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Standard

NETWORK OPERATIONS SYSTEM

BUSINESS NETWORK MANAGEMENT

OSS AUTOMATIC STATION ADMINISTRATION CHANGES UPDATE

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1. ABOUT THIS DOCUMENT

Using this Document

1.01 This Northern Telecom Publication (NTP) describes the Operations Support System (OSS) station administration changes update feature. This feature is used to update remote systems with station administration recent changes (SARC) information from the Business Network Management (BNM) system. For this release, this document describes how to update Computer Operations Support Systems (COSMOS) with station administration changes from BNM.

1.02 This NTP is divided into the following chapters:

About this Document	explains how to use this document
BNM-to-OSS Interface	provides an overview of the OSS automatic station administration changes update feature and how the Host Mediation Services (HMS) is used
COSMOS Administration	contains step-by-step instructions explaining how to update COSMOS systems
HMS Configuration	contains the information required to configure the Host Mediation Services (HMS) for the host database update (HDU) application
Error Messages	explains error messages and tells you what to do about them
Log Messages	explains log messages sent to the Dynamic Network Control (DNC*) log subsystem and tells you what to do about them
DNC Requirements	lists the DNC system hardware and software requirements
Forms	explains the form used for the HDU control file
Abbreviations	defines the abbreviations used in this document

* DNC is a trademark of Northern Telecom.

Document Release Information

1.03 To find out the network software release (NSR) this NTP applies to, see the vintage code in the upper right-hand corner of the front page.

Associated NTPs and Manuals

1.04 For a detailed discussion of HMS, refer to the *HMS General Description, 456-2001-100.* For a list of the NTPs in the HMS library, refer to the *HMS Index of Publications, 456-2001-001*. For DNC-500 background information, refer to *DNC General Description, 450-1011-100.* For BNM information, refer to *BNM General Description, 450-1021-100.*

1.05 For information on the DVIX operating system and DVIX commands, refer to the following manuals:

DVIX V Administrator's Reference manual - Volume 1	P6074-1
DVIX V User's Reference manual - Volume 2	P6074-2

Conventions

1.06 To follow the instructions is this NTP, you need to know the following conventions:

- "Menu items" that can be selected from a menu are shown in quotation marks.
- Hardkeys that are labelled on the keyboard are shown in uppercase bold; for example, **RETURN**.
- Softkey functions are represented by box icons on the bottom of a screen. Softkey functions are performed by pressing the appropriate softkey for an M4000-series terminal or the appropriate function key for a VT100* terminal. Softkeys are shown in bold italics; for example, **<*Select*>.**

*VT100 is a trademark of Digital Equipment Corporation.

2. BNM-T0-OSS INTERFACE

INTRODUCTION

2.01 The Business Network Management (BNM) system offers the Operations Support System (OSS) station administration changes update feature. This feature is used by BNM to interface with an OSS, such as the Computer System for Mainframe Operations (COSMOS). This feature is used to update remote systems with BNM station administration recent changes (SARC) information. Figure 2-1 illustrates the relationship between BNM and OSSs.

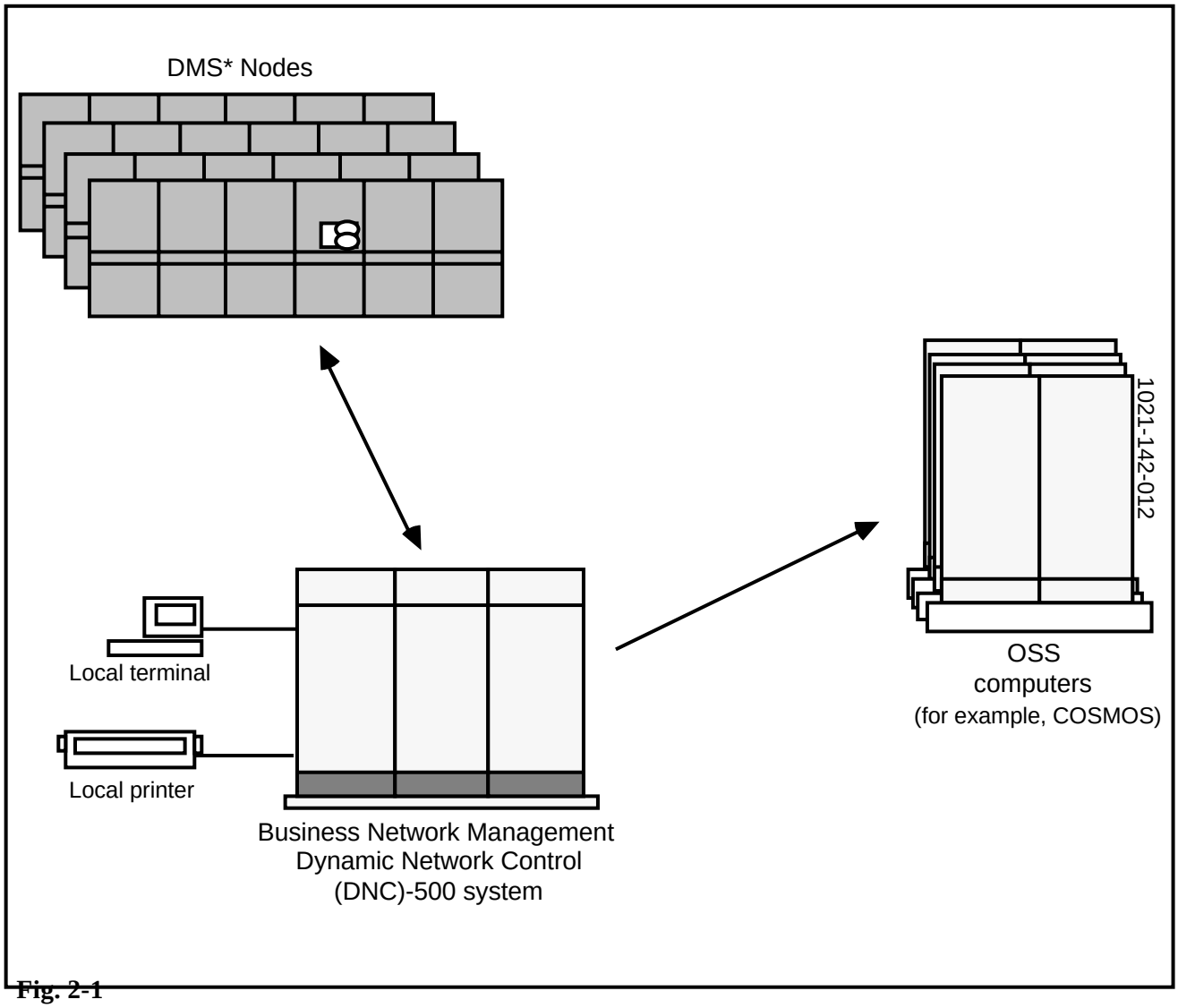

Fig. 2-1
Relationship between BNM and Operations Support System

* DMS is a trademark of Northern Telecom.

2.02 BNM has a station administration feature that is used by customers to administer their telephone network; for example, to make telephone number (TN) swaps. The changes that customers make using the station administration feature must also be reflected in the appropriate OSS computer. The OSS automatic station administration changes update feature offered by BNM is used to automatically transmit station administration changes performed by customers to the appropriate OSS computer.

2.03 An example of an OSS is COSMOS. A COSMOS system keeps track of switching center equipment assignments. It is used to track changes in hunt group sequences, changes in features associated with TNs, and TN swaps.

2.04 The SARC feature of BNM collects information on changes to hunt groups, custom calling features (CCFs), and TN swaps. The BNM-to-OSS interface transmits these changes to the appropriate OSS computers and updates the appropriate databases. To update a database, the BNM-to-OSS interface uses the Host Mediation Services (HMS) of UMPIRE. HMS performs terminal session emulation. It emulates a human operator at a terminal and performs the same series of steps and decisions as the operator. For example, for COSMOS, HMS performs the following steps:

(1) logs in to a COSMOS computer using a valid ID and password

(2) changes to the appropriate wire center directory. (A wire center is a building containing telephone end-office equipment, such as switches.)

(3) deletes the existing COSMOS update file

(4) creates a new COSMOS update file and transfers the information from the switches associated with the wire center into the new file

(5) executes the COSMOS update command to update the database

(6) repeats steps 2 through 5 for other wire centers

(7) logs off from the COSMOS computer

2.05 The BNM-to-OSS interface uses an update control file throughout an update session. The control file stores information describing the different COSMOS computers. For example, it has COSMOS computer names, wire center directory names, userIDs and passwords used to access a COSMOS computer. This file is updated by a telco administrator since some of the information, such as passwords, may have to be updated periodically.

2.06 An update session is performed automatically once a day and is initiated by the DVIX scheduler (called "cron") in the Dynamic Network Control (DNC)-500 system. Update sessions can also be initiated, on demand, by a telco administrator. For each update session, journal files are created that contain a series of messages recording the progress of the session. Whenever there is a problem, an error message appears in the journal file. The telco administrator can use the journal files to find out what happened when an update fails and what to do.

2.07 The BNM-to-OSS interface has two components:

- host database update (HDU) application
- Host Mediation Services (HMS)

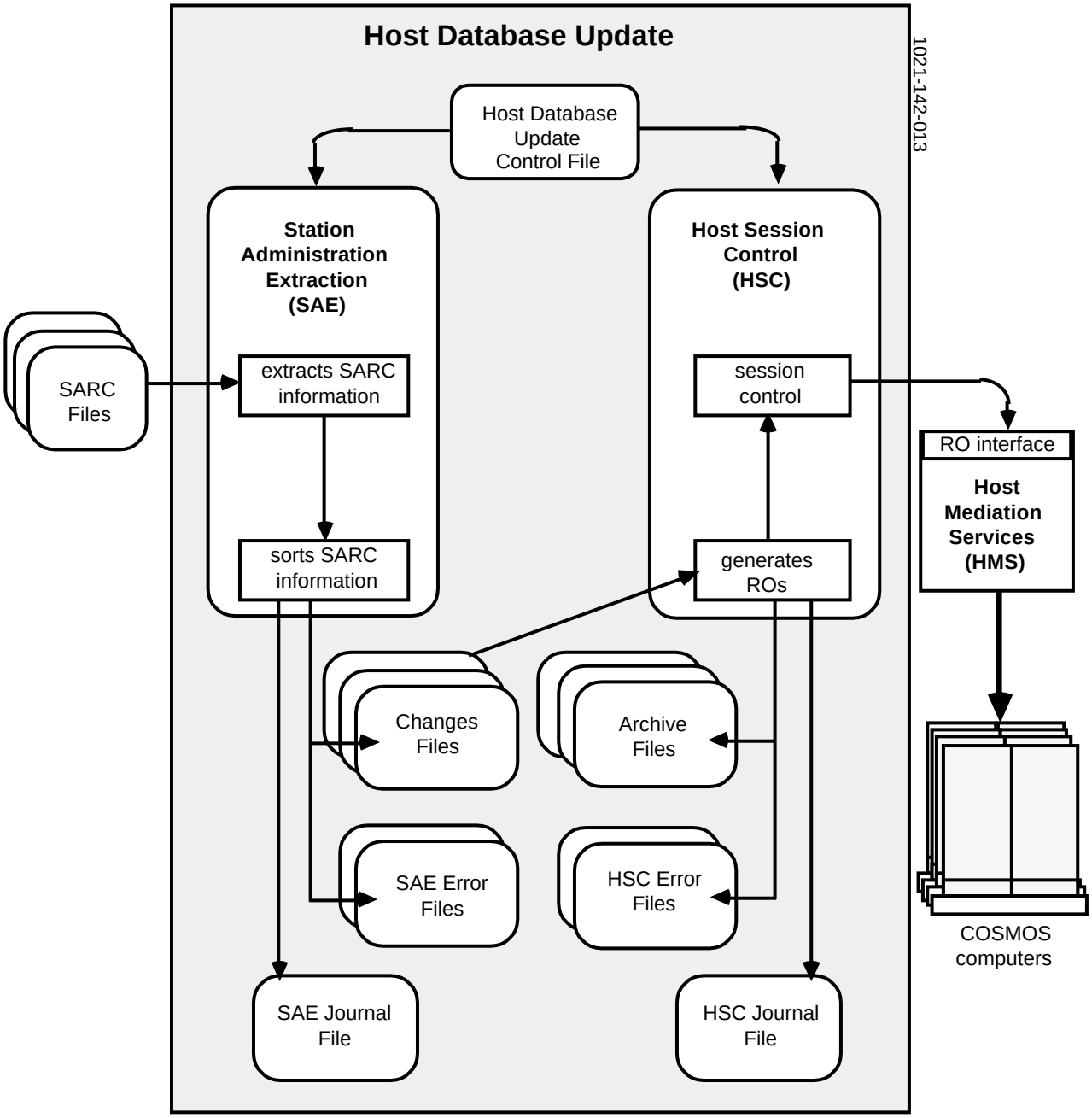

Fig. 2-2
Host Database Update Application

HOST DATABASE UPDATE

2.08 The Host Database Update (HDU) application works with HMS to provide an interface between BNM and OSSs. For example, HDU and HMS can be used to automatically transmit BNM station administration changes to COSMOS computers and update the appropriate databases.

2.09 The HDU application periodically retrieves relevant station administration changes from the SARC files. (These files are generated by the BNM station administration recent changes feature.) The HDU application extracts the appropriate information from the SARC files and sorts the information according to the COSMOS system to be updated. The HDU application creates changes files for each COSMOS system. It creates a changes file for each wire center. (A wire center is a building containing telephone end-office equipment, such as switches. A wire center can have many switches and a COSMOS computer stores information on many wire centers.)

2.10 The HDU application then automatically transfers the changes to the appropriate COSMOS system. To do this, HDU uses HMS to make the appropriate changes to each COSMOS system. The HDU application sends remote operations (ROs) to HMS, which then executes the corresponding operations in the remote host (COSMOS system) by emulating a terminal session.

2.11 To perform an update session, HDU executes the following two processes. Figure 2-2 illustrates what these processes do.

- station administration extraction (SAE)
- host session control (HSC)

Station Administration Extraction

2.12 The SAE process reads the SARC files and extracts the relevant records. It filters the SARC files and extracts records according to the HDU control file. The control file specifies which OSS computers are to be updated and also which changes are to be processed (based on where the changes originate). For example, you can specify that only station administration changes originating from switches are to be processed. The control file also specifies which type of transactions (TN swaps, CCF, and hunt group sequence changes), are to be processed for each OSS computer. The HSC process uses this information to create the host routing table, which is referred to throughout the update session.

2.13 The SAE process sorts the records according to OSS computers, wire centers, and then transaction types. Then, it stores the information it has extracted and sorted in changes files. If an unexpected event occurs when the

2.13 The SAE process sorts the records according to OSS computers, wire centers, and then transaction types. Then, it stores the information it has extracted and sorted in changes files. If an unexpected event occurs when the SAE is processing the SARC file, the SAE puts the records in an SAE error file; for example, if it finds a SARC record that cannot be associated with any OSS computer.

2.14 The SAE process generates a journal file containing messages describing the steps it has performed. Any problems that occur are recorded in the journal file as error messages. You can print journal files or display them to check for error messages. For instructions, refer to "JOURNAL FILES" in the next chapter.

Host Session Control

2.15 The HSC process takes the change files created by SAE and updates the OSS computers with the changes.

2.16 To start, the HSC process reads the HDU control file. The control file specifies the parameters required to access each OSS computer. For example, it specifies the names of the OSS computers, the userIDs and passwords used to access the computer, and the OSS command used to update the database. The HSC process uses this information to create the host access table, which is referred to throughout the update session.

2.17 Then, HSC reads the changes files and generates the appropriate messages, called ROs, to be sent to each OSS computer. These ROs are sent to each remote host using HMS. The HDU application first sends a bind (login) RO to HMS to establish a communication session with a remote host. Then, it transfers the transactions for each wire center associated with the remote host by sending the appropriate ROs. Once all changes have been sent, the HDU process sends an unbind (logoff) request to end the update session.

2.18 After all transactions in the changes files have been successfully transmitted to the remote host, HSC transfers the changes files to the archive directory. If there is a problem, you can access the changes files in the archive directory and resubmit the files. For example, if an update session was performed successfully, but there was a problem with the OSS computer and it was not updated correctly, you may have to resubmit the files. You use the resubmit update option from the COSMOS administration menu to move the files from the archive directory back to the changes directory. The changes are then resubmitted at the next update session.

2.19 For each OSS computer updated, HSC creates a journal file containing messages describing the steps performed to update the database. Any problems are recorded in the journal file as error messages. You can print

2.19 For each OSS computer updated, HSC creates a journal file containing messages describing the steps performed to update the database. Any problems are recorded in the journal file as error messages. You can print journal files or display them on the screen to check for error messages. To find out what to do about error messages, refer to the "ERROR MESSAGES" chapter.

2.20 When HSC cannot update an OSS database, it is usually because there was either a hardware or software problem. Generally, problems are temporary. For example, there may be a problem with the dial-in sequence, the login operation, or there may be no response from an OSS computer. For these types of problems, the changes files remain in the changes directory and they are automatically resubmitted at the next scheduled update session. You can also manually resubmit the changes files by resuming the update session using the resume update option from the COSMOS administration menu.

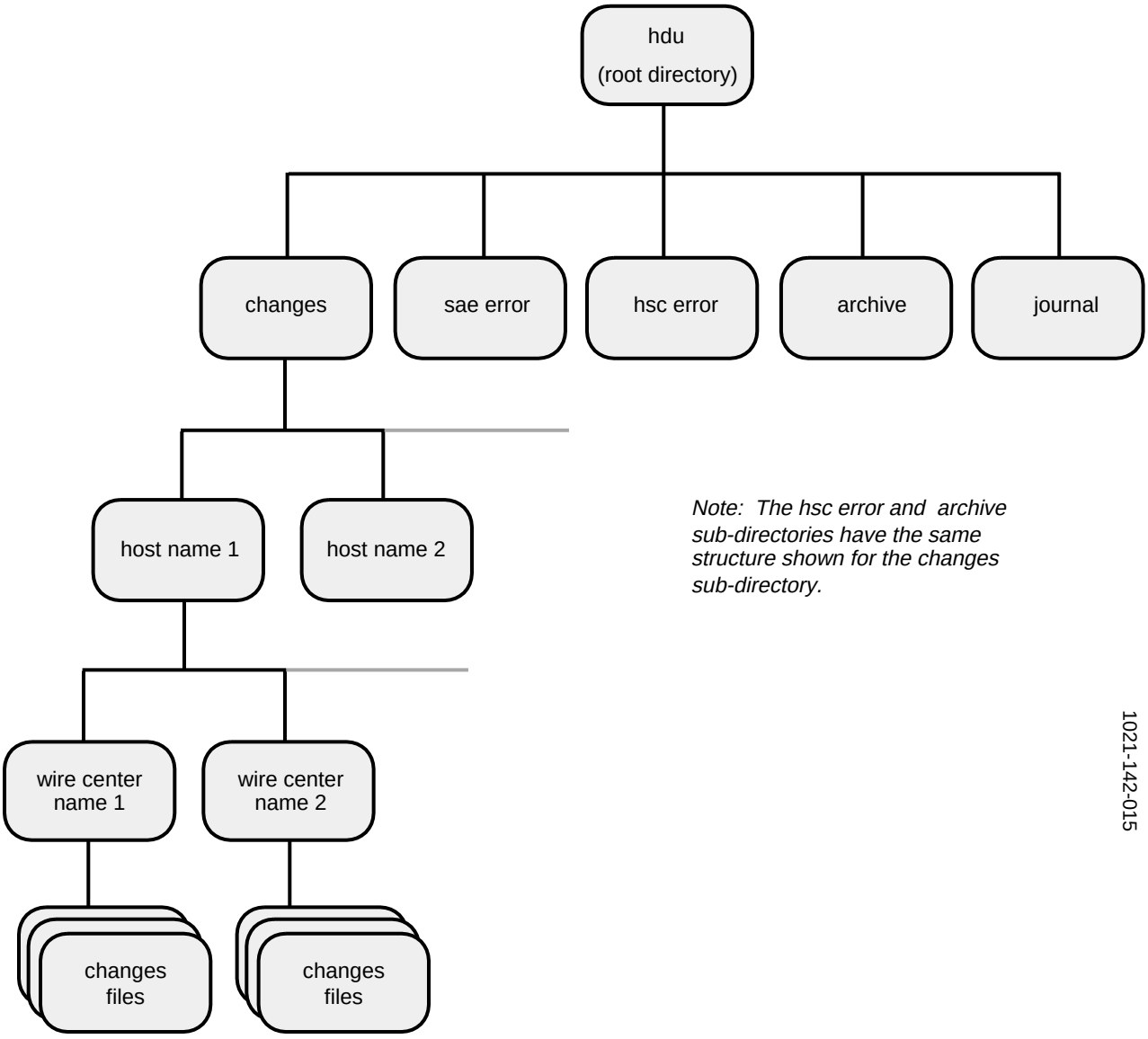

Fig. 2-3
HDU Directory

HDU Directory and Files

2.21 The HDU application operates in the DVIX environment, which is the Northern Telecom (NT) version of the UNIX* System V operating system. Figure 2-3 shows the overall directory structure for the HDU application and the following sections describe the different subdirectories and files that are created. System administrators that have access to DVIX on their system can access the hdu root directory.

2.22 The HDU directory, called hdu root, contains the HDU control file. It also has five subdirectories that contain the following types of files:

- changes files
- error files
- journal files
- archive files

2.23 Changes File Directory This directory contains the changes files created by SAE. The changes files store the station administration (SA) transactions that have been extracted from the SARC files. When SAE extracts and sorts the SA information, it creates a hierarchy of subdirectories and files. It creates a subdirectory for each remote host and, within each remote host subdirectory, it creates subdirectories for each wire center (when applicable). Then, it creates a changes file for each transaction type from a particular SARC file.

2.24 Each file is assigned an individual name based on the date of the SARC file, the day and hour when the file is created, and the type of transaction. The name has the format *yymmddddhh.txtype*, where *yymmdd* is the date extracted from the SARC file name, and *ddhh* is the day and hour when SAE started, and *txtype* is the type of transaction. Transactions types are as follows:

- tns is for a TN swap
- ccf is for custom calling feature
- mch is for make change huntgroup sequence

2.25 For example, a changes file created on September 13, 1988, at 6:00 from a SARC file with the date 880911, for the chgo3c COSMOS system, the cl wire center, and the tns transaction type, would be found in the directory /usr/hdu/changes/chgo3c/cl, and would have the name 8809111306.tns.

*UNIX is a trademark of AT&T.

2.26 SAE Error File Directory This directory contains the error files created by the SAE process. The SAE process creates an error file when it finds SA transactions that it cannot associate to a remote host or wire center. This happens when a switch ID for a SARC record does not appear in the HDU control file and therefore, the SAE process cannot associate the record to a host or wire center.

2.27 Each error file is assigned a name based on the date and time the file is created. The format for the file name is *yymmddhh.serr*, where *yymmddhh* is the date and time the file was created and *serr* means SAE error.

2.28 To recover the SARC information from the error files, you modify the HDU control file and add the missing switch IDs. Then, you move the SAE error files to the SARC directory and the files will be processed automatically at the next scheduled update session.

2.29 HSC Error File Directory When the HSC processes changes files and encounters problems, such as a problem with the dial-up sequence or no response from the host, it leaves the files in the changes directory. The changes can then be resubmitted manually or automatically processed again at the next scheduled update. The HSC error file directory contains only changes files that have been corrupted. Generally, this should not happen, unless someone with sufficient privileges tampers with the files.

2.30 The hierarchy of subdirectories is the same as the changes directory, and the name of the files remains the same as the changes file name.

2.31 Archive File Directory After HSC has successfully processed a changes file, it sends the file to the archive directory. The hierarchy of subdirectories is the same as the changes directory, and the names of the files remain the same as the changes file names. The changes files are kept in the archive directory just in case an error occurs at the remote host and the updates are not made. The changes files can be moved from the archive directory back to the changes directory. The changes will be resubmitted automatically at the next update session.

2.32 Journal File Directory This directory contains the SAE and HSC journal files. Whenever an automatic update session is performed, journal files are created that contain messages describing the steps performed and the problems encountered.

2.32 Journal File Directory This directory contains the SAE and HSC journal files. Whenever an automatic update session is performed, journal files are created that contain messages describing the steps performed and the problems encountered.

2.33 The SAE journal files contain messages describing the steps performed by the SAE process. Any problems that occur while reading the HDU control file, processing the SARC files, and creating the changes files, are reported in the SAE journal files. Since updates are performed daily, an SAE journal file is created each day. The name of file appears in the format *yymmddhh.sjnl* where *yy* is the year, *mm* is the month, *dd* is the day and *hh* is the hour the file was created and *sjnl* means SAE journal file.

2.34 The HSC journal files contain messages describing the steps performed by the HSC process when updating an OSS computer. There is a journal file created for each OSS computer updated. The name of the file appears in the format *hostname.ddhh* where *hostname* is the name of the OSS system, *dd* is the day, and *hh* is the hour the file was created.

Scheduling Update Sessions

2.35 Update sessions are scheduled to run automatically once a day. You can set the time when daily sessions should be started by using the change daily update time option from the COSMOS administration menu. Once you set the time, a scheduler automatically takes care of starting the SAE process and then the HSC process, which run independently until they are finished processing. The scheduler first starts the SAE process and once it is finished, the scheduler automatically starts the HSC process .

2.36 If you have access to DVIX, you can also schedule manually. The SAE and HSC processes can be started periodically and independently using the DVIX "cron" facility. Cron is a system process that runs constantly and invokes other processes at predefined times. The processes are defined in a special file in the DVIX "crontab" directory. To schedule the processes, you submit a cronfile using the "crontab" command.

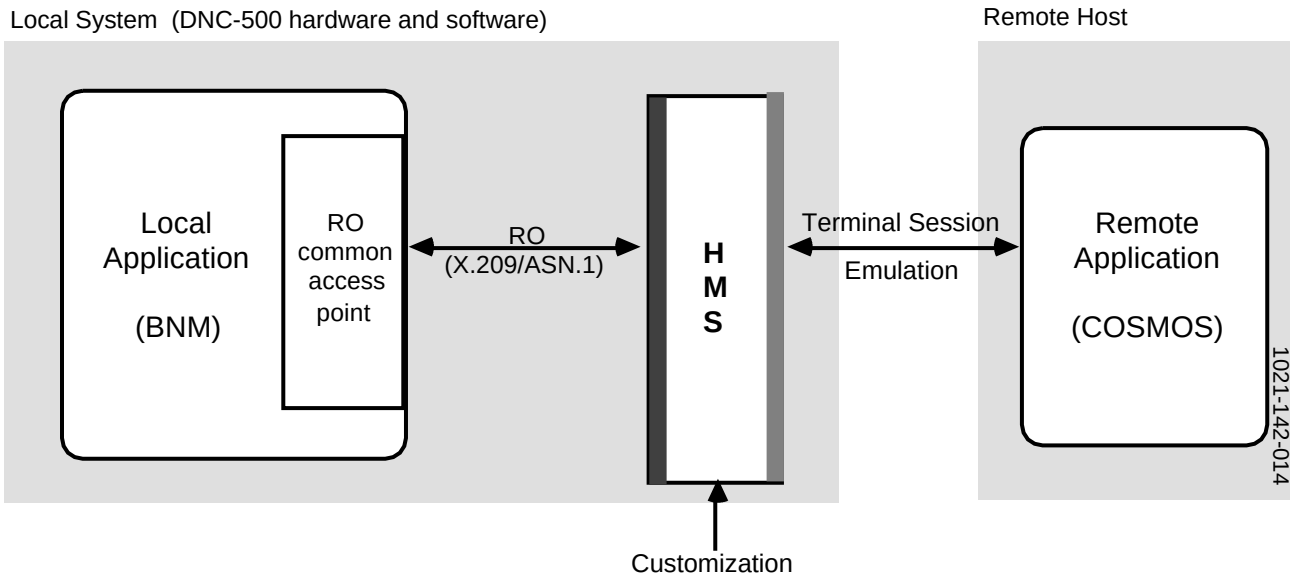

Fig. 2-4
Host Mediation Services

HOST MEDIATION SERVICES

2.37 HMS provides a uniform application interface to the functions and databases of a remote host. The remote host does not have to modified. HMS is typically configured within an application, such as BNM, to provide access to applications on variety of independent hosts, such as COSMOS.

2.38 HMS is software that interfaces between diverse host computer systems and acts as a mediator. It converts remote operations (ROs) issued by an application to a terminal session understood by another application on a remote host (illustrated in Figure 2-4). For example, if BNM issues the RO, Swap TN with two telephone numbers as arguments, HMS takes the RO and emulates a human operator at a terminal, and performs a TN swap (tns) on a COSMOS system. HMS performs the same series of steps and decisions as an operator.

2.39 The HMS base software is composed of generic software modules that are customized for a specific remote host application. HMS can be customized to implement a high-level RO interface to any host with a simple low-level interface. HMS is customized by writing host dialogs. A host dialog describes the data of the RO and user actions required to execute it. The host dialog language (HDL) is a high-level programming language that is used to write or define the dialogs.

2.40 Host dialogs are actually programs that describe the sequence of actions to accomplish the task of an RO. Each dialog specifies the parameters of the RO and the user actions required to execute the RO. There is a host dialog for each RO.

Remote Operations and Host Dialogs

2.41 HDU issues two types of ROs: session control ROs and functional ROs. Session control ROs control the communications session between the HDU application and the remote host. Functional ROs are the HDU's request for operations in the remote host system.

2.42 Session Control Remote Operations Session control ROs are used to establish and release a communications session with a remote host. A session begins with a login procedure to establish a communications session with a remote host. The bind (login) operation is sent by the HDU application to establish a communications session and allocate resources for a subsequent exchange of functional ROs. This RO is sent before any other RO is sent. When HMS receives this RO, it executes a dialog that initiates an autodial connection sequence with the remote host and performs a login procedure by sending the required userID and password.

2.43 A session ends with a logout procedure that terminates a communications session with a remote host. The unbind (logout) operation is sent by the HDU application to terminate a communications session. When HMS receives this RO, it executes a dialog that performs a logoff procedure.

2.44 Functional Remote Operations Functional ROs are used by the HDU application to update the database of a remote host. Each RO is a request to perform a series of actions remotely. The functional ROs are as follows:

- preprocessing ROs
- ROs to update a database
- postprocessing ROs

2.45 Preprocessing ROs are used to perform the appropriate actions to place the host into an entry mode, ready to accept changes. For example, there could be an RO that is used to go to the appropriate menu to make changes. ROs that update a database are used to perform the activities to make changes to the database of a remote host. Then, postprocessing ROs are used to perform the activities required to submit the changes.

2.46 For the BNM-to-COSMOS interface, the functional ROs are as follows:

- host entry mode (preprocessing RO)
- tns, ccf, and mch (ROs to update the database)
- host commit (postprocessing RO)

2.47 Once a session has been established, HDU sends the Host Entry Mode RO, which is a request to put the remote host in an entry mode for the transfer of station administration transactions. When HMS receives this RO, it executes a dialog that changes the directory to the desired wire center directory, deletes the old COSMOS update file, edits a new update file, and puts the remote host in entry mode.

2.48 Then, HDU sends ROs that perform the transfer of station administration transactions. There are three ROs, one for each type of station administration transaction. The Station Administration TN Swap RO makes a telephone move request. When HMS receives this RO, it enters a TN swap for a pair of TNs. The Station Administration Custom Calling Feature Change RO changes the status of certain custom calling features for a line. When HMS receives this request, it enters CCF changes for a specific TN. The Station Administration Make Change Huntgroup RO changes the "hunt to" information for a TN. When HMS receives this RO, it executes the "make change hunt group command". In each of the dialogs, each change is preceded and followed with a general facility report "gfr" command. This is a COSMOS command executed to help recover from errors.

2.49 Once all transactions have been processed, HDU sends the Host Commit RO. This RO submits the transactions to update the database. When HMS receives this RO, it executes a dialog that exits the host entry mode, saves the COSMOS update file, and then executes the COSMOS "que" command to submit the transactions and update the database.

3. COSMOS ADMINISTRATION

INTRODUCTION

3.01 The Business Network Management-to-Computer System for Mainframe Operations (BNM-COSMOS) interface is administered using the COSMOS administration feature. This feature is available from the BNM Main Menu (Figure 3-1) under the heading, OSS Services. Figure 3-2 shows the hierarchy of screens for this feature.

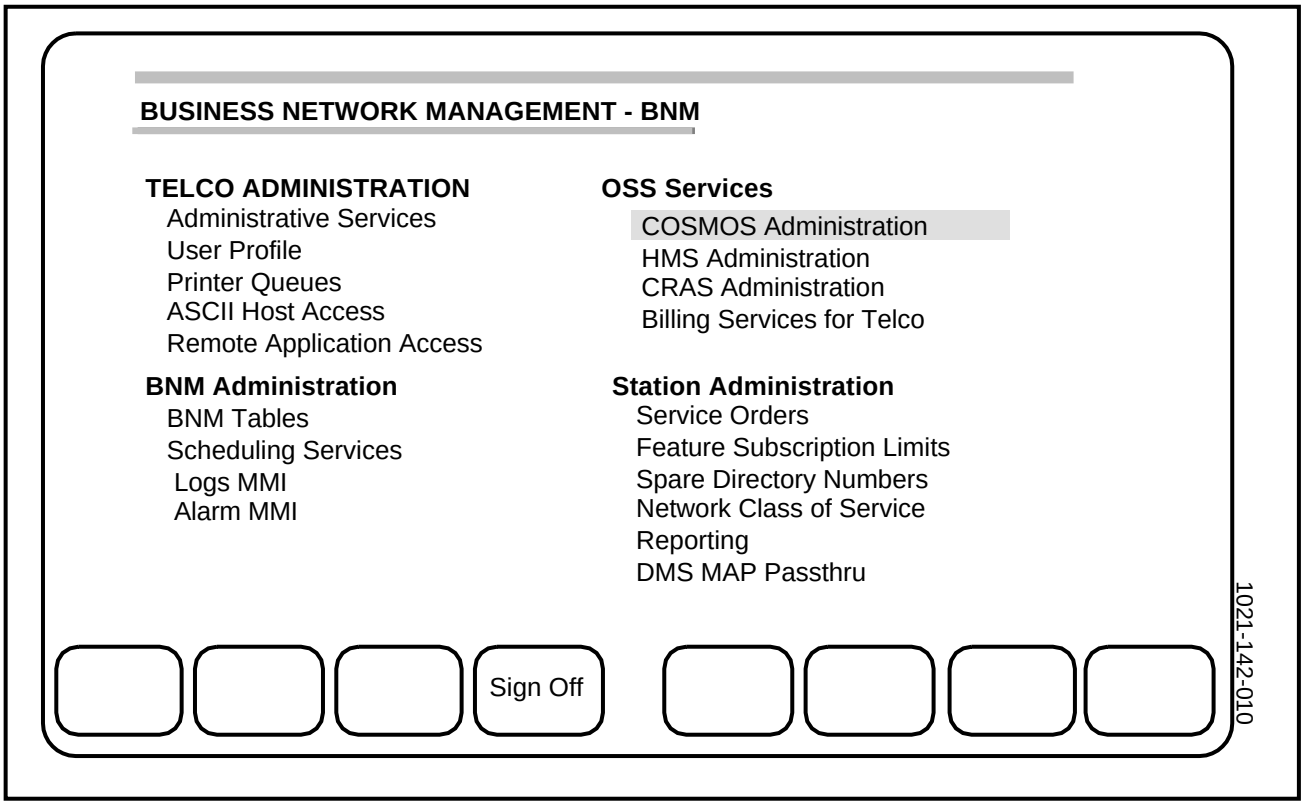

Fig. 3-1
BNM Main Menu

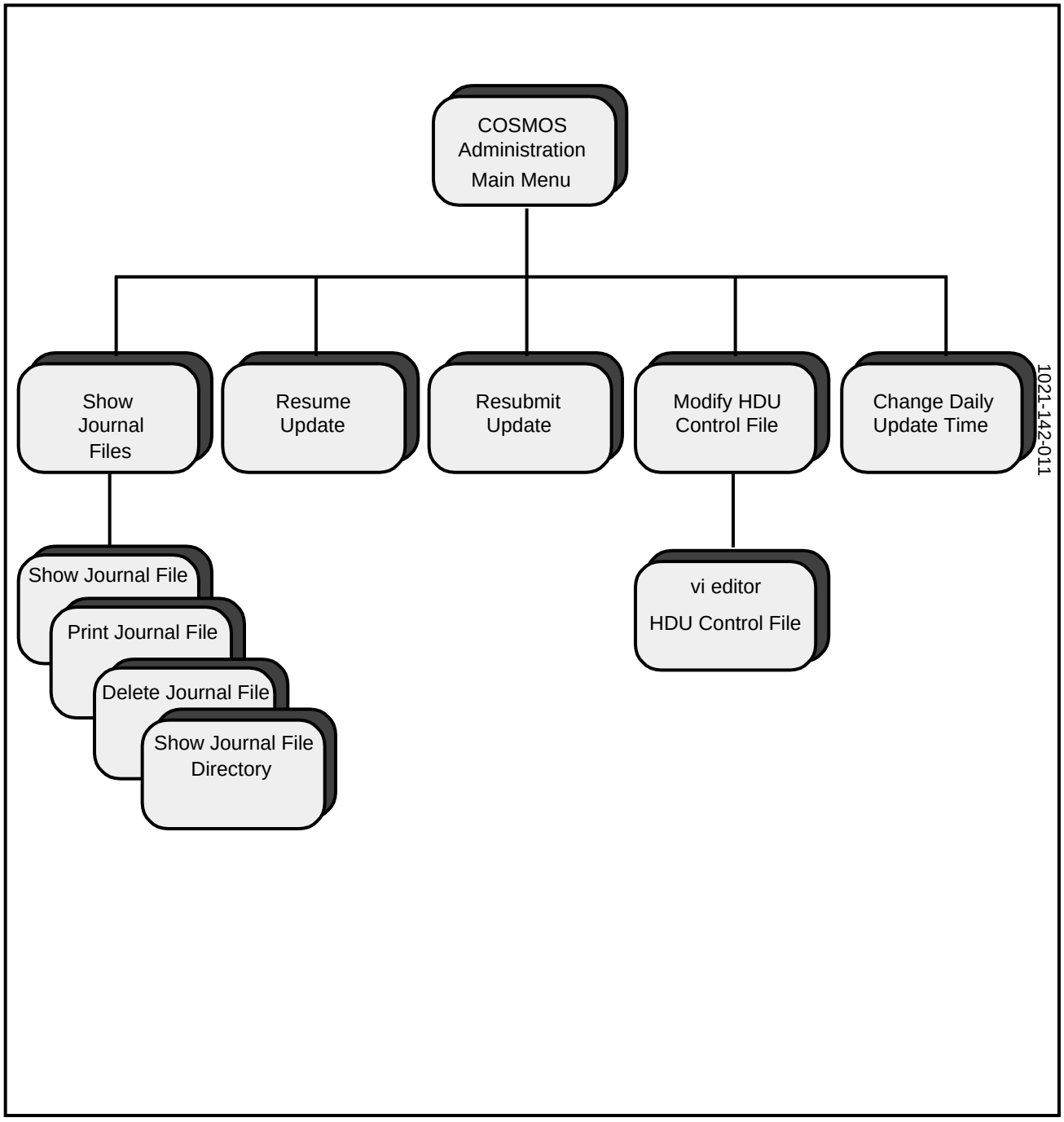

Fig. 3-2
COSMOS Administration Screens

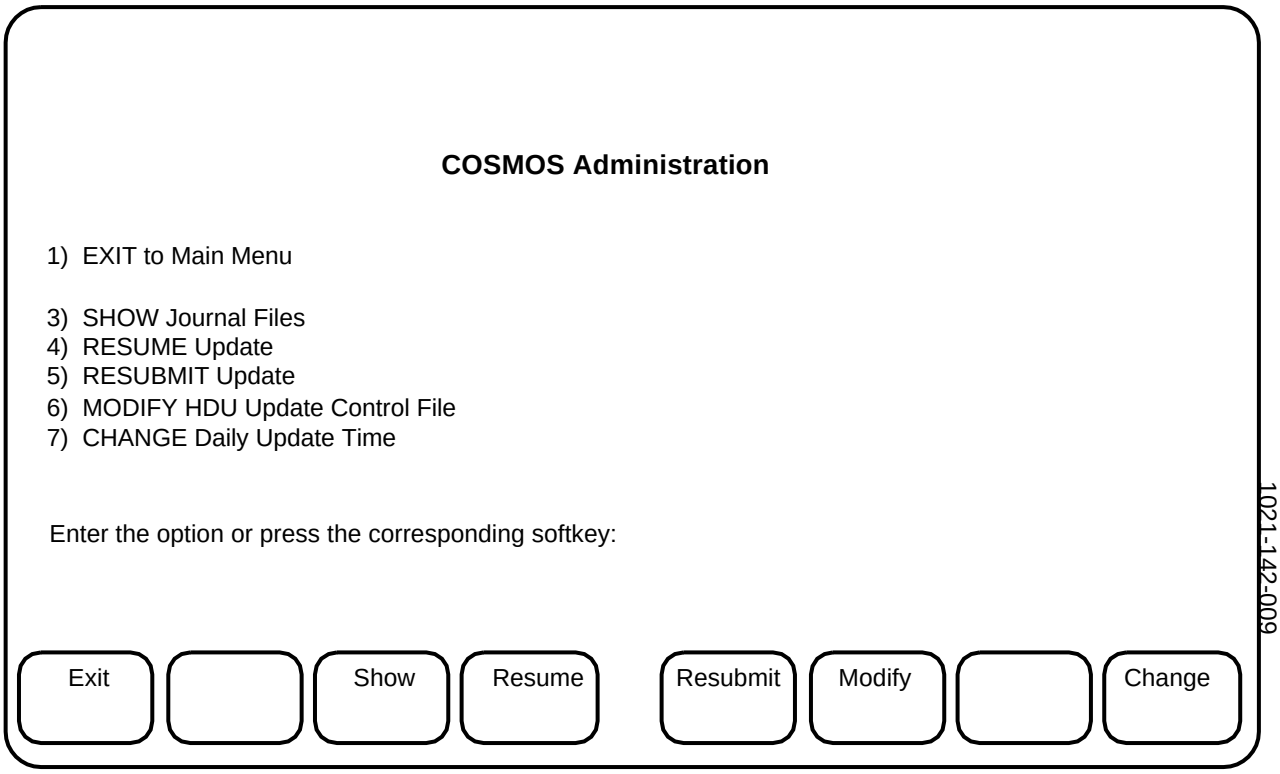

Fig. 3-3
COSMOS Administration Menu

3.02 The COSMOS Administration Menu options (Figure 3-3) are used to:

- show journal files that describe update sessions and list problems
- resume an update and manually update the COSMOS computers that were not done during the automatic update
- submit an update again for selected COSMOS computers (using the changes files in the archive directory)

- modify the host database update (HDU) control file; for example, to change the password used to access a COSMOS computer

- schedule the time when updates are sent to COSMOS computers

SIGNING ON AND OFF

3.03 To sign on, you need a valid userID and password. If you do not have a userID, see the Dynamic Network Control (DNC) system administrator. Before you can sign on, the DNC-500 must be up and running. If the NT logo is on the screen, the DNC is ready.

(1) Press ***<Sign On>.***
==> You are prompted for your userID.

(2) Type your userID and press **ENTER**.
==> You are prompted for your password.

(3) Type your password and press **ENTER**. (For security reasons, the password does not appear.)
==> The BNM Main Menu appears.

3.04 When you are finished using the DNC, you should sign off. This helps to prevent unauthorized use of the DNC.

(1) First, you must exit to the BNM Main Menu. Keep pressing ***<Exit>*** until the BNM Main Menu appears.
==> The BNM Main Menu appears.

(2) Press ***<Sign Off>.***
==> You are prompted to confirm your request.

(3) Press **ENTER**.
==> The NT logo appears.

```
- - - - - - - - - - - - STATION ADMINISTRATION EXTRACTION (SAE) - - - - - - - - - - - -

Start processing:  thu Feb 13 12:24:34 1989

Read HDU Control file
Successfully processed SARC file: 890213141356
Successfully processed SARC file: 890213143445
Switchid for SARC record not found in HDU control file: c103
Successfully processed SARC file: 890213164457

End processing: thu Feb 13 12:34:56 1989
```

```
- - - - - - - - - - - - HOST SESSION CONTROL - - - - - - - - - - - -

Start processing:  thu Feb 13 12:28:46 1989

Read HDU Control file
Host: cos cosln
Login
Start processing wire center: uc
Updated WC: uc
Start processing wire center: cl
Updated WC: cl
Logout

End processing: thu Feb 13 12:34:56 1989
```

1021-142-008

Fig. 3-4
Journal Files

JOURNAL FILES

3.05 Whenever Operations Support System (OSS) computers are updated, the HDU application creates journal files. A journal file contains a series of messages that describe the actions performed and any problems that may have occurred. You use the journal files to make sure the OSS computers have been updated correctly. They help you to determine the cause of a problem and can also tell you what to do to correct a problem.

3.06 The instructions in this section show you how to:

- display the journal file directory and a list of journal files
- display a journal file
- print a journal file
- delete journal files that you do not need

3.07 To find out about error messages appearing in the journal files, see the "ERROR MESSAGES" chapter in this NTP. It explains what to do about the problems.

3.08 There are two types of journal files: station administration extraction (SAE) journal files and host session control (HSC) journal files. Figure 3-4 shows an example of each file.

3.09 The SAE journal files contain messages describing the steps performed by the SAE process. Any problems that occur while reading the HDU control file, processing the station administration recent changes (SARC) files, and creating the changes files are reported in the SAE journal files. An SAE journal file is created each time the SAE is started. The name of file appears in the format *yymmddhh.sjnl* where *yy* is the year, *mm* is the month, *dd* is the day and *hh* is the hour the file was created, and *sjnl* means SAE journal file.

3.10 The HSC journal files contain messages describing the steps performed by the HSC process when it updates an OSS computer. There is a journal file created for each OSS computer updated. The name of the file appears in the format *hostname.ddhh*, where the *hostname* is the name of the OSS system, and *dd* is the day, and *hh* is the hour the file was created.

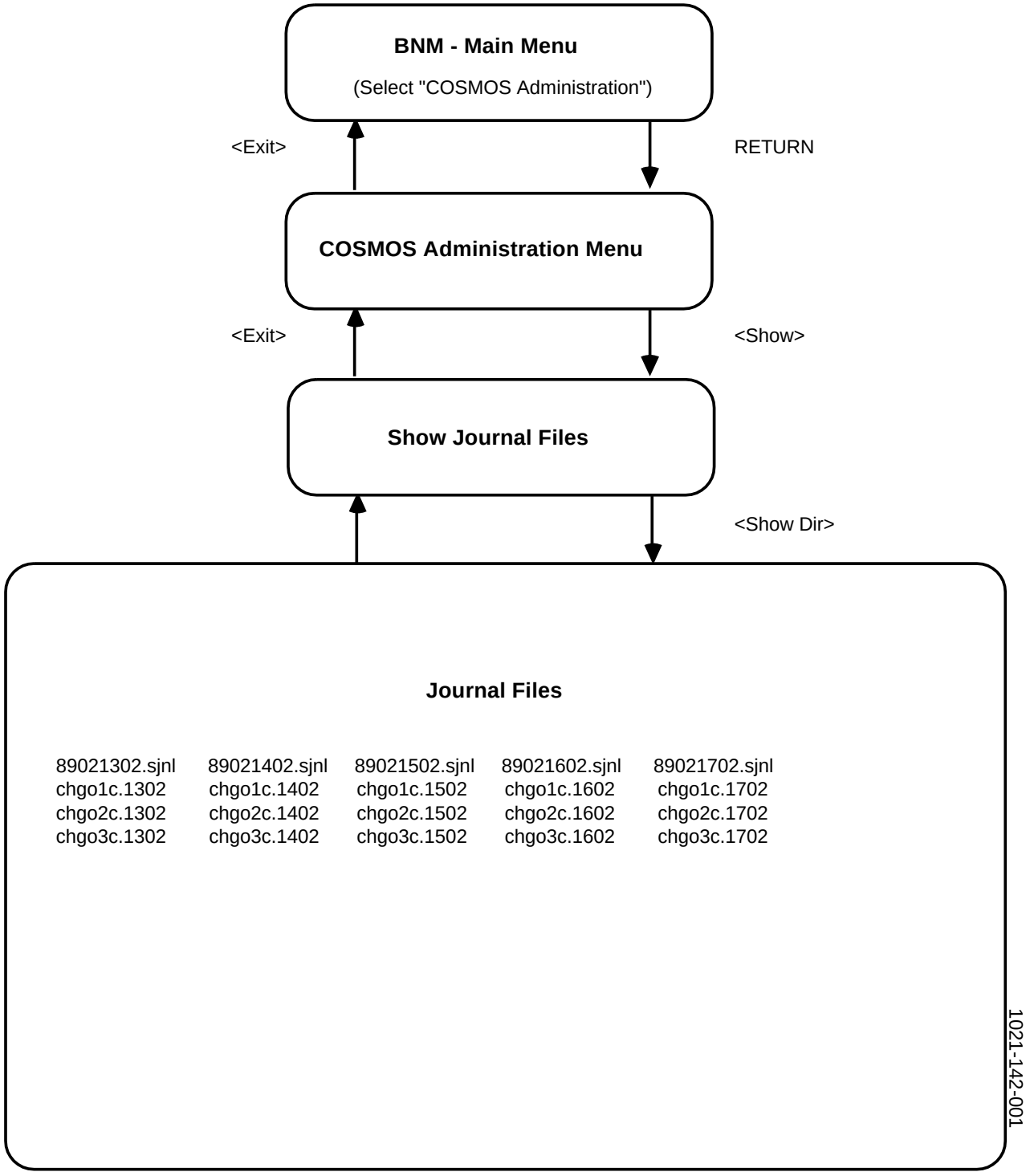

Fig. 3-5
Displaying the Journal File Directory

Displaying the Journal File Directory

3.11 The following steps show how to display the directory of journal files and Figure 3-5 illustrates the screens.

(1) Sign on to the Dynamic Network Control (DNC)-500 system using a valid userID and password.
==> The BNM Main Menu appears.

(2) Select "COSMOS Administration" and press **RETURN.**
==> The COSMOS Administration menu appears.

(3) Press **<*Show*>** (or type "3" and press **RETURN**).
==> The Show Journal Files screen appears.

(4) To display a file, press **<*Show Dir*>** (or type "6" and press **RETURN**).
==> A list of journal files appears.

(5) If there is more than one page of file names, press **RETURN** to display the next page. When you reach the end of the list, press **RETURN** to exit.
==> The Show Journal Files menu appears.

(6) When you are finished, press **<*Exit*>** (or type "1" and press **RETURN**).
==> The COSMOS Administration menu reappears.

(7) When you are finished with COSMOS administration, press **<*Exit*>** (or type "1" and press **RETURN**).
==> The BNM Main Menu appears.

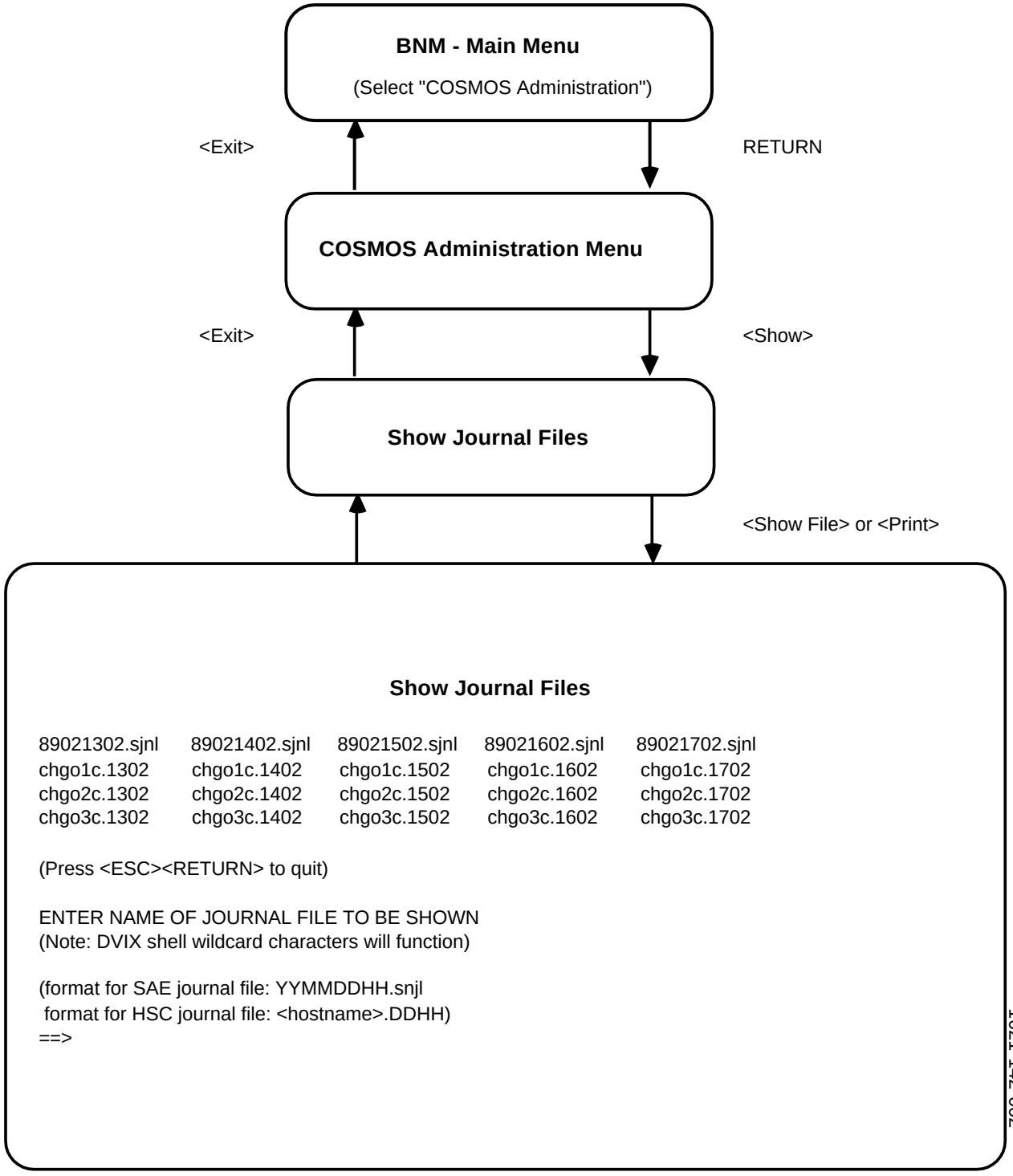

Fig. 3-6
Displaying or Printing Journal Files

Displaying or Printing Journal Files

3.12 The following steps show how to display or print a journal file and Figure 3-6 illustrates the screens.

(1) Sign on to the DNC-500, using a valid userID and password.
==> The BNM Main Menu appears.

(2) Select "COSMOS Administration" and press **RETURN.**
==> The COSMOS Administration menu appears.

(3) Press **<*Show*>** (or type "3" and press **RETURN**).
==> The Show Journal File screen appears.

(4) To display a file, press **<*Show File*>** (or type "3" and press **RETURN**). To print a file, press **<*Print*>** (or type "4" and press **RETURN**).
==> A list of journal files appears.

(5) Press **RETURN** to continue or, if there is more than one page of file names, press **RETURN** to display the next page.
==> You are prompted for the name of the file you want to display or print.

(6) Type of the name of the journal file, then press **RETURN**.
==> The journal file is displayed or is printed, depending on step 4.

Note: When you type the name, you can use the following DVIX wildcard characters to substitute characters in the name:

*	matches any string of characters in the name. For example, if you type "*cos*.0213"*, all file names that begin with *cos* and end with *.0213* and have any string of characters in between are displayed
?	matches any single character
[...]	matches any one of the characters enclosed

(7) If you are displaying a file, to go the next page of the file, press **RETURN**.
==> Once you reach the end of the file, the Show Journal Files screen reappears.

(8) When you are finished, press **RETURN**.
==> The COSMOS Administration menu reappears.

(9) When you are finished with COSMOS administration, press ***<Exit>*** (or type "1" and press **RETURN**).
==> The BNM Main Menu appears.

Deleting Journal Files

3.13 The SAE and HSC journal files are kept for a certain amount of time, after which they are automatically deleted. (When the COSMOS administration software is installed, the system administrator specifies the amount of time files are kept. The default is 7 days.)

3.14 At anytime, however, you can delete journal files that you do not need. The following steps show how to delete journal files and Figure 3-7 illustrates the screens.

(1) Sign on to the DNC-500, using a valid userID and password.
==> The BNM Main Menu appears.

(2) Select "COSMOS Administration" and press **RETURN.**
==> The COSMOS Administration menu appears.

(3) Press **<*Show*>** (or type "3" and press **RETURN**).
==> The Show Journal Files screen appears.

(4) To delete a journal file, press **<*Delete*>** (or type "5" and press **RETURN**).
==> A list of journal files appears.

(5) Press **RETURN** to continue or, if there is more than one page of file names, press **RETURN** to display the next page.
==> You are prompted for the name of the file you want to delete.

(6) Type the name of the name of the journal file you want to delete, then press **RETURN**.
==> You are prompted to confirm your request.

Note: When you type the name, you can use the following DVIX wildcard characters to substitute characters in the name:

*	matches any string of characters in the name. For example, if you type "*cos*.0213"*, all file names that begin with *cos* and end with *.0213* and have any string of characters in between are displayed
?	matches any single character
[...]	matches any one of the characters enclosed

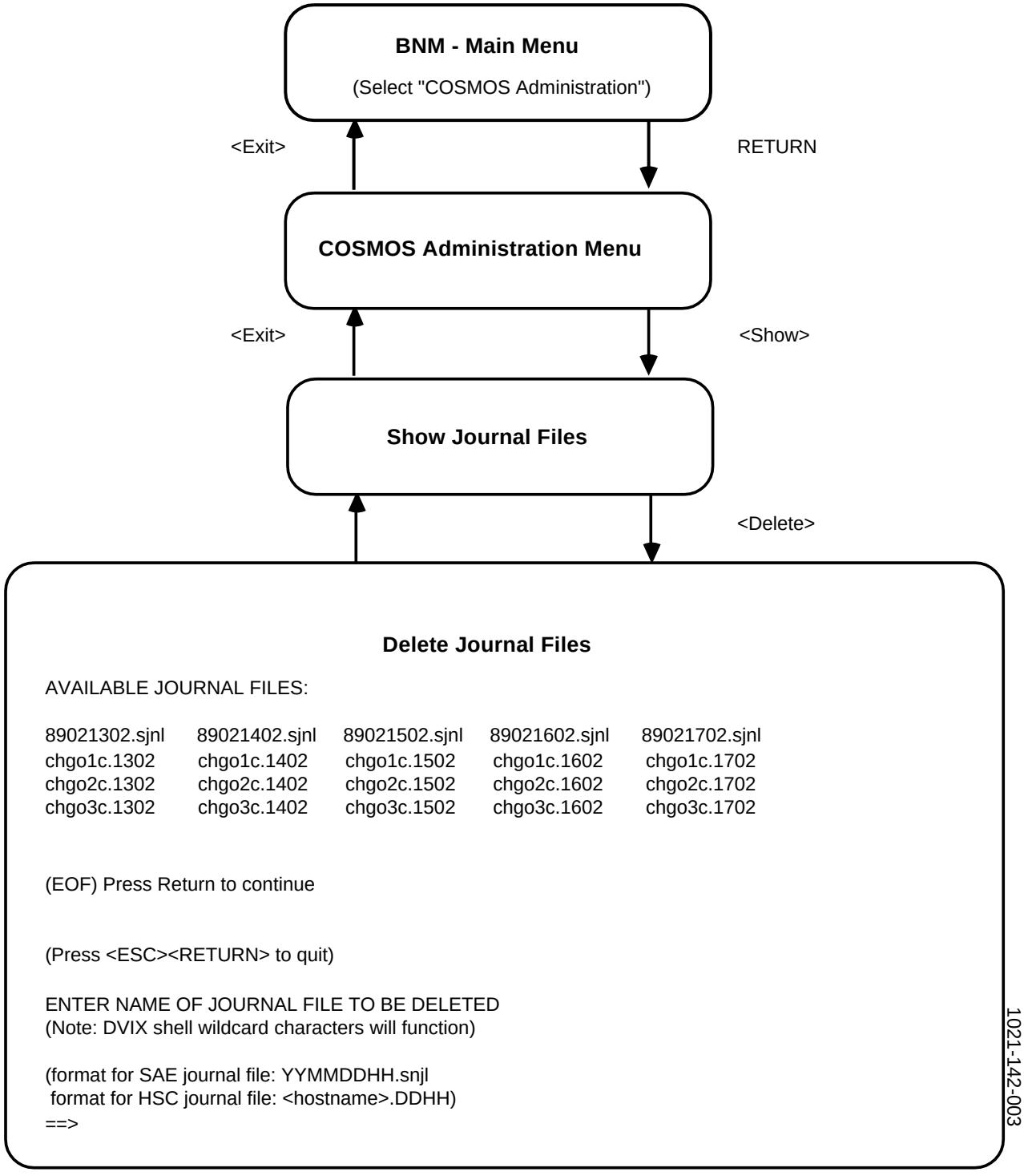

Fig. 3-7
Deleting Journal Files

(7) To delete the file, type "Y", then press **RETURN**.
To cancel your request, type "N", then press **RETURN**.
==> The Show Journal Files menu reappears.

(8) When you are finished, press **<*Exit*>.**
==> The COSMOS Administration menu reappears.

(9) When you are finished with COSMOS administration, press **<*Exit*>** (or type "1" and press **RETURN**).
==> The BNM Main Menu appears.

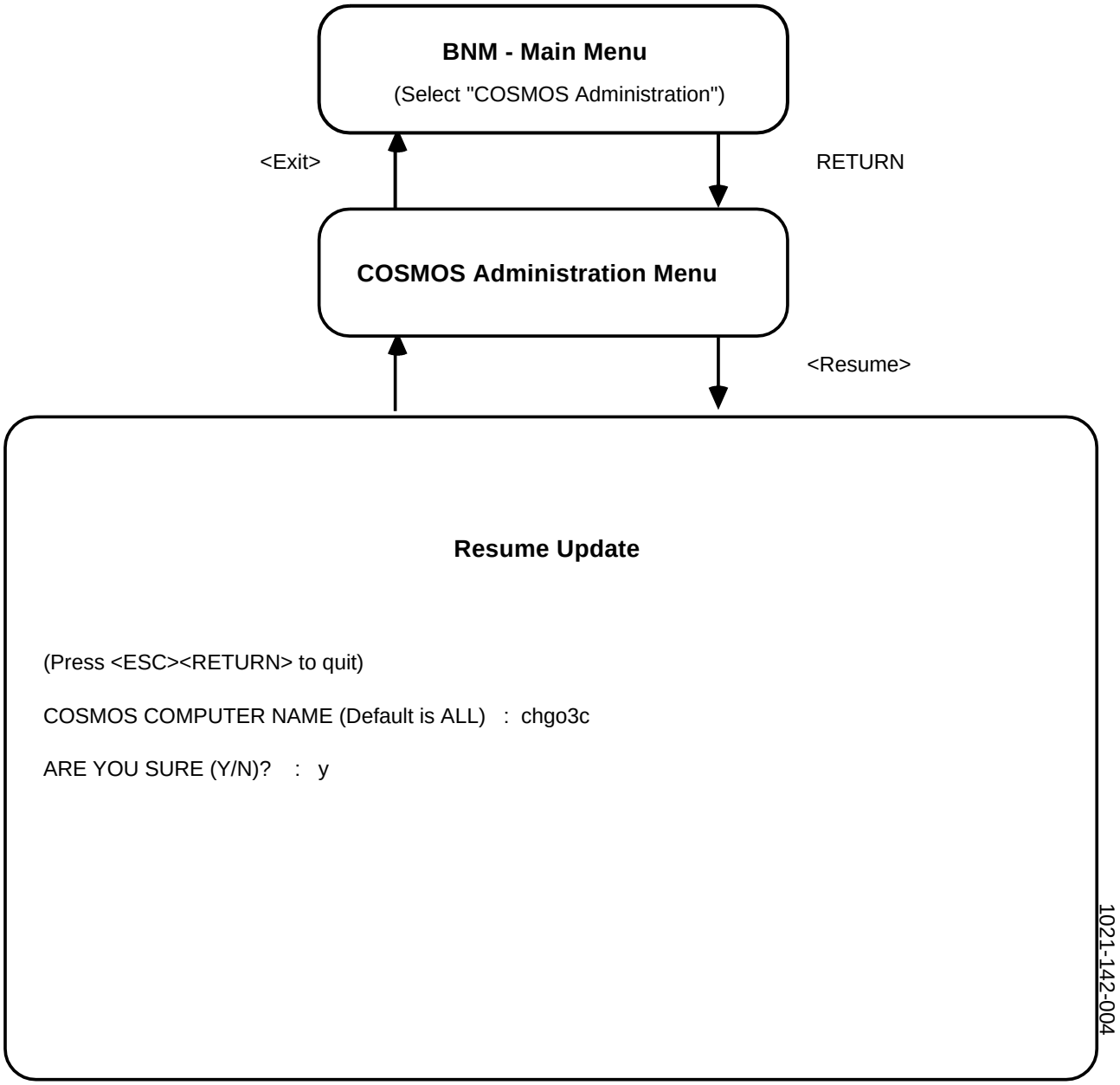

Fig. 3-8
Resuming an Update

RESUMING AN UPDATE

3.15 You can manually restart a transfer of updates to all or selected COSMOS computers. The updates currently in the changes directory are submitted. Updates that have not been successfully sent to COSMOS computers are automatically resubmitted at the next scheduled COSMOS update, but you can use this procedure to manually restart an update. Figure 3-8 illustrates the screens.

(1) Sign on to the DNC-500, using a valid userID and password.
==> The BNM Main Menu appears.

(2) Select "COSMOS Administration" and press **RETURN.**
==> The COSMOS Administration menu appears.

(3) Press **<*Resume*>** (or type "4" and press **RETURN**).
==> The Resume Update screen appears.

(4) To update all COSMOS computers, press **RETURN.** To update a specific COSMOS computer, type the name of the COSMOS computer and press **RETURN**.
==> You are prompted to confirm your request.

(5) To resume the update, type "Y", then press **RETURN.**
To cancel your request, type "N", then press **RETURN**.
==> If you selected all COSMOS computers, all of the COSMOS computers defined in the HDU control file are updated. If you selected a specific COSMOS computer, only that computer is updated. The COSMOS Administration menu then reappears.

(6) When you are finished with COSMOS administration, press **<*Exit*>** (or type "1" and press **RETURN**).
==> The BNM Main Menu appears.

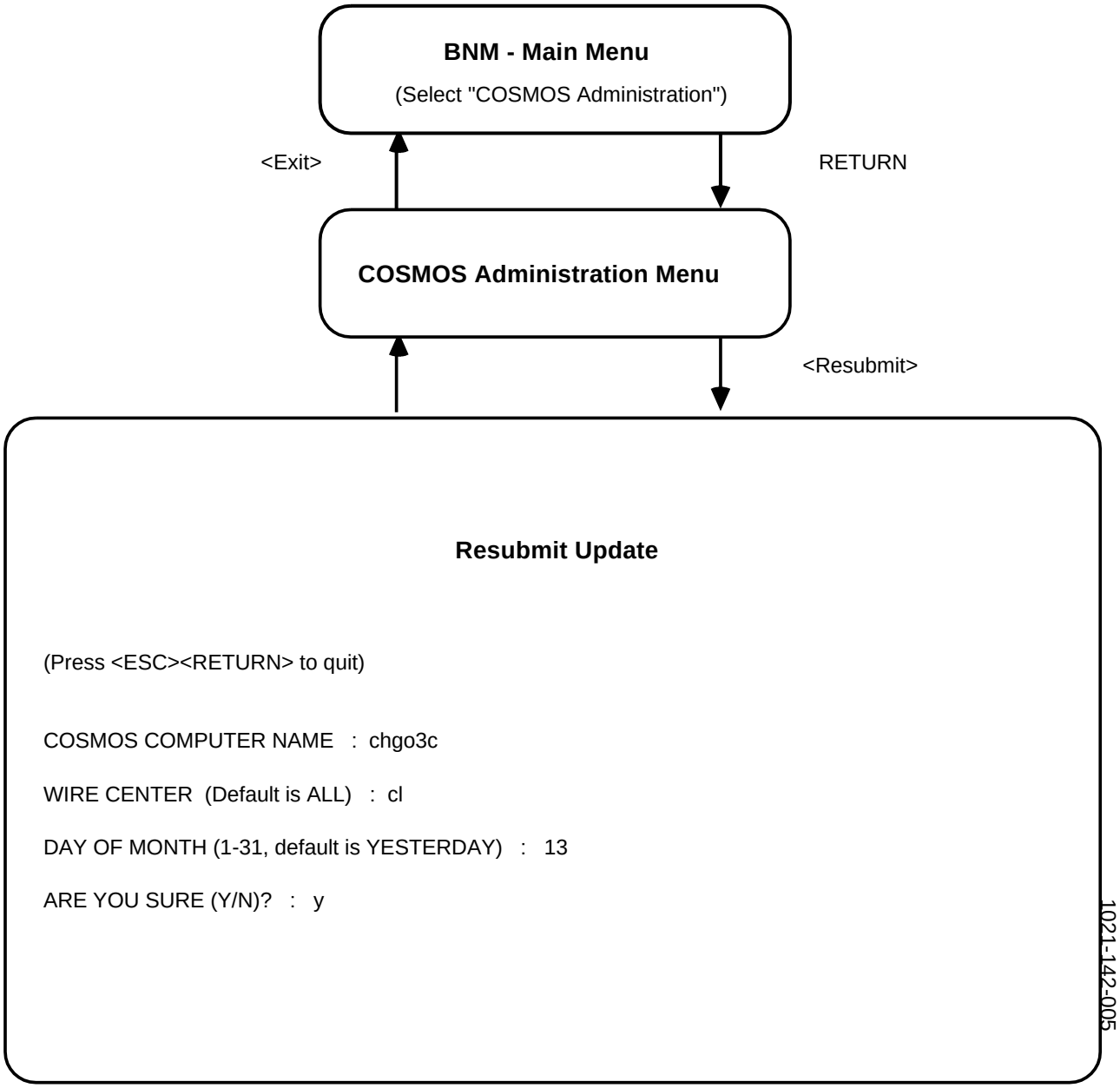

Fig. 3-9
Resubmitting an Update

RESUBMITTING AN UPDATE

3.16 The following steps show you how to resubmit an update for a selected COSMOS computer. You resubmit an update when the update was successfully sent to a COSMOS computer, but an error occurred at the COSMOS computer and it was not updated correctly. This option moves the changes file from the archive directory back to the changes directory. The changes are resubmitted to the COSMOS computer at the next scheduled update or you can use the resume update option to submit the changes immediately. Figure 3-9 illustrates the screens.

(1) Sign on to the DNC-500, using a valid userID and password.
==> The BNM Main Menu appears.

(2) Select COSMOS Administration and press **RETURN.**
==> The COSMOS Administration menu appears.

(3) Press **<*Resubmit*>** (or type "5" and press **RETURN**).
==> The Resume Update screen appears.

(4) Type the name of the COSMOS computer to be updated, then press **RETURN**.

(5) To update all wire centers, press **RETURN**. To update a specific wire center, type the name, then press **RETURN**.

(6) Type the day of the month for the update you want to resubmit. For example, if you want to resubmit the update performed on the 12th, type "12". To resubmit yesterday's update, press **RETURN.**
==> You are prompted to confirm your request.

(7) To resubmit the update, type "Y", then press **RETURN**
To cancel your request, type "N", then press **RETURN**.
==> The COSMOS Administration menu reappears.

(8) When you are finished with COSMOS administration, press **<*Exit*>** (or type "1" and press **RETURN**).
==> The BNM Main Menu appears.

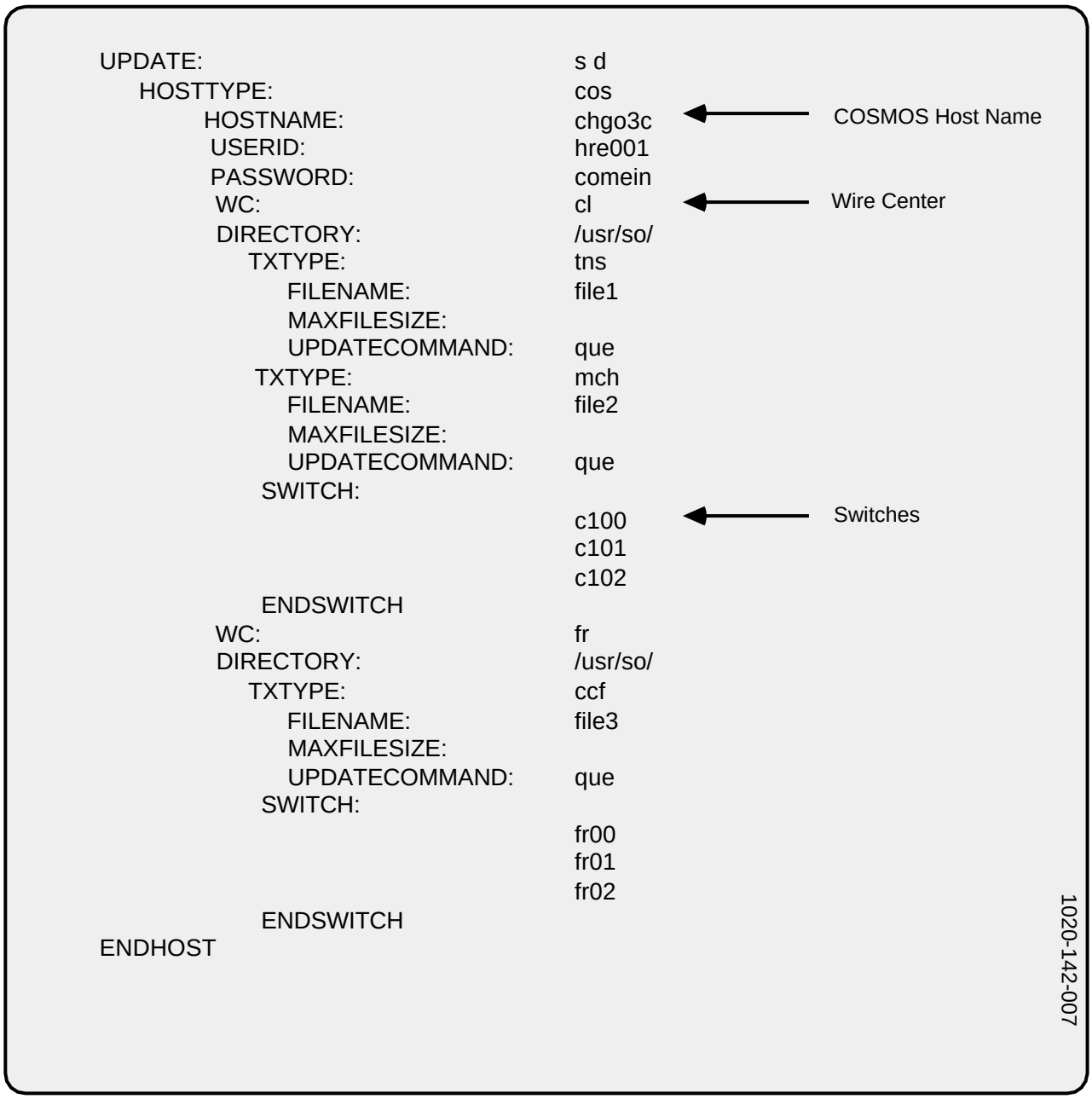

Fig. 3-10
Example of an Update Control File

MODIFYING THE CONTROL FILE

3.17 The HDU control file stores information describing the different OSS computers. For example, it stores the names of the COSMOS computers and the wire centers, as well as userIDs and corresponding passwords used to access each COSMOS computer. The information in this file is used to extract the appropriate station administration (SA) changes from the SARC files and to access each COSMOS computer and perform the appropriate transactions, such as a TN swap (tns).

3.18 You can update the control file and add, delete, or change information for each COSMOS computer. For example, you would update the file whenever the password for a userID has been changed. The control file is an ASCII text file that is updated using the visual (vi) text editor available under the DVIX operating system.

3.19 Figure 3-10 shows an example of a control file. The example illustrates the format of the file and shows sample values. This control file describes one COSMOS computer (chgo3c) with two wire centers (cl and fr); each wire center has three switches (c100, c101, c102 for the cl wire center, and fr00, fr01, fr02 for the fr wire center).

> ***Note:*** The control file shown in Figure 3-8 is an example only. To create your own file, contact your OSS (for example, COSMOS) system administrator for the exact configuration information.

3.20 There is a blank form at the end of this NTP that you and the OSS system administrator can use to complete with the information required for the HDU control file.

Control File Parameters

3.21 The following table describes the parameters for the control file.

Parameter	What to enter . . .
UPDATE	This parameter specifies which SA changes are to be processed based on where the changes originate. This parameter is specified once, at the beginning of the control file, and all OSS computers defined in the file are updated with the type of SA changes specified. Any combination of the values s, d, i, and l, (explained as follows), can be typed, separated by a space. If you do not type a value, the default "s" is used. s - (SOP), SA changes that originated from BNM d - SA changes that originated from the switch (database synchronization) i - SA changes performed at the initial load l - SA changes that originated from a local update ***Note:*** Refer to the BNM Station Administration NTP for more information about SA changes.

(The following parameters are repeated for each OSS computer.)

HOSTTYPE	This parameter specifies the type of OSS system and also indicates the beginning of the description of a specific OSS computer. Currently, the possible values are: COS - COSMOS COSN - Northbrook COSMOS
HOSTNAME	the name of the OSS computer (eight alphanumeric characters)
USER ID	the userID used to logon to the OSS computer (up to 16 alphanumeric characters)
PASSWORD	the password for the userID (up to 16 alpha- numeric characters)

(The following parameters are repeated for each wire center for the OSS computer.)

WC	the name of the wire center (up to 14 alphanumeric characters)
DIRECTORY	the name of the directory in the OSS system where the update file for the wire center will be created (up to 32 alphanumeric characters)
TXTYPE	the type of transactions with which the wire center can be updated, including the following: tns - telephone number swaps ccf - custom calling feature changes mch - hunt group sequence changes
FILE NAME	the name of the update file in the OSS system where the transactions will be stored (up to 32 alpha- numeric characters)
MAX FILE SIZE	the maximum size (in kilobytes) of the OSS update file. If you do not type a value, it is assumed that there is no limit to the size of the file.
UPDATE COMMAND	the OSS command that submits the updates to the OSS database, for example, "que" for COSMOS
SWITCH and ENDSWITCH	a list of the switch IDs associated with the wire center. SWITCH indicates the beginning of the list and ENDSWITCH indicates the end.

(The description of each computer ends with the following parameter.)

ENDHOST	indicates the end of the description for a computer

3.22 The following steps show how to display the update control file. For instructions explaining how to use the vi editor, refer to the *DVIX V User's Reference Guide*.

(1) Sign on to the DNC-500, using a valid userID and password.
==> The BNM Main Menu appears.

(2) Select "COSMOS Administration" and press **RETURN.**
==> The COSMOS Administration menu appears.

(3) To change the update control file, press ***<Modify>*** (or type "6" and press **RETURN**).
==> The vi text editor is invoked and the update control file appears.

(4) Make the required changes to the file. To make changes, refer to the explanation of the control file parameters and values at the beginning of this section.

(5) When you are finished updating the file, type ":wq" to save your changes and exit the vi editor. To exit without saving your changes, type ":q!".
==> The COSMOS Administration menu reappears.

(6) When you are finished with COSMOS administration, press ***<Exit>*** (or type "1" and press **RETURN**).
==> The BNM Main Menu appears.

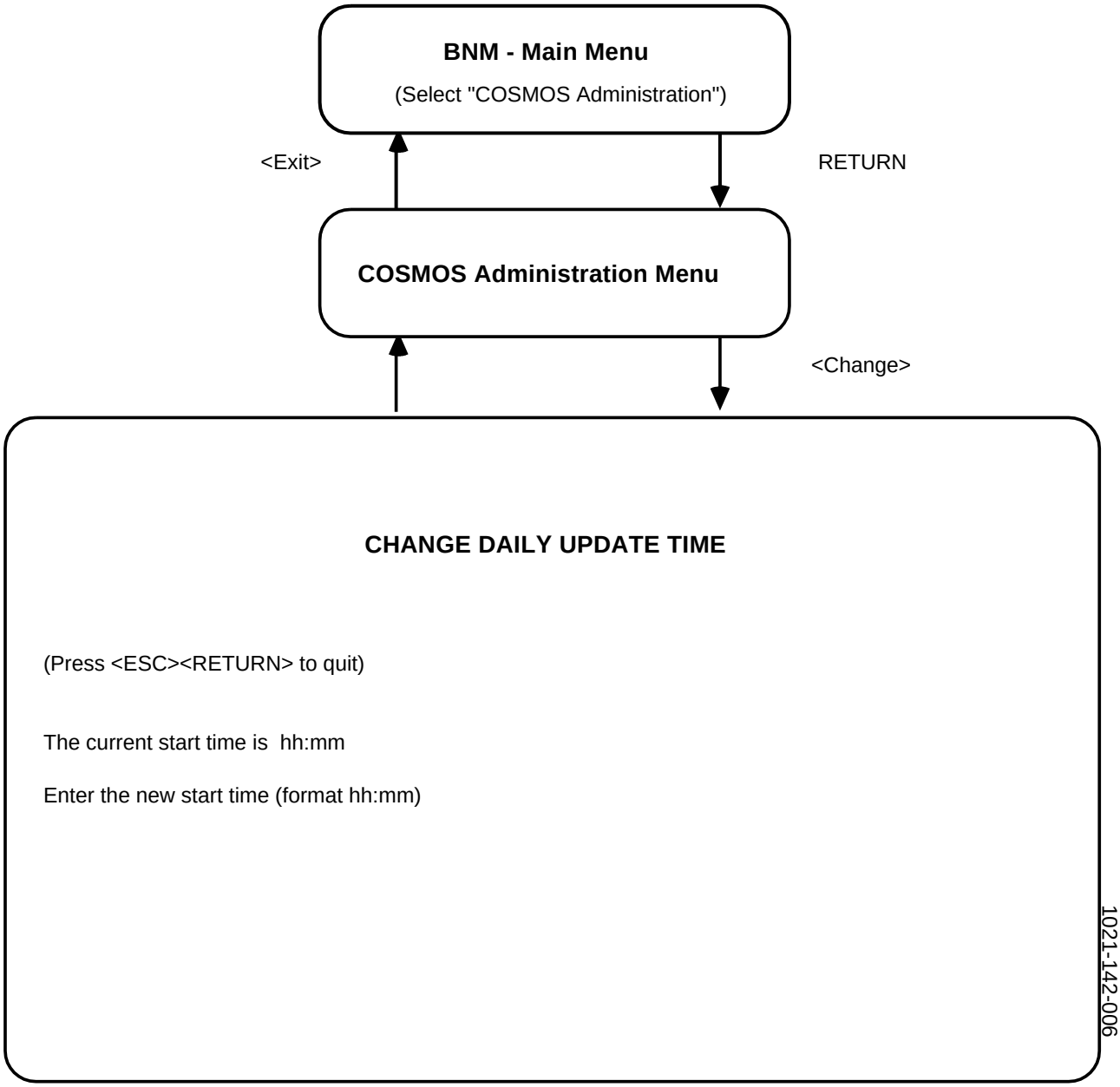

Fig. 3-11
Changing the Update Time

CHANGING THE UPDATE TIME

3.23 Updates to the COSMOS systems are sent once a day. You can schedule the time when the updates are sent. The following steps show how to change the time and Figure 3-11 illustrates the screens.

(1) Sign on to the DNC-500, using a valid userID and password.
==> The BNM Main Menu appears.

(2) Select "COSMOS Administration" and press **RETURN.**
==> The COSMOS Administration menu appears.

(3) To change the daily update time, press **<*Change*>** (or type "7" and press **RETURN**).
==> The Change Daily Update Time screen appears. It displays the current start time for the daily update and prompts for a new start time.

(4) Type a new start time using the hh:mm format (24-hour clock), then press **RETURN.** For example, to start the update at 11:15 p.m., type 23:15.
==> The COSMOS Administration menu reappears.

(5) When you are finished with COSMOS Administration, press **<*Exit*>** (or type "1" and press **RETURN**).
==> The BNM Main Menu appears.

SAE AND HSC SCHEDULING

3.24 If you have access to DVIX, you can schedule the HSC and SAE processes independently and not use the automatic daily update feature. You may want to schedule this way; for example, to start a number of HSC processes at the same time to update a number of OSSs concurrently.

3.25 The SAE and HSC processes can be started periodically and independently using the DVIX "cron" facility. Cron is a system process that runs constantly and invokes other processes at predefined times. The processes are defined in a special file, called cronfile, which is located in the DVIX "crontab" directory. To schedule the processes, you submit a cronfile using the "crontab" command.

Note: For a detailed explanation of these commands, refer to the *DVIX V Administrator's Reference Manual, DVIX V User's Reference Manual* and "Setting up the System" in the *DVIX V Administrator's Guide.*

3.26 You can find an example of a cronfile, called "hducronfile", in the /usr/hdu directory. This file has a number of lines and each line has six fields separated by spaces. The first five fields specify when the processes should start and the sixth field specifies the command and arguments for the HDU processes.

3.27 To define when a process should start and how frequently it runs, you fill in the first five fields as defined below. The acceptable range of values for each field is shown in brackets.

- minute (0 through 59)
- hour (0 through 23)
- day of the month (1 through 31)
- month of the year (1 through 12)
- day of the week (0 through 6; 0 represents Sunday)

3.28 You can type a list of values for a field, separated by commas. For example, suppose you want a process to run on the first and fifteenth of the month; you would type "1,15" for the day-of-the-month field. For a range of numbers, you type two numbers separated by a hyphen. To select all values for a field, you type an asterisk (*). For example, if you type an asterisk for the day-of-the-week field, it means that the process will run every day.

3.29 The day the process runs can be specified by two fields-the day-of-the-month and the day-of-the-week fields. If you use both fields, they are both adhered to. For example, if you type "0 0 1,15 * 1", the process will

3.29 The day the process runs can be specified by two fields-the day-of-the-month and the day-of-the-week fields. If you use both fields, they are both adhered to. For example, if you type "0 0 1,15 * 1", the process will run at midnight on the first and the fifteenth of the month, as well as every Monday. To specify the days using only one field, type "*" for the other field. For example, "0 0 * * 1" would run the process only on Mondays.

3.30 The sixth field specifies the process and their arguments. The SAE process is executed with two arguments as follows (the text in italics indicates information you must provide):

sae -h *hduroot* -s *sarcroot*

where:

-h *hduroot*	This argument specifies the full pathname for the hdu root directory. (When the software was installed, the pathname was /usr/hdu.)
-s *sarcroot*	This argument specifies the full pathname for the SARC directory where the SARC files are located.

3.31 The HSC process is executed with the following arguments:

hsc -h *hduroot* -a|-f *file*|-l *host list*

where:

-h *hduroot*	This argument specifies the full pathname for the hdu root directory. (When the software was installed, the pathname was /usr/hdu.)
-a	This argument specifies that all OSS computers listed in the HDU control file will be updated. No other argument is required.
-f *file*	This argument specifies that all OSS computers listed in the specified file will be updated; for example, -f /usr/hdu/update.list.
-l *host list*	This argument specifies that the OSS computers listed will be updated; for example, -l cosmos1 cosmos2.

4. HMS CONFIGURATION

4.01 This section describes the information used to configure the Host Mediation Services (HMS) for the host database update (HDU) application. The following values are used specifically for the Business Network Management-to-Computer System for Mainframe Operations (BNM-COSMOS) interface. To enter these values, the HMS system administrator uses the HMS configuration services.

Host Details

4.02 These are the values required for the parameters appearing on the Host Details screen:

Idle Timeout Max Data Transfer Time Between RO	set to zero (the default value)
Idle Seq Connecting Sequence	leave blank
Dial Sequence	specify the telephone number used to access the COSMOS system or the statmux
HMS Type	specify "cosmo" for the HMS type
Host Name	specify a unique name identifying the COSMOS system. This should be the same name specified in the HDU control file
Port Locations	specify the physical location of the communication port; for example, "/dev/tty04"
P1	if it is required to go through a statmux to establish a connection, specify the telephone office ID (for example, nt) required to connect the statmux to the correct COSMOS computer. Specify "nomux" if the connection is established directly without a statmux
P2	specify the wire center ID associated with the telephone office ID specified for P1 above

HMS Types

4.03 These are the values required for the parameters appearing on the HMS List screen:

RO Queue Size	10
Number of VCEs	5
Number of HDE-VTEs	5
OM Update Interval	0
Queuing Delay Threshold	9999

VT Profile

4.04 These are the values required for the parameters appearing on the VT Profile List screen:

New Line	OFF
Auto Wrap	ON
Local Echo	OFF
Application Keypad	OFF
Tabs	no tab settings required

Port Profile

4.05 These are the values required for the parameters appearing on the ASYNC Port Profile Details screen:

Flow Control	XON/XOFF
Line Control	full duplex
Auto Echo	OFF
Baud Rate	1200
Character Size	7 bits
Stop Bits	1 bit
Parity Type	even
Modem Type	Hayes* 1200

*Hayes is a trademark of Hayes Corporation.

5. ERROR MESSAGES

5.01 Error messages appear in journal files. Journal files are created for each Operations Support System (OSS) update session and contain a series of messages that record the progress of the session. Whenever there is a problem, an error message appears in the journal file. You can find an explanation of these error messages in the following tables. Table 5-A shows error messages you find in the station administration extraction (SAE) journal file and Table 5-B shows error messages in the host session control (HSC) journal file. The messages are listed in alphabetical order. For some messages, the text appearing in italics indicates that the system provides that information when the message is generated.

Table 5-A
SAE JOURNAL FILE ERROR MESSAGES

Error Message	What happened and what to do
A host type parameter is missing, will process next host type.	In the host database update (HDU) control file, a value has not been typed for the host type parameter. Modify the HDU control file, then manually resume the update session, or wait and the update will be performed automatically at the next scheduled update session.
Cannot identify host with appropriate parameters.	The values typed for the parameters in the HDU control file are not correct. Modify the HDU control file, then manually resume the update session, or wait and the update will be performed automatically at the next scheduled update session.
Cannot open HDU control file.	The HDU control file was not found in the hdu root directory or you have been denied access to the control file because you are not the owner of the file or you have not have been assigned permissions for the file. The superuser can use the DVIX command, "chown", to change the file's ownership or the "chmod" command to change your permissions for the file.
Host name parameter is missing for host type: *host name.*	In the HDU control file, a value has not been typed for the host name parameter. Modify the HDU control file, then manually resume the update session, or wait and the update will be performed automatically at the next scheduled update session.
Error Message	**What happened and what to do**

Table Continued ----------

Table 5-A Continued
SAE JOURNAL FILE ERROR MESSAGES

Error Message	What happened and what to do
Invalid HDU control file, no update type found.	In the HDU control file, a value has not been typed for the update parameter. Modify the HDU control file, then manually resume the update session, or wait and the update will be performed automatically at the next scheduled update session.
Invalid host transaction type. Host: *host name*, wire center: *wire center name* will not be processed.	In the HDU control file, for the host and wire center indicated in the message, a value typed for the transaction type is not correct. Modify the HDU control file, then manually resume the update session, or wait and the update will be performed automatically at the next scheduled update session.
Invalid wire center for host: *host name*.	In the HDU control file, the value typed for the wire center is not correct. Modify the HDU control file, then manually resume the update session, or wait and the update will be performed automatically at the next scheduled update session.
Invalid switchid, host: *host name*, wire center: *wire center name* will not be processed.	In the HDU control file, for the host and wire center indicated in the message, the value typed for the switch ID is not correct. Modify the HDU control file, then manually resume the update session, or wait and the update will be performed automatically at the next scheduled update session.
Missing transaction type: Host: *host name*, wire center: *wire center name* will not be processed.	In the HDU control file, for the host and wire center indicated in the message, the value typed for the transaction type is not correct. Modify the HDU control file, then manually resume the update session, or wait and the update will be performed automatically at the next scheduled update session.
No transaction type specified: Host: *host name*, wire center: *wire center name* will not be processed.	In the HDU control file, for the host and wire center indicated in the message, a value has not been typed for the transaction type. Modify the HDU control file, then manually resume the update session, or wait and the update will be performed automatically at the next scheduled update session.

Table Continued ----------

Table 5-A Continued
SAE JOURNAL FILE ERROR MESSAGES

Error Message	What happened and what to do
No switchid, host: *host name,* wire center: *wire center name* will not be processed.	In the HDU control file, for the host and wire center indicated in the message, switch IDs have not been typed for the switch parameter. Modify the HDU control file, and add the appropriate switch IDs. Then, manually resume the update session, or wait and the update will be performed automatically at the next scheduled update session.
Too many transaction types. Host: *host name,* wire center: *wire center name* will not be processed.	In the HDU control file, for the host and wire center indicated in the message, too many transactions types have been typed. You can type up to three transaction types. Modify the HDU control file, then manually resume the update session or wait and the update will be performed automatically at the next scheduled update session.
SAE progam aborted.	The Station Administration Extraction (SAE) process has been aborted; the remaining station administration recent changes (SARC) files will be processed at the next scheduled update session. You can manually resume the update to process the remaining files.
Switch ID for SARC record not found in HDU control file: *switch ID name.*	The switch ID for a SARC record does not match any of the switch IDs in the HDU control file. Modify the HDU control file and add the missing switch ID. Then, move the SAE error file to the appropriate SARC directory. The SARC record will be processed again at the next scheduled update session.
Unlink failed for SARC file: *SARC file name.*	You have been denied access to the specified SARC file because you have not have been assigned permissions for the file. The superuser can use the DVIX command, "chmod", to change your permissions for the file. The file should be removed manually so that it is not processed again.

Table 5-B
HSC JOURNAL FILE ERROR MESSAGES

Error message	What happened and what to do
Cannot access changes files.	The HSC process has aborted the update for the wire center because it could not access the changes file for the wire center. The superuser must verify the file access permissions for the changes files.
Cannot access changes files for wire center: *wire center name.*	The HSC process has aborted the update for the wire center because it could not access the changes file for the wire center. The HSC process continues processing the remaining wire centers. The superuser must verify the file access permissions for the changes files.
Cannot open HDU control file.	The HDU process control file was not found in the hdu root directory or you have been denied access to the control file because you are not the owner of the file or you have not have been assigned permissions for the file. The superuser can use the DVIX command, "chown", to change the file's ownership or the "chmod" command to change your permissions for the file. The HSC process stops processing.
Cannot process changes files. Remote host's update size limit reached.	The HSC process has stopped the transfer of transactions for the wire center because the remote host's update file has reached its maximum size. The remaining transactions for this host will be transferred at the next scheduled update, or you can manually resume the session. The HSC process continues processing with the next host.
Error reading directory for wire center: *wire center name.*	The HSC process could not use the directory for the wire center indicated in the message. Modify the HDU control file and type the correct directory. Then, manually resume the update session, or wait and the update will be performed automatically at the next scheduled update session. The HSC process continues processing with the next host.

Table Continued ----------

Table 5-B Continued
HSC JOURNAL FILE ERROR MESSAGES

Error message	What happened and what to do
Error reading password.	The HSC process could not access the remote host using the password in the HDU control file. Modify the HDU control file and type the correct password. Then, manually resume the update session, or wait and the update will be performed automatically at the next scheduled update session. The HSC process continues processing with the next host.
Error reading user ID.	The HSC process could not access the remote host using the userID in the HDU control file. Modify the HDU control file and type the correct userID. Then, manually resume the update session, or wait and the update will be performed automatically at the next scheduled update session. The HSC process continues processing with the next host.
Host not found in HDU control file.	The HSC process has aborted the update for the host because it was not in the HDU control file. Modify the HDU control file and add the host. Then, you can manually resume the update session for this host, or wait and the update will be performed automatically at the next scheduled update session. The HSC process continues processing with the next host.
Invalid control parameter.	The HSC process has stopped processing because it has encountered a problem with the HDU control file. A value typed for one of the parameters in the file is incorrect. Check the HDU control file and make the corrections. You can manually resume the update session for the hosts, or wait and the update will be performed automatically at the next scheduled update session.

Table Continued ----------

Table 5-B Continued
HSC JOURNAL FILE ERROR MESSAGES

Error message	What happened and what to do
Lost communication with remote host: problem: *problem number*, reason: *reason number*.	The HSC process has aborted the update because it lost communications with the remote host. You can manually resume the update session for this host (with the remaining wire centers), or wait and the update will be performed automatically at the next scheduled update session. The HSC process continues processing with the next host. The problem numbers appearing in the message are explained below and the reason numbers are explained in Table 5-C. 1 The problem was momentary. The HSC process made three attempts and then quit. Try again. 2 The problem is temporary. Try again later. 3 This is a permanent communication problem. The HMS system administrator should look into the problem.
No response from host: *one of the following messages appears:* - statmux not responding - statmux not responding to ID. - no login prompt received. - password prompt received. - no wire center prompt received after login. - no command line prompt received after login.	The HSC process has aborted the update for the host because of the problem indicated in the message. You can manually resume the update session for this host or wait and the update will be performed automatically at the next scheduled update session. The HSC process continues processing with the next host.
No response from host: *one of the following messages appears:* - command line prompt not received - when attempting to change wire center. - when attempting to remove old update file. - when attempting to edit new update file.	The HSC process has aborted the update for the wire center because of the problem indicated in the message. The HSC process continues processing the remaining wire centers. You can manually resume the update session for this wire center, or wait and the update will be performed automatically at the next scheduled update session.

Table Continued ----------

Table 5-B Continued
HSC JOURNAL FILE ERROR MESSAGES

Error message	What happened and what to do
No response from host: *one of the following messages appears:* - when attempting to save and quit the update. - after executing update.	The HSC process has aborted the update for the host because it could not invoke the commit operation on the remote host. You can manually resume the update session for this host, or wait and the update will be performed automatically at the next scheduled update session. The HSC process continues processing with the next host.
No response to dial-in: problem: *problem reason*, reason: *reason number*.	The HSC process has aborted the update for the host because there was a problem dialing up the remote host. You can manually resume the update session for this host, or wait and the update will be performed automatically at the next scheduled update session. The HSC process continues processing with the next host. The problem numbers appearing in the message are explained below and the reason numbers are explained in Table 4-C. 1 The problem was momentary. The HSC made three attempts and then quit. Try again. 2 The problem was temporary. Try again later. 3 This is a permanent communication problem. The HMS system administrator should look into the problem.
No update data for wire center: *wire center name*.	The HSC process did not find any update data for the wire center. No action is required. The HSC process continues processing with the next wire center.
Unable to invoke an SA transaction remote operation.	The HSC process has lost communications with the remote host and has aborted the update for the current wire center, as well as all remaining wire centers for the host. You can manually resume the update session for this host, or wait and the update will be performed automatically at the next scheduled update session. The HSC process continues processing with the next host.

Table Continued ----------

Table 5-B Continued
HSC JOURNAL FILE ERROR MESSAGES

Error message	What happened and what to do
Unable to invoke commit operation.	The HSC process has aborted the update for the host because it could not invoke the commit operation on the remote host; for example, due to an HMS problem. You can manually resume the update session for this host, or wait and the update will be performed automatically at the next scheduled update session. The HSC continues processing with the next host.
Unable to invoke host entry mode.	The HSC process has aborted the update for the wire center because it could not invoke the host entry mode on the remote host; for example, due to an HMS problem. The HSC process continues processing the remaining wire centers. You can manually resume the update session for this wire center, or wait and the update will be performed automatically at the next scheduled update session.
Unable to invoke logon.	The HSC process has aborted the update for the host because it could not logon to the remote host; for example, due to an HMS problem. You can manually resume the update session for this host, or wait and the update will be performed automatically at the next scheduled update session. The HSC process continues processing with the next host.
Unable to locate an HMS instance.	The HSC process has aborted the update for the host because it could not locate a running HMS instance; for example, due to an HMS problem. You can manually resume the update session for this host, or wait and the update will be performed automatically at the next scheduled update session. The HSC process continues processing with the next host.
Unable to logout.	The HSC process was not able to logout from the remote host; for example, due to an HMS problem. Dial up the remote host using a terminal and perform the logout manually.

5.02 Since HDU uses HMS, when HMS encounters communications problems, HDU encounters problems as well. Table 5-C describes the reasons for the HMS problems and what to do about them.

Table 5-C
REASONS FOR COMMUNICATION PROBLEMS

Reason number	What it means and what to do
3	The required HMS instance has been taken out of service. The HMS system administrator can use the HMS maintenance services to put the instance back into service.
4	The remote operation (RO) queue size has been exceeded. The HMS system administrator can use HMS configuration services to increase the amount for the RO queue size on the HMS List screen.
5	There is a shortage of resources. The HMS system administrator can reduce the number of RO users (local applications) running concurrently, increase the amount for the number of VCEs or the number of HDE-VTEs on the HMS list screen, reduce the number of processes running concurrently, or install a second DVIX processor.
9	An RO has been requested after a session has been released. This could happen; for example, when a temporary problem was encountered and the session was released.
10	There is a problem with memory. The number of allocated memory segments has exceeded the limit imposed by the system. The HMS system administrator can reduce the number of applications running concurrently or install a second DVIX processor.
11	The number of message queues has exceeded the limit imposed by the system. The HMS system administrator can reduce the number of applications running concurrently and using message queues.
13	The HMS instance could not access a device driver; for example, because it was busy.
14	There was a temporary problem preventing HMS from communicating with a remote host; for example, no carrier was available or the line was busy.

Table Continued ----------

Table 5-C Continued
REASONS FOR COMMUNICATION PROBLEMS

Reason number	What it means and what to do
15	A binary file could not be executed because there is a problem with the arguments or the file name. The HMS system administrator can correct the number and types of arguments to execute the binary file.
17	The HMS instance encountered a problem when reading the host configuration data because it could not access or read the file, it found an invalid field in the file, or it found the size of the file was incorrect. The HMS system administrator can use the DVIX command, "chmod", to change the permissions for the file or the directory. Or, if there is a problem with the file, the system administrator can use the DVIX command, "rm", to delete the file, then use the configuration services to type the configuration data for the host again and create a new file.
18	The HMS instance encountered a problem when reading the port configuration data because it could not access or read the file, it found an invalid field in the file, or it found the size of the file was incorrect. The HMS system administrator can use the DVIX command, "chmod", to change the permissions for the file or the directory. Or, if there is a problem with the file, the system administrator can use the DVIX command, "rm", to delete the file, then use the configuration services to type the configuration data for the host again and create a new file.
19	The HMS instance encountered a problem when reading the terminal configuration data because it could not access or read the file, it found an invalid field in the file, or it found the size of the file was incorrect. The HMS system administrator can use the DVIX command, "chmod", to change the permissions for the file or the directory. Or, if there is a problem with the file, the system administrator can use the DVIX command, "rm", to delete the file, then use the configuration services to type the configuration data for the host again and create a new file.
20	A communications problem has occurred because of an invalid port address. The HMS system administrator can use the configuration services to make sure the port addresses typed for the remote host are correct.

6. LOG MESSAGES

6.01 The host database update (HDU) application generates log messages that record normal occurrences, as well as abnormal occurrences such as error conditions. The log messages plot the progress of update sessions and help you monitor the sessions. The Dynamic Network Control (DNC)-500 log subsystem is used to store and display log messages. For instructions explaining how to use the DNC log subsystem to display the log messages, refer to the *Guide to DNC Logs and Alarms, 450-1011-511*.

6.02 The following messages are reported by the Operations Support System (OSS) Station Administration (SA) Changes Update program resource unit (PRU). The report number is 0001 for all of these messages and the error number is shown in the left column for each message.

ERROR NUMBER

0001

Message: Software error.

Meaning: A call to a system function or a Host Mediation Services (HMS) function has returned an error code. The severity of this event is major.

Action: Report this software problem to the software support group.

0002

Message: Starting an SAE instance.

Meaning: A station administration entity (SAE) instance has been successfully initiated.

Action: None.

0003

Message: An SAE instance is already running, second instance cannot be initiated.

Meaning: The SAE instance has been aborted because another instance is already running. The severity of this event is minor.

Action: Wait for the current instance to terminate before initiating another instance.

0004

Message: Invalid SAE calling arguments. SAE usage: sae -h <hduroot> -s <sarcroot>.

Meaning: An SAE instance was called with invalid arguments. The run-time data identifies the incorrect arguments. The severity of this event is minor.

Action: Re-initiate the SAE instance with the correct arguments using the following format: sae -h <hduroot> -s <sarcroot>.

0005

Message: Terminating an SAE instance.

Meaning: An SAE instance has terminated. If the message "SAE program ended normally" appears for the run-time data, then the SAE has correctly processed the station administration recent changes (SARC) files. However, if the message, " SAE program aborted" appears, then a major problem has occurred and only part of the SARC file was processed.

Action: If the SAE program was aborted, check previous log messages and the SAE journal files for the cause of the error.

0006

Message: Error reading HDU control file.

Meaning: The SAE or host session control (HSC) instance has encountered a format error within the HDU control file. The run-time data indicates the type of error. The severity of this event is major.

Action: Correct the error within the HDU control file and re-initiate the instance.

0007

Message: Insufficient memory to create the host routing table.

Meaning: The SAE instance was aborted because there was not enough memory to create the host routing table. The severity of this event is major.

Action: Configure the HDU application on a processor with enough memory.

0008

Message: Cannot access HDU subdirectory.

Meaning: An SAE instance was not able to create or read from the specified HDU subdirectory (the changes, saejournal, or saeerror) because the user does not have the execute (x) permission. The run-time data identifies the directory. The severity of this event is major.

Action: The superuser can use the DVIX command, "chmod", to change the execute permissions for the specified HDU subdirectory.

0009

Message: Cannot read/write/create a changes file.

Meaning: The SAE instance was not able to read, write, or create a changes file because the user does not have the correct permissions. The run-time data identifies the problem. The severity of this event is major.

Action: The superuser can use the DVIX command, "chmod", to change the user's permissions for the file.

0010

Message: Cannot read/write/create a SAE or HSC error file.

Meaning: The SAE or HSC instance was not able to read, write, or create the error file because the user does not have the correct permissions. The run-time data identifies the problem. The severity of this event is major.

Action: The superuser can use the DVIX command, "chmod", to change the user's permissions for the file.

0011

Message: Cannot read SARC file.

Meaning: The SAE instance was not able to read the SARC file because the user does not have the read (r) permission. The run-time data identifies the error type. The severity of this event is minor.

0011

Message: Cannot read SARC file.

Meaning: The SAE instance was not able to read the SARC file because the user does not have the read (r) permission. The run-time data identifies the error type. The severity of this event is minor.

Action: The superuser can use the DVIX command, "chmod", to change the user's permissions for the file.

0012

Message: Unable to request a remote operation, communication problem with HMS.

Meaning: The HSC instance was not able to request a remote operation (RO) because of a communications problem with the HMS instance. The run-time data identifies the RO that was requested. The severity of this event is major.

Action: Using the maintenance services of HMS administration, make sure that an HMS instance is running.

0013

Message: Return error indication received from a remote operation request. Update for wire center was aborted.

Meaning: The HSC instance received a return error from an RO request. The run-time data identifies the host and wire center that could not be updated, along with the problem RO. The severity of this event is minor.

Action: Refer to the associated HSC journal file for more details on the error.

0014

Message: Cannot create the SAE journal file.

Meaning: The SAE instance was not able to create the journal file because the user does not have the write (w) and execute (x) permissions for the SAE journal directory. The severity of this event is major.

Action: The superuser can use the DVIX command, "chmod", to change the user's permissions for the SAE journal directory.

0015

Message: Maximum number of HSC instances already running: (max = 8) cannot initiate new HSC instance.

Meaning: The HSC instance could not be initiated because the maximum number of HSC instances is already running. The severity of this event is minor.

Action: Wait for the HSC instances that are currently running to finish.

0016

Message: Invalid HSC calling arguments. HSC usage: hsc -h <hduroot> -a|-f|-l[host list]

Meaning: The HSC instance was called with invalid arguments. The run-time data identifies the incorrect argument. The severity of this event is minor.

Action: Re-initiate the HSC instance with the correct arguments in the following format: hsc -h <hduroot> -a|-f <file>|-l [host list]. See the section, "SAE AND HSC SCHEDULING", for details.

0017

Message: Insufficient memory to create host access table.

Meaning: The HSC instance was aborted because there was not enough memory to create the host access table. The severity of this event is major.

Action: Configure the HDU application on a processor with sufficient memory.

0018

Message: Terminating an HSC instance.

Meaning: An HSC instance has terminated. If the message "HSC program ended normally" appears for the run-time data, then the HSC has correctly processed data without a major error. However, if the message "HSC program aborted" appears, then a major problem has occurred and only part or none of the host was updated.

Action: If the HSC program was aborted, check previous log messages and the HSC journal file for the cause of the error.

0019

Message: Cannot create the HSC journal file.

Meaning: The HSC instance was not able to create the HSC journal file because access permissions for the journal subdirectory were not correct. The severity of this event is major.

Action: Make sure that the HSC journal subdirectory has the write (w) and execute (x) permissions. The superuser can use the DVIX command, "chmod", to change the permissions.

0020

Message: Number of hosts to be updated by a single HSC instance exceeds the allowable limit of 50. Only the first 50 hosts will be updated.

Meaning: The HSC instance has updated the maximum number of hosts for a single instance. The changes files for the remaining hosts will not be processed. The severity of this event is minor.

Action: Reduce the number of hosts to be updated to 50 or less, then initiate another HSC instance to process the remaining hosts.

0021

Message: Starting an HSC instance.

Meaning: The HSC instance has been initiated. The run-time data identifies the parameters that have been provided to the HSC instance.

Action: None.

7. DNC REQUIREMENTS

7.01 The host database update (HDU) application operates in the DVIX environment, which is the Northern Telecom (NT) version of UNIX. DVIX does not use program resource units (PRUs), it uses DVIX processes for its software operations. The following sections describe the software and hardware requirements for the HDU application.

Software Requirements

7.02 The minimum software requirements are as follows:

- Dynamic Network Control (DNC)-500 system operating with a network software release of NSR28 or higher
- Business Network Management (BNM) network software release of NSR28 or higher
- Host Mediation Services (HMS) software release of HMS 1.0 or higher
- Host Database Update (HDU) software release of NSR28 or higher

Hardware Requirements

7.03 In addition to the standard DNC-500 hardware configuration required for BNM, the following hardware is also required:

- a 68020 SCSI file processor
- a 7-megabyte memory
- a 350-megabyte (SCSI) disk storage
- an APIO-configured LIU port
- a Hayes-compatible modem (for example, at 1200 baud)

8. FORMS

8.01 This chapter shows the form for the host database update (HDU) control file and explains how to complete the form. At the end of this chapter, there is a blank form that you can photocopy.

8.02 This form, shown in Figure 8-1, is completed with the information required for the HDU control file. This file stores the names of the different Operations Support System (OSS) computers, the wire center names, as well as the userIDs, and corresponding passwords. The HDU control file is used throughout an update session.

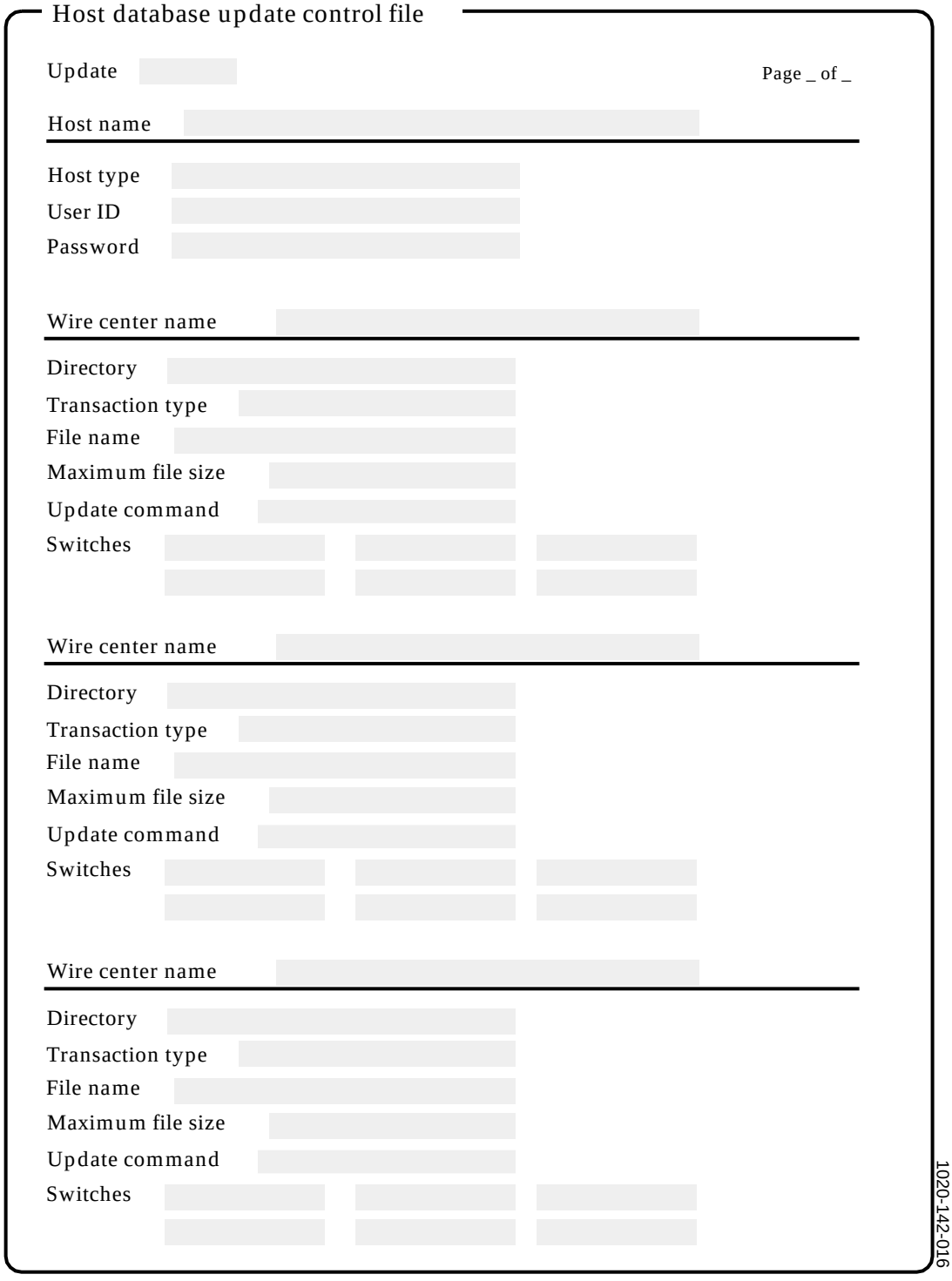

Fig. 8-1
Form for the HDU Control File

Completing the Form

8.03 You complete one of these forms with information describing each remote host. For example, for the Business Network -to-Computer System for Mainframe Operations (BNM-COSMOS) interface you would enter information on the form for each COSMOS computer. The information required can usually be supplied by the telco administrator of the remote host. At the end of this chapter there is a blank form you can photocopy to enter information for a number of remote hosts and associated wire centers. The following table explains the information required for the form. Field name is the name of the field appearing on the form, Size is the number of alphanumeric characters you can enter, and Description tells you what to enter on the form.

Field name	Size	Description
Update	1	Enter an "s", "d", "i", or "l" to specify which station administration (SA) changes are to be processed (based on where the changes originate). This parameter is specified once, at the beginning of the control file, and all OSS computers defined in the file are updated with the type of SA changes specified. Any combination of the values "s", "d", "i", and "l", can be typed. s - (SOP), SA changes that originated from BNM d - SA changes that originated from the switch (database synchronization) i - SA changes performed at the initial load l - SA changes that originated from a local update ***Note:*** Refer to the BNM Station Administration NTP for more information about SA changes.
Host name	8	Enter the name of the OSS computer.
Host type	4	This is the type of OSS system, which can be COS for COSMOS, or COSN for Northbrook COSMOS.
User ID	16	Enter the userID that will be used to logon to the computer.
Password	16	Enter the corresponding password for the userID above.
Wire center	14	Enter the name of the wire center.
Directory	32	Enter the name of the directory in the OSS system where the update file for the wire center will be created.

Field name	Size	Description

Field name	Size	Description
TX type	3	Enter the type of transactions with which the wire center can be updated. The possible transactions types are as follows: tns - telephone number swaps ccf - custom calling feature changes mch - hunt group sequence changes
File name	32	Enter the name of the update file in the OSS system where the transactions will be stored.
Maximum file size	-	Enter the maximum file size, in kilobytes, for the OSS update file.
Update command	-	Enter the OSS command that submits the updates to the OSS database; for example, "que" for COSMOS.
Switches	-	Enter the list of switch IDs associated with the wire center.

Host database update control file

Update

Page _ of _

Host name

Host type
User ID
Password

Wire center name

Directory
Transaction type
File name
Maximum file size
Update command
Switches

Wire center name

Directory
Transaction type
File name
Maximum file size
Update command
Switches

Wire center name

Directory
Transaction type
File name
Maximum file size
Update command
Switches

1020-142-016

9. ABBREVIATIONS

9.01 The following list defines the abbreviations and acronyms used throughout this NTP.

ASCII	American Standard Code for Information Interchange
APIO	ASCII Programmed Input/Output
ASYNC	Asynchronous
BNM	Business Network Management
ccf	custom calling feature
COSMOS	Computer System for Mainframe Operations
DMS	Digital Multiplex System
DNC	Dynamic Network Control
DVIX	UNIX environment for the DNC
gfr	general facility report
HD	Host Dialog
HDE	Host Dialog Entity
HDL	Host Dialog Language
HDU	Host Database Update
HMS	Host Mediation Services
HSC	Host Session Control
ID	Identification
LAN	Local Area Network
LIU	LAN Interface Unit
mch	make change huntgroup sequence
NSR	Network Software Release
NT	Northern Telecom
NTP	Northern Telecom Publication
OSS	Operations Support System

PRU	Program Resource Unit
r	read (permission)
RO	Remote Operation
SA	Station Administration
SAE	Station Administration Extraction
SARC	Station Administration Recent Changes
SCSI	Small Computer System Interface
serr	SAE error
sjnl	SAE journal file
telco	telephone operating company
TN	Telephone Number
tns	telephone number swap
tx type	transaction type
VCE	Virtual Connection Entity
VTE	Virtual Terminal Entity
vi	visual (editor)
WC	Wire Center
w	write (permission)
x	execute (permission)