DX10 Common Communications DSR Object Installation

READ FIRST

Contents

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| READ THIS  DOCUMENT  BEFORE  ATTEMPTING  TO  INSTALL  ANY  DX10   |
| COMMUNICATIONS DSR.                                               |
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Section 1

Introduction

1.1 GENERAL INFORMATION

This document describes the installation of the DX10 Common Communications DSR object for the DX10 operating system (release 3.5 or later). The installation procedure employs the DX10 Execute Auto SYSGEN (XGEN) utility and the object media for each communications package supplied by Texas Instruments Incorporated.

Before beginning the DSR installation procedure, review the object installation guide(s) for all communications packages to be included in the DX10 system.

All DX10 commands in this document can be executed by entering the command in condensed format or by using interactive prompting from the System Command Interpreter (SCI). For a discussion of the SCI commands, refer to the DX10 Operating System Operations Guide (Volume II), part number 946250-9702.

1.2 SYSTEM GENERATION OVERVIEW

Perform the following steps to generate a DX10 operating system that supports any DX10 communications package described in this document.

1. Install the communications DSR installation procedure (IDC command).

2. Generate a DX10 operating system configuration using the XGEN utility. Only the XGEN step of a system generation is done at this time. Before beginning, be sure to review any XGEN information for the particular communications package(s) you are installing. Information concerning each communications package can be found in this document beginning with Section 5.

3. Execute the communications DSR installation procedure for DSR generation. If you are building more than one communications protocol, make sure that all communications DSR information is available before executing the communications DSR installation procedure.

4. Assemble, link, and patch (ALGS and PGS commands) the DX10 operating system and apply any communications DSR patches (PCS command).

5. Install (IUT command) and patch (PUT command) the Communications Download and X.21 Utilities. This step need only be executed if the communications package(s) being installed executes on the Four Channel Communications Controller (FCCC), X.21 BCAIM, or if it is specified by the particular protocol(s) being installed. Information concerning each communications package can be found in this document beginning in Section 5. (Refer to the table of contents for the specific communications package.)

To apply any DSR, Download, or X.21 Utility patches you receive after your communications system is installed, refer to paragraphs 2.3 and 2.5.

Section 2

Installation and Patching Procedures of the
Communications DSRs and Download Utilities

This section discusses the procedures necessary to install and
execute the install communications DSR procedure, generate a DX10
system with communications DSRs, install the communications
utilities, and patch the communications DSRs (including patching
any downloaded character detect(s)), and utilities.

2.1 INSTALLING AND EXECUTING THE COMMUNICATIONS DSR INSTALLATION PROCEDURE

The following paragraphs discuss installing and executing the
communications DSR installation procedure.

NOTE

It is recommended that you log-on the system
using an ID with a user privilege code of
seven (7) that is reserved for generating
DX10 systems with communications support.
Synonyms assigned under this user ID should
only be those required by the installation
process.

2.1.1 Installing the Communications DSR Installation Procedure

Use the following procedures to install the communications DSR
installation procedure on the DX10 system.

NOTE

Before proceeding, refer to the installation
guide provided with each individual
communicatons package that is to be included
in the DX10 system for proper installation
instructions.

If the DX10 system is to include more than
one communications package, all of the DSR
parts needed must be available to build those
communications packages. If these parts are

not available, the process for generating multiple communications DSRs terminates unexpectedly. Typically, the Build Communications DSR (BCD) procedure terminates with no error message. These parts are provided by the execution of the Install Communications Commands (ICC) procedure described in the object installation guide for each communications package.

1. Enter the following command to access the communications DSR object directory:

   .USE <sysgen data disk>.S$SYSGEN.DXCMO

   where:

   <sysgen data disk>   is the volume/directory name that contains the DX10 system generation parts directory (.S$SYSGEN). The name entered here must be the same volume/directory name that will be entered in response to the DATA DISK/VOLUME prompt issued by the XGEN utility during the DX10 system generation procedure.

2. Execute the Install Communications DSR Commands (IDC) SCI command as follows:

   [ ] IDC
   INSTALL COMMUNICATIONS DSR COMMANDS
     SYSGEN DATA DISK/VOLUME:
     LISTING DIRECTORY NAME:

   SYSGEN DATA DISK /VOLUME
        Enter the access name of the disk (or volume) that contains the DX10 system generation parts directory (.S$SYSGEN). The response to this prompt must also be the response that will be entered for the DATA DISK/VOLUME prompt issued during execution of the XGEN utility.

LISTING DIRECTORY NAME
Enter the pathname of the directory to be used for
any listings generated by the communications DSR
generation procedure. IDC creates this directory
with a maximum entry size of 10 and creates a
batch listing subdirectory named .BL.

2.1.2 Executing the Communications DSR Installation Procedure

After entering the response to the last prompt from the IDC
procedure, press the RETURN key and two batch streams will
execute. One updates the communications DSR installation
procedures and the other applies patches to the Communications
Configuration Task. When these batch streams terminate, the
following messages appear (press the RETURN key after each
message appears to display the next message):

0026 SVC ERROR (SVC CODE, ERROR CODE)
Normal message for creation of listing directory

- This message only appears if the specified listing
directory already exists

n ERRORS IN PATCH STREAM $CLST.BL.PPRCOMM
Communications DSR Installation procedures patch process

n ERRORS REPORTED IN PATCH STREAM $CLST.BL.GENPAT
Communications CONFIG task patch process

If n is not equal to zero, determine the cause of the error(s) by
examining the files $CLST.BL.PPRCOMM and/or $CLST.BL.GENPAT,
where $CLST is the directory pathname entered in response to the
LISTING DIRECTORY NAME prompt. Take the appropriate action
indicated and restart the IDC procedure.

When the communications DSR installation procedure is
successfully installed, proceed to paragraph 2.2 for a
description on generating the DX10 system.

NOTE

The IDC command assigns synonyms required for
proper execution of the Build Communications
DSR (BCD) command. Therefore, the IDC
command should always be executed before the
BCD command.

2.2 GENERATING THE DX10 SYSTEM

A DX10 system is generated using the XGEN utility. The XGEN utility process is described in the DX10 Operating System Systems Programming Guide (Volume V), part number 946250-9705.

Be sure to review the section(s) in this installation guide for each communications package before executing the XGEN utility. These sections contain further information on generating communications devices using the XGEN utility.

CAUTION

> Do not assemble, link, or patch the system
> until all required communications protocol
> DSRs have been successfully generated.

When generating a DX10 system that includes the FCCC, enter the TILINE address in response to the COMM DEVICE ADDRESS? prompt, not the CRU address of the slot in which the board resides. Normally, this TILINE address is >F900.

When the definition of the DX10 operating system is complete, proceed to paragraph 2.2.1 to build the DX10 Communications DSR(s).

2.2.1 Building Communications DSRs

Execute the communications DSR installation procedure using the BCD command as follows:

```
[ ] BCD
BUILD COMMUNICATIONS DSRS
  SYSGEN DATA DISK/VOLUME: DS01
            SYSTEM NAME:
```

SYSGEN DATA DISK/VOLUME
   Enter the access name of the disk (or volume) containing the DX10 system generation parts directory (.S$SYSGEN). The response to this prompt must also be the response entered for the DATA DISK/VOLUME prompt during the execution of the XGEN utility, usually DS01.

SYSTEM NAME
   Enter the name you specified in response to the OUTPUT CONFIGURATION prompt during the execution of the XGEN utility.

BCD invokes a task called CONFIG that reads the configuration file generated during execution of the XGEN utility. This task also accumulates the parameters entered when a communications device is defined. If the initial phase of this task executes without an error, proceed to paragraph 2.2.2 to define the DSR. If an error occurs during the initial execution phase of this task, the build process terminates and error messages are queued for display. The first message to appear is as follows:

DSR GENERATION FAILED. CHECK FOLLOWING ERROR MESSAGE.

Press the RETURN key to display the next message, which is one of the following messages:

ABNORMAL TERMINATION ERROR >xxxx

or

ABNORMAL TERMINATION-ILLEGAL FORMAT OF SYSTEM CONFIGURATION FILE

An explanation of the error code >xxxx is described in the DX10 Operating System Error and Recovery Manual (Volume VI), part number 946250-9706. Read the explanation and follow the recovery procedure (user action) specified. To restart the DSR generation, reexecute the BCD command.

Two conditions cause illegal format termination: the configuration file generated during execution of the XGEN utility was edited, or the configuration file was generated incorrectly. The illegal format error message appears if one of the following occurs:

* The CONFIG task does not find any communications devices in the configuration file

* The CONFIG task encounters an End-of-File (EOF) marker before all parameters are accumulated.

* The CONFIG task reads unexpected data when accumulating the information on a communications device.

Reading of the system configuration file continues until all communications devices and protocols are defined or an EOF is reached.

2.2.2   DSR Definition

The definitions of the communications DSR components include the
following:

* * Board type definition -- The communications controllers
    that are used.

* * Data link control definition -- The Automatic Call Unit
    (ACU) response time-outs, thresholds, etc., for each
    protocol.

* * Linking the DSR -- Each protocol's DSR that is linked.

* * Error Messages -- The messages that are displayed.

2.2.2.1   Board Type Definition.   When all of the information
describing the first communications device has been gathered
(defined during execution of the XGEN utility), the following set
of prompts appear:

DEFINE COMMUNICATIONS BOARD TYPE AT DEVICE ADDRESS >xxxx
                BOARD TYPE: <type>

where:

   <type>   is the type of communications controller that is
            installed at the displayed address >xxxx.

Enter one of the following responses to the BOARD TYPE prompt:

* * COMIF, for a Communications Interface Module controller

* * FCCC, for a Four-Channel Communications Controller

* * BCAIM,   for   a   Bit-oriented/Character-oriented
    Asynchronous Interface Module controller or the X.21
    Bit-oriented/Character-oriented Asynchronous Interface
    Module controller

* * ALPHA, for the communications-option port   on   the
    Business System 300 (S300)

If the board type specified for a communications device is
incorrect, press the CMD key and reexecute the BCD command.
After responding to the BOARD TYPE prompt, press the. RETURN key.
The display of prompts that follow depends on the protocol being
defined.   Refer to the appropriate communications protocol
definition found in this document, beginning in Section 5, for
information on the prompts that may appear.

After completing the response to the last prompt for a particular protocol, press the RETURN key and the following message will appear:

CREATE LIST OF DEVICES AND PROTOCOLS

Following related prompt displays for the particular protocol, the previous process is repeated to define the communications controller for the next communications device listed in the DX10 system configuration file. The repeat cycle starts with the definition of the communications board type and continues until all devices are defined.

2.2.2.2 Linking the DSR. After responding to the last prompt associated with the last device and pressing the RETURN key, the following prompt appears:

ENTER <CR> TO START DSR GENERATION PROCESS.:

To continue with the DSR generation, press the RETURN key. To abort the process, enter NO and press the RETURN key which causes the main DX10 menu to appear. Reexecute the BCD command to restart the DSR generation.

The DSR generation process links each communications DSR generated during execution of the BCD command. A message appears at the top of the screen indicating which DSR is being linked. For example, the following message appears at the top of the screen when the 3780/2780 DSR is being generated:

GENERATE 3780/2780 DSR LINK CONTROL FILE AND LINK DSR

A similar message appears for each communications protocol being generated.

When the DSR generation process completes, the following prompt appears:

COMPLETE XGEN PROCESS AND APPLY DSR PATCHES:

Press the RETURN key to display the first of a series of messages, each indicating the number of errors that occurred during each phase of the generation process. Press the RETURN key to display subsequent messages. If the error count reported in any of these messages is nonzero, examine the file named in the message to determine the cause of the error. Correct the problem and restart the DSR generation process. Refer to paragraph 2.2.2.3 for a list of all possible completion messages resulting from the generation of the communications DSR(s). When an error-free DSR generation is completed, proceed to paragraph 2.2.3 to assemble and link the DX10 system.

CAUTION

If you press the CMD key or the RETURN key or
enter a hard break sequence before the
completion of the DSR generation process,
normal operation of the process is
interrupted. You must execute the Kill
Background Task (KBT) command to abort the
DSR generation. To restart, reenter the BCD
command.

2.2.2.3   Error Messages. The following error messages appear at
the end of the DSR generation process. These messages include
the pathnames of the batch listing files which describe the
errors. $CLST represents the name entered in response to the
LISTING DIRECTORY NAME prompt issued by the IDC procedure.

n ERRORS REPORTED IN $CLST.BL.DSRxxxx
    Communications protocol xxxx DSR generation

NOTE

If multiple communications packages are being
built, messages resulting from each DSR
generation process for those packages will
also be displayed.

n ERRORS REPORTED IN $CLST.BL.COMMCOM
    DSR configuration table and software-level scheduler
    generation

2.2.3 Assembling and Linking the DX10 System

To complete the DX10 system installation, use the Assemble and
Link Generated System (ALGS) command as explained in the DX10
Operating System Systems Programming Guide (Volume V), part
number 946250-9705.

When this phase is successfully completed, proceed to patching
the DSR and the operating system.

2.2.4 Patching the Communications DSRs

Apply any patches to the communications DSRs and the DX10 system after you execute the ALGS command to assemble and link the system. Use the Patch Generated System (PGS) command and the Patch Communications System (PCS) command to apply the patches. Refer to the DX10 Operation System Systems Programming Guide (Volume V) for information on the PGS command.

To apply communications DSR and DX10 system patches simultaneously, use the PCS command. The PCS command can also be used to apply patches to the communications DSR(s) after initial installation, as explained in paragraph 2.3.

Use the following procedure to patch the communications DSRs.

1. Enter the Q$SYN command to delete any extraneous synonyms.

2. Enter the PCS command and respond to the prompts as described in the following paragraphs:

   ```
   [ ] PCS
     PATCH COMMUNICATIONS SYSTEM
   SYSGEN DATA DISK/VOLUME:
        TARGET DISK/VOLUME:
              SYSTEM NAME:
          PROTOCOL NAME(S):
       LISTING ACCESS NAME:
       LISTING DEVICE NAME:
   INSTALL MEMRES PATCHES?: NO
   ```

   SYSGEN DATA DISK/VOLUME
         Enter the access name of the disk (or volume)
         where the system generation parts directory
         (.S$SYSGEN) for the DX10 system resides. This
         response should be the same response you specified
         for the DATA DISK/VOLUME prompt during the
         execution of the XGEN utility and the ALGS
         command. After ALGS completes, the DSR becomes
         part of the operating system. This procedure
         assumes that the system and DSR link maps reside
         on the disk under the .S$SYSGEN directory
         generated during the XGEN utility. If these maps
         do not exist, the DSR cannot be patched.

   TARGET DISK/VOLUME
         Enter the access name of the disk (or volume) that
         contains the system being patched. This response
         should match the one given for the same prompt
         during execution of the ALGS command.

SYSTEM NAME
> Enter the name of the system you specified in response to the OUTPUT CONFIGURATION prompt of the XGEN utility.

PROTOCOL NAME(S)
> Enter the names of all communications protocols being patched. This list should contain the names of all communications protocols entered in response to the CHANNEL NUMBER xx PROTOCOL prompts during the definition of communications devices in the XGEN utility. Use commas to separate individual protocols in this response.

LISTING ACCESS NAME
> Enter the pathname of the directory for the batch listings. This directory pathname should have been previously created using the Create Directory File (CFDIR) command. PCS creates a subdirectory named .BL under this directory for batch listings resulting from the patch process. The batch listing file PCS is always placed under the .BL directory.

LISTING DEVICE NAME
> Enter the name of a device to receive the listings from the patch files. If a device is not specified, the patch file listings go to the directory indicated in response to the LISTING ACCESS NAME prompt. Specifying a device minimizes disk usage but a listing file for the patch procedure still needs to be supplied.

INSTALL MEMRES PATCHES?
> Enter NO if the PGS command has already been executed. If PGS has not been executed, enter YES to execute the MEMRES patch batch stream to patch the DX10 system. If a listing device has not been specified, the MEMRES patch batch listing is written to the batch listing directory specified in response to the LISTING ACCESS NAME prompt.

<div align="center">NOTE</div>

> It is highly recommended that the MEMRES patches be applied via the PGS procedure to avoid any problems with synonym table overflow. Applying MEMRES patches via the PCS procedure is provided merely as a convenience.

3. Observe the messages displayed while PCS applies the patches. If any of the following messages appear, take the actions indicated:

* The following message appears if a protocol name is misspelled or if its associated link map cannot be found on the volume name you specified in response to the SYSGEN DATA DISK/VOLUME prompt:

  disk.S$SYSGEN.sysname.DMAPyyyy NOT FOUND:

  where yyyy is a protocol name specified in response to the PROTOCOL NAME(S) prompt.

  When the RETURN key is pressed to acknowledge the message, the following additional message appears:

  COMM PATCHING ABORTED:

  Correct the problem and reexecute the PCS command.

* If the following message appears, ignore it the first time:

  0026 SVC ERROR (SVC CODE, ERROR CODE)

* Each patch stream generates error reports in the following format:

  n ERRORS IN PATCH STREAM list.BL.DPTCOMM
  n ERRORS IN PATCH STREAM list.BL.DPTyyyy
  n ERRORS IN PATCH STREAM list.BL.CMNyyyy

  In the preceding messages, list is the directory specified in response to the LISTING ACCESS NAME prompt.

* If other communications packages are being patched, their patch streams result in additional messages with the following format:

  n ERRORS IN PATCH STREAM list.BL.DPTyyyy
  n ERRORS IN PATCH STREAM list.BL.CMNyyyy

  The file list.BL.CMNyyyy is a patch listing generated from the patch file .S$SYSGEN.DXCMO.DCOMM.P.DPTCMON (where list is the directory specified in response to the LISTING ACCESS NAME prompt and yyyy indicates a protocol).

* If a listing device is specified, error messages appear in the following format:

```
n ERRORS IN PATCH STREAM   .DPTCOMM
n ERRORS IN PATCH STREAM   .DPTyyyy
n ERRORS IN PATCH STREAM   .CMNyyyy
```

(where yyyy is a protocol name specified in response to the PROTOCOL NAME(S) prompt).

Since the listings were written to a specified device, these listing files do not actually exist. Their names are displayed to identify the patch streams whose error listings are sent to the device.

* A summary message appears as follows:

NUMBER OF BATCHES WITH ERRORS = n

This message indicates how many patch streams have errors.

- If no errors occur in any of the patch streams, the following message also appears:

COMM PATCHING COMPLETE

- If there are errors, the following message appears:

ERROR OCCURRED DURING COMM PATCHING

4. If YES was entered in response to the INSTALL MEMRES PATCHES? prompt, PCS attempts to apply the MEMRES patches regardless of any errors reported during the application of DSR patches.

5. If any of these messages report that errors have occurred, the patching process is incomplete. Examine the listing for the file reporting the error(s), correct the problem, and reissue the PCS command.

6. When PCS reports no errors, the disk-resident system is successfully patched. If the newly generated system is configured to contain an FCCC or X.21 BCAIM, or if the instructions for installing the communications protocols specify using the download utilities, proceed to paragraph 2.4. Otherwise, ensure all procedures required for each communications package have been performed before performing an initial program load (IPL) to load the newly patched system into memory.

NOTE

After all communications DSRs are
successfully patched and all procedures
required for each communications package have
been performed, perform an IPL on the system
and determine that the system is installed
correctly. If the system is correctly
installed, delete the listing directory
created in paragraph 2.2.4.

2.3 PATCHING THE COMMUNICATIONS DSR AT A LATER DATE

The following paragraphs describe the steps for applying patches
to communications DSRs that become available after installation.
The patch process uses the Common Communications DSR object parts
directory and the latest communications DSR patches.

Perform the following steps to patch communications DSRs after
installation:

1. Insert the disk containing the new patches in an
   available drive and make it ready. Execute the
   following Install Volume (IV) command to install the
   disk:

   IV U=DSxx, V=<patch volume>

   In this command, DSxx is the name of the drive and
   <patch volume> is the name of the disk to be installed.

2. Assign the synonym DXCMO to the common communications
   DSR object parts using the following Assign Synonym
   (AS) command:

   AS S=DXCMO, V=<sysgen data disk>.S$SYSGEN.DXCMO

   where:

   <sysgen data disk>   is the access name of the disk
                        (or volume) that contains the
                        DX10 system generation parts
                        directory (.S$SYSGEN). The name
                        entered must match the disk (or
                        volume) entered in response to
                        the   SYSGEN DATA DISK/VOLUME
                        prompt issued by the BCD
                        command.

3. Use the following Copy/Concatenate (CC) commands to copy the new common patches to the common communications DSR object parts directory:

   CC IN=<patch volume>.DXCMO.DPTCOMM,
   OUT=DXCMO.DCOMM.P.DPTCOMM, R=Y
      Communications Software-level Scheduler patch
      file applied via the PCS procedure

   CC IN=<patch volume>.DXCMO.DPTCMON,
   OUT=DXCMO.DCOMM.P.DPTCMON, R=Y
      Common Communications DSR parts patch file
      applied via the PCS procedure

   CC IN=<patch volume>.DXCMO.GENPAT,
   OUT=DXCMO.DCOMM.P.GENPAT, R=Y
      Communications DSR installation CONFIG task
      patch file applied via the IDC procedure

   CC IN=<patch volume>.DXCMO.PPRCOMM,
   OUT=DXCMO.DCOMM.P.PPRCOMM, R=Y
      Common Communications Installation procedures
      patch file applied via IDC procedure

4. Use the following CC command to copy the new communications protocol patches to the common communications DSR object parts directory:

   CC IN=<patch volume>.<comm package>.DPTxxxx,
   OUT=DXCMO.Dxxxx.P.DPTxxxx

where:

   <comm package> is the directory name, on the patch
                   disk, for the protocol xxxx.

For example, the DSR patches for the 3780/2780 Emulator would be copied as follows:

   CC IN=<patch volume>.DXCOMOBJ.DPT3780,
   OUT=DXCMO.D3780.P.DPT3780

NOTE

This step is repeated for every communications protocol that is to be patched.

5. Enter the following command to access the Communications DSR object directory:

   .USE DXCMO

6. Execute the IDC command and respond to the prompts as described in the following paragraphs:

   [ ] IDC
   INSTALL COMMUNICATIONS DSR COMMANDS
     SYSGEN DATA DISK/VOLUME:
     LISTING DIRECTORY NAME:

   SYSGEN DATA DISK /VOLUME   Enter the access name of the disk (or volume) that contains the DX10 system generation parts directory (.S$SYSGEN). The response to this prompt must match the response entered for the <sysgen data disk> in step 2.

   LISTING DIRECTORY NAME   Enter the pathname of the directory to be used for any listings generated by the execution of the IDC procedure. IDC creates this directory with a maximum entry size of 10 and creates the batch listing subdirectory .BL under this directory. See paragraph 2.1.2 for a description of the execution of the IDC procedure.

7. Execute the PCS command as described in paragraph 2.2.4.

If necessary, proceed to paragraph 2.5 for an explanation of applying Communications Download and X.21 Utilities patches using the Patch Utility Tasks (PUT) command.

2.4   INSTALLING THE COMMUNICATIONS UTILITIES AND DOWNLOADING   THE FCCC

A DX10 system configured with the FCCC must have the FCCC downloaded. The following paragraphs describe the installation of both the download utilities and the X.21 utilities. Refer to Sections 3 and 4 for further information on the use of these utilities.

2.4.1   Installing the Communications Download and X.21 Utilities

To install the Communications download and X.21 utilities, execute the Install Utility Tasks (IUT) command as follows or respond to the prompts as described in the following paragraphs:

```
    [ ] IUT
    INSTALL UTILITY TASKS
        SYSGEN DATA DISK/VOLUME: DS01
             TARGET DISK/VOLUME: DS01
      BATCH LISTING ACCESS NAME: .IUTLST
```

SYSGEN DATA DISK/VOLUME
    Enter the access name of the disk (or volume) containing the
    DX10 system generation parts directory (.S$SYSGEN). The
    response to this prompt must match the response entered for
    the DATA DISK/VOLUME prompt during the execution of the XGEN
    utility, usually DS01.

TARGET DISK/VOLUME
    Enter the access name of the disk (or volume) where the
    newly-generated system resides. This disk must be installed
    before executing the IUT command. The response to this
    prompt should match the response to the TARGET DISK prompt
    for the ALGS step of the DX10 system generation.

BATCH LISTING ACCESS NAME
    Enter the pathname of the temporary file designated to hold
    the batch listing file generated by the utility task
    installation process.

After responding to these prompts, press the RETURN key and the utility task installation process will begin. When it completes, the following message will appear:

    n ERRORS REPORTED IN BATCH UTLINS

If n is not equal to zero, examine the batch listing file to determine the cause of each error.   Take the appropriate corrective action and reenter the IUT command.

NOTE

Be sure to install any additional download routines required by the particular communications protocol(s) in use.

2.4.2 Patching the Utility Tasks

To patch the utility tasks, execute the Patch Utility Tasks (PUT) command as follows or respond to the prompts as described in the following paragraphs:

```
[ ] PUT
PATCH UTILITY TASKS
    SYSGEN DATA DISK/VOLUME: DS01
          TARGET DISK/VOLUME: DS01
    BATCH LISTING ACCESS NAME: .PUTLST
```

SYSGEN DATA DISK/VOLUME
    Enter the access name of the disk (or volume) containing the DX10 system generation parts directory (.S$SYSGEN). The response to this prompt must match the response entered for the DATA DISK/VOLUME prompt during the execution of the XGEN utility, usually DS01.

TARGET DISK/VOLUME
    Enter the access name of the disk (or volume) where the utility tasks have been installed. The tasks are located on this disk under the program file .S$COMM.S$COMMPF. The response to this prompt must match the response specified for the TARGET DISK/VOLUME prompt when the IUT command was executed.

BATCH LISTING ACCESS NAME
    Enter the pathname of a temporary file designated to hold the batch listing file generated by the patch utility process.

After responding to these prompts, press the RETURN key and the patching process will begin. When it completes, the following message will appear:

n ERRORS IN UTILITY PATCH STREAM

If n is not equal to zero, examine the batch listing file to determine the cause of each error. Take the appropriate corrective action and reenter the PUT command.

2.4.3 Completing the Download Process

To complete the download process, edit the Initialize System (IS) command to include the Communication Device Download Utility (CDL) command as follows:

```
CDL  COMM DEVICE NAME = CMxx,
        INPUT CONTROL ACNM = .S$COMM.FC3CTL,
        OUTPUT CONTROL ACNM = DUMY,
            LISTING ACNM = DUMY
```
where:

> CMxx is the device name assigned to the FCCC during the system generation. Only one channel/device name from each FCCC should be specified for COMM DEVICE NAME. An FCCC should only be downloaded once with the above INPUT CONTROL ACNM, regardless of the number of channels defined.

NOTE

> If necessary, be sure to add any additional CDL commands required by the particular communications protocol(s) in use.

Refer to the DX10 Operating System Operations Guide (Volume II) for information on the IS command.

The system log records a message indicating the success of the download operation. If successful, the following message appears:

```
001:0102+        COMMDWNL(CMxx,80.354),L=yyyy
                 P=.S$COMM.S$COMMPF                        ,B=0000
```
where:

> L=yyyy   specifies the load address.
>
> P=.S$COMM.S$COMMPF   specifies the program file where the code being downloaded resides.

Unsuccessful download completion messages appear in the following
form:

```
219:1310+      COMMDWNL(CM04,80.354),E=xxxx,
               P=.S$COMM.S$COMMPF                    ,B=0000
219:1310+      COMMDWNL(CM04,80.354),R=yyyy,
               P=.S$COMM.S$COMMPF                    ,B=0000
```

where:

E=xxxx   specifies   the   error   returned   during
          execution of the download task.

R=yyyy   specifies that the area starting at the
          indicated location has been released due to
          the error indicated in the preceding log
          message.

Error codes are listed in Appendix B of this document.

Ensure that all procedures required for each communications
package have been performed, then perform an initial program load
(IPL) to load the system into memory.

2.5 PATCHING THE COMMUNICATIONS UTILITIES AT A LATER DATE

The following paragraphs describe the steps for applying patches
to the communications download and X.21 utilities that become
available after installation. The patch process uses the Common
Communications DSR object parts directory, the latest
communications download, and the X.21 utilities patches.

Proceed as follows to patch the communications download and X.21
utilities after installation:

1. Insert the disk containing the new patches in an
   available drive and make it ready. Execute the
   following IV command to install the disk:

   IV U=DSxx, V=<patch volume>

   In this command, DSxx is the name of the drive and
   <patch volume> is the name of the disk to be
   installed.

2. Assign the synonym DXCMO to the common communications DSR object parts using the following AS command:

    AS S=DXCMO, V=<sysgen data disk>.S$SYSGEN.DXCMO

where:

    <sysgen data disk> is the access name of the disk (or volume) that contains the DX10 system generation parts directory (.S$SYSGEN). The name entered here must match the disk (or volume) that was entered in response to the SYSGEN DATA DISK/VOLUME prompt when the IUT command was initially executed.

3. Use the following CC commands to copy the new patches to the common communications DSR object parts directory:

    CC IN=<patch volume>.DXCMO.PPRCOMM,
        OUT=DXCMO.DCOMM.P.PPRCOMM, R=Y
            Common Communications DSR Installation
            procedures patch file applied via
            the IDC procedure

    CC IN=<patch volume>.DXCMO.UTLPAT,
        OUT=DXCMO.DUTIL.P.UTLPAT, R=Y
            Communications Download and X.21 Utilities
            patch file applied via the PUT procedure

4. Enter the following command to access the Communications DSR object directory:

    .USE DXCMO

5. Execute the IDC command and respond to the prompts as described in the following paragraphs:

    [ ] IDC
    INSTALL COMMUNICATIONS DSR COMMANDS
        SYSGEN DATA DISK/VOLUME:
        LISTING DIRECTORY NAME:

SYSGEN DATA DISK /VOLUME
> Enter the access name of the disk (or volume) that contains the DX10 system generation parts directory (.S$SYSGEN). The response to this prompt must match the response entered for the <sysgen data disk> in step 2.

LISTING DIRECTORY NAME
> Enter the pathname of the directory to be used for any listings generated by the execution of the IDC procedure. IDC creates this directory with a maximum entry size of 10 and creates the batch listing subdirectory .BL. See paragraph 2.1.2 for a description of the execution of the IDC procedure.

6. Execute the PUT command as described in paragraph 2.4.2.

If necessary, proceed to paragraph 2.3 for an explanation of applying DSR patches using the PCS procedure.

Section 3

DX10 Communications Download Utilities

This section discusses the DX10 Communications Download Utilities that are installed through the IUT procedure discussed in paragraph 2.4.1.

The DX10 Communications Download Utilities allow you to perform various operations to the memory on the FCCC, BCAIM, and X.21 BCAIM communications controller boards. These operations include download and release memory functions, read reserved memory, list memory and modify memory. In particular, the following areas are discussed:

* CDL -- Communications Device Download Utility

* CRMS -- Communications   Device   Read   Reserved   Memory Status

* CLM -- Communications Device List Memory

* CMM -- Modify Communications Device Memory

3.1   COMMUNICATIONS DEVICE DOWNLOAD UTILITY (CDL)

The CDL utility allows you to download code to the onboard RAM of the FCCC, BCAIM or X.21 BCAIM. The actual execution of the CDL procedure is typically done during the system initialization to assure that the download takes place following each IPL of the system. This utility can accept download code either as program files or files written in ASCII, or compressed object formats. Each of these files must be fully linked prior to the execution of the download utility.

The CDL procedure has the ability to perform the following:

* Relocate code relative to the COMM board load bias

* Allow more than one file to be downloaded as a single block

* Allow for execution of initialization code contained in the download code

* Release single or multiple blocks of reserved memory

* Perform termination logic prior to releasing memory, if so desired

* Report errors to a listing file and/or the system log

3.1.1 Communications Device Download Utility (CDL) SCI Procedure

The CDL procedure invokes the communications download utility. CDL is typically included in the IS procedure to assure that the code is always downloaded following each IPL of the system.

The following are the prompts for the CDL procedure:

```
COMM DEVICE DOWNLOAD UTILITY
       COMM DEVICE NAME:
     INPUT CONTROL ACNM:
    OUTPUT CONTROL ACNM:
           LISTING ACNM:
```

Respond to the CDL prompts as follows:

COMM DEVICE NAME
     Enter the device name assigned to the BCAIM, X.21 BCAIM or the FCCC during system generation. This device name is of the form CMxx and can be found by examining the system configuration file generated by the XGEN utility. A communications device name must be entered in response to this prompt.

                              NOTE

          Only one channel/device name for each FCCC
          needs to be specified when downloading,
          regardless of the number of channels defined
          for that board. An FCCC should not be
          downloaded with the same information more
          than once between IPLs.

INPUT CONTROL ACNM
        Enter the access name of the file containing commands for
        release blocks and/or download object or program files.
        Each command is contained in a single 80 column record. A
        response to this prompt is required. Sample Input Control
        files can be found in Appendix A.

The following is the format for the record:

Column	Field Contents
1-48	Specifies the download object file or program file pathname. A synonym may be used to specify this pathname.
49-52	Specifies the four-digit hexadecimal address of the location of the BLWP vector for executing any initialization code. If no initialization code is to be executed, specify FFFF as this address.

NOTE

An incorrect BLWP vector address or missing
RTWP in download code can result in a hang of
the communications device and the download
utility.

53-59	Specifies the type of action to be taken as either a download or release memory. If the function is to be a download this field is left blank. If the function is to be a release memory, this field should contain the word RELEASE. Note that all requests to release blocks of memory must precede any download requests. Multiple release and download actions can be contained in a single input control file.
60-63	Specifies the four-digit hexadecimal starting address for the release memory action. When the action specified is a download, (i.e., columns 53-59 are blank) this field is also blank.

64-71   Specifies the Task name in the download
             program file specified in columns 1-48
             that is to be downloaded. This field
             must be left blank when object code is
             being downloaded or when the action type
             specified in columns 53-59 is a RELEASE
             function. This task cannot have any
             associated overlays or procedures.   A
             synonym may be used to specify this task
             name.

72-73   Specifies the Task ID in the program
             file specified in columns 1-48, that is
             to be downloaded.   The Task ID   is
             specified as a two-digit hexadecimal
             value. The task that is to be used as
             the downloaded code may be represented
             by either the task name or ID or both.
             When   the   action type specified in
             columns 53-59 is a RELEASE, or object
             code to be downloaded, this field must
             be left blank.

OUTPUT CONTROL ACNM
    Enter the access name or relative record file to be used to
    record the RAM usage of the communications device specified
    in response to the COMM DEVICE NAME prompt. When a relative
    record file is specified in response to this prompt, it must
    have been previously created.   A single record will be
    recorded in this file for the BCAIM and X.21 BCAIM. For the
    FCCC, there are four records. Each FCCC record corresponds
    to one of the four reserved memory blocks.   DUMY is an
    acceptable response to this prompt when an output control
    file is not required. Sample Output Control files may be
    found in Appendix A.

LISTING ACNM
    Enter the access name of the file to be used to provide a
    summary of the transaction commands specified in the file
    entered in response to the INPUT CONTROL ACNM prompt. The
    summary of transactions will be displayed at the terminal
    entering the CDL command when no response is entered to this
    prompt.   DUMY is an acceptable response to this prompt when
    no listing is required.   Sample output contained in the
    listing file may be found in Appendix A.

In addition to the information returned in the output control file and the listing file, the system log contains a record of the success or failure of the download/release action. Appendix A contains sample completion messages found in the system log. Any errors reported in unsuccessful download completion messages are explained in Appendix B.

3.2 READ RESERVED MEMORY STATUS UTILITY (CRMS)

The CRMS utility reads the current reserved memory status of the onboard RAM of the BCAIM, the X.21 BCAIM or the FCCC. This utility may be used to update the information in the relative record file specified in response to the OUTPUT CONTROL ACNM prompt of the CDL utility. Typically, the CRMS utility is used to further verify actions of the CDL utility. If the CRMS utility will be used, the CDL utility must use a relative record file as its OUTPUT CONTROL ACNM. The information returned in the output control file of the CRMS command can only be accurate if the same relative record file is specified as the output file in both the CDL and CRMS commands.

3.2.1 Communications Device Read Reserved Memory Status (CRMS) SCI Procedure

The CRMS procedure invokes the communications read reserved memory utility.

The prompts for CRMS are as follows:

        COMM DEVICE READ RESERVED MEMORY STATUS
            COMM DEVICE NAME:
            OUTPUT CONTROL ACNM:

Respond to the CRMS prompts as follows:

COMM DEVICE NAME
    Enter the device name assigned to the BCAIM, X.21 BCAIM, or the FCCC during the system generation. This device name is of the form CMxx and can be found by examining the system configuration file generated by the XGEN utility. A communications device name must be entered in response to this prompt.

OUTPUT CONTROL ACNM
    Enter the relative record file pathname specified in response to the same prompt issued by the CDL procedure.

3.3 COMMUNICATIONS DEVICE LIST MEMORY UTILITY (CLM)

The CLM utility provides a close emulation of the DX10 SCI List Memory (LM) procedure. The utility lists the specified memory area of a communications device on the specified output device or file. The output defaults to the terminal executing the command if no output device or file is specified. The data listed may be formatted in either ASCII or EBCDIC. Multiple dump requests are permitted within the same invocation of the CLM procedure.

3.3.1 Communications Device List Memory Utility (CLM) SCI Procedure

The CLM procedure invokes the communications list memory utility. This utility can be used to verify that a certain code has been downloaded to a communications device or that the communications device is actually functioning. In the output, the contents of 16 bytes are printed per line. The address of the first byte is the first entry on the line. The contents of each pair of bytes are shown as four hexadecimal digits. At the right end of the line, the contents are printed as ASCII characters when the response entered to the FORMAT (ASCII OR EBCDIC) prompt is A (ASCII). The bytes that contain values corresponding to printable ASCII characters are translated and then displayed or printed as ASCII characters. The nonprintable ASCII characters are displayed or printed as periods.

The prompts for CLM are as follows:

```
COMM DEVICE LIST MEMORY
      COMM DEVICE NAME:
        LISTING ACNM:
```

Respond to the CLM prompts as follows:

COMM DEVICE NAME
      Enter the device name of the desired BCAIM, X.21 BCAIM or
      the FCCC that was assigned during the system generation.
      This device name is of the form CMxx and can be found by
      examining the system congiguration file generated by the
      XGEN utility. A communications device name must be entered
      in response to this prompt.

LISTING ACNM
      Enter the access name to be used for the dump generated by
      the CLM utility. If no access name is specified, the output
      defaults to the terminal executing the command.

When the response to the LISTING ACNM is entered the RETURN key is pressed, the following prompt appears:

LENGTH(BYTES): 32

LENGTH(BYTES)
        Enter the size, in bytes, to be listed. The default for this prompt is 32 bytes. Pressing the CMD key in response to this prompt will terminate the CLM utility.

When the response to the LENGTH(BYTES) prompt is entered and the RETURN key is pressed, the following set of prompts appear:

STARTING ADDRESS:
FORMAT(ASCII OR EBCDIC): A

STARTING ADDRESS
        Enter the address at which to begin the listing.

FORMAT(ASCII OR EBCDIC)
        Enter the desired format type, ASCII or EBCDIC, for the listing. The default for this prompt is A (ASCII).

When the response to the last prompt is entered and the RETURN key is pressed, the utility executes. If the LISTING ACNM is not the terminal, the LENGTH(BYTES) prompt will redisplay when the utility completes. If the terminal is specified as the LISTING ACNM, the memory dump is displayed at the terminal. Pressing the CMD key will cause the LENGTH(BYTES) prompt to redisplay. To terminate execution of the CLM utility, press the CMD key in response to the LENGTH(BYTES) prompt.

3.4 MODIFY COMMUNICATIONS DEVICE MEMORY (CMM)

The CMM utility provides a close emulation of the DX10 SCI Modify Memory (MM) procedure. The utility modifies the memory image of the specified memory area of a communications device, starting at the address specified.

3.4.1 Modify Communications Device Memory Utility (CMM) SCI Procedure

The CMM procedure invokes the modify communications device memory utility. This command is interactive and may be terminated at any time by pressing the CMD key.

The prompts for CMM are as follows:

```
COMM DEVICE MODIFY MEMORY
     COMM DEVICE NAME:
     STARTING ADDRESS:
```

Respond to the CMM prompts as follows:

COMM DEVICE NAME
     Enter the device name of the desired BCAIM, X.21 BCAIM or
     the FCCC that was assigned during system generation. This
     device name if of the form CMxx and can be found by
     examining the system configuration file generated by the
     XGEN utility. A communications device name must be entered
     in response to this prompt.

STARTING ADDRESS
     Enter   the   address   at   which   to   begin   the memory
     modifications.   The command displays 10 words and the
     contents of those words beginning at the specified address.
     Pressing the RETURN key positions the cursor   at   the next
     word.   When   the   cursor is positioned at the last word and
     the RETURN key is pressed, the next 10 words (or portion
     thereof) are displayed. If the address specified is not in
     RAM, an error will be returned by the utility. Pressing the
     CMD key terminates the command and returns the terminal to
     command mode.

Section 4

DX10 X.21 Network Facility Request Utilities

This section discusses the DX10 X.21 Network Facility Request Utilities that are installed through the Install Utilities Task (IUT) procedure discussed in paragraph 2.4.1.

The DX10 X.21 Network Facility Request Utilities perform various operations that load and dump an X.21 BCAIM with various types of facility requests supported by an X.21 Network. The X.21 utilities also include a utility that reads from or writes to the call establishment or data transfer channel parameter table. Currently, X.21 networks are only available in Europe. The DX 3780/2780 Emulator is the only available communications package for use with an X.21 network.

Additional information concerning these utilities can be found in the following manuals:

* Interface Between Data Terminal Equipment (DTE) and Data Circuit Terminating Equipment (DCE) for Synchronous Operation on Public Data Networks document available from the International Consultative Committee for Telegraphy and Telephony (CCITT)

* X.21 BCAIM Specification, part number 2303089-9901

* X.21 Bit-Oriented/Character-Oriented Asynchronous Interface Module Installation and Operation Manual, part number 2263883-9701

In particular, the following areas are discussed in this section:

* CXL -- Communications X21 Load

* CXD -- Communications X21 Dump

* CRWP -- Communications Read/Write Parameters

Error messages returned by the utilities are described in Appendix F.

4.1 COMMUNICATIONS X.21 LOAD (CXL) UTILITY

The CXL Utility loads the X.21 BCAIM with the following three
types of selection signals supported by an X.21 network:

   *   Facility Request Block

   *   Address Block

   *   Registration/Cancellation Block

The selection signal request is written to the X.21 BCAIM.   The
CXL utility can optionally be set to replace the existing
selection signal block. The new selection signal block can be
specified for use with all tasks issuing opens on the X.21 BCAIM
or specified for use with only the next task that issues an open.
Refer to Appendix C of this document for an example input control
file for one of the three types of selection signal blocks.

Each Facility Request Block consists of one or more Facility
Request Signals separated by a comma (,).   The block is
terminated by the dash (-) character.   The Facility Request
Signal consists of a Facility Request Code and, optionally, one
or more Facility Request Parameters. Facility Request codes and
parameters are described in the CCITT document Interface Between
Data Terminal Equipment (DTE) and Data Circuit Terminating
Equipment   (DCE)   for Synchronous Operation on Public Data
Networks. Each Facility Request Code, Facility Parameter and any
subsequent Facility Parameters are separated by the slash (/)
character.   Note that some networks may not have implemented this
feature.

Each Address Block consists of one or more Address Signals
separated by a comma (,). An address signal can be a full
signal or an abbreviated signal. The abbreviated address signal
is preceded by a period (.).

Each Facility Registration/Cancellation Block consists of one or
more facility registration/cancellation signals separated by a
comma (,). The end of the Facility Registration/Cancellation
block is terminated by the dash (-) character.
A registration/cancellation signal consists of up to four ordered
elements as follows:

   *   Facility Request Code

   *   Indicator

   *   Registration Parameter

   *   Address Signal

If one of these elements is not present in the sequence, a zero
(0) is inserted into the control file in its place. For
cancellation, if less than four elements are used, the elements
are eliminated in reverse order. The Registration/Cancellation
request can be immediately sent to the network when the next open
is issued to the X.21 BCAIM.

4.1.1 Communications X.21 Load (CXL) SCI Procedure
The CXL procedure invokes the X.21 Facility Load Request Utility.
The type of request must be specified before executing the
utility.

The following are the prompts for CXL:

```
COMMUNICATION X21 LOAD
        COMM DEVICE NAME:
        ERASE FACILITY ?: NO
 REQUEST TYPE (AD,FR,RC):
       INPUT CONTROL ACNM:
       DELETE AFTER OPEN ?: NO
```


You can accept the displayed values by pressing the RETURN key or
respond to the prompts as follows:

COMM DEVICE NAME
     Enter the device name assigned to the X.21 BCAIM during the
     system generation. This device name is of the form CMxx and
     can be found by examining the system configuration file
     generated by the XGEN utility. A communications device name
     must be entered in response to this prompt.

ERASE FACILITY?
     Enter a YES (Y) if the selection signal block already
     defined on the X.21 BCAIM is to be erased. If you enter
     YES, a response to the INPUT CONTROL ACNM prompt is
     insignificant. Enter NO (N) if the selection signal block
     will over-write the old block. NO is the default value.

REQUEST TYPE (AD,FR,RC)
     Enter the type of load request desired as follows:

                AD - Address Block
                FR - Facility Request
                RC - Registration/Cancellation

INPUT CONTROL ACNM
        Enter the access name of the file containing the selection
        signal block.   If a null response is entered, the input
        defaults to the terminal executing the command.   The CRWP
        control format is as follows:

        COLUMN   ITEM   DESCRIPTION

        01   *   Comment - Ignore.
                   L   Load command.
                   T   Terminate - Return to SCI.

        02   ,   Comma.

        03-80   XXXX   ASCII Address, Facility Request
                          or Registration/Cancellation
                          Information.

DELETE AFTER OPEN?
        Enter NO (N) if the request block is to be sent for any task
        that processes an open on this communications device. Enter
        a YES (Y) if the request is to be sent only for the next
        task that processes an open on this communications device.
        The default value is NO.

If you enter RC in response to the REQUEST TYPE prompt, the
following prompt appears:

        ISSUE R/C IMMEDIATELY?: YES

Accept the displayed value by pressing the RETURN key or respond
to the prompt as follows:

ISSUE R/C IMMEDIATELY?
        Enter YES (Y) if the registration/cancellation request block
        is to be immediately sent to the network. Enter NO (N) if
        the request is to be sent by the first task that opens the
        communications device following execution of the CXL
        utility. The default value is YES.

4.2 COMMUNICATIONS X.21 DUMP

This command dumps the request blocks from the X.21 BCAIM.   The
three types of request blocks supported by the X.21 network are
as follows:

    * Call Progress Signal

    * DCE Provided Information

    * Charge Information

Each Call Progress Sequence consists of one or more Call Progress
Signal Blocks separated by a comma (,).   The Call Progress
Signal consists of two numeric characters. A Call Progress Block
is terminated with the plus (+) character. This termination
character is not returned by the Communications X.21 Dump (CXD)
command.

Each DCE Provided Information Sequence consists of one or more
DCE Provided Information Blocks. The first character in each
block is validated against a table to ensure that the information
received from the network is DCE Provided Information. The block
can be a maximum of 128 characters in length and SYN characters
can be inserted. Note that SYN characters are not returned in
the data from the CXD command. A DCE Provided Information Block
is terminated with the plus (+) character.   This termination
character is not returned by the CXD command.

Currently, three types of DCE Provided Information Blocks are
defined for X.21 operation as follows:

    * Called Line Identification

    * Calling Line Identification

    * Charging Information

For further information on these blocks, refer to the particular
network specification to verify implementation of the option and
to the X.21 BCAIM Specification.

Each Charge Information Block begins with a (/) character.
This optional information is provided after the X.21 BCAIM has
completed a call/disconnect sequence. There are three format
types for charge information as follows:

     Format 1: Monetary Charges

     Format 2: Time Duration Charges

     Format 3: Unit Charges

The Charge Information is displayed in one of the following
formats:

          /<1>/<X....X><+>
          /<1>/<X....X><:><YY><+>
          /<2>/<X....X><+>
          /<3>/<X....X><+>

where:

  <X.....X>   indicates a numerical value

  <YY>   indicates a fractional value for the monetary
              charges

4.2.1 Communications X.21 Dump (CXD) SCI PROCEDURE
The CXD procedure invokes the dump utility. The type of request
must be specified before the utility executes.

The following are the prompts for CXD:

```
COMMUNICATION X21 DUMP
          COMM DEVICE NAME:
             LISTING ACNM:
   REQUEST TYPE(CP,DC,CI):
            BLOCK NUMBER:
                  LENGTH: 32
         RELEASE REQUEST?: YES
```


You can accept the displayed values by pressing the RETURN key or
respond to the prompts as follows:

COMM DEVICE NAME
     Enter the device name assigned to the X.21 BCAIM during the
     system generation. This device name is of the form CMxx and
     can be found by examining the system configuration file
     generated by the XGEN utility. A communications device name
     must be entered in response to this prompt.

LISTING ACNM
> Enter the access name to be used for the dump generated by the CXD utility. If you enter a null value, the listing defaults to the terminal executing the command. When the pathname of an existing file is specified, the information returned from the CXD command is concatenated to the end of that file. However, a sequential file is automatically created if the specified file does not exist.

REQUEST TYPE (CP,DC,CI)
> Enter the type of dump request desired as follows:

> > CP - Call Progress Signal
> > DC - DCE Provided Information
> > CI - Charge Information

BLOCK NUMBER
> Enter the block number desired if the REQUEST TYPE specified is CP or DC. When a zero (0) is entered, the first block of information is returned. When a one (1) is entered, the second block of information is returned, and so forth. The valid range of values for this prompt is zero through nine (0-9).

LENGTH
> Enter the length, in bytes, of the information to be returned. The maximum length allowed is 80 bytes. The default value is 32 bytes.

RELEASE REQUEST?
> Enter a YES (Y) if the information dumped from the X.21 BCAIM is to be released once the command has completed. Enter a NO (N) if the information dumped is not to be released until a task issues an open to the X.21 BCAIM. The default value is YES.

4.3 COMMUNICATIONS X.21 READ/WRITE PARAMETERS

The Read/Write Parameters command reads or modifies information in either the Call Establishment Parameter Table (CEPT) or the Data Transfer Channel Parameter Table (DTCPT) of the X.21 BCAIM. A complete description of these tables can be found in the X.21 BCAIM Specification. A sample template of these tables can be found in Appendix E.

The information in these tables can be used to verify or change certain time-out values associated with the X.21 network and the number of DCE provided information blocks to accept from the network.

4.3.1   Communications   X.21   Read/Write   Parameters   (CRWP)   SCI
Procedure

The CRWP procedure invokes the Read/Write Parameters utility.

The following are the prompts for CRWP:

COMMUNICATIONS READ/WRITE PARAMETERS
        COMM DEVICE NAME:
            LISTING ACNM:
        INPUT CONTROL ACNM:

Respond to the prompts as follows:

COMM DEVICE NAME
    Enter the device name assigned to the X.21 BCAIM during the
    system generation. This device name is of the form CMxx and
    can be found by examining the system configuration file
    generated by the XGEN utility. A communications device name
    must be entered in response to this prompt.

LISTING ACNM
    Enter the access name to be used for the dump generated by
    the CRWP utility. If no access name is specified, the
    listing defaults to the terminal executing the command.

INPUT CONTROL ACNM
    Enter the access name of the file or device containing the
    commands for reading and writing to the CEPT/DTCPT.   If no
    response is entered to this prompt, the input defaults to
    the terminal executing the command. A sample input control
    file and listing file are shown in Appendix D.

The following is the CRWP control format:

COLUMN	ITEM	DESCRIPTION
01	*	Comment - Ignore
	W	Write parameters command - issue WP.
	R	Read parameters command - issue RP.
	T	Terminate - Return to SCI.
02	,	Comma.
03-04	XX	Protocol select for CPT.
05	,	Comma.
06-07	XX	Offset into CPT.
08	,	Comma.
09-10	XX	Byte count.
11	,	Comma.
12-15	XXXX	Data.
16	,	Comma or blank to end of line.
17-20	XXXX	Data.

Repeated Data/Commas until end of line.

Section 5

DX 3780/2780 DSR Installation

This section contains information necessary to complete the generation of a DX10 system with 3780/2780 support. This information includes responses to the prompts of the XGEN utility, information on responses to prompts generated by the BCD process, and information for installing the 3780/2780 Emulator download routines. In particular, the following areas are discussed:

* Supplemental XGEN information

* BCD generated prompts and response explanations

* Installing the Emulator Download Routines -- IEDR

5.1   GENERATING THE DX10 SYSTEM WITH 3780/2780 SUPPORT

Read the following paragraphs before generating the DX10 operating system using the XGEN utility. Supplemental information required to include the 3780/2780 Emulator DSR in the DX10 operating system is provided.

The response to the I/O BUFFERS prompt MUST specify at least >850 (decimal 2128) bytes of additional buffer area for each 3780/2780 communications line included in the configuration.

Both the 3780 and 2780 DSRs require that a device buffer be specified. This buffer size is determined by adding 16 bytes to the byte count of the maximum block size specified during Emulator task installation. Normally, the maximum block size byte count specified is >200 (decimal 512) bytes. In this case, the 3780/2780 device buffer size should be >210 (decimal 528) bytes. If the device buffer size is increased, the additional I/O buffer area can be calculated by multiplying the device buffer size by four.

The response to the CHANNEL NUMBER xx PROTOCOL prompt should be either 3780 or 2780. (In this prompt, xx is the channel number.)

DX10 system generation responses for a DX10 3780/2780 Emulator DSR at CRU address >40, interrupt level four (4) are as follows:

```
                   DEVICE TYPE?   COM
           COM DEVICE ADDRESS?   >0040
           NUMBER OF CHANNELS?   1
    CHANNEL NUMBER 00 PROTOCOL?  3780
                  BUFFER SIZE?   528
                    INTERRUPT?   4
```

For systems with card readers, the first choice of INTERRUPT priority should be three (3).

When the definition of the DX10 operating system is complete, proceed to paragraph 2.2.1 to build the desired communications DSRs.

5.2   DEFINING THE 3780/2780 EMULATOR DSR

The following paragraphs describe the set of prompts and responses that comprise the DSR components for the 3780/2780 Emulator. These definitions include:

* ACU -- The automatic call unit used

* Data link control -- The response time-outs used

* Data link threshold -- The transmission and reception thresholds used

5.2.1   ACU Definition

After responding to the BOARD TYPE prompt discussed in paragraph 2.2.2.1 and pressing the RETURN key, the following display appears if the protocol specified (during execution of XGEN utility) for the communications device being defined is either 3780 or 2780.

```
    DEFINE AUTO CALL UNIT CRU ADDRESS FOR DEVICE CMxx
                ACU CRU ADDRESS:   >FFFF
```

where:

CMxx is the device class and number of the communications device specified in response to the BOARD TYPE prompt.

If an ACU is not associated with the 3780/2780 communications device (CMxx) being defined, accept the default value FFFF by pressing the RETURN key.

If the 3780/2780 communications device (CMxx) being defined is an X.21 BCAIM running on an X.21 Network (not currently available in the United States), enter the value >FFFE.

If the 3780/2780 communications device (CMxx) being defined is for the Business System 300 (S300), accept the default value FFFF by pressing the RETURN key. Currently, ACU support is not available for use with the S300.

If an ACU is present, enter the appropriate CRU base address for the ACU (for example, >0000 or >0020). The address can be found by locating the label(s) that describes the chassis configuration.

If an ACU is specified and the RETURN key is pressed, the following display appears:

      DEFINE AUTO CALL UNIT PARAMETERS FOR DEVICE CMxx
      DIAL TYPE (1=PULSE/0=TOUCH): 1

Respond to the DIAL TYPE prompt by entering 0 (zero) if the data access arrangement (DAA) employs touch-tone dialing. Accept the default (1) if the DAA employs pulse (rotary) dialing by pressing the RETURN key.

                              NOTE

            Your response to the DIAL TYPE prompt has an
            effect if the ACU is internal to the chassis
            (that is, supplied by TI). If the ACU is
            supplied by another vendor, the dial type is
            controlled by the ACU and the default (1)
            should be taken. The dial type required by
            the TI-supplied internal modem depends on
            your telephone company's central office. In
            most cases, pulse can be used successfully;
            however, certain systems may require tone
            selection.

5.2.2 Data Link Control Definition
After responding to the DIAL TYPE prompt, press the RETURN key (or specify no ACU in the previous prompt), and the following display appears:

      DEFINE 3780/2780 LINK CONTROL PARAMETERS FOR DEVICE CMxx
          BID RESPONSE TIMEOUT(SEC): 01
          RECEIVE ACK TIMEOUT(SEC): 03
         RECEIVE DATA TIMEOUT(SEC): 00
            IDLE LINE TIMEOUT(SEC): 20

Accept the displayed values by pressing the RETURN key, or
respond with a two-digit decimal number in the range of 0 through
63 as described in the following paragraphs:

BID RESPONSE TIMEOUT(SEC)
> Enter the waiting time in seconds for a response to a bid
> for the communications line. Standard values are as
> follows:

Installation	Time (secs)
Any 990	01
Host	03
Terminal	01

RECEIVE ACK TIMEOUT(SEC)
> Enter the waiting time in seconds for a response to
> transmitted data. The standard value is 03 seconds.

RECEIVE DATA TIMEOUT(SEC)
> Enter the waiting time in seconds for expected received
> data. The standard value is 00 (no time-out); however, when
> the local station acts as a host station, this should be
> changed to a finite value, such as 30 seconds.

IDLE LINE TIMEOUT(SEC)
> Enter the waiting time in seconds for line activity before
> reporting an idle line error. The standard value is 20
> seconds. A value of 00 specifies an infinite wait.

5.2.3 Data Link Threshold Definition
After responding to the prompts described in paragraph 5.2.2, the
following prompts appear:

```
DEFINE 3780/2780 LINK THRESHOLD PARAMETERS FOR CMxx
                TRANSMIT BID: 15
                 RECEIVE ENQ: 15
                TRANSMIT ENQ: 15
                 RECEIVE NAK: 00
                TRANSMIT NAK: 00
                RECEIVE DATA: 20
```

Accept the displayed values by pressing the RETURN key, or
respond with a decimal number in the range of 0 through 65,535 as
described in the following paragraphs:

TRANSMIT BID
> Enter the number of times to retry a bid before reporting an
> error. The default is 15.

RECEIVE ENQ
> Enter the number of enquiries (ENQs) that can be received (when no data or incorrect data is transmitted) before reporting an error. The default is 15.

TRANSMIT ENQ
> Enter the number of ENQs that can be transmitted (when an incorrect response is received) before reporting an error. The default is 15.

RECEIVE NAK
> Enter the number of negative acknowledges (NAKs), indicating an incorrect data transmission, before the reception is terminated. The default is 00, indicating infinite retries. When the Emulator is to operate as a host, the default can be changed to a finite value, usually 15.

TRANSMIT NAK
> Enter the number of NAKs that can be transmitted (indicating the reception of incorrect data) before the reception is terminated. The default is 00, indicating infinite retries.

RECEIVE DATA
> Enter the number of receive data time-out intervals to wait for line activity between receptions before reporting an error. The default is 20. A value of 00 specifies an infinite number of retries.

After completing the response to the last prompt, press the RETURN key and the following message appears as discussed in paragraph 2.2.2.1:

CREATE LIST OF DEVICES AND PROTOCOLS

Following the display of the previous message, return to paragraph 2.2.2.1 to begin defining any additional communications devices, or to the appropriate section in this document describing the prompts and expected responses for any additional protocol(s) existing on the same multi-channel communications device currently being defined.

5.3   INSTALLING THE 3780/2780 EMULATOR DOWNLOAD ROUTINES

When the 3780/2780 Emulator is configured to run on the FCCC, the Bit-oriented, Character-oriented Asynchronous Interface Module (BCAIM), or the X.21 BCAIM, those devices must be downloaded with the Emulator download routines. The communications download utilities should be installed using the IUT command prior to executing the Emulator download routine installation procedure. The installation of the communications download utilities is described in paragraph 2.4.1. This section describes the Emulator download routines installation procedures and the updating of the IS procedure to perform the download. In particular the following areas are covered:

* IEDR -- Execution of the Install Emulator Download Routines procedure

* Updating the IS procedure

5.3.1   Installing the Emulator Download Routines

To install the Emulator download routines, execute the Install Emulator Download Routines command as follows:

    [ ] IEDR

        INSTALL 3780/2780 EMULATOR DOWNLOAD ROUTINES
                SYSGEN DATA DISK/VOLUME:
                    TARGET DISK/VOLUME:
             BATCH LISTING ACCESS NAME:

SYSGEN DATA DISK/VOLUME
     Enter the access name of the disk (or volume) containing the DX10 system generation parts directory (.S$SYSGEN). The response to this prompt must match the response entered for the same prompt given during the execution of the IUT procedure as described in paragraph 2.4.1.

TARGET DISK/VOLUME
     Enter the access name of the disk (or volume) where the communications utility tasks have been installed. The tasks are located on this disk under the program file .S$COMM.S$COMMPF. The response to this prompt should match the response given to the TARGET DISK/VOLUME prompt issued by the IUT procedure as described in paragraph 2.4.1.

BATCH LISTING ACCESS NAME
     Enter the pathname of a temporary file designated to hold the batch listing file generated by the download routines installation process.

After responding to these prompts, press the RETURN key and the
download routines installation process begins. When it
completes, the following message appears:

        n ERRORS REPORTED IN BATCH DLBSCR

If the error count n is not zero, examine the batch listing file
to determine the cause of each error. Then take the appropriate
corrective action and reenter the IEDR command.

5.3.2 Completing the Download Process
To complete the download process for the 3780/2780 Emulator, edit
the IS procedure to include the Communications Device Download
Utility (CDL) command(s) for the type of communications device(s)
in use.

If the 3780/2780 Emulator has been defined to execute on the
FCCC, add the following CDL command to the IS command:

        CDL COMM DEVICE NAME = CMxx,
          INPUT CONTROL ACNM = .S$COMM.FC378CTL,
         OUTPUT CONTROL ACNM = DUMY,
              LISTING ACNM = DUMY

where:

    CMxx is the device name assigned to the FCCC during the
          system generation. Each FCCC configured in the
          system must be downloaded separately. Specify only
          one channel/device name in response to the COMM
          DEVICE NAME for each FCCC configured, regardless of
          the number of channels defined or used on that FCCC.

Refer to the DX10 Operating System Operations Guide (Volume II)
for information on the IS command.

If the 3780/2780 Emulator has been defined to execute on the
BCAIM or the X.21 BCAIM add the following CDL command to the IS
command:

        CDL COMM DEVICE NAME = CMxx,
         INPUT CONTROL ACNM = .S$COMM.BC378CTL,
        OUTPUT CONTROL ACNM = DUMY,
             LISTING ACNM = DUMY

where:

    CMxx is the device name assigned to the BCAIM or the X.21
          BCAIM during the system generation. Each BCAIM or
          X.21 BCAIM configured in the system must be
          downloaded separately.

The system log records a message indicating the success or failure of the download operation. The format of this message is described in Appendix A.

Ensure that all procedures required for each communications package have been performed, then perform an initial program load (IPL) to load the system into memory.

Section 6

DX10 X25 RFT DSR Installation

This section contains information necessary to complete the generation of a DX10 system with RFT support. The information includes responses to the prompts of the XGEN utility, as well as information on responses to prompts generated by the BCD process. In particular, the following areas are discussed:

* Supplemental XGEN information

* BCD generated prompt and response explanations

NOTE

The DX10 X25 RFT package is available ONLY in Europe.

6.1 GENERATING THE DX10 SYSTEM WITH RFT SUPPORT

Read the following paragraphs before generating the DX10 operating system using the XGEN utility. Supplemental information required to include the X25 RFT DSR in the DX10 operating system is provided.

The response to the I/O BUFFERS prompt of the XGEN utility MUST be modified to specify a maximum table area for RFT file transfers. The value specified is a maximum limit which does not have to be entirely used. A value too small can result in >000E errors being reported by the operating system during remote file transfer operations.

The following formula is recommended when calculating the value
to specify for the I/O BUFFERS prompt:

(150 x (NUMBER OF LINES) x (MAX. NUMBER PENDING READS)) + 200

where:

NUMBER OF LINES   is the number of physical lines
                               supported by RFT (the total
                               number of channels that are to be
                               used). The value specified must
                               be the same value specified
                               during the RFTGEN.

MAX. NUMBER PENDING READS   is the number of individual
                               inputs (calls or data frames) for
                               which a line actively waits. The
                               value specified must be the same
                               value specified during the
                               RFTGEN.

The RFT package requires a device buffer to be specified. This
buffer size is determined by the following formula:

MAX. PACKET SIZE + 5 Bytes

The buffer size value is then rounded up to the nearest even
number. The minimum value specified should be 134, even for
networks with a 64 byte packet size.

The correct response to the CHANNEL NUMBER xx PROTOCOL prompt,
where xx is the is the channel number, is LAP.

DX10 system generation responses for a DX10 X25 RFT DSR running
on two channels of an FCCC at TILINE address >F900, interrupt
level nine (9) are as follows:

```
                DEVICE TYPE?   COM
        COM DEVICE ADDRESS?    >F900
        NUMBER OF CHANNELS?    3
CHANNEL NUMBER 00 PROTOCOL?    LAP
                BUFFER SIZE?   134
CHANNEL NUMBER 01 PROTOCOL?    NONE
CHANNEL NUMBER 02 PROTOCOL?    LAP
                BUFFER SIZE?   134
                  INTERRUPT?   9
```

After successfully declaring the communications devices, it is necessary to declare one master Inter-Process Communications (IPC) device and one slave IPC device using the Special Device (SD) device type. The response to the SPECIAL DEVICE ADDRESS? prompt must be NONE when declaring both the master and the slave IPC device.

The following example declares a master IPC device:

```
            DEVICE TYPE?   SD
SPECIAL DEVICE ADDRESS?    NONE
            DEVICE NAME?   IPC1
             KSB ADDRESS?  NONE
          DSR WORKSPACE?   FC0R0        (0 is zero, not alphabetic O)
        INTERRUPT ENTRY?   IPCINT
               PDT FILE?   rftvol.S$RFTGEN.SRC.IPC1PDT
               DSR FILE?   rftvol.S$RFTGEN.OBJ.IPCDSR
```

where:

rftvol   is the target RFT system disk specified during the RFT object installation. Refer to the DX10 X25 RFT Object Installation guide, part number 946537-9701, for more information.

The following example declares a slave IPC device:

```
              DEVICE TYPE? SD
SPECIAL DEVICE ADDRESS? NONE
           DEVICE NAME? CH01
           KSB ADDRESS? NONE
         DSR WORKSPACE? CH0R0        (0 is zero, not alphabetic O)
       INTERRUPT ENTRY? IPCINT
              PDT FILE? sysgen data disk.S$SYSGEN.name.CH01PDT
              DSR FILE? rftvol.S$RFTGEN.OBJ.IPCDSR
```

where:

   sysgen data disk   is the system generation data disk
                       specified in response to the
                       DATA DISK/VOLUME prompt during the initial
                       execution of the XGEN utility.

   rftvol   is the target RFT system disk specified
                       during the RFT object installation. Refer
                       to the DX10 X25 RFT Object Installation
                       guide, part number 946537-9701, for more
                       information.

   name   is the system name specified in response
                       to the OUTPUT CONFIGURATION prompt during
                       the initial execution of the XGEN utility.

When the definition of the DX10 operating system is complete,
proceed to paragraph 2.2.1 to build the desired communications
DSR(s).

6.2 DEFINING THE RFT DSR

The following paragraphs describe the prompt and response that
comprise the DSR components for the RFT package. This
description includes the RFT session number, which is the number
of concurrent file transfers and/or open messages.

After responding to the BOARD TYPE prompt discussed in paragraph
2.2.2.1, press the RETURN key. The following display appears if
the protocol specified during execution of the XGEN utility for
the communications device being defined is LAP.

```
      DEFINE RFT SESSION NUMBER
         RFT SESSION NUMBER:
```

Respond to the prompt as follows:

RFT SESSION NUMBER
       Enter the maximum number of concurrent file transfers and/or
       open messages. This number depends on the applications in
       use.   The value specified must match the value supplied in
       response to a similar prompt issued during RFTGEN execution.
       Refer to the DX10 X25 RFT System Generation Manual, part
       number   946540-9702,   for   further   information on the
       RFT SESSION NUMBER prompt.

                              NOTE

              This prompt will appear only for the first
              communications device defined with the LAP
              protocol regardless of how   many   other
              communications devices have been defined with
              LAP.

After completing the response to this prompt, press the RETURN
key and the following message, as discussed in paragraph 2.2.2.1,
appears:

                CREATE LIST OF DEVICES AND PROTOCOLS

Following the display of the previous message, return   to
paragraph 2.2.2.1 to define any additional communications devices
or to the appropriate section in this document describing the
prompts and expected responses for any additional protocol(s)
existing   on   the   same multi-channel communications device
currently being defined.

Section 7

DX10 3270 DSR Installation

7.1 INTRODUCTION

This section contains information necessary to complete the generation of a DX10 system with 3270 support. This information includes responses to prompts of the XGEN utility, ICS line definition, and information on installing the ICS character detect routines. In particular, the following areas are discussed:

* Supplemental XGEN information

* BCD generated prompts and response explanations

* Installing the 3270 ICS Download Routines -- IICDR

7.2 GENERATING THE DX10 SYSTEM WITH 3270 ICS SUPPORT

Read the following paragraphs before generating the DX10 operating system using the XGEN utility. Supplemental information required to include the 3270 ICS DSR in the DX10 operating system is provided.

If RTS/915 support is included, perform the RTS/915 installation before the XGEN process. Refer to the DX10 Remote Terminal Subsystem (RTS) Model 915 Remote Terminal Object Installation guide, part number 2250685-9701, for RTS/915 installation instructions.

ICS requires that you declare additional input/output (I/O) buffer area. The exact amount of additional I/O buffer required depends on the largest number of outstanding transmissions you expect at one time. If your I/O buffer area is not large enough, errors can occur when too many ICS transmissions are initiated simultaneously. Use the following formula to determine the additional I/O buffer area (in bytes) required for ICS:

Additional I/O = 304 x (max. no. of pending transmits - 1)

If you install other packages that require additional I/O buffer area, such as the 3780 Emulator, specify the sum of these requirements as the additional I/O buffer area.

If you intend to use a Programmed Station Control (PSC) task in conjunction with ICS, you should define an intertask communication area of at least 520 words. Do not accept the initial value of 100 in response to the INTERTASK prompt. Enter 520 if you intend to use one PSC task on your system. If you intend to use more than one PSC task at a time, you may require more than 520 words for the intertask communication area. If you do not wish to use PSC, accept the default value of 100 words.

The correct response to the CHANNEL NUMBER xx PROTOCOL prompt is 3270. (In this prompt, xx is the channel number.)

DX10 system generation responses for a DX10 3270 ICS DSR at CRU address >40 and interrupt level four (4) are as follows:

```
                DEVICE TYPE? COM
         COM DEVICE ADDRESS? >140
         NUMBER OF CHANNELS? 1
CHANNEL NUMBER 00 PROTOCOL? 3270
                 INTERRUPT? 4
```

It is recommended that you do not select an interrupt level greater than seven (7). For systems with card readers, the first choice of interrupt priority should be 3.

When you complete the definition of the DX10 operating system, proceed to paragraph 2.2.1 to build the desired communications DSRs.

7.3 ICS LINE DEFINITION

After you respond to the BOARD TYPE prompt discussed in paragraph 2.2.2.1 and press the RETURN key, the following prompts appear:

```
ICS LINE CONTROL TABLE VARIABLES FOR CMxx
   HIGHEST TERMINAL ADDR(0-31):
      POLL TIMEOUT(1/4 SEC INT): 240
```

You can accept the displayed values by pressing the RETURN key or respond to the prompts as follows:

HIGHEST TERMINAL ADDR(0-31)
    Enter the largest decimal terminal address that you have reserved for each ICS communications line name declared. This value is the number you enter for the HIGHEST TERMINAL ADDR(0-31) prompt during the definition of the ICS task parameters.

POLL TIMEOUT(1/4 SEC INT)
    Enter the number of one-quarter second intervals that you wish your poll time-out to be. The poll time-out defines how long ICS waits for a host poll before it generates an error. Your response can be a maximum of 255.

    ICS generates the following message when this time-out occurs:

        HOST NOT POLLING ON COMMUNICATIONS LINE CMxx

    where:

    xx   is the device name of the ICS communications port

Once ICS encounters this error, subsequent transmission attempts fail immediately.

After you enter your responses to these prompts for the first 3270 communications device (ICS line), you are prompted for the highest terminal address for the second 3270 communications device (ICS line) if two 3270 communications devices were specified during XGEN. Remember the value for the highest terminal address. You will be prompted for this address during ICS task installation.

After entering the response to the last prompt and press the RETURN key, the following message appears as discussed in paragraph 2.2.2.1:

    CREATE LIST OF DEVICES AND PROTOCOLS

Following the display of this message, return to paragraph 2.2.2.1 to begin defining any additional communications devices, or to the appropriate section in this document that describes the prompts and expected responses for any additional protocol(s) that exist on the same multi-channel communications device currently being defined.

7.4   INSTALLING THE ICS DOWNLOAD ROUTINES

After successfully completing the Install Utility Tasks (IUT) procedure as dicussed in paragraph 2.4.1, perform the Install 3270 ICS Communications Download Routines (IICDR) procedure.

IICDR copies the object files and control files of the ICS character detect routines to the target disk under the <target disk>.S$COMM directory. To perform this procedure, enter IICDR and the following prompts appear:

    [ ] IICDR

        INSTALL 3270 ICS COMMUNICATIONS DOWNLOAD ROUTINES
            SYSGEN DATA DISK/VOLUME:
                TARGET DISK/VOLUME:
          BATCH LISTING ACCESS NAME:

Respond to the prompts as follows:

SYSGEN DATA DISK/VOLUME
    Enter the access name of the disk (or volume) containing the DX10 system generation parts directory (.S$SYSGEN). The response to this prompt must match the response entered for the same prompt given during the execution of the IUT procedure as described in paragraph 2.4.1.

TARGET DISK/VOLUME
    Enter the access name of the disk (or volume) where the communications utility tasks have been installed. The tasks are located on this disk under the program file .S$COMM.S$COMMPF. The response to this prompt should match the response entered for the same prompt issued by the IUT procedure as described in paragraph 2.4.1.

BATCH LISTING ACCESS NAME
    Enter the pathname of the temporary file designated to hold the batch listing file generated by the utility task installation process.

When you have completed your responses to these prompts, the utility task installation process begins. When it completes, the following message appears:

        n ERRORS IN yy

where:

        yy   is your response to BATCH LISTING ACCESS NAME.

If the error count n is not zero, examine the batch listing file
to determine the cause of each error. Then, take the appropriate
corrective action and reenter the IICDR command.

7.4.1 Completing the Download Process

To complete the download process for 3270 ICS, edit the IS
procedure to include the Communications Device Download Utility
(CDL) command(s) for the type of communications device(s) in use.

If the 3270 ICS has been defined to execute on the FCCC, add the
following CDL command to the IS command:

```
CDL    COMM DEVICE NAME = CMxx,
          INPUT CONTROL ACNM = .S$COMM.ICSFCCTL,
         OUTPUT CONTROL ACNM = DUMY,
               LISTING ACNM = DUMY
```

where:

    CMxx   is the device name assigned to the FCCC during the
            system generation. Each FCCC configured in the
            system must be downloaded separately. Specify only
            one channel/device name in response to the COMM
            DEVICE NAME for each FCCC configured, regardless of
            the number of channels defined or used on that
            FCCC.

Refer to the DX10 Operating System Operations Guide (Volume II)
for information on the IS command.

If the 3270 ICS has been defined to execute on the BCAIM, add the
following CDL command to the IS command:

```
CDL    COMM DEVICE NAME = CMxx,
          INPUT CONTROL ACNM = .S$COMM.ICSBCCTL,
         OUTPUT CONTROL ACNM = DUMY,
               LISTING ACNM = DUMY
```

where:

    CMxx   is the device name assigned to the BCAIM during the
            system generation. Each BCAIM configured in the
            system must be downloaded separately.

The system log records a message indicating the success or
failure of the download operation. The format of this message is
described in Appendix A.

Ensure all procedures required for each communications package
have been performed, then perform an initial program load (IPL)

to load the system into memory.

After successfully completing the communications DSR installation, return to Section 4 of the DX10 3270 ICS Object Installation guide, part number 2250942-9701, for instructions on completing the DX10 ICS installation.

Section 8

DX10 HDLC DSR Installation

This section contains information necessary to complete the generation of a DX10 system with HDLC support. This information includes responses to prompts of the XGEN utility, information on responses to prompts generated by the BCD command, and information on enabling the SVC >4D processor. In particular, the following areas are discussed:

* Supplemental XGEN information

* BCD generated prompts and response explanations

* Enabling SVC >4D

8.1 GENERATING THE DX10 SYSTEM WITH HDLC SUPPORT

Read the following paragraphs before generating the DX10 operating system using the XGEN utility. Supplemental information required to include the HDLC DSR in the DX10 operating system is provided.

The response to the I/O BUFFERS prompt must include >850 (2128) bytes for each HDLC communication line included in the configuration.

The HDLC DSR requires that a device buffer be specified. This buffer size is determined by adding 16 bytes to the byte count of the maximum block size specified during HDLC task installation. Normally, the maximum block size byte count specified is >200 (decimal 512) bytes. In this case, the HDLC buffer size should be >210 (decimal 528) bytes. If the device buffer size is increased, the additional I/O buffer area can be calculated by multiplying the device buffer size by four.

The correct response to the CHANNEL NUMBER xx PROTOCOL prompt is COMA. (In this prompt, xx is the channel number.)

DX10 system generation responses for a DX10 HDLC DSR at TILINE address >F900, interrupt level seven (7) are as follows:

```
                DEVICE TYPE? COM
      COM DEVICE ADDRESS? >F900
        NUMBER OF CHANNELS? 4
CHANNEL NUMBER 00 PROTOCOL? COMA
              BUFFER SIZE? 528
CHANNEL NUMBER 01 PROTOCOL? COMA
              BUFFER SIZE? 528
CHANNEL NUMBER 02 PROTOCOL? COMA
              BUFFER SIZE? 528
CHANNEL NUMBER 03 PROTOCOL? COMA
              BUFFER SIZE? 528
                INTERRUPT? 7
```

When the definition of the DX10 operating system is complete, proceed to paragraph 2.2.1 to build the desired communications DSRs.

8.2   ACU DEFINITION

After responding the the BOARD TYPE prompt as described in paragraph 2.2.2.1 and pressing the RETURN key, the following display appears:

```
DEFINE AUTO CALL UNIT CRU ADDRESS FOR DEVICE CMxx
              ACU CRU ADDRESS: >FFFF
```

where:

CMxx   is the device class and number of the communications device specified in response to the BOARD TYPE prompt.

For the DX10 HDLC communications package, accept the default value >FFFF by pressing the RETURN key.

8.3   ENABLING THE SVC >4D PROCESSOR

After you have patched the communications DSRs using the PCS command as described in paragraph 2.2.4, you must now enable the SVC >4D processor. The HDLC communications package contains a patch file for this purpose. This patch file can be applied to the operating system by entering the Execute Patch Synonym Processor (XPS) SCI command and responding to the prompts as follows:

[] XPS

```
EXECUTE PATCH SYNONYM PROCESSOR
      LINK: <sysgen data disk>.S$SYSGEN.<system name>.LINKMAP
     INPUT: <sysvol>.INDSCOMM.PATCH4D
    OUTPUT: <sysgen data disk>.S$SYSGEN.PATCH4D
     ERROR: ME
```

where:

<sysgen data disk>   is the system generation data disk
                          specified in response to the
                          DATA DISK/VOLUME prompt during the
                          initial execution of the XGEN
                          utility.

<system name>   is the name of the system you
                          specified in response to the
                          OUTPUT CONFIGURATION prompt during
                          XGEN execution.

<sysvol>   is the name of the target system
                          disk you specified in response to
                          the SYSTEM DISK ACCESS NAME prompt
                          during execution of the ICC
                          command.

When the XPS command completes, the following message appears:

    STOP 0
    NORMAL PROGRAM COMPLETION

After executing the synonym processor, apply the patch to the system by entering the Execute Batch (XB) SCI command as follows:

[] XB

 EXECUTE BATCH
      INPUT ACCESS NAME: <sysgen data disk>.S$SYSGEN.PATCH4D
    LISTING ACCESS NAME:

Respond to the LISTING ACCESS NAME prompt with the name of the file receiving the batch stream output and press the RETURN key.

After the batch stream executes, the following message appears:

PATCH ERROR COUNT = n

If the error count n is not zero, examine the batch listing file to determine the cause of each error. Take the appropriate corrective action and reenter the XPS and XB commands.

Ensure all procedures required by each communications package have been performed, then perform an initial program load (IPL) to load the system into memory.

Appendix A

Sample CDL Control Files

This section contains three examples of the construction of an input control file to be used in downloading a communications device.

A.1 EXAMPLE 1

The following example illustrates the construction of an input control file to be used in downloading a communications device, and the contents of the output control file, the listing file, and the system log. The COMM device is assumed to be an FCCC.

A.1.1 Input Control File
The following example illustrates an input control file with two commands. The first command downloads an object file with a BLWP vector located at relative location >0000 to the object file. The second command uses task FCCC2 located on program file VOL.BANK.PGMFIL.DWNL as the code to be downloaded. Note that no BLWP vector is specified in the second command.

```
VOL.BANK.OBJ.FCCC2                          0000
VOL.BANK.PGMFIL.DWNL                         FFFF            FCCC2
```


A.1.2 Output Control File
If the download successfully takes place using the above input control file, the output control file contains the following:

READ RESERVED MEMORY STATUS

BEG	END	PATHNAME OF 1ST DOWNLOAD FILE	DATE	TIME
8A96,	DAF0	VOL.BANK.OBJ.FCCC2	2/14/81,	17:55:14
0000,	0000		2/14/81,	17:55:14
0000,	0000		2/14/81,	17:55:14
0000,	0000		2/14/81,	17:55:14

Only the first pathname specified in the input control file is displayed in the output control file. The output control file can be viewed by executing the Show File (SF) SCI command.

A.1.3 Listing File
After all of the commands specified in the input control file have executed, a summary is provided in the listing file with the following format:

COMMDWNL OF CM03   2/14/81 17:55:14

PATHNAME	ACTION ERRORS
VOL.BANK.OBJ.FCCC2	0000
VOL.BANK.PGMFIL.DWNL	0000
OTHER ERRORS DETECTED	0000

A.1.4 System Log
The following example illustrates a successful download as it would be recorded in the system log. An unsuccessful download is explained in Example 3 and in Appendix B.

```
45:1016+        COMMDWNL(CM03,80.354),L=8A96,
                  P=VOL.BANK.OBJ.FCCC2          ,B=0000
45:1016+        COMMDWNL(CM03,80.354),L=8AF0,
                  P=VOL.BANK.PGMFIL.DWNL        ,B=FFFF
```

A.2 EXAMPLE 2

The following example illustrates constructing an input control file to be used to release a block of memory using the CDL command. The examples also illustrate the contents of the output control file, the listing file and the system log. The COMM device is assumed to be an FCCC.

A.2.1 Input Control File
To release a block of memory, information about the starting address of the block and the pathname of the first file occupying the block of memory is needed. If the output control file was used during the download process, this information is included in that file. This information can also be gathered from reading the successful completion of the download in the system log or by using the CRMS command. The CRMS command is described in paragraph 3.2 of this document. The following is an example of the command used to release the memory reserved by the download specified in Example 1:

VOL.BANK.OBJ.FCCC2   0000RELEASE8A96

The CRMS command requests the release of a block of memory starting at address >8A96. Before this release takes place, the command also requests that an initialization code be executed. There is also a BLWP vector specified at location >0000 relative to the memory block.

A.2.2 Output Control File
If the release successfully takes place using the preceding input control file, the output control file is updated as follows:

READ RESERVED MEMORY STATUS

BEG END	PATHNAME OF 1ST DOWNLOAD FILE	DATE TIME
0000,0000		2/14/81,17:58:38
0000,0000		2/14/81,17:55:14
0000,0000		2/14/81,17:55:14
0000,0000		2/14/81,17:55:14

A.2.3 Listing File
After all of the commands specified in the Input Control file have executed successfully, a summary is provided in the listing file in the following format:

COMMDWNL OF CM03   2/14/81 17:58:38

PATHNAME	ACTION ERRORS
VOL.BANK.OBJ.FCCC2	RELEASE 0000
OTHER ERRORS DETECTED	0000

A.2.4 System Log
The following example illustrates a successful release as it would be recorded in the system log. Unsuccessful release error codes are described in Appendix B.

45:1034+   COMMDWNL(CM03,80.354),R=8A96
              P=VOL.BANK.OBJ.FCCC2   ,B=FFFF

A.3 EXAMPLE 3

When an error occurs, the error code can be found in the listing file as well as the system log. The listing file and system log in paragraphs A.3.1 and A.3.2 are examples of an SVC error occuring in one of the download specifications from Example 1.

A.3.1 Listing File
The following example illustrates an unsuccessful attempt to download the FCCC. The 0826 error reported in this listing file is an SVC error. No downloading is performed when an error is returned by the download task. All errors are documented in Appendix B.

FCCCDWNL OF CM03   2/12/81 10:54:59

PATHNAME	ACTION ERRORS
VOL.BANK.OBJ.FCCC2	0826
OTHER ERRORS DETECTED	0000

A.3.2 System Log
The following example illustrates an unsuccessful attempt to download the FCCC. The 0826 error reported in the system log is an SVC error. No downloading is performed when an error is returned by the download task. All errors are documented in Appendix B of this document.

```
45:1034+       COMMDWNL(CM03,80.354),E=0826
               P=VOL.BANK.OBJ.FCCC2              ,B=0000
```

Appendix B

Download Utility Error Codes

This appendix describes a set of communications download utility error codes that can be returned to the listing file or the system log if the CDL procedure is unsuccessful. Appendix B explains the format of the CDL completion messages.

Error Code	Action/Explanation
0001	An invalid BLWP address has been specified in the input control file used for a download or release function.
	Check the input control file specified to be sure that the BLWP vector field (Columns 49-52) is not blank or that the address entered is a valid hexadecimal address.
0002 0100	An invalid address has been specified as the starting point of a release reserved block function in an input control file or, the control file specified has an invalid ordering of download and release functions.
	Check for valid address specification for release functions in the control file being executed. When both download and release functions are specified in the same control file, all release functions must preceed any download functions.

Error Code	Action/Explanation
0004 0008 0010 0020 0040 1000	The download object code specified in a control file is invalid due to one of the following: -The object file specified contains an EOF before the normal end of object file record (: record) -The ASCII object file contains a checksum error -The object file contains an invalid tag -The file specified is not an ASCII or compressed object -The file specified is not a program file -The length field of the object file is less than or equal to zero -The object file contains a bad address following a tag Check to be sure that the correct file has been specified as the download object or an attempt to recover the object file.
0080	Download utility task execution error. Reinstall the utility tasks.
02XX	SVC error in assign luno, open program file, read record, release luno, or close program file, where XX indicates the SVC error code. The program file name or task specified in the Input Control File may be incorrect. See that the program file and/or specified task exists.

Error Code	Action/Explanation
08XX	SVC error occurred during the processing of Opcode 8. XX indicates the SVC error code.
	Ensure that the IS command does not contain two CDL commands that attempt to download the same code to the same communications device. In some cases, the error code received will be returned to the access name specified in response to the LISTING ACNM prompt for the CDL proc.
2000 4000	The synonyms ´COMM´ and ´$CMLU´ have invalid values assigned to them.
	Check to be sure that the utility tasks are being executed via the standard procs provided with the utility task installation procedure.
8000	The task specified as the download object in a control file has attached procedures or overlays.
	Check to be sure that the correct task and program file have been specified and that the task does not have any associated overlays or procedures.

Appendix C

Sample CXL Input Control File

The following example shows an Input Control File used with the CXL command. The CXL command is described in paragraph 4.1.

C.1 EXAMPLE CXL INPUT CONTROL FILE

```
*
* LOAD PHONE NUMBER
*
L, 5125554515
T
```
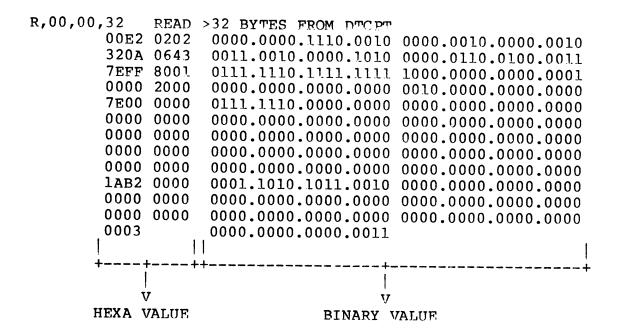
Appendix D

Sample CRWP Input Control and Listing Files

The following example shows an Input Control File used with the CRWP command and the resulting listing file. The CRWP command is described in paragraph 4.3.

D.1 EXAMPLE CRWP INPUT CONTROL FILE

```
*
* SET HALF-DUPLEX BIT ORIENTED PARAMETERS (BOP)
*
W,02,00,02,0080     SELECT BOP PARAMETERS,
*                   SELECT SWITCHED RTS AND SQUELCH,
*                   RECEIVER DURING TRANSMIT.
W,00,0E,02,2000     SELECT OPEN TIMEOUT IN MINUTES AND
*                   SINGLE CRB QUEUE.
W,00,22,02,4000     SELECT IGNORE ABORT ON FIRST CHARACTER.
W,00,26,02,11FF     SET POLL ADDRESS >11 AND ACCEPT
*                   BROADCAST ADDRESS >FF.
*
* DUMP DATA TRANSFER CPT FOR A BCAIM CHANNEL.
*
*
R,00,00,32          READ >32 BYTES FROM DTCPT.
*
* MODIFY CALL ESTABLISHMENT CPT FOR X21 BCAIM.
*
W,40,0C,02,0320     SELECT ACCEPT 3 CPS BLOCKS FROM
*                   NETWORK, EACH WITH A BYTE COUNT
*                   OF >20 BYTES.
W,40,1C,02,0C78     SELECT T3A TIMEOUT EQUAL >0C
*                   (3 SECONDS). LEAVE T3B TIMEOUT
*                   EQUAL TO >78.
W,40,26,02,0240     SELECT ACCEPT 2 DCE BLOCKS FROM
*                   NETWORK, EACH WITH A BYTE COUNT
*                   OF >40 BYTES.
*
* DUMP CALL ESTABLISHMENT CPT FOR A X21 BCAIM CHANNEL
*
*
R,40,00,32          READ >32 BYTES FROM CECPT.
T
```

D.2 EXAMPLE CRWP LISTING FILE

```
R,00,00,32    READ >32 BYTES FROM DTCPT
      00E2 0202   0000.0000.1110.0010  0000.0010.0000.0010
      320A 0643   0011.0010.0000.1010  0000.0110.0100.0011
      7EFF 8001   0111.1110.1111.1111  1000.0000.0000.0001
      0000 2000   0000.0000.0000.0000  0010.0000.0000.0000
      7E00 0000   0111.1110.0000.0000  0000.0000.0000.0000
      0000 0000   0000.0000.0000.0000  0000.0000.0000.0000
      0000 0000   0000.0000.0000.0000  0000.0000.0000.0000
      0000 0000   0000.0000.0000.0000  0000.0000.0000.0000
      0000 0000   0000.0000.0000.0000  0000.0000.0000.0000
      1AB2 0000   0001.1010.1011.0010  0000.0000.0000.0000
      0000 0000   0000.0000.0000.0000  0000.0000.0000.0000
      0000 0000   0000.0000.0000.0000  0000.0000.0000.0000
      0003        0000.0000.0000.0011
      |         | |                   |                    |
      +----+----++-------------------+--------------------+
           |                         |
           V                         V
      HEXA VALUE                BINARY VALUE
```

Appendix E

CRWP Channel Parameter Tables

The following listings show the Data Transfer Channel Parameter Table (DTCPT) and the Call Establishment Channel Parameter Table (CEPT) for the CRWP command. The CRWP command is described in paragraph 4.3.

E.1   DATA TRANSFER CHANNEL PARAMETER TABLE - DTCPT

OFFSET

0000 0000 CPPROS DATA 0   PROTOCOL SECTION WORD
                       BIT   0   RESERVED
                       BIT   1   RESERVED
                       BIT   2   CLOCK SELECT
                                       0=EXTERNAL CLOCKING
                                       1=RATE SPECIFIED BY BITS 4-7
                       BIT   3   EIA PIN 24 CONNECTION
                                       0=9903 XMIT CLOCK INPUT PIN
                                       1=INTERNAL XMIT CLOCK
                       BITS 4-7   TRANSMIT SPEED SELECTION
                                                    BCAIM/FCCC
                                          >0=SPEED A   50 BPS
                                          >1=SPEED B   75 BPS
                                          >2=SPEED C   110 BPS
                                          >3=SPEED D 134.5 BPS
                                          >4=SPEED E   150 BPS
                                          >5=SPEED F   200 BPS
                                          >6=SPEED G   300 BPS
                                          >7=SPEED H   600 BPS
                                          >8=SPEED I   1200 BPS
                                          >9=SPEED J   1800 BPS
                                          >A=SPEED K   2400 BPS
                                          >B=SPEED L   3600 BPS
                                          >C=SPEED M   4800 BPS
                                          >D=SPEED N   7200 BPS
                                          >E=SPEED O   9600 BPS
                                          >F=SPEED P RESERVED
                       BIT   8   0=ENABLE ECHO
                                       1=DISABLE ECHO
                       BIT   9   0=SWITCHED RTS
                                       1=CONTINUOUS RTS
                       BIT   10   SQUELCH RECEIVER DURING XMIT
                                       DON'T SQUELCH RECEIVER DURING XMIT
                       BIT   11   RESERVED
                       BITS 12-15   RECEIVE SPEED SELECTION

```
                                 BITS SAME DEF AS 4-7
0002    00 CPXTOC BYTE 0         XMIT TIMEOUT INTER CHAR
0003    00 CPRTOC BYTE 0         RECV TIMEOUT INTER CHAR
0004 0000 CPCRUI DATA 0          XMIT CRU INSTRUCTION
0006 0000 CPCNTL DATA 0          BIT 0 : 1= NRZI CIRCUIT ENABLE
                                 9903 CONTROL WORD
0008    00 CPSYN1 BYTE 0         SYNC 1 CHARACTER
0009    00 CPSYN2 BYTE 0         SYNC 2 CHARACTER
000A    00 CPSPCL BYTE 0         SPECIAL MODIFIERS
                      BIT   0    9903 TRANSPARENCY FLAG (1=ON)
                      BITS 1-7   RESERVED
000B    00 CPSCNT BYTE 0         # OF INITIAL SYNCS TO SEND
000C 0000 CPRECL DATA 0          RECORD LENGTH
000E 0000 CPISRF DATA 0          ISR PARAMETER FLAG
                      BIT   0    0=XMIT TIMEOUT IN 1/4 SECS
                                 1=XMIT TIMEOUT IN MINUTES
                      BIT   1    0=RECV TIMEOUT IN 1/4 SECS
                                 1=RECV TIMEOUT IN MINUTES
                      BIT   2    0=OPEN TIMEOUT IN 1/4 SECS
                                 1=OPEN TIMEOUT IN MINUTES
                      BIT   3    0=NO-OP TIMEOUT IN 1/4 SECS
                                 1=NO-OP TIMEOUT IN MINUTES
                      BIT   4    0=DONT CLEAR RECVR AFTER FRAME
                                 1=CLEAR RECVR AFTER FRAME
                      BIT   5    0=SINGLE CRB QUEUE
                                 1=SEPARATE XMIT & RCV CRB QUEUES
                      BIT   6    0=DONT ASSERT RTS ON OPENS
                                 1=ASSERT RTS ON OPENS
                      BIT   7    0=DONT WAIT FOR CD ON OPEN
                                 1=WAIT FOR CD ON OPENS
                      BIT   8    0=LEAVE RTS ALONE AFTER OPEN COMP
                                 1=DEASSERT RTS AFTER OPEN COMP
                      BITS 9-10  FOR DEVICE DEPENDENT USE
                      BIT   11   0=WAIT FOR DSR ON OPEN
                                    MONITOR DSR WHEN CONNECTED
                                 1=DON'T WAIT FOR DSR ON OPEN
                                    DON'T MONITOR DSR WHEN CONNECTED
                      BIT   12   RESERVED
                      BITS 13-15 FIREWARE USE ONLY
                                 0=BOP MODE
                                 2=COP SYNC MODE
                                 4=ASYNC MODE
0010    00 CPIDLE BYTE 0         CON RTS IDLE CHAR
0011    00        BYTE 0         RESERVED
0012 0000 CPXMMT DATA 0          XMIT DATA THRESHOLD (OUTPUT FIFO)
0014    00 CPTPAD BYTE 0         TRAILING PAD VALUE
0015    00 CPPADC BYTE 0         TRAILING PAD COUNT
0016    00 CPOPNT BYTE 0         WAIT FOR OPEN COMPLETION TIMEOUT
0017    00 CPDIST BYTE 0         DISCONNECT DETECT TIMEOUT
0018    00 CPCDLY BYTE 0         DELAY FORCED BETWEEN CONNECTIONS
0019    00        BYTE 0         RESERVED
001A 0000         DATA 0         RESERVED
001C 0000         DATA 0         RESERVED - PROTOCOL DEPENDENT USE
001E 0000         DATA 0         RESERVED - PROTOCOL DEPENDENT USE
```

```
0020 0000            DATA 0              RESERVED - PROTOCOL DEPENDENT USE

      ISR - CHARACTER DETECT RELATED PARAMETERS

0022 0000 CPCDFL DATA 0                  CHARACTER DETECT FLAG
                         BIT  0          0=3780 TABLE TYPE
                                         1=2780 TABLE TYPE
                         BIT  1          0=REPORT ABORT ON 1ST CHARACTER
                                         1=IGNORE ABORT ON 1ST CHARACTER
0024 0000 CPCDTB DATA 0                  TABLE OF CD ROUTINE ADDRESSES
0026 0000 CPOLAD DATA 0,0,0,0            POLL ADDRESSES OR POINTERS
0028 0000
002A 0000
002C 0000
002E 0000 CPSYNI DATA 0                  1/4 SEC TICKS DEFORE SYNC INSERTION

          GLOGAL FLAGS

0030   00 CPGLFL BYTE 0                  GLOBAL FLAGS (RESERVED)
0031   00 CPBFCT BYTE 0                  RESERVED
     0032 CPEISR EQU  $                  END OF ISR HANDLED PARAMETERS
     0032 CPSIZE EQU  CPEISR-CPPROS   SIZE OF CHAN PARM TABLE
```

E.2 CALL ESTABLISHMENT CHANNEL PARAMETER TABLE - CECPT

OFFSET

```
0000 0000 CXPROS DATA 0            PROTOCOL SECTION WORD
                      BIT  0       RESERVED
                      BIT  1       RESERVED
                      BIT  2       CLOCK SELECT
                                   0=EXTERNAL CLOCKING
                                   1=RATE SPECIFIED BY BITS 4-7
                      BIT  3       EIA PIN 24 CONNECTION
                                   0=9903 XMIT CLOCK INPUT PIN
                                   1=INTERNAL XMIT CLOCK
                      BITS 4-7     TRANSMIT SPEED SELECTION
                                                 BCAIM/FCCC
                                   >0=SPEED A     50 BPS
                                   >1=SPEED B     75 BPS
                                   >2=SPEED C    110 BPS
                                   >3=SPEED D  134.5 BPS
                                   >4=SPEED E    150 BPS
                                   >5=SPEED F    200 BPS
                                   >6=SPEED G    300 BPS
                                   >7=SPEED H    600 BPS
                                   >8=SPEED I   1200 BPS
                                   >9=SPEED J   1800 BPS
                                   >A=SPEED K   2400 BPS
                                   >B=SPEED L   3600 BPS
                                   >C=SPEED M   4800 BPS
                                   >D=SPEED N   7200 BPS
                                   >E=SPEED O   9600 BPS
                                   >F=SPEED P   RESERVED
                      BIT  8       0=ENABLE  ECHO
                                   1=DISABLE ECHO
                      BIT  9       0=SWITCHED RTS
                                   1=CONTINUOUS RTS
                      BIT  10      SQUELCH RECEIVER DURING XMIT
                                   DON'T SQUELCH RECEIVER DURING XMIT
                      BIT  11      RESERVED
                      BITS 12-15   RECEIVE SPEED SELECTION
                                   BITS SAME DEF AS 4-7
0002 00         BYTE 0            RESERVED
0003 00         BYTE 0            RESERVED
0004 0000 CXCRUI DATA 0           XMIT CRU INSTRUCTION
0006 0000 CXCNTL DATA 0           9903 CONTROL WORD
0008 00   CXSYN1 BYTE 0           SYNC 1 CHARACTER
0009 00   CXSYN2 BYTE 0           SYNC 2 CHARACTER
000A 00   CXSPCL BYTE 0           SPECIAL MODIFIERS
                      BIT  0       9903 TRANSPARENCY FLAG (1=ON)
                      BITS 1-7     RESERVED
000B 00   CXSCNT BYTE 0           # OF INITIAL SYNCS TO SEND
000C 00   CXXCNC BYTE 0           CALL PROGRESS INFO. BLOCK COUNT
```

```
000D    00 CXREC1 BYTE 0              CALL PROGRESS INFO. BLOCK LENGTH
000E  0000 CXISRF DATA 0              ISR PARAMETER FLAG
                         BIT  0       RESERVED
                         BIT  1       RESERVED
                         BIT  2       0=OPEN TIMEOUT IN 1/4 SECS
                                      1=OPEN TIMEOUT IN MINUTES
                         BIT  3       0=NO-OP TIMEOUT IN 1/4 SECS
                                      1=NO-OP TIMEOUT IN MINUTES
                         BIT  4       RESERVED
                         BIT  5       0=SINGLE CRB QUEUE
                                      1=SEPARATE XMIT & RCV CRB QUEUES
                         BIT  6       RESERVED
                         BIT  7       0=DON'T ABORT CALL ON EVEN PARITY
                                      1=ABORT CALL ON EVEN PARITY CHAR
                         BIT  8       0=ACCEPT CALL CHARGE INFO.
                                      1=DON'T ACCEPT CALL CHARGE INFO.
                         BIT  9       0=WAIT FOR NETWORK ON OPEN
                                      1=ENTER STATE 13, IGNORE CALL SEQ.
                         BIT 10       RESERVED
                         BIT 11       RESERVED
                         BIT 12       0=FIRST CHARACTER IN DCE INFO IS
                                          START OF DCE INFORMATION
                                      1=FIRST CHARACTER IN DCE INFO IS
                                          KEYBOARD IDENTIFIED
                       BITS 13-15     RESERVED
0010    00 CXIDLE BYTE 0              IDLE CHAR, IN CALL ACCEPTED STATE
0011    00 CXREC2 BYTE 0              LENGTH OF CALL CHARGE INFO.
0012  0000 CXCDFL DATA 0              RECEIVE ERROR FLAG MASK
0014    00 CXTPAD BYTE 0              TRAILING PAD VALUE
0015    00 CXPADC BYTE 0              TRAILING PAD COUNT
0016    00 CXCMTC BYTE 0              X.21 DELAY COUNT
0017    00 CXDIST BYTE 0              DISCONNECT DETECT TIMEOUT
0018    00 CPCDLY BYTE 0              DELAY FORCED BETWEEN CONNECTIONS
0019    00 CXXT0  BYTE 0              TIMEOUT VALUE T0 1/4 SEC INTERVALS
001A    00 CXXT1  BYTE 0              TIMEOUT VALUE T1 1/4 SEC INTERVALS
001B    00 CXXT2  BYTE 0              TIMEOUT VALUE T2 1/4 SEC INTERVALS
001C    00 CXXT3A BYTE 0              TIMEOUT VALUE T3A 1/4 SEC INTERVALS
001D    00 CXXT3B BYTE 0              TIMEOUT VALUE T3B 1/4 SEC INTERVALS
001E    00 CXXT4  BYTE 0              TIMEOUT VALUE T4 1/4 SEC INTERVALS
001F    00 CXXT5  BYTE 0              TIMEOUT VALUE T5 1/4 SEC INTERVALS
0020    00 CXXT6  BYTE 0              TIMEOUT VALUE T6 1/4 SEC INTERVALS
0021    00 CXXT7  BYTE 0              TIMEOUT VALUE T7 1/4 SEC INTERVALS
0022  0000 CXSTBL DATA 0              X.21 STATE PROCESSOR ADDRESS
0024  0000 CXTRNC DATA 0              X.21 TRAINING COUNT
0026    00 CXXCNT BYTE 0              DCE PROVIDED INFO. BLOCK COUNT
0027    00 CXREC3 BYTE 0              DCE PROVIDED INFO. BLOCK LENGTH
0028  0000 CXDCEI DATA 0              POINTER TO DCE PROV INFO TABLE
002A    00 CXXPAD BYTE 0              TERMINATING PAD CHARACTER
002B    00 CXCHGC BYTE 0              CHARGE INFO BLOCK START CHARACTER
002C  0000 CXXCPT DATA 0              POINTER TO CALL PROGRESS TABLE
002E    00 CXREGS BYTE 0              REGISTRATION TERMINATION CHARACTER
002F    00 CXCIDL BYTE 0              IDLE CHARACTER IN STATE 5
```

```
0030 0000 CXSSET DATA 0          X.21 LEASED LINE ENTRY VECTOR
     0032 CXEISR EQU  $          END OF CECPT
     0032 CXSIZE EQU  CXEISR-CXPROS   SIZE OF CHAN PARM TABLE
```

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Appendix F

X.21 Utility Error Messages

This appendix lists the possible error messages returned by the X.21 utilities described in Section 4. These messages are displayed on the terminal executing the utility command.

The following is the message format:

ERROR= >XXXX (Message Text)

where:

>XXXX   is an error code returned by the system or the X.21 utility task.

(Message Text) is a an explanation of the type of error message. Each of these types is described in this appendix.

Table F-1 X.21 Utility Error Messages

ERROR MESSAGE	ACTION/EXPLANATION
>XXXX ILLEGAL PARAMETER	A system error has occurred. For an explanation of error >XXXX and the recovery action, refer to the <u>DX10 Operating System Error Reporting and Recovery Manual (Volume VI)</u>, part number 94620-9706.
>9024 DEVICE NAME IS REQUIRED	An invalid communications device name has been entered in response to the COMM DEVICE NAME prompt. Ensure the specified device name is of the form CMxx and that it specifies a valid communications device for the system executing the X.21 utility.
>9010 UNKNOWN FILE OR DEVICE	A file pathname or an invalid communications device name has been specified in response to the COMM DEVICE NAME prompt. Ensure the specified device name specified is of the form CMxx and that it specifies a valid communications device for the system executing the X.21 utility.
>XXXX INPUT FILE OR DEVICE	An attempt to assign a LUNO to the access name entered in response to the INPUT FILE ACNM prompt has failed, or an attempt to open the assigned LUNO to the input access name has failed. For an explanation of error >XXXX and the recovery action, refer to the <u>DX10 Operating System Error Reporting and Recovery Manual (Volume VI)</u>.

Table F-1 X.21 Utility Error Messages (continued)

ERROR MESSAGE	ACTION/EXPLANATION
>XXXX OPEN COMM DEVICE >XXXX CLOSE COMM DEVICE	An open/close issued to the device name specified in response to the COMM DEVICE NAME prompt of the CXL command has failed. For an an explanation of error >XXXX and the recovery action, refer to the DX10 Operating System Error Reporting and Recovery Manual (Volume VI). This message is usally returned when the open/close fails after YES has been entered in response to the ISSUE R/C IMMEDIATELY? prompt of the CXL command.
>XXXX OUTPUT FILE OR DEVICE	The utility is unable to open the file or device specified in response to the LISTING ACNM prompt of the CXD command. For an explanation of error >XXXX and the recovery action, refer to the DX10 Operating System Error Reporting and Recovery Manual (Volume VI).
>XXXX I/O COMM DEVICE	An error has occurred during input from, or output to, the communications device. For an explanation of error >XXXX and the recovery action, refer to the DX10 Operating System Error Reporting and Recovery Manual (Volume VI).

Table F-1 X.21 Utility Error Messages (continued)

ERROR MESSAGE	ACTION/EXPLANATION
>XXXX INVALID COMMAND FIELD	An invalid command format was specified in the input control access name for the CRWP command. For an explanation of error >XXXX and the recovery action, refer to the <u>DX10 Operating System Error Reporting and Recovery Manual (Volume VI)</u>.
>XXXX INVALID REQUEST BLOCK	An invalid block number was specified in response to the BLOCK NUMBER prompt of the CXD command. Valid block numbers range from zero through nine (0-9). Reexecute the CXD command specifying a valid block number.
>XXXX REQ LENGTH TOO BIG	The buffer size requested in response to the LENGTH prompt of the CXD command is too large. Error >XXXX is the buffer size requested. The maximum buffer size allowed for this prompt is 80 bytes. Reexecute the CXD command specifying an allowable buffer size.