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STAR 2000™

STAR PHARMACY
MICROMEDEX® Access Guide

Release 17.0
October 2011

P17000111

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Publication date

October 2011

Produced in Cork, Ireland

Product and version

STAR 2000 Release 17.0

Publication number

P17000111

Reader comments

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STAR 2000 Documentation Team
McKesson
Mail Stop ATHQ-3302
5995 Windward Parkway
Alpharetta, GA 30005

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Preface

The *STAR Pharmacy MICROMEDEX® Access Guide* describes the access available from STAR Pharmacy to MICROMEDEX® Computerized Clinical Information System® (CCIS®), a stand-alone PC- and CD-ROM-based online clinical and pharmaceutical database system. The access software enables STAR users to access information on the MICROMEDEX system about drug therapy, drug manufacturer's identification, toxic substances, and emergency care procedures. In addition, STAR users can print output from the MICROMEDEX system on printers attached to the STAR system.

STAR users can access the MICROMEDEX system through a Transport Control Protocol/Internet Protocol (TCP/IP) interface. This access enables up to 254 users to access the MICROMEDEX system at the same time, depending on the number of seats in your license with MICROMEDEX. STAR users still have the option of defining the interface as asynchronous, as in the past. Under the asynchronous interface, you can provide simultaneous access for up to seven STAR users.

The *MICROMEDEX Access Guide* provides information about installation, user functions, and printing capabilities. It also provides technical information about control characters and checksum calculations.

NOTE: The *MICROMEDEX Access Guide* assumes that STAR Patient Care and STAR Pharmacy are on the same CPU. If they are not on the same CPU in your hospital and you want to implement the MICROMEDEX Access, contact your McKesson technical advisor.

For more information about the MICROMEDEX software, call MICROMEDEX, Inc., at 1-800-525-9083.

NOTE: Although the MICROMEDEX Access software is most commonly used in STAR Pharmacy and STAR Patient Care, users of any product in the STAR network that has set up the MICROMEDEX Access software can access the MICROMEDEX system. The MICROMEDEX Access software must be purchased from McKesson.

Documentation Conventions

Documentation for McKesson's STAR 2000™ line of products follows these conventions:

Revisions
Text revisions are indicated by a change bar in the left margin. Paragraphs that contain grammatical changes that do not affect content are not marked.

Canadian Documentation
This volume may include documentation for Canadian users of this product. Complete sections of Canadian text are identified by "CN" and "CN Only."

Key Names
Named keys, such as SHIFT, CTRL, ALT, and ENTER, are displayed in this document in uppercase (capital) letters. A symbol key is written as text in this document followed by the symbol in parentheses, such as hyphen (-) and asterisk (*).

Key Chords
Key chords are key entries that require you to hold down one or more keys (typically, CTRL, ALT, or SHIFT) before pressing another key. In this document, key chords are displayed as the names of each key in the chord separated by a hyphen (-) (for example, CTRL-ALT-DEL).

Enter
ENTER is a key on a computer keyboard used to complete an entry on a STAR system. (This key may also be referred to as NEW LINE or NL in the STAR system.)

Data Entries
Letters or words you enter in response to the system are displayed in **bold** letters in this document. For example: Enter **Y** for Yes or **N** for No.

Selecting an Entry
This document often instructs you to "select an entry." The method you use to select an entry depends on whether you are using STAR from a terminal or IBM-compatible personal computer. Entry methods include:

- Entering the option number
- Using your arrow keys to highlight the option and pressing ENTER
- Clicking on the option using a mouse or other pointing device (PC only)

For more information about these options, see the *General Information Volume*.

Prompts
System prompts are displayed at the bottom of many STAR screens when the system requests an entry or displays a message. In this document, these prompts are indented and the text italicized, as shown in the following example:

Enter patient name--

Field Characteristics

STAR product documentation provides field explanation codes, in addition to a narrative description for each field on a screen. These codes display the maximum length of your entry in the field, the type of entry you make in the field, and whether the field is required. This information displays in the following format:

- DISPLAY ONLY for a field you cannot edit.
- For X-YY-Z field types, where:
  - X is the maximum number of characters permitted in the field:
    - P for a field length determined by a Parameter
    - T for a field length determined by a Table
    - U for a field having an Undefined length
  - YY is the type of entry technique permitted in the field:
    - A for Letters only
    - AC for Letters and Punctuation only (no numbers)
    - AN for Numerals and Letters only (no punctuation)
    - C for Characters (including punctuation)
    - N for Numerals only
    - NC for Numerals and Punctuation only (no letters)
  - Z is the requirement indicator of the field:
    - C if an entry is Conditionally required or optional
    - O if an entry is Optional to complete the function
    - R if an entry is required to complete the function

      NOTE: Facilities can designate that certain fields be Required. STAR product documentation does not display R for fields designated as Required by a facility.
  - For YY-Z field types, where YY is:
    - DATE for a field subject to the date entry conventions described in the *General Information Volume*.
    - SPECIAL FORMAT for a field having data entry requirements not conforming to standard format. The field definition contains the specific data entry requirements for the field.
    - TABLE LOOKUP for a field that enables you to select from a displayed table. See the *General Information Volume* for more information regarding this entry technique.
    - TIME for a field subject to the time entry conventions described in the *General Information Volume*.

    NOTE: For use of the Z position in this format, refer to the explanations for Z under X-YY-Z.

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Introduction

This guide contains technical and user information about functions available on the STAR Pharmacy MICROMEDEX Access Utilities menu. STAR users of MICROMEDEX Access can sign on to the MICROMEDEX system from CRTs or PCs connected to STAR. In addition, they can perform certain functions on the MICROMEDEX Access Utilities menu.

Chapter 1: Overview/Description

This chapter provides a general description of the MICROMEDEX Access software and its features and functions.

Chapter 2: Installation

This chapter provides information about system requirements for hardware, software, cables, and ports.

Chapter 3: User Functions

This chapter documents the user functions on the MICROMEDEX Access Utilities menu, including how to define the interface as asynchronous or TCP/IP, maintain the Access, clear statistics, enable or disable log-on, edit the bulletin board, make inquiries, and access the MICROMEDEX system.

Chapter 4: Printing Capabilities

This chapter provides technical information about the printing capabilities of MICROMEDEX Access, along with user information about printing data from the MICROMEDEX system through STAR.

Chapter 5: Troubleshooting

This chapter contains information about termination messages encountered when using MICROMEDEX Access.

Appendix A: Control Characters

This appendix summarizes the control characters used with the MICROMEDEX printing capabilities under the asynchronous interface.

Appendix B: Checksum Information

This appendix provides technical information about the computation of the checksum, under the asynchronous interface.

Chapter 1 - OVERVIEW/DESCRIPTION

NON-TECHNICAL FUNCTIONAL OVERVIEW

McKesson's MICROMEDEX Access provides STAR users with access to the MICROMEDEX online databases of clinical information, such as drug therapy, drug manufacturer's identification, toxic substances, and emergency care procedures. STAR users can access the MICROMEDEX system through a Transport Control Protocol/Internet Protocol (TCP/IP) interface or an asynchronous interface.

TCP/IP Interface

The MICROMEDEX system runs on a number of UNIX®-based systems. STAR users of the MICROMEDEX Access function on the MSE platform can access the MICROMEDEX system through a TCP/IP interface.

Under the TCP/IP interface, the central processing units (CPUs) for both STAR and the MICROMEDEX system must be accessible on the same network. Up to 254 STAR users can access the MICROMEDEX system at the same time.

Asynchronous Interface

Under the asynchronous interface, up to eight ports are available on each MICROMEDEX server for use by the STAR system. Of these ports, seven are access ports and one is a printer (output) port. Therefore, only seven STAR users may access any one MICROMEDEX server at one time, and all print requests must be channeled back to STAR through the printer port. The seven access ports may be split in any combination between two or more STAR CPUs.

For example, in an environment where STAR Pharmacy is networked to STAR Patient Care, it might be useful to split the seven access ports in some combination between the two CPUs.

NOTE: Under the asynchronous interface, the MICROMEDEX Maintenance function on STAR enables up to seven MICROMEDEX PCs to be defined for use on the STAR system. However, having more than one or two MICROMEDEX PCs may be cost-prohibitive for the hospital.

FEATURES/FUNCTIONS

The MICROMEDEX Access Utilities menu provides the following functions to STAR users of the MICROMEDEX system.

MICROMEDEX Maintenance
This function enables you to configure and maintain the MICROMEDEX system as either an asynchronous or TCP/IP interface.

MICROMEDEX Statistics Clear
This function enables you to clear individual MICROMEDEX jobs or all statistics.

MICROMEDEX Enable/Disable Log-on
This function allows you to enable or disable log-on to the MICROMEDEX system.

MICROMEDEX Bulletin Board Edit
This function enables you to enter information on the MICROMEDEX system bulletin board.

MICROMEDEX Inquiry
This function enables you to view information about MICROMEDEX system sessions.

MICROMEDEX Access
This function provides access for STAR users to the MICROMEDEX system, either through the asynchronous interface or the TCP/IP interface.

Chapter 2 - INSTALLATION

SYSTEM REQUIREMENTS

Hardware

TCP/IP INTERFACE

STAR must be running on an MSE UNIX platform. The MICROMEDEX system must be running on a UNIX platform. Both the STAR and MICROMEDEX CPUs must be connected through an Ethernet.

ASYNCHRONOUS INTERFACE

In addition to the MICROMEDEX server, you need an RS-232 asynchronous communication line directly connected from the MICROMEDEX server printer port to a STAR RS-232 port, and one or more RS-232 lines that connect access ports on the MICROMEDEX server to the STAR RS-232 ports.

On STAR, the port must have a first-in first-out (FIFO) size of 100 bytes or more.

Software

MICROMEDEX Access has been qualified on all operating systems currently supported by McKesson, including STARBASE, AOS, and UNIX.

The 8.0 release or later of STAR Pharmacy is required for the asynchronous or TCP/IP interfaces. Under the TCP/IP interface, STAR supports only one MICROMEDEX server.

PORTS FOR THE ASYNCHRONOUS INTERFACE

The following information is for the asynchronous interface.

The MICROMEDEX server needs to be located near the central processing unit (CPU). The ports assigned as links to the MICROMEDEX PC need to be RS-232 cabling with the following port configuration:

Terminal Type	COMPUTER LINK, Desktop
Clock Rate	9600 baud
Stop Bits	1
Data Bits	8
Parity	None
Comm Protocol	RS-232
Device Options	Disable Echo

NOTE: Modem ports communicating with the MICROMEDEX system must also be configured with a clock rate of 9600 baud. Modems that support this protocol are:

- Any 9600 baud modem
- Microcom AX 2400 baud with MNP error correction version 5.0 or later

The server and host modems must be the same type.

NOTE: For information about settings for term servers, please contact the McKesson Technical Advisor for your account.

CABLING FOR THE ASYNCHRONOUS INTERFACE

The host server and the DG (Data General was acquired by EMC Corporation 2000®) mini-computer are linked together via RS-232 communications line. Cabling is as follows, using 25-pin DBF/DBM cables:

Data General End
1-8 ST
20 ST

Host Server End
1-8 ST
2 x 3 Cross
4 + 5 Jump
6 + 8 + 20 Jump

Chapter 3 - USER FUNCTIONS

MICROMEDEX MAIN MENU

When you select MICROMEDEX Access Utilities from a STAR menu, the system displays the following screen:

```
   General Hospital Micromedex Access Utilities Processor
                                                  Thu Jul 06, 2000 12:25 pm
Micromedex Access Utilities Input Options

            Option No.  Option
            ----------------------------------------
                1       Micromedex Maintenance
                2       Micromedex Statistics Clear
                3       Micromedex Enable/Disable Log-on

                4       Micromedex Bulletin Board Edit
                5       Micromedex Inquiry

                6       Micromedex Access









Enter option number--
```

These options are discussed in the following subsections.

MICROMEDEX MAINTENANCE

The Micromedex Maintenance function defines how the system is configured. You can set the access to be either asynchronous or TCP/IP.

When you access this function, the system displays a screen like the following. This example shows settings already defined for parameters and port/print configuration for a TCP/IP interface:

```
                  General Hospital Micromedex Maintenance Processor
                                                Thu Jul 06, 2000 03:29 pm

Parameters
 1 Interface Type                      2 Login Password     3 Allow Server Check
   TCP/IP                                ccis                 Yes
 4 Number of Micromedex Servers        5 Max Users/Server   6 Start Process Pool
   1                                     16                   1
 7 Alias of Micromedex Server          8 Access Shell Directory
   ccis                                  ccis/usr/hboshell
 9 Sign-on Key Distribution
   `~`[1]
Access Port/Print Configuration  NFS Print Interface is Dormant
 1 STAR Host Spooler Port  2 STAR Temporary Directory           3 Poll Interval
   8210                      hbo/tmp                            60 seconds
 4 Micromedex NFS Spool Directory      5 Micromedex Local Spool Directory
   ccis/usr/tmp/hbo                      usr/tmp/hbo




Edit (P)arameters, Port/Print (C)onfiguration or Print (I)nterface Polling ?--
```

To set up or edit the maintenance parameters, enter **P** for Parameters. To edit the port/print configuration entries, enter **C**. To initiate or terminate interface polling, enter **I**.

Parameters

When you enter P, you can access the following fields:

1. INTERFACE TYPE (1-A-R)
This field specifies the type of interface to be used by MICROMEDEX. To use an asynchronous interface, enter **A**. To use a TCP/IP interface, enter **T**. The default is Asynchronous.

You can access the Number of Micromedex Servers field only if this field is set to Asynchronous.

You can access the Start Process Pool, Alias of Micromedex Server, and the Access Shell Directory fields only if this field is set to TCP/IP.

When you access this field, the system displays the following prompt:

Use (A)synchronous link or (T)CP/IP to access Micromedex? [A]--

2. LOGIN PASSWORD (15-A-N)
This field specifies the login password that the MICROMEDEX Access function uses to automatically sign on to the MICROMEDEX system. The MICROMEDEX system assigns the password. If you do not want to have an automatic sign-on with that password, leave this field blank. If you do want auto sign-on, enter the password here. When you access the MICROMEDEX system with auto sign-on, the system takes you directly to the initial menu after the login message. Without auto sign-on, you must enter your password after the Login message.

When you access this field, the system displays the following prompt:

Enter new login name for auto sign-on--

3. ALLOW SERVER CHECK (1-A-R)
This field determines if the STAR system checks whether the Micromedex system is up and running before attempting access. Set this field to No only if the STAR CPU is not capable of querying the MICROMEDEX system.

When you access this field, the system displays a prompt specific to the server:

Allow system to check if TCP/IP Server is up before login? (Y/N) [Y]-- |

Enter **Y** or press ENTER to set up checking of the server. If your STAR CPU cannot query the MICROMEDEX system, enter **N**.

If this field is set to Yes and you try to access MICROMEDEX when the MICROMEDEX CPU is down, the system displays an error message that is specific to the server:

Error: Micromedex Server ccis01 is down!

4. NUMBER OF MICROMEDEX SERVERS (1-N-R)
This field specifies the number of MICROMEDEX servers that can be accessed through asynchronous communication lines. The number must be between 1 and 9.

When you access this field, the system displays the following prompt:

Enter number of Micromedex servers on this CPU--

You can access this field only if the Interface Type field is set to Asynchronous. If you try to access this field with the Interface Type field set to TCP/IP, the system displays the following message:

Only 1 server is allowed per STAR CPU under TCP/IP interface!

5. MAX USERS/SERVER (2-N-R)
This field specifies the maximum number of simultaneous users for each MICROMEDEX Access Server. If the Interface Type field contains Asynchronous, the maximum value is 7. If the Interface Type field contains TCP/IP, the maximum value

is 999. McKesson recommends that this number be set to 50 or less to maintain a reasonable response time.

When you access this field, the system displays the following prompt:

Enter the new maximum number of simultaneous STAR users per Micromedex server--

6. START PROCESS POOL (3-N-C)
This field specifies the beginning number for the pool of numbers that are assigned to users as they access Micromedex. The number that you enter must be between 1 and 254. You can access this field only if the Interface Type field is set to TCP/IP.

The Micromedex Access function reserves a pool of process ID numbers for each STAR UNIX CPU. The first user receives the number you enter here. As additional users access Micromedex, the function assigns the next available number from the pool, until the maximum number of users, as specified by the Max Users/Server field, is reached.

When you access this field, the system displays the following prompt:

Enter new starting Micromedex process ID pool number--

NOTE: It is the responsibility of the user to ensure that these number pools remain unique across STAR CPUs. For example, if STAR CPU A has Max Users/ Server set to 16 and Start Process Pool set to 1, the pool of numbers 1-16 is assigned to this CPU. If STAR CPU B also wishes to access the same Micromedex CPU, set the Start Process Pool field on CPU B to a number higher than 16.

7. ALIAS OF MICROMEDEX SERVER (33-A-R)
This field specifies the TCP/IP alias assigned to the Micromedex CPU when a TCP/IP interface is used. You can access this field only if the Interface Type field is set to TCP/IP. Enter the alias that the UNIX administrator assigned to the Micromedex server.

The administrator assigns the alias when mounting the Micromedex CPU on the STAR UNIX CPU. This alias allows the STAR UNIX CPU to locate the Micromedex CPU.

When you access this field, the system displays the following prompt:

Enter new alias assigned to Micromedex server--

For the interface to work properly, this field must contain the same alias that is assigned to the Micromedex server on the STAR UNIX CPU during implementation.

8. ACCESS SHELL DIRECTORY (33-A-C)
When a TCP/IP interface is used, this field specifies the UNIX directory on the MICROMEDEX CPU in which the Micromedex Access function generates a UNIX shell

to initiate sessions on the MICROMEDEX system under TCP/IP. You can access this field only if the Interface Type field is set to TCP/IP. You must enter the name of a valid UNIX directory on the MICROMEDEX CPU. Typically, it is preceded by the alias assigned to the MICROMEDEX CPU.

For example, the *usr/hboshell* directory is a valid directory on the MICROMEDEX CPU. The MICROMEDEX CPU is mounted on the STAR UNIX CPU and assigned an alias of **w0099**. The value of the Access Shell Directory field needs to be:

w0099/usr/hboshell

When you access the Access Shell Directory field, the system displays the following prompt:

Enter Micromedex-generated access shell directory--

9. SIGN-ON KEY DISTRIBUTION (TABLE LOOKUP-O)
You can reserve a designated number of ports for a department sign-on with this function. By reserving a number of ports with a sign-on key, you can prevent other users from accessing the MICROMEDEX system if those are the only ports available.

For example: Your pharmacy purchases the MICROMEDEX system and the STAR access. You want the emergency room personnel, laboratory, and physicians to have access to the MICROMEDEX database, but your pharmacy wants to be guaranteed it always has a port available. By distributing one port to the pharmacy sign-on, your pharmacy always has at least one access to MICROMEDEX system.

NOTE: Your total distribution for all sign-on keys cannot exceed the total number of ports available. If the total number of ports available for the MICROMEDEX system changes, you need to consider making changes in distribution also.

When you access this field, the system displays the following prompt:

Enter choice or 'A' to add--

If you enter a choice, the system displays a prompt that is specific for the choice, such as:

Enter number of ports reserved for sign-on key '~' [10]--

To accept this choice, press ENTER.

If you enter A, the system displays the following prompt:

Enter sign-on key to add or '-' for list--

If you enter a hyphen (-), the system displays a list of available sign-on keys that show settings for the TCP/IP interface. Select a sign-on key from this list.

An example screen is displayed:

```
        General Hospital Micromedex Maintenance Processor
                                                Thu Sep 05, 2002 03:39 pm

Parameters
 1 Interface Type                    2 Login Password     3 Allow Server Check
   TCP/IP                              ccis                 Yes
 4 Number of Micromedex Servers      5 Max Users/Server   6 Start Process Pool
   1                                   16                   1
 7 Alias of Micromedex Server        8 Access Shell Directory
   ccis                                ccis/usr/hboshell
 9 Sign-on Key Distribution
-> `~`[1]

Page:01                           Sign-On Keys
( 1) ALLSTAR                             ( 6) STAR Financial System
( 2) Create Product Tape                 ( 7) Accounts Payable
( 3) NRC System Login                    ( 8) Human Resources
( 4) Timesheet                           ( 9) Materials
( 5) Editor                              (10)

Enter choice--
                                  next page(/)
```

Port/Print Configuration

If you enter C to edit the port/print configuration, the system displays different screens depending on whether the interface is TCP/IP or asynchronous. Information on the TCP/IP interface follows. For information about the asynchronous interface, see the Asynchronous Interface subsection.

TCP/IP INTERFACE

If the Interface Type field is set to TCP/IP, the system displays the following Access Port/Print Configuration screen:

```
           General Hospital Micromedex Maintenance Processor
                                                 Thu Jul 06, 2000 05:09 pm
Access Port/Print Configuration
 1 STAR Host Spooler Port  2 STAR Temporary Directory           3 Poll Interval
   8210                      hbo/tmp                             60 seconds
 4 Micromedex NFS Spool Directory     5 Micromedex Local Spool Directory
   w0099/usr/tmp/hbo                   usr/tmp/hbo









Enter field number or '/' starting field number--
```

Field Explanations

1. STAR HOST SPOOLER PORT (5-N-R)
This field specifies the port on the STAR system that the Micromedex Print Interface program uses to issue UNIX commands to spool printed output to a printer on the STAR system. Enter the number of the port for the Print Interface to use to initiate shell files.

For more information on Host Spooler Ports, consult the *MultiSTAR UNIX Operations Guide*, or your UNIX system administrator.

When you access this field, the system displays the following prompt:

Enter STAR host spooler port number--

2. STAR TEMPORARY DIRECTORY (33-C-N)
This field specifies the directory on the STAR UNIX CPU where generated UNIX shells from the Micromedex Print Interface job are temporarily stored until they are executed. All users must have rights to this directory. The default value for this field is hbo/tmp, which is typically a valid directory on the STAR UNIX CPU. McKesson recommends that you use hbo/tmp, but a different valid directory may be used. When you access this field, the system displays the following prompt:

Enter STAR temporary directory [hbo/tmp]--

3. POLL INTERVAL (3-N-N)
This field specifies the number of seconds that the Micromedex Print Interface process waits before checking, or *polling*, for the existence of spooled output from MICROMEDEX. Enter a number between 15 and 999. The default value for this field is 60 seconds, which is the McKesson-recommended Poll Interval.

NOTE: Setting this value too low may cause an inordinate amount of CPU utilization, while setting it too high may result in long waits between the time of a print request and the time the output is spooled. You may wish to experiment with adjusting this value.

When you access this field, the system displays the following prompt:

Enter new number of seconds Print Interface job is to wait between polls [60]-

4. MICROMEDEX NFS SPOOL DIRECTORY (33-C-N)
This field specifies the name of the Network File System (NFS) directory on the Micromedex CPU to which Micromedex system directs spooled output. This must be the same directory that was previously defined and mounted as an NFS directory on the STAR UNIX CPU.

For example, the Micromedex CPU's Local Spool Directory is usr/tmp/hbo. This directory has been mounted as an NFS directory on the STAR UNIX CPU, which uses the alias w0099 for the MICROMEDEX CPU. Thus the value of this field needs to be:

w0099/usr/tmp/hbo

When you access this field, the system displays the following prompt:

Enter Micromedex NFS spooler directory--

5. MICROMEDEX LOCAL SPOOL DIRECTORY (33-C-N)
This field specifies the local spooler destination directory on the MICROMEDEX CPU. Enter the name of the directory to which the MICROMEDEX directs spooled output.

This value of this field is passed as a parameter to the MICROMEDEX system, which spools printed output to the designated directory.

NOTE: The value of this field is typically the same as the value of the Micromedex NFS Spool Directory, minus the preceding alias.

For example, if the Micromedex NFS Spool Directory field has the value **w0099/usr/tmp/hbo**, where **w0099** is the alias, the Micromedex Local Spool Directory's value is: **usr/tmp/hbo**.

When you access this field, the system displays the following prompt:

Enter new local spool destination directory on the Micromedex CPU--

ASYNCHRONOUS INTERFACE

If the Interface Type field is set to Asynchronous, the system displays several fields for each configured PC:

```
Configuration
 PC# PL   Access Ports                        Prt Line  Status
 1   Yes  243                                     81    Idle


Edit (P)arameters, Port/Print (C)onfiguration or Print (I)nterface Polling ?--
```

PL	Indicates whether the print line is active
Access Ports	Lists the current access ports
Prt Line	Indicates the port number to which the print line is attached
Status	Indicates whether the print interface is running or idle

If you enter C at the prompt on the MICROMEDEX Maintenance screen, the system displays the Port/Print configuration screen and the following prompt:

Edit/view the access port configuration? (Y/N) [Y]--

If you enter Y, the system displays a list of MICROMEDEX PCs, indicating the number of the PC, whether it can print, and the port number. Enter the number for the PC you want to edit. The system then displays a horizontal screen that contains the current configuration:

```
   PC#1
 1 Print on this CPU?    2 Print Interface Port
   Yes                     81
 3 Access Ports
   243
```

Field Explanations

1. PRINT ON THIS CPU? (1-A-R)
If the MICROMEDEX system print line is directly connected to a port on this CPU, as opposed to a different CPU), enter **Y** for Yes. If the print line from the server is connected to a different CPU, enter **N**.

2. PRINT INTERFACE PORT (4-N-O)
Enter the STAR port number to which the MICROMEDEX system print line is attached.

3. ACCESS PORTS (34-A-O)
Enter the numbers of the access ports directly connected from this CPU to the MICROMEDEX server. Use commas to separate the numbers.

Print Interface Polling

To cycle through current status of the print interface for each MICROMEDEX server with a print line attached to the CPU, enter **I**.

If polling is active and the status display is *Running*, the system is actively looking for print requests from the MICROMEDEX server. If polling is inactive and the status display is *Idle*, the system is not looking for print requests from the MICROMEDEX server.

STATUS (DISPLAY ONLY)
This field indicates the activity status of the print interface polling. This field indicates *Running* for active, and *Idle* for inactive.

TCP/IP INTERFACE

For TCP/IP, the print interface looks at the MICROMEDEX NFS spool directory for any print files that are to be queued to print. Run only one instance of the print interface

per MICROMEDEX box. The polling can be started from any ID and any STAR box that has a TCP/IP connection to MICROMEDEX. It is preferable to run from the STAR box or ID that does the most printing.

For TCP/IP, if polling is active, the system displays the following prompt:

Polling is active! Inactivate polling? [N]--

If you enter Y, the system displays the following message:

Halting Print Interface Polling for NFS!

For TCP/IP, if polling is inactive, the system displays the following prompt:

Polling is inactive! Activate polling? [N]--

If you enter Y, the system displays the following message:

Micromedex Print Interface -- Polling for NFS started

ASYNCHRONOUS INTERFACE

For asynchronous, the print interface looks at the port that is assigned to MICROMEDEX for printing and gets information that comes through as a print request. Run only one instance of the print interface per MICROMEDEX box. The polling can be started from any ID on the STARbox that is connected to the MICROMEDEX printer port. It is preferable to run from the STAR box or ID that does the most printing.

For asynchronous, if polling is inactive, the system displays the following prompt:

Polling is inactive! Activate polling? [N]--

If you enter Y, the system displays a message specific to the PC and port:

Micromedex Print Interface -- Polling started for PC #1 on port 81

For asynchronous, if polling is active, the system displays the following prompt:

Polling is active! Inactivate polling? [N]--

If you enter Y, the system displays a message specific to the PC and port:

Micromedex Print Interface -- Polling terminated for PC #1 on port 81

MICROMEDEX STATISTICS CLEAR

This function enables you to clear MICROMEDEX statistics. It is possible for the information in the inquiry screen display to be incorrect if a job is removed while you are accessing the MICROMEDEX system or if there was a system failure. You can choose to clear individual jobs or all statistics.

NOTE: Users need to refrain from accessing MICROMEDEX system if you choose All statistics. If the system is IPL'd, this function automatically runs.

When you select this function, the system displays the following prompt:

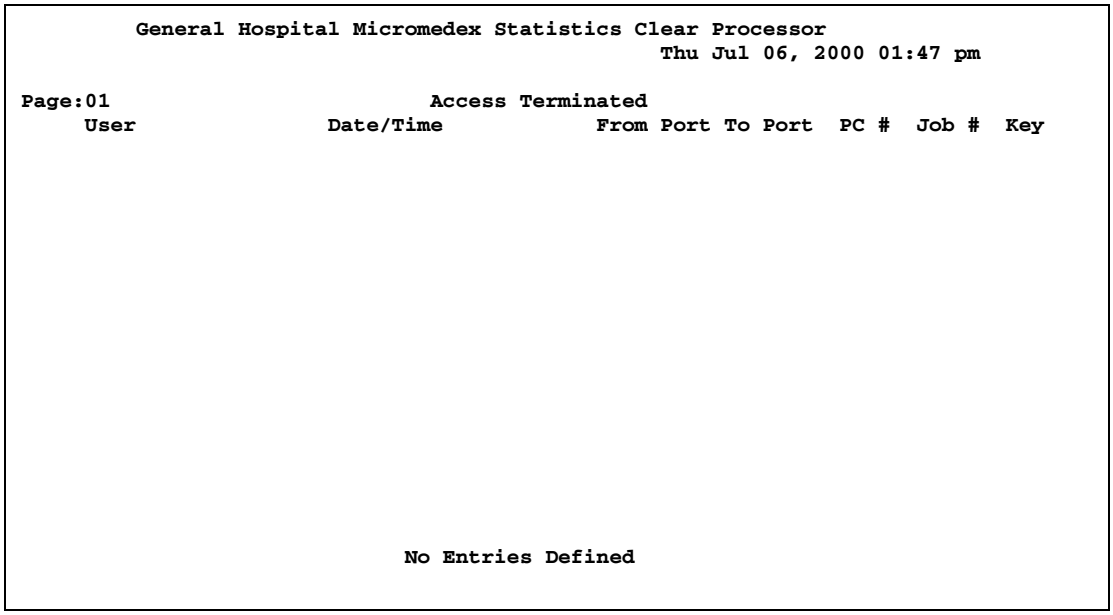
Clear (A)ll statistics or (I)ndividual jobs--

To clear all jobs, enter **A**. The system displays the following warning message:

```
          General Hospital Micromedex Statistics Clear Processor
                                                Thu Jul 06, 2000 01:47 pm









          This option will clear the Micromedex inquiry information.
        This should only be used when no users are accessing Micromedex.




Clear Micromedex statistics? (Y/N) [N]--
```

If you enter Y to continue, the system resets ports and sign-on keys that are in use and resets the job log. If you enter N or press ENTER, the system returns you to the previous prompt.

To clear all individual jobs, enter **I**. The individual clear option removes statistics for jobs aborted while connected to the MICROMEDEX system. After you select this option, the system displays the Statistics Clear screen with only aborted jobs. You then choose the job number that is to be removed.



The display screen provides the following information:

User	User's name
Date/Time	Date and time access was terminated
From Port	User's CRT port number
To Port	CPU port number
PC #	Number of the MICROMEDEX PC
Job #	Job number of the session
Key	User's sign-on key

MICROMEDEX ENABLE/DISABLE LOG-ON

This function allows you to enable or disable log-on to the MICROMEDEX system. You can choose to enable or disable individual MICROMEDEX servers or to enable or disable all MICROMEDEX PCs. Users need to refrain from accessing the MICROMEDEX system when MICROMEDEX software is being updated.

When you access this function, the system displays the following screen:

```
        General Hospital Micromedex Enable/Disable Log-on Processor
                                                  Thu Jul 06, 2000 01:25 pm

Page:01                          Server #/Log-On Status             ##=Current Choices
( 1) 1     Enabled









Enter choice or (A)ll--
                                 end selection(NL)
```

The screen indicates the status of the MICROMEDEX servers as either *Enabled* or *Disabled*.

Enter the number of the server you want to change, or enter **A** for All.

If you select a server that is enabled, the system displays a prompt like the following:

Disable log-on status for Server # 1? (Y/N)--

If you enter Y, the system displays a Log-on Disabled! message. If you enter N, the system returns you to the previous prompt.

If the server is disabled, the system displays a prompt like the following:

Enable log-on status for Server # 1? (Y/N)--

If you enter Y, the system displays a *Log-on Enabled!* message. If you enter N, the system returns you to the previous prompt.

If you enter A for All and the servers are enabled, the system displays the following prompt:

Disable long-on status for All Servers?

If you enter Y, the system displays a *Log-on Disabled!* message. If you enter N, the system returns you to the previous prompt.

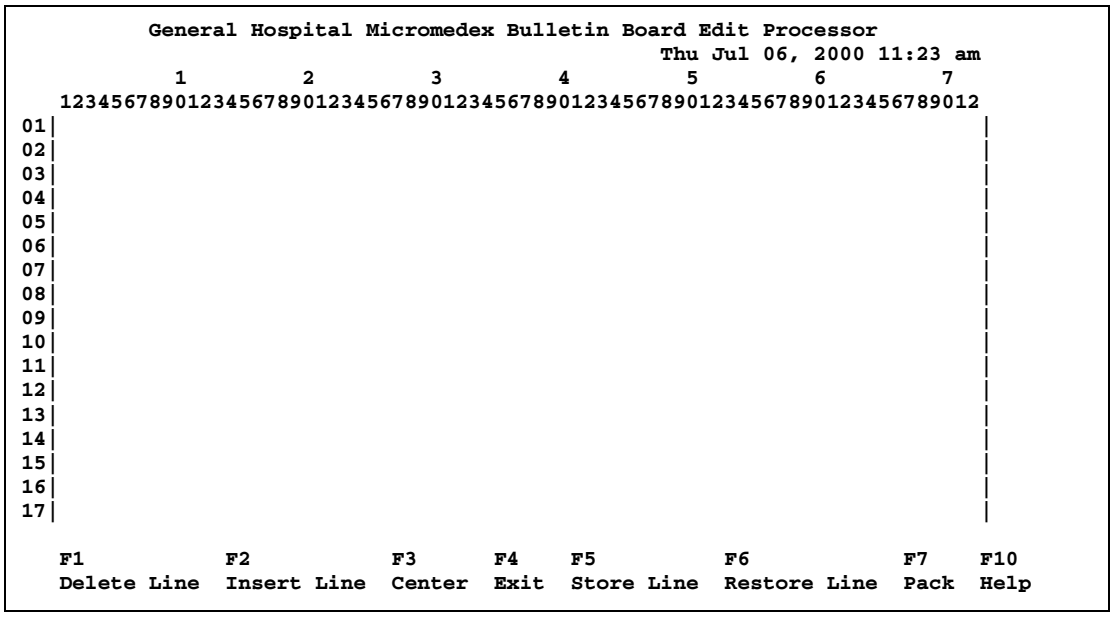
If you enter A for All and the servers are disabled, the system displays the following prompt:

Enable log-on status for All Servers? (Y/N)--

If you enter Y, the system displays a *Log-on Enabled!* message. If you enter N, the system returns you to the previous prompt.

MICROMEDEX BULLETIN BOARD EDIT

The Bulletin Board displays each time you log on to the MICROMEDEX system. To create a bulletin board message to distribute information to MICROMEDEX system users, you select the MICROMEDEX Bulletin Board Edit function. When you access the bulletin board, the system displays the following screen:



Enter the information you want to provide to other MICROMEDEX system users. To exit, press F4. The system displays the following prompt:

Accept (Y/N)? [Y]--

To keep your changes, enter **Y** or press ENTER. To exit without keeping changes, enter **N**.

MICROMEDEX INQUIRY

You can use the inquiry function to display information about current users of the MICROMEDEX system. You can use the inquiry information to generate statistics and also to monitor who is using the MICROMEDEX system if a port is needed for an emergency.

TCP/IP Interface

When the interface is TCP/IP, the system displays the following MICROMEDEX Inquiry screen.

```
                    General Hospital Micromedex Inquiry Processor
                                                    Thu Jul 06, 2000 03:16 pm
                                                     =Access Terminated
 User                Time Started          From Port Type     MPID  Job #  Key
                     06/30/00 04:31pm      85        Host     001   148    ~









Press NL--
```

The display screen provides the following information:

User	User's name
Date/Time	Date and time access was terminated
From Port	User's CRT port number
To Port	CPU port number
PC #	Number of the MICROMEDEX PC
Job #	Job number of the session
Key	User's sign-on key

Asynchronous Interface

When you access this function under the asynchronous interface, the system displays the following screen:

```
               General Hospital MICROMEDEX Inquiry Processor
                                                  Thu Jul 06, 2000 7:14 am

                                                 =Access Terminated  |
User              Time Started       From Port  To Port  PC #  Job #  Key |
Smith,John        01/19/00 06:45am   99         227      1     9      P   |
Worth,Sarah       01/19/00 07:00am   45         228      1     11     L   |









Press NL
```

The display screen provides the following information:

User	User's name
Date/Time	Date and time access was terminated
From Port	User's CRT port number
To Port	CPU port number
PC #	Number of the MICROMEDEX PC
Job #	Job number of the session
Key	User's sign-on key

MICROMEDEX ACCESS

This option enables you to sign on to the MICROMEDEX system.

If the Interface Type field is set to Asynchronous and the number of users is *less than* the value of the Max Users/PC field, you can sign on to MICROMEDEX. If the number of users is *equal to* the value of the Max Users/PC field, the system displays an error message and does not allow access.

If the Interface Type field is set to TCP/IP, you can access MICROMEDEX if the number of users logged on is less than the number specified in your MICROMEDEX site license.

If the Allow Server Check field on the Micromedex Maintenance screen is set to Yes, and you try to access MICROMEDEX when the MICROMEDEX CPU is down, the system displays an error message that is specific to the server:

Error: Micromedex Server ccis01 is down!

When you access this function, the system displays the following screen:

```
                        CLINSTAR-Micromedex Access


                      HBO & Company interface to:

          Micromedex Computerized Clinical Information System (R)


                        Volume 85  Expires 9/95









                         Your HBO printer is: RXHSP

Press NL for Access--
               Follow screen directions to exit Micromedex C.C.I.S.
```

This screen identifies your McKesson printer and displays any Bulletin Board messages.

To access the MICROMEDEX system, press ENTER. On the next screen, the Login message displays. Press ENTER. You can choose to set up an automatic sign-on or to enter a password each time you sign on. For more information about automatic passwords, see the Login Password field in the Parameters subsection.

NOTE: After you sign on to the MICROMEDEX system, you are no longer in the STAR environment.

If all ports attached to the MICROMEDEX system are in use or have been reserved for other departments, the system prompts you to either retry or return to the main menu.

The following example shows a MICROMEDEX system menu:

```
          MICROMEDEX COMPUTERIZED CLINICAL INFORMATION SYSTEM (R)


    A. TOXICOLOGY INFORMATION
        POISINDEX(R), TOMES(R), AND IDENTIDEX(R) Systems
    B. DRUG INFORMATION
        DRUGDEX(R), MARTINDALE, ADIS, IDENTIDEX(R) Systems
    C. DISEASE AND TRAUMA INFORMATION FOR ACUTE CARE
        EMERGINDEX(R) System
    D. AfterCare(TM) Instructions
    E. REPRORISK(R) System - Reproductive Risk Information System
        REPROTEXT(R), TERIS, SHEPARD'S Systems, AND REPROTOX(TM)
    F. GENERAL INFORMATION
        WHAT'S NEW, USING THE SYSTEM, EDITORIAL BOARDS


                          Choose a letter:
 POISINDEX, DRUGDEX, EMERGINDEX, IDENTIDEX, MICROMEDEX, TOMES and CCIS are
Trademarks of Micromedex, Inc. THE INFORMATION AND SYSTEMS CONTAINED HEREIN
 ARE BELIEVED TO BE ACCURATE; HOWEVER, NO GUARANTEE OR WARRANTY IS MADE TO
    THIS EFFECT.  FOR FULL STATEMENT AND FURTHER INFORMATION, PRESS 'F'.
                           * F11. Exit CCIS(R) *
              Copyright (c)1974 through 1995 Micromedex, Inc.
                  All Rights Reserved VOL. 85 EXPIRES 9/95
```

For more information about using the MICROMEDEX system, see the MICROMEDEX documentation that accompanies the product.

NOTE: To disconnect from the MICROMEDEX system and return to the STAR menu, follow the screen directions. For example, on the above screen, press F11.

Chapter 4 - PRINTING CAPABILITIES

OVERVIEW

This section contains information about the print capabilities that the MICROMEDEX Access provides. For user information on how to print, see the Printing MICROMEDEX Output subsection.

TCP/IP Interface

You can automatically print to the default printer for your CRT.

Asynchronous Interface

The MICROMEDEX Access function provides the capability of routing printed output from the MICROMEDEX system to the STAR printer assigned to your STAR CRT or PC.

After the hardware and software are correctly configured, any STAR user may access the MICROMEDEX system and route printed output to the default printer assigned to your CRT on the STAR system.

HARDWARE ISSUES

NOTE: The following information is for the asynchronous interface.

On each MICROMEDEX server, one port is dedicated to handling printed output. All print requests are channeled back to the STAR system through this port.

In an environment where a single MICROMEDEX server services a multiple-CPU STAR network, you must select the CPU in the STAR network that is to be connected to the MICROMEDEX printer port. In such a configuration, the STAR system is responsible for routing the printed output back to the CPU from which the request originated.

For example, if you connect the print line to CPU MED, and a user on CPU CLN requests a print job, the output first goes to CPU MED. However, MED sends the output across the network to the spooler on CPU CLN, where it originated.

NOTE: The best CPU choice for the print line is the CPU with the most anticipated print job activity.

INSTALLATION

NOTE: The following information is for the asynchronous interface.

To implement printing capability, a cable must run from a designated RS-232 port on the McKesson CPU to the eighth access port on the MICROMEDEX PC. The cabling specifications for this cable are the same as the other MICROMEDEX access ports.

Verify that the RS-232 port you are connecting to has a minimum FIFO Input Buffer of 100 bytes and a minimum FIFO Output Buffer size of 10 bytes. You can verify this by using the Port Modification Utility and checking the upper right-hand portion of the screen for FIFO sizing.

You must IPL the system for a change in FIFO size to take place.

NOTE: If you do not have correct FIFO sizing, please contact your McKesson representative for assistance.

LOG-ON PRINT PARAMETERS

NOTE: The following information is for the asynchronous interface.

For print capability purposes, the STAR system sends two pieces of data at log-on time in addition to the logon password. These are the report name and the STAR system ID number from which the user has logged on. The three pieces of data are visible when you access the MICROMEDEX system.

The report name portion contains the name of a report that has been previously defined through STAR Output Management utilities. These utilities enable you to assign report characteristics based on the type of report, including printer ports and retention days. In addition, if the printed output is spooled to disk, the utilities enable the output to be reprinted on demand. Report names can be up to eight characters in length.

The STAR system ID number portion contains the number of the ID from which the print request originated. You may maintain multiple copies of the same software and data on the same CPU in separate partitions (called IDs), which are numbered from 0-255.

Log-on messages consist of three pieces, separated by colons. For example, for *user:RXHSP:1*, *user* is the password; *RXHSP* is the printer name; and *1* is the ID number.

PRINTING MICROMEDEX OUTPUT

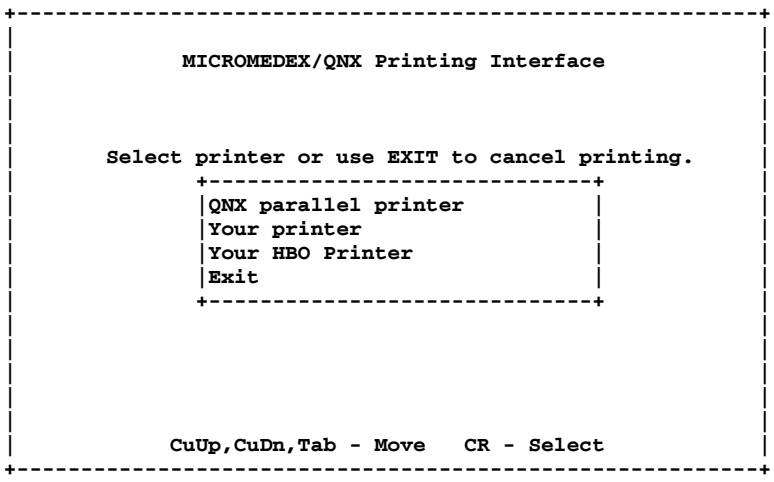
You can select a McKesson printer from within the MICROMEDEX system by invoking the print capability. For more information on how to print MICROMEDEX data, refer to the MICROMEDEX documentation.

TCP/IP Interface

When you select Print, the STAR system automatically sends the data to the default printer for your CRT, using the settings on the Access Port/Print Configuration screen. For more information, see the description of port/print configuration for TCP/IP interfaces in "Chapter 3 - USER FUNCTIONS".

Asynchronous Interface

When you request a print job in the MICROMEDEX system, a screen similar to the following one displays:



To route the printed output to your McKesson printer, select *Your HBO Printer*: use the arrow keys to move the bar down to *Your HBO Printer,* and press ENTER. (The others listed are local printers on the MICROMEDEX server.) STAR routes the output to the correct printer.

TECHNICAL NOTES

TCP/IP Interface

For TCP/IP, the polling program works as follows:

In the MICROMEDEX system, the user presses the F4 key to print the selected data. The MICROMEDEX system then packages the printed output and spools it to disk, placing it in a UNIX temporary directory.

The STAR print interface looks for printed output in the MICROMEDEX temporary directory, accessible to the STAR CPU through an NFS connection. The STAR Print Interface, a background job that can be initiated and terminated from within the Micromedex Maintenance function, uses the specified Host Spooler Port to continuously check (poll) for the existence of files in the MICROMEDEX temporary directory. When a spooled output file is found, the STAR Print Interface directs and spools the data to the STAR spooler, which sends it to the correct STAR printer. After the data is printed, the STAR Print Interface then deletes the temporary file from the MICROMEDEX CPU's temporary directory.

Asynchronous Interface

The following steps outline the internal process that takes place when a STAR user requests printed output from the MICROMEDEX system under the asynchronous interface:

- MICROMEDEX sends an ASCII *A* to STAR, and then waits a specified number of seconds for a valid response (an <ACK>). If it times out, it assumes the STAR system is down, and then aborts the request.

- On STAR, the *A* triggers the initiation of a print data receive program (AUMEDIP). This program reads print data from MICROMEDEX, and then spools it to the desired printer.

  NOTE: The installer must set up AUMEDIP in Sign On Maintenance as the sign-on program for the character *A*. It must be specific to the port that is designated as the print output from MICROMEDEX. If it times out, it goes to end-of-job.

- MICROMEDEX immediately sends an <ACK> from STAR, responding with a parameter specification line similar to the following:

```
<STX>PRINTER=RXHSP:ID=1<ETX><CR>
      --------^^^^^----^
```

Characters underscored by a hyphen (-) are hardcoded; characters underscored by a tilde (^) are filled in by MICROMEDEX, based on the pieces appended to the sign-on.

MICROMEDEX waits for an <ACK> from STAR as an acknowledgement that the message has been received. If it times out, or if it receives a <NAK>, it sends a <CAN> message (informing STAR to abort) and it then aborts itself. If it receives an <ENQ>, it attempts to retransmit the above message and again wait for an <ACK>. If it does this more than the specified number of retries, it sends a <CAN>, informing STAR to abort, and then aborts itself.

- On STAR, AUMEDIP reads the above parameter specification message and strips off the control characters. If the resulting message is not in the format "PRINTER=xxxxxxxx:ID=xxx" (where x can be any character), it sends a <NAK> to MICROMEDEX. If it is in the correct format but STAR does not recognize the printer and/or ID number, AUMEDIP discards the message, sends an <ENQ>, and awaits a retransmission. If it receives a <CAN>, it writes a *MICROMEDEX Print Job Aborted* message to the console log and goes end-of-job. The printer field needs to be eight characters, left-justified, space-filled, and the ID field needs to be three characters, left-justified, space-filled.

  If the message is in the correct format, AUMEDIP does the following:

  - Resets into the specified ID
  - Opens the spooler with the specified report name
  - Sends an <ACK> to MICROMEDEX, indicating it is ready to proceed
  - Waits for the next transmission

- MICROMEDEX is now ready to transmit text lines. The format is as follows:

Characters	Contents
1	<STX>
2-3	length of text (numeric, zero-filled, 0-80)
4	form feed indicator (0=no, 1=yes)
5-7	checksum of text (numeric, zero-filled)
8-n	test (maximum of 80 characters)
next-to-last	<ETX>
last	<CR>

NOTE: In order to compute the checksum, both MICROMEDEX and STAR need to perform an *exclusive OR* on each byte in the text string (characters 8-n) and return the value in a three-character string (characters 5-7).

After transmitting a text line, MICROMEDEX waits for a response from STAR. If it times out at this point or receives a <NAK>, it aborts. If it receives an

<ENQ> from STAR, it attempts to retransmit the line that was just sent. If this happens six times, it sends a <CAN> instructing STAR to abort, and then abort itself. If it receives an <ACK>, MICROMEDEX then proceeds to transmit the next line of text. This continues until all text lines have been successfully transmitted.

- On STAR, AUMEDIP reads the text transmission and verifies that it is valid. First, it checks to see if it is an <EOT>; if it is, AUMEDIP closes the spooler file and goes to end-of-job. If it is a <CAN> it does the same thing, but first it writes a MICROMEDEX Print Request Aborted message to the console log.

  If the message was not an <EOT> or <CAN>, it checks to see if the format is correct for a text message. If the message does not begin with an <STX> or end with an <ETX> <, AUMEDIP sends a <NAK>, informing MICROMEDEX to abort the print request.

  Next, if either of the following conditions is true, AUMEDIP sends an <ENQ>, indicating MICROMEDEX is to retransmit the text transmission.

  - The length of the text line in positions 2-3 does not match the length of the text line as measured by STAR.

  - The checksum (positions 5-7) on the text (positions 8-n) does not match the results of the checksum as performed by STAR.

  If neither of the conditions is true, the text line is assumed to be valid. AUMEDIP then writes the line of text to the spooler, sends and <ACK> message to MICROMEDEX, and awaits the next transmission.

- After the last line of text has been transmitted, MICROMEDEX sends an <EOT> message and exits.

- Upon receiving an <EOT>, AUMEDIP closes the spooler file and goes to end-of-job.

Chapter 5 - TROUBLESHOOTING

OVERVIEW

This section contains information helpful in troubleshooting possible problems when using the MICROMEDEX Access.

Termination Messages

The system prints messages on the console log when the interface is terminated. You can use these messages to help determine the cause of termination.

When a user terminates the interface, the system prints the following message on the console log:

Micromedex NFS Print Interface terminating per request!

When the interface is terminated other than by a user action, the system prints the following error message on the console log:

Micromedex NFS Print Interface terminating!

Appendix A - CONTROL CHARACTERS

CONTROL CHARACTERS USED IN PRINTING FOR AN ASYNCHRONOUS INTERFACE

The following table summarizes control characters used with the MICROMEDEX print capability under the asynchronous interface:

Name	Key	ASCII	Meaning in this context
STX	**^B**	002	Start of text
ETX	**^C**	003	End of text
EOT	**^D**	004	Normal end of job
ENQ	**^E**	005	Previous message not in correct format; retransmit
ACK	**^F**	006	Previous message successfully received and interpreted
CR	**^M**	013	Carriage return
NAK	**^U**	021	Previous message not what was expected
CAN	**^X**	024	Abort print job

Appendix B - CHECKSUM INFORMATION

COMPUTING THE CHECKSUM FOR AN ASYNCHRONOUS INTERFACE

In computing the checksum for an asynchronous interface, both the MICROMEDEX system and STAR use an *exclusive or* algorithm to generate a value based on the line of text sent. If the checksum computed by STAR does not match the checksum sent by the MICROMEDEX system, STAR concludes that the message has been garbled in transmission.

The *exclusive or* routine works as follows:

For each character in the text string, the algorithm matches the binary bit pattern of the character against the bit pattern produced by the checksum of all previous characters. The result of the *exclusive or* bit match is defined as:

	0	1
0	0	1
1	1	0

For example: 0 XOR 0 = 0,
0 XOR 1 = 1,
1 XOR 0 = 1,
and 1 XOR 1 = 0

For instance, to find the checksum of the string ABC:

- First do a binary bit match on *A* (in binary, 00010001) and *B* (00010010). The result is:

A	XOR	B	=	
0		0	0	
0		0	0	
0		0	0	
1		1	0	
0		0	0	
0		1	1	
1		0	1	or 00000011

- Match the result (00000011) against *C* (00010011); the result is 00010000.
- Repeat until all characters have been summed. The final checksum (in binary) of *ABCDE* is 0010001.
- Convert the binary result to a numeric value (zero-filled, right-justified). The checksum of *ABCDE* is 065. The result is always a number between 000 and 255. Therefore, three digits are allowed.

Index

■ Reader Comment Form ■

We value your suggestions for improving our documentation. Please use this form to evaluate the *MICROMEDEX® Access Guide* for *STAR Pharmacy* for Release 17.0.

Topic	Poor	Fair	Good	Excellent
Organization of information	❑	❑	❑	❑
Accuracy of information	❑	❑	❑	❑
Completeness of information	❑	❑	❑	❑
Clarity of information	❑	❑	❑	❑
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