Honeywell

Understand US Activity

L61530

TotalPlant

Notices and Trademarks

This module supports **TotalPlant** Solution (TPS) system network.

TPS is the evolution of TDC 3000^{X}.

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Table of Contents

Acronyms

GUS	Global User Station
HM	History Module
ME00	Memory device $Memory
ME01	Memory device $EMEMORY
NCF	Network Configuration File
PSDP	Processor Status Data Point
PAJ	Process Alarm Journal
RTJ	Real Time Journals
US	Universal Station

Parameters

ALENBST	Alarm Enable State

Tables

Figures

Module Introduction

Purpose

The purpose of this course module is to give you an understanding of

- what occurs during a US node or GUS Native Window load or Area change,
- how to configure the pathname catalog for optimum performance,
- how US memory is allocated, and
- the R500 alarm overview PSDP parameters.

Module Objective

Objectives

Given a Universal Station or GUS Native Window, be able to

- Recognize loading errors caused by memory resident schematics or free format logs.
- List the rules and recommendations that should be considered when configuring the Area Pathname Catalog.
- Configure Extra Schematic Memory
- Utilize PSDP alarm parameters in a custom display.
- Identify the effects of disabling point, console, and system alarms.
- Define the scope of alarm acknowledgment from a US/GUS.

Peer Node Communications

Peer Nodes

Peer Universal Stations or GUS Native Windows on the LCN are defined as stations that are

- loaded and running the operator or universal personality,
- in the same console,
- loaded with the same Area and Area database version,
- using the same NCF version.

Area Manager Tasks

The Area Manager subsystem in the US/GUS is a function set responsible for managing the area database during node startup and during subsequent area changes. The Area Manager task has three basic responsibilities:

1. Copying standard abstracts, button configuration, custom schematics, and free format logs into the memory resident volume during startup.
2. Requesting data from peer nodes for use in the local US or Native Window area database during startup.
3. Controlling the transfer of area database data during an area change.

Activities During Station Load or Area Change

When a Universal Station or Native Window is loaded or its Area database is changed:

1. The Area Manager sends out a request for peer data to an existing peer within the console.
2. The request is received by the Area Manager in the peer node.
3. The message containing the following peer data is returned to the requesting node:
   - Last 10 group definitions,
   - Overview display suppression data,
   - Report scheduling data,
   - Report printer assignments,
   - Unit assignments,
   - Real Time Journal active/suppress status,
   - Real Time Journal printer number.
4. The above peer data is copied to the requestor's existing Area database in memory.

Invoke User-Defined Schematic Upon Area Change

In R520 or later, the user can define a schematic to be automatically displayed after an area change. The schematic must have the file name AREACHnn.DO (where nn is the area number to which the station is being changed). This file must be located in the area directory &Dnn.

If no AREACHnn.DO is specified in the area directory, then the Console Status and Assignment Display will be shown when the station's area is changed.

Loading Standard Displays

&DSY Directory

Displays are loaded into US or GUS LCNP memory from the &DSY directory from either the History Module or from removable media.

List of Memory-Resident Standard Displays

The Universal Station (US) or GUS LCNP memory is loaded first with this group of standard displays:

1. Top Two Lines (includes system time and station number)
2. Console Status Display
3. Standard System Status Display
4. LCN Node Status Displays
5. Mount Media Display
6. Group Display
7. Process Module Display
8. Status Detail Display

In addition to these standard displays, the customized System Status display is loaded, if configured.

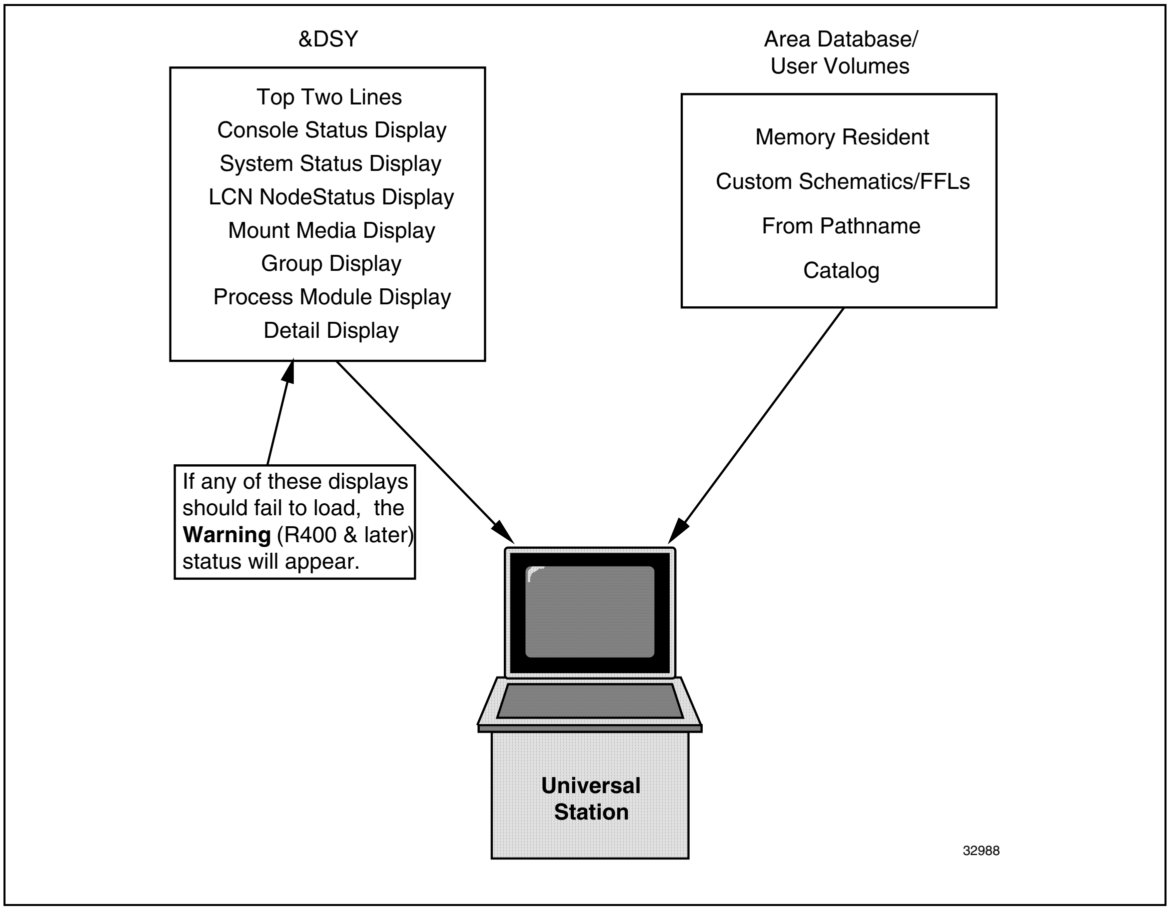

Figure 1 Universal Display/Native Window Loading

Display Access

When the System Status display (Console Status display on R4xx) appears after a node load, you can call up *any operating display or schematic*, even though the loading is not complete. If the display is not in memory yet, it is immediately copied into memory by a separate function and as a temporary file. This applies to the Operator and Universal Personalities.

If you attempt to call up a memory-resident display before it has been loaded into the station memory, the display callup time is slightly slower than if the display is already in memory; however, within minutes the display resides in permanent memory and the callup time is normal.

Loading Errors

On R400 and later, if any of the standard displays are not copied into memory, the Console Status display indicates “WARNING.”

On R500 and later, the System Status display also indicates “WARNING.”

The node Status Detail display indicates whether all standard displays were copied to memory.

Loading Schematics and Free Format Logs

Area Pathname Catalog

In the Area Pathname Catalog, the user specifies what additional displays and/or logs are to be memory-resident. The user-specified displays/logs are loaded from the pathnames the user also specifies in the Area Pathname Catalog (see Figure 2).

The Area Pathname Catalog has three sections.

Section	Description
1. Button Configuration File	For the Universal Station to be able to load the Button Configuration file, its pathname must be entered. NOTE: The Button File must be on the same physical media as the stations' Area database file.
2. *Pathnames* to Schematics and Free Format Logs	There are up to 20 possible pathnames in the Area Pathname Catalog: R500 and later = 20 pathnames Before R500 =10 pathnames These pathnames are used by the US/GUS to locate the named memory resident displays and logs when loading the Area database into station memory. The station also uses the pathnames to search for nonmemory-resident schematics and FFLs or GUS display builder .pct files when called up during normal online operations.

3. *Names* of Memory-Resident Schematics and Free Format Logs	In this section of the catalog you enter the names of "classic" (picture editor) schematics and/or logs that are to be loaded into the US/GUS's memory when the Area database is loaded. The schematic/log object files must reside in one of the pathnames listed in the Area Pathname Catalog. As shown in Figure 2, a [FFL] target appears to the right of each name entry port. The [FFL] target must be selected if a Free Format Log file name is entered. Although the Area Pathname Catalog contains ports for 36 (before 500) or 200 (R500 and later) schematics/logs, the actual number that can be loaded depends on the amount of memory in the station and the size of the schematics/logs. In a standard configuration, there are 72 K words of station memory available for schematics and logs. In R500 and later, additional station memory may be allocated for memory resident schematics and logs.

Loading Sequence

The US/GUS searches the pathnames from left to right and top to bottom. Memory-resident schematics and free format logs are loaded from left to right and top to bottom as specified in the Pathname Catalog.

Optimum Performance

For optimum performance, it is best to do the following:

1. For quickest station load and schematic access, place the most important and most frequently displayed "classic" schematics and free format logs in directories on the "fast search" user volume. Each History Module can have a fast search volume which is the first user volume configured on each HM. Each of these volumes can have 63 directories.

2. To ensure that the nonmemory-resident schematics and FFLs are retrieved as quickly as possible, specify the paths to these directories as the first search paths in the Pathname Catalog.

Equipment List Considerations

It is important to note that an Equipment List declare file is not bound to a custom display object file, as are subpictures, for example. Instead, it is accessed at runtime and, therefore, must be located by using the Area Database Pathname Catalog as a search path. You must be aware of the fact that in the case of the Equipment List declare file (.QO), the US searches the catalog in *reverse order*.

If it is taking a considerable amount of time to display Equipment List custom displays, check the pathname catalog.

Selecting a target that references the Equipment List .QO file, causes the station to search the Area Database Pathname Catalog in reverse order.

To prevent a long access time, you must configure your pathname catalog to accommodate the reverse search. The following table describes how to configure your pathname catalog for Equipment list.

IF …	THEN…
.QO and .DO files are in the *same* directory	Configure the directory at the beginning *and* at the end of the catalog.
.QO and .DO files are in the *different* directories.	Configure the **.**DO directory at the beginning and the **.**QO directory at the end of the catalog.

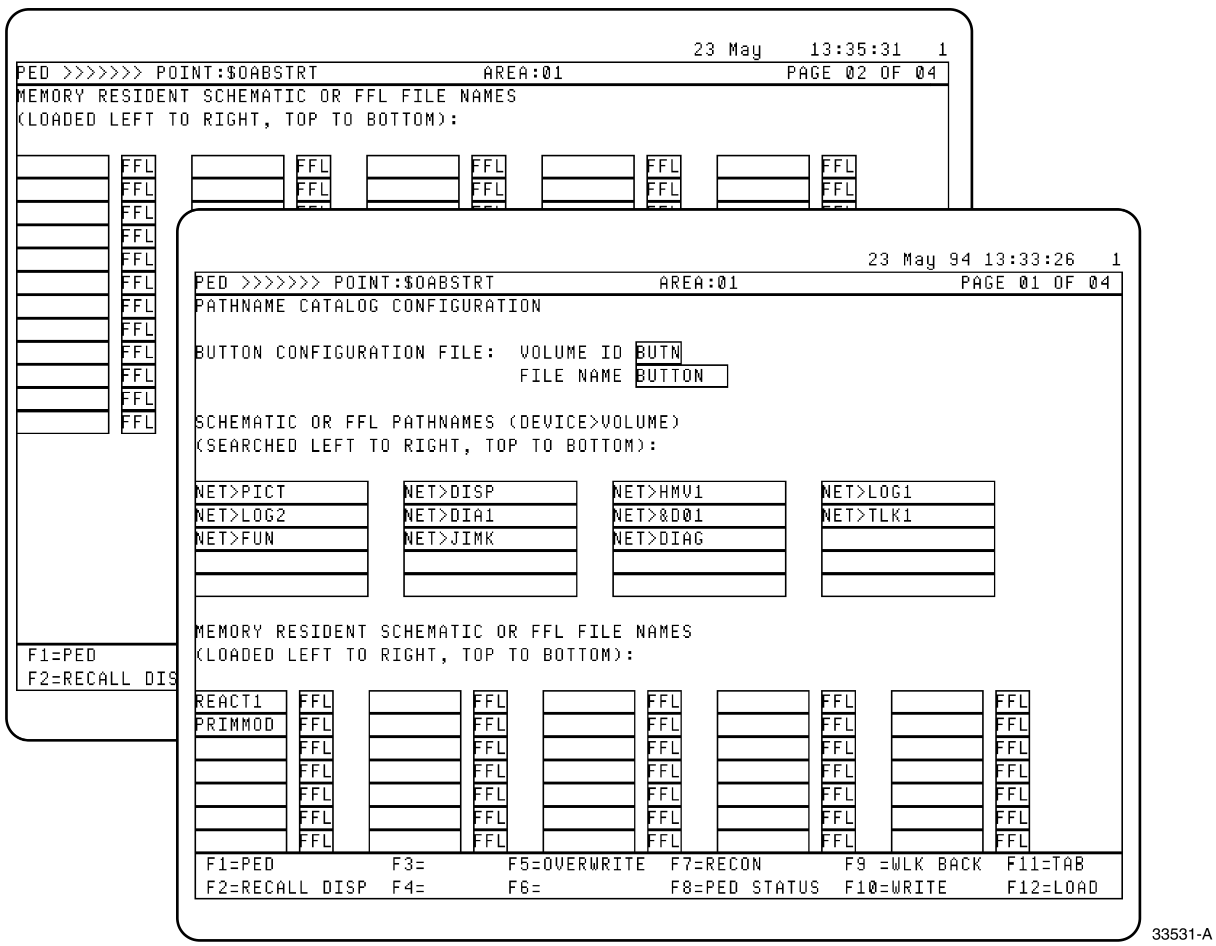

Figure 2 R500 Pathname Catalog Example

Purpose of Memory-Resident Schematics/Logs

There are two reasons for memory-resident schematics and free format log files:

1. Quick call-up of commonly used schematics or logs.
2. Availability of essential or critical schematics or logs in case of HM failure.

Note: Only picture editor graphics may be memory-resident.

Determining the Displays that Have Been Loaded Into Memory

To determine the displays that have been loaded into the US/GUS memory, call up the Schematic/FFL Titles display:

1. Press [SYSTEM MENU]
2. Select ORGANIZATIONAL SUMMARY MENU
3. Select SCHEMATIC/FFL TITLES

Display Colors: Yellow—Memory-resident displays/logs

Cyan—Displays/logs that were configured for memory residency, but were not actually loaded.

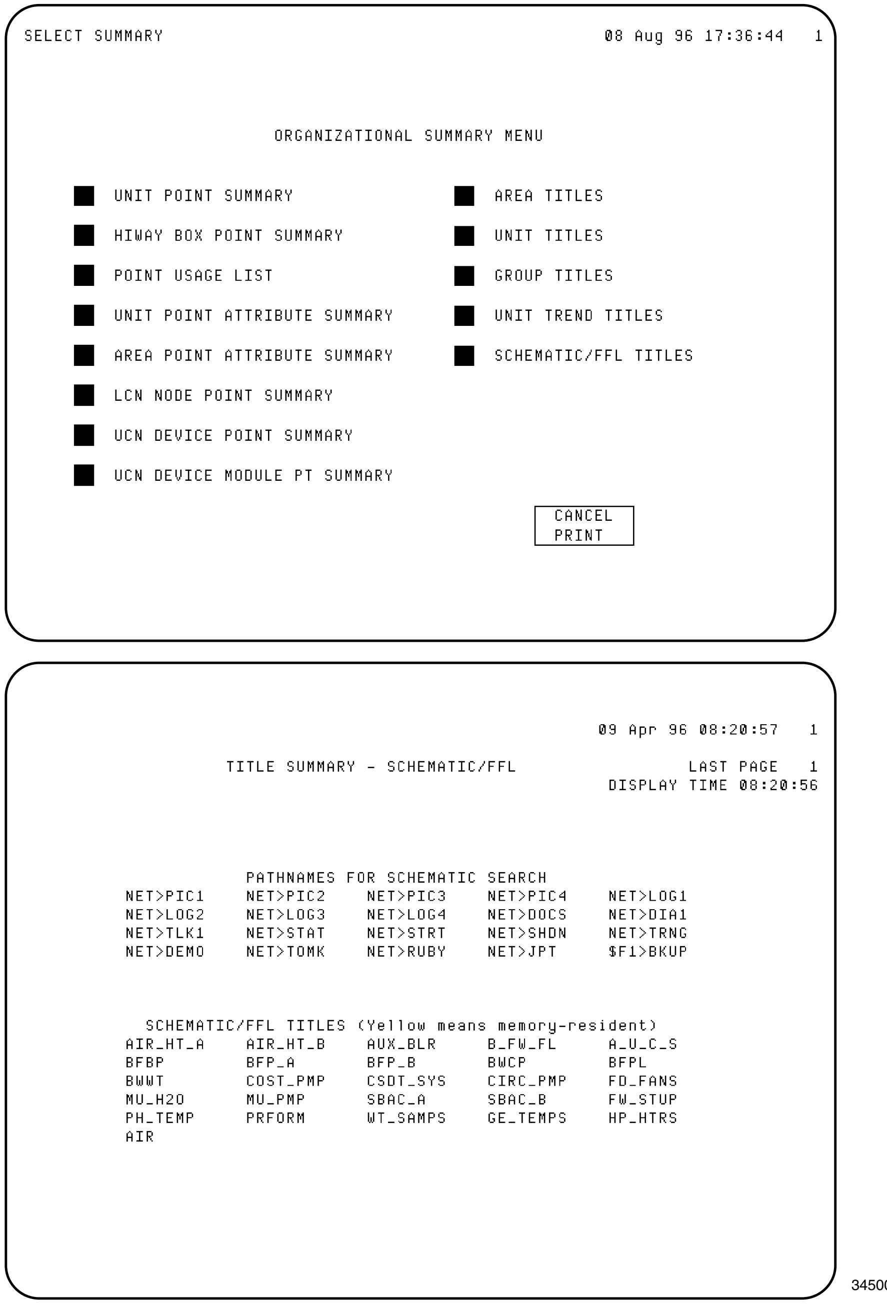

Figure 3 R500 Schematic/FFL Titles Display

Schematic Redundancy

It is a good idea to configure several options for schematic access to ensure they are always available in the event of HM failure.

Table 1 describes the ways schematic redundancy can be handled.

Table 1 Schematic Redundancy Methods

Method	Description
Have schematics reside in the station's memory	Memory-resident schematics provide faster callup time, but are redundant in the sense that they will be loaded in station memory and will also be present on the HM.
Duplicate files on two different HMs.	If the system has multiple HMs, create two directories (each with unique names) on two of the HMs, then duplicate the schematic object files in each directory. When entering the schematic/log pathnames in the Area Pathname Catalog, include both directory names. If one HM fails and the directory cannot be found, the US/GUS searches for the other directory. The search can take up to 8 seconds.
Include a directory that "points" to a removable media drive.	Copy the critical schematic object files onto a floppy or cartridge disk, and make the disk available for insertion in the drive in case of HM failure.

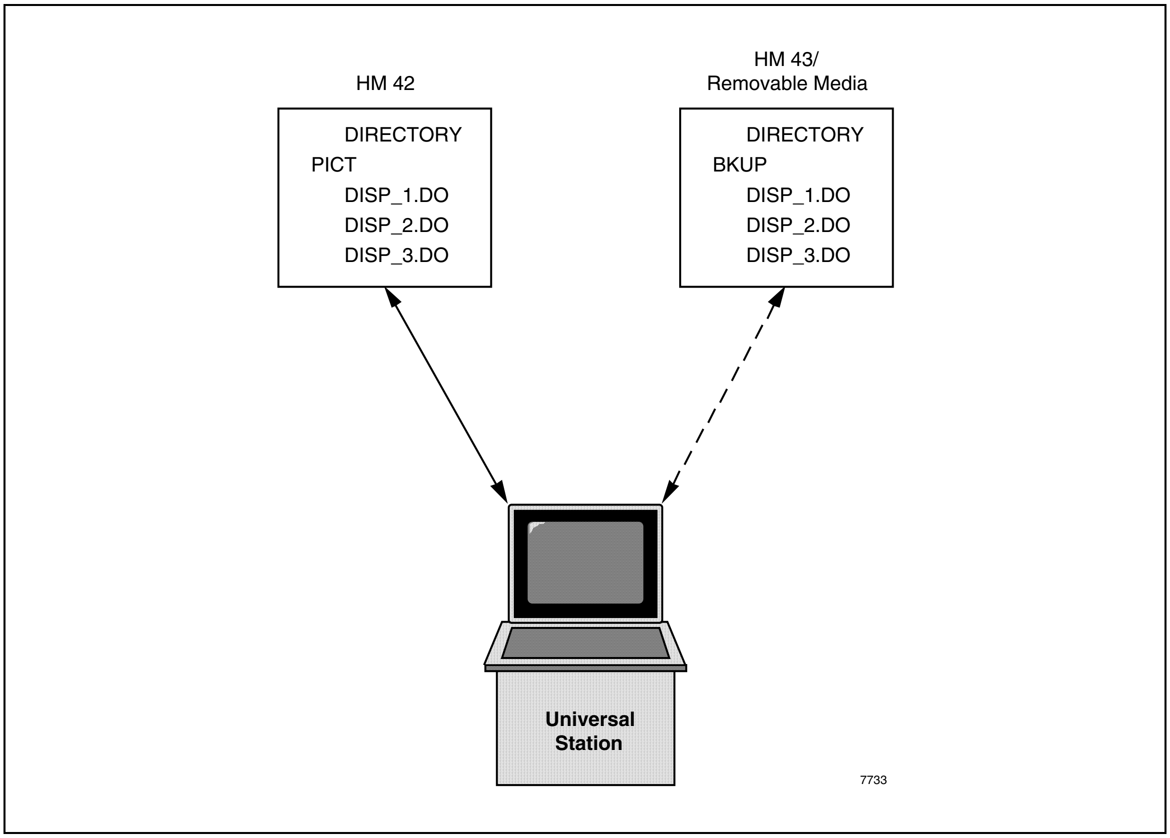

Figure 4 Schematic Redundancy

ATTENTION

ATTENTION—If you maintain multiple copies of schematics, make sure you have good update procedures in place in case a schematic is modified.

Prior Display Function

Description

Before R510, a Universal Station read any non-memory resident Picture Editor display into memory every time it was involved. After Release 510, the last three most recently invoked displays are kept in US/GUS memory to reduce their call-up time:

Configuration Procedure

One consequence of keeping the last three prior displays in memory is that when building a new custom schematic the engineer will typically want to check its operation and revise it. After making changes, the changed schematic is usually compiled to an HM.

In R510 and later systems, to clear the old display out of US/GUS memory and read in the latest revision of the custom display, two methods are provided:

- The Clear Screen function on the System Menu clears the screen *and* the prior display *if* that display was a custom schematic.
- The Clear Screen actor also clears the screen *and* the prior display *if* that display was a custom schematic. In order to use the actor, you might want to add it to one of the configurable buttons.
- Invoking the Picture Editor also clears memory.

Note: an area change does not clear this memory location.

REFERENCE—Additional information can be found in the following manuals in binder TPS 3032-2:

The Clear Screen actor (CLR_SCRN) is described in Section 2 of the *Actors Manual*.

Section 4 of the *Picture Editor Data Entry manual* explains how to clear the prior schematic from US memory.

Extra Schematic Memory

Description

In R500 and later, the External Schematic Memory NCF entry can be used to allocate additional memory in a Universal Station for memory-resident user Picture Editor schematics and free format logs. You can install additional memory in the station beyond the size required for the personality, then use a new NCF entry to allocate all or a portion of the space for memory-resident schematics and logs.

The area of US memory used for memory-resident displays/logs is named ME01. The new NCF entry can be used to expand the size of ME01 beyond its minimum size. The minimum size of ME01 is the space required to store Honeywell’s memory-resident &DSY displays and the base amount for user memory-resident files.

NCF Display

Figure 5 shows page 2 of the Universal Station NCF configuration. The entry you use to allocate additional memory appears at the bottom of the display:

`EXTERNAL CUSTOM SCHEMATIC MEMORY (KILOWORDS)`

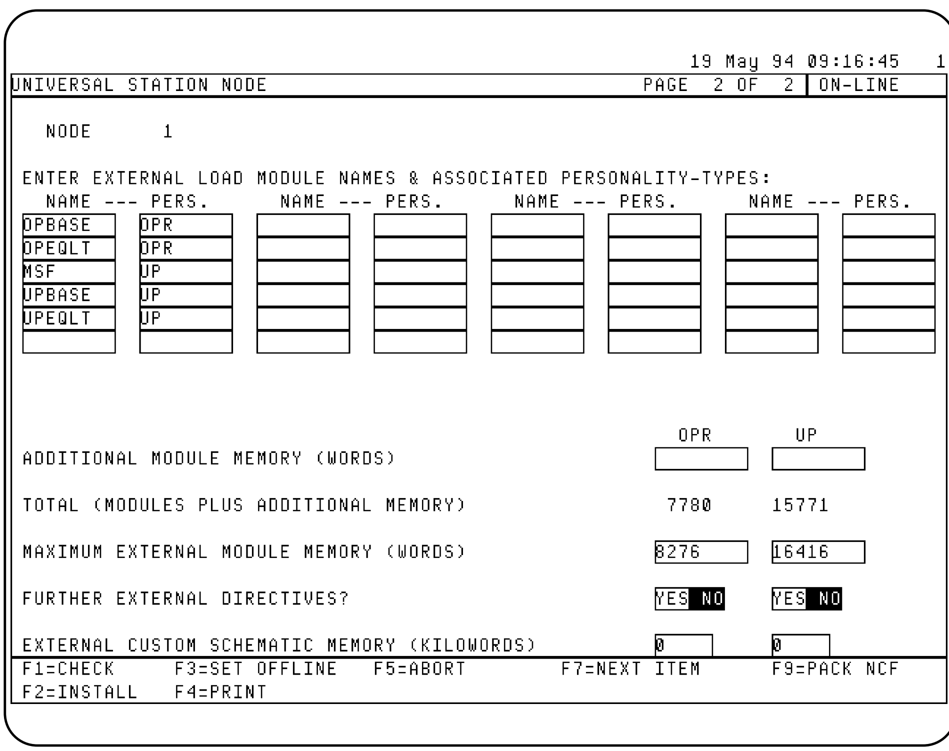

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Figure 5 Universal Station Configuration—Page 2

NCF Entry

The possible entries for External Custom Schematic Memory are

ALL = Maps all additional US memory (above what is required for the personality) as memory-resident file space.
If you enter ALL, then you can add additional memory to the station at any time, and the node administrator will map it as memory-resident file space without requiring an NCF change.

nn = If you enter a specific number of kilowords, that amount of additional memory is mapped as memory-resident file space and the remainder is released to heap. If your entry is more than is available, at load time the station allocates as much as possible.

The default NCF entry is zero Kw. If you don't configure External Schematic Memory, any additional memory is available as heap.

External Schematic Memory can be changed as an *online* NCF change.

Heap

Heap refers to dynamically allocated node memory. Each task in the node goes and gets a number of blocks of heap memory as needed, then releases the memory when the task terminates.

The dictionary defines the word "heap" as a pile of things. Heap memory can be thought of as a "pile" of memory that is not used for fixed structures or other files that are loaded at load time. Tasks borrow memory from the heap and then put it back.

The term "heap eater" refers to a task that gets memory but does not put it back. Users who observe this condition should request Honeywell technical assistance.

ME00 and ME01

Memory-resident files are stored in a file system in the US referred to as ME01 (memory device $EMEMORY). Another file system in the US is ME00 (memory device $MEMORY). Before R500, the Honeywell supplied &DSY memory-resident displays and the user's memory-resident displays and logs resided in ME00. In R500, all memory-resident displays reside in ME01.

Memory-resident Files

You can use the following Command Processor command to list the names of the files in ME01:

```
LS $EMEMORY>MRnn>*.*
```

where `nn` = node number (can specify only local node)

Figure 6 is a partial example listing. Remember that the standard Honeywell displays are in ME01 along with the user's schematics/logs. Page to the end of the listing to see the user schematics/logs.

```
$EMEMORY>MR01>*.* 05/23/94 14:40:26

DEVICE   DIR  FILENAME EXT TYP P VER  TIME STAMP  # RECS  RECSIZ #BLKS BLKSIZ START  END
 ------- --- --------- --   -  - -- ------------- ------ ------ ------ ---- ----  -------
$EMEMORY MR01 DISPLAY1 SV   C    -- 05/23/94 14:15 ------ ------   270  ----   62    331
$EMEMORY MR01 DISPLAY2 SV   C    -- 05/23/94 14:15 ------ ------   270  ----  332    601
$EMEMORY MR01 DISPLAY3 SV   C    -- 05/23/94 14:15 ------ ------   270  ----  602    871
$EMEMORY MR01 TOP2LINE DO   C  *  4 03/01/94 11:53 ------ ------     2  ----  872    873
$EMEMORY MR01 $SS_STAT DO   C  *  4 03/01/94 11:52 ------ ------     6  ----  874    879
$EMEMORY MR01 FLOPPYH  DO   C  *  4 03/01/94 11:52 ------ ------     8  ----  880    887
$EMEMORY MR01 BUTTON   KO   L     3 05/23/94 10:53      1 ------     1     4  888    888
$EMEMORY MR01 DETTITLE DO   C  *  4 03/01/94 11:52 ------ ------     3  ----  893    895
$EMEMORY MR01 DTGRPCHG DO   C  *  4 03/01/94 11:52 ------ ------     1  ----  896    896
$EMEMORY MR01 DTCHANGE DO   C  *  4 03/01/94 11:52 ------ ------     2  ----  897    898
$EMEMORY MR01 $DCGPCHG DO   C  *  4 03/01/94 11:51 ------ ------     3  ----  899    901
$EMEMORY MR01 OS_TOP   DO   C  *  4 03/01/94 11:52 ------ ------    38  ----  902    939
$EMEMORY MR01 CON_ASGN DO   C  *  4 03/01/94 11:52 ------ ------    35  ----  940    974
$EMEMORY MR01 NODE_STS DO   C  *  4 03/01/94 11:52 ------ ------    50  ----  975   1024
$EMEMORY MR01 GROUP    DO   C  *  4 03/01/94 11:52 ------ ------     1  ---- 1025   1025
$EMEMORY MR01 MOD_GRP  DO   C  *  4 03/01/94 11:52 ------ ------    42  ---- 1026   1067
$EMEMORY MR01 $STSDTL1 DO   C  *  4 03/01/94 11:52 ------ ------    31  ---- 1068   1098
$EMEMORY MR01 DTDACRG1 DO   C  *  4 03/01/94 11:52 ------ ------    18  ---- 1099   1116
$EMEMORY MR01 DTDACRG2 DO   C  *  4 03/01/94 11:52 ------ ------    19  ---- 1117 1135
$EMEMORY MR01 DTDACNRG DO   C  *  4 03/01/94 11:52 ------ ------    14  ---- 1136 1149
```

Figure 6 Partial $EMEMORY Listing of Memory-Resident Files

Conceptual Diagram of US Memory

Figure 7 shows the following items in a conceptual diagram of US memory:

- memory required for personality
  - personality image (PI) files
  - custom systems (optional external load module software)
  - minimum ME01 (default size required for memory-resident Honeywell standard abstracts from &DSY and base amount for user-memory resident files)
  - minimum heap
- additional space for ME01 (user-configurable)
- ME00 (contains only the user's Areann.DA file and several Honeywell journal manager files)

As shown in Figure 7, the size of ME01 expands to meet the user's NCF request. The amount of available heap expands if the user releases any additional memory to heap.

The term "external" in reference to External Customer Schematic Memory pertains to memory external to ME00; that is, ME01.

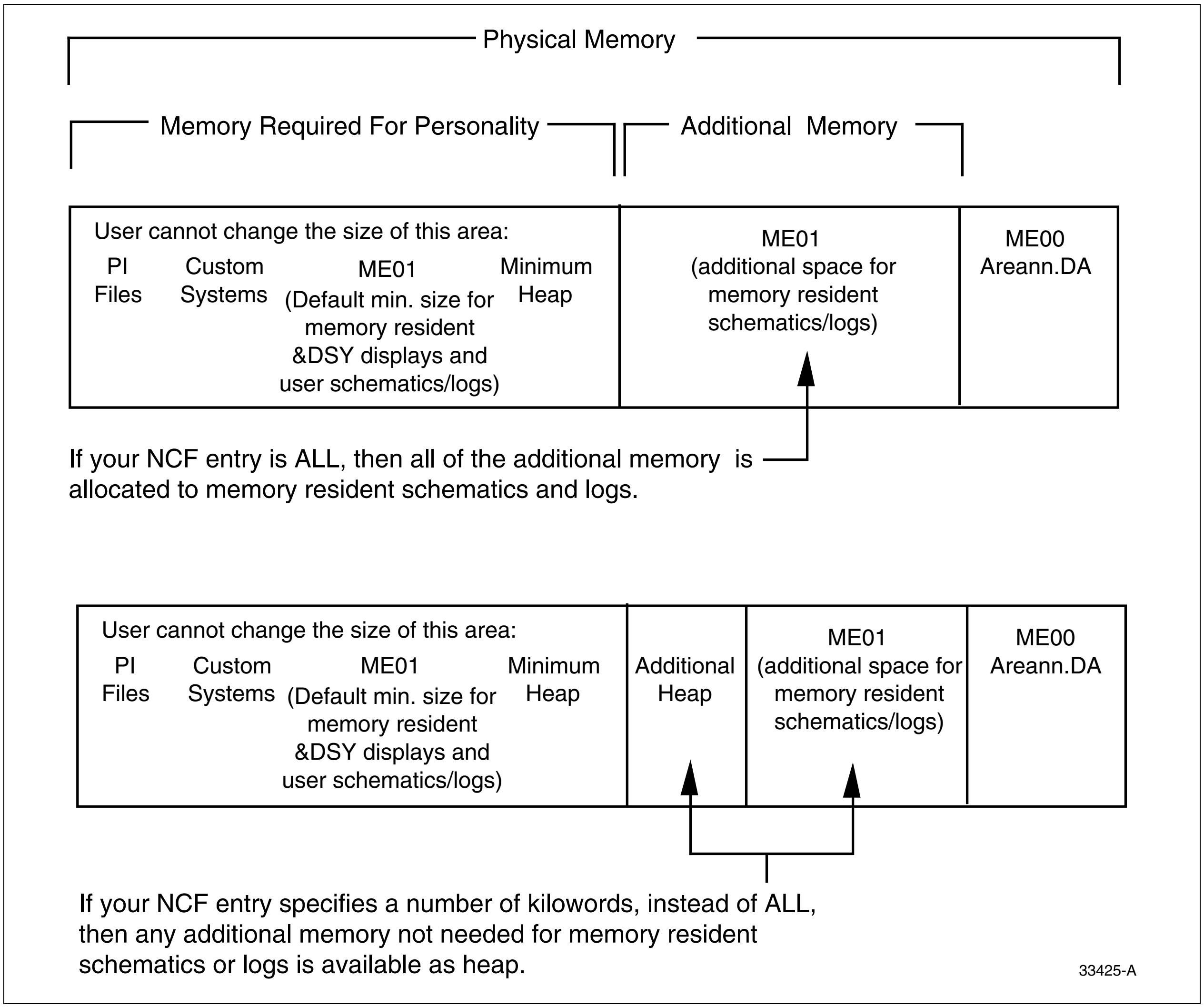

Figure 7 US Memory Diagram

Custom Systems

In R500 and later, Honeywell allocates the following space for External Load Module software in the “custom systems” area of US memory:

- OPR - 250 K
- UNP - 300 K

Example

As an example of how to configure External Schematic Memory, assume we have added two Mw (2000 Kw) of additional memory to a station that previously had four Mw.

We will enter 1250 Kw into the NCF configuration for EXTERNAL CUSTOM SCHEMATIC MEMORY. The result is that 1250 Kw of the additional memory is mapped for memory-resident files and 750 Kw is released to heap.

How to Determine Current ME01 Usage

You can use the following Command Processor command at the station in question to see how much space is currently being used for ME01:

```
LS $EMEMORY -D
```

The command can display only the local node's information. The command lists TOTAL SECTORS available in ME01 and SECTORS IN USE (see Figure 8).

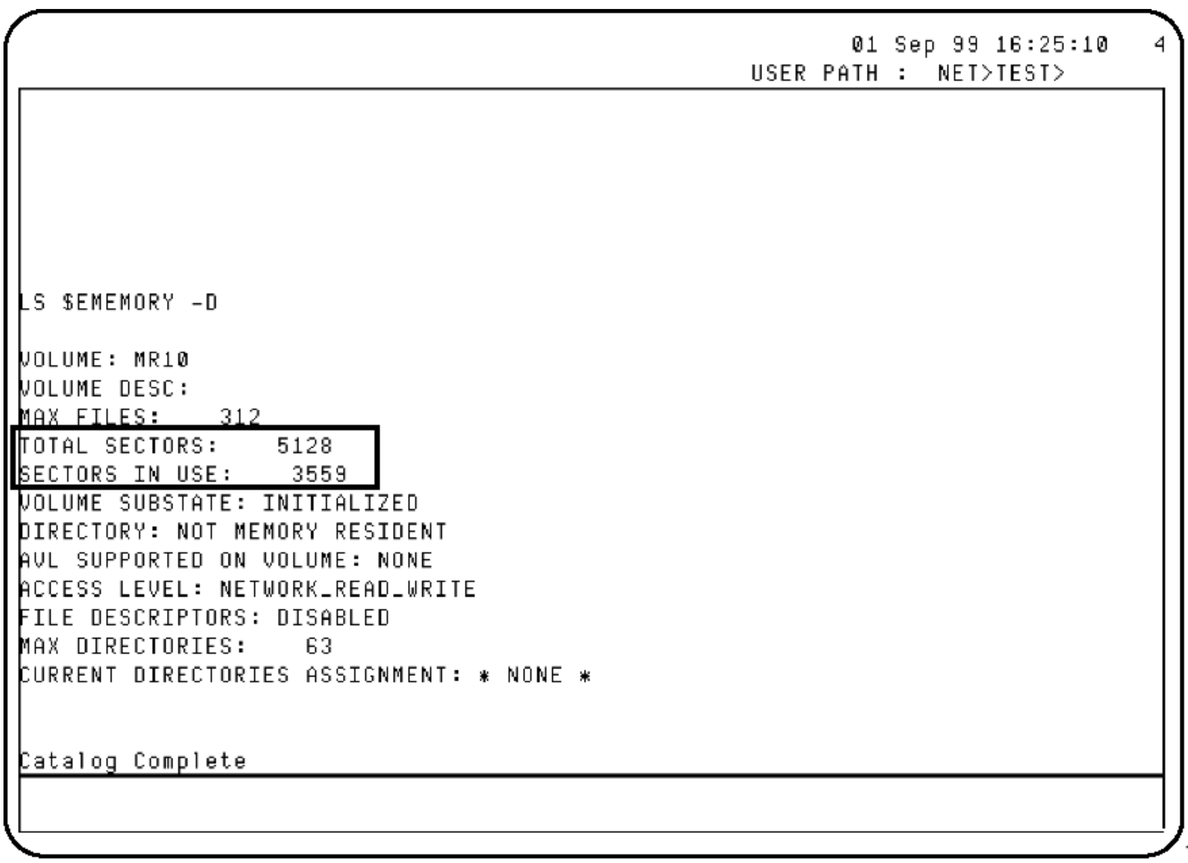

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Figure 8 $EMEMORY Command

Mw, Kw, and Sectors

Use the following information to interpret the $EMEMORY display:

1 sector =1 block
8 sectors = 8 blocks = 1 K words
1000 K words = 1 Mw
1 Mw = 8000 blocks (32 schematics at maximum size) = 8000 sectors

NOTE: In R500, the maximum size of a custom schematic display increased from 150 blocks (≈19 K words) to 250 blocks (32 K words).

$EMEMORY Examples

Figure 9 shows three different examples of LS $EMEMORY, showing results when the NCF entry set to zero, 1000 Kw, and ALL. The SMCC REV/CONFIG display shows that the station has 8 Mw of memory.

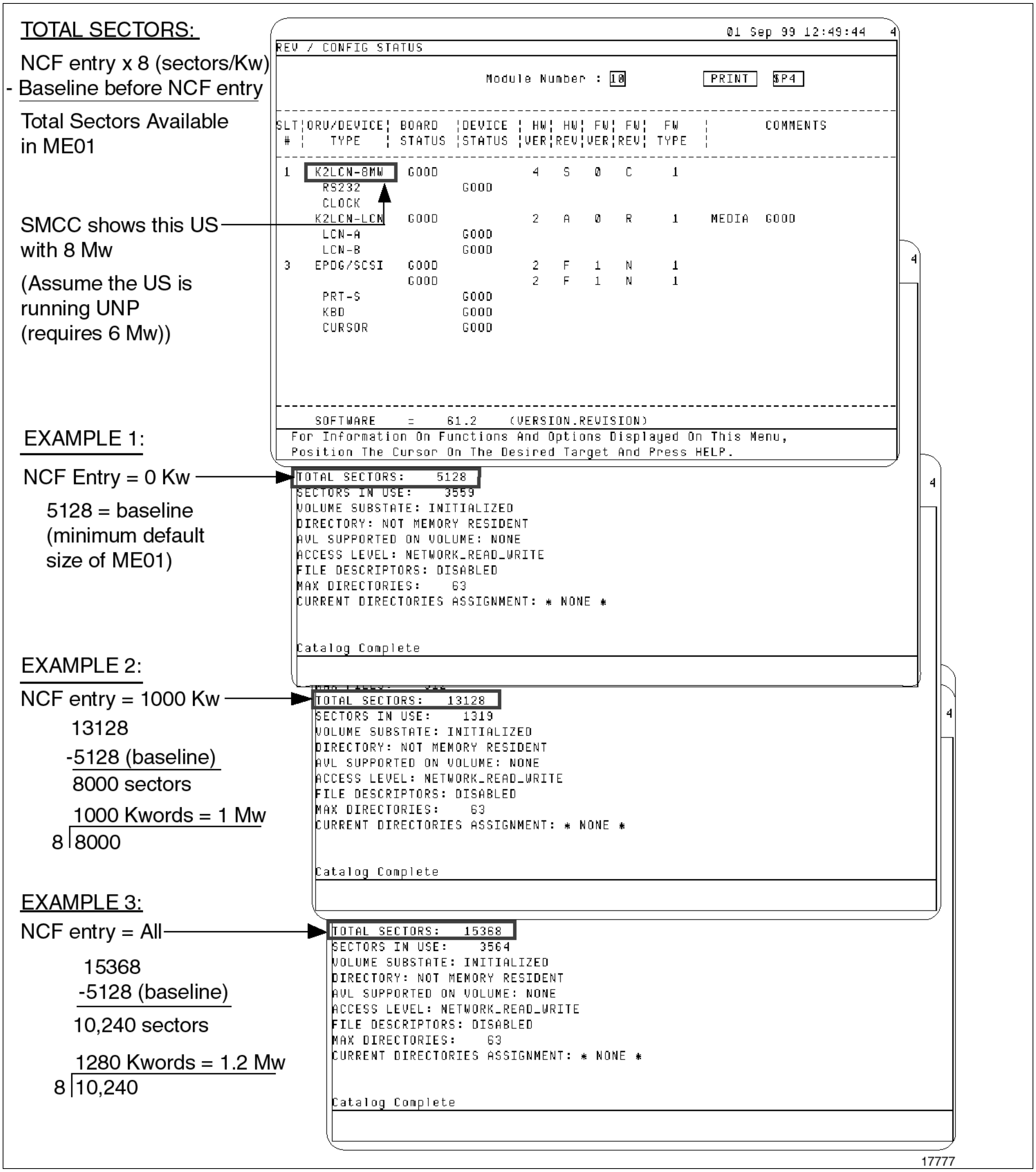

Figure 9 $EMEMORY Examples

Requirements

The maximum amount of total mappable memory in a station depends on whether it uses an EPDG, PDG, or TPDG.

- A station with a EPDG board can use up to 7.25 Mw of installed memory.
- A station with a TPDG or PDG board can use up to 7.50 Mw of installed memory.

Listed below are the memory requirements for each personality, the maximum amount of memory that is usable by the station, and the amount of additional ME01 space that can be allocated for External Schematic Memory.

	Required Memory	Maximum Mappable Memory	**Maximum Available for Additional ME01 Space**
OPR w/EPDG	4 Mw	up to 7.25 Mw	**3.25 Mw (3250 Kw)**
OPR w/PDG	4 Mw	up to 7.50 Mw	**3.50 Mw (3500 Kw)**
UNP w/EPDG	6 Mw	up to 7.25 Mw	**1.25 Mw (1250 Kw)**
UNP w/PDG	6 Mw	up to 7.50 Mw	**1.50 Mw (1500 Kw)**
UXS w/TPDG	8 Mw	up to 7.50 Mw	**0 Mw**

Written Exercise

1. How much usable memory is available in a station with the hardware installation shown below? (Use Table 2 to determine the amount of memory on each board.)

EPDG
EMEM
EMEM
EMEM
LLCN
HPK-3

Mappable Memory=_____Mw

2. If this station has the OPR personality loaded, how much memory is required by the personality? _____Mw

3. With the OPR loaded, how much of this station's memory can be used for External Schematic Memory? _____Mw or _____Kw

4. How much usable memory is available in a station with the hardware shown below?

EPDG
K4LCN-8

Mappable Memory=_____Mw

5. If this station has the UNP personality loaded, how much memory can be used for External Schematic Memory? _____Mw or _____Kw

Board Memory

Table 2 shows the amount of memory available on the various types of LCN node processor boards and the two types of external memory boards that can be used in addition to the processor memory.

Table 2 Board Memory

<table>
<tr><th colspan="2">Processor Board</th><th colspan="2">External Memory Boards</th></tr>
<tr><th>Type</th><th>Memory Size</th><th>Type</th><th>Memory Size</th></tr>
<tr><td>HMPU*
HPK2-2*
HPK2-3</td><td>2 Mw
2 Mw
3 Mw</td><td>EMEM (Rev. E or higher
QMEMn</td><td>1 Mw
n = 2, 3, or 4 Mw</td></tr>
<tr><td>K2LCNn*</td><td>n = 2, 3, 4, 6, or 8 Mw</td><td colspan="2" rowspan="2">These processors cannot address external memory boards.</td></tr>
<tr><td>K4LCNn**</td><td>n = 4, 8, or 16 Mw</td></tr>
<tr><td colspan="4">* 68020
** 68040</td></tr>
</table>

Written Exercise Answers

Example 1

1.

EPDG		
EMEM	*(1 Mw)*	
EMEM	*(1 Mw)*	*Mappable Memory = 6 Mw*
EMEM	*(1 Mw)*	
LLCN		
HPK-3	*(3 Mw)*	

2. OPR personality requires 4 Mw

3. Available External Schematic Memory = 2 Mw or 2000 Kw

Example 2

4.

EPDG		
		Mappable Memory= 7.25 Mw
K4LCN-8	*(8 Mw)*	

5. Available External Schematic Memory = 1.25 Mw or 1250 Kw

Memory-Resident Files Error Message

There is a configuration error message related to the External Schematic Memory NCF entry. If you enter a specific number of kilowords, the NCF configurator does not validate that the station has enough memory to satisfy your entry and it does not limit your entry.

If there is not enough memory available to satisfy the NCF request, an error message similar to the one shown in Figure 10 is recorded at load time in the Status Notification (aux node) Event History Journal:

```
Not enough ME01 space (A 1280 KW) to fill request (R 3000 KW)
```

where:

`A 1280 KW` = Actual amount of memory currently *available* for the External Schematic Memory function.

`R 3000 KW` = Amount of memory *requested* in the NCF entry.

If the requested memory is not available at load time, the node allocates as much memory as possible, allowing you to configure a memory size in anticipation of a future node memory upgrade.

```
                                                                          03 Jan    13:17:13  10


AUXILIARY NODE STATUS JOURNAL                                                           PAGE 001
--------------------------------------------------------------------------------

RM            ):KEY LEVEL ACCESS CHANGED TO           ENGR                              76
    ->OK      ):Custom Names were successfully loaded                                   76
    ->OK      ):Custom/Standard parameter duplicate XRef created 0000-R00590            76
    ->OK      ):Custom/Standard parameter duplicate XRef created 0000-R00590            76
RM            ):Loaded 2 Custom System Status Displays.                                 76
    ->OK      ):Button file was successfully copied to memory.                          76
    ->OK      ):Loading displays into memory.                                           76
RM            ):KEY LEVEL ACCESS CHANGED TO           OPR                               76
    ->OK      ):                                                                        76
    ->OK      ):No errors found in configuration file.                                  76
RM            ):KEY LEVEL ACCESS CHANGED TO           ENGR                              76
    ->OK      ):All displays were successfully copied to memory.                        76
    ->OK      ):Custom Names were successfully loaded                                   76
    ->OK      ):Custom/Standard parameter duplicate XRef created 0000-R00590            76
    ->OK      ):Custom/Standard parameter duplicate XRef created 0000-R00590            76
RM            ):Not enough ME01 space (A 1280KW) to fill request (R 3000KW)             76
RM            ):Loaded 2 Custom System Status Displays.                                 76
    ->OK      ):Button file was successfully copied to memory.                          76
    ->OK      ):Loading displays into memory.                                           76
                                    ROLL
                                    LEFT
```

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Figure 10 Status Notification (Aux Node Status) Journal

RTJ Buffer Size

In R500 and later, the Universal Station/Native Window Real Time Journal (RTJ) buffer can be increased from 100 to 400 events. Increasing the buffer size minimizes loss of event printouts caused by buffer overflow during a process upset.

If there is overflow of the buffer and events are lost, they are lost only to the RTJ. The RTJ will print a message stating that there was overflow and some events were "lost" (not printed). The events will still be in history on the HM if the HM is configured for journaling of those units. Figure 11 shows the NCF selection for RTJ buffer size. 100 is the default.

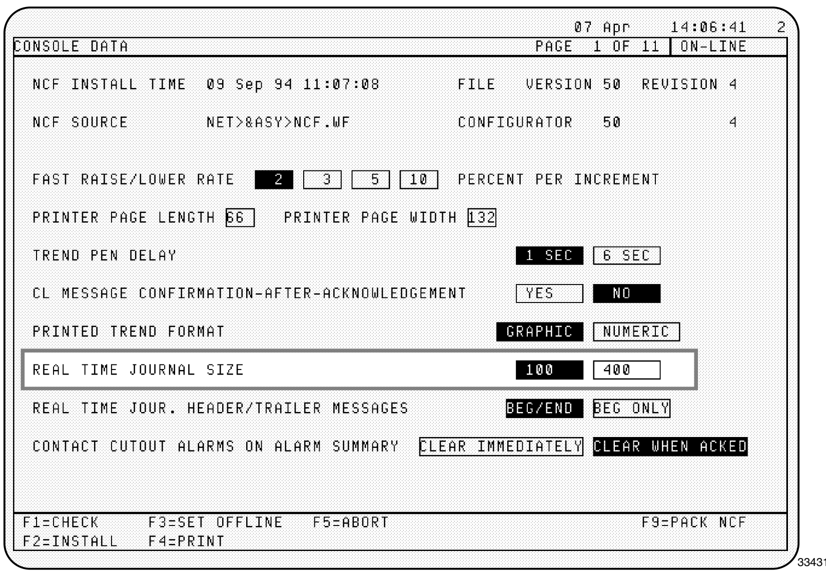


Figure 11 RTJ Buffer Size

Guidelines

If the Real Time Journal is an important part of your operating philosophy and it would be detrimental to lose any printed events, select the 400-event buffer. If your system is very small or does not have many alarms, or if the RTJ is not important the 100-event buffer will be adequate.

Memory Requirement

A buffer size of 400 requires an additional 21.3 Kwords of heap space in each US/GUS. If the large buffer does not "fit" into the US/GUS memory, it defaults to 100 events and sends the following message to the Status Notification RTJ and event history journal:

```
RTJ buffer size has been reduced from 400 to 100 due to memory
allocation
```

The error message occurs only in abnormal situations where the node is so short of memory that tasks are not working properly. Shortage of memory should not occur but if it does, the error message may be helpful to the troubleshooter analyzing the situation; however, the RTJ buffer size reduction is just a symptom of a larger problem.

New US/GUS PSDP Parameters for Alarm Overview

Description

Universal Station (R500 and later) or Global User Station (R510 and later) PSDP parameters are available for read-only access to the following information for a specified unit in the local station's Area.

- Unit ID
- Unit Composite Alarm Status
- Unit Alarm Count
- Unit Assignment State
- Unit Assignment State
- Unit Assignment State
- Unit Lost Event Recovery State

Using these parameters, the information that is shown on the unit annunciator boxes of the Alarm Summary and Alarm Annunciator displays, as well as information from the unit assignment display, can be shown on custom schematics. In addition, a count of alarms at each priority level on each unit can be shown on custom schematics.

The PSDP parameters require the area-relative unit number (see Figure 12) and the local node number; however, if you want to provide a complete alarm overview schematic, the PSDP parameters provide access to additional information (assignment state, system alarm state, console alarm state, and lost event recovery state).

Figure 12 shows the Area-relative unit index numbers as they appear in the Area Unit Assignment configuration display.

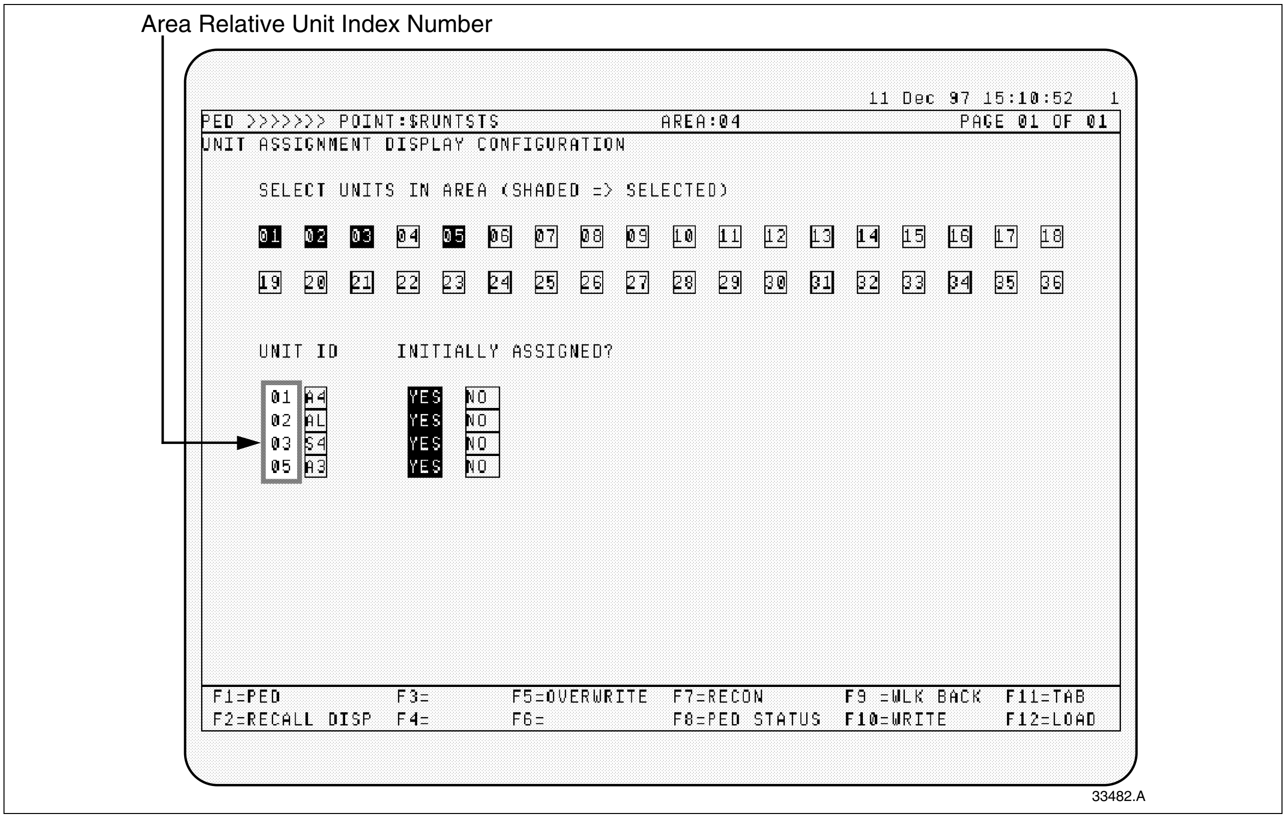


Figure 12 Area Relative Unit Numbers

Parameters

Each of the new PSDP parameters is an array of 36 values, as indexed by the Area relative unit number. Table 3 defines each parameter (where ii = the Area relative unit index number, and nn = the local US node number).

When adding these values to a custom schematic, the system display database parameter $MY_PNA can be used to access the local station's node number.

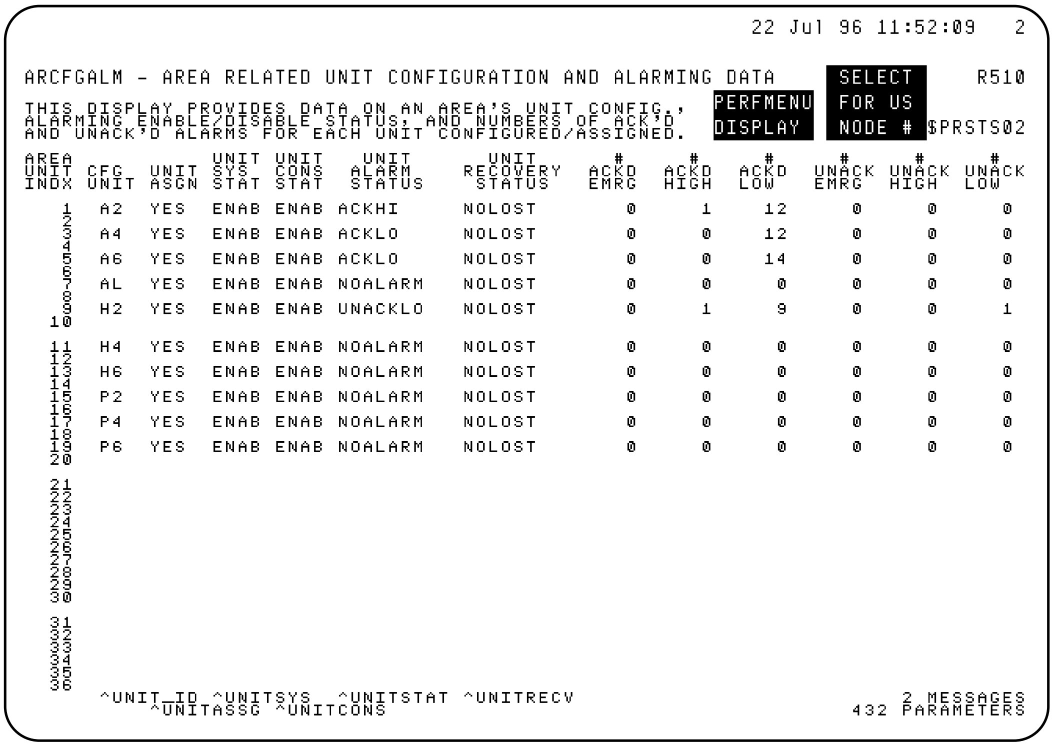
Table 3 New US PSDP Parameters

Parameter	Definition
$PRSTSnn.UNIT_ID(ii)	Unit ID—This parameter of type string returns the 2-character user-configured Unit ID, as defined in the NCF Unit Names. If the Unit is not configured, "garbage" is returned. This will be fixed in a maintenance release to return blanks.
$PRSTSnn.UNACKEM(ii) $PRSTSnn.UNACKHI(ii) $PRSTSnn.UNACKLO(ii) $PRSTSnn.ACKEM(ii) $PRSTSnn.ACKHI(ii) $PRSTSnn.ACKLO(ii)	Unit Alarm Counter—These parameters of type integer return the number of alarms (0-600) for a specified alarm status category in the specified unit. If the Unit is not configured, the counters are zero. The unit alarm count is also available using the following Picture Editor collector: $UNITCNT(Unit ID, $ALRMSTS:nnnnnnnn)
$PRSTSnn.UNITSTAT(ii)	Unit Composite Alarm Status—This parameter returns a state of the enumeration $ALRMSTS indicating the current composite alarm status of the specified unit. The states are listed below in order of precedence: UNACKEM UNACKHI UNACKLO ACKEM ACKHI ACKLO If all the counters are zero, the status is NOALARM. If the Unit is not configured, the status is NOTCONFG The composite Unit alarm status is also available using the following Picture Editor collector: $UNITSTS ("Unit ID")
ii=Area relative unit number (index number of unit) nn=US node number	

Parameter	Definition
$PRSTSnn.UNITSYS(ii)	Unit System Alarm Status—This parameter returns a state of the enumeration ALENBST, indicating if the process alarms for the unit will be annunciated system-wide: ENABLE (alarms are annunciated, historized, and journaled.) DISABLE (alarms are not annunciated. The process alarm event history collection and RTJ are not affected.) INHIBIT (alarms are not annunciated, and the process alarm event history collection and RTJ are stopped.) If the Unit is not configured, the status is DISABLE.
$PRSTSnn.UNITCONS(ii)	Console Alarm Status—This parameter returns a state of the enumeration ALENBST, indicating if the process alarms for the unit will be annunciated on the stations in the local console: ENABLE (alarms are annunciated) DISABLE (alarms are not annunciated) If the Unit is not configured, the status is DISABLE.
$PRSTSnn.UNITASSG(ii)	Unit Assignment Status—This parameter returns a state of the enumeration UNITASGN, indicating if the unit is under the control of the local area: NO (unit is not assigned) YES (unit is assigned) If the Unit is not configured, the status is @@@.
$PRSTSnn.UNITRECV(ii)	Unit Lost Event Recovery Status—This parameter returns a state of the enumeration $UNITREC, indicating the current unit alarm recovery state: NOLOST (no lost events) RECVREQD (event recovery has been requested) LOSTEVNT (lost events exist, but no recovery has been requested) RECINPRG (event recovery is in progress) If the Unit is not configured, the status is NOLOST.
ii = Area relative unit number (index number of unit) nn = US node number	

Area Configuration and Alarm Display

The Area Configuration and Alarm display (ARCFGALM) from the PERFMENU shows the value of the alarm overview PSDP parameters for each unit in the area. The Area relative index number for each unit is shown here also.



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ARCFGALM - AREA RELATED UNIT CONFIGURATION AND ALARMING DATA SELECT R510

THIS DISPLAY PROVIDES DATA ON AN AREA'S UNIT CONFIG., PERFMENU FOR US
ALARMING ENABLE/DISABLE STATUS, AND NUMBERS OF ACK'D
AND UNACK'D ALARMS FOR EACH UNIT CONFIGURED/ASSIGNED. DISPLAY NODE # $PRSTS02

AREA UNIT INDX	CFG UNIT	UNIT ASGN	UNIT SYS STAT	UNIT CONS STAT	UNIT ALARM STATUS	UNIT RECOVERY STATUS	# ACKD EMRG	# ACKD HIGH	# ACKD LOW	# UNACK EMRG	# UNACK HIGH	# UNACK LOW
1	A2	YES	ENAB	ENAB	ACKHI	NOLOST	0	1	12	0	0	0
2												
3	A4	YES	ENAB	ENAB	ACKLO	NOLOST	0	0	12	0	0	0
4												
5	A6	YES	ENAB	ENAB	ACKLO	NOLOST	0	0	14	0	0	0
6												
7	AL	YES	ENAB	ENAB	NOALARM	NOLOST	0	0	0	0	0	0
8												
9	H2	YES	ENAB	ENAB	UNACKLO	NOLOST	0	1	9	0	0	1
10												
11	H4	YES	ENAB	ENAB	NOALARM	NOLOST	0	0	0	0	0	0
12												
13	H6	YES	ENAB	ENAB	NOALARM	NOLOST	0	0	0	0	0	0
14												
15	P2	YES	ENAB	ENAB	NOALARM	NOLOST	0	0	0	0	0	0
16												
17	P4	YES	ENAB	ENAB	NOALARM	NOLOST	0	0	0	0	0	0
18												
19	P6	YES	ENAB	ENAB	NOALARM	NOLOST	0	0	0	0	0	0
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												

^UNIT_ID ^UNITSYS ^UNITSTAT ^UNITRECV 2 MESSAGES
^UNITASSG ^UNITCONS 432 PARAMETERS

34501

Figure 13 Area Configuration and Alarm Display

Other US PSDP Parameters

$PRSTSnn.CURRDSP

In R600 and higher, a US/GUS PSDP parameter, $PRSTSnn.CURRDSP (where nn is the station node number) will indicate the standard or Picture Editor schematic currently invoked at that node. If the display is a custom schematic, it will show its filename. If the display is a standard display, it will show its name (for example, CON_ASGN or SYS_MENU).

This parameter may allow the user to:

1. Track the displays that are most used.
2. Determine the displays that are no longer used.
3. Determine the sequence of displays invoked by the operator.
4. Find the name of the schematic that is currently being displayed.
5. Associate the schematic source filename on each schematic.

$PRSTSnn.USKEYACC

In R610 and higher, a US/GUS PSDP parameter, $PRSTSnn.USKEYACC (where nn is the station node number) provides the ability to read from and write to the keylevel access parameter of any US/GUS on an LCN.

Any time the hardware key is changed, this PSDP parameter will reflect the value of the hardware key.

Any time the key access is changed using Picture Editor actors (KEYENG, $KEYCHG), this PSDP parameter will reflect that change until the next time the key access is changed, either through the hardware key or another actor.

When the station is reloaded, this PSDP parameter returns to its default value.

Alarm Handling

This section discusses the following topics:

- alarm handling by the serving and receiving nodes,
- alarm enable states,
- console alarm states, and
- system alarm states.

ALENBST

In Figure 14, the parameter "ALENBST" has been selected on a point's Detail display.

Table 4 Description of ALENBST

ALENBST	Description
ENABLE	Allows the configured priority for this point to take place upon entering the alarm state.
DISABLE	Allows indication of the alarm on the screen, but the alarm is not sent to the alarm summary or the Real Time Journal (RTJ). Disabled alarms that go into alarm are reported to the Process Alarm Journal and logged.
INHIBIT	Does not allow the alarm to be displayed on the screen or be logged by either the RTJ or Process Alarm Journal. An indication of "INH" appears on the group and detail displays of the point that is set to the "INHIBIT" alarm state.

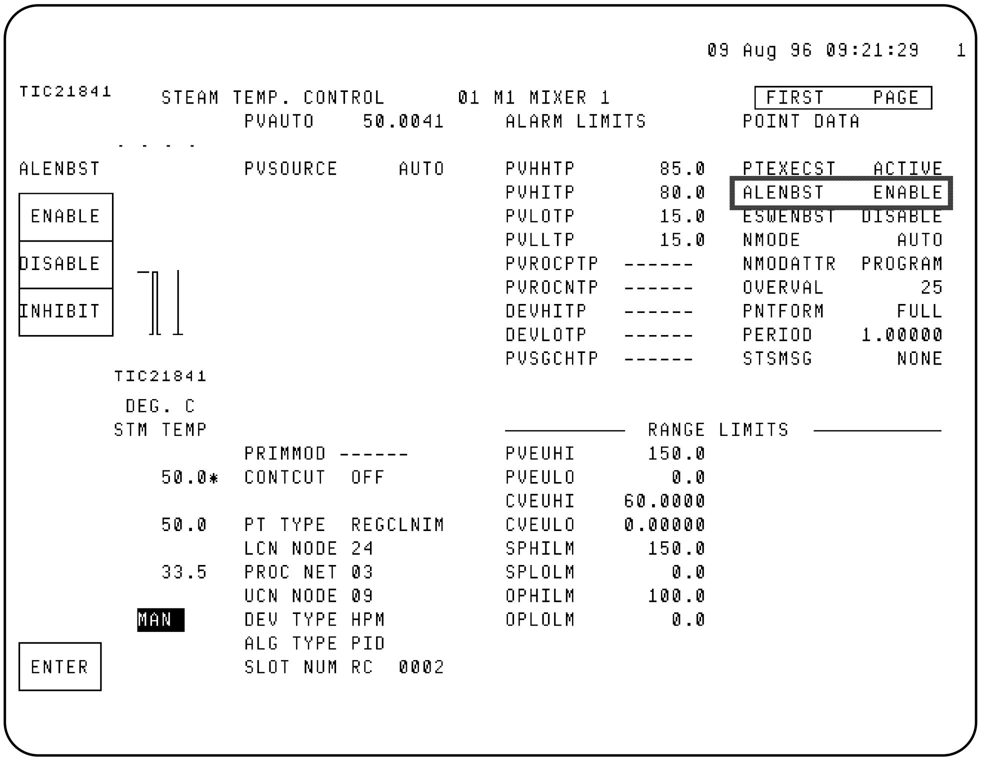

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Figure 14 Example—ALENBST on Detail Display

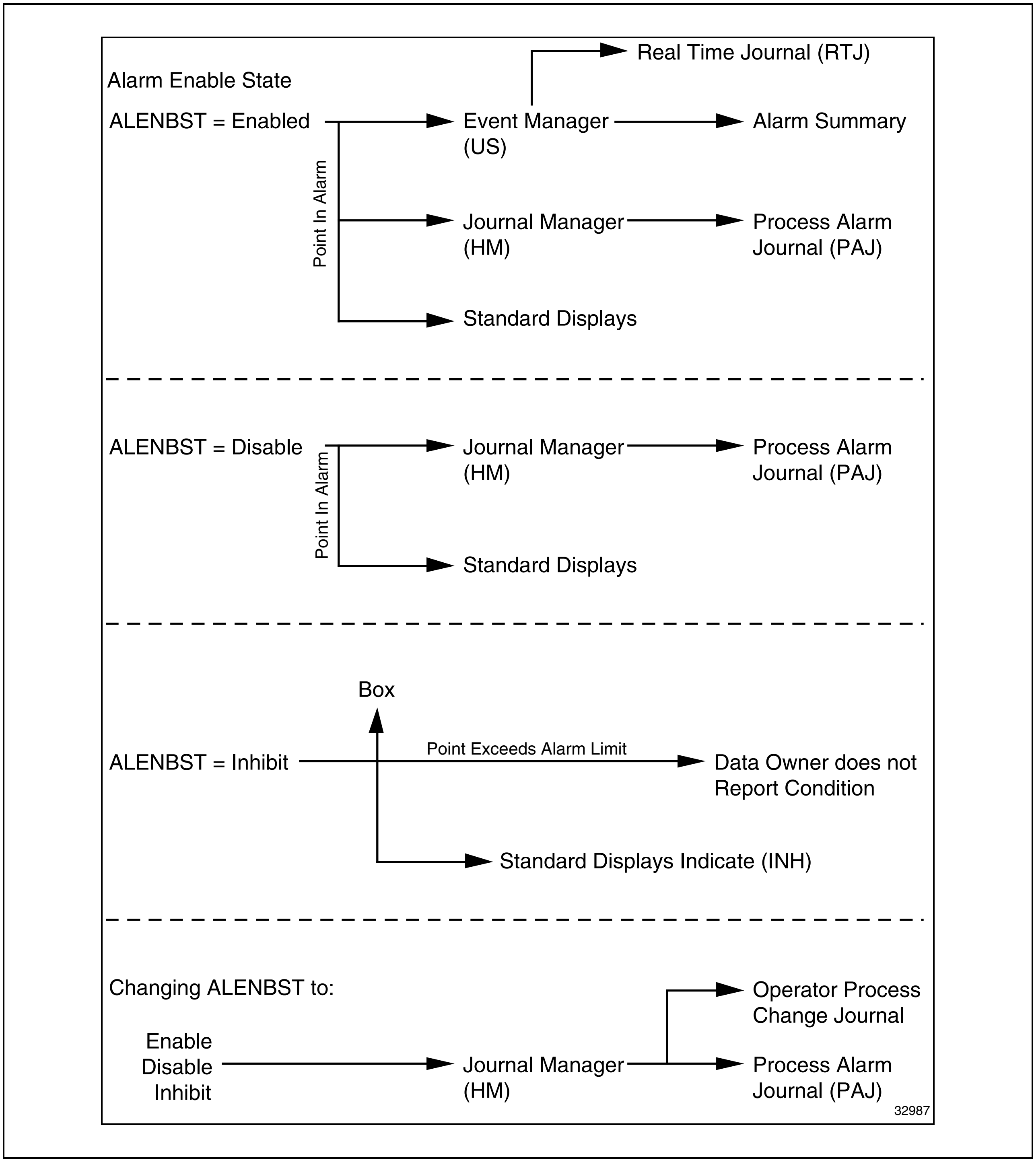

Figure 15 Alarm Enable State Definition

System and Console Alarms

As shown in Figure 17, the Unit Assignment Display is accessed from the Console Status Display by selecting the UNIT DISPLAY target. The Unit Assignment display provides targets to disable alarm annunciation, either console-wide or system-wide:

System Alarm State—The DISABLE , ENABLE , INHIBIT targets listed under the System Alarm State heading affect all points in a selected unit the same way as the "ALENBST" parameter affects the individual points. As shown in Figure 16, the System Alarm States are handled by the data owner.

Console Alarm State—As shown in Figure 17, the disable target listed under the Console Alarm State is used to disable alarms on a console-basis only, assuming that one area is loaded in the console.

For example, disabling the console alarm state for Unit AL prevents alarms in Unit AL from annunciating on the US/GUSs loaded with the same Area database within the same console as the US/GUS from which the state was disabled. The actual data owner is not affected; that is, ALENBST is not changed.

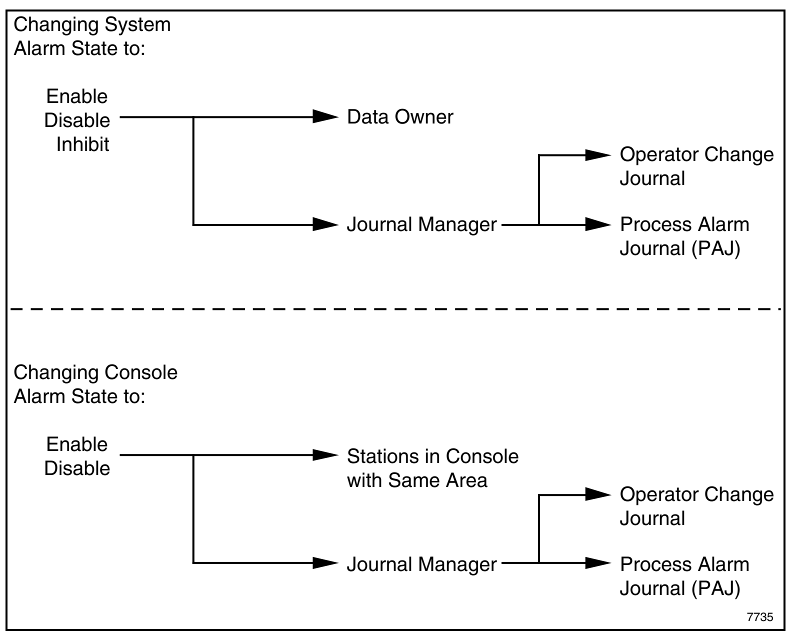

Figure 16 System and Console Alarms

ATTENTION

When alarms are enable, disabled, or inhibited ***by using the System Alarm State targets on the Unit Assignment display, the*** *action is system-wide. "*

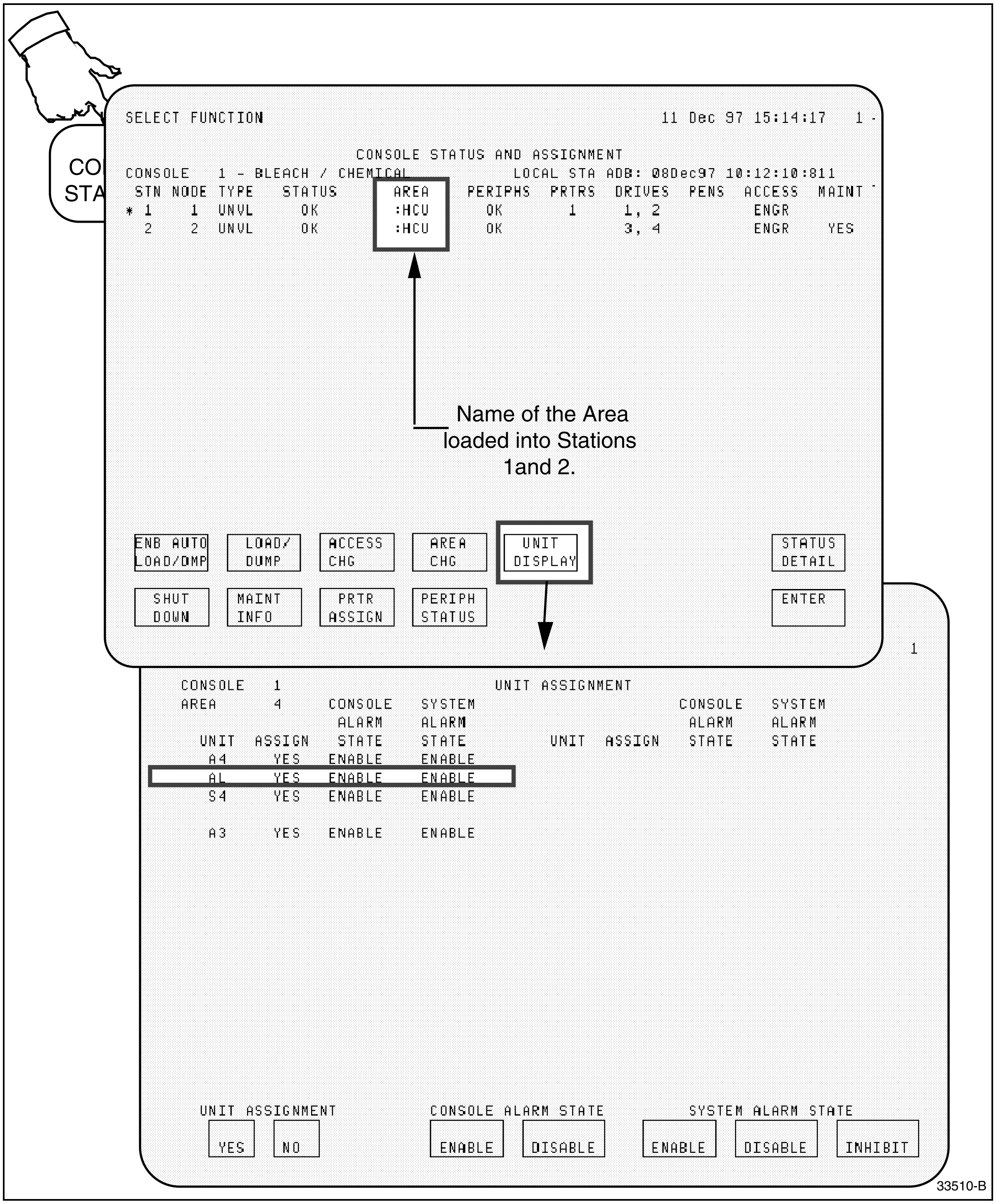

Figure 17 Unit Assignment Display

Alarm Acknowledge

Operator silence and acknowledgement of alarms can be performed from one station in a console. All stations in that console, loaded with the same Area:

- receive the silence/acknowledge, and
- show the alarms as being acknowledged on the alarm displays.

NCF Configurable Alarm Option—R410 and later:

Cross-Console Acknowledgement

When a point alarm is acknowledged at a station, the alarm is acknowledged at all USs on the LCN that are loaded with the same Area, regardless of the console.

The silence key's scope is console only. In R510 and later, an NCF System-Wide Values option allows for console-wide silencing of horns (Figure 18). When this option is configured, pressing the Silence key from any station in the console will silence the horn at any other station in the console, regardless of the area.

Not configuring this option enables silencing of horns based on area within the console.

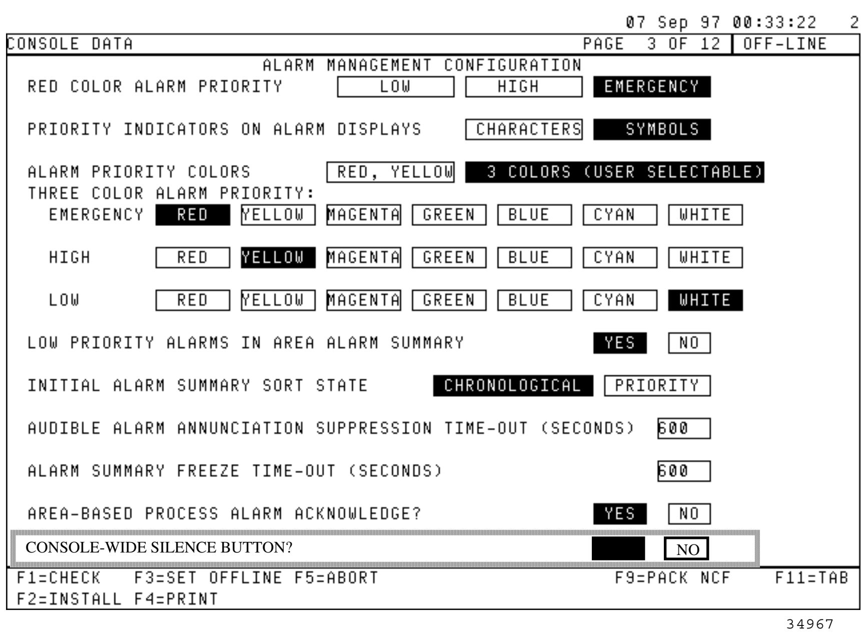

Figure 18 Console-Wide Silencing

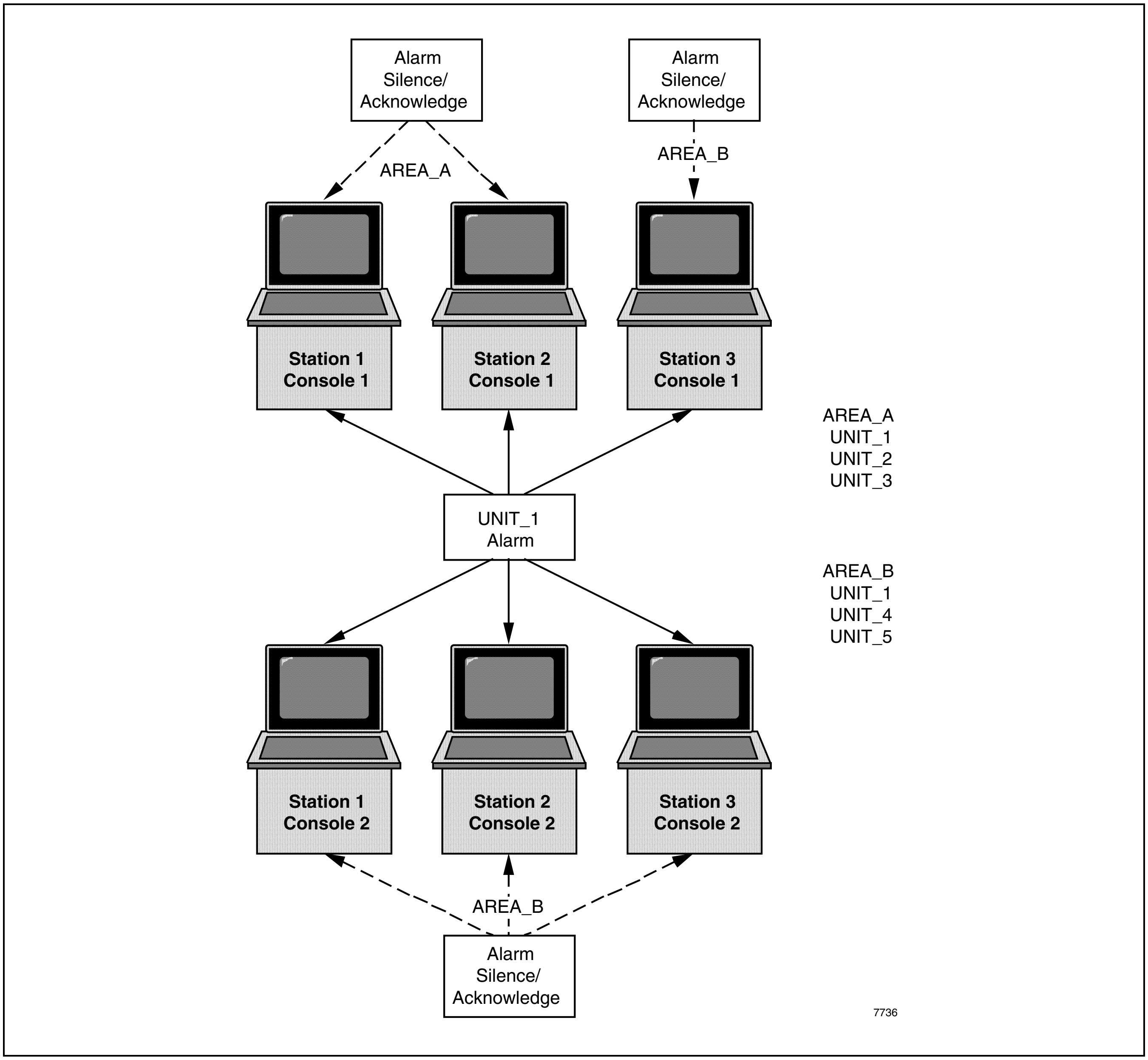

Figure 19 Ownership of Alarm Silence and Acknowledgment

Lab Exercise

Lab Exercise 1

Create Custom Alarm Schematic and Invoke Upon Area Change

1. Create two directories on a cartridge:

   &Dnn (where nn is the area number on your partition sheet)
   &DSY

2. Copy all files from the NET to your cartridges:

   ```
   CP NET>&Dnn>*.*   $Fn>&Dnn=
   CP NET>&DSY>*>*   $Fn>&DSY>=
   ```

3. Working from the area database on your cartridge, determine your area-relative unit index number by reconstituting the Area Data Base Unit Assignment display for your area.

4. From the Picture Editor, create a custom alarm graphic using the GUS/GUS PSDP alarm parameters. Include the following:

   Unit ID
   Unit Alarm counters
   Unit system alarm status

   Name the file AREACHnn (where nn is your area number).

5. Copy the `AREACHnn.DO` to `$Fn>&Dnn` (where nn is your area number).

   Change the area at your station from your cartridge. Verify that your custom alarm schematic is invoked upon the area change.

LAST PAGE

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