the communications package on the computer.

Use XModem CRC file transfer mode.

Make sure that parameters in the communications package you are using are properly set. Refer to the instructions provided with your computer for information regarding parameter settings. Some of the parameters may be preset. All values must be set as follows to ensure proper operation:

8 Bits, 1 Stop, No Parity, Full Duplex, (See Note) bps.
No Strip, Block Size 128 bytes

Note: The baud rate (bps) depends on the type of modem used and should correspond to the settings at the Option 11. The only settings that can be used are 300 bps, 600 bps, 1200 bps, 2400 bps, 4800 bps, 9600 bps and 19200 bps.

3   Press the <CR> (carriage return) key.

The Option 11 displays its present activity.

Example:
OVL111 44 IDLE
TTY 00 SCH MTC BUG 23:18

4   Set the CAPS LOCK key on your keyboard to the caps lock setting

Type LOGI and press the <CR> key.

The Option 11 responds with **PASS?**
Example:
LOGI
PASS?

5   Type the four-digit password assigned to the Option 11 accessed and press the <CR> key.

The Option 11 responds with a period (.) and a caret (>).

Example:

.
>

6   The Option 11 is accessed and is ready to continue.

Refer to the appropriate procedure in this chapter and continue.

——————————— *End of Procedure* ———————————

How to backup the configuration database

This procedure describes how to copy the configuration database from the System Core card Flash ROM of the Option 11 to a computer disk.

Procedure 4
Backing-up the configuration database

1   Access the Option 11 and log in.

See "Accessing remotely" on page 16 or "Accessing from on-site" on page 18.

2   Load overlay program 43. Type LD 43 and press the <CR> key.

The Option 11 responds with EDD followed by a period (.).

Example:
EDD000

.

CAUTION

During the completion of a command in overlay 43, the system will produce the percentage symbol (%) approximately every two seconds. This symbol indicates that the command is still in-progress. To avoid the potential corruption of data, do not attempt to interrupt power, initialize the system, or abort the overlay until it has fully completed processing the command

---

3   *Caution:* **It is extremely important that this step be completed. Its purpose is to make sure that the latest configuration database, including recent service changes, is copied from the system main memory (RAM) to the Primary Flash ROM, Backup Flash ROM and PCMCIA card (if one is present).**

In the case of pre-Option 11C systems (Option 11 and 11E), the customer Service changes are automatically dumped to the cartridge Flash ROM when the midnight routine runs. However, the changes are not dumped to the System Core Flash ROM by the midnight routine. This is done by manually loading overlay 43 (LD 43) and performing an EDD.

Type EDD and press the <CR> key to perform a data dump.

4   Wait for the Option 11 to complete the data dump.

It takes approximately five minutes to complete a data dump. Once the data dump is completed, the Option 11 responds with:

DATABASE BACKUP COMPLETE

The following is an example of what may be displayed on the screen during the data dump. (During the data dump, the percentage symbol, "%", is displayed approximately every 2 seconds. This indicates that EDD command is still being processed.)

```
EDD TO SYST CORE
%%%%%%%%%%%%%%%%%%%%
%%%

DIRECTORY
CONFIG

.
.
.
CHECKING
RECORD COUNT = 43

EDD TO CARTR.
%%%%%%%%%%%%%%%%%%%%
%%%

DATABASE BACKUP COMPLETE
```

Note: Review Steps 5 through 9 before proceeding. If they are not completed within approximately 5 minutes after the XBK command is entered, the system will time out.

5   This step applies only to Option 11C systems. For pre-Option 11C systems (Option 11 or 11E), go to Step 6.

Type four asterisks ∗∗∗∗ to exit overlay program 43.

Load overlay program 143. Type LD 143 and press the <CR> key. Wait for overlay program 143 to load, then proceed to Step 6.

Note: With Option 11C systems, the remaining commands in this procedure are invoked using overlay program 143 (LD 143). With previous systems (Option 11 and Option 11E) these commands are invoked using overlay program 43 (LD 43).

6   Type XBK and press the <CR> key to begin a configuration data backup.

The system responds with:

INFO:

Note: Steps 7 and 8 must be completed within 5 minutes or the system will time out. If a time-out occurs, return to this step and type the XBK command.

7   Enter the text that will appear as a header on this data file.

The INFO: prompt allows the entry of up to 128 characters of text (including spaces, carriage returns and line feeds). The text entered is added to the configuration database and serves as a header for the file.

Note: If more than 128 characters are entered, the Option 11 will exit the text entry mode and, after a few seconds, respond with R> as described in the next step. If you do not wish to enter any text, press the <CR> key twice as described in Step 8.

The following is an example of what may be displayed on the screen:

.XBK

INFO:
CONFIGURATION DATA FROM YOUR OPTION 11 SYSTEM
JULY 7/92

8   When all the text is entered, press the <CR> key twice.

After a few seconds the Option 11 responds with **R>** indicating that it is ready to continue.

The following is an example of what may be displayed on the screen:

.XBK

INFO:
CONFIGURATION DATA FROM YOUR OPTION 11 SYSTEM
JULY 7/92

R>

Note: The next step must be completed within 2 minutes or the system will time out. If a time-out occurs, return to and type the XBK command.

9   Using the communications software on the computer, receive the configuration database file using XModem CRC protocol. The file received will be in binary format.

Refer to the manual supplied with the communications software package provided for the computer for information about receiving files.

The file is transferred and stored on the computer's hard disk or on floppy disk.

10   Wait for the file transfer operation to complete.

File transfer may take up to 30 minutes to complete (depending on baud rate).
When successfully completed, the Option 11 responds with OK.

If the file transfer fails, the Option 11 responds with one of the following:

BKP003
Indicates that the Flash ROM in use contains invalid data and data transfer will not be attempted.

Corrective Action:

•   Do an EDD to update the flash ROM in use.

•   Repeat the backup procedure using the XBK command.

BKP008

The BKP008 message indicates that the data transfer procedure was interrupted by the Option 11 (timed out) or by a problem on the telephone line (such as excessive noise).

Corrective Action:

• Repeat the backup procedure.

11 Type XVR and press the <CR> key. Wait for the Option 11 to respond with the R> prompt.

The **XVR** command is used to verify the backed-up data file. It sends the backed-up file back to the Option 11 and compares it with the configuration data stored in the Option 11. This ensures the integrity of the backed-up data file.

12 With the communications software on the computer, send the backed-up data file using XModem CRC protocol to the Option 11 for a comparison.

Refer to the manual supplied with the communications software package provided for the computer for information about sending files.

The Option 11 displays the character **C** every 3 seconds until the file is sent. The file must be sent before the character **C** is displayed 20 times (approximately 1 minute) to avoid an Option 11 system time-out.

The following is an example of what may be displayed on the screen:

.XVR
R>
CCCCCCCCCC

When the file is successfully verified, the Option 11 responds with **OK**.

If the file verification fails, the Option 11 responds with one of the following:

BKP002

Indicates a mismatch in the data file.

Corrective Action

• Compare the file again with the XVR command.

• If the verification fails again, repeat the backup and then re-verify using the XVR command.

- Check your communications package parameters. Make sure that the parameters such as Mode (should be set to BINARY) or Protocol (should be set to XModem) are correctly set. Another possible cause is that the communications package is stripping characters.

BKP003

Indicates that the Flash ROM in use contains invalid data and data transfer will not be attempted.

Corrective Action

- Do an EDD to update the flash ROM in use.

- Repeat the verification procedure.

BKP008

Indicates that a transmission error occurred. The procedure may have timed-out or there was a problem on the telephone line such as excessive noise.

Corrective Action

- Repeat the verification procedure.

13   The configuration database backup procedure is completed.

Type four asterisks ∗∗∗∗ to exit the overlay program. Log out of the Option 11 by typing **LOGO**.

———————————— *End of Procedure* ————————————

How to restore or update the configuration database on an operating Option 11

This procedure describes how to transfer the configuration database from a computer disk to an operating Option 11.

Procedure 5
Restoring or updating database (system operating)

1   Access the Option 11 and log in.

2   **Option 11C system**
Type LD 143 and press the <CR> key.
Wait for overlay program 143 to load.

Note: With Option 11C, the database can also be restored or updated using the Software Installation Program. For details, refer to the *Software Installation Program Guide* provided with the Option 11C.

Pre-Option 11C systems (Option 11 or 11E)
Type LD 43 and press the <CR> key.
Wait for overlay program 43 to load.

3   Type XRT and press the <CR> key to begin the configuration database restore procedure.

The Option 11 prepares to receive the configuration database file from the computer and restores it onto the System Core Flash ROM.

The Option 11 responds with WAIT - - 2 MINUTES followed by R>.

Example:
.XRT

WAIT - - 2 MINUTES

R>

CAUTION: The Flash ROM is erased at the start of this step. If a problem occurs during the restore procedure, DO NOT leave the Option 11 in this state. Repeat the restore procedure. If problems are still encountered, type the command EDD in LD 43 to data dump the current data from the Option 11 memory (RAM) to the Flash ROM.

4   With the communications software on the computer, send the
backed-up data file using XModem CRC protocol to the Option 11.

Refer to the manual supplied with the communications software
package for information about sending files.

The Option 11 displays the character **C** every 3 seconds until the file
is sent. The file must be sent before the character **C** is displayed 20
times (approximately 1 minute) to avoid an Option 11 system time-out.

CAUTION

The System Core Flash ROM on the System Core card is erased at the
first stage of this step. If a time-out or other problem occurs during the
restore procedure, **DO NOT** leave the Option 11 in this state. Repeat
the restore procedure. If problems are still encountered, type the
command **EDD** in LD 43 to data dump the current data from the
Option 11 memory (RAM) to the System Core card Flash ROM.

The data is copied from the computer to the System Core Flash ROM.
The Option 11 site ID contained on the software cartridge on the
System Core card is checked against the ID contained in the
configuration database record being sent. If the IDs do not match, the
data will still be restored and the Option 11 will operate but the
following message will appear.

BKP011
Indicates that the Site ID in the customer data being restored does not
match that of the Option 11 data stored on the System Core card.

Note: The procedure completes normally. This message is only a
warning.

Corrective Action

If using this feature as an install tool, this message is normal and does
not indicate an error condition. The site ID will be automatically
corrected on the next data dump (EDD) and backup.

Check the customer data file to ensure it is the correct one. You may
inadvertently be restoring the wrong date file to the Option 11. If the
data file is the correct one, contact Northern Telecom technical
support.

When the file is successfully restored on the Flash ROM, the Option 11

---

responds with **OK**.

If the file restore fails, the Option 11 responds with one of the following:

BKP004
Indicates a failure to erase the System Core Flash ROM.

Corrective Action

- Repeat the Restore procedure.

- If it fails again, a faulty Flash ROM is the probable cause. Replace the System Core card or the S/W cartridge as appropriate.

Note: Option 11C systems are not equipped with S/W cartridges.

 BKP003

Indicates that the Flash ROM in use contains invalid data and the procedure failed.

Corrective Action

- Check the customer data file being transmitted to ensure that it is the correct one.

- Repeat the Restore procedure using the XRT command. If it still fails, then a corrupted customer data file is a probability.

BKP008
Indicates that a transmission error occurred. The procedure may have timed-out or there was a problem on the telephone line such as excessive noise.

Corrective Action

- Repeat the procedure.

5   Type XVR and press the <CR> key. Wait for the Option 11 to respond with the R> prompt.

The **XVR** command is used to verify the data file sent to the Option 11 by comparing it with the one in the computer.

6   With the communications software on the computer, send the backed-up data file using XModem CRC protocol to the Option 11 for a comparison.

Refer to the manual supplied with the communications software package provided for the computer for information about sending files.

The Option 11 displays the character **C** every 3 seconds until the file is sent. The file must be sent before the character **C** is displayed 20 times (approximately 1 minute) to avoid an Option 11 system time-out.

The following is an example of what may be displayed on the screen:

.XVR

R>
CCCCCCCCCC

When the file is successfully verified, the Option 11 responds with **OK**.

If the file verification fails, the Option 11 responds with one of the following:

BKP002
Indicates a mismatch in the data file.

Corrective Action

- Compare the file again with the XVR command.

- If the verification fails again, repeat the backup or restore process, and then re-verify using the XVR command.

- Check your communications package parameters. Make sure that the parameters such as Mode (should be set to BINARY) or Protocol (should be set to XModem) are correctly set. Another possible cause is that the communications package is stripping characters.

BKP003
Indicates that the Flash ROM in use contains invalid data and the procedure failed.

Corrective Action

- Do an EDD to update the flash ROM in use.

- Repeat the Verify procedure using the XVR command.

BKP008

Indicates that a transmission error occurred.
The procedure may have timed out or there was a problem on the
telephone line such as excessive noise.

Corrective Action

• Repeat the procedure.

7 **This step does not apply to Option 11C systems. If this is an
Option 11C, go to Step 8.**

If this is a pre-Option 11C system (Option 11 or 11E),
type UPS and press the <CR> key

The **UPS** command copies the existing configuration database from
RAM to the cartridge Flash ROM on the software cartridge only. The
purpose of the UPS command is to instruct the Option 11 to mark the
cartridge Flash ROM not to load at the next system reload
(SYSLOAD), but to load the restored configuration database from the
System Core Flash ROM.

8 Type XSL and press the <CR> key.

This prepares the Option 11 to perform a SYSLOAD. The Option 11
responds with CONFIRM? (Y/N).

9 Type N if you <u>do not</u> wish to continue: or Y if you wish to continue: and
press the <CR> key.

If you typed **Y** the Option 11 responds with PSWD?.

10   Type the Option 11 reload confirmation password and press the <CR> key.

Wait for the SYSLOAD to complete. The Option 11 responds with various SYSLOAD related messages and DONE when it is completed.

Example:

.XSL

CONFIRM? (Y/N): Y

PSWD?:

Note: The password is not displayed when it is entered. HWR007 is displayed after the correct password is entered.

SYS000 0400 0003 0800 00
DATA FROM SYSTEM CORE EDD/UPS
DONE

11   Log in to the Option 11.
Type LD 2 to load overlay program 2.

LD 2 allows the time and date to be reset in the Option 11.

The option 11 responds with TFC000 and a period (.)

Example:

TFC000

.

12   Type STAD (day) (month) (year) (hour) (minute) (second).

This corrects the time and date in the Option 11.

Example:
.STAD 08 07 1992 15 51 30

Type TTAD to check the time and date. The Option 11 responds with the updated time and date.

Example:

.TTAD WED 08 07 1992 15 51 32

13   Type four asterisks ✶✶✶✶ to exit overlay program 2. Type LD 43 to load overlay program 43.

Type EDD NBK and press <CR>.

Wait for the data dump to complete.

Option 11C

The configuration database in memory (RAM) is copied to the Primary Flash ROM and to the Backup Flash ROM.

Pre-Option 11C (Option 11 and 11E)

The configuration database in memory (RAM) is copied to the cartridge Flash ROM on the software cartridge.

14   The configuration database restore procedure is completed.

Type four asterisks ✶✶✶✶ to exit overlay program 43. Log out of the Option 11 by typing **LOGO**.

————————————— *End of Procedure* —————————————

How to restore or update the configuration database on a non-operating Option 11

This procedure describes how to transfer the configuration database from a computer disk to a non-operating Option 11 that is continuously and unsuccessfully attempting to complete a SYSLOAD or an INITIALIZE.

WARNING

Do not attempt to perform this procedure unless the system is unsuccessfully attempting to complete a SYSLOAD or an INITIALIZE. Corruption of the Option 11 system data and complete system failure may occur if this procedure is performed under any other circumstances. The backed-up data being restored must have originated from this Option 11.

The configuration database is copied from the computer to the Primary Flash ROM in Option 11C systems, and to the cartridge Flash ROM on the software cartridge in pre-Option 11C (Option 11 and 11E) systems.

Procedure 6
Restoring or updating database (system not operating)

> *Note:* This procedure requires the presence of a technician at the Option 11 site to enable the login procedure bypass feature.

1   At the Option 11, enable the login procedure bypass mode.

Make a note of the existing switch settings.

Enable the override mode by setting the switches on the System Core card located in slot 0 of the main cabinet. Set the switches to operate at 1200 or 2400 baud rate (depending on the modem or computer) as follows:

Override setting for 1200 baud modem			Override setting for 2400 baud modem		
BAUD rate switch	**Switch OFF**	**Switch ON**	**BAUD rate switch**	**Switch OFF**	**Switch ON**
150	•		150	•	
300	•		300	•	
600	•		600	•	
1200		•	1200	•	
2400		•	2400		•
4800		•	4800		•
9600		•	9600		•
19200		•	19200		•

2   Access the Option 11 using port 0 on the System Core card.

See or .

Note: Do not perform the login procedure when the Option 11 is in override mode. The computer accesses the Flash ROM directly.

3   Type XRT and press the <CR> key to begin to restore the configuration database.

The Option 11 prepares to receive the configuration database file from the computer and store it on the Flash ROM.

The Option 11 responds with WAIT - - 2 MINUTES followed by R>.

Example:
XRT

WAIT - - 2 MINUTES

R>

4   With the communications software on the computer, send the backed-up data file using XModem CRC protocol to the Option 11.

Refer to the manual supplied with the communications software package provided for the computer for information about sending files.

The Option 11 displays the character **C** every 3 seconds until the file is sent. The file must be sent before the character **C** is displayed 20 times (approximately 1 minute) to avoid an Option 11 system time-out.

The data is copied from the computer disk to the Flash ROM. The Option 11 site ID is checked against the ID contained in the configuration database record being sent. If the IDs do not match, the data will still be restored and the Option 11 will operate but the following message will appear.

BKP011
Indicates that the Site ID in the customer data being restored does not match that of the Option 11 being restored.

Note: The procedure completes normally. This message in only a warning.

Corrective Action

- If using this feature as an install tool, this message is normal and does not indicate an error condition. The site ID will be automatically corrected on the next data dump (EDD) and backup.

- Check the customer data file to ensure it is the correct one. You may inadvertently be restoring the wrong date file to the Option 11. If the data file is the correct one, contact Northern Telecom technical support.

When the file is successfully restored on the Flash ROM, the Option 11 responds with **OK**.

If the file Restore fails, the Option 11 responds with one of the following:

BKP004
Indicates a failure to erase either the cartridge or System Core Flash ROM

Corrective Action

- Repeat the Restore procedure.

- If it fails again, a faulty Flash ROM is the probable cause. Replace the System Core card or the S/W cartridge as appropriate.

Note: Option 11C systems are not equipped with S/W cartridges.

BKP003

Indicates that the Flash ROM in use contains invalid data and the procedure failed.

Corrective Action

- Check the customer data file being transmitted to ensure that it is the correct one.

- Repeat the Restore procedure using the XRT command. If it still fails, then a corrupted customer data file is a probability.

BKP008
Indicates that a transmission error occurred.
The procedure may have timed-out or there was a problem on the telephone line such as excessive noise.

Corrective Action

- Repeat the procedure.

5   Disable the login procedure bypass mode.

Reset the switches on the front of the System Core card to their original setting.

WARNING

The override mode must be disabled for the Option 11 to operate. The switches on the front of the System Core card must be restored to their original settings.

---

6   Initiate an Option 11 system reload (SYSLOAD) manually.

The Option 11 may SYSLOAD automatically when the override mode is disabled. If it does not, initiate a SYSLOAD by setting the circuit breaker on the front of the power supply unit in the main cabinet to OFF, then to ON. The Option 11 will SYSLOAD from the Flash ROM which was just restored. It should then operate normally.

7   Log in to the Option 11.   Type LD 2 to load overlay program 2.

LD 2 allows the time and date to be reset in the Option 11.

The Option 11 responds with TFC000 and a period (.)

Example:

TFC000

.

8   Type STAD (day) (month) (year) (hour) (minute) (second).

This corrects the time and date in the Option 11.

Example:
.STAD 08 07 1992 15 51 30

Type **TTAD** to check the time and date. The Option 11 responds with the updated time and date.

Example:
.TTAD WED 08 07 1992 15 51 32

9   Type four asterisks ✴✴✴✴ to exit overlay program 2. Type LD 43 to load overlay program 43.
Type EDD and press <CR>.

Wait for the data dump to complete.

Option 11C

The configuration database in memory (RAM) is copied to the Primary Flash ROM and to the Backup Flash ROM.

Pre-Option 11C (Option 11 and 11E)

The configuration database in memory (RAM) is copied to the cartridge Flash ROM on the software cartridge.

10   The configuration database restore procedure is completed.

Type four asterisks ✴✴✴✴ to exit overlay program 43. Log out of the Option 11 by typing **LOGO**.

————————————— *End of Procedure* —————————————

Chapter 4 — Error messages and fault clearing

Introduction

This chapter describes error messages and fault indications associated with the Customer Configuration Backup and Restore (CCBR) feature and what corrective action, if any, is required.

Error messages and fault indications

BKP002

Indicates a mismatch in the data file

Corrective Action

- Compare the file again with the XVR command.

- If the verification fails again, repeat the backup or restore process, and then re-verify using the XVR command.

- Check your communications package parameters. Make sure that the parameters such as Mode (should be set to BINARY) or Protocol (should be set to XModem) are correctly set. Another possible cause is that the communications package is stripping characters.

BKP003

Indicates that the Flash ROM in use contains invalid data and the procedure failed.

Corrective Action:

When doing a backup (with the XBK command):

- Do an EDD to update the flash ROM in use.

- Repeat the backup procedure using the XBK command.

When doing a Verify (with the XVR command) after performing a backup (with the XBK command):

- Do an EDD to update the flash ROM in use.

- Repeat the Verify procedure using the XVR command.

When doing a restore (with the XRT command):

- Check the customer data file being transmitted to ensure that it is the correct one.

- Repeat the Restore procedure using the XRT command. If it still fails, then a corrupted customer data file is a probability.

When doing a Verify (with the XVR command) after performing a Restore (with the XRT command):

- Repeat the Restore procedure using the XRT command.

BKP004

Indicates a failure to erase either the cartridge Flash ROM (when in override mode) or System Core Flash ROM

Corrective Action

- Repeat the Restore procedure.

- If it fails again, a faulty Flash ROM is the probable cause. Replace the System Core card or the S/W cartridge as appropriate.

   Note: Option 11C systems are not equipped with S/W cartridges.

BKP007

Indicates that the Flash ROM is not available at this time (it is being used by another process).

Corrective Action

•   Wait for the current process to complete and try again.

BKP008

Indicates that a transmission error occurred. The procedure may have timed-out or there was a problem on the telephone line such as excessive noise.

Corrective Action

•   Repeat the procedure.

BKP011

Indicates that the Site ID in the customer data being restored (XRT command) or verified (XVR command) does not match that of the Option 11 data stored in the system.

Note: The procedure completes normally. This message is only a warning.

Corrective Action

When doing a Restore (with the XRT command):

•   If using this feature as an install tool, this message is normal and does not indicate an error condition. The site ID will be automatically corrected on the next data dump (EDD) and backup.

•   Check the customer data file to ensure it is the correct one. You may inadvertently be restoring the wrong date file to the Option 11. If the data file is the correct one, contact Northern Telecom technical support.

When doing a Verify (with the XVR command) after a Restore (with the XRT command) or a backup (with the XBK command):

Do an EDD to update the flash ROM in use.

- Repeat the Restore or Backup procedure.

- Repeat the Verify procedure.

BKP009/BKP012

Indicates that the Flash ROM could not be written properly.

Corrective Action

- Repeat the Restore procedure using the XRT command. If it still fails, ensure the file size does not exceed the size of the Flash ROM.

- If it fails again, a faulty Flash ROM is the probable cause. Replace the System Core card or the S/W cartridges as appropriate.

    Note: Option 11C systems are not equipped with S/W cartridges.

HWR007

Indicates that the software and the System Core card have been reset.

Corrective Action

- No corrective action required.

Connection to Option 11 is interrupted

Indicates that the procedure was interrupted.

Corrective Action

- Check the modem settings and set them correctly. Re-access the Option 11 and start over again.

    Note: The SDI port may have been disabled during the interruption. It will be automatically enabled after 5 minutes.

Connected to the Option 11 system but unable to communicate with it

The SDI port is probably temporarily disabled.

Corrective action

• Do not disconnect from the Option 11. The SDI port should automatically enable after approximately 5 minutes.

Unable to access overlays and an OVL005 message is displayed

The manual initialization button on the System Core card may have accidentally been pressed while using the Customer Configuration Backup and Restore feature.

Corrective action

• After logging in at the TTY, issue the ENLT command.

Chapter 5 — Protocol specifications

Introduction

The protocol specifications information given in this Chapter is intended to assist those who wish to create a personal communications software package that is compatible with the protocols used by the SDI port in the Option 11.

XModem protocol specifications

Note: Not all XModem CRC protocols are identical. Some may not operate properly with the Configuration data back-up and restore feature. Ensure that your communications package complies to the protocol specifications outlined in this chapter.

XModem transmission medium level protocol is asynchronous, 8 data bits no parity, one stop bit. It allows the sending of all types of data including binary, which is the data type used with the Customer Configuration Backup and Restore (CCBR) feature.

The following definitions apply to XModem protocol:

    <soh>01H
    <eot>04H
    <ack>06H
    <nak>15H
    <C>43H

This protocol does not restrict the contents of data sent. Control characters are not processed in the 128-byte data messages (they are handled the same as other characters).

CRC protocol specifications

The Cyclic Redundancy Check (CRC) protocol is a form of block check which provides more robust error detection than the original checksum. The CRC-CCITT used by the modem protocol detects all single- and double-bit errors, all errors with an odd number of bits, all burst errors of length 16 or less, 99.97% of 17-bit error bursts, and 99.98% of 18-bit and longer bursts.

Each block of the transfer in CRC mode looks like:

        <soh><blk #><255-blk #><--128 data bytes--><CRC hi><CRC lo>

in which:

        <soh>= 01 hex
        <blk #>= binary number, starts at 01 increments by 1, and wraps OFFH to 00H (not 01)
        <255-blk #>= ones complement of blk #
        <CRC hi>= byte containing the 8 hi order coefficients of the CRC
        <CRC lo>= byte containing the 8 lo order coefficients of the CRC

CRC Calculation

To calculate the 16-bit CRC, the message bits are considered to be the coefficients of a polynomial. This message polynomial is first multiplied by X^{16} and then divided by the generator polynomial ($X^{16} + X^{12} + X^5 + 1$) using modulo 2 arithmetic. The remainder left after the division is the desired CRC. Since a message block in the Modem Protocol is 128 bytes or 1024 bits, the message polynomial will be order of X^{1023}. The hi order bit of the first byte of the message block is the coefficient of X^{1023} in the message polynomial. The lo order bit of the last byte of the message is the coefficient of X^0 in the message polynomial.

Example:

```
/* update CRC */
unsigned short
updcrc(c, crc)
register c;

register unsigned crc;
{
    register count;

    for (count=8; --count>=0;) {
        if (crc & 0x8000) {
                            crc <<= 1;
                            crc += (((c<<=1) & 0400)!= 0);
                            crc ^= 0x1021;
        }
        else {
                            crc <<= 1;
                            crc += (((c<<=1) & 0400)!= 0);
        }
        }
    return crc;
}
```

A receiving program that wishes to receive in CRC mode implements the mode setting handshake by sending a <C>. After the receiver has sent the <C> it waits up to 3 seconds for the <soh> that starts the first block. If no <soh> is received within 3 seconds, the receiver will resend a <C>. After the mode has been sent by the initial <C> the protocol follows the flow shown in the following example.

Example

This flow example shows a case where the receiver requests transmission in the CRC mode and the sender supports the CRC option. The example includes various transmission errors. <xxxx> represents 2 CRC bytes.

```
SENDER                              RECEIVER
                          <---     <C>
                              times out after 3.4 seconds,
                          <---     <C>
                              times out after 3.4 seconds,
                          <---     <C>
                              times out after 3.4 seconds,
                          <---     <C>
                              times out after 3.4 seconds,
                          <---     <C>
<soh> 01 FE -data- <xxxx>  --->
                          <---     <ack>
<soh> 02 FD -data- <xxxx>  ---> (data gets line hit)
                          <---     <nak>
<soh> 02 FD -data- <xxxx>  --->
                          <---     <ack>
<soh> 03 FC -data- <xxxx>  --->
(ack gets garbage)        <---     <ack>
                              times out after 6.8 seconds
                          <---     <nak>
<soh> 03 FC -data- <xxxx>  --->
                          <---     <ack>
<eot>                      --->
                          <---     <ack>
```

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