Honeywell

Build Efficient Custom Displays

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Figures and Tables

Acronyms

CL..... Control Language
DDB..... Display Database
HM..... History Module

Parameters

PV ..... Process Variable

References

Publication Title	Publication Number	Binder Title	Binder Number
Picture Editor Reference Manual	SW09-550	Implementation/Engineering Operations-2	TDC 3032-2

Introduction

Module Overview

About this module

This course module discusses the practices that are useful when building custom displays, in order to make the displays as efficient as possible.

Inefficient display practices may affect the following:

- maintainability,
- troubleshooting,
- memory use,
- update cycle time, and
- system loading.

Objectives

Given a custom display with performance problems, identify the problems and modify the schematic to make it operate as efficiently as possible.

Sample test items

This course module's Criterion Test includes the following items:

1. Evaluate the efficiency of one or more displays in the DEMO directory on your cartridge disk. Locate at least three efficiency problems. Describe to your course manager the problems and how to correct them.

Build Efficient Custom Displays

Guidelines For Display Efficiency

Beauty is only pixel deep

The prettier the displays, the slower they are. Avoid the following:

- three-dimensional change zones,
- three-dimensional solids, and
- round buttons (they take longer to draw than square buttons).

Build efficient change zones

Follow these guidelines when building change zones:

- Determine whether to use custom or standard change zones. The standard change zone
  - consumes less space,
  - has its own update (can update all variables independently),
  - has its own set of DDBs, and
  - interfaces to almost all point types.
- Determine whether to use variants:
  - Editing a variant is not always simple.
  - If you have 10 subpicture change zones and the US runs out of memory, it deletes all subpictures (the US either grabs all or grabs none). This is a good reason not to use a variant.
- Use variants as a windowing tool within a single custom display or use the MULT_OV actor, then put just one view in one window.

Don't do control!

Don't do control with a custom display:

- Avoid targets to do process actions, unless they are easy to maintain (permissives). Determine the complexity and maintainability.
- Use CL instead of targets. It is easier to edit and troubleshoot.
- Do startup/shutdown in CL, not in a custom display.

  A custom display is limited to two or three actions per second. Have a target set a flag that is picked up by CL, then the display "comes back" immediately — you could use a variant in the display to show what is happening.
- Build a startup/shutdown interface to a CL application.

  The application does the data handling and logic, the custom display is simply the interface to the application.
- If the function has to run all the time, put it in CL; if not, put it in a custom display.

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Guidelines For Display Efficiency, Continued

Targets with delays

If a touch target accesses data with delays incorporated into it, the target slows display activity. You will not be able to use that station until the target completes. This may not be desirable in an emergency situation.

Observe limits

Observe these guidelines when building a custom display:

- 200 variables per Collection Group, and
- 50 fast parameters.

Troubleshooting

For ease of editing and troubleshooting:

- Spread out a custom display's complexity horizontally, not vertically. For example, don't put variants inside variants, in a target.
- Document the display by using the Comment command and the bracketed comments within entry ports, such as targets, variants, conditions, and initial action.

Subpictures

Do not store subpictures outside of the drawing area. The station has to draw the subpictures, then throw them away. This lengthens the drawing time.

Area Pathname Catalog

Display callup

Configuration of the Area Pathname Catalog affects display callup:

- Memory-Resident Displays

  Determine what displays should be memory-resident. List the largest display first (example: MOOSE in Figure 1 has the largest **.**DO file).

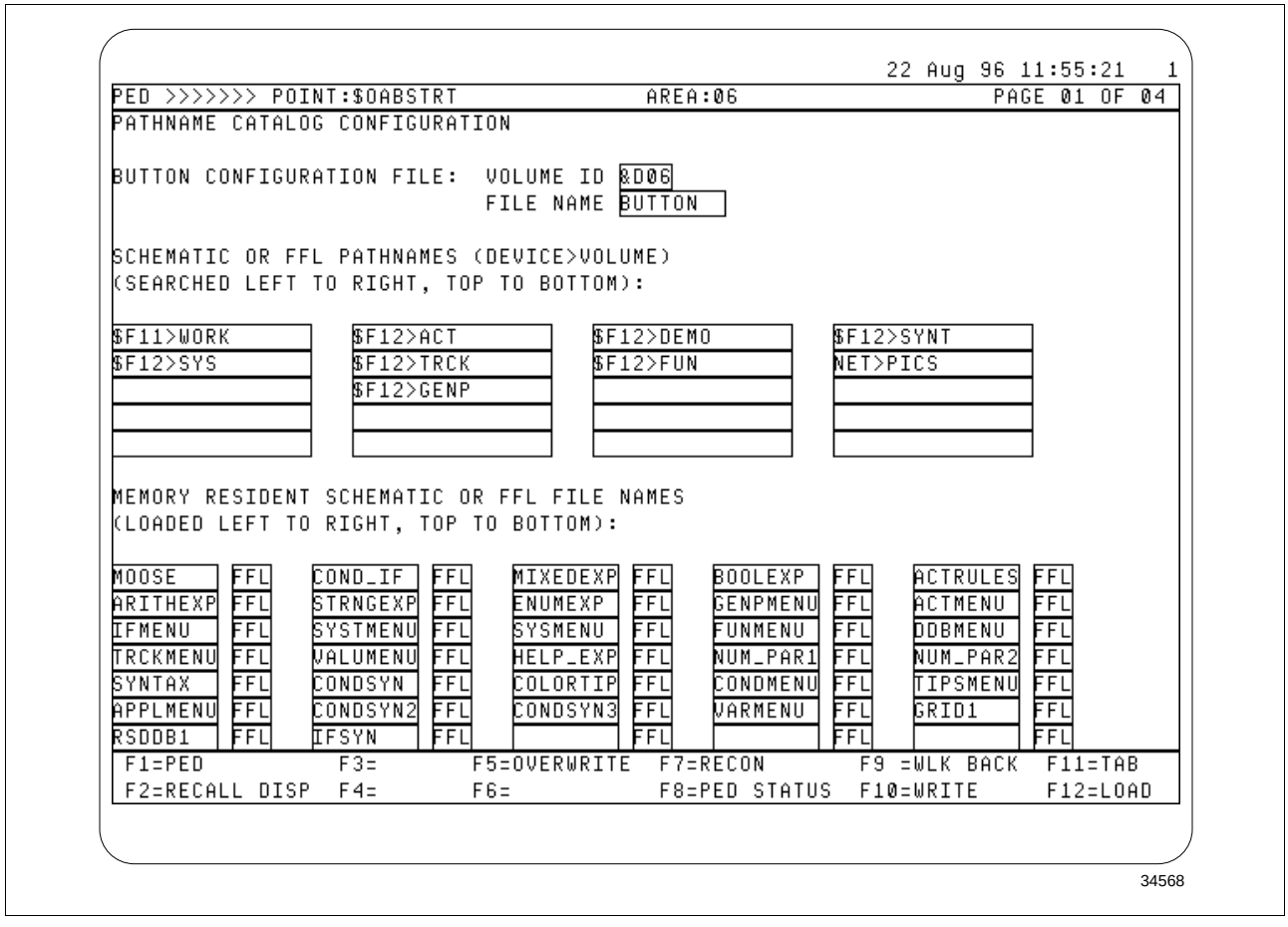
- Equipment List

  If using Equipment List, remember that the station searches for the **.**QO files from last pathname to first, so configure the directory containing the **.**QO files as the last pathname.

- Backup Removable Media

  Configure one pathname to removable media for display backup in case the HM becomes unavailable.

Figure 1 Area Pathname Catalog



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Area Pathname Catalog, Continued

Station memory

In R4xx, 72 Kwords (144 Kbytes), of station memory is available for Custom Schematics and Free Format Log object files.

In R500 and later, you may increase the space available for US-resident schematics and logs through an NCF configuration entry (in kilowords) called External Custom Schematic Memory.

	Required Memory	Maximum Usable 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)**
U^{X}S w/TPDG	8 Mw	up to 7.50 Mw	**0 Mw**

Determine available memory

To determine the remaining available memory, list the files that are currently memory-resident:

R4xx: LS $MEMORY>MRnn>*.*

R5xx: `LS $EMEMORY>MRnn>*.*`

nn = station node number

Figures 5 and 6 show examples of the results.At the end of the listing are the memory-resident user **.**DO files.

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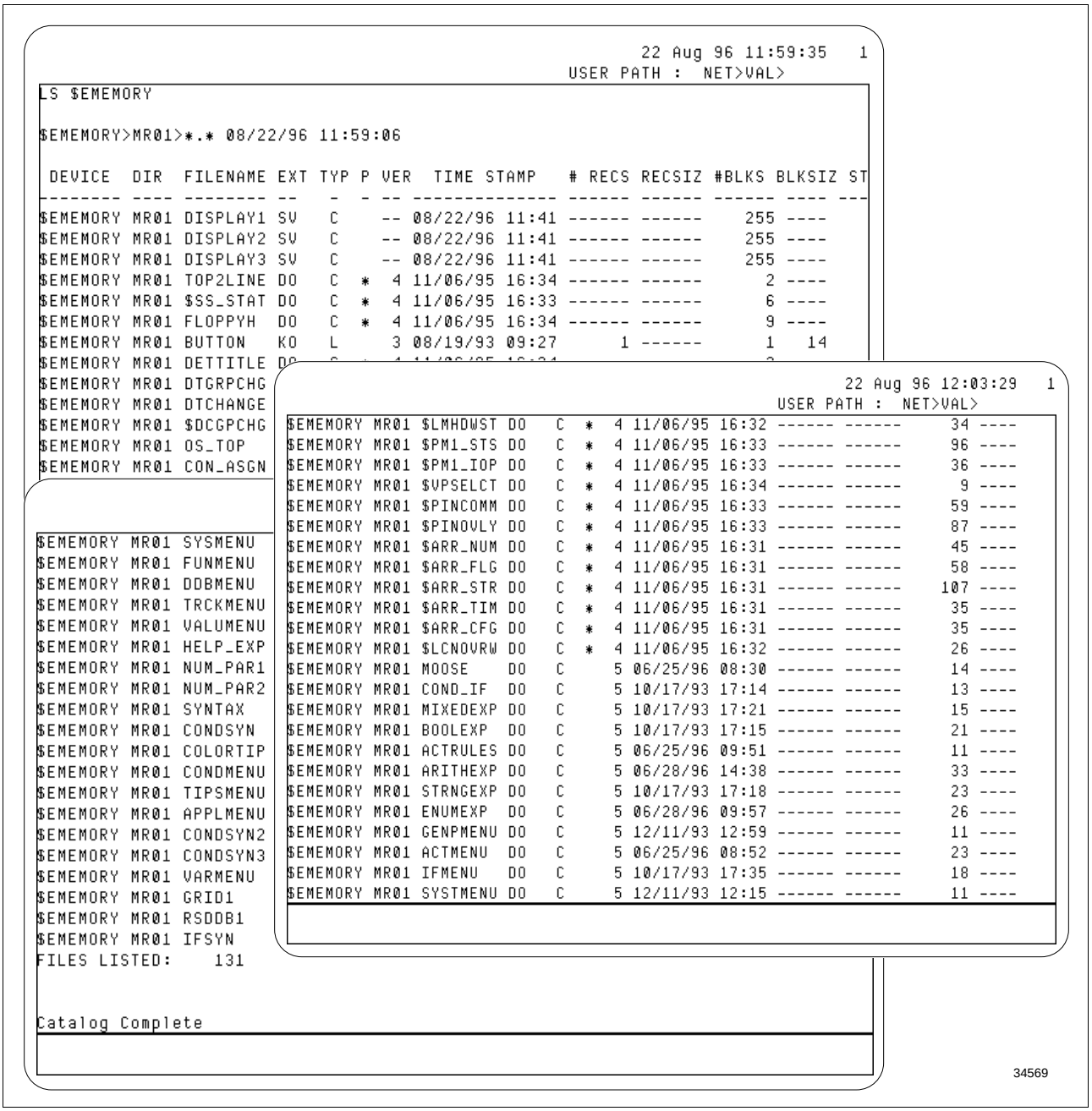
Figure 2 Memory-Resident Displays—R500



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Area Pathname Catalog, Continued

.DO block size

The maximum size of a **.**DO file (display or overlay) is

- R4xx = ≈17 K words (150 blocks)
- R5xx = ≈32 K words (250 blocks)

As shown in Figures 5 and 6, .DO files are sized in blocks.
256 bytes = 1 block
8 blocks = 1 K words
1000 K words = 1 Mw
1 Mw = 8000 blocks
8000 blocks = 32 schematics at maximum R5xx size

Collection Set

Reduce node loading

You should be aware of the affects of a "busy" display on gateway loading.

Determine where the display spends its time (runtime environment).

You may not see problems in the display update, but you may see NIM overruns. It is possible that the NIM overruns can be corrected by improving the efficiency of the custom displays that access it.

Configure the Collection Set of the custom display (using the Picture Editor Set Collection command) to reduce the demand on the US and associated nodes/controllers.

Collection Set

Follow these guidelines when configuring the Collection Set of a display or overlay:

- The Collection Rate of many variables should be zero (such as a local variable containing an entity name).
- If DDBs get loaded with a target action that includes an Update actor, turn off the Collection Set update.
- Watch for compound references (If the "end" is something you want updated, leave it at the default rate or slower. If you don't want it updated, turn it off). For example, if the value GENERIC.BOILER (1).NAME is added to a display, the following symbols are added to the Collection Set. You may want to turn off the update of NAME.
  - `GENERIC.BOILER(1)`
  - `GENERIC.BOILER(1).NAME`
- Variables used in custom change zones are grouped. Use the specific form of the Update actor (specify the Collection Group ID).
- Even with overlays and the R400 increase in block size, custom displays frequently push the limits. (The display may crash or stop updating. PVs show up as bad values.) Your recourse is to adjust the Collection Rates.

Lab Exercise

Evaluate Display Efficiency

Instructions

Look at these custom displays in the Demo directory on your cartridge disk and evaluate them against the efficiency recommendations described in this course module:

- C3COAL1
- REACT_OV
- KILN
- MILL
- CDUALBLR
- BSW1, 2, 3, 4
- GDUALBLR

In the space provided below, list at least five problems you find in the displays.

If you have any questions on how to resolve the problems you find, discuss them with your course manager.

Display	Efficiency Problem

Directions

DIRECTIONS—This is the end of the study material for this module. Discuss questions concerning the study material or the lab activities with a colleague or a course manager

If you are satisfied that you have achieved the objectives of this module, continue with the next section, the Student Proficiency Evaluation.

Student Proficiency Evaluation

Criterion Test

Instructions

Completion of the lab exercise satisfies the majority of the test requirements for this course module.

Be prepared to discuss with your course manager how to resolve at least three of the problems you listed in the lab exercise.

Self-Evaluation

Solutions

Display	Efficiency Problem

Directions

DIRECTIONS—This is the end of this module.

Use your course map to

- Get your course manager to sign off this module.
- Choose your next eligible module.

If you have a question

- Ask your course manager.

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