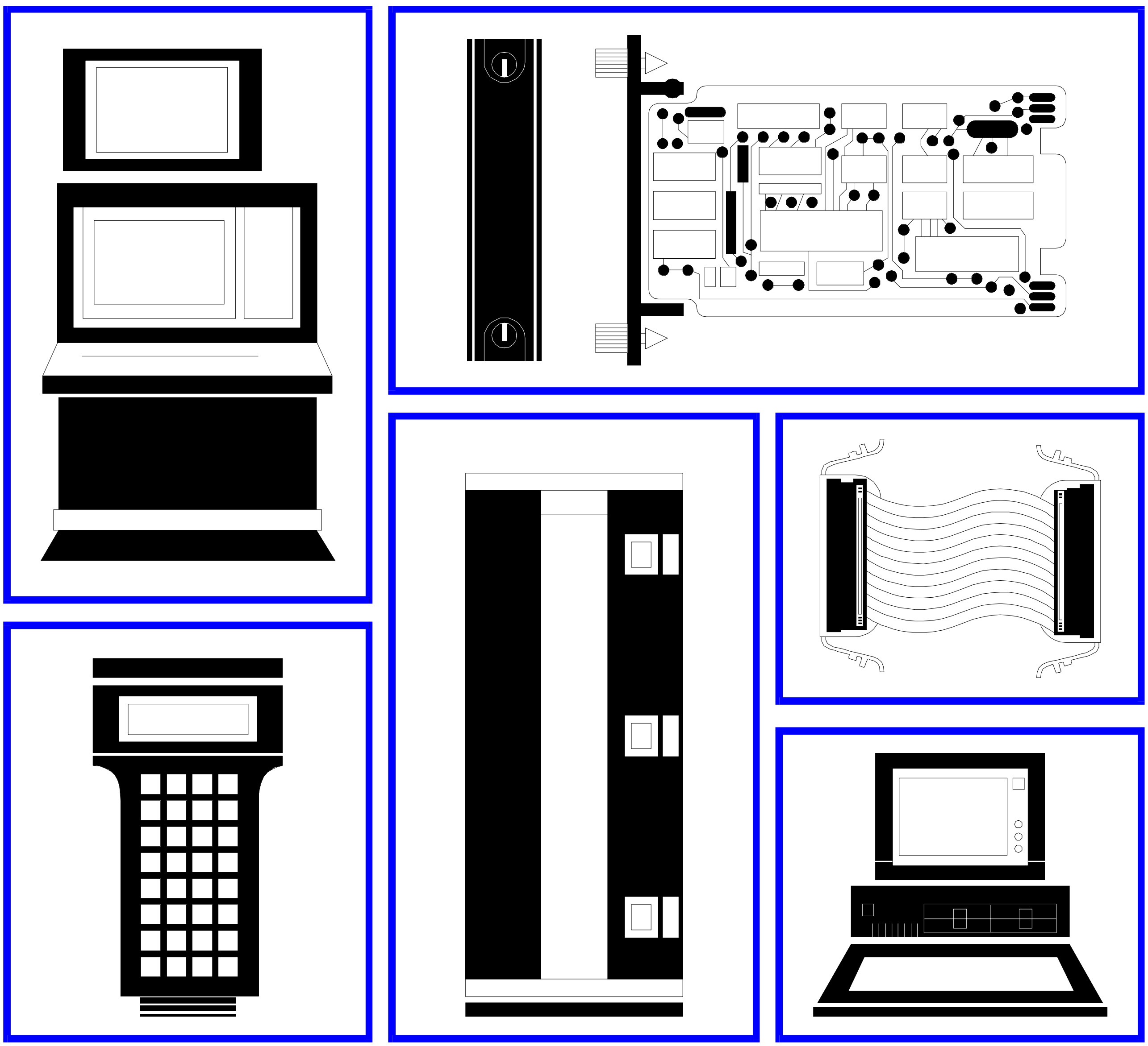
E96-102-6.1

Bailey® infi 90®

Instruction

Operator Interface Station (OIS12) Configuration

(Software Release 5.1A/5.2)



Bailey® Process Control and Automation Solutions from Elsag Bailey Group

WARNING notices as used in this instruction apply to hazards or unsafe practices that could result in personal injury or death.

CAUTION notices apply to hazards or unsafe practices that could result in property damage.

NOTES highlight procedures and contain information that assists the operator in understanding the information contained in this instruction.

WARNING

INSTRUCTION MANUALS

DO NOT INSTALL, MAINTAIN, OR OPERATE THIS EQUIPMENT WITHOUT READING, UNDERSTANDING, AND FOLLOWING THE PROPER **Elsag Bailey** INSTRUCTIONS AND MANUALS; OTHERWISE, INJURY OR DAMAGE MAY RESULT.

RADIO FREQUENCY INTERFERENCE

MOST ELECTRONIC EQUIPMENT IS INFLUENCED BY RADIO FREQUENCY INTERFERENCE (RFI). CAUTION SHOULD BE EXERCISED WITH REGARD TO THE USE OF PORTABLE COMMUNICATIONS EQUIPMENT IN THE AREA AROUND SUCH EQUIPMENT. PRUDENT PRACTICE DICTATES THAT SIGNS SHOULD BE POSTED IN THE VICINITY OF THE EQUIPMENT CAUTIONING AGAINST THE USE OF PORTABLE COMMUNICATIONS EQUIPMENT.

POSSIBLE PROCESS UPSETS

MAINTENANCE MUST BE PERFORMED ONLY BY QUALIFIED PERSONNEL AND ONLY AFTER SECURING EQUIPMENT CONTROLLED BY THIS PRODUCT. ADJUSTING OR REMOVING THIS PRODUCT WHILE IT IS IN THE SYSTEM MAY UPSET THE PROCESS BEING CONTROLLED. SOME PROCESS UPSETS MAY CAUSE INJURY OR DAMAGE.

Preface

This manual applies to the OIS12 console which can use either the LAN-90® PCV® Software Release 5.1A or 5.2.

This manual provides general information and specific instructions on configuring the base system package and for its intended application. Together with the OIS12 Hardware manual and the OIS12 Operation manual, this manual provides a complete description of the base system package.

This manual can be used as a reference guide for system engineers and technicians responsible for installing and configuring the OIS12 console. It assumes the reader has a general knowledge of CRT-based process control systems.

List of Effective Pages

Total number of pages in this instruction is 301, consisting of the following:

Page No.	Change Date
Preface	Original
List of Effective Pages	Original
iii through xviii	Original
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6-1 through 6-40	Original
7-1 through 7-35	Original
8-1 through 8-6	Original
9-1 through 9-6	Original
10-1 through 10-17	Original
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B-1 through B-7	Original
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When an update is received, insert the latest changed pages and dispose of the superseded pages.

NOTE: On an update page, the changed text or table is indicated by a vertical bar in the outer margin of the page adjacent to the changed area. A changed figure is indicated by a vertical bar in the outer margin next to the figure caption. The date the update was prepared will appear beside the page number.

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Safety Summary

SPECIFIC WARNINGS	This procedure shuts down the node's OIS12 console software. If you are restoring a server level configuration, the server will shutdown. (p. 7-16) Be careful not to save files with the user interface while the restore is in progress. You might overwrite the same files that are being restored. (p. 7-16) You will lose ALL data currently stored on the specified device. For this reason you will not be allowed to write to any 'mounted' device (except for floppy devices). If you want to backup to an optical device that is being used for archiving you will have to unmount the volume first. (p. 7-35) Restoring a backup will remove some of the data collected on the running server. Of note are the gather.gcf and misc.nsf files which contain the statistical and lab/note data respectively. Any statistical or lab/note data stored after the backup was made will be lost when the backup is restored. (p. 7-35) If you are not using the Quality element then set it to a constant zero value. Also set the Alarm element to zero if it is not used. (p. 15-14) Lock out of a point that is RED TAGGED must occur in the external device. (p. 15-15) Files in this temporary area can be deleted without warning. Always specify a directory. (p. 15-28)

SPECIFIC CAUTIONS	Do not reboot the computer if the OIS12 console software is already running. Use the Exit & Shutdown command first or you may corrupt files and loose important information on your hard disk. (p. 1-15) Do not delete the default name “ARCH.X” and save. (p. 2-13) This backup does NOT save collected data (e.g., trend data, log data). You should always keep a backup of your current configuration, so that you will not lose any of your work if you have to reload a node (e.g., if the hard disk fails). (p. 7-7) You should save the configuration for each node. Each node's configuration is slightly different so, to make reloading configurations easier, you should back up each node's complete configuration to a different set of floppy disks. (p. 7-7) All disks used will be formatted by the backup procedure. (p. 7-8)

SPECIFIC CAUTIONS (continued)	The Restore Configuration function erases existing configuration files before restoring the configuration files from floppy disk. (p. 7-14)
	When you restore files, any existing files with the same name will be overwritten. (p. 7-19)
	Never remove user pcv or root or you will not be able to log in. (p. 11-13)
	Do not load a configuration unless you have saved the previous configuration. You may need to restore it if the new configuration does not control the process. (p. 13-8)
	Changing function code types or locations may invalidate tags based on the previous configuration. (p. 13-8)
	Do not load a configuration unless you have saved the previous configuration. You may need to restore it, if the new configuration does not control the process. (p. 13-15)
	Changing function code types or locations may invalidate tags based on the previous configuration. (p. 13-15)

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SECTION 1 - INTRODUCTION

OIS12/OIC12 OPERATORS CONSOLE

The Operator Interface Station 12 (OIS12) is a third generation OIS console. The OIS console is based upon Elsag Bailey's LAN-90 Process Control View (PCV) software. Currently the OIS12 console has been released with both LAN-90 PCV Software Release 5.1A and Software Release 5.2. This manual may be used to configure either version of the software. Any differences between the two versions will be identified.

> **NOTE:** All consoles should be using the same Release version of LAN-90 PCV software. Failure to do so will result in consoles not being able to communicate with each other via Ethernet.

The OIS12 Operator Interface allows the operator to monitor, manipulate, control, collect and analyze real-time process data from Elsag Bailey's INFI 90® OPEN, INFI 90 and Network 90® Distributed Control Systems (DCS).

This manual also applies to the Operator Interface Console 12 (OIC12), which is an optional slave console (also referred as a client node) to the OIS12 master console (also referred to as a server node).

Key Features of the OIS12 Console

The OIS12 console supports a wide range of standard hardware in a variety of configurations:

- Connects to the INFI 90 OPEN DCS via a high-speed intelligent serial card.
- Connects to stand-alone process control units.
- Runs on stand-alone computers or on networked systems.
- Networked systems can have redundant connections to the INFI 90 OPEN system.
- Stores data on a variety of media: hard disks, floppy disks, and rewritable optical disks.
- Accepts command and text input from regular keyboards, Elsag Bailey operator keyboards, and Elsag Bailey annunciator/display panels.
- Installable support for PLCs.

Using the OIS12 is easy and secure:

- Functions are grouped together logically in menus and organized in a tree-structured hierarchy that branches out from a single Main menu.
- Context-sensitive help screens are provided at every menu.
- Access to different functions is restricted by assigning users to various permit groups, each group containing up to 20 different access levels.

A comprehensive set of console configuration functions are available on-line:

- The tag database, which defines the INFI 90 OPEN points to be monitored or controlled, can be defined on-line.
- Trends (tag values collected on a regular basis and written to disk) are defined on-line.
- All configurable text (e.g., engineering units) can be edited on-line, and substitutes for some standard text (such as alarm codes) can be added.
- Alarm tones, alarm inhibiting and broadcasting alarm acknowledgments to other consoles on the INFI 90 system are configured on-line.
- Graphic displays can be configured on-line to include display and control faceplates for any tag type as well as trend charts.

Compatibility with other Elsag Bailey consoles allows you to use some of the functions of the Elsag Bailey Engineering Workstations (EWS) to configure the OIS12 console off-line:

- Graphic displays, trend and tag databases can be created off-line, then loaded into the OIS12 console.

A complete set of process monitoring and control functions make OIS12 a powerful operator console:

- Color graphic displays allow you to monitor process values as numbers and symbols and take control actions.
- Process alarms are easily managed with the advanced alarm capabilities of the OIS12 console: alarm groups, alarm priorities, alarm indicators, alarm summaries, operator alarm inhibiting and general and individual alarm acknowledgment.
- System status displays allow you to diagnose and troubleshoot your INFI 90 OPEN system.

- System Event logs collect and print information about alarms, process events, and operator actions.

- Tuning and block details displays allow you to modify INFI 90 OPEN modules to optimize your process performance. Access to these displays is restricted to users through permit groups.

Utilities provide file, data and system support functions:

- Tag summaries let you query the database for configuration and live value information.

- File and disk utilities let you copy files to and from all supported media (hard disks, floppy disks, and rewritable optical disks). With the file/disk utilities you can format the different media, back up and restore files between media, and translate the OIS12's data files to common file formats such as ASCII text and DIF®.

- System diagnostic screens report the status of CIU communication, redundancy failover, trend collection, system activity and system messages.

- Printer utilities allows you to turn the alarm printer on and off and cancel or hold printouts sent to any printer.

The Logging package collects historical information in report form for printing and saving on disk. There are six types of logs:

- Periodic logs collect tag information on a regular basis (hourly, daily, weekly, etc.).

- Trigger logs collect tag information between process events.

- Trend logs print out collected trend data.

- Trip logs collect tag information before and after a process event.

- Expanded System Events Log Functions: Archiving, Retrieval and Backup.

- Sequence of Events Logs - one millisecond resolution event recording.

Periodic and Trigger logs are configured using a spreadsheet which gives you complete control over the appearance of the log, and allows you to use formulas to calculate new information not available directly from process tags (e.g., costs). The other log types have a relatively fixed format and only report the information collected.

OIS12 Console Optional Software Package

Optional applications can be added to your OIS12 console system to further enhance its power:

- The Quality Analysis & Control (QAC) package provides both Statistical Process Control (SPC) charts and Time Series Analysis (TSA) charts. SPC charts (Shewhart, CUSUM, or EWMA) monitor the historical and current trended values for a tag. When the tag value is out of spec, the chart is highlighted and alarms can be generated. Variation in tag values can be minimized by using TSA charts to analyze trend data to pinpoint interrelationships between variables and sources of variation.

- The classCONNECT/DDE and TCP Link package provides network connectivity between the OIS12 consoles and the DOS™ world using TCP/IP protocol communication. The classCONNECT/DDE package includes the necessary software for both the OIS12 console and the DOS based computer to communicate over the ethernet using TCP/IP protocol.

New Features in Software Release 5.2

- ***Harmony 90.*** Harmony 90 provides additional external device interface capabilities for the OIS12 console. Traditionally the OIS12 console communicates with the Elsag Bailey INFI 90 OPEN and INFI 90 OPEN process control modules. Harmony 90 provides communication paths to other process controllers. Drivers are available for a range of protocols to support most PLC makes. The OIS12 console is released with two new option packages. These are Protocol Specific Drivers allowing Harmony 90 to connect to Modbus protocol devices and the Bailey-Fischer & Porter Micro-DCI controller family. Other protocols can be supported as Engineered solutions.

- ***Module Time Stamping.*** Exception reports available from the INFI 90 OPEN process control modules are accurate to the millisecond. The OIS12 console now supports millisecond time stamping directly from the process control modules. This feature is selectable as a system option.

- ***Support for NE-2100 Ethernet Connections.*** Ethernet support now includes WD-8003, NE-2000 and NE-2100. The OIS12 console supported computer list includes the HP XU and XM series which includes a NE-2100 ethernet connection on board.

- ***Distributed SOE Support.*** The Elsag Bailey INFI 90 OPEN Distributed Sequence of Events (SOE) system is an alternative SOE System to the external Sequential Events

Recorder (SER). The function codes (FC 210, 241, to 246) associated with the Distributed SOE system are also supported.

New Features in Software Release 5.1/5.1A

- ClassCONNECT/DDE and TCP-link which allows DOS based computers access to the OIS12 console information.
- Enhanced Data Collection System allows filtering and ageing of system events.
- Text String Tag Support.
- Sequence of Events Logs.
- Simplified network design with on-line configurability.
- Improved installation and setup.

RELATED DOCUMENTS

For information not covered in this manual, refer to one of the following manuals:

- ***OIS12 Operations***, ***I-E96-102-6.2.***
- ***Software Release 5.2 Quality Analysis & Control***, ***I-E97-811-4***.
- ***Software Release 5.2 classCONNECT/DDE and TCP-Link Software User's Guide***, ***I-E97-811-18***.

Other Elsag Bailey manuals that can be useful are:

- ***INFI-NET Communications Modules, I-E96-601***).
- ***Computer Interface Unit Product Instruction, I-E93-905-2***).
- ***Engineering Work Station CAD/TXT Software Product Instruction, I-E96-701***).
- ***Function Code Application, I-E96-200***).
- ***Management Command System Operation/Configuration, I-E93-901-21***).
- ***Operator Interface Station (IIOIS10) Hardware***, ***I-E96-107***).
- ***Software Logging Database Graphics (SLDG) Product Instruction, I-E96-716***).

Third-party software manuals you should have:

- ***QNX® Operating System Manual*** set of six books.
- ***QWindows™ System Manual*** set of two books.
- ***RIPCAM2® User Guide***.
- ***MS-DOS® Operating System Manual***.

You should also have the computer hardware and setup manuals for your computer and the hardware manuals for any peripheral equipment you have (e.g., optical disks, printers).

CONVENTIONS USED IN THIS MANUAL

You will find the following conventions used throughout this manual.

NOTE: Used to highlight important or additional information.

CAUTION: Used to highlight information that, if ignored, could result in property or information damage.

WARNING: Used to highlight information that, if ignored, could result in personal injury.

bold Used for anything that must be typed exactly as shown. For example, you could be told to press **y** or type **ls /dev/hd0t77** (QNX4 example).

italic Used for information you must provide. For example, if you are told to enter a file name, type the actual name of the file instead of the italicized word. Also used to show information displayed by the computer.

Initial Capitals Used for menu and screen titles.

`small text` Used to show the contents of text files.

<Key> Used for the names of special keys (non-alphabetic, non-numeric, non-punctuational) that can be found on the regular QWERTY keyboard or can be found on both the Elsag Bailey operator and regular keyboards. Some of the key names used are:

<Enter>	The enter key.
<Num+>	The plus key on the numeric keypad.
<Space>	The space bar.
<PgUp>	The page up key.
<Left>	The left cursor key.

{Key} Used for the names of keys found only on the Elsag Bailey operator keyboards. Some of the Elsag Bailey operator keyboard key names are Silence and DoubleUp.

<Key Key> When two or more keys are to be pressed together, the key names appear together within the brackets or braces. For example, to reboot the computer, you can press <Ctrl Alt Shift Del>; that is, press the Ctrl, Alt, Shift, and Del keys in that order without releasing any one until you have pressed them all.

"name" Used for file names, directory names, and device names.

OIS12 BASICS

When you turn on the computer, the OIS12 console software will start automatically.

Before You Turn On the Computer

Before you turn on the computer, there are a couple of things you should check.

If you have an optical disk drive attached to your computer, turn it on and insert a disk in the drive before you turn on the computer.

In general, any peripheral devices (e.g., printers) connected to your computer should be turned on before you turn on the computer.

Peripheral devices should be turned on first because the computer, on start-up, tries to establish communications and initialize the software and hardware of the peripheral devices.

Overview of the INFI 90 OPEN System

The INFI 90 OPEN system is a distributed process management system. A network of control units is connected by a Plant Communication Loop (INFI 90 OPEN Communication Loop) so the control units can share information.

Control units, called Process Control Units (PCUs), collect information from field sensors and use the information for manipulation of field equipment. For example, if a sensor indicated a tank was full, the PCU through a designed logical sequence could turn off the valve that fed the tank. PCUs know what action to take because they are programmed by an engineer with a control scheme for the process. There can be up to 250 PCUs connected to the INFI 90 OPEN Communication Loop.

Generally an operator would not control the level of fluid in a tank by turning pumps and valves on or off. Instead an operator would control a set point, say 2,000 gallons and the PCU, through its program logic would control the valves or motors as necessary to maintain the set point level.

Operator consoles, display process data and facilitate control of the process. The console communicates with the Process Control Units through an interface (CIU) to the INFI 90 OPEN Communication Loop.

Any information gathered by a PCU (e.g., flow rate, temperature, level, and pressure) can be displayed. By using keyed-in controls on the console, operators can send signals to the PCUs, making changes to the way the process is run. An operator can change set points, turn equipment on and off, or change constants used by programmed schemes.

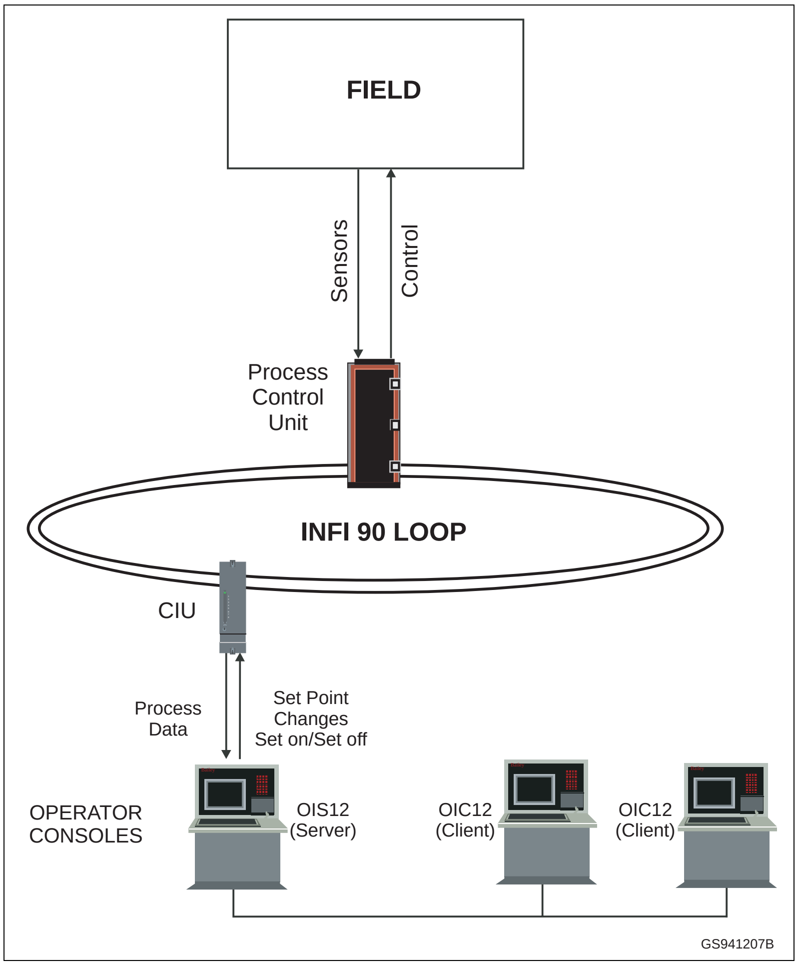

Figure 1-1. Process Control Overview

Process Control Unit (PCU)

The Process Control Unit (PCU) is the primary control unit of an INFI 90 OPEN system. A PCU connects directly to field sensors and equipment. Each PCU is made up of a variety of INFI 90 OPEN control modules, which are small plug-in, rack-mounted computers specialized for manipulating process data and implementing process control schemes. The PCU is connected to the Plant Communication Loop so that the information in the modules can be shared with other process control units.

Computer Interface Unit (CIU)

The Computer Interface (CIU) is used to connect computers, other than the PCU modules, to the INFI 90 OPEN Communication Loop.

The OIS12 console (Server) connects to a CIU and gathers process information, shows the information on the display screen, and sends your control instructions to the PCUs.

THE CONSOLE

The OIS12 console software consists of a set of programs that run on a standard IBM®-compatible computer. The computer is equipped with a Super VGA graphics monitor, a QWERTY and mylar keyboard, a mouse or trackball and possibly a printer. A serial communication board in the computer connects the console to the CIU.

The monitor displays high resolution Windows®-based full color interactive process displays on a Super VGA compatible monitor screen. The screen is your primary source of information. You use a variety of displays to perform many different functions.

The keyboards included are a standard typewriter-style keyboard with push-button keys and a mylar membrane-covered keyboard with flat keys. The alphabetic, numeric, and specialized function keys on the keyboards are used to move between displays, control the process, and run all functions.

It is by the use of the keyboard, that you will be able to manipulate the console's software to view or control the functional operation of your process.

The mouse or trackball device will provide a means of moving a pointer/arrow indicator over the screen display. Movement of the mouse or rotation of the trackball causes a relational movement of the pointer over the screen area. Both the left and right hand buttons on the mouse or trackball are used for specific functions by the console.

Left Button Pressing the left button while on a menu or icon button will activate the menu or icon button function.

Right Button Pressing the right button while on a menu or icon button will cause a submenu to be displayed, if it exists.

The use of the mouse enables you to reduce keystroke operations and group various functions into a pictorial format.

A printer can be used to print alarm occurrences, log reports, and graphic displays.

USING THE CONSOLE

Tags

The tag list defines the interaction between the console and the Process Control modules.

Process Control modules contain and process more information than is useful to an operator. For example, the voltage drop across a thermostat is of no value until it has been converted to temperature in degrees. Your console displays temperature by configuring an analog tag to read the temperature in degrees. Do not configure any tags to display the voltage drop, nor any of the steps in the conversion.

The console uses a tag list to identify which data points in the modules are of interest for operator control. Data in the modules is contained in function blocks. These function blocks exist in a variety of forms, thus a variety of tag types exist to exchange data with the modules.

Information from tags is presented via operator displays in a useful form. Graphic displays can be custom configured to visually represent your process and there are also many standard display formats available. Tags report when they enter and leave alarm conditions. These alarms can be grouped and prioritized to enable operator interaction. Operators can call up displays and control faceplates in order to adjust set points and otherwise control the process.

Monitoring and Controlling a Process

You can monitor and control overall plant operation using the console.

Tag values and alarm states travel via the plant communication loop. Data is received and displayed on the monitor screen.

Tags may be assigned to more than one display. The value or state of a tag can be displayed in several different ways. Tags may also be set up on the displays for control. By using the keyboard, you can use the display elements to send messages to the PCU modules and control your system process.

Graphic displays are the primary method for displaying tag information and controlling the tag's function.

Tag values can also be collected and stored on the computer's hard disk. This collected information is used for trend displays and log reports.

Any of the tags can be selected for historical data collection. The collected data is displayed on trend displays, which are grid or graph plots of the data over time. You can scroll back in time through the data, or compress or expand the time span viewed to get wider or narrower views of the data.

Logs show historical data in report form. There are many different kinds of logging. One kind, called Periodic logging, prints reports of collected data to the printer or computer disk at regular intervals (such as, every hour, every day, or every week). Your system may or may not have logging installed.

Alarm Reporting

The console can maintain up to 99 alarm groups. While on-line, it monitors the alarm status of all tags, regardless of which display is currently on the monitor. The Executive Bar on each monitor lists the alarm groups that currently have tags in an alarm state. A list of the most recent alarms is maintained in order of occurrence.

When an alarm first occurs, it is unacknowledged (indicated by the presence of a flashing alarm group number). After you acknowledge the alarm, the flashing stops. If you acknowledge alarms as they occur, you can easily recognize new alarms, because they are flashing.

Alarm information can include bad quality. A tag has bad quality when the value of a tag goes out of range or when the tag cannot be accessed because communication with the module or field sensor is broken.

Alarms are printed on the printer as they occur, if a printer is attached. You can turn alarm printing on or off without interruption to the flow of data or monitoring of the system.

Troubleshooting the INFI 90 OPEN System

Tags can be set up to reflect the current state of modules connected to the INFI 90 OPEN system. Using these tags, status displays can show the status of all INFI 90 OPEN equipment connected to the plant communication loop. These status displays show you if PCUs and CIUs are working. They also show the current state of modules within a functioning PCU. There are three levels of status displays:

- The System Status display lists all nodes connected to the plant communication loop, and whether the nodes are in error or not.

- The Node Status display lists all modules within a particular node (such as a PCU), and the current mode and status of each module.

- The Module Status display gives a detailed list of all problems in a particular module.

Viewing and Tuning Module Configurations

There are various types of displays that allow you to view the module settings for a tag:

- Block details graphic.
- Tuning displays graphics.
- Editing of a database tag.
- Tag operating parameters.
- The Configuration Loading System (CLS) application.

Depending on your permissions, you can modify or tune some or all of the module settings for a tag.

The module setting information can always be viewed without modification by any user.

Overview of Your System Hardware

The console has the following components:

- Computer.
- Monitor.
- Keyboard.
- Mouse/trackball.
- Optional peripheral devices.

The computer is the heart of the console. It runs the programs which communicate with the INFI 90 OPEN system, displays process information, and allows you to configure the console. Programs are run in the computer's memory or RAM. Information is stored on the hard disk. You can copy information from the hard disk to floppy disks in the floppy disk drive.

The computer displays information on the monitor, which is also known as a CRT (cathode ray tube).

The keyboard and mouse/trackball allow you to communicate with the console software and INFI 90 OPEN modules.

System Security

User permissions control access to the various console functions. Each user can be configured under a general group assignment for limiting access to specific console functions.

Likewise, specific user assignments may be configured on an individual basis.

In general, if you have been configured to have no access to a specific type of console function, then the menu item is displayed in a shadowed or dimmed text format. If you have access, the text is displayed in black.

Refer to Section 11 for complete details.

Networked Systems

The console software can run on computers that have been connected together to form a network. This allows the computers to share information.

Network Terminology

Each computer on the network is called a node, and each node has a unique node number which identifies the computer to the rest of the network.

Types of Nodes

Each computer plays a certain role in providing information to the rest of the network:

- OIS12 (Server node).
- OIC12 (Client node).
- OIS12 (Redundant Server node).

Server nodes connect directly to the INFI 90 OPEN system via a CIU. These nodes exchange information with the INFI 90 OPEN system and serve the information to other nodes on the network. Often there is only one Server node on the network at a time, however, additional Server nodes can be added. Client nodes can access additional Server nodes via system configuration.

Client nodes do not connect directly to the INFI 90 OPEN system; they get all their process information from a Server node.

Redundancy

A redundant network has two Server nodes (two computers that are directly connected to the INFI 90 OPEN system via their own CIU). However, only one Server node is being addressed by other nodes on the network. The redundant Server node is obtaining the identical information from the same INFI 90 OPEN system. It contains the same hardware and software configuration as the Server node.

The live Server node is the computer currently acting as the single connection to the INFI 90 OPEN system. The redundant Server node gets its process information from the live Server node (just like a Client node), but it is ready to take over as the connection to the INFI 90 OPEN system if the current live Server cannot communicate with the INFI 90 OPEN system or with the rest of the network. Usually, the live Server node is simply called the Server node, and the redundant Server node is called the redundant node.

Networked Computers

If you are running on a network, you should start the Server nodes first. You can then start the rest of the nodes in any order. The Server nodes should be started first, so they will have the needed information accessible to the remaining nodes of the network.

Node Names

Each node is given a distinct node name, the default is "**BCI**.*nodenumber*", where the "*nodenumber*" is the numerical node number that is assigned to the node when the LAN-90 PCV software was loaded. For example: node # 1's node name is "BCI.1".

The node names can be modified via the menu system to reflect the area of the plant for which it is responsible.

In the case of Server nodes, a distinct Server name is assigned, the default is "**PCV**.*nodenumber",* where the *"nodenumber"* is the numerical node number that is assigned to the node when the console software was loaded. For example: node # 2 is a Server node, its node name is "PCV.2".

The Start-Up Sequence

After you turn on the computer, you will see various messages displayed on the screen by the system start-up file as different programs are started.

During start-up, the screen changes the size of text being used. This is a normal operation and is simply a means of initializing the console for the windows application. As programs are started, a *[success]* message signifying proper start-up of each program module is displayed.

Once the programs have successfully started up, the console automatically goes into the windows system and displays a prompt to have you login.

> **NOTE:** Prior to starting the windows system, you have a few seconds to press <Ctrl Break> to avoid starting windows and performing some other operation from the QNX4 system prompt.

Booting DOS Instead of OIS12

Normally, a computer that starts-up the OIS12 console software can also boot into DOS. These computers have their hard disk divided into two sections or partitions: one for the QNX4 operating system and one for the DOS operating system.

If you want to start-up DOS instead of QNX, you need to know the DOS partition number, typically partition four, then:

1. Shut down the OIS12 console software, if it is running. This is done by selecting the **Exit** menu option from the Main menu and then selecting **Exit & Shutdown** from the prompt. You require Exit-System permission to perform this operation.

2. Reboot the computer by pressing <Ctrl Alt Shift Del>.

3. When you see the message:

   QNX Loader
   Boot Partition ___

press the DOS partition number (usually four). You have about one second to press the DOS partition number before QNX4 starts. If you do not press the DOS partition number in time, and QNX starts to boot, follow steps 1 to 3 above and make another attempt.

CAUTION	**Do not reboot the computer if the OIS12 console software is already running. Use the Exit & Shutdown command first or you may corrupt files and loose important information on your hard disk.**

LOGGING-IN/SIGNING-IN

By default, when the system starts-up, the console comes up with the windows display showing the Executive Bar across the top of the screen and the sign-in dialog prompt box waiting for your login entry.

The Executive Bar includes the current user logged into the system and the current Server name to which the Client software is connected. This information is shown immediately to the left of the date/time display (Figure 1-2).

In order to perform configuration of the system or control of the process, you are required to be logged in as a user that has permission to perform the required functions. If you have logged in with limited access, menu items are displayed in a shadowed text and these options cannot be selected.

However, some applications you are allowed to select, have only the ability to view, not change the data. These applications display a *[View Only]* message on the window control select region or on the lower region of a text screen application.

You can add new users and assign to them a particular group of permits. From the Main menu of the OIS12 Hierarchical menu system select the **Sign In/Out** item. Then select the **Sign**

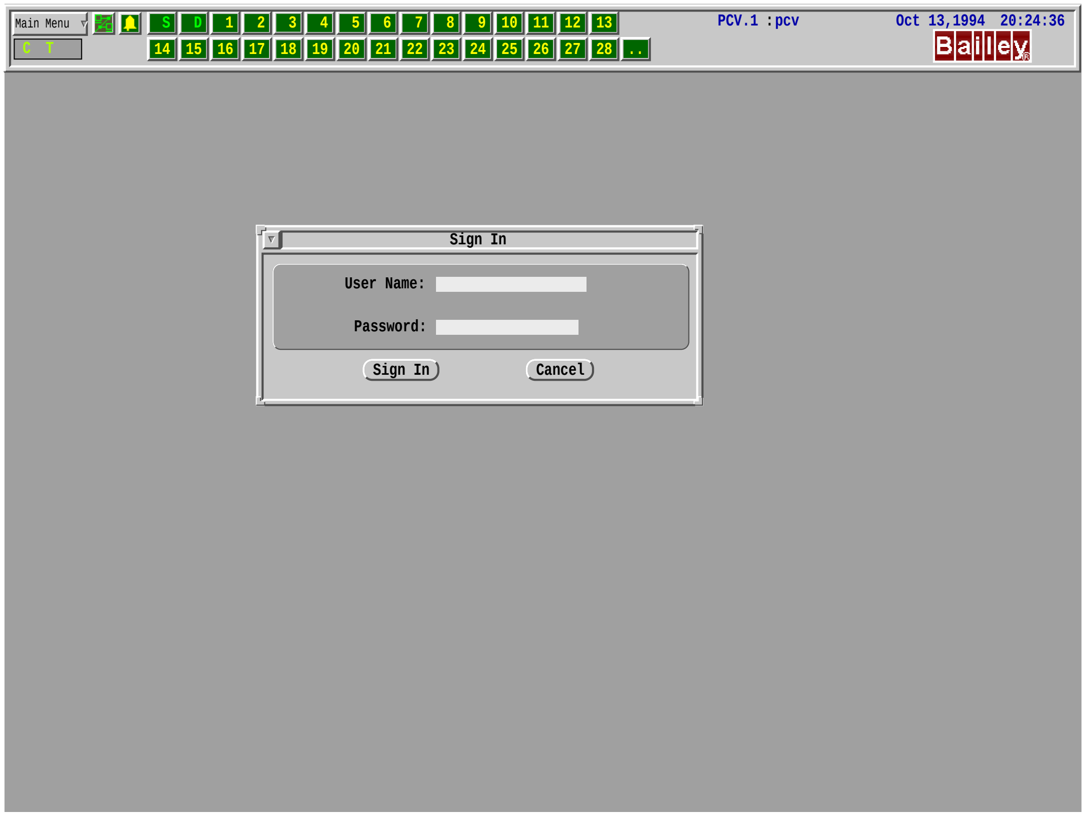

Figure 1-2. The Executive Bar

In menu item from the submenu. You are presented with the Sign-In Window. Enter a valid user name and password. If an error was made on entry, you are warned and returned to the login window.

Once you have entered your user name, press <Tab> to move to the *Password* entry field. You may also move the mouse to point and click on the *Password* entry field to edit the entry. When your entries are complete click on the **Sign In** control key or press <Enter> to process your login.

The Sign-In window may be cancelled in one of two ways:

- Use the mouse to click on the **Cancel** control key.
- Press <Esc>.

NOTE: You may directly call up the Sign-In window by moving the pointer to the current user name and pressing the left button.

The user ID and password are case-sensitive. For example, **operator** and **opErator** are two distinct words. Be sure to use the required case for both entries. If you enter your user ID and password correctly, the default opening graphic will be displayed. If you have made a mistake, you will have to re-enter them.

SECTION 2 - SYSTEM CONFIGURATION

SYSTEM CONFIGURATION

Your system configuration requires the definition of both the console hardware and software for each node in the network.

First, select the **Console Configuration** menu item from the System Options menu as shown in Figure 2-1.

Second, define the type of console using the **Edit Console Definition** (Figure 2-2).

Third, select the options for this console through **Edit Console Options**. The options provided vary depending on the type of console you select.

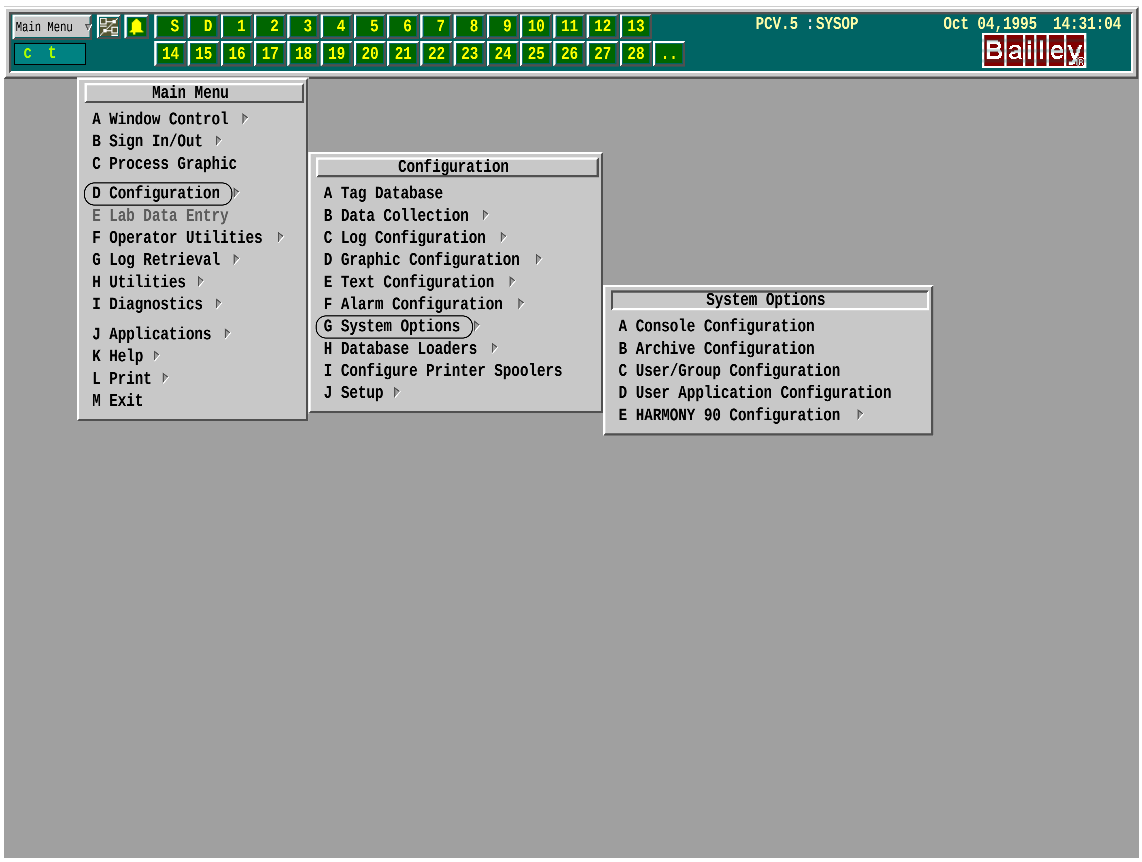

Figure 2-1. Main Menu Layout

```
< Console List >

NODE  CONSOLE-TYPE      SERVER-NAME       GROUP-NAME

  1    SERVER-CLIENT     PCV.1             NODE1and2
  3    SERVER-CLIENT     PCV.2             NODE1and2
  4    SERVER-CLIENT     PCV.3             *NOT REDUNDANT*
  2    DISKLESS-CLIENT   NODE1and2
  5    CLIENT-WITH-DISK  NODE1and2

F1  Edit Console Definition              F2  Edit Console Options
F3  Edit Group List

F9  Help                                 F0  Exit
```

Figure 2-2. Console List Menu

EDIT CONSOLE DEFINITION

The Console List menu (Figure 2-2) summarizes all the consoles currently configured on the network. The cursor keys can be used to select any console, to review or edit its Console Definition, Options or Group List. The Console Configuration menu (Figure 2-5) provides the means to modify the console type, node name or redundant group.

The fields are detailed below.

NOTE: The node for which the console configuration is being configured must be up and running on the network, or an error message will be displayed, and modifications to the console configuration will not be allowed.

Console Type

Move the cursor <Left>/<Right> to select the type. Three choices exist:

1. Server-Client.

2. Client-with-Disk.

3. Diskless-Client.

Server-Client

The Server-Client runs both client and server software. The server software performs data collection through its CIU connection, distributes this information to all clients and records the data in its tag database. The Server stores server level graphic displays that can be used by any attached Client. Thus a Client attached to the "PCV.1" (the default Server name), will see "PCV.1" Server level graphic displays; and the Client attached to the "PCV.3" Server will see "PCV.3" Server level graphic displays. There are no process control differences between the client software on a Server-Client and on a Client-with-Disk. There will be a larger set of configuration options available on the Server.

Client with Disk

The Client-with-Disk stores user and node level graphic displays and all programs. It gets its Server level graphic displays from the Server to which it is attached. A display may retrieve tag data from multiple Servers, not just the Server to which it is attached.

Diskless Client

The Diskless-Client gets everything across the network from the Server to which it is attached.

Node Name

Node Name is used to identify this node. The node name is used where node specific choices are being made. An optical disk is connected to a particular node. You may use any name you wish: e.g., *Bill's computer*, *Powerhouse*, *Crusher-1*, *Crusher-2*.

Client and Server nodes display different subsequent fields. The Server-Clients display *Server name* and *Group name* fields, while the Client-Only nodes display a *Default Server* field.

Server Fields

Server Name

The Server Name is used to identify a Server-Client. This is the name displayed when server specific tasks are being performed. Tag databases and CIU connections to the loop are server specific.

Server/Group Name

The Server group name identifies a Server as a member of a redundant Server pair. When you cursor to this field a pick list offers the choices of non-redundant or the server group name. See ***REDUNDANCY*** for further details.

Client Fields

Default Server

When a Client node first comes on-line, it will attempt to get permissions from the Server named in the Server name field. If that Server is not available, it will use any available Server. If the default Server is no default then the Client will start unattached to any Server.

REDUNDANCY

Setting up Redundancy requires installing the Redundancy disk, changing the console configurations of the two Server nodes and restarting all nodes in the network.

The Redundancy disk should be installed on every node except the diskless nodes. Redundancy can be installed as part of the initial installation or later on by choosing **Main Menu**, **Configuration**, **System Options**, **Setup, Installing Options.**

The Redundancy disk enables the Redundancy menu items and Client access to Servers in redundant groups.

Assuming the Redundancy disk is installed, this is how you configure Redundancy: Choose **Main Menu**, **Configuration**, **System Options**, **Console Configuration**.

```
                      < Console List >

NODE  CONSOLE-TYPE   SERVER-NAME           GROUP-NAME

1  SERVER-CLIENT       PCV.1             *NOT-REDUNDANT*
2  SERVER-CLIENT       PCV.2             *NOT-REDUNDANT*
3  SERVER-CLIENT       PCV.3             *NOT-REDUNDANT*
4  DISKLESS-CLIENT     PCV.1
5  CLIENT-WITH-DISK    PCV.1

F1  Edit Console Definition               F2  Edit Console Options
F3  Edit Group List
F9  Help                                  F0  Exit
```

Figure 2-3. Console List Before Redundancy

```
                    < Group List >
        GROUP/SERVER NAME          NODE  NODE NAME

           group1and2
           PCV.1                     1     BCI.1
           PCV.2                     2     BCI.2
           PCV.3                     3     BCI.3

F1  Add New Group                    F2  Delete Group
F3  Change Group Name

F9  Help                             F0  Return to Previous Menu
```

Figure 2-4. Adding Redundant Group Name

```
             < Node 1 Console Configuration >

CONSOLE TYPE   : SERVER-CLIENT CLIENT-WITH-DISK DISKLESS-CLIENT
NODE NAME      : BCI.1
SERVER NAME    : PCV.1
REDUNDANT GROUP: group1and2

                        *NOT-REDUNDANT*
                        groupland2

F1  Save Configuration

F9  Help                             F0  Return to Previous Menu
```

Figure 2-5. Making a Server a Member of a Redundant Group

Choose **<F3> Edit Group List**.

Choose **<F1> Add New Group**.

Supply a group name such as **Pump_group**. We use **group1and2** for the example.

Press <F10> and return to the Console List screen.

Select the first member of the redundant group.

Choose **<F1> Edit Console Definition**.

Cursor down to **Redundant Group**. Using <Ctrl> and <Down> move cursor to the group name just created.

Press <F1> and save the configuration.

Do the same for the second member of the redundant pair.

Press <F10> to return to the Console List.

```
< Console List >

 NODE  CONSOLE-TYPE      SERVER-NAME       GROUP-NAME

   1  SERVER-CLIENT      PCV.1             group1and2
   3  SERVER-CLIENT      PCV.2             node1and2
   4  SERVER-CLIENT      PCV.3             *NOT-REDUNDANT*
   2  DISKLESS-CLIENT    node1and2
   5  CLIENT-WITH-DISK   node1and2

F1  Edit Console Definition          F2  Edit Console Options
F3  Edit Group List

F9  Help                             F0  Exit
```

Figure 2-6. Console List After Redundancy is Configured

Press **<F1> Edit Console Definition**.

Cursor to Redundant Group. Select the new group name.

Press <F1> to save.

Press <F10> to return to the Console List.

After configuring Client consoles to use the Redundant Group the Console List now looks as follows:

After changing the console definitions, take a look at the *Group List* screen - Press <F3>. The redundant pair is now grouped under the new group name.

```
< Group List >

                  GROUP/SERVER NAME     NODE  NODE NAME

                  group1and2
                      PCV.1                1  BCI.1
                      PCV.2                2  BCI.2
                      PCV.3                3  BCI.3

F1  Add New Group                    F2  Delete Group
F3  Change Group Name

F9  Help                             F0  Return to Previous Menu
```

Figure 2-7. Group List After Redundancy is Configured

Exit Console Configuration, press <F10>, then restart the software on the console you want as the primary. Select **Exit** from the **Main Menu**, then **Exit** and **Shutdown** and then press <Ctrl Alt Shift Del>.

To ensure the configurations on both are the same, you should do a Redundant Server Restore. This will copy the Primary Server's configuration and database files to the Redundant Server. If the Redundant Server has the newer configuration or data then it will need to be the Primary Server. The menu path is **Main Menu**, **Utilities**, **Redundant Server Restore**. Move to the Server, press <Space>, then press **<F1> Server Restore**. Redundant Server Restore is described in ***Operations***, Section 9.

Restart the second or Redundant Server after performing Redundant Server Restore.

Removing Redundancy

To remove redundancy, re-edit the Console Definition for both members of the pair and select **non-redundant** as the group name. Check the server-name field of all clients and change any that use the old group. Use whichever server is appropriate. On the two former redundant consoles, exit and restart the consoles.

All remaining nodes must then be restarted.

Configuration Changes

Redundancy maintains up-to-date tag databases, however, redundancy saves overhead by not checking for configuration changes other than through the Tag Database Editor. Whenever you make configuration changes to one member of a redundant pair, the same change must be made to both. The utility, Redundant Server Restore, is provided to assist you in maintaining the equality of the configurations on the two redundant consoles.

EDIT CONSOLE OPTIONS - SOFTWARE OPTIONS

The Console Option screens define the hardware configuration of the selected node. On servers, an extra screen enables and disables Server specific functions.

The Server only screen is presented first.

A console option is active when the text *Enabled* is displayed in the color white and *Disabled* when displayed in the color green.

The console option is not available when the text *Disabled* is displayed in the color cyan and the text *Enabled* is displayed in the color cyan and is shadowed.

```
                    < Server-Client Options (PCV.1) >

 SOFTWARE OPTIONS                                          Page 1 of 3

 Number of Tags                     5000

 Base Logging System              Disabled    Enabled
     System Event Printing        Disabled    Enabled
     System Event Logs            Disabled    Enabled
     Periodic / Trigger Logs      Disabled    Enabled
     Trip Logs                    Disabled    Enabled
     Trend Logs                   Disabled    Enabled
     SOE Logs                     Disabled    Enabled

 Batch Historian                  Disabled    Enabled

 Enhanced Data Collection         Disabled    Enabled
     Lab Data Entry               Disabled    Enabled

 SPC Manager                      Disabled    Enabled
     SPC Alarming                 Disabled    Enabled

     F1 Save  F9 Help  F10 Exit            PgDn Hardware Page 1
```

Figure 2-8. Server Software Setup

Number of Tags

The maximum tag size is fixed on the Tag Database disk supplied with the OIS12 console software. The maximum can be determined by entering a large number such as 20,000. The field will be set to your maximum. You will not be able to exceed this maximum. You can reduce the maximum to save on disk space.

Logging

To enable any logging options you must first enable the base logging system. Move the cursor to the option and set the state by moving the cursor left or right. If the base logging system is disabled, you may not enable any of the logging options. Trend logs require the Enhanced Data Collection System to be enabled.

Batch Historian

The Batch Historian is an optional package for historical collection of batch instead of continuous type of processes.

Enhanced Data Collection System

The enhanced data collection system (EDCS) is part of the base OIS12 console software. When enabled, it stores the values of tags for which historical collection is configured. This stored data is used for trending and analysis.

If trends only show current traces, and appear to loose the traces when closed or scrolled, either the EDCS is not enabled, or the tags on your trends are not configured for historical collection. Such tags will show *no data* in the value position.

See Appendix B for a complete description of EDCS.

Lab Data Entry

Lab data entry is an optional package which provides for manual entry of lab results for use in analysis. This package is not available for OIS12 consoles.

SPC Manager

The Statistical Process Control system is an optional logging package, which provides one millisecond resolution.

EDIT CONSOLE OPTIONS - HARDWARE OPTIONS (FIRST PAGE)

There are two screens of hardware configuration. If you have optional hardware devices installed, you must define them here.

The first hardware page (Figure 2-9) configures the Mylar Keyboards, the Alarm Terminal and on servers, the CIU and Harmony Executive.

```
                    < Server-Client Options (PCV.2) >

HARDWARE OPTIONS 1                                         Page 2 of 3

MKM/EMKI Keyboard              Not Installed   N90     INFI 90 OIS
Keyboard Por                     /dev/ser2
Auxiliary Keyboard Node              0

Alarm Terminal                   Disabled    Enabled
   Alarm Port                    /dev/ser2
   Baud Rate                     9600
   Terminal Type                 vt100

CIU Scanner                      Disabled    Enabled
   Net Type                      Plant-loop  Infi-net
   Driver                        Seria       Simulator
   Module Time Stamp             Disabled    Enabled
   Baud Rate                     19200
   Parity                        NONE
   Device                        /dev/ser1

Harmony Executive                Disabled    Enabled
   First Index                   3000

 F1 Save F9 Help F10 Exit PgDn Hardware Page 2 PgUp Software Page
```

Figure 2-9. Hardware Setup Page One

Mylar Keyboards

Mylar keyboards are industrially hardened flat keyboards used on Elsag Bailey's OIS console products. If you only have a standard computer keyboard, set this keyboard field to **not installed**. See the IIOIS12 Hardware or IIOIC12 Hardware sections in the

OIS12 Hardware manual, if you need help in identifying your keyboard or instruction on connecting the hardware. Set the device to either "/dev/ser2" or, if this computer has a Connect-Tech Incorporated (CTI) Intellicon® serial card, set the device to "/dev/cti2".

The Auxiliary Keyboard Node is used to enable control of two computer screens from one keyboard, or conversely, the sharing of one mylar keyboard between two computers. On the computer with the keyboard physically attached, enter the node number of the other computer. On the computer with which you will be sharing this keyboard, set the auxiliary node number to the number of the node that has the keyboard physically attached. Both computers must refer to each other. A mylar keyboard user can not take control of another computer unless that computer has been configured to allow transfer of control. On the computer sharing the keyboard, the keyboard field must be not installed, as there is no keyboard physically attached.

CIU Scanner

The CIU (Computer Interface Unit) is connected to a serial port of the Server. If you have a CIU02 or CIU03 select **Plant Loop**, otherwise, set the CIU to **INFI-NET**. For training and testing, the simulator mode is available. Baud, parity and device are required to complete the serial driver configuration. The device is normally either "/dev/ser1" or "/dev/cti1". These fields are set to the values chosen during installation.

Module Time Stamping

NOTE: This feature is supported by Software Release 5.2 only.

Most Elsag Bailey modules add millisecond time-stamps to the exceptions they issue. This time-stamp is normally filtered by the CIU to reduce overhead on the connection to the console. The OIS12 consoles time-stamp exceptions to the closest second as soon as they are received. Enabling Module Time Stamping configures the server's CIU to pass the millisecond resolution time-stamp to the console. Because this time-stamp is applied at the module, it is more accurate than a time-stamp applied when exceptions are received by console.

The time-stamp is propagated throughout the OIS12 console system for use in alarm summary displays, alarm printing and system event logs. Default alarm summaries are configured for the default time-stamp accuracy. See the graphics configuration section should you need to configure the increased resolution.

Module time-stamps are more accurate than console based time-stamps since exception reports are not guaranteed to arrive at the console in the order in which they may have occurred in the INFI-NET control system. Furthermore, the OIS12 module time-stamp integration into the OIS12 console has had no adverse affects on the base OIS12 software.

As Module Time Stamping adds six extra bytes to each exception report, throughput in high traffic systems can be affected. The maximum throughput will be reduced when Module Time Stamping is enabled. If the console does not read the exception reports out of the CIU fast enough, the exception reports can be overwritten, causing potential data to be lost from the console' s point of view.

Enabling Module Time Stamping

To enable module time-stamping, call up console's configuration via the menu path **Main Menu, Configuration, System Options, Console Configuration.** Select your console and press <F2>, then <PgDn>. On Hardware Options 1, page 2 of 3 (Figure 2-9), cursor down to the CIU SCANNER section and set Module Time Stamp to **enabled**. Press <F1> to save the change. The changes will not take effect until the console has been shut down and restarted.

Note that only INFI-NET / SuperLoop (SSM/ICT) devices support Module Time Stamp and are approved for use with the OIS12 console.

EDIT CONSOLE OPTIONS - HARDWARE OPTIONS (SECOND PAGE)

Hardware Options 2 (Figure 2-10) provides the fields necessary to configure the ConnectTech Incorporated (CTI) Intellicon serial card, Diagnostic Message Output and the Optical Drive. Since TCP/IP is an option for both Client and Server, this option is not placed on the Server Software Configuration page.

Intellicon CTI Card

Set the Intellicon Serial card to the settings used during installation of the card in the computer.

Diagnostic Message Output

Diagnostic Message Output determines where the diagnostic messages are sent. They are normally sent to the screen at "/dev/con" but can be sent to a connected printer. These are the same messages visible through **Main Menu, Diagnostics, System Messages** or **Main Menu, Window Control, Status Windows, Error Log.** The size of the file used to save system messages is specified by the file size in kilobytes. The default file size is 10 k and the maximum file size is 99 k.

```
               < Server-Client Options (PCV.1) >

 HARDWARE OPTIONS 2                                  Page 3 of 3

 Intellicon Serial Card         Not Installed  AT Bus  Micro Channel™
   Memory Address               D0000
   I/O Port                     300
   Interrupt                    3

 Diagnostic Message Output      /dev/con
   File Size                    99 K

 Optical Disk                   Not Installed   Installed
   Drive Name                   /op0
   Block Device Name            /dev/hd2


 SOFTWARE OPTIONS
 TCP/IP Remote Data Access      Disabled    Enabled
   Remote Login                 Disabled    Enabled
   Host Address                 127.  0.  0.  1

          F1 Save F9 Help F10 Exit PgUp Hardware Page 1
```

Figure 2-10. Hardware Setup Page 2

Optical Disk

Only install the optical disk if it is physically attached to this node. Set to **installed** and select the Block Device Name from the supplied pick list. The Drive name will automatically be set.

TCP/IP Option

TCP/IP remote data access is part of the optional classCONNECT/DDE and TCP-Link package. You will need to obtain and install the QNX TCP/IP disk in order to enable it. This package allows information to be transferred from the OIS12 console to other TCP/IP workstations.

Refer to the ***classCONNECT/DDE*** and ***TCP-Link Software User's Guide*** for details.

EDIT ARCHIVE DEFINITION

The *Edit Archive Definition* menu item (Figure 2-1) allows you to define the nodes on which one or more archive managers are started. Attached to these nodes should be the magneto-optical drives to which all files are archived. An archive manager supports storage and retrieval of historical data collected by the various data collection systems distributed on your network. The first archive manager on the network performs the actual work. Each Archive Manager is in charge of the optical drives physically attached to its node. Every node that has an optical drive that is to be used for archiving data must have an Archive Manager defined for it. There is no use in defining an Archive Manager on a node that doesn't physically have an optical disk drive attached.

Figure 2-11 is an example of the initial screen with which you are presented. This screen lists the archive managers currently defined for each node on your network. Press <Up>, <Down>, <Home>, <End>, <PgUp> and <PgDn> to move between the node items in the menu.

```
< Archive List >

NODE  NODE-NAME          SERVER-NAME

1   QNX4_SERVER
2   ROD_NODE_2
3   SIMON_NODE_3         Arch_Node3
4   ADRIAN_NODE_4        Arch_Node4
5   FREE_NODE_5
6   FREE_NODE_6
7   FREE_NODE_7
8   FREE_NODE_8

F1  Edit Archive Definition

F9  Help                                        F0 Exit
```

Figure 2-11. Viewing Archive Managers on the Network

Press <F1> to assign the name of an archive manager to start on the highlighted node. Figure 2-12 shows the screen for assigning the name. The default name is "**ARCH**.*node*", however you can assign a more meaningful name. To remove an archive manager simply delete the name.

```
< Archive Configuration >

SERVER NAME:   ARCH.1

F1  Save Configuration

F9  Help                                F0  Return to Previous Menu
```

Figure 2-12. Assigning an Archive Manager's Name

Press <F1> to save the archive manager assignment. If you delete the archive server name do not be alarmed if the name reappears (especially if you used the default), the software is simply suggesting the default again. When you exit you will see that the archive assignment has been removed.

CAUTION	**Do not delete the default name "ARCH.X" and save.**

Archive Status Tags

The current state of the Archive Manager is provided back to the OIS12 console through the use of three tags with specific tag names. It is recommended that these three tags be included in your OIS12 tag database, however, if they are not defined in the tag database then the information provided will not be available.

The archive status tag uses the tag name “NoStoreVolume” and must be defined as one of the following tag types: an internal digital, digital report or a RCM (Remote Control Memory). The tag should also be placed in the D (devices) alarm group. The purpose of the archive status tag is to notify the operator that there are no more optical disks available for archiving data, the tag will be set to the zero state when there are optical disks available for archiving data and set to the one state when no more optical disks are available for archiving data.

The archive volume node uses the tag name “ArchVolumeNode” and must be defined as one of the following tag types: an internal analog, analog report or a RMSC (Remote Manual Set Constant). The tag should also be placed in the D (devices) alarm group. The purpose of the archive volume node is to identify which node has the currently active storage volume. If there is no storage volume currently active, the tag will have a value of zero.

The archive volume uses the tag name “ArchVolume” and must be defined as one of the following tag types: an internal analog, analog report or a RMSC (Remote Manual Set Constant). The tag should also be placed in the D (devices) alarm group. The purpose of the archive volume is to identify the device number of the optical disk drive that is the currently active storage volume (i.e., a value of 2 indicates “/dev/hd2”). If there is no storage volume currently active, the tag will have a value of zero.

USER/GROUP CONFIGURATION

Use this menu item to configure permit groups for your operators. Refer to Section 11.

USER APPLICATION CONFIGURATION

Use this menu item to configure additional custom applications. Refer to Section 12.

NETWORK CONFIGURATION

There are three options available from the Set up menu (Figure 2-13) to modify the system configuration.

1. Add Diskless Client.

2. Rebuild System Files.

3. Install Optional Packages.

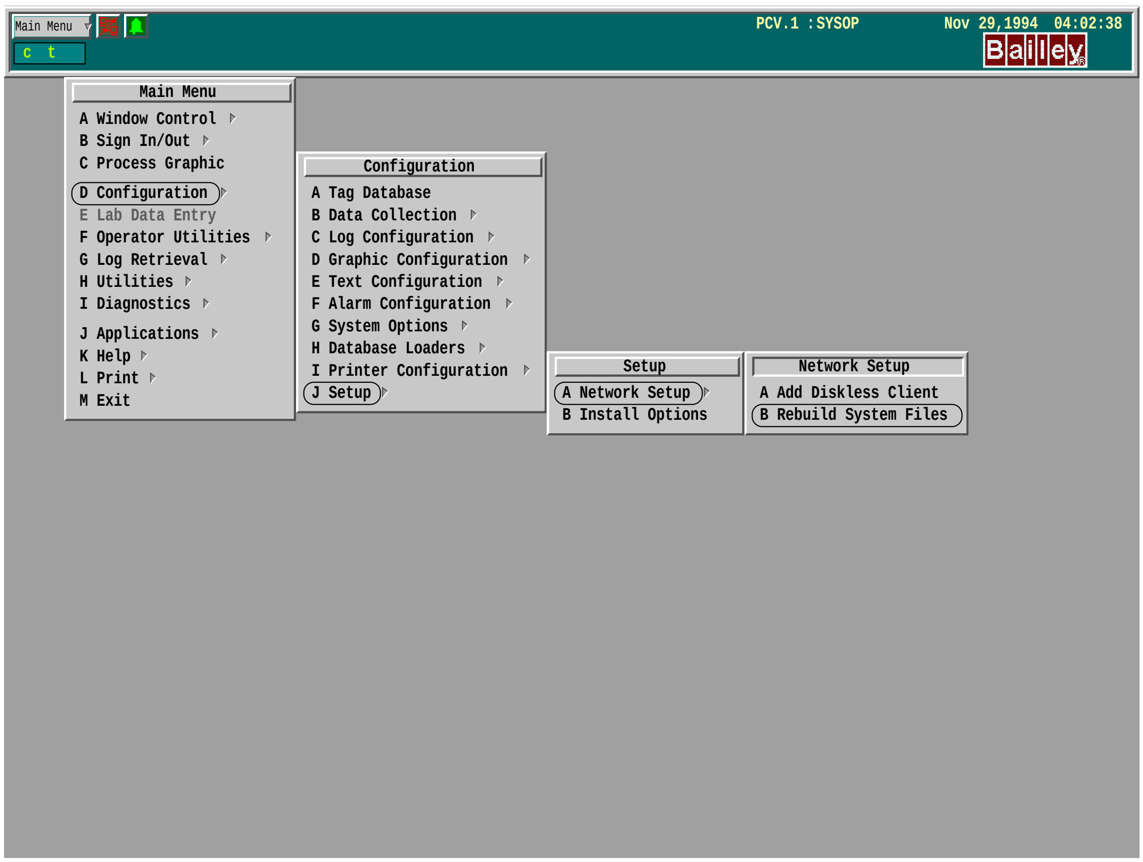

Figure 2-13. Network Configuration Menu Path

Add Diskless Client

Diskless Clients need to have a QNX Boot ROM installed and enabled on their network card. Refer to Appendix A of the OIS12 Hardware manual for details.

This utility is used to define the node number for this new Diskless Client. Verify that there are sufficient QNX licenses to add another node. Record the necessary network information (Figure 2-14) for this node in all other nodes in the OIS12 console system.

> **NOTE:** If this utility displays a message indicating that the number of QNX licenses must be increased and to insert the QNX license at this point, place the new QNX license disk provided with the Diskless node into the floppy disk drive. If your OIS12 console system consists of more than one node with a hard disk then the number of QNX licenses must be increased on every node using the procedure described in Expanding Your License in Appendix A of the ***OIS12 Hardware*** manual.

Pressing <F1> will update the OIS12 console system files on the Server for the Diskless Client. The Diskless Client can then be attached to the network (if not previously done) and rebooted.

```
                    < Hardware Configuration >

CLOCK                    :  UTC Local

TIME ZONE                : Eastern

KEYBOARD                 :  USA

HARD DISK DRIVER         : Fsys.ide
CONSOLE TYPE             : SERVER CLIENT

NETWORK TYPE             : Ethernet Arcnet
  Driver                    : NE-2000 NE-2100 WD-8003
  IRQ                       : 10 11 12 15 2 3 4 5
  I/O Port                  : 340 320 360 300
  Physical Address          : 00C09300DB48

F1  Make System Files

F9  Help                                  F0  Next Screen
```

Figure 2-14. Network Hardware Setup

> **NOTE:** The Time Zone entry is supported by Software Release 5.2 only.

Rebuild System Files

The rebuilding of System Files allows you to change a number of entries which were defined when both the QNX and OIS12 console software were initially installed on this node.

Figure 2-14, shows the various entries that can be modified. Refer to Appendix A of the ***OIS12 Hardware*** manual for a description of each entry.

Before the menu in Figure 2-14 is displayed, a dialog box is displayed requesting information regarding this node's configuration.

NOTES:

1. If you change the time zone, it is necessary to reboot the computer for this change to take effect.

2. See Appendix C for a table of time zone rules.

Install Options

The Install Option menu item allows the installation of optional OIS12 software packages without the need for taking down the entire OIS12 console system. The affected nodes will usually need to be restarted for the new option to take effect. Now you can install new options on day shift and restart the computers during less critical times. You will be asked which floppy drive to use and then be prompted to insert diskettes.

SECTION 3 - CONFIGURING TAGS AND DATA COLLECTION CLASSES

OVERVIEW

Tags can be configured on-line using the tag database editor.

The tag database can also be configured off-line using the Software Logging Database Graphics (SLDG) program. Refer to the SLDG manual and Using Off-Line Tag Database Files.

Valid Tag Names

Tag names can be up to 14 characters long, and any printable keyboard characters can be used.

NOTES:
1. DO NOT use a comma (,) in a tag name that will be used in logs.

2. DO NOT use a forward slash (/), comma (,) colon (:), semicolon (;), ampersand (&) or equal sign (=) in a tag name that will be used in displays.

Tag names are case sensitive. Make sure you use the proper case when entering tag names defined in the database.

The following words are reserved for naming calculation types in the logging system and must not be used as tag names. Since calculation types are NOT case-sensitive, bol, BOL, Bol, etc. are all recognized as calculation types. **AVOID** all use of these words as tag names:

Table 3-1. Invalid and Reserved Tag Names

Invalid Tag Name	
bol	dom
dow	doy
hod	len
moh	moy
sod	som
txt	woy
yoc	
Reserved Tag Names	
NoStoreVolume ArchVolumeNode ArchVolume	

Configuring Tags On-Line

To start configuring tags, click/press on the **Main Menu** button, click/press **D Configuration** to display the Configuration menu (Figure 3-1).

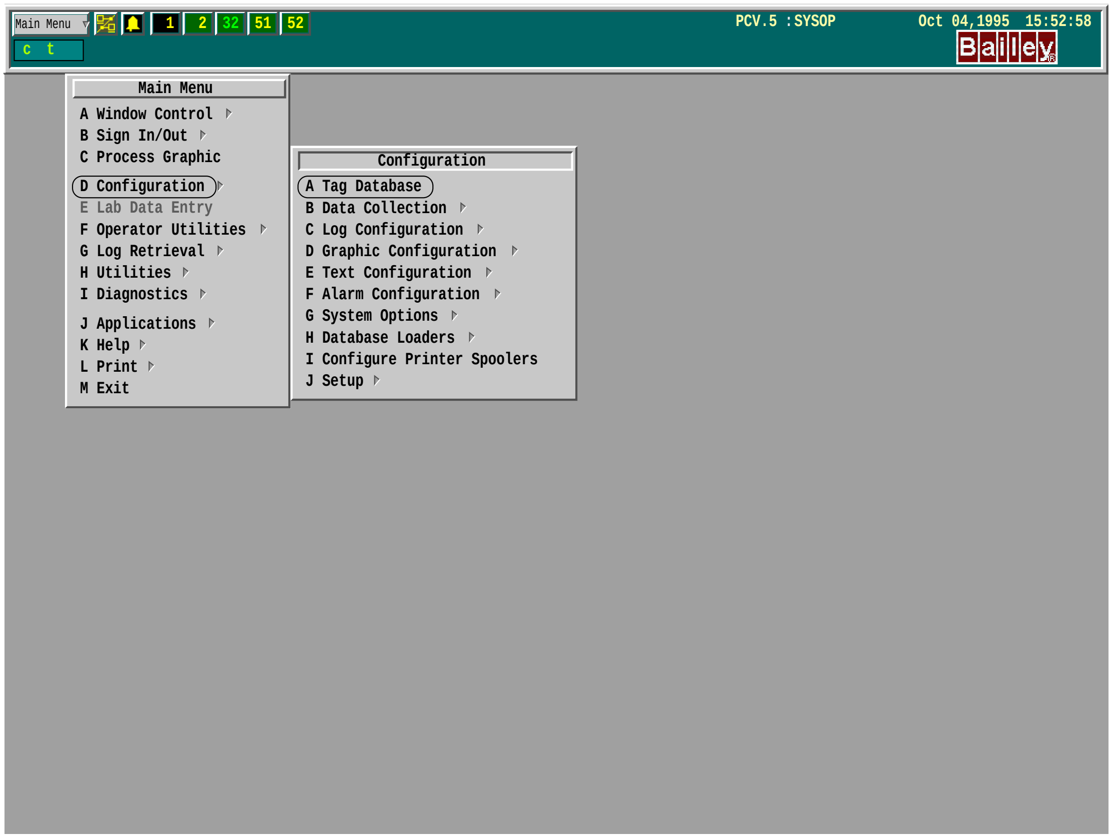

Figure 3-1. Menu Layout

Press/click **A** or click from the Tag Database Configuration menu to display the Tag Database screen (Figure 3-2).

Select a tag to edit by pressing <Up>, <Down>, <PgUp>, <PgDn>, <Home>, and <End> or by clicking the scroll bar to highlight the tag you want.

You can move directly to a given tag index by pressing/clicking the **Find** button, then pressing/clicking **B** and entering the tag index you want in the Dialog window displayed.

You can move directly to a given tag name by pressing/clicking the **Find** button, then pressing/clicking **A**, and entering the tag name you want to find in the Dialog window displayed. Tag names are case sensitive, so be sure to distinguish between uppercase and lowercase letters. For example, if the correct tag

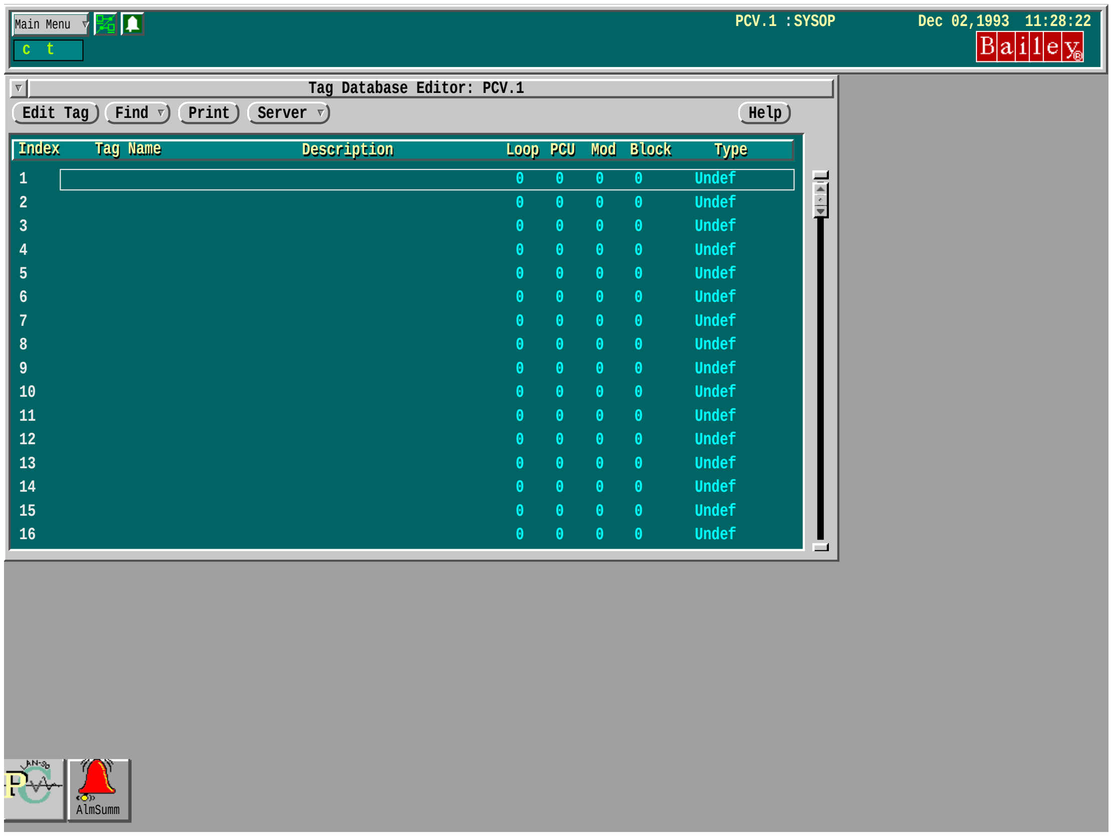

Figure 3-2. Tag Database Screen

name is "**sta01**", but you enter "**STA01**", the tag will not be found.

You can move to the next and previous blank tag entries by pressing/clicking the **Find** button and **Previous** or **Next**.

NOTE: Blank tags are those with a tag type of Undefined (abbreviated to *Undef* on the summary).

Printing Tag Indexes

You can print a range of tag indexes by pressing/clicking the **Print** button from the Tag Database screen (Figure 3-2).

In the Dialog window displayed, enter the first tag index to be printed, and then enter the last tag index to be printed.

Servers

In a LAN-90 PCV network consisting of more than one Server node, clicking the **Servers** button will display a list of the Servers Names in the LAN-90 PCV system. All the active Servers will have their Server Names displayed in black text, while any inactive Servers will have their Server Names displayed in shadowed text.

Edit Tag Database

Once you have selected a tag, press/click the **Edit Tag** button or press <Enter>, or click on the Tag name or Tag description. This displays the Tag Database Editor window (Figure 3-3), where you can define the tag parameters.

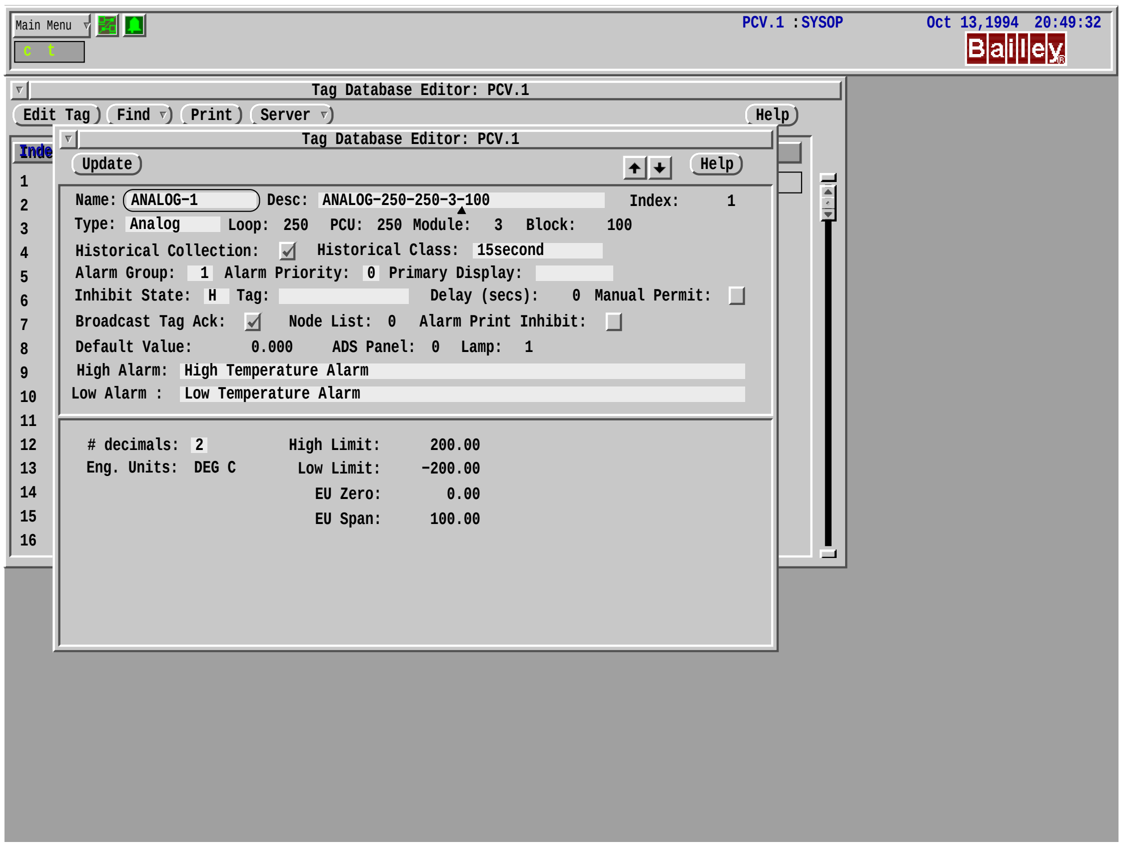

Figure 3-3. Tag Database Editor Window

The Tag Database Editor window contains two sections of input fields for the tag. The upper section shows the same fields for all tag types. These can be edited in this window, as explained in Table 3-1. The fields in the lower section change for each tag type. The information for most fields in the lower section is read from the module configuration and cannot be edited in this window. Some fields appearing in the lower section can be edited in this window, and they are explained in Tables 3-2 through 3-9.

To save the changes to the tag record, press or click the **Update** button.

You can move to the Edit Tag window for the next and previous tag indexes by pressing/clicking <PgDn>{NextPage} and <PgUp> {PrevPage} or using the <Up>/<Down> arrow keys.

To return to the Tag Database window, press <Esc> or select **Quit** from the **Menu** button.

Table 3-2. Tag Fields

Field	Description	
Tag Name	Enter a name for the tag. This name will be used to refer to this tag. See ***Valid Tag Names*** for more information about naming tags.	
Tag Desc	Enter a description of the tag (up to 32 characters long).	
Tag Type	Choose the tag type by menu selecting on the type field and then select/press on the desired type in the Dialog window.	
	Analog	Analog (function code 30).
	AngRpt	Analog Report. The tag value is reported to the loop and is available to other modules on the loop.
	DAANALG	Data Acquisition Analog (function code 177).
	DD	Device Driver (function code 123).
	Digital	Digital (function code 45).
	DigRpt	Digital Report. The tag value is reported to the loop and is available to other modules on the loop.
	IntAng	Internal Analog. The tag value is available only to application programs (e.g., displays, logs). It is not available on the loop.
	IntDig	Internal Digital. The tag value is available only to application programs (e.g., displays, logs). It is not available on the loop.
	MSDD	Multistate Device Driver (function code 129).
	N90sta	Network 90 Status. This tag reports the status of modules.
	RCM	Remote Control Memory (function code 62).
	RMCB	Remote Motor Control Block (function code 136).
	RMSC	Remote Manual Set Constant (function code 68).
	Station	Station (function codes 21, 22, and 80).
	Text	Text selector (function code 151). The tag value is an index number of a text message. See Section 4 for details.
	Text str	Text string (function code 194). Up to 80 characters from exception report.
	Undef	Tag is removed from the tag database and disestablished from the CIU.
Loop	Enter the Loop number where the PCU is located (0 - 250). For Internal Analog, Internal Digital, Analog Report, and Digital Report tags, enter 0 (This field is ignored on Plant Loop).	
PCU	Enter the PCU (Node) number where this tag is located (0 - 250). For Internal Analog, Internal Digital, Analog Report, and Digital Report Tags, enter 0.	
Module	Enter the module address within the PCU (0 - 31). For Internal Analog, Internal Digital, Analog Report, and Digital Report Tags, enter 0.	
Block	Enter the block number within the module (1 - 65535). For Internal Analog, Internal Digital, Analog Report, and Digital Report Tags, enter 0. For N90 Status tags, enter 0.	
Historical Collection	Click/select on the check box to toggle this field. If selected, all incoming exception reports for this tag are collected and stored on-line for later retrieval.	

Table 3-2. Tag Fields (continued)

Field	Description
Historical Class	Click the right mouse button on this field or press <Alt Enter> to get a popup list of currently configured historical class names. You can also manually enter an historical class name. The historical class definition controls the collection, filtering, aging, retention and archiving of the tag's collected exception reports.
Alarm Group	Enter the alarm group number for this tag (0 - 99, S, or D). Alarm groups 1 through 99 are typically used for process tags, S is used for N90 Status tags, and D is used for hardware devices. A tag in alarm group zero does NOT report any alarms: it does NOT appear in any alarm summary.
Alarm Priority	Enter the priority of the tag's alarm (0 - 7). Priority 1 is the highest, priority 7 is the lowest, and a priority of 0 means the tag always appears at the end of the summary lists.
Primary Display	Enter the file name of the graphic that you want to call up directly from the alarm summary that contains this tag.
Inhibit State	Choose the state of the Alarm Inhibit tag that inhibits this tag's alarms by pressing <Ctrl Up> and <Ctrl Down>. Alarm states are: High Alarm, Low Alarm, High Deviation, Low Deviation, Digital Alarm, Zero State, One State, Two State, Three State.
Inhibit Tag	Enter the tag name that will be used to inhibit alarming of this tag. A tag cannot inhibit itself. If no tag name is entered then no alarm inhibiting occurs.
Inhibit Delay (secs)	Enter the number of seconds (0 - 465, in 15-second increments) to delay before returning an inhibited tag to an active state. This only applies to tags inhibited by the Inhibit Tag. The delay begins once the tag's inhibit condition has been lifted.
Manual Inhibit Permit	Click/select the ***check*** box to toggle this field. If allowed, the operator can inhibit alarm reporting of this tag by calling the operating parameters window and clicking **manual inhibit.**
Broadcast Tag Ack	Click/select on the **check** box to toggle this field. If selected, acknowledgment of the tag's alarm is broadcast to other consoles on the INFI 90 OPEN/Network 90 Communication Loop.
Node List	Enter the node list number that the tag's alarm acknowledgment is broadcast to (0 to 4). 0 - broadcast to all nodes defined by N90 tag types in the tag database. 1, 2, 3, 4 - broadcast to nodes listed in node list 1, 2, 3, or 4.
Alarm Print Inhibit	Click/select on the **check** box to toggle this field. If selected, the alarm will still be annunciated, but it will not appear in the system event logs.
Default Value	Enter the value to use in log calculations when the tag's value is bad quality. See the ***Operations*** manual for details.
ADS Panel-Lamp	If you have an ADP (Annunciator/Display select Panel), you can specify the panel and lamp to use to indicate the tag's alarm: Enter **1** for the panel number. Enter the lamp number to use (1 - 64).
Alarm Comments: High & Low	Enter a text string to display on alarm summaries when the tag goes into High or Low alarm. Can also be displayed on graphic displays. For digital tags, the High Alarm Comment will be printed when the tag goes into alarm, and the Low Alarm Comment is printed when the tag is not in alarm.

Table 3-3. Additional Fields for Analog-Type Tags

Field	Tag Types	Description
# decimals	Analog AngRpt DAANALG IntAng RMSC Station Text	Enter the number of decimal places to use when the value is displayed (0 - 9).
Eng. Units	AngRpt IntAng	Choose the engineering units (EU) for the tag by menu clicking on this field, and then select one from the Dialog window.
High Limit	AngRpt IntAng	Enter the high alarm value for the tag (in EU).
Low Limit	AngRpt IntAng	Enter the low alarm limit for the tag (in EU).
EU Zero	AngRpt IntAng	Enter the value for the tag (in EU).
EU Span	AngRpt IntAng	Enter the span of tag values (in EU).

Table 3-4. Additional Fields for Digital-Type Tags

Field	Tag Types	Description
Zero State Descriptor	Digital DigRpt IntDig	Choose the logic state descriptor to use for the tag's zero state by menu clicking on this field, and then selecting from the list presented.
One State Descriptor	Digital DigRpt IntDig	Choose the logic state descriptor to use for the tag's one state by menu clicking on this field, and then selecting from the list presented.
Alarm Defn	Digital IntDig	Enter logic state to alarm on (0 - 2). 0 - alarm on logic state zero 1 - alarm on logic state one 2 - no alarm state
Print State Changes	Digital DigRpt IntDig	Choose whether you want changes in state printed on the current system event log by clicking on the checkbox. See the Operations manual for details.
Save State Changes	Digital DigRpt IntDig	Choose whether you want changes in state saved in the current system event log by clicking on the checkbox. See the ***Operations*** manual for details.

Table 3-5. Additional Fields for Switch-Type Tags

Field	Tag Types	Description
Zero State Descriptor	DD MSDD RCM RMCB	Choose a logic state descriptor (LSD) for the tag's zero state by menu clicking on this field, then select one from the list presented.
One State Descriptor	DD MSDD RCM RMCB	Choose a descriptor for the tag's one state by menu clicking on this field, then select one from the list presented.
Two State Descriptor	MSDD	Choose a descriptor for the tag's two state by menu clicking on the field, then selecting one from the list presented.
Three State Descriptor	MSDD	Choose a descriptor for the tag's two state by menu clicking on the field, then select one from the list presented.
Feedback Zero State Descriptor	DD MSDD RMCB	Choose a descriptor for the zero state of Feedback Input #1 and #2 by menu clicking on the field, and selecting one from the list presented.
Feedback One State Descriptor	DD MSDD RMCB	Choose a descriptor for the one state of Feedback Input #3 and #4 by pressing/clicking on the field.
Permissive State Descriptor	RMCB	Choose a descriptor for the permissive states of an RMCB by menu clicking on the field, and selecting one from the list presented.
Text Set #	RMCB	Enter the text set number (0 - 99) that this tag uses to describe error codes. You configure RMCB text sets using the Text Configuration function (see Section 5 for details).

Table 3-6. Additional Fields for N90 Status Tags

Field	Tag Types	Description
Trans Ack	N90sta	Select whether or not you want the server to transmit global acknowledges to this node by pressing/clicking the checkbooks.
Trans Sil	N90sta	Select whether or not you want the server to transmit global silences to this node by pressing/clicking the checkbox.

Table 3-7. Additional Fields for Textstr Tags

Field	Tag Type	Description
Control Enabled	Textstr	Choose whether strings can be sent to function code 194 blocks and whether the block's mode (AUTO or MANUAL) can be changed.
# Characters	Textstr	Maximum number of characters (limit of 80) expected in string from function code 194.
Default Text	Textstr	Initial value text string for the tag. String's length will be written to Default when updating the tag record.

Internal Tags

Internal analog and internal digital tags are values that are available to application programs only: they are not available on the plant communication loop. Internal tags can be used in graphic displays, trends, and logs. The value of an internal tag can be set by some applications, such as the Logging package (via the Export function), and the Lab Data Entry package.

Report Tags

Analog report and digital report tags are values that are available to both the OIS12 console software and the plant communication loop: they are stored in the CIU. When you configure the report tag, you specify a hardware address of 0, 0, 0, 0 (loop, PCU, module, and block). The tag does have a real hardware address: it is the loop and PCU number of the CIU, on INFI 90 OPEN systems the module is set to 2 (refer to Table 3-8 for module and block addresses for a Plant Loop system) and the block number is the same as the tag index number. This is the address Elsag Bailey modules would use to get the report tag's value. The value of a report tag can be set by some applications, such as the Logging package (via the Export function), and the Lab Data Entry package.

NOTE: On Plant Loop, tag indexes/block numbers above 1024 cannot be seen by other modules on the Network 90 system, therefore indexes are accessed from this module as listed:

Table 3-8. Report Tag Addresses for Plant Loop Systems

CIU Indexes Accessed From Another Node	Module	Block Number
0 - 1023	2	0 - 1023
1024 - 2047	3	0 - 1023
2048 - 3071	4	0 - 1023
3072 - 4095	5	0 - 1023
4096 - 5000	6	0 - 904

N90 Status Tags

Set up a status tag in the tag database for each module that is to be monitored on a System Status or node status display. The settings you should use are described in Table 3-9.

By assigning each module status tag to alarm group S, you will get all status alarms annunciated.

Table 3-9. N90 Status Tag Settings for Nodes and Modules

Tag Database Fields	Valid Entry
Loop Number	0 - 250
Node /PCU	1 - 250
Module Address	0 - 31[1]
Block Number	0
Tag Type	N90sta
Alarm Group	S
Primary Display	nodsta##[2]

NOTES:
1. By convention, the interface module connecting a PCU to the loop uses module address 0. The redundant connection uses address 1 and a computer interface uses address 2.
2. "nodsta##" is a typical filename for a node status display, where ## is the node number. For node numbers greater than 99, you will have to use another convention for the node status display file name.

If you assign both the alarm group S and the file name of the node status display as the primary display name, when module alarms are annunciated, you can view the Alarm Summary, and quickly access the node status display.

Tag Alarms

To have a tag's alarm states annunciated, you must give it a non-zero alarm group number. Alarm groups 1 through 99 can be used for your process alarms. Alarm group S is given to N90 Status tags, and alarm group D is reserved for hardware devices.

The alarm priority determines the order alarms will appear in alarm summaries. Priority 1 tags always appear at the top of the alarm summary; then priority 2 through 7 are displayed in sequence, with priority 0 tags displayed at the bottom of the list. Within each priority, the alarms are listed in order of occurrence with the most recent listed at the start of the priority list.

Alarm comments are displayed on all graphic alarm summaries. The display of alarm comments can be toggled on the text Alarm Summary. Alarm comments can also be displayed on graphics.

While viewing an alarm summary you can call up the primary display by pressing or clicking on the letter that appears in red to the left of the alarm entry.

Inhibiting Alarms

When a tag's alarms are inhibited, the tag's regular alarm status is not reported to the alarm group indicator or to the standard alarm summary; it does not cause alarm tones to be annunciated or cause RCMs to be set/reset. Inhibited tags are not reported to the System Events log and are not printed.

Once the inhibiting condition of the tag is removed, and the tag remains or goes into alarm, then it will be reported to the alarm printer, annunciated, etc.

There are three ways of inhibiting a tag during configuration:

- Group inhibit.
- Tag inhibit (auto inhibit).
- Manual inhibit.

Refer to Section 5 in this manual and ***HANDLING ALARMS*** in Section 4 in the ***Operations*** manual.

Group Inhibit

Group inhibit uses the Alarm Group Field to inhibit a collection of alarms. Consider this grouping as you plan your tags.

Tag Inhibit

An inhibiting tag, configured for automatic alarm inhibition of another tag, when in a specified condition, will suppress other tags from annunciating their alarm. Inhibit tags can be either analog or digital. Tag inhibit is also called auto inhibit. Tag inhibit involves three fields:

- Inhibit state.
- Tag.
- Delay.

Tag To set up automatic alarm inhibition, enter the tag name of the inhibiting tag in the Tag field, and choose the desired inhibition state.

Inhibit State If an analog-type tag is used, the following alarm states can be used to invoke inhibition:

H	High Alarm.
L	Low Alarm.
HD	High Deviation Alarm.
LD	Low Deviation Alarm.

If a digital-type inhibit tag is used, the following states can be used to invoke inhibition:

A	Alarm.
S	Zero State Alarm.
1S	One State Alarm.
S	Two State Alarm.
3S	Three State Alarm.

Delay The Inhibit Delay field specifies the number of seconds taken to release the inhibit on alarming of the tag once the inhibiting tag exits the inhibition condition.

Manual (Inhibit) Permit

Operators can manually inhibit tags using Tag Operating Parameters. (Refer to Section 5).

If tags are required to be inhibited by operators, make sure the Manual Inhibit Permit field is enabled.

Alarm Print Inhibit

The Alarm Print Inhibit field only affects whether the tag's alarm is reported to the System Events Log or not. Alarm annunciation is not affected.

Broadcasting Alarm Acknowledgment

To broadcast an acknowledge for a specific tag, the Broadcast Tag Ack field in the tag database must be enabled.

To send the acknowledgment to all nodes that have N90 Status tags in the database, enter 0 (zero) in the Node List field. You can limit the nodes the acknowledgment is sent to by entering a node list number (1 - 4) in the Node List field instead. See Section 5, for details about creating node lists and making broadcasting function.

NOTE: The Transmit Ack and Transmit Sil fields of each N90 Status tag determine whether global acknowledges and silences are to be sent to that node.

ADP Lamps

The OIS12’s ADP (Annunciator/Display select Panel) provides 64 lamps to indicate alarms and 32 push-buttons to call up related displays.

The ADP lamps are similar to the alarm group indicator buttons displayed in the Executive Bar on the screen. A lamp flashes when one or more of the tags assigned to it are in alarm and have not been acknowledged. A lamp remains on and steady when one or more of the tags assigned to it are in alarm and all have been acknowledged. A lamp remains off when all tags assigned to it are no longer in alarm.

To configure a tag to display its alarms on an ADP lamp, enter the following information in the ADS Panel-Lamp fields:

- Enter **1** in the left field (the Panel number).
- Enter the lamp number in the right field (the Lamp field).

You can assign more than one tag to the same ADP lamp.

The ADP panel contains 32 push-buttons and 64 lamps (LEDs) in a mylar enclosure. Each push-button has a red and yellow LED mounted above the right hand corner of the push-button.

The push-button and red LEDs are numbered from one to 32 starting in the upper left hand corner of the panel and counting from left to right across the panel.

The yellow LEDs are numbered from 33 to 64 starting in the lower right corner of the panel and counting from right to left across the panel.

The configuration of the ADP lamps is updated on-line when you save the tag configuration.

CONFIGURING HISTORICAL CLASSES

Press/click **D Configuration** from the Main Menu to display the Configuration menu. Press/click **B Data Collection** to display the Data Collection menu (Figure 3-1). Press/click **A Historical Classes** to display the list of Historical Classes to configure (Figure 3-4).

The Historical Class Configuration screen lets you view and modify the historical classes defined in the data collection system belonging to the default real-time server to which you are currently connected. The Select Historical Class Name screen lets you view the list of currently defined historical collection classes. Historical classes specify the way in which historical information for a tag belonging to a particular historical class is treated with respect to collection, filtering, aging and archiving. You can define up to 250 unique historical classes.

Press <UP>, <Down>, <PgUP>, PgDn>, <Home> and <End> to move between the historical class names.

Press <F1> to modify the historical class definition for the currently highlighted class name. The screen is replaced with the data entry fields filled with the current parameters for the class definition (Figure 3-5).

```
<Select Historical Class Name>

001 AnaClass-01  002 AnaClass-02  003 AnaClass-03  004 AnaClass-04

005 AnaClass-05  006              007 AnaClass-07  008 AnaClass-08

009 AnaClass-09  010 AnaClass-10  011 AnaClass-11  012 AnaClass-12

013 AnaClass-13  014 AnaClass-14  015 AnaClass-15  016 AnaClass-16

017 AnaClass-17  018              019              020

F1  Edit Class Definition             F2  Add Class Definition
F3  Delete Class Definition

F9  Help  F0  Exit
```

Figure 3-4. Sheet Historical Class Menu

Press <F2> to add a new historical class definition. If you do not have Configure Database access, nothing happens when you press <F2>. The utility finds the first blank class name. If found, the screen is replaced with the blank data entry fields ready for defining a new historical class. If all classes have been defined, you will see the following warning message:

```
Can't find an empty class definition!
 (Requested class does not exist)

            Continue
```

Figure 3-5. Class Location Warning Message

Press <F3> to delete the currently highlighted historical class. If the class name is blank or you do not have Configure Database access, nothing happens when you press <F3>. Otherwise, the following message appears to verify that you want to delete the historical class definition. The XXXX is filled with the highlighted class name.

```
Delete 'XXXXXXXXXXXXXX?

    Yes       No
```

Figure 3-6. Verification Prompt

If you select **No** nothing happens. If you select **Yes**, the highlighted class definition is updated with default values. The data collection system is then informed of the new definition for this class.

EDIT HISTORICAL CLASS DEFINITION

The Edit Historical Class Definition <F2> screen lets you modify the historical class definition for the currently highlighted class name in the previous screen. You must have Configure Database access in order to modify an historical class definition.

```
< Edit Historical Class Definition >

Class Name:        XXXXXXXXXXXXXX
Collection Type          Analog     Digital       Manual/Import
Trigger Tag        XXXXXXXXXXXXXX  Trigger State    ZERO    ONE
Event Filter:      % Change of Span      XX
                   Minimum Report Time   XX Seconds


Aging Period            RetentionPeriod        Archive

Raw Events              XXXXX    hours        NO    YES
Hourly Statistics       XXXXX    days         NO    YES
Shift Statistics        XXXXX    days         NO    YES
Daily Statistics        XXXXX    days         NO    YES
Weekly Statistics       XXXXX    weeks        NO    YES
Monthly Statistics      XXXXX    months       NO    YES

F1  Save Class Definition


F9  Help                                F0  Return to Previous Menu
```

Figure 3-7. Edit Historical Class Screen

Press <UP>, <Down>, <PgUP>, PgDn>, <Home> and <End> to move between the data entry fields.

The *Class Name* field lets you enter and assign a unique class name to the historical class parameters you are about to define. You can enter a name up to 14 characters long. If you try to enter a duplicate name, the following message appears:

```
You must enter a unique class name!
            Continue
```

Figure 3-8. Duplicate Class Name Message

The Collection Type lets you select the class of tags for which you want to define the collection parameters. Press <Ctrl Left> and <Ctrl Right> to move between the collection types. You will notice that various fields are dimmed and un-dimmed as you move from one type to the next.

With Analog collection, all fields are enabled. Any live analog-type tag can be assigned to this class. With Digital collection, only the *Trigger Tag*, *Trigger State*, *Minimum Report Time* and *Raw Events* fields are enabled. In both cases, the real-time exception reports being collected for these tags are always in time-stamp order. These exception reports can be filtered, aged, and archived automatically based on the subsequent parameters you define.

Only one Manual/Import class can be defined. You will notice the class name is fixed and the field dimmed. The only fields enabled are for the *Raw Events* parameters.

The Trigger Tag field lets you enter the name of a digital-type tag. The tag must be already defined in the real-time database, otherwise, you will see the message:

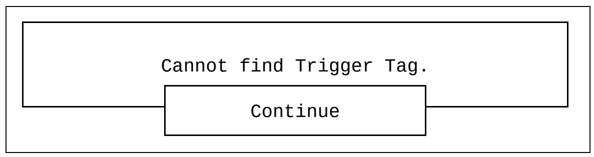

Figure 3-9. Cannot Find Trigger Tag Message

If the tag you entered is defined in the real-time database, but is not a digital-type tag, you will see the message:

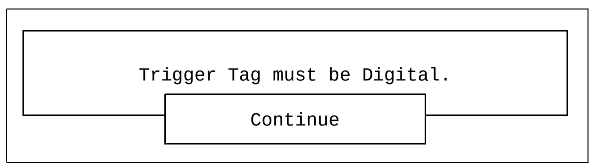

Figure 3-10. Trigger Tag Type Message

The Trigger State field lets you select the state when collection begins. Press <Ctrl Left> and <Ctrl Right> to move between the ZERO and ONE states.

The combination of Trigger Tag and Trigger State allows triggered or batch collection of exception reports for tags belonging to the class. Collection is initiated upon the transition of the digital tag from its current state to the selected trigger state. Collection is stopped when the trigger tag returns to the opposite state.

Event filtering provides additional filtering of exception reports received at the console from the module. Two filtering methods are included as indicated by the *% Change of Span* and *Minimum Report Time* data entry fields.

The *% Change of Span* field is only enabled for the Analog collection type. You can enter a value in the range 0 to 100. The *Minimum Report Time* field is enabled for the Analog and Digital collection types. You can enter a value in the range 0 to 225 seconds. By combining these methods the latest exception is stored if its value compared to the last exception's value has exceeded the specific percentage change of span when or after the specified minimum report time has expired, otherwise, the exception is discarded.

The *Retention Period* field for Raw Events lets you set the period for retaining all exception reports on-line for the tags belonging to a class. Setting the period to zero means you do not want to store any of the raw exception reports being received or generated by the console. Entering a non-zero value retains all exception reports on the local hard-disk for the time period you enter. The retention period is in days.

The *Archive* field for Raw Events lets you select whether to archive exception reports when the retention period is reached. Data is archived to removable off-line storage media such as optical disks. Press <Ctrl Left> and <Ctrl Right> to move between the **YES** and **NO** states. Selecting **NO** means the exception reports beyond the retention period are deleted from the on-line storage area. Selecting **YES** means that the exceptions reports are first archived before being deleted from the on-line storage area.

For some groups of tags, maintaining a copy of every exception report generated is undesirable. This statement is especially true if the data is only being used to generate hourly or shift reports. To reduce on-line storage needs and speed up retrieval, the data collection system supports live, on-going accumulation of statistics over several periods of time for all Analog type exception reports. Currently, five periods are supported; hour, shift, day, week and month. Separate data entry fields are provided for *Aging Period*, *Retention Period* and *Archiving of Values*.

For each period the following minimum set of statistics are maintained:

- Percentage of time the values were bad during the period.
- Number of good values during the period.
- Summation of the good values during the period.
- Summation of the good values squared during the period.
- The minimum good value during the period.
- The time when the minimum good value occurred during the period.
- The maximum good value during the period.
- The time when the maximum good value occurred during the period.

These calculated values are the components of more complex calculations such as standard deviation, average and variance.

Press <F1> to save the changes you have made to the historical class definition. If the class name is not blank, the data collection system is informed of the new definition for the class. A Sending message appears while the class is being stored and updated by the data collection system.

A blank class name indicates that you want to delete (return to default) the parameters for the current historical class. The following message appears to verify that you want to delete the historical class definition:

```
Delete Class?
Yes     No
```

Figure 3-11. Delete Class Confirmation

If you select **NO** nothing happens. If you select **YES** the class definition is reset to default values.

When updating or deleting a class definition, if one or more of the retention periods has changed to zero, you will see the following question appear:

```
One or more retention periods have changed to zero!
What should be done with collected events?
Delete   Archive   Cancel
```

Figure 3-12. Collected Events Prompt

The data collection system needs to know what to do with the cached and on-line events that have already been collected. By default, the **Archive** option is highlighted. The **Delete** option deletes all current cached and on-line historical data for the zeroed retention periods. The **Archive** option first flushes all cached events to disk, then schedules all on-line historical data for archiving to off-line storage for all zeroed retention periods. The **Cancel** option cancels the query and aborts the delete operation.

SECTION 4 - CONFIGURING TEXT

OVERVIEW

Text which appears on graphic displays to indicate the status of a process point can be configured to site specific text.

The following types of text can be configured:

- Engineering Unit Descriptors.
- Logic State Descriptors.
- Text Tag Messages.
- Remote Motor Control Text.
- Text Substitution.

CONFIGURING TEXT

Press/click **E** at the System Configuration menu to display the Text Configuration menu (Figure 4-1).

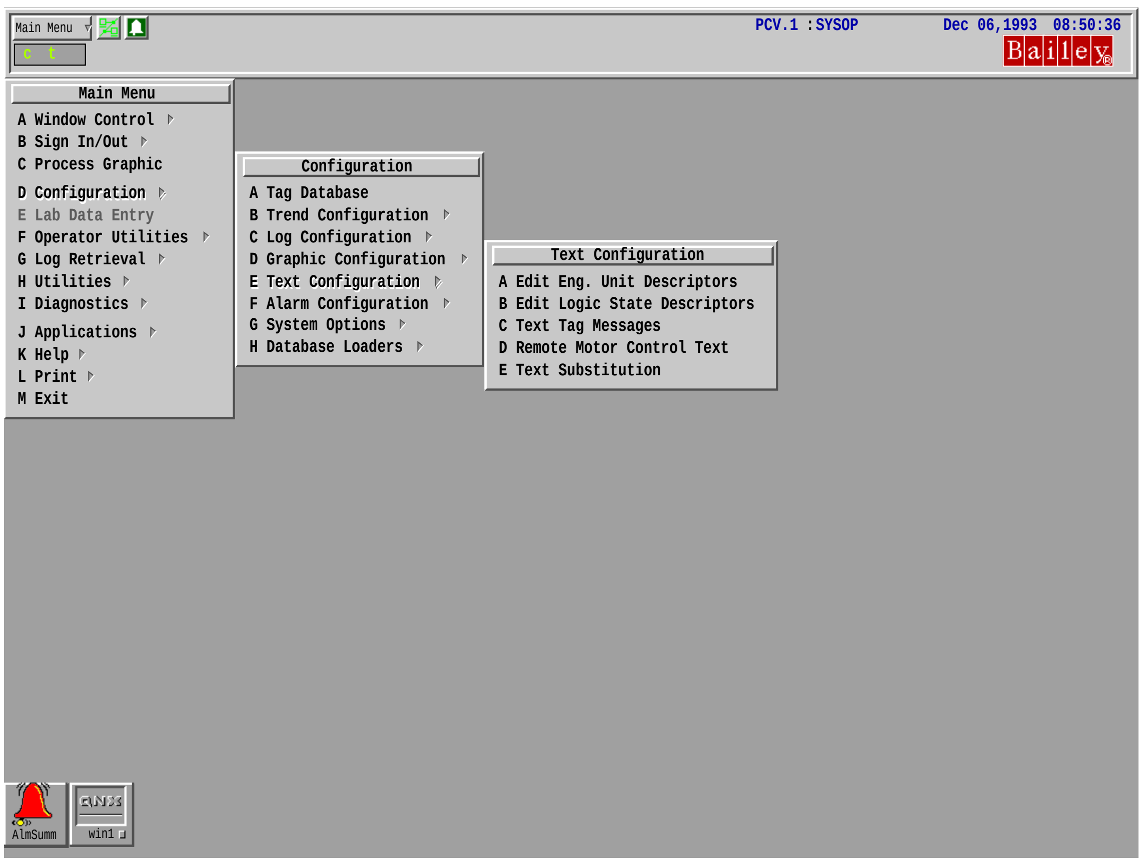

Figure 4-1. Text Configuration Menu

Engineering Unit and Logic State Descriptors

Engineering unit descriptors describe the units of measurement for analog-type values. The engineering units are usually displayed beside the value. For example, if a water flow is measured as 8 and the engineering units descriptor is kPa, the display shows 8 kPa.

Logic state descriptors describe the states of digital-type and switch-type tags (e.g., ONE and ZERO, ON and OFF). The logic state descriptors are displayed to show the state of a tag.

Up to 256 descriptors can be configured. The first 16 descriptors are reserved for the Elsag Bailey standard descriptors; you cannot edit them. Table 4-1 lists the reserved descriptors.

Table 4-1. Standard Elsag Bailey Descriptors

Index	Engineering Unit Descriptor	Logic State Descriptor
0	blank	ZERO
1	blank	ONE
2	%	ON
3	DEG F	OFF
4	DEG C	NO
5	PSIA	YES
6	PSIG	CLOSED
7	IN H20	OPEN
8	GPM	LOW
9	CFS	HIGH
10	CFM	EMPTY
11	LB/HR	FULL
12	GAL	RUN
13	AMPS	STOP
14	IN HG	TRIP
15	KLB/HR	blank

To edit engineering unit descriptors, press/click **A** from the Text Configuration menu. To edit logic state descriptors, press/click **B**. The Edit Logic State Descriptors screen is shown in Figure 4-2.

Up to 64 descriptors are shown at a time. Press <PgUp> {PrevPage} and <PgDn>{NextPage} to see more descriptors.

To edit a descriptor, use the arrow keys to highlight the descriptor you want, then type a new descriptor or edit an existing one.

```
< Edit Logic State Descriptors >

 0. ZERO          1. ONE            2. ON             3. OFF
 4. NO            5. YES            6. CLOSED         7. OPEN
 8. LOW           9. HIGH          10. EMPTY         11. FULL
12. RUN          13. STOP          14. TRIP          15.
16.              17.               18.               19.
20.              21.               22.               23.
24.              25.               26.               27.
28.              29.               30.               31.
32.              33.               34.               35.
36.              37.               38.               39.
40.              41.               42.               43.
44.              45.               46.               47.
48.              49.               50.               51.
52.              53.               54.               55.
56.              57.               58.               59.
60.              61.               62.               63.

F1  Save Descriptor Changes


F9  Help                                F0 Exit to Prev Menu
```

Figure 4-2. Edit Logic State Descriptors Screen

Save your changes by pressing <F1>.

To exit the screen, press <F10>.

Text Tag Messages

You can use text messages to display descriptions of process events on graphic displays and in some log spreadsheets. The index number of a text message is specified by the value of a text tag and displayed on graphic displays using the Text dynamic. Up to 10,000 text messages can be configured.

Press/click **C** from the Text Configuration menu to display the Text Tag Message editor (Figure 4-3).

```
< Edit Text Tag Messages >

Text Index       2      Last Text Index:       101

This is text message index 0
This is text message index 1
This is text message index 2









F1  Find Text Index


                                         F0  Exit
```

Figure 4-3. Text Tag Messages Editor

Up to 15 messages are shown at a time. Select a text message to edit, by pressing <Up>, <Down>, <PgUp> {PrevPage}, and <PgDn> {NextPage}. The *Text Index* display in the top left corner of the screen shows the index number of the currently selected text message. You can move directly to a given text message index by pressing <F1>, then entering the text message index number you want.

Type any text into the space. Text messages can be up to 80-characters long, and any printable keyboard character can be entered.

The text message is automatically saved when you move the cursor to another text message or when you return to the Text Configuration menu. You do not have to press any function key to save your changes.

Exit the screen by pressing <F10>.

Remote Motor Control Block (RMCB) Text

RMCB text message sets are used to describe the error code returned from RMCBs. They are displayed on graphic displays using the RMCB Error Code Text dynamic. These error messages are configured as a set; each RMCB uses a specific text set number (see ***CONFIGURING TAGS AND DATA COLLECTION CLASSES*** in Section 3). Up to 99 sets can be configured.

To display the Edit RMCB text screen (Figure 4-4), press/click **D** from the Text Configuration menu.

```
                      < Edit RMCB Text >

Total Number of RMCB Text Sets:  25

   RMCB Text Set Number:  0         RMCB Text Set Number:  1

Error Code         Error Code Text  Error Code  Error Code Text

0. No Error        No Error 1       0. No Error
1. Stopped         Stopped 1        1. Stopped
2. Interlock 1     Interlock 1      2. Interlock 1
3. Interlock 2     Interlock 2      3. Interlock 2
4. Interlock 3     Interlock 3      4. Interlock 3
5. Interlock 4     Interlock 4      5. Interlock 4
6. Feedback 1 = 0  Feedback 1 = 0   6. Feedback 1 = 0
7. Feedback 2 = 0  Feedback 2 = 0   7. Feedback 2 = 0
8. Feedback 1 = 1  Feedback 1 = 1   8. Feedback 1 = 1
9. Feedback 2 = 1  Feedback 2 = 1   9. Feedback 2 = 1

F1  Save                            F2 Change Number of Sets
F3  Find Set Number

                                    F0  Exit to Previous Menu
```

Figure 4-4. Edit RMCB Text

By default, you have 25 sets to configure. You can change the maximum number of sets by pressing <F2>, then entering the maximum number.

Two sets are shown on the screen at the same time. Select the set to edit by pressing <PgUp> {PrevPage} and <PgDn> {NextPage}. You can go directly to a given set number by pressing <F3>, then entering the set number you want.

Use the arrow keys to move between error code fields, and edit the text for each error code.

To save your changes, press <F1>.

To exit from the screen, press <F10>.

Text Substitution

Some of the default text uses can be changed by using the Text Substitution editor. Press/click **E** from the Text Configuration menu to display the Text Substitution menu (Figure 4-5).

```
< Text Substitution >

01 ALARM_STATUS              02 ALARM_STATUS_CHAR
03 QUALITY_CHAR              04 EXCEPTION_REPORT_TEXT
05 RED_TAG_STATUS            06 TRUNCATION_TEXT

F1  Edit Text

F9  Help                                    F0  Return to Previous Menu
```

Figure 4-5. Text Substitution Menu

There are five categories of configurable text:

- Alarm Status text (Figure 4-6).
- Single Character Alarm Status text (Figure 4-7).
- Quality text (Figure 4-8).
- Exception Report text (Figure 4-9).
- Red Tag Status text (Figure 4-10).

Select the category you want by using the arrow keys to highlight it, then press <F1> to call up the Text Substitution Editor (Figures 4-6 to 4-10).

```
< Text Substitution >

ALARM_STATUS

Description              Default     Substituted

NORMAL                   "N "        "  "
ALARM (DIGITAL)          "A "        "A "
BAD QUALITY              "* "        "* "
OUT OF SERVICE           "* "        "* "
HIGH                     "H "        "HH"
LOW                      "L "        "LL"
HIGH DEVIATION           "HD"        "H "
LOW DEVIATION            "LD"        "L "
TWO HIGH                 "2H"        "2H"
TWO LOW                  "2L"        "2L"
THREE HIGH               "3H"        "3H"
                                                  < more >
F1  Save                    F2  Set Defaults

F9  Help                    F0  Return to Previous Menu
```

Figure 4-6. Text Substitution Editor (Alarm Status)

```
< Text Substitution >

ALARM_STATUS_CHAR

Description              Default     Substituted

NORMAL                   "N"         "N"
ALARM (DIGITAL)          "A"         "A"
BAD QUALITY              "*"         "*"
OUT OF SERVICE           "*"         "*"
HIGH                     "H"         "H"
LOW                      "L"         "L"
HIGH DEVIATION           "D"         "D"
LOW DEVIATION            "D"         "D"
TWO HIGH                 "H"         "H"
TWO LOW                  "L"         "L"
THREE HIGH               "H"         "H"
                                                  < more >
F1  Save                    F2  Set Defaults

F9  Help                    F0  Return to Previous Menu
```

Figure 4-7. Text Substitution Editor (Single Character Alarm Status)

```
< Text Substitution >

QUALITY_CHAR

Description              Default     Substituted

GOOD QUALITY             " "         " "
BAD QUALITY              "*"         "*"
DISESTABLISHED           "x"         "x"
SUBSTITUTED              "s"         "s"
SUSPECT (NO SPECS)       "?"         "?"
INHIBITED (AUTO)         "i"         "i"
INHIBITED (GROUP)        "g"         "g"
INHIBITED (MANUAL)       "m"         "m"

F1  Save                    F2  Set Defaults

F9  Help                    F0  Return to Previous Menu
```

Figure 4-8. Text Substitution Editor (Quality Text)

```
< Text Substitution >

EXCEPTION_REPORT_TEXT

Description                   Default          Substituted

ANALOG:  Calib. Quality       "NORMAL      "   "NORMAL      "
                              "OUT OF RANGE"   "OUT OF RANGE"
         Point Disabled       "NORMAL      "   "NORMAL      "
                              "SERVICED    "   "SERVICED     "
         Red Tag Status       "NORMAL      "   "NORMAL      "
                              "RED TAGGED  "   "RED TAGGED  "
DIGITAL: State                "ZERO        "   "ZERO        "
                              "ONE         "   "ONE          "
         Red Tag Status       "NORMAL      "   "NORMAL       "
                              "RED TAGGED  "   "RED TAGGED  "
STATION: SP Tracking          "NO TRACK    "   "NO TRACK    "
                                                      < more >
F1  Save                      F2  Set Defaults

F9  Help                      F0  Return to Previous Menu
```

Figure 4-9. Text Substitution Editor (Exception Report Text

```
< Text Substitution >
RED_TAG_STATUS

Description              Default               Substituted

NORMAL                   "    "                "    "
RED TAGGED               "RT  "                "RT  "

F1  Save                      F2  Set Defaults

F9  Help                      F0  Return to Previous Menu
```

Figure 4-10. Text Substitution Editor (Red Tag Status)

If there are more fields than fit onto one screen, you can scroll the screen up and down with the arrow keys and <PgUp> {PrevPage} and <PgDn> {NextPage}.

Highlight the text you want to change, then enter the new text.

You can reset the default text for the entire Substituted Text column by pressing <F2>.

Save any changes you make, by pressing <F1>.

To exit the editor, press <F10>.

In an OIS12 console system with either a Redundant Server or multiple Servers, any changes made to one Server's Text Substitution file are not passed on to the Redundant Server or the other Servers in the system. In order for the modification to be seen system-wide, the same modifications must be made on each Server, including the Redundant Server.

SECTION 5 - CONFIGURING ALARMS

CONFIGURING ALARMS

Press/click **F** from the Configuration menu to display the Alarm Configuration menu (Figure 5-1).

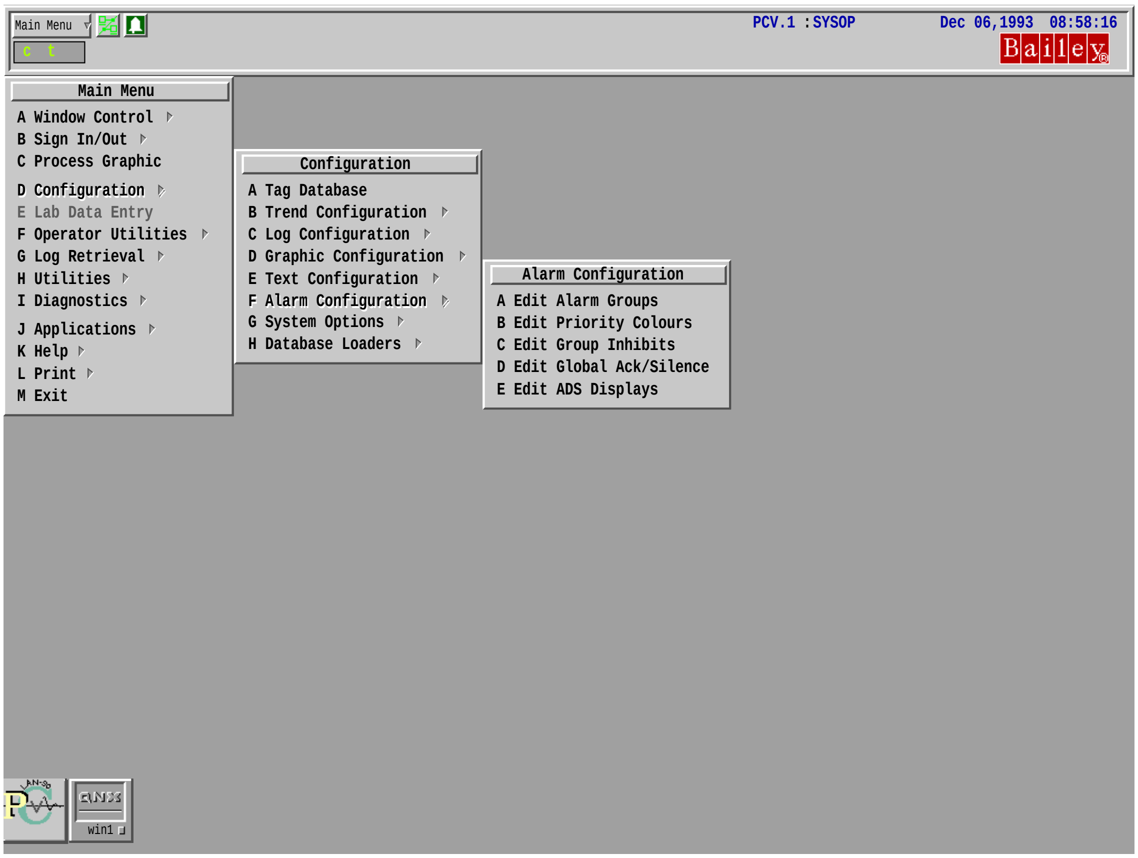

Figure 5-1. Alarm Configuration Menu

Press/click **A** to display the Configure Alarm Groups menu (Figure 5-2) from the Alarm Configuration menu.

Editing Alarm Groups

Each alarm group (except 0) can be configured to generate an alarm tone on the console speaker or on the MKM/EMKI keyboard speaker. The tone sounds when the alarm group has a new unacknowledged alarm or an unacknowledged alarm returns to normal. Pressing {Silence} or <F11> silences this tone. It is also silenced when at least one tag in each alarming group is acknowledged.

```
< Configure Alarm Groups >

F1  Edit Alarm Tone Groups            F2  Edit RCM Tag Groups

F9  Help                              F0 Return to Previous Menu
```

Figure 5-2. Alarm Group Configuration

In each alarm group, you can also have RCM tags set or reset when alarms occur or when the alarms return to normal.

Any number of relays or RCMs can be in either a set or reset state at the same time. Silencing or acknowledging an alarming group with an RCM defined, causes the RCM to change to the opposite of its configured state. If the “Alarm Tag field” and “Return to Normal Tag field” are defined as the same tag with the same state, the RCM will go into opposite state of that defined for the Alarm Tag. Relays and RCMs remain in their configured state until acknowledged or silenced.

Alarm tones maintain a natural priority: alarm tone 1 overrides tone 2 which overrides tone 3, etc. A higher numbered tone cannot sound at the same time as a lower numbered tone.

Press <F1> from the Configure Alarm Groups menu. You will be presented with a list of nodes, which can be selected by using <Up>/<Down> key and pressing <F1>. You will then be presented with the Configure Alarm Tone Groups display (Figure 5-3).

Select the alarm group to edit by pressing <PgUp> {PrevPage} and <PgDn> {NextPage}. To move directly to a given alarm group: press <F2>, type the alarm group number and press <Enter>. Table 5-1 explains the fields. To clear all fields in the current alarm group, press <F3>.

To copy the current alarm group definition to another alarm group, press <F4>, then enter the alarm group number to copy the current group to.

```
─< Configure Alarm ToneGroups >─────────  Mar 21 10:40:11 AM ──

 Alarm Group   1

 Alarm Tone     0                 Return to Normal Tone     0

 Alarm Relay    0                 Return to Normal Relay    0




 Alarm Device  Console Speaker  Keyboard

 F1  Save                         F2  Find Group
 F3  Clear Group                  F4  Copy to Group
                                  F6  Copy to Range of Groups
 F7  Define Tones
 F9  Help                         F0 Exit to Previous Menu
```

Figure 5-3. Configure Alarm Tone Groups

To copy the current alarm group definition to a range of other alarm groups, press <F6>, then enter the first group number and the last group number to copy the current group to.

Table 5-1. Alarm Group Fields

Field	Description
Alarm Tone	The alarm tone sequence to sound when a tag in this group goes into alarm. Enter a 0 (no alarm) or 1 to 5.
Return to Normal Tone	The alarm tone to play when the last unacknowledged alarm in this group returns to normal. Enter a 0 (no alarm) or 1 to 5.
Alarm Relay	The MKM/EMKI keyboard relay to close when a tag in this alarm group goes into alarm. This option is supported only with an MKM/EMKI keyboard installed. Enter a 0 (no alarm) or 1 to 6.
Return to Normal Relay	The MKM/EMKI keyboard relay to close when the last unacknowledged alarm in this group returns to normal. This option is supported only with an MKM/EMKI keyboard installed. Enter a 0 (no relay) or 1 to 6.
Alarm Tag	The name of an RCM tag to set or reset when a tag in this alarm group goes into alarm. Enter the tag name, and press <Right> and <Left> to choose Set or Reset. If the tag name is left blank, no signal is sent.
Return to Normal Tag	The name of an RCM tag to set or reset when the last unacknowledged alarm in this group returns to normal. Enter the tag name, and press <Right> and <Left> to choose Set or Reset. If the tag name is left blank, no signal is sent.
Alarm Device	Specifies whether to use the console speaker or the MKM/EMKI keyboard tone generator. Press <Right> and <Left> to choose.

Defining Alarm Tones

The five alarm tones played when alarm group tags go into and out of alarm can be edited. The alarm tones are patterns of notes.

Press <F7> at the Configure Alarm Tone Group menu to display the Alarm Tone Definition menu (Figure 5-4).

```
                    < Alarm Tone Definition >

FREQ CONSOLE     KEYBOARD TONE     DURATION(*50ms)
No   Freq Hz Pitch  Volume No     Short  Long  Off      PLAY PATTERN

1     200     1       8     1      2      10     5       L1
2     400     2       8     2      2      10     5       L2
3     600     3       8     3      2      10     5       L3
4     800     4       8     4      2      10     5       L4
5    1000     5       8     5      2      10     5       L5

                                                  PLAY PATTERN CODES

                                                  'S' - Short Tone
                                                  'L' - Long Tone
                                                  'O' - No Tone (off)
                                                  '!' - Cancel Tone

F1  Save
F3  Play Tone on Console Speaker        F4  Play Tone on Keyboard

F9  Help                                F0  Exit to Previous Menu
```

Figure 5-4. Alarm Tone Definition

To define alarm tones:

1. Define the five notes that can be used. The notes played on the computer speaker are defined by the frequency (hertz) in the console Frequency column. The notes played on the MKM/EMKI keyboard are defined by their pitch and volume in the keyboard Pitch and Volume columns. The MKM/EMKI keyboard has a few fixed pitches (Table 5-2). The MKM/EMKI keyboard volume is 0 (no sound) or 1 (soft) to 15 (loud).

Table 5-2. MKM/EMKI Keyboard Pitches

Pitch #	Hertz	Pitch #	Hertz	Pitch #	Hertz
1	554	6	934	11	1360
2	639	7	1033	12	2020
3	683	8	1323	13	1717
4	817	9	928	14	2923
5	763	10	1194	15	4163

2. Define the durations for each of the five notes. For each note, you specify a Long, Short, and Off duration. The duration is specified as a number of 50 millisecond (1/20 of a second) periods (e.g., a duration of 10 equals 0.5 seconds).

3. Define the five alarm tones. Each tone is made up of a series of notes (1-5), which can be modified by durations (Short, Long, Off). There must be at least one note specified in a pattern. If no duration is specified, Short is used as the duration for each note. The pattern automatically repeats unless there is a cancel tone symbol (!).

Examples:

L1	Plays a single continuous tone.
S12	Plays a fast warble between tones 1 and 2.
L111!	Plays a tone for three long durations then stops.
S123432	Plays a siren-like tone.
L1O	Plays a pulsing on/off tone.

NOTE: If you upgraded from Software Release 4.1 and you used alarm tone patterns under Software Release 4.1, you may have to change your alarm tones to get the same sound. Alarm tone patterns were specified differently under Software Release 4.1: they were made up of a series of durations, modified by notes. To play a fast warble between tones 1 and 2 under Software Release 4.1, you would have used **1S2S**, but now you use **S12**. To play a siren-like tone under Software Release 4.1, you would have used **1S2S3S4S3S2S**, but now you use **S123432**.

To play a tone move the cursor to the same row as the pattern, then press <F3> to play it on the computer speaker or <F4> to play it on the MKM/EMKI keyboard.

NOTE: While you are testing/playing alarm tones, real alarms will be silenced on your console. It is as if you press {Silence} whenever you press play.

Press <F1> to save your note, duration, and tone definitions. Press <F10> to return to the Configure Alarm Tone Groups menu.

Edit RCM Tag Groups

By pressing <F2> from the Configure Alarm Group screen a select Family screen appears. Select the Family Name (Node Name) you want and the Configure RCM Alarm Group screen appears. Select an RCM Tag name for this group. Select **Set** or **Reset** and then do the same for Return to Normal Tag.

<F1>	Will save the configuration.
<F2>	Will allow the operation to select a specific Alarm Group.

<F3>	Will clear the Alarm Group.
<F4>-<F6>	Will copy this alarm group to another group or a range of groups.

Editing Alarm Priority Colors

Alarms are listed in order of priority on alarm summaries. To change the colors used to display each priority press/click **B** from the Alarm Configuration menu to display the Priority Colors editor (Figure 5-5).

```
              ALARMS                   RETURN TO NORMAL

          ---------------< Priority Colors>---------------
          Background  Foreground  Background  Foreground
Priority    Color       Color       Color       Color       Format

1           NONE        NONE        NONE        NONE         0
2           NONE        NONE        NONE        NONE         0
3           NONE        NONE        NONE        NONE         0
4           NONE        NONE        NONE        NONE         0
5           NONE        NONE        NONE        NONE         0
6           NONE        NONE        NONE        NONE         0
7           NONE        NONE        NONE        NONE         0
0           NONE        NONE        NONE        NONE         0

F1  Save


F9  Help                                F0  Exit to Previous Menu
```

Figure 5-5. Priority Colors Editor

The current colors used for each priority are listed on the screen. The colors are listed as color index numbers (Table 5-3). The Alarm Background and Foreground Colors are used for tags that are in alarm. The Return-To-Normal Background and Foreground Colors are used for tags that have returned to normal but haven't been acknowledged yet. A Foreground color of NONE will display in a mix of green and cyan colors. A Background color of NONE will display in the background color of the display. The Format field is not currently used.

Use the arrow keys to move through the priorities and enter color index numbers (Table 5-3). To enter NONE for a color, press <Space><Enter>. To save your changes, press <F1>. To exit from the Priority Colors editor, press <F10>. In an OIS12 console system with either a Redundant Server or multiple Servers, any changes made to one Server's Alarm Priority Colors file are not passed on to the Redundant Server or the other Servers in the system. In order for the modification to be seen system-wide, the same modifications must be made on each Server, including the Redundant Server.

Table 5-3. Color Indexes for Alarm Priorities

Colors	Shades							
	Light	Bright	Medium	Dark	Blinking Light	Blinking Bright	Blinking Medium	Blinking Dark
Black	0	16	32	48	128	144	160	176
White	1	17	33	49	129	145	161	177
Red	2	18	34	50	130	146	162	178
Green	3	19	35	51	131	147	163	179
Blue	4	20	36	52	132	148	164	180
Cyan	5	21	37	53	133	149	165	181
Magenta	6	22	38	54	134	150	166	182
Yellow	7	23	39	55	135	151	167	183
Orange	8	24	40	56	136	152	168	184
Yellow-Green	9	25	41	57	137	153	169	185
Green-Cyan	10	26	42	58	138	154	170	186
Cyan-Blue	11	27	43	59	139	155	171	187
Blue-Magenta	12	28	44	60	140	156	172	188
Magenta-Red	13	29	45	61	141	157	173	189
Dark Gray	14	30	46	62	142	158	174	190
Light Gray	15	31	47	63	143	159	175	191

Inhibiting Alarms for an Alarm Group

When a tag's alarms are inhibited, the tag's regular alarm status is ignored. An inhibited tag is not listed in the alarm group indicator, alarm summaries, or displays; it does not sound alarm tones or set/reset RCMs. You can view inhibited tags in alarm on inhibited alarm summaries. After inhibition is removed, a tag's alarm state will be annunciated.

You can inhibit the alarms for all tags in an alarm group by using the Alarm Group Inhibit screen.

Press/click **C** from the Alarm Configuration menu to display the Alarm Group Inhibit screen (Figure 5-6).

The *Inhibit* column shows whether alarms in the alarm group are inhibited or not. The *In Alarm* and *Unacked* columns show the current number of alarms in the alarm group and the number of unacknowledged alarms. They are updated whenever you change pages.

Select an alarm group by pressing <Right>, <Left>, <Up>, <Down> <PgUp> {PrevPage}, and <PgDn> {NextPage}.

You can move directly to a given alarm group by pressing <F2>, then entering the alarm group number you want.

To toggle the selection for an alarm group, press <Enter>.

To suppress alarms for an alarm group, set Inhibit to **YES**.

```
< Alarm Group Inhibit>
GroupInhibitInAlarm  UnAcked      Group   Inhibit  InAlarm  UnAcked
1      NO       0       1            16       NO       0        0
2      NO       1       1            17       NO       0        0
3      NO       0       0            18       NO       0        0
4      NO       1       1            19       NO       0        0
5      NO       0       0            20       NO       0        0
6      NO       1       0            21       NO       0        0
7      NO       0       0            22       NO       0        0
8      NO       0       0            23       NO       0        0
9      NO       0       0            24       NO       0        0
10     NO       0       0            25       NO       0        0
11     NO       0       0            26       NO       0        0
12     NO       0       0            27       NO       0        0
13     NO       0       0            28       NO       0        0
14     NO       0       0            29       NO       0        0
15     NO       0       0            30       NO       0        0

F1  Save                                  F2  Find Group
F3  Inhibit Range of Groups

F9  Help                                  F0  Exit to Previous Menu
```

Figure 5-6. Alarm Group Inhibit Screen

To enable alarms, set Inhibit to **NO**.

You can change the setting for a range of alarm groups by pressing <F3>, entering the first group number (1-99, S, or D) and last group number you want, and then choosing the inhibit state (**YES** or **NO**).

Press <F1> to save your changes.

Press <F10> to exit from Edit Group Inhibit.

Global Alarm Acknowledges and Silences

Alarms acknowledged on one console are automatically seen by other consoles on the same PC network (Ethernet or Arcnet). Consoles on independent networks are not updated. Alarms acknowledged on one console can be broadcast to these other independent consoles through the INFI-NET loop. In addition, the {Silence} key at one console can broadcast a silence command to the independent consoles linked to the same INFI-NET loop. Each console can be configured to send or receive alarm acknowledgments and send or receive silencing.

To broadcast an acknowledge for a specific tag, the *Broadcast Tag Ack* field in the tag database must be check-mark enabled. One of four node lists can be specified in the tag database or zero to send to all nodes configured for broadcast. List zero consists of all nodes defined by N90-status tag types configured in the database.

The Transmit Ack of each N90-status tag type can be configured to control sending of global acknowledgments and silences to specific nodes. Broadcasts will only be sent to a node when the corresponding N90-status tag has transmits enabled. A server will only transmit or receive broadcasts if the global settings are enabled.

Press/click **D** at the Alarm Configuration menu to display the Global Alarm Acknowledge and Silence menu (Figure 5-7).

```
<Global Alarm/Silence>

Global Alarm Acknowledge                Send   Receive

Global Silence                          Send   Receive

Node List Activation
Node List 1   Inactive   Active
Node List 2   Inactive   Active
Node List 3   Inactive   Active
Node List 4   Inactive   Active

F1  Save
F3  Edit List 1                         F4  Edit List 2
F5  Edit List 3                         F6  Edit List 4

F9  Help                                F0  Exit to Previous Menu
```

Figure 5-7. Global Alarm Acknowledge and Silence

You specify whether your console can send and receive global acknowledgments and silences using the Global Alarm Acknowledge and Global Silence fields. To toggle sending to other consoles, highlight the **Send** choice with the cursor, then press <Space>. To toggle receiving from other consoles, highlight the **Receive** field with the cursor, then press <Space>. White is enabled, green disabled.

Each Node List can be made active or inactive if required. Press <Right> and <Left> to change the setting for each list.

To edit a Node List, press <F3>, <F4>, <F5>, or <F6>. This displays the Edit Node List menu (Figure 5-8).

The Edit Node List page lets you specify up to 64 node addresses to broadcast alarm acknowledgment and silences to. For each node, you must specify the loop number in the left column and the node number in the right column. If you are using Plantloop, the loop field is not required; any loop numbers entered are ignored.

> **NOTE:** There must be a N90 Status tag for every node you define in the node list. Any nodes listed that have not been defined will NOT receive or transmit broadcasts.

Even if a N90-status tag is on the node list, if it does not have transmit enabled, then transmits will not be sent to that node.

Press <F10> to return to the Global Alarm/Silence menu.

```
< Edit Node List 1 >

0   0    0    16   0    0    32   0    0    48   0    0
1   0    0    17   0    0    33   0    0    49   0    0
2   0    0    18   0    0    34   0    0    50   0    0
3   0    0    19   0    0    35   0    0    0    0    0
4   0    0    20   0    0    36   0    0    0    0    0
5   0    0    21   0    0    37   0    0    0    0    0
6   0    0    22   0    0    38   0    0    0    0    0
7   0    0    23   0    0    39   0    0    0    0    0
8   0    0    24   0    0    40   0    0    0    0    0
9   0    0    25   0    0    41   0    0    0    0    0
10  0    0    26   0    0    42   0    0    0    0    0
11  0    0    27   0    0    43   0    0    0    0    0
12  0    0    28   0    0    44   0    0    0    0    0
13  0    0    29   0    0    45   0    0    0    0    0
14  0    0    30   0    0    46   0    0    0    0    0
15  0    0    31   0    0    47   0    0    0    0    0

F9  Help                        F0  Return to Global Alarm/Silence
```

Figure 5-8. Edit Node List

To save changes made to the Global Alarm/Silence menu and node lists, press <F1>.

SECTION 6 - GRAPHIC CONFIGURATION

CONFIGURING GRAPHIC DISPLAYS

The Graphics Designer (GraD) is used to create graphic faceplate displays used in the QNX Windows™ graphic display system.

Displays which may be created are standard faceplate displays. The following element types are supported: text, faceplate symbols, alarm summary, trend, XYPlot, block details, MPR, interactives, and control buttons.

Faceplate displays may be modified and compiled in the QNX Windows Graphical User Interface (GUI) environment, eliminating the need to do this operation off-line. All user interaction is provided by the QNX Windows GUI which follows the Open Look standard.

NOTE: Although the Graphics Designer will allow you to use file names up to a maximum of 20 characters, it is recommended that you limit the file names to a maximum of eight characters as several other areas of the OIS12 console and off-line database and graphics generator have this limitation.

General Description

Overview

With the Graphics Designer (GraD) you can create new displays for controlling or observing your process. These displays use predefined objects that have been created in the SODG package. A tool set of faceplates, one or more for each tag type, is provided with the package. You can import other SODG files which are in the ".DR" format.

Other objects are provided through a Custom menu option. Example custom objects are trend displays, alarm summaries and block details.

GraD does not provide facilities for creating new object types. Generally, GraD is used to produce faceplate displays for short term use and SODG is used to create displays used for the long term. SODG can create new object types. The toolbars may be customized to create standards for use in displays within your site.

Once configured, a display can be called to the process graphic windows by selecting display by name and entering the name. Faster methods of calling displays have also been provided. Each tag has a primary display field where you can reference a display name. Menu clicking on the tag name usually offers a menu which contains a display option which will call up this display. Action clicking on the tag in the alarm summary will also call up this display. Interactive elements provide another method of calling displays. The interactive is two red letters or numbers placed on a display. The interactive is configured with a display name. Clicking or keying the interactive will call up the configured display. Use of interactives allows creating speedy links between certain displays. Interactives are a form of custom object. Some faceplate objects have interactives elements built-in. These single letter interactives are used to call up the control pop-ups via the keyboard.

Introductory Example

This example will create a new process graphic which will contain one station faceplate and one RCM faceplate. Ask your system supervisor for the tags you should use and whether you can adjust the settings on these tags when you pulll up your new display. Do not change the settings on these tags without permission and understanding of what these tags are controlling.

- Call up the **Graphics Designer** (Figure 6-1).

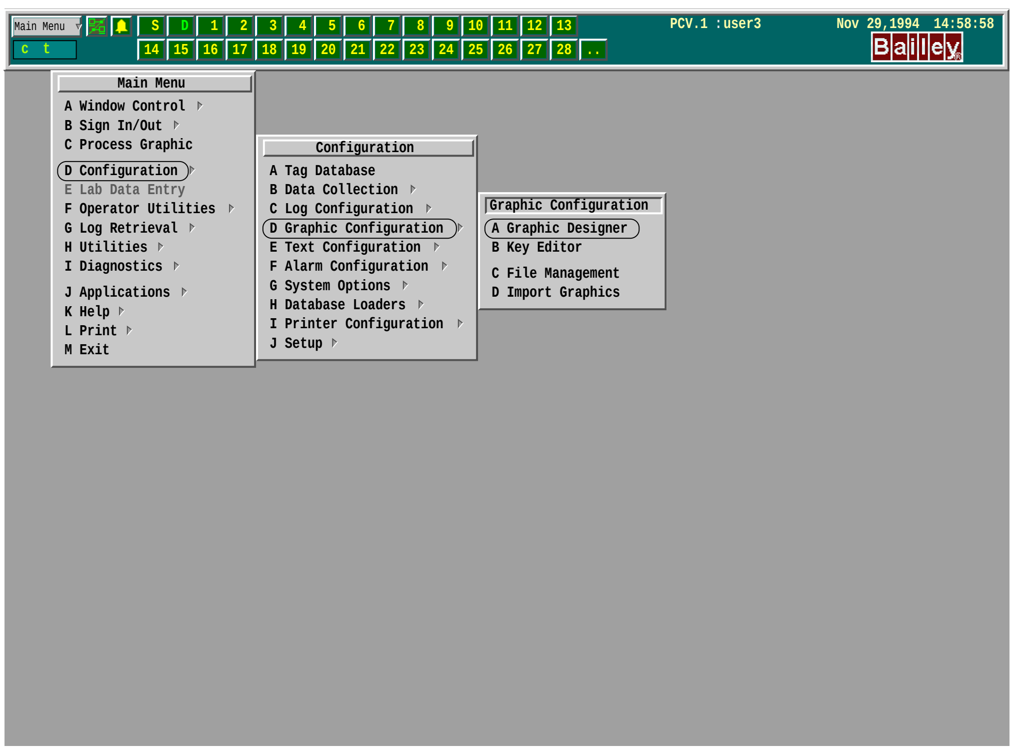

Figure 6-1. Graphics Designer Menu Path

- Click on **Tools** on the button bar, select and open **Faceplates - Subset**.

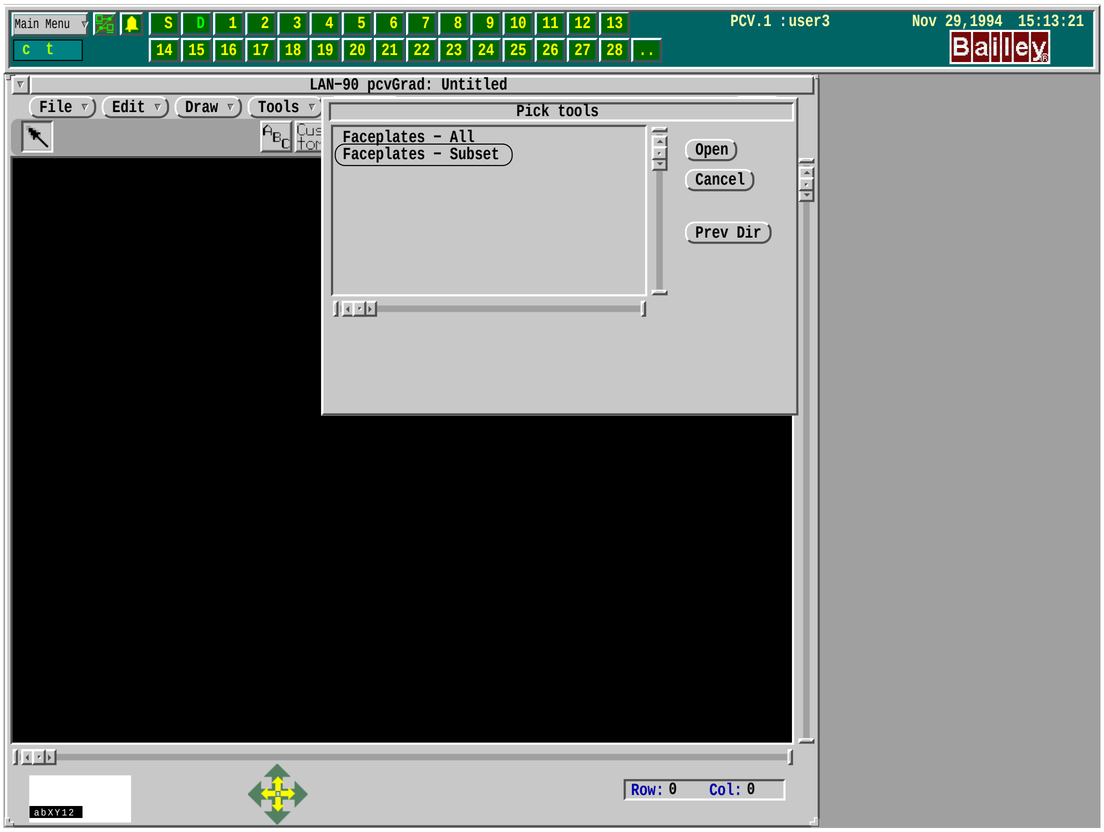

Figure 6-2. Accessing Tools

- Drag a station (full) Faceplate onto the workspace.

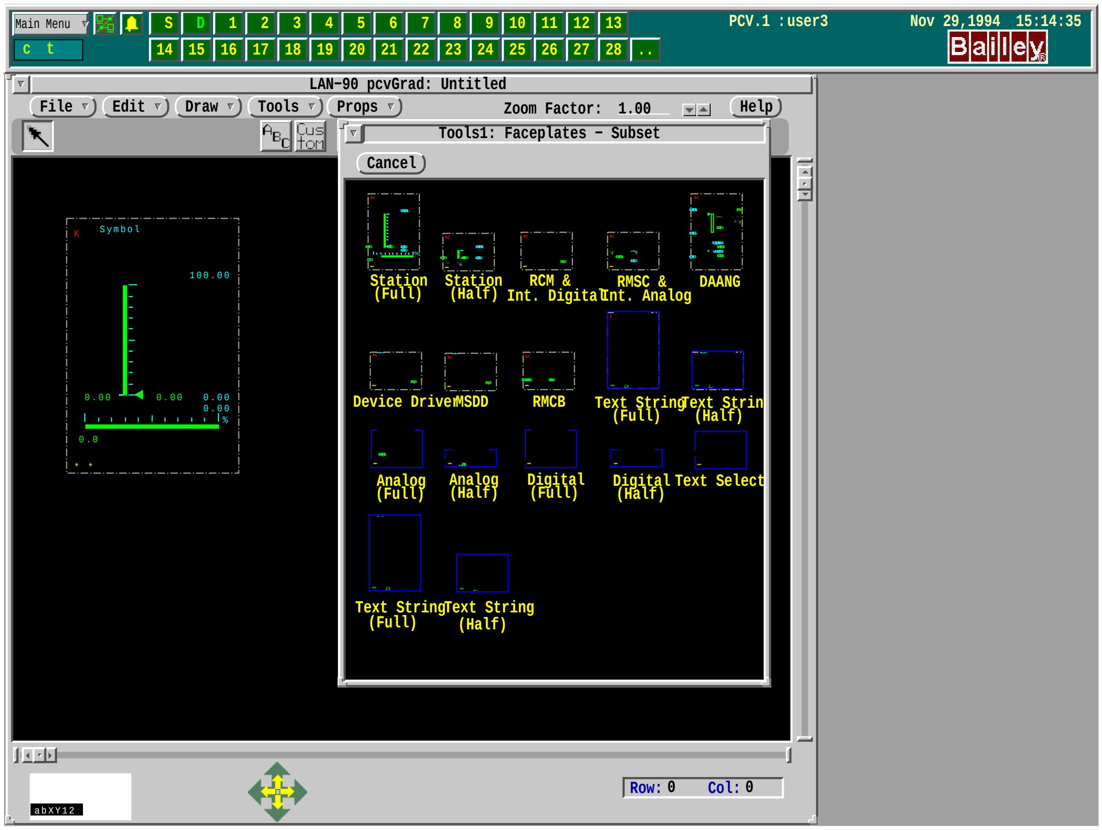

Figure 6-3. Faceplate Palette

- Drag an RCM faceplate as well. Cancel the Tools. Move the RCM into position. Select/click on the station to highlight it in red. Menu click to bring up the Object menu. Select **Properties**.

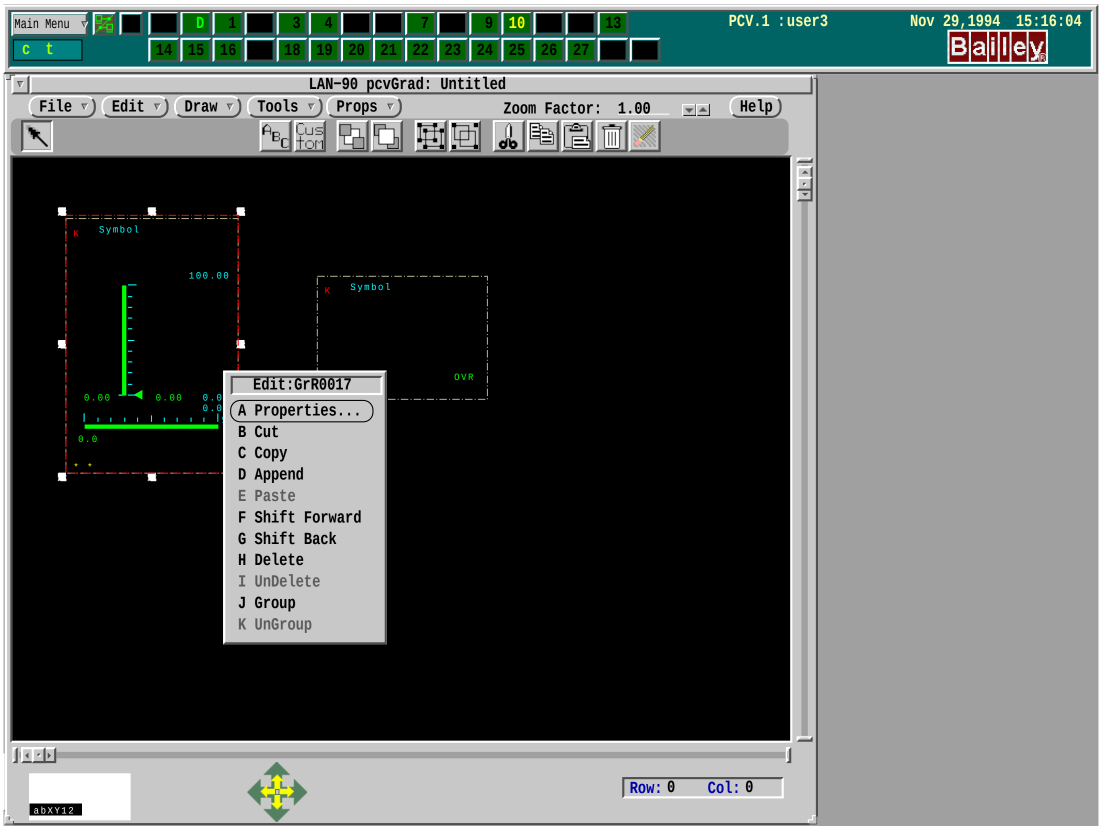

Figure 6-4. Object Menu (Select Properties)

- In the middle of the properties dialog find *To Tag 1:* Click on the button beside *To Tag 1:*. This calls a Tag List. Select the **Target Station**. This tag name will automatically be entered into the field.

- At the bottom of the properties dialog find *To key:* Enter an **A** here.

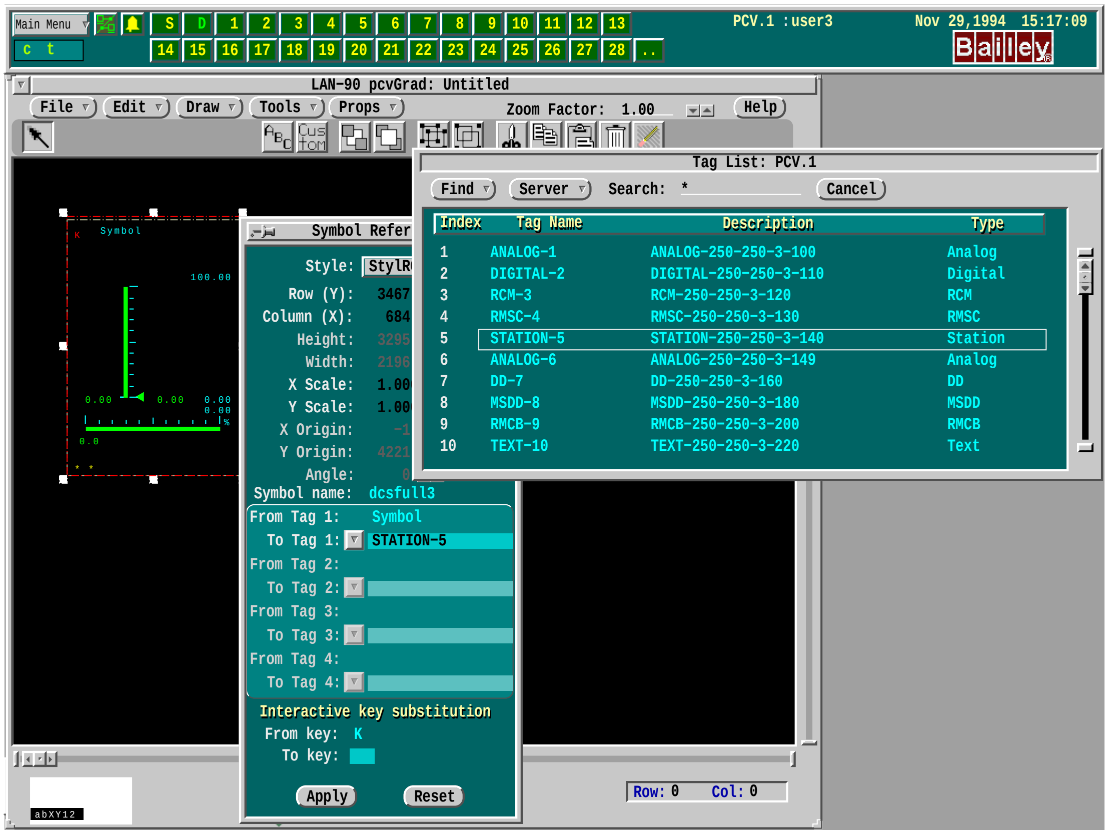

Figure 6-5. Select Tag From the Tag List

- Select/click on the RCM, then menu click and select **Properties.**
- Select the target RCM.
- Set the interactive key to **B**.
- Click on the **File** button on the button bar. Select **Save**.

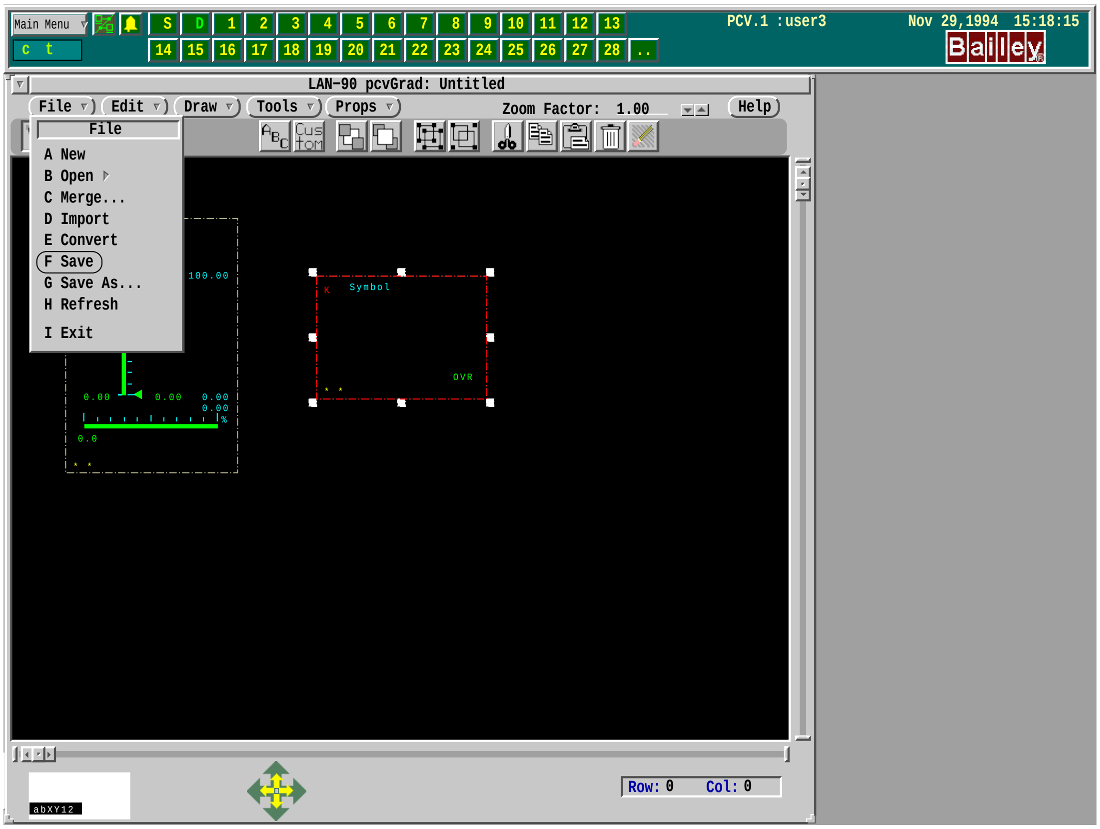

Figure 6-6. Select Save

- Leave the directory as is. (*GOFdisplays*) Press <Enter>.
- Enter **gradsamp** for the display name.
- Save to the User level (This is just an example).

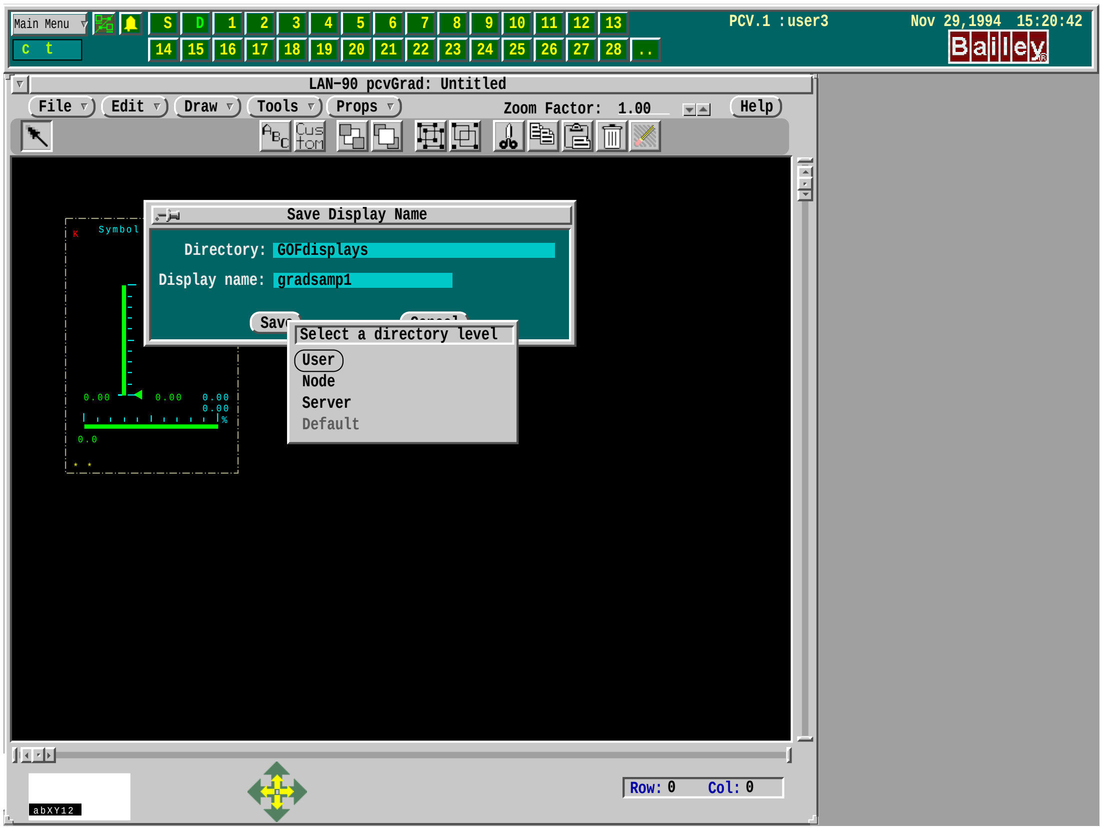

Figure 6-7. Saving to User Level

- Click on the **File** button on the button bar. Select **Convert**.
- Leave the file name as is. Press <Enter>.
- Save to the User level.

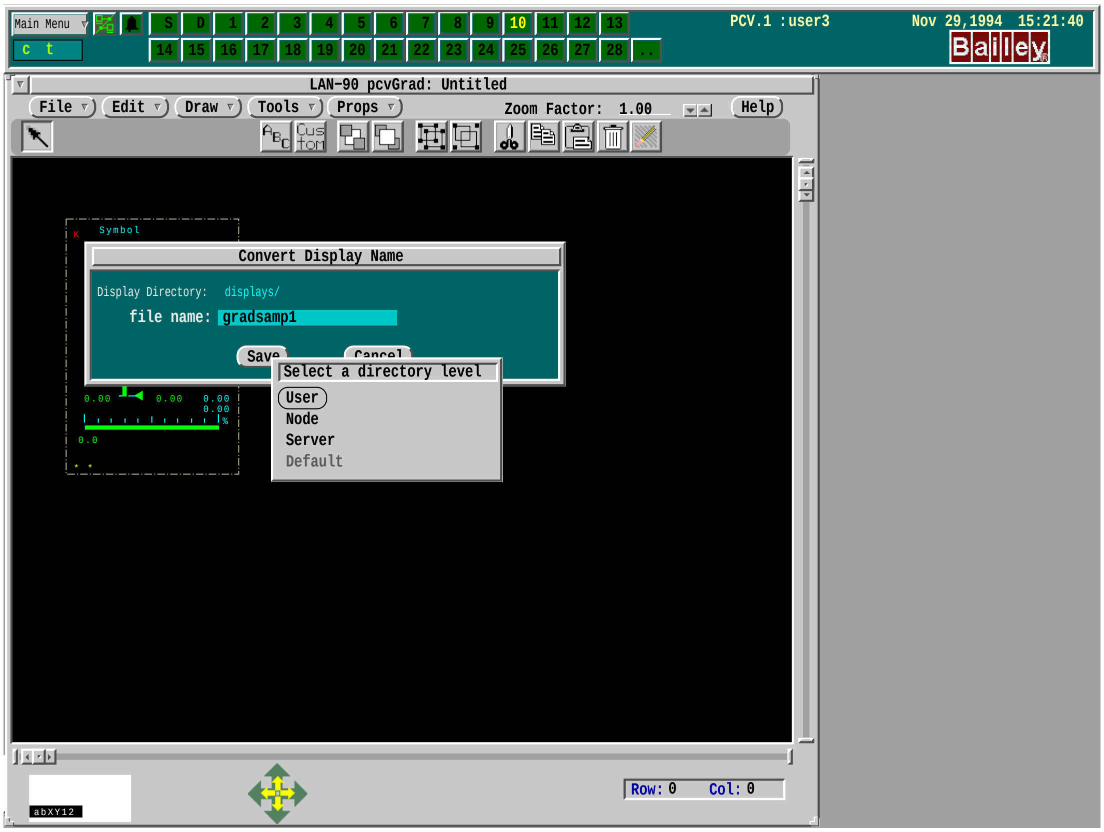

Figure 6-8. Convert and Save at User Level

- Call up this new display. Menu click on **Main Menu** on the Executive Bar. Select **Process Graphic**. Action click on the display button on the process graphic. Enter **gradsamp** and press <Enter>.

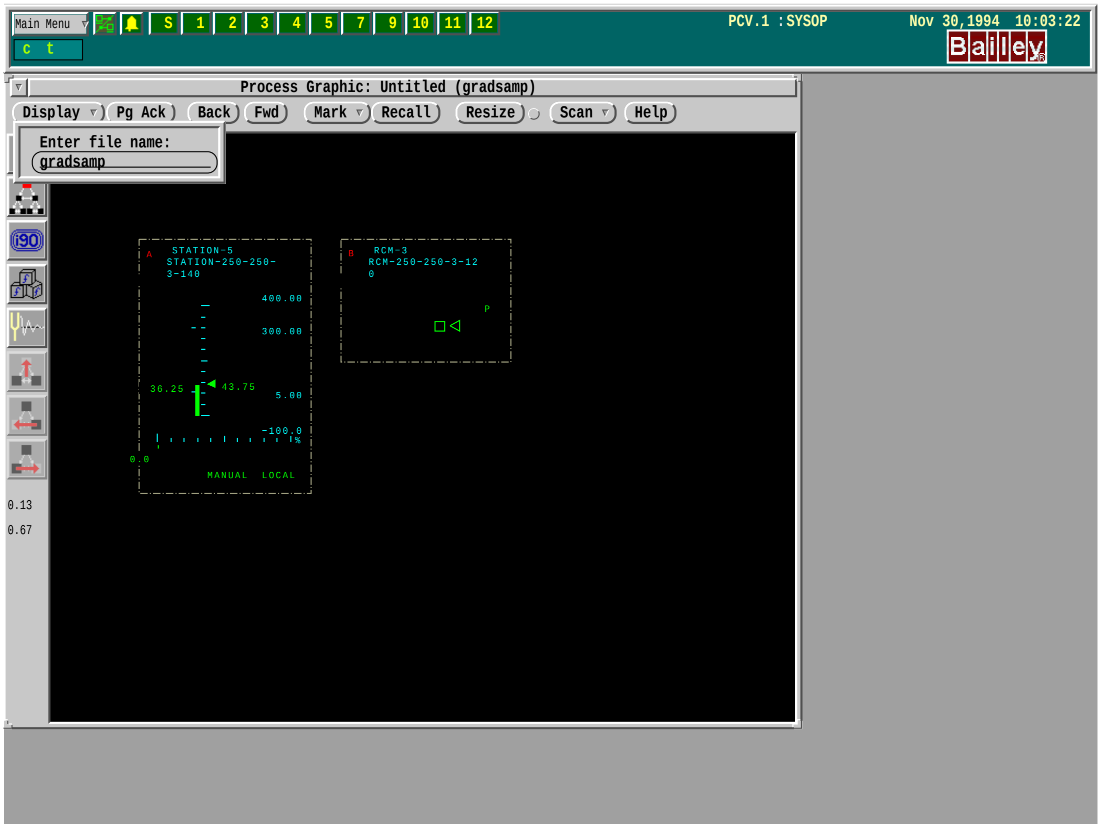

Figure 6-9. Calling Up the New Display

- To remove the sample, menu click on **Main Menu** on the Executive Bar, select **Configuration**, then **Graphic Configuration** and (graphic) file manager. Find “gradsamp.dw” and “gradsamp.pict”. There should be a *U* beside them to indicate they are user level displays. Click on one. Hold <Shift> down and click on the other. Now select **File Cmds,** choose **Delete.**

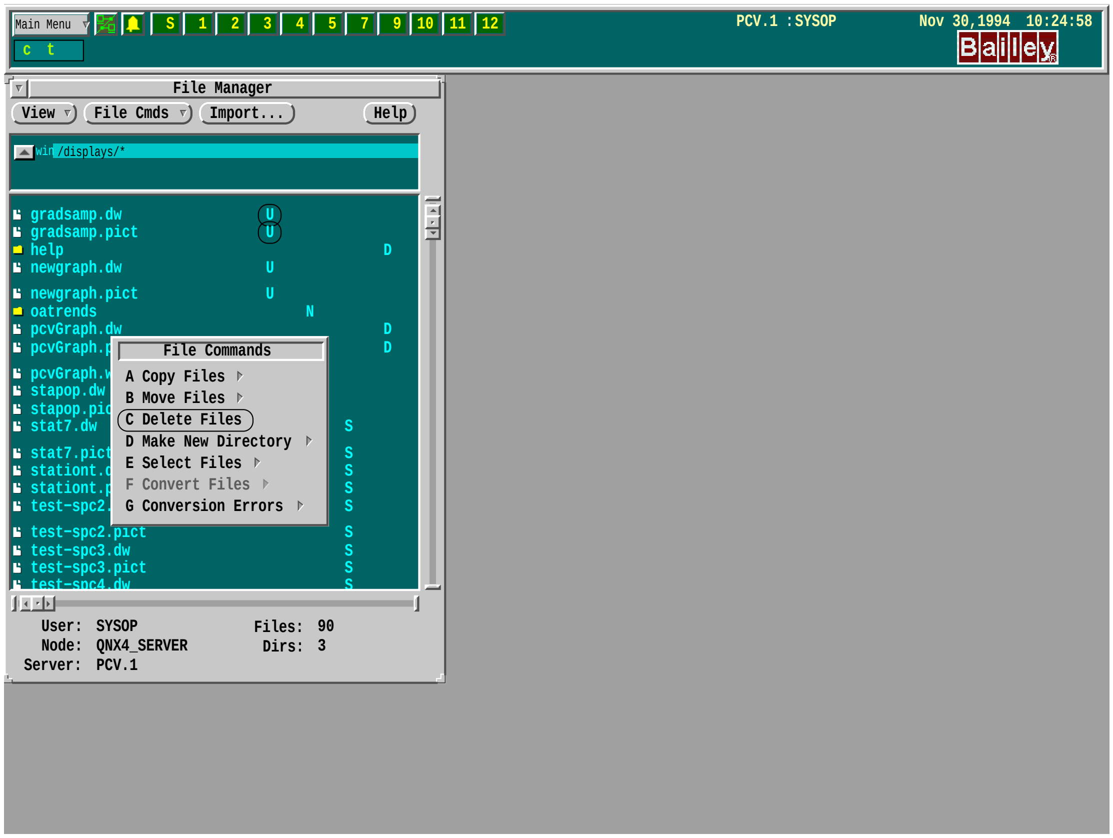

Figure 6-10. Deleting Graphic Displays

Selecting Objects For Modification

The **Select** (left) and **Adjust** (right) mouse buttons are used to select graphic objects. Operations may be performed on selected objects.

Select an object by pointing to it with the pointing device, then press the **Select** button. This will cause any other selected object to be deselected. Pressing the **Select** button when not pointing at any object will deselect all objects. After an object is selected, additional objects can be selected by pointing at them and pressing the middle mouse button or holding <Shift> and pressing **Select**. Once you have selected one or more objects you may use the **Menu** (right) mouse button in order to open the Editing menu. The Editing menu allows you to modify the objects that have been selected.

Objects can also be selected within a particular rectangular area. To do this, press the **Select** button and hold it down. While holding the **Select** button, drag the mouse to open a bounding rectangle. Any object completely inside this bounding rectangle will be selected when the **Select** button is released.

When an object is selected a set of grab handles are displayed with it. These grab handles are small squares attached to the corners of the object. They serve as indicators that the object is selected and provide a method of resizing resizable objects.

For example, if you wish to expand the size of a faceplate first select it to display the grab handles. Then point at one of the grab handles and press the **Select** button to drag it to adjust the rectangle. The object will be resized when you release the **Select** button.

To move objects by a small increment up/down, or right/left, select the object to move. Then click/select on the appropriate nudge tool arrows on the bottom window bar to move the object.

Graphics Designer Menus

The button bar at the top of the GraD windows contains five labeled buttons (Refer to Figure 6-8):

- File.
- Edit.
- Draw.
- Tools.
- Props.
- Help.

A zoom factor adjustment field and 12 icon buttons:

- Pointer.
- Text.
- Custom.
- Push to Back.
- Pull to Front.
- Ungroup.
- Group.
- Cut.
- Copy.
- Paste.
- Delete.
- Undelete.

These items are described in the following pages.

File Menu

The File menu provides options to load or save files.

New Allows creation of a new graphic. If the current graphic has been modified and not saved you will be prompted before being allowed to continue. The new graphic will be untitled and must be named prior to saving it.

Open Allows you to load an existing graphic display into the editor. Clicking **Menu** while in the Open selection will bring up the File Open Dialog. Selecting **By Name** will allow you to enter the file name directly. Selecting **Browse** will bring up a file selection dialog. You can select from the list by pointing at a file or by entering in the file name. This function also checks that the current graphic is saved before bringing in a new one. Most displays will be in the GOF displays directory.

Merge The **Merge** button is similar in operation to the **Open** button. It differs in that it does not replace the current graphic being edited, but adds to what is already in the current graphic. The current graphic name will remain what it was prior to the merge operation.

Import Provides access to graphics generated with the Elsag Bailey SODG graphics editor (".dr format"). It is similar to the Open operation, except it translates the file as it loads.

Convert Converts the current display to a form which is optimized for the display system. After exporting, the display can be used in the run-time display system.

Save Writes the graphic being edited back to the file it was loaded from. If the **New** button was used to initiate editing, the graphic will not have a file name. In this case the **Save As** option must be used.

Save As Permits saving the current graphic into a file other than the one it was loaded from. This must be used to save new displays.

Refresh Forces a redraw of all objects in the current display.

Exit Terminates the graphics designer. If editing changes have been made and have not been saved, you will be prompted before an exit can be made. This will allow you to back out, save and then exit, or, abandon and exit.

Edit Menu

The Edit menu provides access to a set of tools which allow you to modify graphic objects and change the style. It is accessed by first selecting one or more object as described above. Once an object or group of objects has been selected by clicking on the **Edit** button on the menu bar or pressing the mouse **Menu** button will open the Edit menu.

Properties Opens the properties dialog associated with the selected object. If you have selected more than one object a general properties dialog is opened. This dialog only contains those properties that apply to all the graphic objects. The general properties dialog includes properties such as element style etc. When you only have one object selected, a dialog is opened containing all of its properties. You may edit the properties or simply view them.

If no object is selected, then a properties dialog of the display is presented. This will allow modification of the display title and the display background style.

The **Properties** button on the Main menu provides access to global properties while this menu operates on the local, selected object.

Cut Operates on the currently selected object or group of objects. This removes objects from the graphic and stores them in the internal clipboard. The previous contents of the internal clipboard are discarded. The new contents of this clipboard can then be pasted back onto the graphic one or more times using the Paste button.

Copy Operates similarly to the **Cut** button except it leaves the object or objects on the graphic instead of removing them.

Append Appends the selected objects to the internal clipboard. Any objects previously copied into the clipboard will not be discarded as done in the cut and copy operations.

Paste Allows the clipboard contents to be placed anywhere on the display. When selected, a special paste cursor will appear. Copying is completed by pressing the **Select** button. This does not clear out the internal clipboard, so more than one paste operation can be done to copy the internal clipboard contents onto the current display.

Shift Fwd Moves the currently selected objects in front of unselected objects in the graphic. The unselected objects which overlay the selected ones will be partially hidden.

Shift Back Moves the currently selected objects to the back of unselected objects in the graphic. The unselected objects which overlay the selected ones will partially hide them.

Delete Removes the currently selected object or objects from the graphic.

Undelete Restores the previously deleted objects onto the graphic. Up to the last ten delete operations may be undeleted.

Group Associates the selected objects (which may be groups as well) together as one object.

UnGroup Dissociates elements in the selected group. All elements are treated as before the group operation. Note that the group may contain subgroups which still remain as groups until further ungrouped.

Draw Menu

When you select the Draw menu, the following options are displayed:
Line, Rectangle, Polygon, Circle, Arc, Text and Custom Object.

Currently, however, only two classes of objects may be created: Text and Custom Objects

Text Creates a text object which may be placed on the display. When positioned, this object must be edited in the properties dialog to modify the text string and the text style which includes colors and style.

Custom Object There are eight types of custom objects which may be created:

Interactive
Display select (key and touch)

Symbol Reference
Inserts a symbol reference into the current display (selected from a menu list of symbol names).

Trend
Inserts a trend element into the current display. The default size is half height.

XY Plot
Inserts an XY Plot element into the current display.

Alarm Summary
Inserts a Alarm summary element into the current display.

Block Details
Inserts a Block detail element into the current display.

Control Button
Inserts a Custom Control button into the current display. Examples of this are, up/down ramp keys, set point, set/reset buttons, target prompt etc.

SPC Chart (statistical process control)
Inserts two charts into the current display selected from the Tag Database.

NOTE: Control buttons must be grouped with a faceplate containing touch and key control elements in order to work.

Tools Menu

The **Tools** button provides access to the Tool Box menu. There are two default tool boxes provided for building faceplate displays; one containing all faceplates and one containing a subset of the faceplates.

When selected, a window of faceplates is presented. These faceplates may be selected, dragged and then dropped into the current display to create a faceplate display.

Zoom Factor

The **Zoom** Factor is used to change the scale of the current display. Since the origin is at the lower left, the display will appear to be shifted upward.

Properties Menu

The Props menu provides access to the global properties: styles, the grid and the about message.

Global Styles Permits editing and viewing of global styles.

Grid Options Presents a dialog in which the snap grid may be turned on or off, and where the grid spacing may be set. Note that the grid line uses the line color as found in the display style.

About A message about the graphics designer which indicates which version you are running.

Help Menu

The **Help Menu** button opens the help dialog. Here you will be presented with several help topics to choose from. Topics which require more than one visible page can be scrolled in order to view the full topic's description.

Styles

Styles are used to group standard element attributes such as color. This group is given a name which can be referred to by static and custom graphical elements.

Styles can be arranged in a hierarchical manner so that new styles can be based on the existing ones.

There are two classes of styles: local or global. Global styles can only be changed by calling the Style Edit function directly from the Props menu on the button bar. For local styles use properties on the Edit menu. These styles are available to all displays and can be used to create new local styles if desired. Local styles are only associated with the display in which they are created.

A style entry will contain the following fields:

- Style Name, Parent, Description.
- Style Parent.
- Line Color.
- Line Style.
- Line Thickness.
- Fill Color.
- Fill Pattern.
- Text Color.
- Text Font.
- Text Font Size.
- Text Background Color.
- Text Background Pattern.
- Text Spacing.
- Options, enclosed, modeled or shadowed.

A default global style will exist called STYLROOT which will be the parent of all styles in the system.

There are two ways in which styles can be edited, either by invoking the style edit function directly or indirectly.

When the style edit function is accessed directly all styles can be modified, assuming you have the correct access permissions. This will permit modification of existing styles and creation of new styles.

The style editor can be invoked indirectly from the element properties dialog. In this case you can only create new styles based on existing ones, or modify local styles. Global styles can only be changed by invoking the style editor directly, from the properties menu.

For example:

- Click on the **ABC** icon.
- Insert a text object.
- Select/click on the object.
- Menu click, select **Properties**.
- Click on the style field. Default will be selected.
- Chose **Edit**. Modify the style name to **Test**.
- Click on the **Text Background** field.

- Select **Yellow**.
- Apply the change to the style definition.
- Choose **Select** to pick this new style.
- Change the text to something new.
- Choose **Apply** to apply new properties.
- Select **File** and **Save** the new display as **Gradstyle** at user level.
- Convert the display and save at user level.
- Exit GraD.

Display this graphic. The text will show as yellow.

NOTE: The default text object is not enclosed in a box, so you cannot change the Fill color nor the Line color.

TREND DISPLAY

To place a trend on the display, press/click the **Draw** button and select item **G Custom Object**.

Select item **C Trend** from the list.

Your cursor will change from the normal arrow shape to a position entity shape. Move the cursor about half way down the left side of your work area and press/click the left button. An empty faceplate will appear with a trend definition box.

The default display resolution is 1 minute, but you can change it by pressing/clicking in the *Resolution* field or by clicking the arrow boxes and entering any valid resolution (e.g., Resolution 15, Units seconds).

To enter your first trend point move your cursor to the first database **Tag** menu button and press/click on it. You can have up to five trend points per trend faceplate.

Choose an appropriate tag from the list but remember that it must also be defined in the Trend Database for the point to display properly.

NOTE: If a new tag is entered and the symbol name is “trndmthf” then pcvGrad will fill in the remaining information using that tag, in the database. To do this, simply enter/choose the tag names for the traces, then press/click on the **Apply** button. The fields for each trend trace tag will be filled in. If the default needs to be changed they can be changed as described below. To delete a tag, blank out the name and set the symbol name to “trndmthf”.

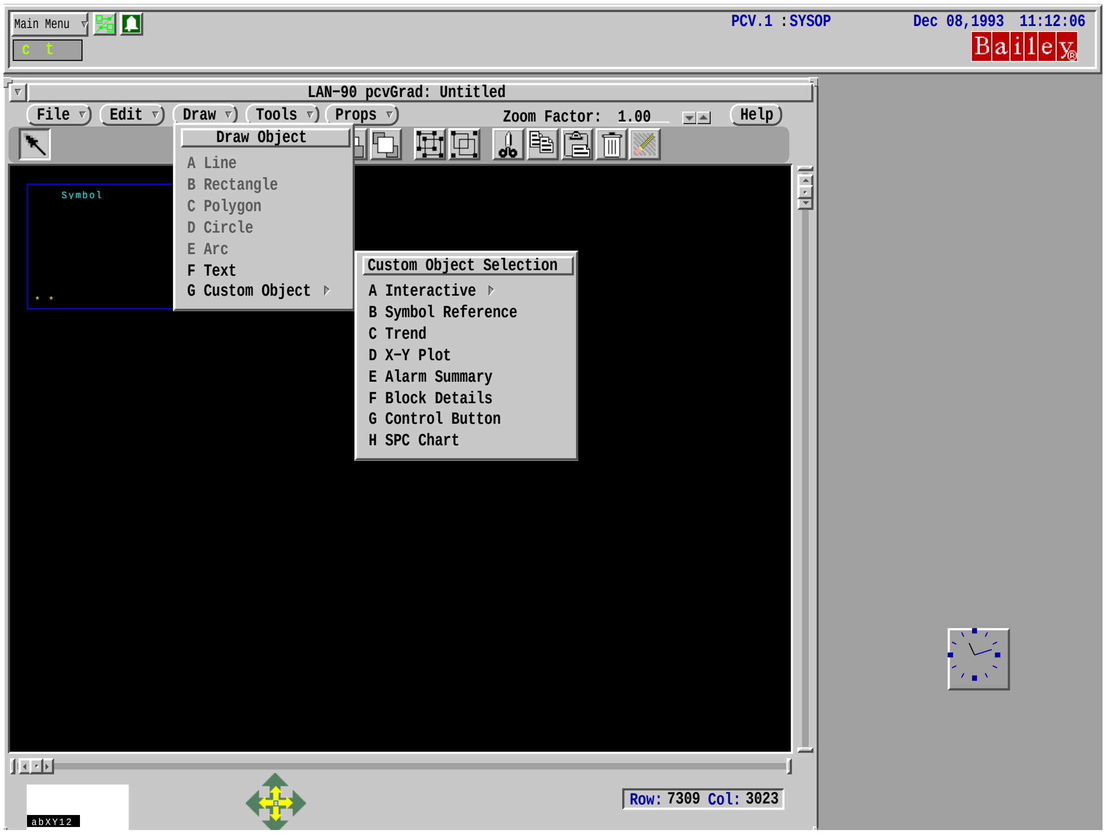

Figure 6-11. Custom Object Menu

Depending on the tag you have chosen you could have one of four possible subtypes:

PV - Process Variable.

SP - Set Point.

CO - Control Outputs.

RI - Ratio Index.

Next choose an appropriate trend symbol box. Press/click on the **Symbol Name** menu button.

Since you are only defining one point for this example, you can choose "trndanlf.gof" by pressing/clicking twice (quickly) on that element.

The label choice simply means what keys should be pressed on the keyboard to activate this trend.

If you choose to use numbers, you will need two digits, if you choose to use letters one will be enough.

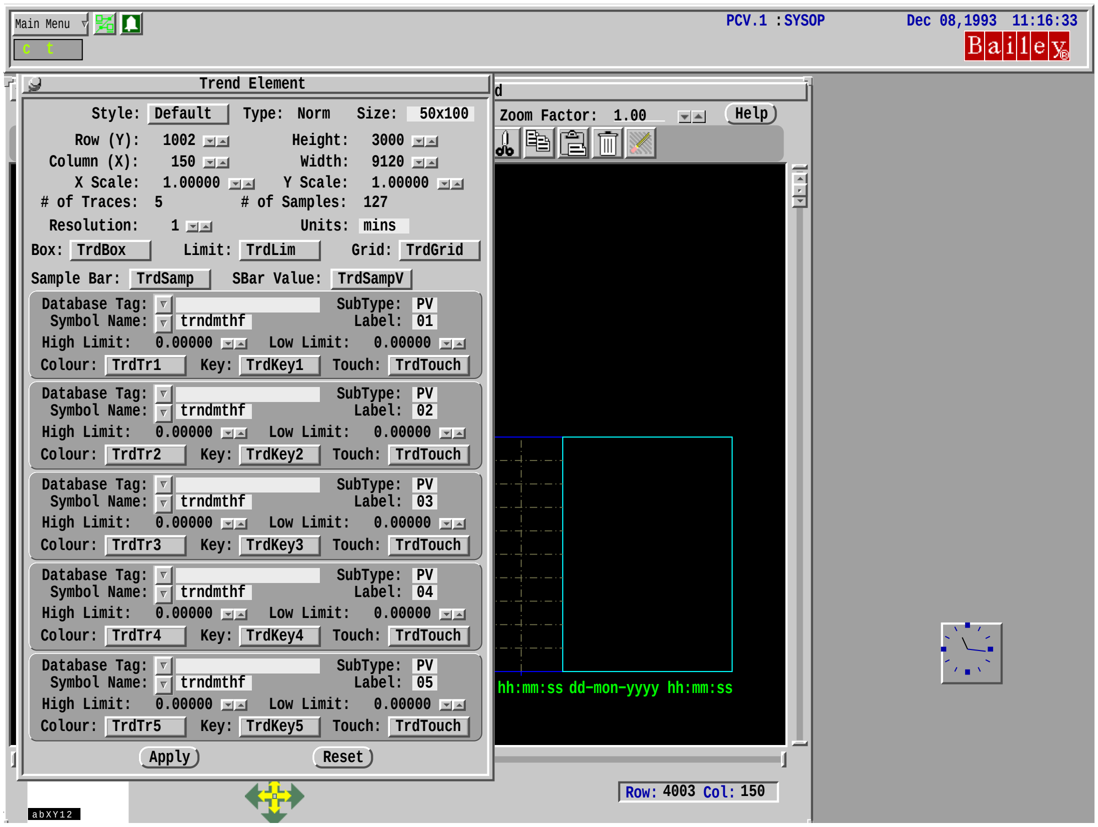

Figure 6-12. Trend Menu Definition

Next you will need to define the high and low limits desired. This is dependent on your chosen tag, it could be any Analog value depending on your process.

When you have finished press/click the **Apply** button to define your setting.

Saving and Converting Your Display

To save your display press/click **File** from the menu Command buttons and choose **F Save**. Press/click on the *Display Name* field and enter **f11a**. Press/click on the **Save** button and you will be asked to choose a directory level to save at.

User means only you will have access to the display.

Node means those users on your current node will be able to access it.

Server means all users whose nodes are attached to this Server will have access to it.

Of course, the users would need to have their access permission defined in the password file to get to the display.

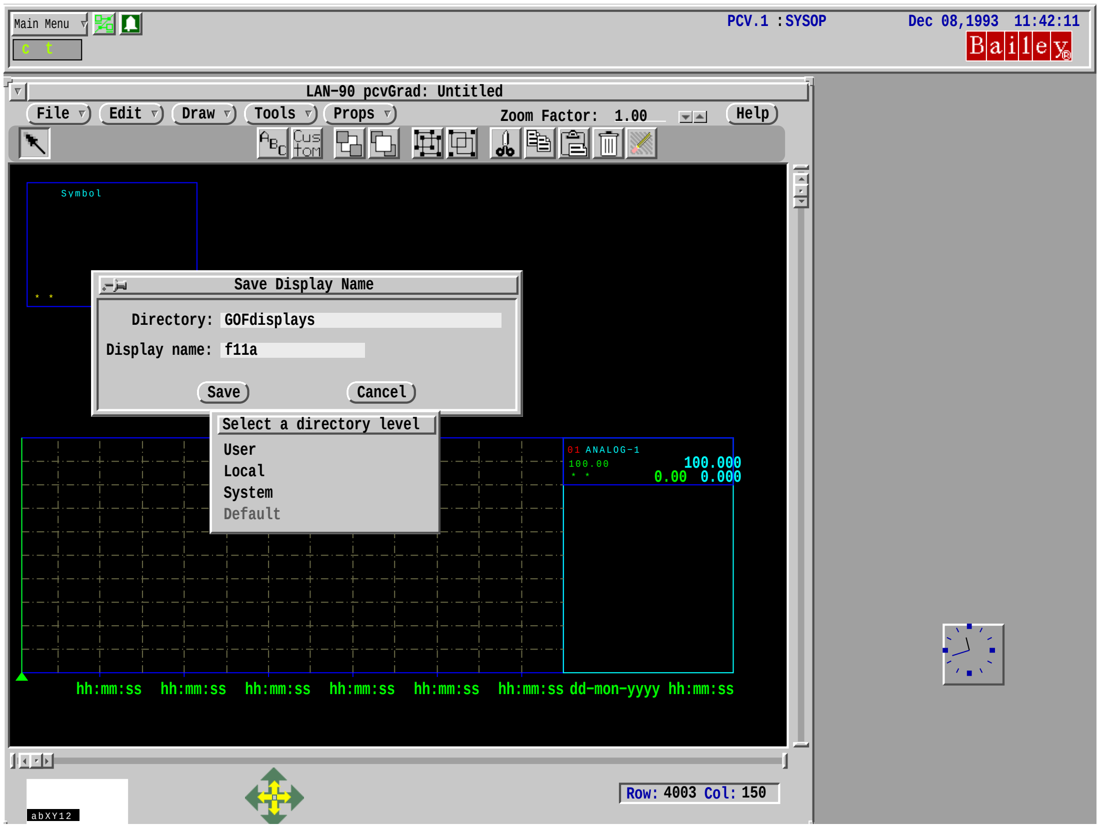

Figure 6-13. Save Display Menu

Converting the file to make it functional is done as follows:

Choose **File** from the File Command menu button and select **E - Convert**. Then press/click the **Save** button. Select a level as before and your graphic is nearly finished.

You should give your graphic a title.

To do this press/click the right mouse button on the *pcvGrad* work area. Select **Properties** from the menu and then choose an appropriate title, just type **f11a** for this example, press/click the **Apply** button and resave and reconvert your display.

GRAPHIC FILE MANAGER

Overview

The PCV File Manager (*pcvFM*) and Importer (pcvImportDR) are application programs designed to work in the QNX-Windows Graphical User Interface (GUI) environment. The goal of these programs is to provide users with an environment in which they may view and manipulate files relating to the OIS12 graphical displays. These programs perform the following functions:

1. Display the hierarchy of system and user-created files, primarily graphical display files, in a manner that is concise and easy to understand.

2. Allow the user to manipulate these files using simple GUI methods. File manipulation commands include delete, copy and move.

3. Provide tools to allow the user to import files with formats not used by the OIS12 console, and convert them for use by the OIS12 console.

Theory of Operation

The File Manager (*pcvFM*) is meant to present the user with a visual representation of the file system used by the OIS12 graphical interface (Figure 6-14*)*. It is not intended to be used with files used by any other OIS12 subsystem. The graphical interface consists of all the programs that interact with the user in a graphical manner. This does not include text-based (wterm) applications. Files used by the graphical interface include picture files (".pict"), window template files (".wnd"), graphical object files (".gof"), etc. Many of these files are provided with the system and should not be manipulated. The majority, however, are user-created graphic display files, and it is the manipulation of these files that *pcvFM* is targeted for.

> **NOTE:** Although the Graphic File Manager will allow you to use file names up to a maximum of 20 characters, it is recommended that you limit the file names to a maximum of eight characters as several other areas of the OIS12 console system and off-line database and graphics generator have this limitation.

Directory Structure

The graphical interface uses a complex four-dimensional directory system. Any file used by the graphical interface system may exist in one or more of the four dimensions (Figure 6-14).

The four dimensions are User, Node, Server, and Default.

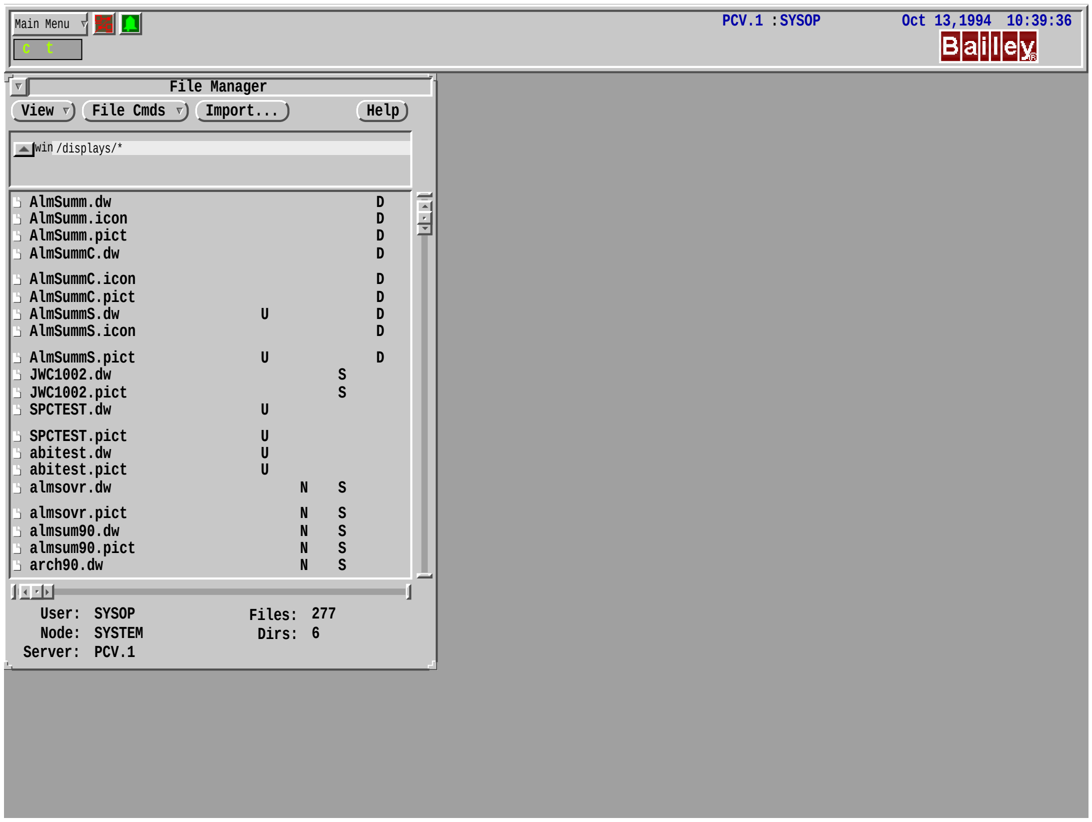

Figure 6-14. File Manager Menu

User (U) These are files that are used only by particular users. User files are stored in a particular user's "/home" directory, and are only visible to that user. Examples of user files are:

- Environment setup files.

Node (N) Node files are stored on a particular computer node, and are only visible to users seated at that computer. Examples of node files are:

- Dedicated workstation graphics: If a workstation has been dedicated to a particular plant area, graphic displays may be put on the node.

Server (S) Server files are stored on one of the central system servers, and are available to any user on any node who is currently attached to that server. This level will be where most installations will store their graphic displays. Examples of server files are:

- Most graphic display files.

Default (D) These files are provided by default to all installations. They reside on all installed LAN-90 PCV nodes, and are available to everyone. Examples of default files are:

- Default graphic files, such as the alarm summary and block details display files.

Every time the graphical interface system needs to open a file, it starts a search. First it looks to see if the file exists at the user level. If the file is found there, it is used. If not, the node level is searched. The search continues to the server, and then the default level.

This structure allows the system flexibility of configuration. For example, a physical computer node may be designated as the only place at which control of some area may occur and the graphic displays for that area would only be available at that node. Or perhaps only certain users should have access to a graphic display.

As another example, an installation may have a standard environment, in which all users start when they sign in, or users may create their own individual environments.

The User's View

The Graphic Files Manager *(pcvFM)* simplifies the file structure by imposing a simple one-dimensional model over the multidimensional directory structure. It does this by combining all four directories into one “virtual” directory. To the user, this would appear as a simple directory structure, but each file and subdirectory in the virtual directory exists in one (or more) of the four directories.

For example, suppose the graphical object source file “sample.gof” exists in both the Server and the Node “GOFdisplays” directory. If a user wanted to manipulate these files using traditional methods, they would have to go to the “/bci/pcv/config/win/GOFdisplays” directory to access the server file, and “/bci/local/pcv/config/win/GOFdisplays” to access the node file.

Using *pcvFM*, the user will simply view the virtual “/win/GOFdisplays” directory, and see a single entry for “sample.gof”. Beside this entry, however, will be indicators that “sample.gof” exists in both the Server directory and the Node directory. The user, who may not have known before this that the Server file was being superseded by the Node file, may now perform file manipulation, as necessary.

pcvFM provides a view of the file system one (virtual) directory at a time. Files are differentiated from subdirectories with the use of appropriate icons. Beside the names of the files or subdirectories in the current directory are the letters *U*, *N*, *S* and/or *D*, denoting that this file or subdirectory exists in one or more of the User(U), Node(N), Server(S) or Default(D) directories.

Navigation

Navigation tools are provided to move the user between directories. The user may enter the path of the directory they want to see. Alternately, they may click on the icon of the directory into which they wish to descend. An icon is always available to move the user back up one directory level. Under no circumstance will the user be taken above the 'win' directory level. Files above this level do not follow the four-dimensional directory structure, and are not visible through *pcvFM*.

Example: To create a display directory called 'customer' using D Make New Directory from the File Manager.

1. Select **D Make New Directory**

2. In the Make Directory dialog box, select **A User Directory**

3. In the Base Window dialog box, enter **/displays/customer**. Click on the **Apply** button.

> **NOTE:** If “/displays” was not included, the directory “/customers” would have been placed under the “/win” directory.

4. In the File Manager window, click on the *Displays* directory icon. The *customers* directory icon should now be displayed.

Commands

pcvFM provides various file and directory manipulation commands. These allow the user to delete files or directories, and copy/move files from place to place. Commands are also provided to view the properties of files, and in the case of graphic display files, actually view the static graphic file. These commands are available via the pop-up menus View, File Cmds and Import.

View Button

When *pcvFM* is first invoked, the view that is displayed is based on the user’s current server, node, and user-name. This view may be changed. For example, the User may be changed, to give the system view that would be encountered by a different user. This means that when displaying the files in the User dimension, the new user's home directory is used, rather than that of the actual user of *pcvFM*, while the Node and Server views remain the same. It is possible to change the Node view and the Server view in the same way.

The result of this capability is that it is possible to simulate the system view of any user, logged into any node and connected to any server, all from one location. This is obviously useful from a system administration viewpoint.

The names of the User, Node and Server belonging to the current view are always shown.

Additional commands allow the user to Refresh the current directory and Remove Directories. The Refresh feature is useful especially when multiple windows are active during various file manipulations, such as converting graphics. The Remove Directories feature allows you to remove directories that are no longer required, provided that you have the correct permission.

File Commands Button

The File Commands menu provides a multifile select feature, that lets you select files according to a given pattern, such as user level or file name.

The File Commands are:

A Copy Files Allows the user to copy one or more files. The destination may be in the same directory or a different directory in any User, Node or Server view available on the network.

B Move Files Same as Copy Files, but deletes the file after copying it.

C Delete Files Same as Copy Files, but deletes files from the current directory.

D Make New Directory Creates a new subdirectory.

E Select Files Provides a way of selecting multiple files based on a common item such as file name, user level.

F Convert Files If the file is a ".gof" file, the user may convert it to be usable by the OIS12 graphic system. Refer to the section on the Import function for creating the ".gof" files.

G Conversion Errors When a graphic display file is converted, a report is appended to the Conversion Errors Summary file. This report will identify if the conversion was successful or if any errors were encountered with the file conversion (Figure 6-15).

Commands that are inappropriate for the selected file or directory are dimmed.

To process multiple graphic files, select the first file with the left mouse button. Select subsequent graphic files by holding the <Shift> key down and clicking the left mouse button. Use the **File Command** button to perform the selected operation.

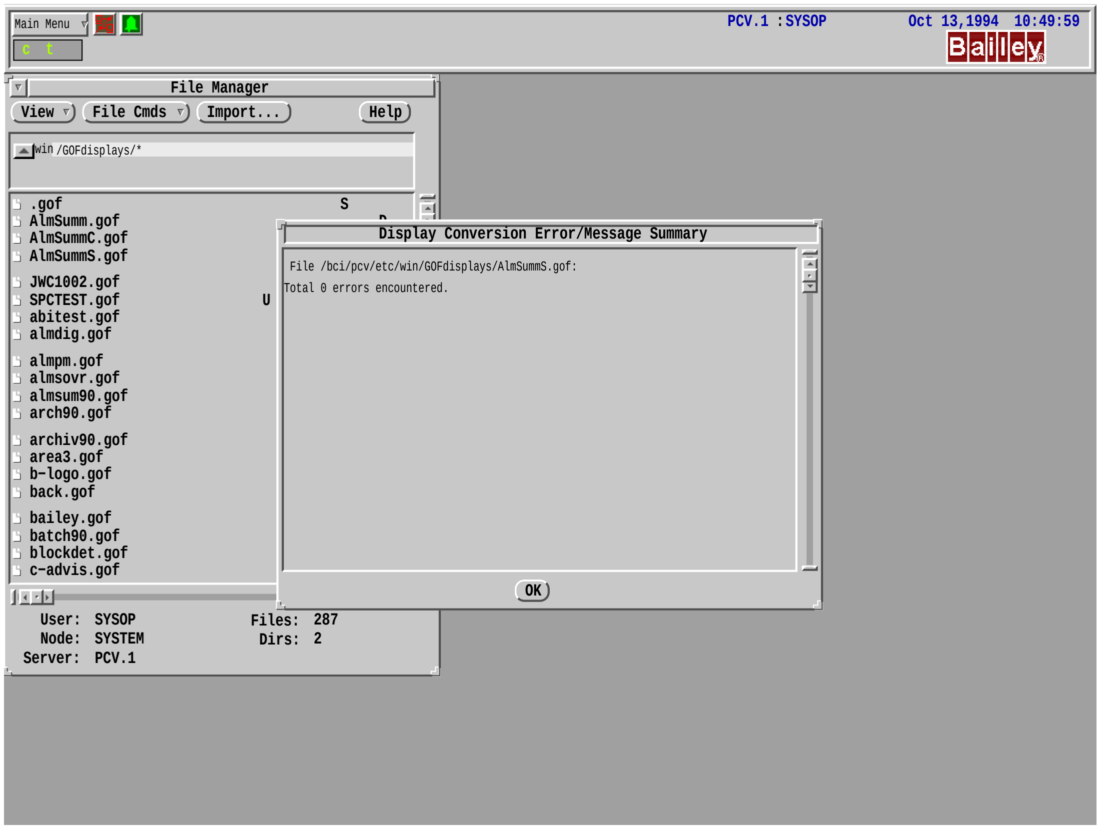

Figure 6-15. Display Conversion Message Summary

Import Button

The Graphics Import subfunction provides the user with the ability to import non-OIS12 graphic type files into the OIS12 graphic system, by directly starting the Import Graphics function.

NOTE: While the Import Graphics function is active the File Manager is reduced to an icon (Figure 6-16*).* When the Import Graphics function is completed, the File Manager is returned as a window. Refer to the following section on importing graphic files.

Window File Commands

The Window File Commands menu is a pop-up menu that is selected by using the mouse to point at a graphics file User level and clicking the **Select** (right) mouse button. The pop-up menu lets you select the operations listed below. The File Commands are:

A Copy File Allows the user to copy the selected file to a destination directory. The destination may be in the same directory or a different directory in any User, Node or Server view available on the network.

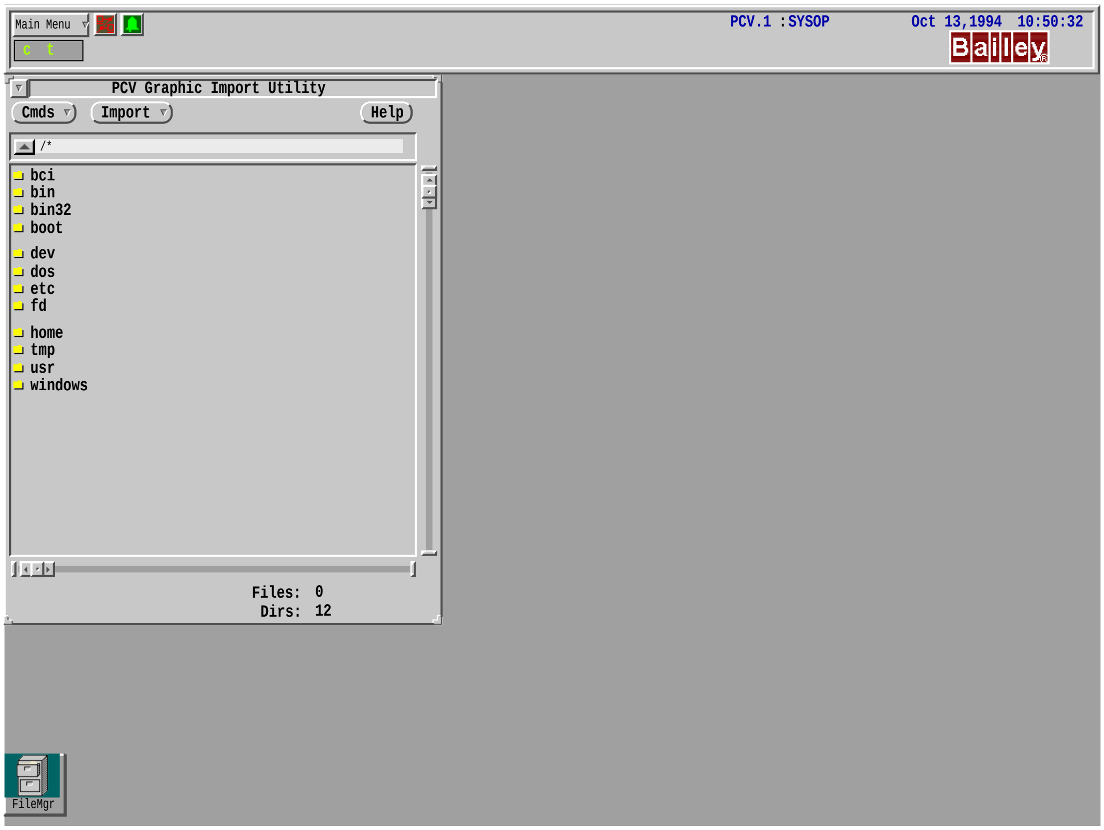

Figure 6-16. Graphic Import Submenu

B Move File Same as Copy File, but deletes the file after copying it.

C Delete File Deletes the file from the current directory.

D View Properties Lists all the properties of a subdirectory, including such items as the owner and the read/write permissions.

E Preview Display If the file has either a ".pict" or a ".gof" extension, the user may view it graphically.

F Convert If the file is a ".gof" file, the user may convert it to be usable by the OIS12 graphic system. Refer to the section on the Import function for creating the ".gof" files.

Commands that are inappropriate for the selected file or directory are dimmed.

IMPORT GRAPHICS

The Import Graphics function operates in a similar way to the File Manager, but is not concerned with the multidimensional nature of the system directories. Instead, it provides a basic directory viewer, capable of viewing any directory. This includes the ability to view files on other nodes, and other disks (i.e., floppy disks). All directories are available to the importer, but only files with the appropriate file extensions will be listed. These extensions include ".dr", ".dy", ".cf", and ".gof". Only the file or directory name is shown.

The Import Graphics function allows you to add to the OIS12 graphic system the graphic displays "*.dr" and symbols ".dy" that were developed using Elsag Bailey's SODG package. These graphic displays and symbols maybe imported from floppy disk and converted to the graphics format used by the OIS12 console.

Use the SODG utility in SLDG to create, and edit graphic displays and symbols for the OIS12 console. The displays and symbols are imported without translation by SLDG. The user selects the display and symbol files to be imported. After the importation is completed, the OIS12 console will display a list of files with any errors found. The user can then select which imported displays are to be converted into the internal display format.

Symbols do not have to be selected for conversion as symbols are converted, when required, by displays.

The OIS12 console does **not** support these SODG features:

- Nested dynamic symbols (a symbol calling another symbol which is changed by a tag's value).
- Definition of Default Symbols (a grouping of symbols and interactives to be used as one symbol).
- Redefinition of alarm summary formats (the OIS12 console has a set of predefined formats).
- Several graphic display escape codes (listed in Appendix A).

Process graphic displays and trend configurations imported into the OIS12 console should have the tag names configured. However, when graphics are imported onto a workstation, if a dynamic object has a blank tag name, the tag index will be used to obtain the tag name from the default Server. The use of unique tag names allows an operator console to accept tag values which come from other Servers on the OIS12 console network.

NOTE: Although Import Graphics will allow you to use file names up to a maximum of 20 characters, it is recommended that you limit the file names to a maximum of eight characters as several other areas of the OIS12 console and off-line database and graphics generator have this limitation.

Navigation

Navigation tools are provided to move the user between directories. The user may enter the path of the directory they want to see. Alternately, they may click on the icon of the directory into which they wish to descend. An icon is always available to move the user back up one directory level.

Commands

To start the process, click/press on **D Import Graphics** from the Graphic Configuration menu (Figure 6-1). This will display the Import Graphics window (Figure 6-17).

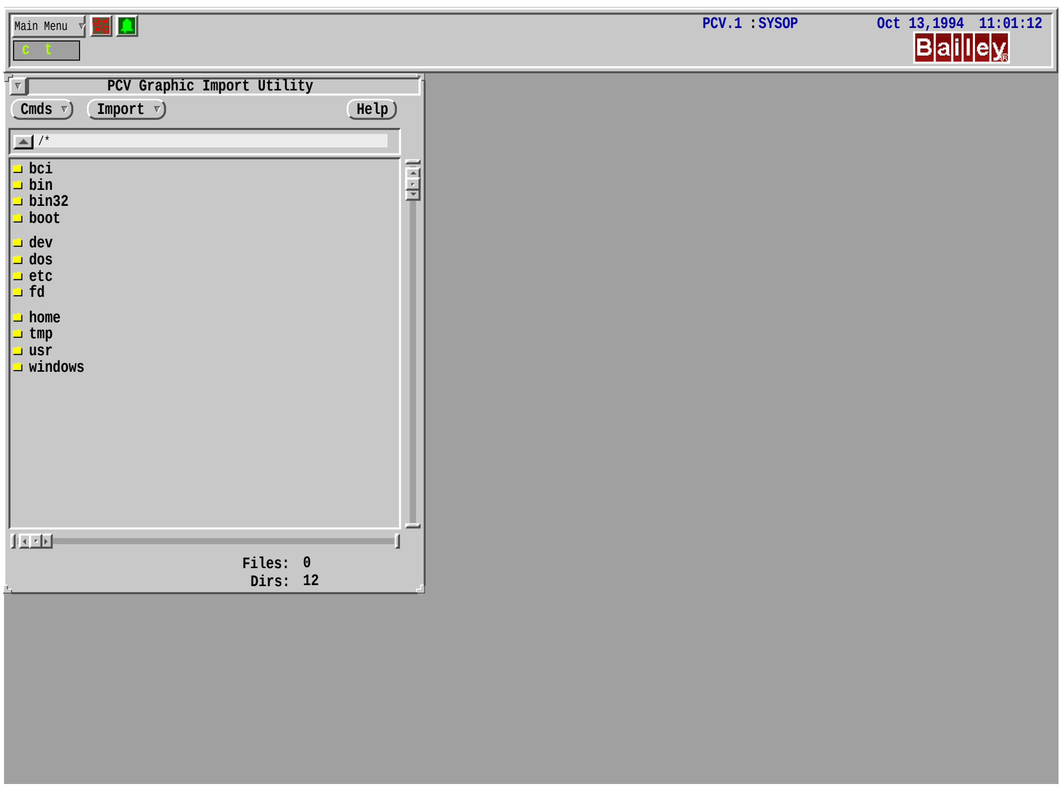

Figure 6-17. Graphic Import Menu

The two menu buttons displayed are *Cmds* and *Import* which provide the useful utilities for importing and converting graphic displays.

CMDS

The Commands menu provides the necessary features listed below:

A Show Dirs The Show Directories function displays other directories.

B Remove Dirs The Remove Directories feature allows you to remove directories that are no longer required, provided that you have the correct permission.

C Refresh The Refresh feature is useful especially when multiple windows are active during various file manipulations, such as converting graphics.

D Select Files Provides a way of selecting multiple files base on a common item such as file name, file extension.

E Conversion Size Selects the size of window the graphic is scaled to. The default factor is one, which is the standard window size. If you wish to increase the size of the graphic, increase the conversion size before converting the graphic display.

> **NOTE:** If you have changed the conversion size then preview the graphic display before importing it.

Import

The Graphics Importer also allows the user to select one or more files (in the same way as with the File Manager), and select the **Import** command.

Import the file into ".gof" format. The user will be prompted for the desired destination and dimension (User, Node, Server). There is no ability to specify a different User, Node or Server, in the Importer. The Importer works with the view of the current user.

Once the files have been imported, the Importer may be **Quit** and the files may be converted into display format using the **Convert** function in the File Manager.

Viewing Graphic File Options

By clicking on the graphic file name with the right hand mouse button a pop-up menu will appear with the following menu selections.

A Properties The user may view the ownership, access permission, creation dates, etc. of the selected display.

B Preview Display Allows the user to view the display file graphically.

CALLING DISPLAYS

The OIS12 console is configured to your site through a unique database of tags and through the configuration of process displays that show and allow control of these tags. Rapid access to these displays is provided through multiple access methods.

These methods include the following:

From Process Graphic
Call up a process graphic, click on the **Display** button and enter the display name.

From Alarm Summary
Press the letter displayed to the right of an alarm detail line. This calls up the Primary Display configured for this tag in the tag definition.

From Tag Menu
Menu click on a tag label to call up the Tag menu. Select **Display** to call up the Primary Display for this tag.

By Display Interactives
Buttons placed on displays are configured to link to a specific display. Interactives can be placed on any display. The *Block* details display for example is automatically configured to facilitate calling any function spec that is a block reference. The display summary icon (the pyramid icon second from the top of the side icons) calls up the top display for your site. This display is manually configured to link to other displays.

From ADS Panel
Each button on the ADS panel can be configured to call up specific displays.

Function Keys And Icon Buttons
The functions keys, *Shifted, Controlled* or *Alternated* can each call a specific display. The icon buttons on the left side of the process graphic can also be configured to call site specific displays through the same configuration menu.

Display Callup Icons
The bottom three icons are automatically configured to the functions Escape, Next and Prior. These icons will be grayed out unless the current display contains interactives for these functions.

The most important method from a configuration point of view would be the use of interactives. The above methods are described or referenced in the following text.

Process Graphic

Call up a process graphic or make a current graphic active by clicking on it. **Menu** click on the **Display** button and select or enter the name of the graphic to display. This method is useful when you know the name of the graphic or the graphic is not linked into your other graphics.

Alarm Summary and Tag Menu

Both these methods call the primary display that was specified when this tag was defined. From the Main menu, call up configuration, tag database and select a tag. In the primary display field enter the name of the best display to use when you want to control this tag. If this tag is a sensor then the display should contain the tags that control the process the sensor is monitoring. From this display you would adjust the process such that the alarm condition is corrected. If the tag does not have a primary display configured, the OIS12 console will report that the display ".dw" could not be found.

ADS Panel

See the ADS panel section for a full description.

Display Interactives

There are two basic styles of interactives, touch and key interactives. These two styles support keyboard and touch screen input. Both support mouse input.

The touch interactives are large buttons.

The key interactives normally show two red characters such as 01. When you are adding an interactive to a display using the graphics designer, select the custom icon, insert the interactive and select its properties dialog. Enter the display name to be called when this interactive is activated.

Display Callup Icons

These icons are activated when the current display contains key interactives that have the following codes replacing the default 01:

Escape icon - ES.
Next - NX.
Prior - PR.

CONFIGURING FUNCTION KEYS

You may use function keys to call up displays. The following shows how to call up the Key Editor.

In a new system, only the default function key configuration is available for editing. You may modify the default function key configuration and save your new configuration to a different directory level before you exit the menu.

When a function key is pressed, the graphic display that will appear will depend on whether a function key configuration has been defined starting at the User level. If a User level function key configuration is not defined then the Node and Server

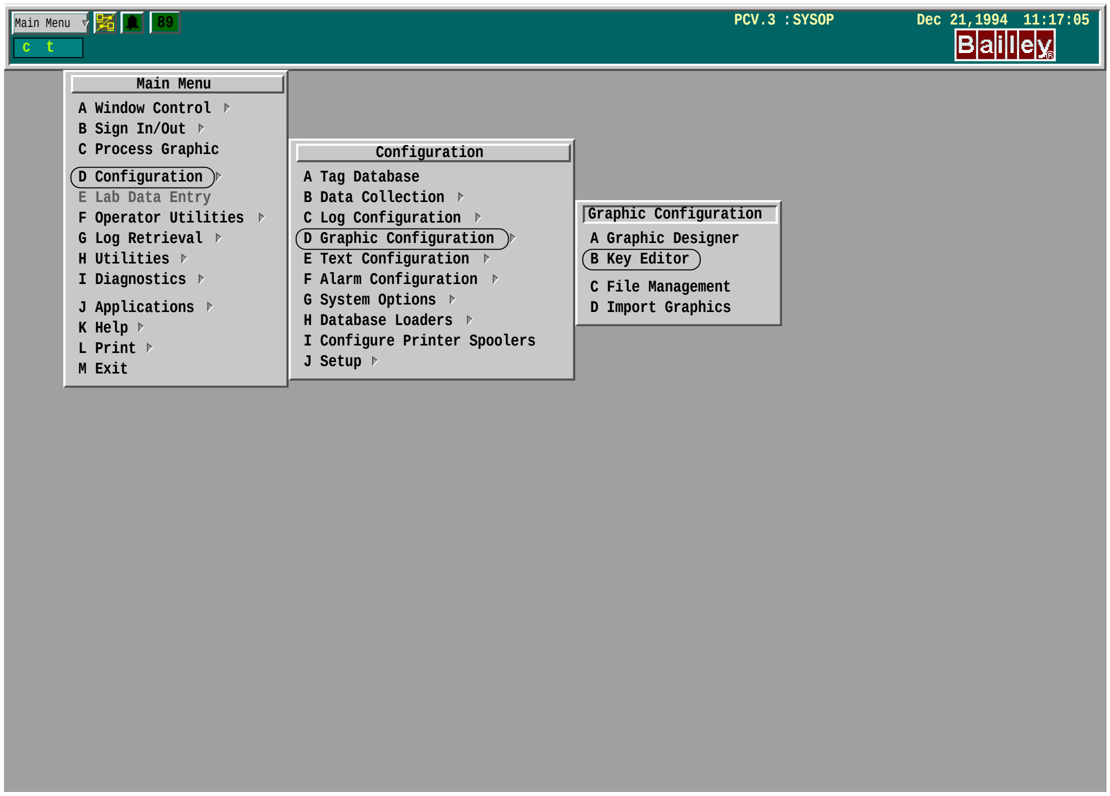

Figure 6-18. Calling Up Key Editor

level will be checked. If no other configurations are defined, the Default function key configuration will be used.

Example: Node 1 is a Server and Node 2 is a Client.

A function key configuration has been defined and saved on Node 1 on the Node level and a different function key configuration has been saved on Node 1 on the Server level. If the <F1> key is pressed on Node 1 and on Node 2, different graphic displays would be called up. If on Node 1 the Node level function key configuration is deleted then pressing the <F1> key again on both Node 1 and Node 2 would call up the same graphic display.

NOTE: This figure shows the loading dialog. Note that this system has User & Server configurations but no Node level configuration.

Enter the name of the display to be called when the function key is pressed. The icons on the left side of the Process Graphic Window (refer to Section 6 of the ***Operation*** manual) can also be configured with this editor. The default display names are shown in Figure 6-20.

If you need to browse the names of the available graphics, call up the Graphics File Manager, via **Main Menu, Configuration,**

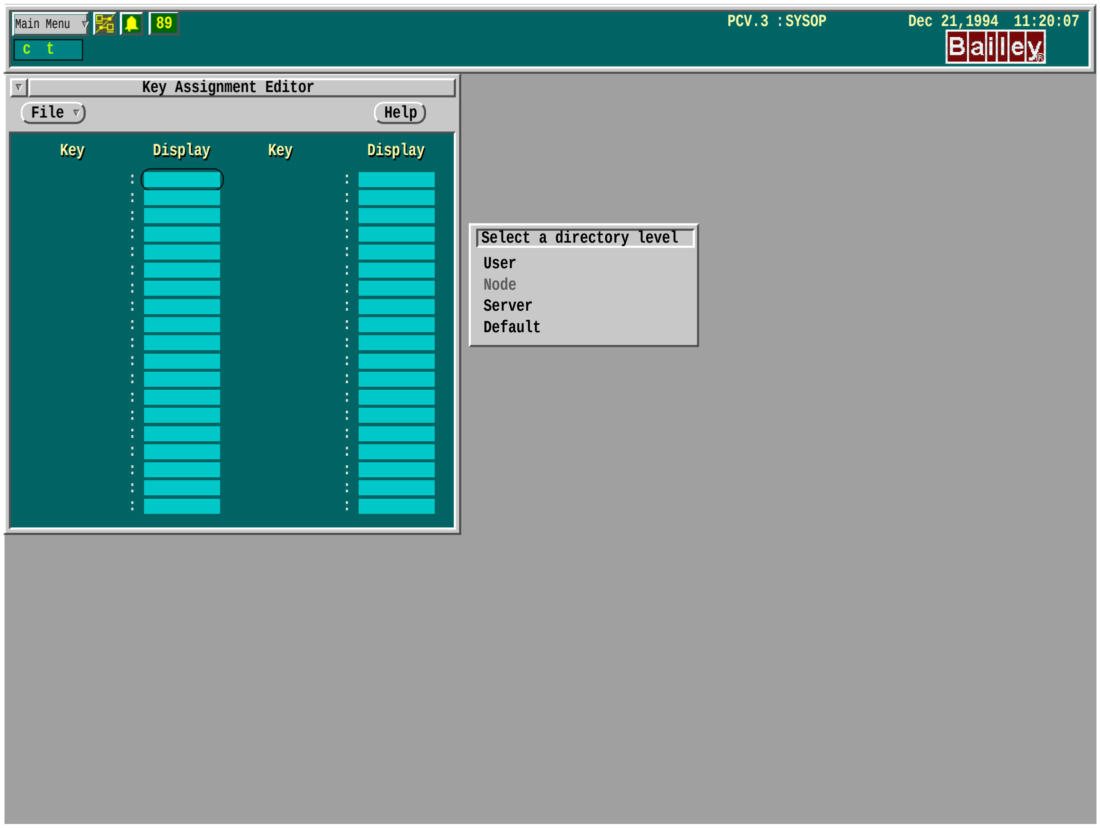

Figure 6-19. Loading Key Editor

Graphic Configuration, File Management as shown in Figure 6-20.

CONFIGURING SYSTEM STATUS DISPLAYS

Overview

The OIS12 System Status displays are used to diagnose and troubleshoot the INFI 90 OPEN and Network 90 Distributed Control Systems. The displays depict various levels of diagnostic information from the system level to the individual module level.

The displays can be brought up by clicking on the I90 logo on the left of the process graphic. There are three steps to setting up System Status displays for your system:

1. Set up the status tags in the tag database for each module.

2. Edit the System Status display to show the PCU level status.

3. Edit the System Status display to show the module level status.

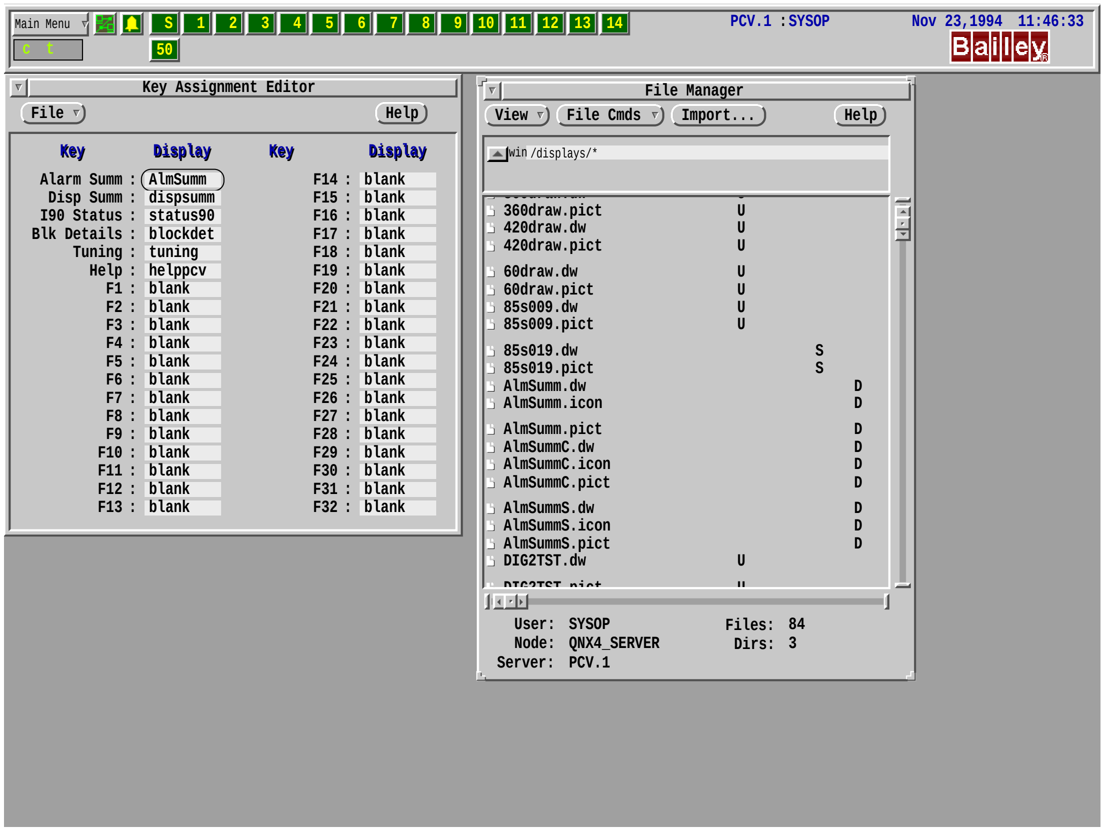

Figure 6-20. Using Graphic File Manager to Find File Names

Setting Up Status Tags

Add a tag to the tag database for each module/PCU to be displayed.

1. Set the loop, PCU and module to the address used by the module.

2. Set the block number to **0**.

3. Set the tag type to **N90Sta**.

4. Set the alarm group to **S** (for status).

By convention, the interface module connecting a PCU to the loop uses module address 0. The redundant connection uses address 1 and a computer interface uses address 2.

Loop and PCU addresses are from 1-250, module addresses are from 0-31.

Editing The System Status Displays

The first level of the system status displays shows the PCU status. The interactive provides access to the module page for that PCU and the module page provides interactives (jump buttons) to display the error report on each module.

Default versions of these displays are available on the system. Each uses elements not available from the menus in the Graphics Designer. You copy and modify these displays.

This example will configure PCU 06, and module 07.

The default system status display when loaded into GraD is shown in Figure 6-21.

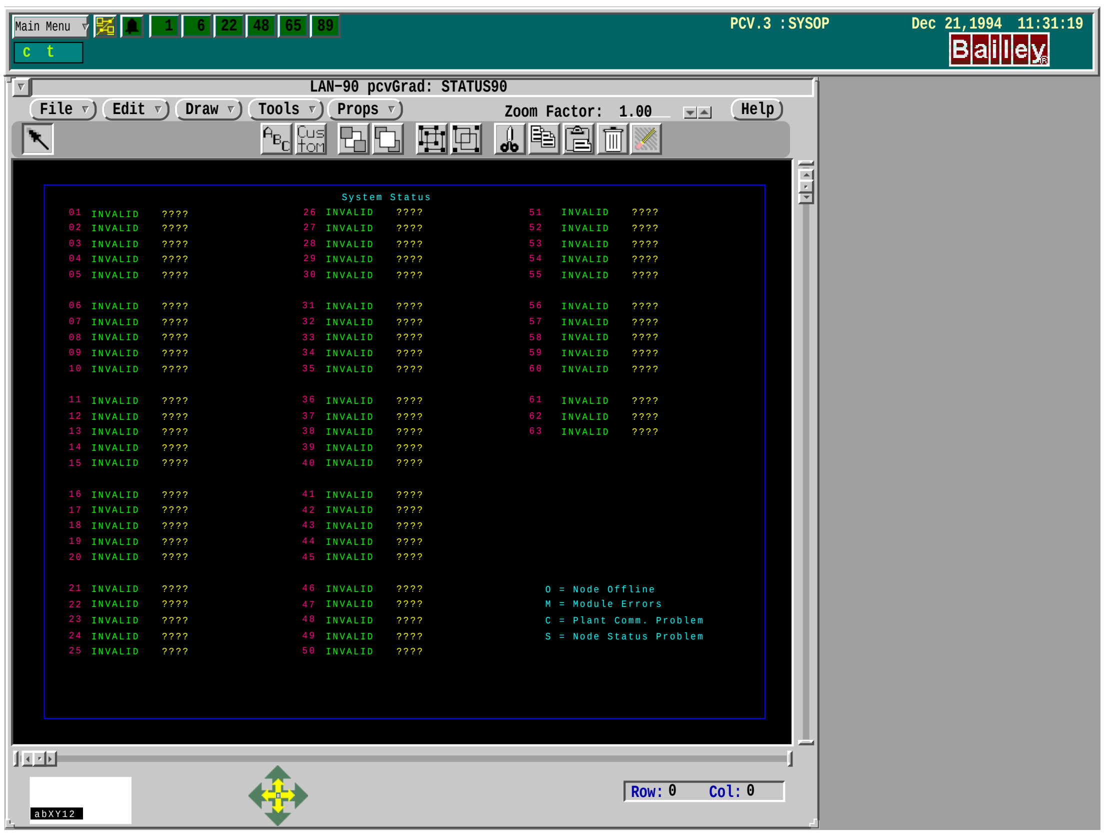

Figure 6-21. Default Status90 Display

PCU Status Display

Use the Graphics Designer to modify this display to match the PCUs on your system.

- Starting at the **Main Menu**, chose **Configuration**, **Graphic Configuration, Graphic Designer**.

- Select **File**, open **status90**.

Select the graphic element to modify, say PCU 06. Set the interactive:

- Select/click on the **06**. Menu click, choose **Properties**, set the display to **nod0106**.

- Select/click on the word **invalid**. **Menu** click, choose **Properties**, set the tag name.

Save this display as **status90** - this is the suggested name. It is the default display called when someone clicks on the I90 logo on the left of the process graphic. To assign a different display name to this function key use **Main Menu, Configuration, Graphic Configuration, Key Editor.**

Convert this display.

Select **File Menu**, choose **Convert**.

Module Status Display

If a module level display exists, you may call it up and modify it. However if this is a new display then you must start from the supplied default “nodstaxx.gof”.

- Select the **File Menu**, choose **Open**, open **nodstaxx**.

- Select the word **invalid** next to number 07. **Menu** click, choose **Properties**. Set the tag name.

The interactive is preconfigured to call function MPR (Module Problem Report). To set the loop and PCU.

- Select/click on the **07**. **Menu** click, select **Properties**.

- Set parameter 1 to the loop number. Set parameter 2 to the PCU number. Parameter 3 is preset to the module number.

To configure the PCU interface module, set the tag name and interactive as above but for the address of the interface module:

- Select/click on **00**, **Menu** click, choose **Properties**, set the parameters for Loop 1, PCU 06, Module 00.

- Select/click on **invalid**, **Menu** click, choose **Properties**. Set the tag name to **L1P6M0**.

- Select/click outside of the blue border.

- **Menu** click, select **Properties**. Set the title according to the naming convention used. For this example set it to **Nod0106**.

- Save this display as **nod0106**. (Loop 01, PCU 06, All modules) Convert this display also.

Testing

Test it by clicking on the I90 logo. This displays the system status showing PCU status.

- Click on the **06**. This should bring up the System Status Display for PCU 06 showing the status of all the modules in that PCU.

- Click on the **07**. The Module Problem Report should be retrieved from the module. This is a text report. Quit when done with the report.

- Click on the **00**. This will retrieve the Problem Report from the Interface Module.

When a module goes into alarm, it will cause the status alarm group *S* to appear on the Executive Bar (Since all status tags were set to alarm group S).

Click on the **S** to bring up the Alarm Display. If the tag has the primary display field set to the display on which this module is configured then clicking on the tag will call up that display. For the example given, the display field would be set to **nod0106**. You can set this field from the display, by menu clicking on the tag, choosing definition and setting the primary display field of the tag.

The module problem report can be called up by clicking on the interactive. The alternate method is to menu click on the tag when in either the status or the alarm display, then select **problem report**. Using the alternative method allows you to call up the problem report for the PCU interface module directly from the main system status display. The mylar keyboard requires the interactives to be configured where there is no mouse.

Configuring AlmSumm for Module Time Stamp

NOTE: This feature is supported by Software Release 5.2 only.

In order to observe the increased time stamp resolution provided by Module Time Stamping, the alarm summary display must be modified to display the resolution you need. The module time stamp option must also have been enabled in the console configuration. See ***Module Time Stamping*** in Section 2.

There are four versions of the alarm summary provided with the OIS12 console:

- AlmSumm Default summary with 1 sec resolution.
- AlmSummM 1/10 second resolution.
- AlmSummCM 1/10 second resolution with alarm comments.
- AlmSummSM 1/10 second resolution in a small font.

The following are the instructions for displaying 1/10, 1/100 and 1/1000 second resolution on the alarm summary;

- In Grad open **AlmSumm**. This example starts with the display named AlmSumm.

- Backup the original **AlmSumm**, such as by using **SaveAs**.

- **Menu** click and select **Properties**.

- On the left side just above the Column offset section is the time format field. Change the time format string from “%I:%M:%S%p” to:

- “%I:%M:%S.m%p” - for 1/10 second resolution.
- “%I:%M:%S.mt%p” - for 1/100 second resolution.
- “%I:%M:%S.mts%p” - for 1/1000 second resolution.

- In the *Column offset* section find the *Tag Name* field and increase the offset so that the extra time stamp characters do not overlap the field. You must apply the change in order to see the effect. Add about 100 for each new character. Then adjust the *Tag Desc* field as well.

- Save the file with either its current name or with one of your choosing.

- Convert the file.

If you modified **AlmSumm** then you have modified the default name. If you are using a descriptive name for this file, then you will need to modify the name of the file used by the system for alarm displays. This is a simple name change in one field. Select the menu path **Main Menu/Configuration/Graphic Configuration/Key Editor** and change the graphic name in the first field on the display, *Alarm Summ* from **AlmSumm** to **AlmSummM** or whatever. The name used must be a maximum of eight characters so you must rename **AlmSummCM** or **AlmSummSF**.

SECTION 7 - UTILITIES: FILE AND DISK

OVERVIEW

Click/press **H** from the Main menu to display the Utilities menu (Figure 7-1). Module Configuration (CLS) is discussed in Section 13. The file and disk utilities are used to copy files to and from the computer's hard disk to the different type of media supported: hard disk, floppy disk, and optical disk. With the file/disk utilities you can format media, back up and restore files between media, and translate data files to common file formats such as ASCII text and DIF. You can also restore configuration to a Redundant Server Node if you have the Redundant Server option.

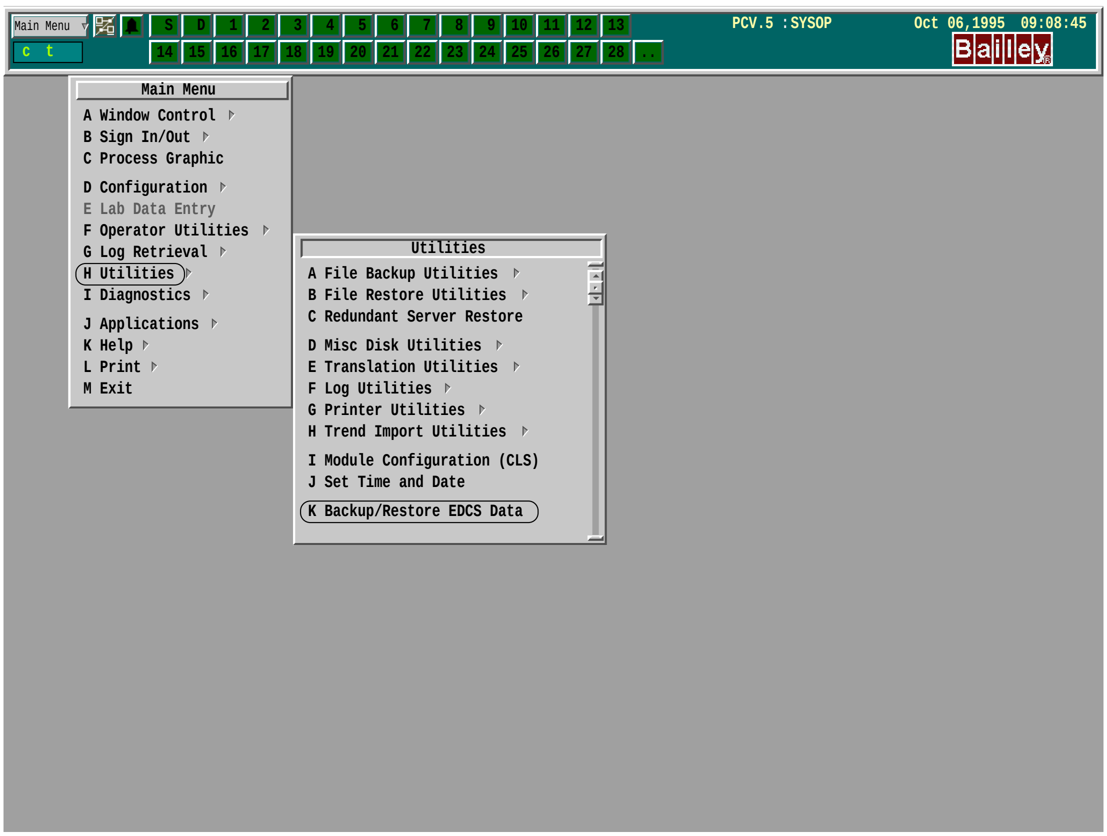

Figure 7-1. Utilities Menu

The file and disk utilities support the following storage media:

- QNX4 floppy disk.
- DOS floppy disk.
- Floppy archive.
- Rewritable optical disk.

Table 7-1 briefly describes each type of storage media.

Table 7-1. Types of Media Supported by File and Disk Utilities

Type of Media	Description	
QNX4 Disk	A floppy disk formatted for use by the QNX4 operating system.	
	Advantages:	Can be used by QNX4 programs. Easy to access individual files.
	Disadvantages:	Relatively slow. Files larger than a single disk cannot be stored.
	Uses:	Good for small backups and restores. Good for storing frequently used files.
DOS Disk	A floppy disk formatted for use by the DOS operating system.	
	Advantages:	Can be used by both QNX4 and DOS programs. Easy to access individual files.
	Disadvantages:	Slower than a QNX4 Disk. Files larger than a single disk cannot be stored.
	Uses:	To transfer files to DOS programs.
Floppy Archive	A specially-formatted series of floppy disks. The first disk in the series contains a list of all files stored in the archive. The files are stored on the remaining part of the first disk and subsequent disks in the series.	
	Advantages:	Faster to write to and read from than a QNX4 Disk. Files larger than a single disk can be stored.
	Disadvantages:	The maximum number of files that can be stored in the archive is specified when the first disk is formatted. More difficult to access individual files.
	Uses:	Good for large backups and restores. Good for long term storage of data files.
Rewritable Optical Disk	A rewritable optical disk. Referred to in most utilities as Optical Disk or Magneto-Optical Disk.	
	Advantages:	Large amount of storage capacity. Easy to access individual files.
	Disadvantages:	
	Uses:	Good for any size backups or restores. Good for automatic backups. Good for long term storage of data files.

PREPARING MEDIA FOR USE

Click/press **D** from the Utilities menu to display the Miscellaneous Disk menu. (Figure 7-2 shows you the path to take through the menu hierarchy to prepare media for use.)

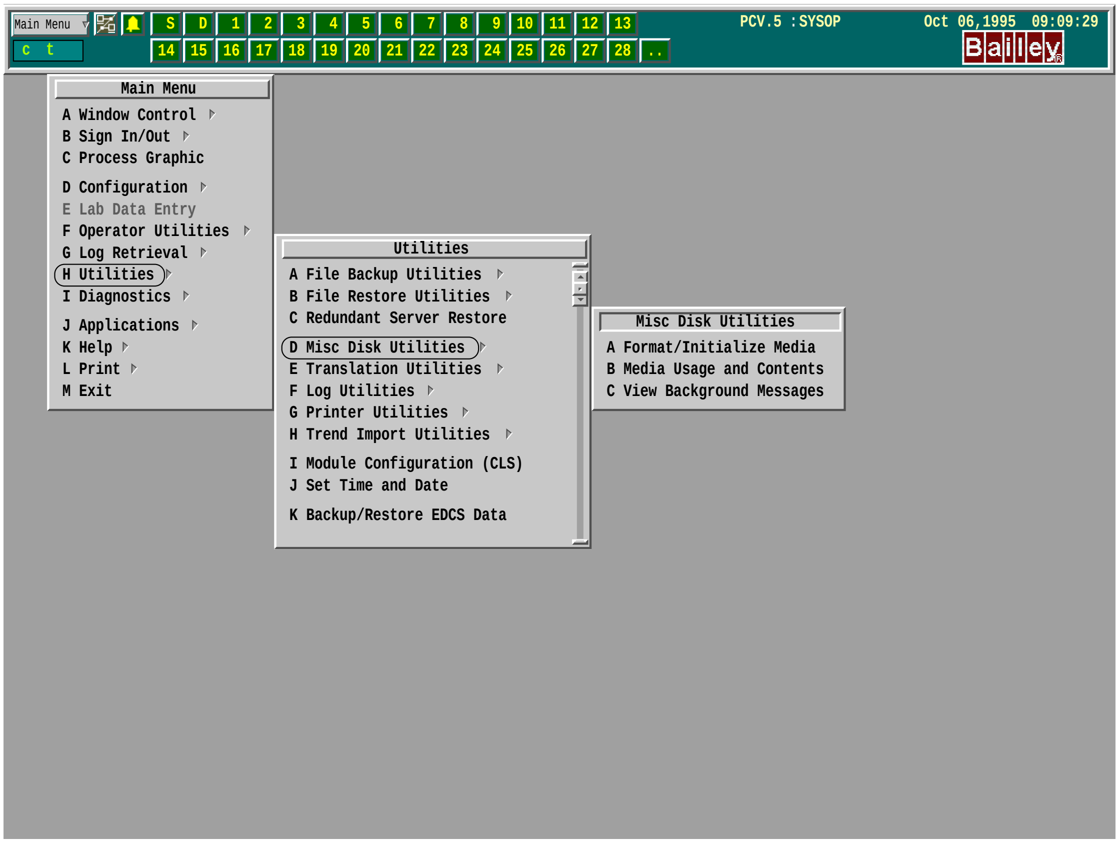

Figure 7-2. Miscellaneous Disk Utilities

```
< Format/Initialize Media >

     Node: QNX4_SERVER
    Media: QNX4 Disk
    Drive: Floppy Disk 1 Floppy Disk 2
 Capacity: 360K 1.2M

 F1   Begin Formatting

                                       F8   Change Media
 F9   Help                             F0   Exit to Previous Menu
```

Figure 7-3. Format/Initialize Media Menu

FORMATTING AND INITIALIZING DISKS

In order to use the different types of media, you have to initialize or format the media first so that it can be read from and written to by the OIS12 console.

In this menu, you specify the type of media you want to format, where the media can be found, and choose options specific to the type of media. Table 7-2 describes the fields found in the Format/Initialize Media menu.

To format media:

Select the node using <Ctrl Up>/<Ctrl Dn> arrow keys to where the media you want to format currently resides, (by default the current node number on the system you are using is shown). Press <Enter>.

Use arrow keys to move down to the *Media* field and use <F8> to scroll through the media choices and make your selection. Press <Enter>.

Use arrow keys to move to the drive field and use the <Ctrl Right>/<Ctrl Left> arrow keys to highlight the drive destination.

Use arrow keys to move to the *Capacity* field and use the <Ctrl Right>/<Ctrl Left> arrow keys to select the capacity of the media.

Once you have chosen the formatting options, press <F1> to begin formatting and initializing the disk.

QNX4 Disks

You can format 5.25-inches floppies to capacities of 360 Kb, 1.2 Mb and 3.5-inches floppies to capacities of 720 Kb and 1.44 Mb.

DOS Disks

For 3.5-inches drives you can format DOS disks to 720 Kb and 1.44 Mb. For 5.25-inches drives you can format DOS disks to 360 Kb and 1.2 Mb.

Optical Disks

Optical disks come in one of two formats: 512 bytes/sector or 1024 bytes/sector. You can only use optical disks with 512 bytes/sector

The QNX4 operating system treats an optical disk in exactly the same way as it treats a fixed disk. When you select **optical disk** as the media format, you will see the QNX4 *fdisk* menu (Figure 7-4).

Type **c** to change the partition.

Type **77** as the OS type.

Enter the start cylinder as **0.**

Enter the end cylinder as given on the bottom of the menu.

Type **s** to save this change and **q** to quit the *fdisk* menu.

```
More  Next  Prev  Change  Delete  Mount  Boot  Unboot  Save  Quit

    OS                start         start          Number      Boot
name type            Cylinder      Cylinder   Cylinders Blocks

—>1. QNX4 (77)        0             914         915      233325
2.      (   )         —-            —-          —-       —-
3. —- (—-)            —-            —-          —-       —-
4. —- (—-)            —-            —-          —-       —-
```

Figure 7-4. The "fdisk" Menu

Table 7-2. Formatting and Initializing Media Fields

Field	Media Types	Description
Node	All	Choose the Node name where the media is located by pressing <Ctrl Up/Ctrl Dn> and pressing <Enter>. By default this field shows the current node.
Media	All	Select the type of media to format by pressing <F8>: - QNX4 Disk - DOS Disk - Magneto-Optical Disk The type of media you choose affects which of the remaining fields are displayed. By default QNX disk is selected.
Drive	QNX4 Disk DOS Disk Optical Disk	Choose the drive destination of the media by pressing <Ctrl Right>/<Ctrl Left>.
Capacity	QNX4 Disk DOS Disk	Choose the capacity of the floppy disk by pressing <Ctrl Right> and <Ctrl Left>. - 360 Kb, low density 5.25-in. floppy - 720 Kb, low density 3.5-in. floppy - 1.2 Mb, high density 5.25-in. floppy - 1.4 Mb, high density 3.5-in. floppy The choices available depend on the drive chosen (5.25 in., or 3.5 in.)

LISTING MEDIA USAGE

The Media Usage and Contents utility, allows you to view how much space has been filled on various types of media or view the names of the files stored on them.

To display the Show Media Usage and Contents function window, press **B** from the Miscellaneous/Disk Utilities menu (Figure 7-5).

In this menu, you specify the location and type of media you want to examine. Table 7-3 describes the fields found in the Show Media Usage and Content menu. Once you have specified the media, press <F1> to find out how much of the media has been used, or press <F2> to get a list of the files on the media. In either case, you are prompted to continue or exit the operation you chose.

```
               < Show Media Usage and Contents >

     Node:  QNX4_Server

Media:  QNX4 Disk

     Drive:  Floppy Disk 1
             Floppy Disk 2
             Local Hard Disk
             Network Root

F1  Show Usage                          F2  List Files

                                        F8  Change Media
F9  Help                                F0  Exit to Previous Menu
```

Figure 7-5. Media Usage Menu

Table 7-3. Media Usage Fields

Field	Media Types	Description
Node	All	Choose the Node name where the media is located by pressing <Ctrl Up/Ctrl Dn> and pressing <Enter>. By default this field shows the current node.
Media	All	Select the type of media to format by pressing <F8>. There are three types of media supported: - QNX4 Disk - DOS Disk - Optical Disk
Drive	All	Choose the drive destination of the media by pressing <Ctrl Up>/<Ctrl Dn> and pressing <Enter>.

When you press <F2>, you must to wait while the program retrieves the list of files on the media. The screen is then cleared so you can browse through the list of file names, by pressing <PgUp> and <PgDn>. To exit from the list of files, press <Esc> or **Q**.

BACKING UP FILES

Click/press **A** from the Utilities menu to display the File Backup Utilities menu (Figure 7-6).

With this menu, you can perform three types of backups:

- Back up your configuration to floppy disk.
- Back up trend or log data to floppy disk.
- Back up any files to any type of media.

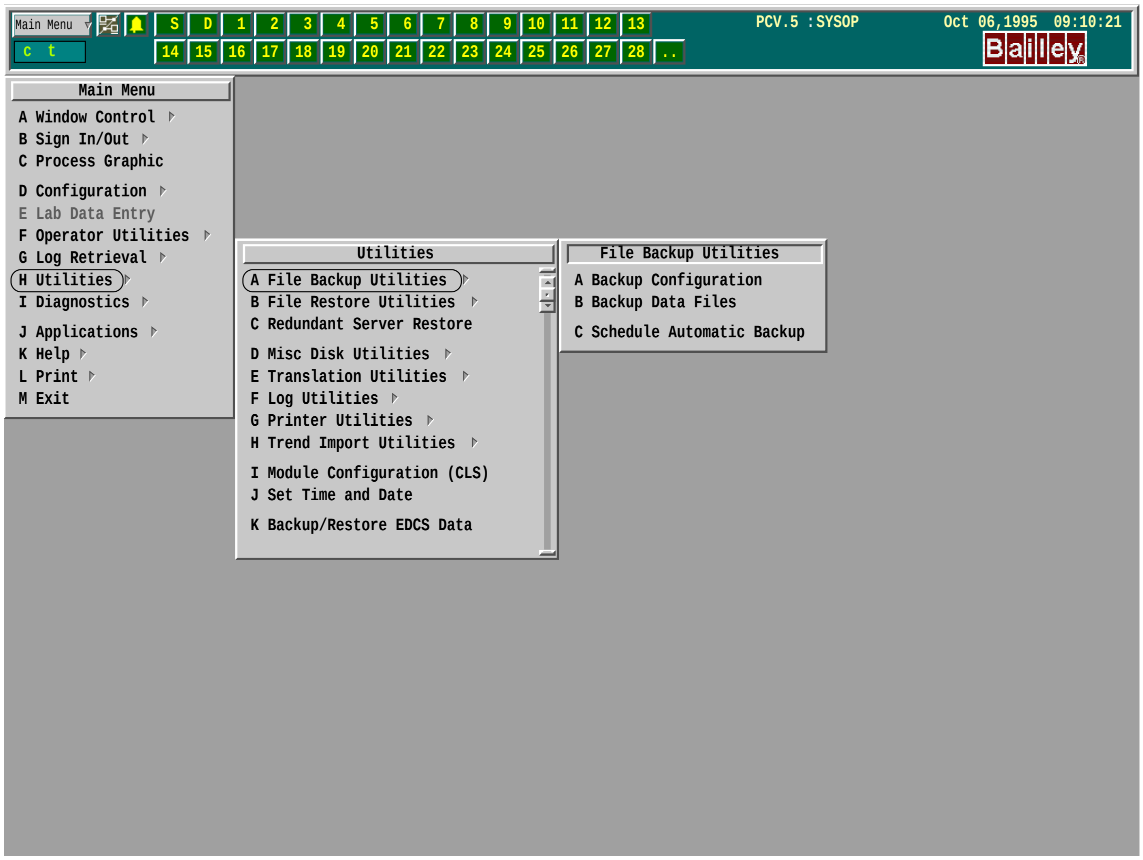

Figure 7-6. File Backup Utilities Menu

Backing Up Your Configuration

The Backup Configuration function is the easiest way to save the configuration files from each node. The files are saved to floppy disk in archive format. The floppy disks do not have to be pre-formatted. This function saves all the information you configured for your tag database, trend database, graphic displays and symbols, and logs.

CAUTION	**This backup does NOT save collected data (e.g., trend data, log data). You should always keep a backup of your current configuration, so that you will not lose any of your work if you have to reload a node (e.g., if the hard disk fails).** **You should save the configuration for each node. Each node's configuration is slightly different so, to make reloading configurations easier, you should back up each node's complete configuration to a different set of floppy disks.**

Click/press **A** from the File Backup Utilities menu, to display the Backup Configuration menu (Figure 7-7).

```
< Save Configuration >

Console Type: Server-Client
DESTINATION: Floppy Disk 1   Floppy Disk 2
Include User Files:   NO  YES
Include System Files: NO  YES

F1  Save

F9  Help                                F0  Exit
```

Figure 7-7. Save Configuration Menu

The Console Type field automatically detects the type of console for which you are going to be backing up files. The console types are Server-Client, Client-with-Disk and Diskless Client. This field is provided purely for information purposes.

Provided that the node has more than one floppy disk drive, you must select the floppy disk drive by using the <Ctrl Right>/<Ctrl Left> keys. Use the <Up>/<Down> keys to go to the Include fields.

The *Include User Files* and *Include System Files* fields are shown only when the node is either a Server-Client or a Client-with-Disk. Enabling these two options allows you to save extra configuration information beyond the normal or default configuration for the console type. Enabling the Include User Files option lets you save all User related files, such as the environmental configuration for logging in. Enabling the Include System Files option lets you save the network configuration information. Since both the User and System files are mirrored (ie. copied) from one node to another so that all nodes have the identical information, these two options only needs to be enabled when backing up one of your nodes. By default, both of these options are disabled. To change either of these options use the <Ctrl Right>/<Ctrl Left> keys to toggle the selection.

Insert the floppy disk in drive 1, then press <F1>.

CAUTION **All disks used will be formatted by the backup procedure.**

The backup starts copying the configuration files to the floppy disk. When the current floppy disk is full, the backup will pause and ask you to insert a new floppy disk. Insert the new disk, then press <F1>. The backup continues, asking for new disks as it requires, until all the configuration files have been saved.

Backing Up Selected Data Files

If you want to back up files other than configuration, or you want to back up files to media other than floppy disks in drive 1, you can use the Backup Data Files function.

The Backup Data Files function lets you choose the location of the data files you want to back up, select the files you want to back up, then specify the media you want to copy the data files to. You can back up files across the network to drives on other computers. You can start the backup then go on to other tasks while it runs.

Click/press **B** (Backup Data Files) from the File Backup Utilities menu to display the Backup Files screen window (Figure 7-8).

```
                         < Backup Files>
 Family:  PCV.1
  Media:  QNX DiskDrive: Network Root

 Log Data:  Event  Periodic  Trigger  Trip  Trend  SOE
 Event   :  Events  Actions



 All Files  Before : Tue Oct 11 21:00:00 1994
[Source]

 Family: BCI.1
  Media: QNX DiskDrive:  Floppy Disc 1
[Destination]
 F1 Selection   F3 Display  F4 Options  F5 Switch   F9 Help  F10 Exit
```

Figure 7-8. Backup Files Window

There are two parts to the menu:

- The Source Box (the upper box) lets you specify the media you want to back up files from and select the files to copy.
- The Destination Box (the lower box) lets you specify the media you want to copy the selected files to.

You only use one of the boxes at a time, and you can choose which box you are using by pressing <F5>. Each box has its own menu, and the menu for the current box is displayed on the bottom line of the screen. To back up selected files:

1. Select the files to back up from the Source Box.
2. Specify the destination to copy the files to in the Destination box.
3. Run the backup from the Destination Box menu.

Selecting Files for Backup

Make sure the *Source Box* is highlighted (if it is not highlighted, press <F5>).

There are three sections to the Source Box:

- Source media.
- File categories.
- File names.

You work in one section at a time but to move between sections, press <Alt Up> and <Alt Dn>. (You can only do this with the QWERTY keyboard.)

You will use the source media and the file category sections the most.

The source media section lets you specify the node and media you want to copy files from. The only media you can back up are: QNX4 Disks, DOS Disks, and Optical Disks.

The file category section lets you select categories of files, from a hierarchical classification, to include in the backup. Higher level categories are more general and include more files than lower level categories. The current category is highlighted by the cursor. As you move back and forth through the categories in a level, the display of the lower levels changes to display the subcategories belonging to the current category. You select the current category and all its subcategories by pressing <Space>. You can unselect a category (and all its subcategories) by pressing <Space> again.

There is one main file category for backup:

- Data (collected trend, log, and lab data files).

The file name section lets you pick individual files belonging to the current category to include in or exclude from the backup.

Table 7-4 describes the different sections.

The Source Box menu provides the following functions:

- <F1> Selection lets you quickly select or unselect categories or file names.

- <F2> File lets you save your current selection of categories to a file and recall these saved selections. Only selected file categories are saved (not file names). Note, however, that indexed items displayed as categories (such as tags, or log titles) are not saved.

Table 7-4. Selecting Files for Backup

Section of Source Box	Description	
Source Media	Specify the media that has the files you want to use.	
	Family	Choose the node name where the media containing the files is located by pressing <Ctrl Up>/<Ctrl Dn> and pressing <Enter>. This field defaults to the current node.
	Media	Choose the type of media by pressing <F8>. The media are: - QNX4 Disk - DOS Disk - Optical Disk
	Drive	Choose the source drive by pressing <Ctrl Up>/<Ctrl Dn> and pressing <Enter>.
To move between sections, press <Alt Up> and <Alt Dn>.		
File Categories	Select the categories of files you want to use. The categories are presented as a hierarchical classification of files. There can be up to three levels in the hierarchy; each is shown on its own line with a title for the level shown at the left. Higher levels are more general and include more files than lower levels. Each level is a horizontal list that may extend beyond the edge of the screen and scrolls to reveal more choices; a + symbol at the edge of the screen indicates that there are more choices. Your current position is shown by the highlighted cursor. As you scroll through the categories in a level, the lower levels change to show the subcategories of the current category. To select a category, press <Enter> or <Space>. Selected categories are displayed in white, unselected in green. Selecting a category causes all its subcategories to be selected; unselecting a category item unselects all subcategories below it.	
To move between sections, press <Alt Up> and <Alt Dn>.		
File Names	The third box shows a multicolumn list of the files belonging to the current category in the lowest level of the hierarchy above. You can scroll through the list and select files just as you select categories in the categories section.	

- <F3> Display lets you change the way the Source Box displays categories and file names. You can have indexed items that appear as categories (such as tags or log titles) displayed by either their names or indexes or both. File names can be displayed as just file names or with more extensive information (such as file dates). You can even turn off the display of the file name box if you find moving through file categories too slow because there are a large number of files.

- <F4> Options lets you specify a subset of the selected files to back up. By default, all files specified are backed up, but, by using this function, you back up only files that have changed since the last backup or only files with certain dates. The current options are displayed in the fourth section of the Source Box.

- <F5> Switch switches you to the Destination Box.

Table 7-5 describes the Source Box menu functions,

Table 7-5. Source Box Menu Functions

Function	Description		
<F1> Selection	Displays a submenu of functions for changing and previewing your selection.		
	<F1> Classification	Displays a submenu of functions for changing your file category selections.	
		<F1> Select All	Selects all categories at the current level (and all levels below).
		<F2> Unselect All	Unselects all categories at the current level (and all levels below).
	<F3> Preview	Lists all the files selected to the screen. The list is displayed using the QNX4 “more” utility, so you can browse through the list. Press <Esc> to exit from the list.	
<F3> Display	Displays a submenu of functions that let you change how the Source Box displays categories and file names.		
	<F1> Index Lists	Displays a submenu of functions to change the way indexed items are displayed when they appear as a classification level.	
		<F1> Index Only	Display the index only.
		<F2> Index & Description	Display the index and name.
		<F3> Description	Display the name only.
	<F2> File Info	Displays a submenu of functions to change the way file names are displayed.	
		<F1> File Only	Display only the file name.
		<F2> Brief File Info	Display the file name, its time and date of creation, and whether or not the file is new (an *N* is displayed beside new files).
		<F3> Full File Info	Display the full path and file name, time and date of creation, size, and whether or not the file is new (an *N* is displayed beside new files).
	<F3> File Name Box	Toggles the display of the file name box on and off. If you are only selecting files at the file category level, the display is faster if you turn off the file name box.	
<F4> Options	Displays a pop-up window that lets you specify a subset of your selection to use.		
	<F1> Set Options	Choose whether you want to use all files selected, or only the files that are new (new files are files that have been created or modified since the last backup). Press <Ctrl Left> and <Ctrl Right> to choose either All Files or New Files.	
	<F8> Change Dated	Select a range of files by their file date. Select Before, After, or Range by pressing <F8>, then enter the date or dates you want.	
<F5> Switch	Switches you from the Source Box to the Destination Box.		

Specifying the Destination

When you have finished selecting the files for backup, highlight the Destination Box by pressing <F5>.

Specify the media you want to back up the files to, using the fields in the Destination Box (Table 7-6).

Table 7-6. Backup Destination Fields

Field	Media Type	Description
Node	All	Choose the node name where the destination media is located by pressing <Ctrl Up>/<Ctrl Dn> and pressing <Enter>. This field defaults to the current node.
Media	All	Choose the type of media you want to back up the files to by pressing <F8>. Media supported are: - QNX4 Disks - DOS Disks - Floppy Archives - Optical Disk
Drive	All	Choose the drive by pressing <Ctrl Up>/<Ctrl Dn> and pressing <Enter>.

Running the Backup

When you have selected the files to back up and have specified the destination media, you are ready to start the backup.

To start the backup, press <F1> which displays a Destination Box submenu that gives you a choice of running the backup in the background or foreground.

To run the backup in the foreground, press <F2>. If you run a backup in the foreground, you will not return to the Backup Files menu until the backup is finished. During the backup, the files that are being copied are displayed in the menu. If the destination media fills, you will be asked to insert a new one (you will have the option to format the new media too). You can run foreground backups to any supported media.

To run the backup in the background, press <F1>. If you run a backup in the background, you are returned to the Backup Files menu as soon as the backup starts, and you can leave this function window and go to other tasks. You cannot interact with the backup, and the backup will run in the background until it is finished. You can only run background backups to hard disks and optical disks. You cannot run a background backup to floppy disk, or floppy archive, (because the backup cannot ask you to change the disk when the current one is full).

The <F4> Options menu function gives you access to the following utilities from within the Backup Selected Files screen:

- Format/Initialize Media (see ***FORMATTING AND INITIALIZING DISKS*** for details).
- Media Usage (see ***LISTING MEDIA USAGE*** for details).

Table 7-7 describes the Destination Box menu functions.

Table 7-7. Backup Menu Functions

Function	Description	
<F1> Back Up	Displays a submenu of functions for starting the backup.	
	<F1> Background	Runs the backup in the background. Once the backup has been started, you can go on to perform other tasks while the backup continues. You can only run a backup in the background if the destination media is a hard disk or optical disk.
	<F2> Foreground	Runs the backup in the foreground. You have to wait until the backup is finished.
<F4> Options	Displays a submenu of functions that run other utilities. When you exit any of these utilities, you return to this Back Up Selected Files screen, and none of your selections or options will have changed.	
	<F1> Format/Init	Runs the Format/Initialize Media utility in a pop-up window.
	<F2> Media Usage	Runs the Media Usage utility in a pop-up window.
<F5> Switch	Switches you from the Destination Box to the Source Box.	
<F8> Change Media	Switches from QNX4 to DOS to Floppy Archive to Optical Disk	

RESTORING FILES

Click/press **B** from the Utilities menu to display the File Restore Utilities menu (Figure 7-9). With this menu, you can perform two types of restores:

- Restore your node's configuration from floppy disks.
- Restore data files, log or trend.

Restoring Your Configuration

CAUTION **The Restore Configuration function erases existing configuration files before restoring the configuration files from floppy disk.**

Click/press **A Restore Configuration** from the File Restore Utilities menu, to display the Restore Configuration menu (Figure 7-10). The *Console Type* field automatically detects the type of console for which you are going to be restoring files. The console types are Server-Client, Client-with-Disk and Diskless Client. This field is provided purely for information purposes.

Provided that the node has more than one floppy disk drive, you must select the floppy disk drive by using the <Ctrl Right>/ <Ctrl Left> keys. Use the <Up>/<Down> keys to go to the Include fields.

.The *Include User Files* and *Include System Files* fields are shown only when the node is either a Server-Client or a Client-with-Disk. Enabling the **Include User Files** option lets you restore all User related files, such as the environmental configuration for logging in. Enabling the **Include System Files**

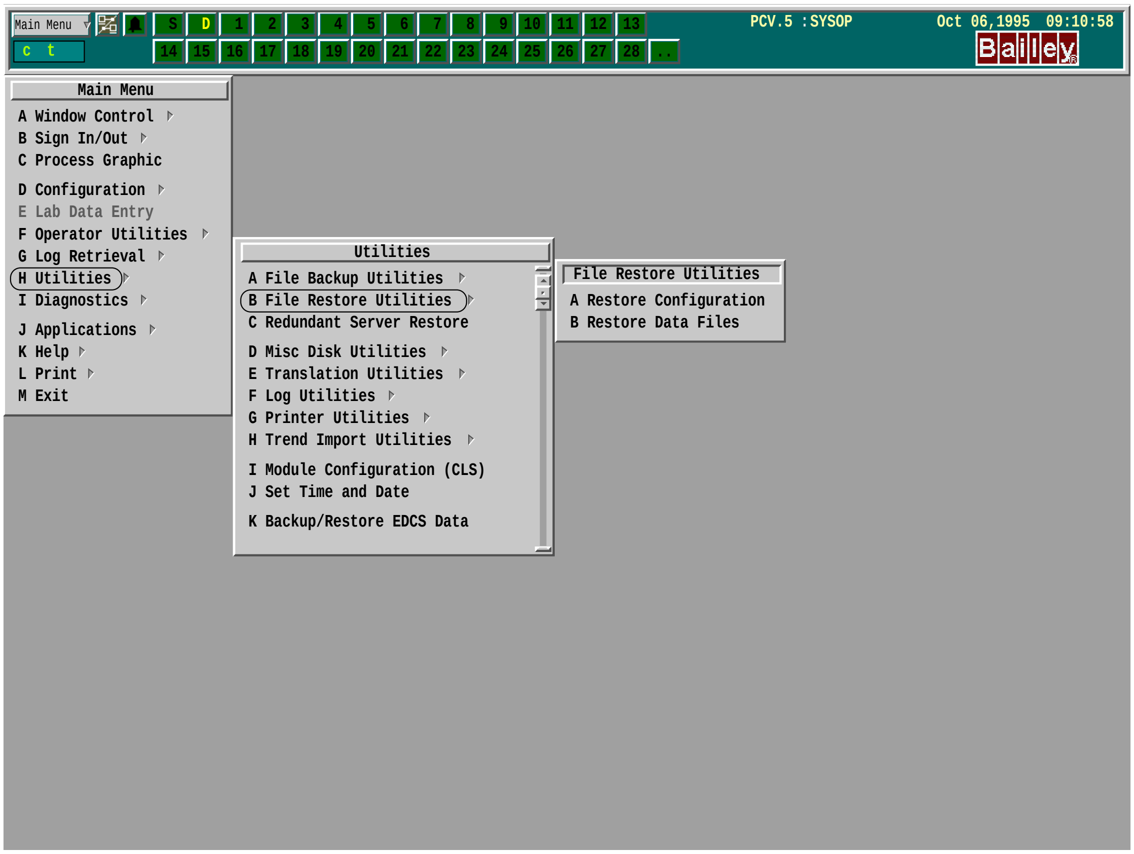

Figure 7-9. File Restore Utilities Menu

```
< Restore Configuration >

Console Type: Server-Client
SOURCE: Floppy Disk 1   Floppy Disk 2
Include User Files:   NO  YES
Include System Files: NO  YES

Release:  5.1  5.0  4.x  3.x

F1  Restore


F9  Help                                F0  Exit
```

Figure 7-10. Restore Configuration Menu

Option lets you restore the network configuration information. If the configuration you are restoring does not contain either User or System level files these options are ignored. By default, both of these options are enabled. To change either of these options use the <Ctrl Right>/<Ctrl Left> keys to toggle the selection.

The Release field lets you select the LAN-90 PCV release under which the configuration files were originally saved. The paths to the configuration files vary between the releases, it is therefore critical that the correct release level be specified.

Press <F1> to initiate the Restore Configuration.

WARNING	**This procedure shuts down the node's OIS12 console software. If you are restoring a server level configuration, the server will shut down.**

To continue with the restore, press <F1>. The OIS12 console software will then be shut down for this node.

WARNING	**Be careful not to save files with the user interface while the restore is in progress. You might overwrite the same files that are being restored.**

The following message will appear:

Vol: When drive light goes out insert disk 1 and press <Return>

The program will now copy the files from the floppy disk to the hard disk.

After completing the restoration, finish the standard node shut down procedure and reboot the node.

Restoring Selected Data Files

If you want to restore files other than configuration, or you want to restore data from media other than floppy disks in drive 1, you can use the Restore Data Files function.

The Restore Data Files function lets you choose the location of the files you want to restore, select the types of files you want to restore, then specify the media you want to copy the files to. You can restore files across the network, and you can run the restore in the foreground (you wait while the restore runs) or in the background (you start the restore then go on to other tasks while it runs). You can restore files to either their original directories, or to an alternate directory.

Click/press **B** from the File Restore Utilities menu to display the Restore Files function menu. There are two parts to the menu:

- The Source Box (the upper box) lets you specify the media you want to restore files from and select the files to copy.

- The Destination Box (the lower box) lets you specify the media you want to copy the selected files to.

You only use one of the boxes at a time, and you can switch which box you are using by pressing <F5>. Each box has its own menu, and the menu for the current box is displayed on the bottom line of the display.

To restore selected files:

1. Select the files to restore from the *Source Box*.

2. Specify the destination to copy the files to in the *Destination Box*.

3. Run the restore from the Destination Box menu.

Selecting Files

Make sure the **Source Box** is highlighted (if it is not highlighted, press <F5>).

There are three sections to the Source Box:

- Source media.
- File categories.
- File names.

You work in one section at a time. To move between sections, press <Alt Up> and <Alt Dn>.

You will use the source media and the file category sections the most.

The source media section lets you specify the node and media you want to copy files from. You can choose from any of the supported media.

The file category section lets you select categories of files from a hierarchical classification to include in the restore. Higher level categories are more general and include more files than lower level categories. The current category is highlighted by the cursor. As you move back and forth through the categories in a level, the display of the lower levels changes to display the subcategories belonging to the current category. You select the current category and all its subcategories by pressing <Space>. You can unselect a category (and all its subcategories) by pressing <Space> again.

There is one category of data files for restore: data (collected trend, log, and lab data files). The file name section lets you pick individual files belonging to the current category to include in or exclude from the restore.

Table 7-8 describes the different sections.

Table 7-8. Selecting Files for Restore

Section of Source Box		Description
Source Media		Specify the media that has the files you want to restore.
	Family	Choose the node name where the media containing the files is located by pressing <Ctrl Up>/<Ctrl Dn> and pressing <Enter>. This field defaults to the current node.
	Media	Choose the type of media by pressing <F8>. The media are: - QNX4 Disk - DOS Disk - Floppy Archive - Optical Disk
	Drive	Choose the drive by pressing <Ctrl Up>/<Ctrl Dn> and pressing <Enter>.
To move between sections, press <Alt Up> and <Alt Dn>.		
File Categories		Select the categories of files you want to use. The categories are presented as a hierarchical classification of files. There can be up to five levels in the hierarchy; each is shown on its own line with a title for the level shown at the left. Higher levels are more general and include more files than lower levels. Each level is a horizontal list that may extend beyond the edge of the screen and scrolls to reveal more choices; a + symbol at the edge of the screen indicates that there are more choices. Your current position is shown by the highlighted cursor. As you scroll through the categories in a level, the lower levels change to show the subcategories of the current category. To select a category, press <Enter> or <Space>. Selected categories are displayed in white, unselected in green. Selecting a category causes all its subcategories to be selected; unselecting a category item unselects all subcategories below it.
To move between sections, press <Alt Up> and <Alt Dn>.		
File names		The third box shows a multicolumn list of the files belonging to the current category in the lowest level of the hierarchy above. If you are restoring from a Floppy Archive, file names will NOT be listed until you try to enter the file name section (by pressing <Alt Dn> from the file category section). Only then will the archive be read for the list of files it contains. Reading an archive could take some time. You can scroll through the list and select files just as you select categories in the file categories section.

The Source Box menu provides the following functions:

- <F1> Selection lets you quickly select or unselect categories or file names.

- <F3> Display lets you change the way the Source Box displays categories and file names. You can have indexed items that appear as categories (such as tags or log titles) displayed by either their names or indexes or both. File names can be displayed as just file names or with more extensive information (such as file dates). You can even turn off the display of the File Name Box if you find moving through file categories too slow because there is large number of files.

- <F4> Options lets you specify a subset of the selected files to restore up. By default, all files specified are restored, but, by using this function, you restore only files that have changed since the last restore or only files with certain dates. The current options are displayed in the fourth section of the Source Box.
- <F5> Switch switches you to the Destination Box.

Table 7-5 in the section ***Backing Up Selected Data Files*** describes the Source Box menu functions.

Specifying the Destination

When you have finished selecting the files for restore, highlight the Destination Box by pressing <F5>.

Specify the media you want to restore the files to using the fields in the Destination Box (see Table 7-9).

CAUTION	**When you restore files, any existing files with the same name will be overwritten.**

Table 7-9. Restore Destination Fields

Field	Description
Family	Choose the node network where the destination media is located by pressing <Ctrl Up>/<Ctrl Dn> and pressing <Enter>. This field defaults to the current node.
Media	Choose the type of media you want to restore to by pressing <F8>. Media supported are: - QNX4 Disks - DOS Disks - Optical Disks
Drive	Choose the drive by pressing <Ctrl Up>/<Ctrl Dn> and pressing <Enter>.
Path	You have two choices of where to restore the files to: - Original - Alternate Restoring to the original path means files are copied to the directories they came from. The existing files are overwritten by the restored files. Use the original path to restore configuration files that have been lost from the hard disk. You must have Configuration level access or greater to restore to the original path. Restoring to the alternate path means files are copied to a different directory than they came from, so the existing files are not overwritten. Use the alternate path to restore data files (e.g., trend data, log data) to the hard disk so that you can view the old data. You must have control level access or greater to restore to the alternate path.

Running the Restore

When you have selected the files to restore and have specified the destination media, you are ready to start the restore.

To start the restore, press <F1> which displays a Destination Box submenu that gives you a choice of running the restore in the background or foreground.

To run the restore in the foreground, press <F2>. If you run a restore in the foreground, you do not return to the Restore Selected Files menu until the restore is finished. During the restore, the files being copied are displayed in the menu.

To run the restore in the background, press <F1>. If you run a restore in the background, you are returned to the Restore Selected Files menu as soon as the restore starts, and you can leave the function window and go to other tasks. You cannot interact with the restore, and the restore will run in the background until it is finished. You can only run background restores from hard disks and optical disks. You cannot run a background restore from floppy disk, or floppy archive (because the restore cannot ask you to change the disk when it needs a new one).

Table 7-10 describes the Destination Box menu functions.

Table 7-10. Restore Menu Functions

Function	Description	
<F1> Restore	Displays a submenu of functions for starting the restore.	
	<F1> Background	Runs the restore in the background. Once the restore has been started, you can go on to perform other tasks while the restore continues. You can only run a background restore if the source media is a hard disk or optical disk.
	<F2> Foreground	Runs the restore in the foreground. You have to wait until the restore is finished.
<F5> Switch	Switches you from the Destination Box to the Source Box.	

SCHEDULING AUTOMATIC BACKUPS

Regular backups are important. You should always have your latest configuration backed up. If you are interested in maintaining records of collected data for longer periods of time than can be stored on the hard disk, you should back up data files too. With the Schedule Automatic Backup function, you can have your files backed up automatically on a regular basis to optical disks.

The Schedule Automatic Backup function lets you choose the location of the files you want to back up, select the types of files you want to back up, specify the media you want to copy the files to, and how often to run the backup. You can set up more than one automatic backup (e.g., one for trend data files, and another for log data files). You can even force an automatic backup to run, in case the scheduled backup did not work because a disk was full.

Click/press **C** from the File Backup Utilities menu to display the Schedule Automatic Backup function window (Figure 7-11).

```
< Schedule Automatic Backups >

Node:  Automatic Backup   1

Media:  QNX4 Disk        Drive 3

PCV         :  Data  Configuration  General
Data        :  Trend Data  Log Data  Lab Data
Index       :  33-LVI-2105A      33-LVI-2105B

All Files  Before:  23-Mar-92  1:00:00 pm
[Source]

       Node:  Automatic Backup 1

       Media:  Tape Archive    Name:
    Schedule:  Daily Weekly Monthly    State:  Enable  Disable
Day of Month:  1  Day of Week:  Sunday    Time:  0: 0
[Destination]
F1 File  F2 Run Backup Now   F4 Options  F5 Switch  F9 Help  F10 Exit
```

Figure 7-11. Schedule Automatic Backups Menu

There are two parts to the menu:

- The Source Box (the upper box) lets you specify the media you want to back up files from and select the files to copy.
- The Destination Box (the lower box) lets you specify the media you want to copy the selected files to and how frequently you want to run the backup.

You only use one of the boxes at a time, and you can switch which box you are using by pressing <F5>. Each box has its own menu, and the menu for the current box is displayed on the bottom line of the display.

To schedule automatic backups:

1. Select the files to back up.
2. Specify the destination media and time of backup.
3. Save your selection and specifications.

SELECTING FILES

Make sure the Source Box is highlighted (if it is not highlighted, press <F5>).

There are two sections to the Source Box:

- Source media.
- File categories.

(This is the same Source Box that the Backup Selected Files utility uses, but the display of the file name section has been turned off.)

Work in one section at a time. To move between sections, press <Alt Up> and <Alt Dn>.

The source media section lets you specify the node and media you want to copy files from. The only media you can back up are: QNX4 Disks, DOS Disks, and Optical Disks.

The file category section lets you select categories of files from a hierarchical classification to include in the backup. Higher level categories are more general and include more files than lower level categories. The current category is highlighted by the cursor. As you move back and forth through the categories in a level, the display of the lower levels changes to display the subcategories belonging to the current category. You select the current category and all its subcategories by pressing <Space>. You can unselect a category (and all its subcategories) by pressing <Space> again.

There is one category of files for backup: data (collected trend, log, and lab data files).

Table 7-11 describes the two sections.

Table 7-11. Selecting Files for Automatic Backup

<table>
<tr><th>Section of Source Box</th><th colspan="2">Description</th></tr>
<tr><td rowspan="4">Source Media</td><td colspan="2">Specify the media that has the files you want to use.</td></tr>
<tr><td>Node</td><td>Choose the node name where the media containing the files is located by pressing <Ctrl Up>/<Ctrl Dn> and pressing <Enter>. This field defaults to the current node. This field defaults to the current node.</td></tr>
<tr><td>Media</td><td>Choose the type of media by pressing <F8>. The media are:
- QNX4 Disk
- DOS Disk
- Optical Disk</td></tr>
<tr><td>Drive</td><td>Enter the drive specification for the disk.</td></tr>
<tr><td colspan="3">To move between sections, press <Alt Up> and <Alt Dn>.</td></tr>
<tr><td>File Categories</td><td colspan="2">Select the categories of files you want to use. The categories are presented as a hierarchical classification of files. There can be up to three levels in the hierarchy; each is shown on its own line with a title for the level shown at the left. Higher levels are more general and include more files than lower levels.

Each level is a horizontal list that may extend beyond the edge of the screen and scrolls to reveal more choices; a + symbol at the edge of the screen indicates that there are more choices. Your current position is shown by the highlighted cursor. As you scroll through the categories in a level, the lower levels change to show the subcategories of the current category.

To select a category, press <Enter> or <Space>. Selected categories are displayed in white, unselected in green. Selecting a category causes all its subcategories to be selected; unselecting a category item unselects all subcategories below it.</td></tr>
</table>

The Source Box menu provides the following functions:

- <F1> Selection lets you quickly select or unselect categories or file names.

- <F3> Display lets you change the way the Source Box displays categories. You can have indexed items that appear as categories (such as tags or log titles) displayed by either their names or indexes or both.

- <F4> Options lets you specify a subset of the selected files to back up. By default, all files specified are backed up, but, by using this function, you back up only files that have changed since the last backup or only files with certain dates. The current options are displayed in the fourth section of the Source Box.

- <F5> Switch switches you to the Destination Box.

Table 7-5 in the section ***Backing Up Selected Data Files*** describes the Source Box menu functions.

SPECIFYING DESTINATION AND TIMES

When you have finished selecting the files for backup, highlight the Destination Box by pressing <F5>.

Specify the media you want to back up the files to and the frequency and times to run the backup by using the fields in the Destination Box (Table 7-12).

Table 7-12. Automatic Backup Destination and Schedule Fields

Field	Description
Family	Choose the node name where the destination media is located by pressing <Ctrl Up>/<Ctrl Dn> and pressing <Enter>. This field defaults to the current node.
Media	Media type supported is Optical Disk.
Drive	Choose the optical drive by pressing <Ctrl Up>/<Ctrl Dn> and pressing <Enter>.
Schedule	Specify how often the backup will run by pressing <Ctrl Right> and <Ctrl Left>. There are three choices: - Daily - Weekly - Monthly
State	Choose whether or not you want the backup to run by pressing <Ctrl Right >or <Ctrl Left>. This setting allows you to enable or disable an automatic backup without deleting the selections you've made.
Day of Month	If you chose a monthly backup, enter the day of the month to run the backup (1 - 31).
Day of Week	If you chose a weekly backup, choose the day of the week the backup runs by pressing <Ctrl Up> and <Ctrl Dn>.
Time	For all backup schedules (monthly, weekly, and daily), enter the time of day the backup runs (24hr format, midnight = 00:00).

SAVING THE AUTOMATIC BACKUP SPECIFICATION

When you have selected the files to back up and have specified the destination media and backup schedule, you are ready to save the automatic backup.

To save the automatic backup, press <F1> which displays a Destination Box submenu, then press <F1> to save your current settings. A pop-up window will ask you for the name to save the file under. The name can be any valid QNX4 file name (letters, numbers, underscores, and dashes, but not spaces) up to 12 characters long.

Once saved, the automatic backup will run at the time you scheduled it (if it is Enabled).

You can set up several different automatic backups by selecting files, specifying destinations and schedules, then saving each under a different file name.

To edit an existing automatic backup, press **<F1>, File**, then **<F2>, Load**. Select the file name from the pop-up window displayed, and the Source and Destination boxes will be set with the settings for that automatic backup. Edit the settings, then save them under the same file name, and the automatic backup will use the new settings from now on.

Table 7-13 describes the Destination Box menu functions for Schedule Automatic Backups.

Table 7-13. Automatic Backup Functions

Function	Description	
<F1> File	Displays a submenu of functions for saving and editing your automatic backups.	
	<F1> Save	Save the current settings to a file. <Enter> a file name up to 12 characters long in the pop-up window displayed. Once an automatic backup specification is saved, the automatic backup will take place (if it is Enabled).
	<F2> Load	Load an automatic backup specification file's settings into the Source and Destination box. Select the file you want to load from the pop-up window of file names displayed.
	<F3> Delete	Delete an automatic backup specification file. Select the file you want to delete from the pop-up window of file names displayed. When the file is deleted, that automatic backup will no longer run.
	<F4> Summary	Generates a summary report of all the automatic backup specification files. You can list this report to a printer, screen, or file.
<F2> Run Backup Now	Displays a submenu of functions that let you run the currently specified automatic backup.	
	<F1> Background	Run the current automatic backup in the background (you start the backup, then go on to other tasks while the backup continues to run).
	<F2> Foreground	Run the current automatic backup in the foreground (you wait while the backup takes place).

Table 7-13. Automatic Backup Functions

Function	Description	
<F4> Options	Displays a submenu of functions that run other utilities. When you exit any of these utilities, you return to the Schedule Automatic Backups screen, and none of your setting will have changed.	
	<F1> Format/Init	Runs the Format/Initialize Media utility in a pop-up window.
	<F2> MediaUsage	Runs the Media Usage utility in a pop-up window.
<F5> Switch	Switches you from the Destination Box to the Source Box.	

RUNNING AN AUTOMATIC BACKUP AT AN UNSCHEDULED TIME

It is possible that an automatic backup can't run at the scheduled time; the destination media could have been full or missing. If this happens, you do not have to wait until the next scheduled backup to save your files.

To run an automatic backup at an unscheduled time:

1. Press <F1>, File, <F2> and Load. Select the file name of the backup you want to run from the pop-up window displayed; the Source and Destination boxes will be set with the settings for that automatic backup.

2. Press <F2>, Run Backup Now, then press either <F1> to run the backup in the background or <F2> to run the backup in the foreground.

VIEW BACKGROUND MESSAGES

Click/press **D** from the Utilities menu to display the Miscellaneous Disk Utilities menu (Figure 7-2).

Because you do not have any interaction with utilities you run in the background, you don't see any messages or errors these utilities report while they are running. Most background utilities display their messages on the standard system message console and file, but they also write the same message to a file that is used only by background utilities. By viewing these messages, it is easier to find out if a utility ran successfully or not.

To view messages from background utilities, click/press **C** from the Miscellaneous Disk Utilities menu (Figure 7-2). The messages are displayed using the QNX4 utility *more*, so you can scroll through the messages by pressing <PgUp>, <PgDn>, <Up>, and <Down>. To exit from the messages, press <Esc>, <Esc>.

IMPORTING TREND CONFIGURATION

Click/press **H Utilities** from the Main menu to display the Utilities menu (Figure 7-1). Click/press **H Trend Import Utilities** to display the Trend Import Utilities menu. Click/press **A Trend**

Configuration to import a Release 4.2, 4.3, and 5.0 Trend Configuration file into a Real-Time Server.

You must select the Real-Time Server to which the configuration is imported. The data collection system within the given server must be on-line for configuration records to be imported successfully. If it is not, you will see the message in Figure 7-12.

```
Historical collection on XXXXXXXXXXX is off-line
                    Continue
```

Figure 7-12. Data Collection Off-Line Message

If you select a group, records are imported to all the Real-Time Servers within the group. Therefore, it is important to have all families on-line within a group when importing. You must remember to do a redundant server backup when the server is brought on-line if a server within the group was off-line.

Press <Up>, <Down>, <Ctrl PgUp>, <Ctr PgDn>, <Ctrl Home> and <Ctrl End> to move within the list of real-time servers in Figure 7-13.

```
                  < Import Trend Configuration >

Server Name : PCV.1
              PCV.2
              PCV.3
              PCV.4
              PCV.5

F1  Import Configuration

F9  Help                              F0  Return to Previous Menu
```

Figure 7-13. Import Trend Configuration

Press <F1> to import the Trend Configuration file for the highlighted Real-Time Server name. You will see the message in Figure 7-14.

Press **Y**, or <Enter> to begin the process of importing the trend configuration. Press **N**, or <Esc> to abort importing the selected trend configuration.

```
Import Trend Configuration from 'Adrian_Node4'?
               Yes     No
```

Figure 7-14. Configuration Import Confirmation

IMPORT TREND DATA FILES

Click/press **H Utilities** from the Main menu to display the Utilities menu (Figure 7-1). Click/press **H Trend Import Utilities** to display the Trend Import Utilities menu. Click/press **B Trend Data Files** to import Release 4.x, and 5.x Trend Data files.

Trend data files are imported from a variety of devices. At least one archive manager and catalog must be running on the network in order to import trend data files. If an archiver cannot be located, the message in Figure 7-15 appears.

```
Archive manager must be on-line to import data!
                  Continue
```

Figure 7-15. Archive Manager Off-Line Message

The Import Trend Data File Screen

Press <Up>, <Down>, <Ctrl PgUp>, <Ctrl PgDn>, <Ctrl Home> and <Ctrl End> to move within the list of Real-Time Servers (Figure 7-16).

```
Import to server    :    PCV.1
                         PCV.2
                         PCV.3
                         PCV.4
                         PCV.5
                         PCV.6
```

Figure 7-16. Server Selection Screen

The highlighted server is the server to which you will import trend files. If you select a server group, data is only imported to the primary data collection system, since it is responsible for making sure imported data is archived (Figure 7-17).

Press <Up>, <Down>, <PgUp>, <PgDn>, <Home> and <End> to move between the data entry fields.

```
                    < Import Trend Data File>

 Import To Server    : PCV.1

 Import From Release : 5.0 4.3 4.2

 Import From Format  : Floppy Disk Floppy Archive

 Floppy Drive        : Drive 1 Drive 2

 F1  Select Trend Files

 F9  Help                          F0  Return to Previous Menu
```

Figure 7-17. Import Trend Data File

Press <Ctrl Left> and <Ctrl Right> to select the releases of your trend data. You will notice the *Import From Format* field changes when you change Releases. The **Optical Disk** option only appears in the *Import From Format* field if the optical disk has been enabled for the computer on which you are running this utility.

For Release 5.x, Trend Data files can be imported from either floppy disks, floppy archives or optical disks. Press <Ctrl Left> and <Ctrl Right> to move horizontally between the formats. In all cases, trend data files are accessed from the "/bci/pcv/data/trend" directory of the media. When importing from floppy or tape archives, the entire archive is first copied to a temporary work area on the hard disk. This work area is later deleted when importing is complete.

For Releases 4.x, Trend Data files are stored on QNX 2 file system formatted disks. QNX 2 floppy and optical disk file systems are supported. The bciQnx2fsys utility is started in order to allow reading a QNX 2 file system. Trend data files are accessed from the "/qnx2/*drive*/pcw/trend_data" directory of the media. Importing from tape and floppy archives is supported if the QNX Migration Tool-kit utilities fbackup and tbackup are detected when starting this utility. Press <Ctrl Left> and <Ctrl Right> to move horizontally between the formats.

When a floppy disk device is highlighted in the *Import From Format* field, the *Floppy Drive* field is un-dimmed. The *Floppy Drive* fields let you select the floppy disk from which to import trend files. Press <Ctrl Left> and <Ctrl Right> to move horizontally between the two drive names.

Press <F1> to start the process of viewing the trend directories and files on the media you have selected. The real-time database within the selected real-time server must be on-line for files to be imported successfully. If it is not on-line, you will see the message in Figure 7-18.

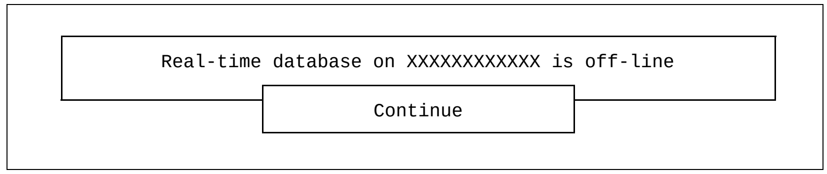

Figure 7-18. Database Off-Line Message

The utility determines the working directory from which to read trend directories and files based on the combination of release and format.

For Release 5.x, the working directory for file system floppy disks is “/fd”.

This can be over-ridden by using the **-F** command line option of this utility. Floppy archives are imported by loading the entire archive to a temporary work area on the hard disk. The working directory for floppy archives is “/tmp/import”. Optical disks are imported from the optical disk mount point defined in the system options file for this computer. By default this is “/op0”. Importing from optical disk only functions on the attached computer.

For Releases 4.x, the bciQnx2fsys utility is started for floppy and optical disks. For optical disks, first, all current partitions for the optical disk are un-mount. You are then prompted with the message in Figure 7-19.

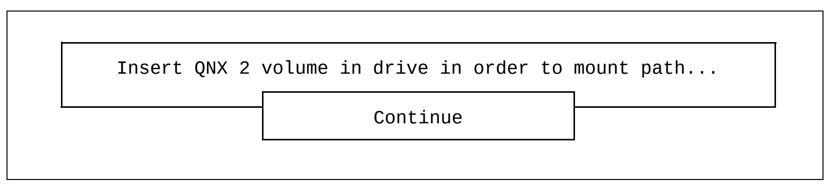

Figure 7-19. Insert Optical Disk Prompt

Provided you insert a QNX 2 optical disk, a QNX 2 file system is mounted. If the disk does not contain a QNX 2 partition the following message in Figure 7-20 appears:

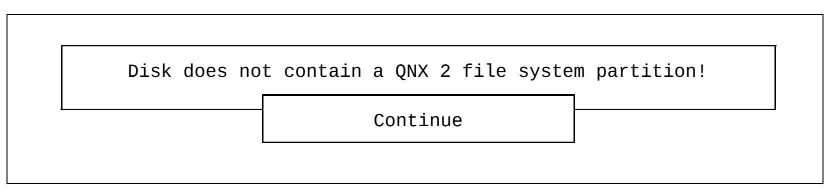

Figure 7-20. Invalid File System Message

Otherwise, the message in Figure 7-21 appears while the QNX 2 file system is being started for either floppy or optical disks.

```
Starting QNX 2 file system...
```

Figure 7-21. Starting File System Message

If the bciQnx2fsys utility fails to start you will see the message in Figure 7-22. This can happen if the utility could not be found, which should not happen!

```
Can't start Qnx2fsys on local computer!
Continue
```

Figure 7-22. Utility Failed Message

The working directory for floppy disks is "/qnx2". The working directory for optical disks is "/qnx2/3". However, drive 3 depends on whether the bciQnx2fsys utility detected any other QNX 2 partitions mounted under the "/dev" directory on start-up. Just in case you have multiple optical disks or still have a QNX 2 partition on your hard disk, use the **-O** command line option to override the default of drive 3. You will have to manually start the bciQnx2fsys utility to determine which drive number the utility assigns to the partition. Floppy and tape archives are imported by loading the entire archive to a temporary work area on the hard disk. The working directory for floppy and tape archives is "/tmp/import".

Once the working directory is chosen, the directory "/bci/pcv/data/trend" is appended for Release 5.x and "/pcw/trend_data" for Releases 4.x. If the disk contains no trend directories or the trend configuration does not match the tags in the real-time database, you will see the warning message in Figure 7-23.

```
Media contains no trend directories!
Continue
```

Figure 7-23. Empty or Invalid Media Message

Otherwise, at this point the screen is replaced with a list of trend directories found under the constructed working directory. You can now view, select and import trend files. Once importing is complete, if a temporary work area was used, all the files underneath it are removed.

The View/Select Trend Directories Screen

The View/Select Trend Directories screen (Figure 7-24) lists all the trend directories found on the media you selected in the Import Trend Data File screen (Figure 7-17). The list is sorted from lowest index to highest. Directories are included only if the old trend index has been assigned to a new Real-Time Database tag index.

```
< View/Select Trend Directories>

 01 trend005      02 trend006      03 trend007      04 trend008
 05 trend012      06 trend013      07 trend014      08 trend015
 09 trend016      10 trend017      11 trend018      12 trend019
 13 trend020      14 trend021      15 trend022      16 trend023
 17 trend024      18 trend025      19 trend026      20 trend027
 21 trend028

F1  View Files                        F2  Import Selected Files
F5  Select All                        F6  Unselect All
F9  Help                              F0  Exit
      < Press <Space Bar> to toggle directory selection >
```

Figure 7-24. View/Select Trend Directories

Press <Left>, <Right>, <Up>, <Down>, <PgUp>, <PgDn>, <Home> and <End> to move between the trend directory names. Press <Space> to toggle the selection of the highlighted trend directory. Selected trend directories are displayed in white, un-selected in green. Selecting a trend directory selects all the files within the directory.

The message in Figure 7-25 is displayed if there are no trend files in the directory. In this case, the directory is not selected.

```
Directory trendXXX contains no files!
             Continue
```

Figure 7-25. Empty Directory Message

Press <F5> to select all the trend directories. This feature avoids making you manually select each individual directory when you simply want to import them all. Depending on the speed of the device, number of directories and files within them, this operation may take some time as the media is being read. A *Working...* message is displayed to let you know that the operation is still in progress. When complete, the screen is refreshed. Selected directories with file in them are displayed in white, empty directories are displayed in green.

Press <F6> to un-select all the trend directories. This operation does not access the media and is therefore very quick. When complete, the screen is refreshed. All trend directories return to being displayed in green.

Press <F1> to view the files within the currently highlighted trend directory. Internally, if no files are attached to the directory, the directory is scanned for files. If the directory is empty, you will see *the Directory trendXXX contains no files!* message. Otherwise, the screen is replaced with a list of trend files found within the directory. Upon returning to this screen, if any files within the directory are selected, the directory is selected and displayed in white. Likewise, if no files within the directory are selected, the directory is un-selected and displayed in green.

Once selection is complete, press <F2> to import the trend files you have selected. The message in Figure 7-26 appears to let you watch the progress as each file is imported.

```
Importing trendXXX/<trend file>
```

Figure 7-26. Importing Trend Message

There are two types of trend data files; periodic and discrete. The version and format of these files is the same for all three supported releases. Each trend file it copied into the trend file area recognized by the data collection system for the real-time server you selected. Files belonging to the same trend index are stored under a common directory. The directory name is based on the real-time database tag index. If the source of the file is from a temporary work area, after copying it is deleted from the temporary area to free up disk space.

If the file came from QNX 2 the file name is changed from “YY_MM_DD_HH.trd” to the data collection system format “CCYYMMDDHH*subtype*.tr.” If the file came from release 5.0, the minute and seconds are dropped and the subtype is added to the file name. The subtype is either **PV**, **SP** or **CO** and distinguishes the three kinds of trends stored under the same directory for a single tag. The file name is based on coordinated universal (Greenwich-Mean) time and is the only format recognized by the data collection system.

Any time-stamp stored in the trend file is converted to universal time. For large discrete trend files this may take some time. A *Working...* message is displayed to let you know that the operation is still in progress. Once imported, each trend file is immediately submitted for archiving to off-line storage.

The data collection system is capable of reading release 5.0 historical trend files in addition to its own high performance file format. However, retrieval performance decreases when accessing trend files.

The View/Select Trend Files Screen

The View/Select Trend Files screen (Figure 7-27) lists all the trend files found in the current trend directory you have highlighted in the previous screen (Figure 7-24). The list is sorted from oldest to newest file. Files are included only if they end with the ".tr" or ".trd" extension. Files under the 4.x release are named "YY_MM_DD_HH.trd" and are based on local time. Files under release 5.x are named CCYYMMDDHHMMSS.tr and are based on coordinated universal (Greenwich-Mean) time. To avoid confusion, the actual time the file represents is displayed next to the file.

```
< View/Select Trend Files >

 01 Tue Mar 15 04:00:00 1994 (19940315090000.tr)
 02 Tue Mar 15 05:00:00 1994 (19940315100000.tr)
 03 Tue Mar 15 06:00:00 1994 (19940315110000.tr)
 04 Tue Mar 15 07:00:00 1994 (19940315120000.tr)
 05 Tue Mar 15 08:00:00 1994 (19940315130000.tr)

F5  Select All                              F6  Unselect All

F9  Help                                    F0  Exit
       < Press <Space Bar> to toggle directory selection >
```

Figure 7-27. View/Select Trend Files

Press <Left>, <Right>, <Up>, <Down>, <PgUp>, <PgDn>, <Home> and <End> to move between the trend file names. Press <Space Bar> to toggle the selection of the highlighted trend file. Selected trend files are displayed in white, un-selected in green.

Press <F5> to select all the trend files. This feature avoids making you manually select each individual file when you simply want to import them all. Depending on the speed of the device and number of files, this operation may take some time as the media is being read. A *Working...* message is displayed to let you know that the operation is still in progress. When complete, the screen is refreshed with all files displayed in white.

Press <F6> to un-select all the trend files. This operation does not access the media and is therefore very quick. When complete, the screen is refreshed. All trend files return to being displayed in green.

BACKUP/RESTORE EDCS DATA

```
--------------------< EDCS Backup Utility >----------------------

 EDCS Server:            PCV.5

 Data Directory:         //5/bci/PCV.5/data/hist

 Backup Device:          /dev/fd0

 Backup Retained Files?  Yes   No

------------------------------------------------------------------
 F1  Backup                              F2  Estimate Backup Size

 F5  Restore

 F9  Help                                F0  Exit
```

Figure 7-28. Backup/Restore EDCS Data

NOTE: The Backup EDCS Data utility need only be used when upgrading your OIS12 console software or moving the server to another machine. Day to day use of this utility is not required as regular backups are done by the archive device.

This EDCS Backup Utility menu (Figure 7-28) is used to back up/restore on-line historical data from/to an EDCS server. You must invoke this menu on the server that you want to back up or restore.

Data Directory This specifies where the historical data resides on the server's hard drive. You will not usually modify this field and is only provided for those users who have customized systems.

Backup Device This is the device that will be receiving the backup archive. By default backups are written to, or read from the first floppy drive (A:) on your local machine but you can redirect the backup to be written to any device on the network by changing this path. For example:

Use second floppy: **/dev/fdl**
Use floppy on node 6: **//6/dev/fdO**
Use optical on node 4: **//4/dev/hd2**

WARNING	**You will lose ALL data currently stored on the specified device. For this reason you will not be allowed to write to any 'mounted' device (except for floppy devices). If you want to back up to an optical device that is being used for archiving you will have to unmount the volume first.**

Backup Retained Files

Retained files are those files maintained on-line but are not part of the working set. You will usually want to back up these files unless:

1. You have an archive device defined and enabled.

   - and -

2. You have archiving enabled for RAW events in all your historical classes.

If the above two cases are true then you do not have to back up retained files because they have already been stored on the archive device.

Note that this switch does not affect the restoration of backed-up data. All data on a backup archive will be restored.

The following function keys are available:

F1 Backup

Perform backup according to the specified parameters. You will receive an error message if you attempt to back up to an illegal device (see Backup Device above).

F2 Estimate Backup Size

Estimates the amount of disk space required to hold the backup. The number of diskettes required to hold the backup is also specified. Note that this is an ESTIMATE and that you may require 1 or 2 more or fewer diskettes than is specified.

F5 Restore

Restores a backup from the Backup Device. All files in the backup will be restored to the Data Directory.

Note that the original source server is not recorded as part of the backup so it is possible to restore files backed up from a different server.

WARNING	**Restoring a backup will remove some of the data collected on the running server. Of note are the gather.gcf and misc.nsf files which contain the statistical and lab/note data respectively. Any statistical or lab/note data stored after the backup was made will be lost when the backup is restored.**

F9 Help

Display this information.

F10 Exit

Exit menu.

SECTION 8 - UTILITIES: PRINTER AND TIME/DATE

PRINTER UTILITIES

Click/press **G** from the Utilities menu to display the Printer Utilities menu (Figure 8-1).

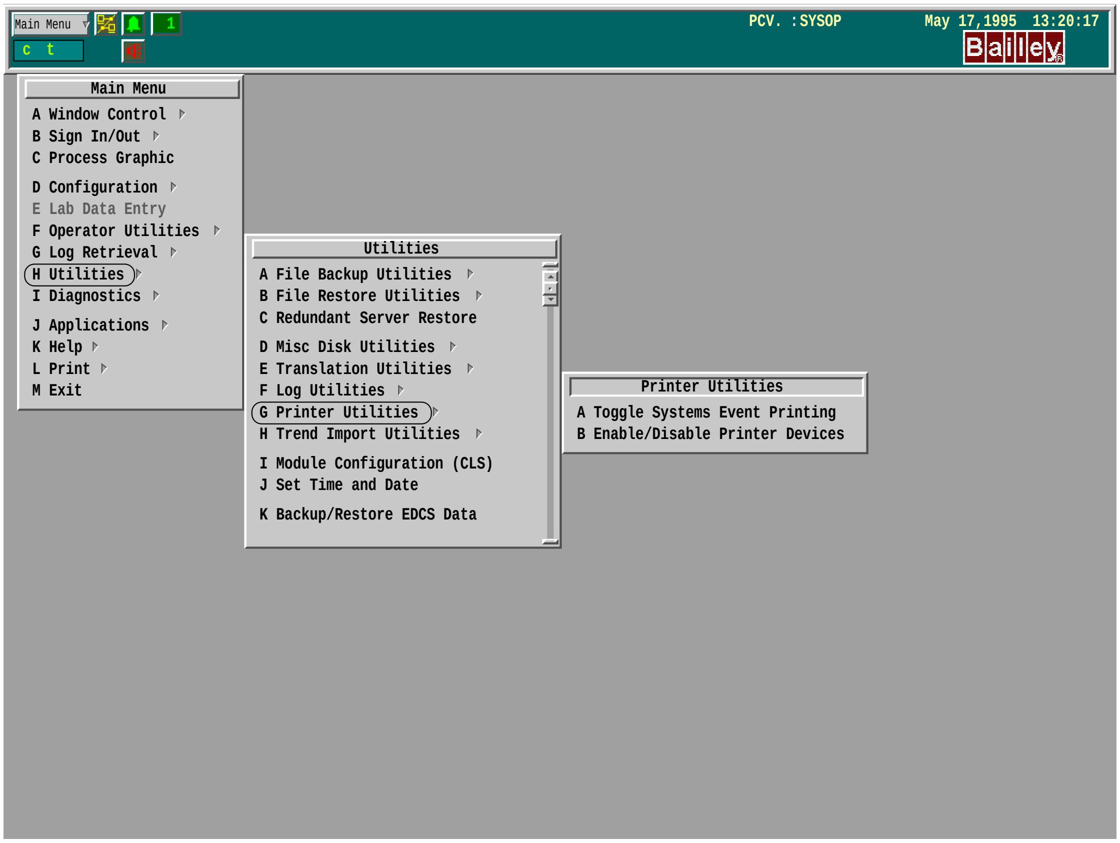

Figure 8-1. Printer Utilities Menu

CONFIGURE PRINTER SPOOLERS

You can have different printers connected to different nodes on the network, each dedicated to a particular type of output. The print spooler setup file must be modified to configure the print devices accordingly.

Default Configuration

The default printer setup (Figure 8-2) has all text, and alarms printed to a parallel printer attached to the first parallel port of the node. All graphics will be printed to a PostScript® printer attached to the second parallel port of the node. This default configuration can be modified at any time.

Changing the Default Printer Configuration

Each OIS12 or OIC12 node has its own spooler started when the system is initialized. The spooler's name is set to

/qnx/spooler#

where the '#' symbol represents the node number of the OIS12 or OIC12 node. Each spooler has the following queues ("devices") defined:

"txt", "txt132", "alarm", "ps", "pictps"

The OIS12 console system requires these queue names to remain unchanged.

Programs direct their output to the spooler device names shown in Table 8-1.

Table 8-1. Standard Logical Printer Devices

Spooler Device Name	Description
/dev/spool/txt	The default device used by many utilities. It is page-oriented and is assumed to leave the printer at top-of-page. It uses the "bciSpool.co" utility to print an 80 char x 60 line page on standard 81/2 x 11 inch paper.
/dev/spool/txt132	The default device used by many utilities. This device is page-oriented and is assumed to leave the printer at top-of-page. It uses the "bciSpool.co" utility to print a 132 char x 80 line page on standard 81/2 x 11 inch paper.
/dev/spool/alarm	The default device used by the alarm management system to print alarm events. It is meant for printing single line reports. This device defaults to 132 char x 80 line format. If a page-oriented device ("/dev/spool/txt", "/dev/spool/txt132", "/dev/spool/pictps") is used before a full page is printed, the page is ejected to top-of-page first. Blank lines and form feeds are ignored.
/dev/spool/pictps	Used to print graphic pages ONLY: it should not be used for any other purpose. It is a page-oriented device and will leave the printer at top-of-page.
/dev/spool/ps	Used to print PostScript files only. It is a page-oriented device and will leave the printer at top-of-page.

To use a printer setup other than the default setup, you must use the Spooler Configuration utility function.

Spooler Configuration

The Spooler Configuration can be called from the **Main Menu, Configuration, Configure Printer Spoolers** menu sequence (Figure 3-1). The list of all configured [txt], [txt132], [alarm], [ps], [pictps] queues of all nodes is displayed. Use <Up>/<Down> and <PgUp>/<PgDn> keys to view a list or select a spooler queue.

First page of the spooler configuration brings a list of configured queues. The selected item is displayed in reversed video.

```
< Spooler Configuration //1 >              Apr 05  03:30:40 PM

Node     Queue         PrinterType      Device

1        txt           Line Printer     /dev/par1
1        txt132        Line Printer     /dev/par1
1        alarm         Line Printer     //2/dev/spool/alarm
1        ps            Post Script      //2/dev/spool/ps
1        pictps        Post Script      /dev/par2

F1  Configure                                F2  Reroute

F9  Help                                     F0  Exit
```

Figure 8-2. Spooler Configuration Menu

Figure 8-2 represents the default settings. You can edit this list and change the spooler routing as desired. If you do not have a second parallel port on your current node, you may want to configure another nodes' parallel port for use with the PostScript Graphic printer.

Configuring a spooler is done in the Queue Configuration menu (Figure 8-3).

```
 < Spooler Configuration    >              Apr 05  03:25:12 PM

Node                    1Queue   [pictps]

Printer Type            Post Script
Max. Files              20
Priority                50
Port                    par1
Picture Type            Open Look

F1  Save

F9  Help                                     F0  Exit
```

Figure 8-3. Queue Configuration Menu

You can configure each Queue for your particular application. Defining the maximum number of files allowed for the queue and the priority of the individual queue. We recommend that you leave the priority settings at default to prevent conflicting with other more critical processes.

Upon saving a spooler configuration the "lpsrv.node" file (on all nodes) will be changed.

Rerouting Spoolers

If during normal operation you find it necessary to re-direct print information from one nodes' print spooler to another, you would do it using the Queue Rerouting function (Figure 8-3).

Rerouting a spooler is done using the Queue Rerouting menu (Figure 8-4). Choose which queue you want to redirect. From the Queue Rerouting menu, choose which node to reroute to.

```
< Queue Rerouting >                    Apr 05   03:25:12 PM

Node     1         Queue    [txt]

Reroute to Node    2



F1  Save

F9  Help                                    F0  Exit
```

Figure 8-4. Queue Rerouting Menu

Shut down and reboot your node for the changes to take effect.

TOGGLING SYSTEM EVENTS PRINTING

Click/press **B** from the Printer Utilities menu (Figure 8-1) to toggle the printing of system events on or off.

ENABLE/DISABLE PRINT DEVICES

Whenever anything is requested to be printed, it is first spooled. Spooling means the printout waits its turn if a printer is busy, then prints when all the printouts ahead of it are finished. You can monitor the status of spooled printouts using the Enable/Disable Printer Devices function.

Click/press **C** from the Printer Utilities menu (Figure 8-1) to display the Spooler Monitor screen (Figure 8-5).

The screen title identifies the name of the spooler queue being viewed. If you have more than one printer, you can view another spooler print queue by pressing <F2>, then entering

```
< Spooler Monitor for '/qnx/spooler/txt' >

Spooler: /qnx/spooler, on node 1
Printer: txt         (ready)

0000:     root [job #1 ]  active 7350 bytes -- standard input --

F1 Cancel Highlighted Job          F2  Change Spooler and Queue Name
F3 Hold All Jobs                   F4  Continue All Jobs
F5  Cancel All Queue Jobs          F6  Cancel Current User Jobs

F9  Help                           F0  Exit to Previous Menu
```

Figure 8-5. Spooler Monitor Screen

the name of the spool queue you want to view in the pop-up window displayed.

Default spool queues are:

- txt - regular text print.
- txt132 - compressed text print.
- alarm - alarm output.
- ps - PostScript output.
- pictps - graphic display permit queue.

The Spooler Monitor Screen lists all printouts waiting for the printer. If the top portion of the screen is empty, there are no printouts being sent to the printer. The printout listed at the top of the screen is currently being printed; printouts listed below are waiting for their turn to use the printer (Figure 8-5).

You can highlight any of the printouts listed by pressing <Up>, <Down>, <PgUp>, <PgDn>, <Home>, and <End>.

ENTER TIME AND DATE

Click/press **I** from the Utilities menu to display the Set System Time and Date screen (Figure 8-7).

Use the <Tab>/<Back Tab> keys to move between fields, alternatively, the mouse may be used to select fields to change. Enter the correct value for the date and time. Select/click on the **Apply** button to change the system time to that which was entered. Select/click on the **Reset** button to reset the fields to the current system time. Select/click on the **Cancel** button or press <Esc> to cancel this dialog.

The arrow buttons may be clicked on, to give an incremental change to that field.

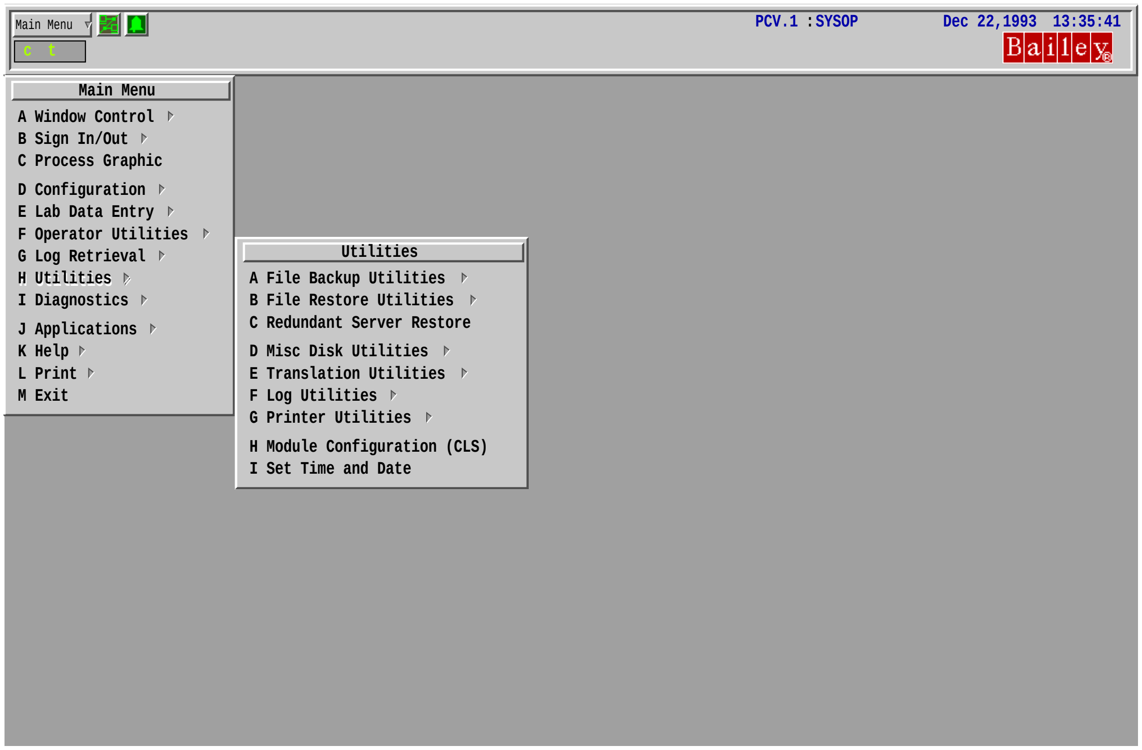

Figure 8-6. Utilities Menu

Figure 8-7. Enter System Time and Date Screen

SECTION 9 - DIAGNOSTIC UTILITIES

OVERVIEW

Click/press **I** from the Main menu to access the System Diagnostics menu (Figure 9-1).

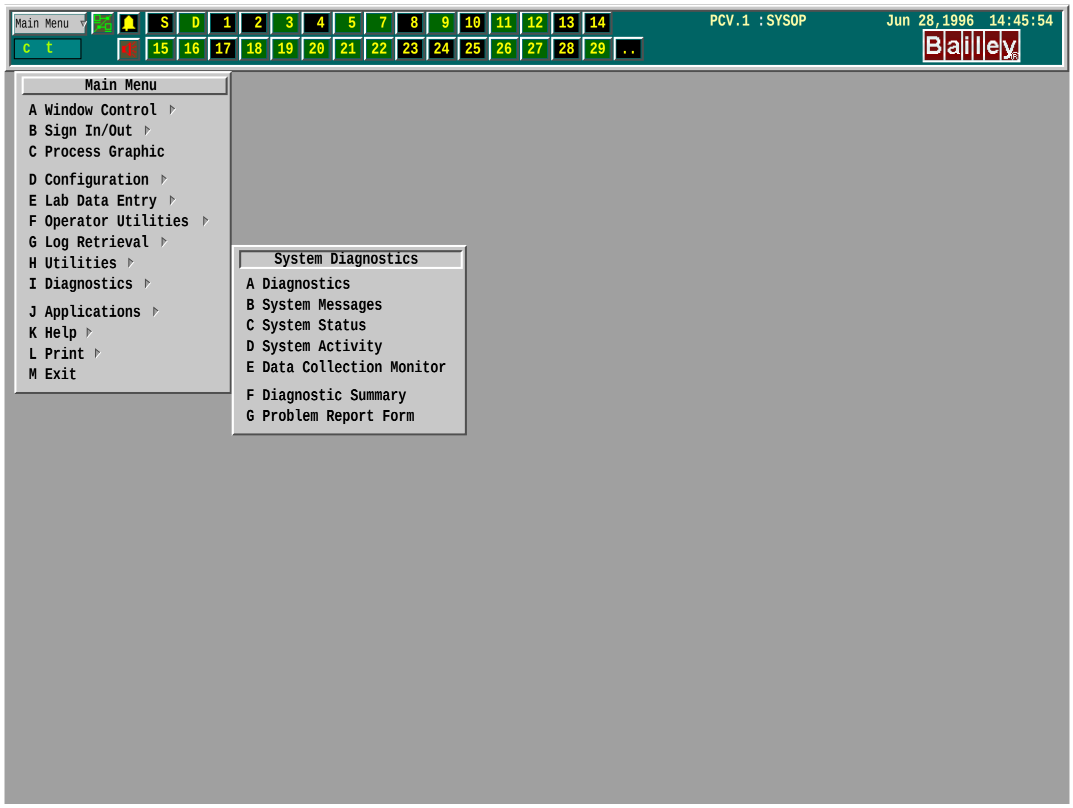

Figure 9-1. System Diagnostics Menu

NODE DIAGNOSTICS

The System Diagnostics menu items apply only to the node it was called from or the Server to which it is attached.

Additional Diagnostics which apply to the Servers only can be requested from the Network Status button menu which is accessed from the Network Status. Refer to ***Network Status Button*** in Section 3 of the ***Operation*** manual.

Diagnostics

Click/press **A** from the System Diagnostics menu to view the System Monitor Diagnostics display (Figure 9-2). This display shows how well the Server is communicating with its CIU.

When the display is requested from a Client node, it will display the status of the Server to which it is attached.

```
                        < System Monitor >

Server      PCV.1
                        CIU Read Statistics
Ring   0  Node   0    CIU02 in 02 mode Rev 5_0    Number of tags 3001
CIU scan time (secs) 0.100(0.000) CIU on-line on Sat Mar 12 17:01:17 1994

Exceptions      23551     9/sec     Specs              9      0/sec
Misc except.        0     0/sec     Sta specs          4      0/sec
Sta except.         4     0/sec     Regen. specs       0      0/sec
Intl except.        0     0/sec     Dis/establish #    0
                           System Errors
    Reply    0  Module   0  Communication      0  General CIU  0
    Restarts 1              Message retries    0  D_admin      0
                       System Point Type Summary
         Station     0   Analog     3   Digital        0
         RCM         0   RMSC       0   DD             0
         MSDD        0   N90 status 0   IntAnalog      0
         IntDigital  0   Text       0   Text String    0
         R MotorCon  0   DA Analog  0   Undefined   2997

                         Press F10 to exit
```

Figure 9-2. System Monitor Diagnostics Display

System Messages

Click/press **B** from the System Diagnostics menu to view the System Message Summary. Messages printed by system tasks are listed on the screen using the QNX "more" utility. You can scroll through the listing by pressing <Up>, <Down>, <PgUp>, and <PgDn>. To exit from the listing, press <Esc>.

The System Message summary is a copy of the previous error log file with the current error log file appended to it.

System Status

Click/press **C** from the System Diagnostics menu to display the System Status. This function is used to verify that the critical OIS12 console system background tasks are running. If all the required tasks are running the message *all system tasks are running* is displayed. Messages are displayed for each task that is not running.

If any task is not running, first check the System Options menu to be sure that the task is enabled, then verify that the task has not been deliberately halted. If the System Status still shows tasks not running that cannot be accounted for, shut down and reboot the node as described in Section 2, ***Basics***, in the ***Operation*** manual. Check System Status again by clicking/pressing **C** from the System Diagnostics menu. If the message *all system tasks are running* is not displayed, call your nearest Elsag Bailey Service Representative.

System Activity

Press **D** from the System Diagnostics menu to view the System Activity Bar Chart (Figure 9-3). A total of 32 priority levels are used in QNX. Idle tasks run at priority 0 and 1. Normally the system will have a large amount of idle time. If any priority, other than priorities 0 and 1, constantly shows a loading in excess of 75%, contact your nearest Elsag Bailey Service Office.

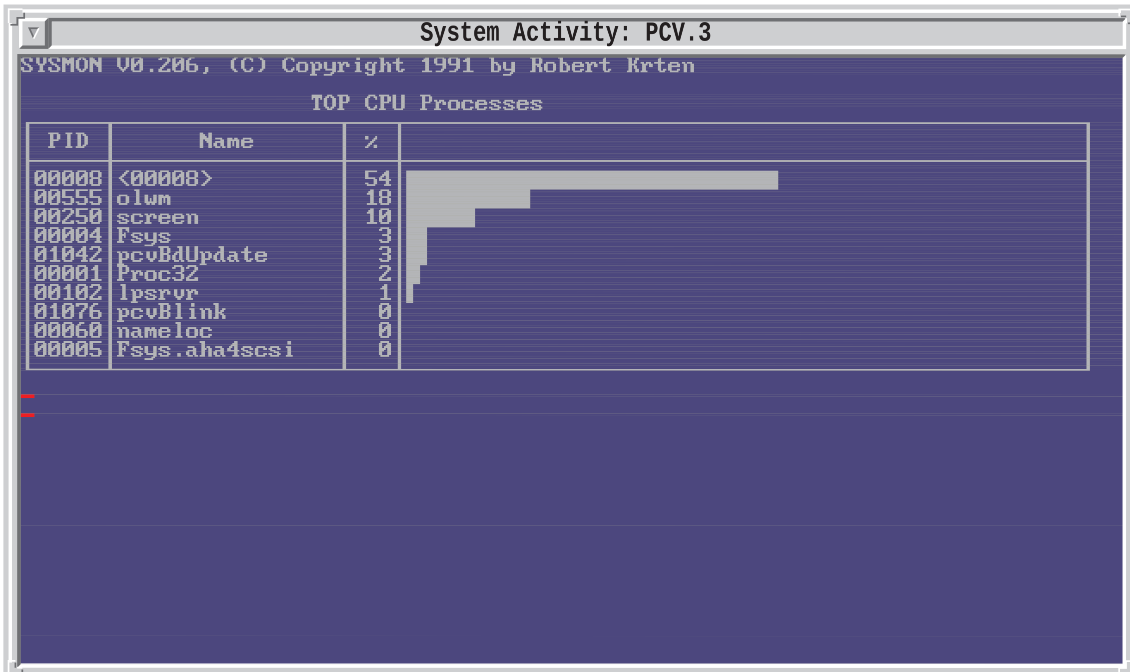

Figure 9-3. System Activity Bar Chart

Data Collection Monitor

The Data Collection Monitor provides information regarding the operation of the EDCS system.

Diagnostic Summary

The Diagnostic Summary form has been developed by Elsag Bailey's Technical Support Group to assist you with providing and standardized report form for reporting the hardware configuration of your OIS12 console system. A hard copy of the completed report should be attached to the Problem Report Form and can be printed and either mailed or faxed to the nearest Elsag Bailey Service Office.

Problem Report Form

The Problem Report form has been developed by Elsag Bailey's Technical Support Group to assist you with providing and standardized report form for reporting any problems you might have been experiencing with your OIS12 console system. A hard copy of the completed report can be printed and either mailed or faxed to the nearest Elsag Bailey Service Office.

SERVER DIAGNOSTICS

The following menus (Figure 9-4) are called by the clicking the right menu button on the Network Status button on the Executive Bar, then clicking the right mouse button on the Server's Status box. These diagnostics allow you to check the status of any Server in the OIS12 console system from any node, provided that the Server Node is not unavailable.

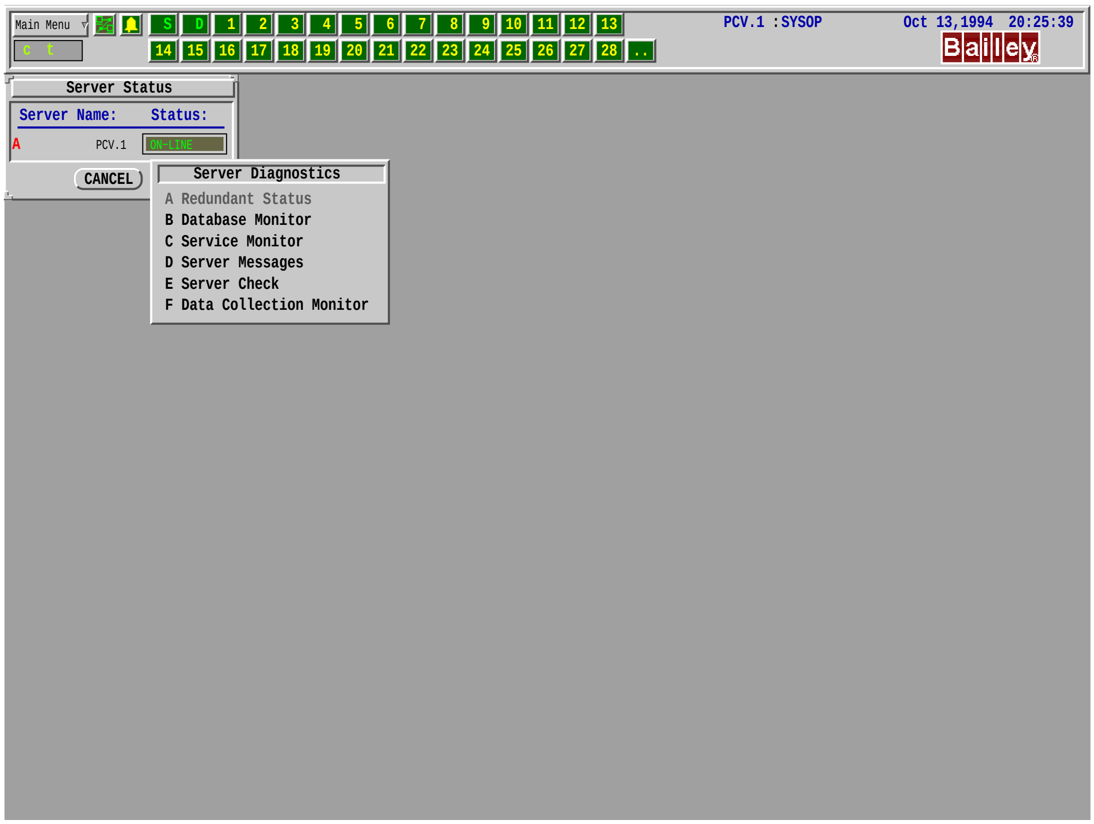

Figure 9-4. Server Status Diagnostics Display

Redundant Status

Press/click on **A** of the Server Diagnostics menu to display the Redundant Server Status. The Redundant Server Status menu displays the current status of the two Servers that make up the Redundant Server pair, provided your OIS12 console system includes this optional package.

Database Monitor

Press/click on **B** of the Server Diagnostics menu to display the Database Monitor. The System Monitor (as described earlier) for selected Server will be displayed.

Service Monitor

Press/click on **C** of the Server Diagnostics menu to display the Service Monitor (Figure 9-5). The Service Monitor displays a summary of the tasks performed by the selected Server.

The state of each task is listed as one of:

ONLINE	component is running.
NOT RUNNING	component is not running.
SUSPECT	component is running but showing problems.

The term *critical* maybe displayed to the right of a particular task's state. This indicates that in the case of redundant Servers, the redundant Server will take over the task in the event that the primary Server fails.

```
Local Families
ARCH_CAT             ONLINE CRITICAL
  ARCH               ONLINE CRITICAL
BCI.5 : ONLINE
  TONER              ONLINE
  SECURITY           ONLINE CRITICAL
 MIRROR              ONLINE
  LAN_CONFIG         ONLINE
  EVENT_TIMER        ONLINE
  ERROR_DEVICE       NOT RUNNING
PCV.5 : ONLINE PRIMARY
  TREND              ONLINE
  SYS_EVENT          ONLINE
  SPC_ADMIN          NOT RUNNING
  SCANNER_CIU        ONLINE
  PERIODIC_LOGS      ONLINE
  HIST_STORAGE       ONLINE
  HIST_RETRIEVAL     ONLINE
  HARMONY            ONLINE
  GLOBAL_ACK         ONLINE
  DATABASE           ONLINE CRITICAL
  CIU_SCANNER        ONLINE CRITICAL
  ALARMS             ONLINE CRITICAL
```

Figure 9-5. Service Monitor

Server Messages

Press/click on **D** of the Server Diagnostics menu to display the Server Messages. The System Messages (as described earlier) for the selected Server will be displayed.

Server Check

Press/click on **D** of the Server Diagnostics menu to display the Server Check. The System Status (as described earlier) for the selected Server will be displayed.

Data Collection Monitor

Press/click on **E** of the Server Diagnostics menu to display the Data Collection Monitor. The Data Collection Monitor is the same as described earlier, however, from this menu you can select the Server to monitor.

SECTION 10 - DATABASE LOADER

OVERVIEW

These are the steps in configuring the OIS12 console using SLDG 5.6.1:

1. In SLDG 5.6.1:

    a. Specify system type “PCV 5.x”, upon which the OIS12 console is based.

    b. Create an alarm comment list.

    c. Create an appropriately named tag database (e.g., “TAG-FILE.DBF”).

    d. Create an appropriately named trend configuration (e.g., “TRENDS.DBF”).

    e. Create the process graphic symbols and displays.

    f. Translate alarm comment list and tag database into ASCII files, updating Engineering Unit and Logic State Descriptor files.

    g. Translate the trend configuration into an ASCII file.

2. On the OIS12 console:

    a. Enable desired console options (i.e., Enhanced Data Collection).

    b. Load the binary database files for Engineering Unit and Logic State Descriptors.

    c. Reboot the console.

    d. Import the ASCII tag database and alarm comments with Database Loader.

    e. Import the ASCII trend configuration with Trend Loader.

    f. Import the process graphic symbols and displays with the Graphics Importer.

    g. Convert the process graphic displays with the Graphics File Manager.

NOTES:

1. Certain steps must be executed in a specific order. If there are any changes to Descriptors, load these before loading the tag database. Import any changed tag database records before importing trends. Graphics may be imported before or after any of the other configuration items.

2. Tag databases and trend configurations must be imported into OIS12 Server consoles (consoles interfaced to INFI-NET). Graphics may be imported into any Server or Client (operator) console. Transfer files from the EWS to the consoles, either manually using MS-DOS format floppy diskettes, or over the network after rebooting the EWS as a diskless client console and then referencing the DOS partition containing the configuration files.

DATABASE LOADER

The Database Loader provides a menu-driven utility to import/export an ASCII database. To access the Database Loader menu perform the following steps:

From the Main menu, press/click **D - Configuration**, then press/click **H - Database Loader** to display the Database Loader menu, then press/click **A - Tag Loader** (Figure 10-1).

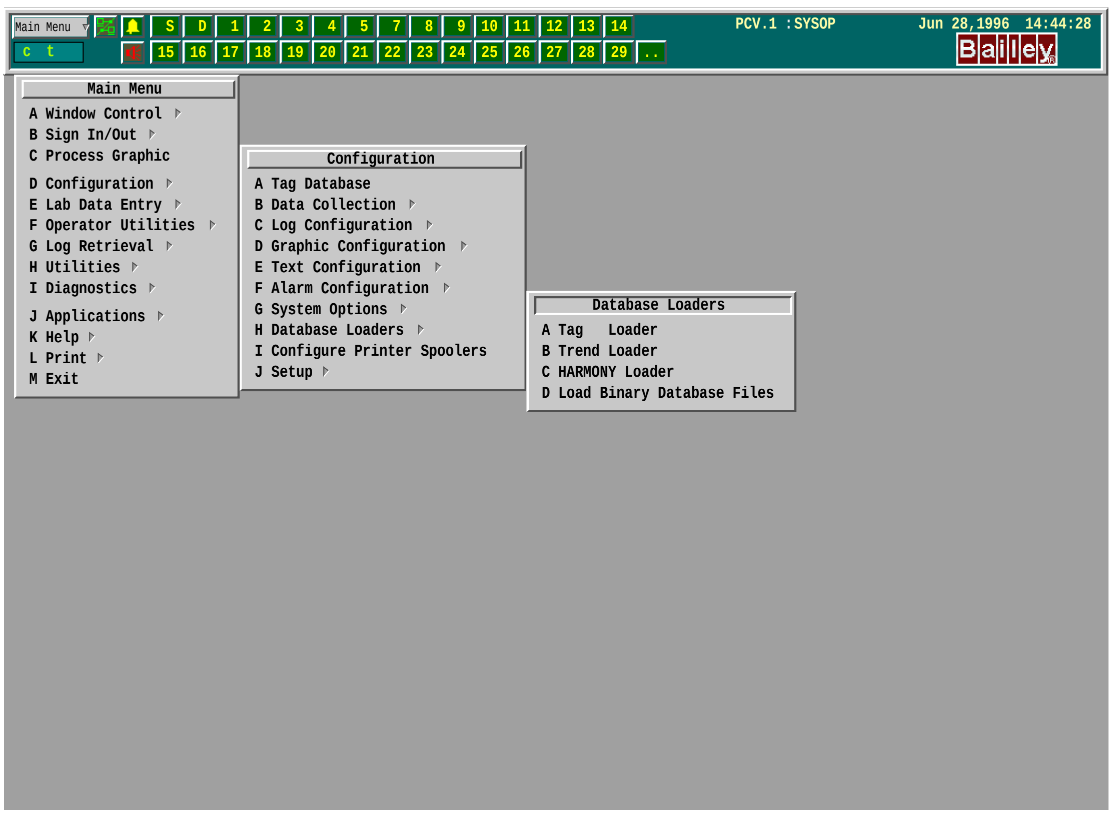

Figure 10-1. Tag Loader Menu

```
< Database Loader >

Format File Name                      oisl.fmt
Format Description                    PCV <==> ASCII (MCS rev L)
First Index in Configuration             1
Last  Index in Configuration          3000
Index Offset                             0
Database Server                       PCV.1

F1  Select Offset                     F2  Select First Index
F3  Select Format                     F4  Select Last Index
F5  Select Server                     F6  Import Tags
F7  Export Tags                       F8  View   Tags
F9  Help                              F0  Exit to Previous Menu
```

Figure 10-2. Database Loader Menu

An explanation of the functions keys associated with this menu is given in Table 10-1.

Table 10-1. Operation of Function Keys in Database Loader

Function Key	Operation
F1	Sets the offset that will be added to the index number when files are being read or written.
F2	Sets first index to include in generated configuration files.
F3	Select a format. OISI.fmt and OISS.fmt are the only choices.
F4	Sets last index to include in generated configuration files.
F5	Select the server to load tags to.
F6	Overwrites existing database files with tag data from the specified ASCII file.
F7	Initiates the building of an ASCII text file using the currently selected format. Enter the file pathname of the ASCII text file to be generated. Five configuration files: tagname.cf, tagdesc.cf, custtgid.cf, tagcnfg.cf, almdesc.cf are used in generating the text file.
F8	Displays all tags of the ASCII file starting from the first tag in the file, the selected index, or a selected tag name.
F9	Invokes the help screens.
F10	Exits to the previous menu.

Earlier releases supported only the MCS rev L tag database ASCII format definition, “oisl.fmt”. For compatibility with earlier configurations, this format definition is still available. However, the default format definition, “oiss.fmt”, supports the additional parameters required for the TextStr tag type and an alarm comment list separated from the rest of the tag database definition. The “oiss.fmt” format definition is compatible with MCS rev S.1 and OIS-40 rev E.1 configurations in ASCII format.

For the OIS12 console, SLDG 5.6.1 will create an S.1 format tag database, as described in Instruction Manual ***Personal***

Computer Software Console Configuration Utilities (Release SLDG 5.6), Table 4-8: Tag List Attributes for MCS and MCS PLUS S and Later, IIOIS20 E and Later, 40 Series E and Later, OAS E and Later. The OIS12 console supports the L.3/M.1 format tag database used with earlier versions of LAN-90 PCV but the S.1 format has these advantages:

- Includes additional fields required by Text String tags.
- Reduces space requirements by putting alarm comments into a separate file, indexed by the tag record, to eliminate duplicate and empty alarm comments.

Refer to Table 10-5. Tag List Attributes for the S.1 tag format fields used by OIS12's Database Loader.

> **NOTE:** Avoid the use of User Fields when creating the tag database. User Fields add 132 bytes to every tag record and are ignored by the OIS12 console.

SLDG 5.6.1 translates a tag database into the following ASCII files:

- A tag database file with the file extension ".TTG" file (e.g., "TAG-FILE.TTG").
- An alarm comment file named "ALRMCMNT.TAC".

Tag database files are often too large to fit on a single floppy diskette. Use an ASCII editor to split the tag database file into smaller files (perhaps 2000 tags each), which can be separately imported into the OIS12 console. Include the alarm comment file on each tag database diskette.

Specifying first and last tag indices and a tag index offset is useful when merging or splitting tag databases. Use the <F2>, <F4>, and <F1> keys respectively. One central SLDG tag database can be split into several OIS12 console tag databases. Specifying the first and last tag indices allows you to choose a specified range of tags to be imported from the common tag database.

Or, if several individuals have configured different portions of a console tag database, the different portions can be separately imported by using the tag index offset to load each portion into the appropriate range of tag records.

The tag index is always added last. Use the View Tags <F8> key to verify that the correct tag records will be imported: For example, tags with indices in the range 1201 to 1600 could be imported into the range 2501 to 2900 by specifying First Index = 1201, Last Index = 1600, and Offset = 2500.

NOTE: The OIS12 console creates a temporary file when exporting tag databases. If there is insufficient space for the tag database file or alarm comment file, or if the destination is write-protected, an error message will be displayed with the temporary files name, “ascidb.txt”.

If you wish to use L.3/M.1 tag format for compatibility with earlier consoles, use the <F3> key to specify the “oisl.fmt” format file in place of the default “oiss.fmt”.

NOTES:

1. The Software Logging Database Graphics (SLDG) revision 5.6 configuration tool includes the definition of PCV 5.x as a console type. If using an earlier version of SLDG, specify OIS-40 E.1 as the console type.

2. The First Index cannot be greater than the Last Index. The difference between Last Index and First Index must not exceed the size of the tag database. Therefore, if importing a subset of a large configuration into a system with a small tag database, a few steps may be necessary to specify the desired range of tag indices. For example if tags between 1001 and 1500 are to be imported into a 500 tag database, do these steps:
   (1) set First Index to 500;
   (2) set Last Index to 999;
   (3) set First Index to 999;
   (4) set Last Index to 1498;
   (5) set First Index to 1001;
   (6) set Last Index to 1500;
   (7) import the tag definitions.

3. When importing tags, you will be asked if you wish to first remove the existing tag definitions for the desired range of tags. This is a convenient way to “Undefine” a range of tags. If the displayed range of tags to be removed does not match the range you expect to use, press the <Esc> key on the keyboard.

You may import and export tag definitions for any Server node your console node is connected to through a Local Area Network (LAN). Tag definitions can be imported from or exported to either a QNX or DOS format hard disk partition or floppy.

TREND LOADER

The Trend Loader is a menu-driven utility to import/export an ASCII trend definition.

To access the Trend Loader:

From the Main menu, press/click **D - Configuration**, then press/click **H - Database Loader** to display the Database Loader menu, then press/click **B - Trend Loader**.

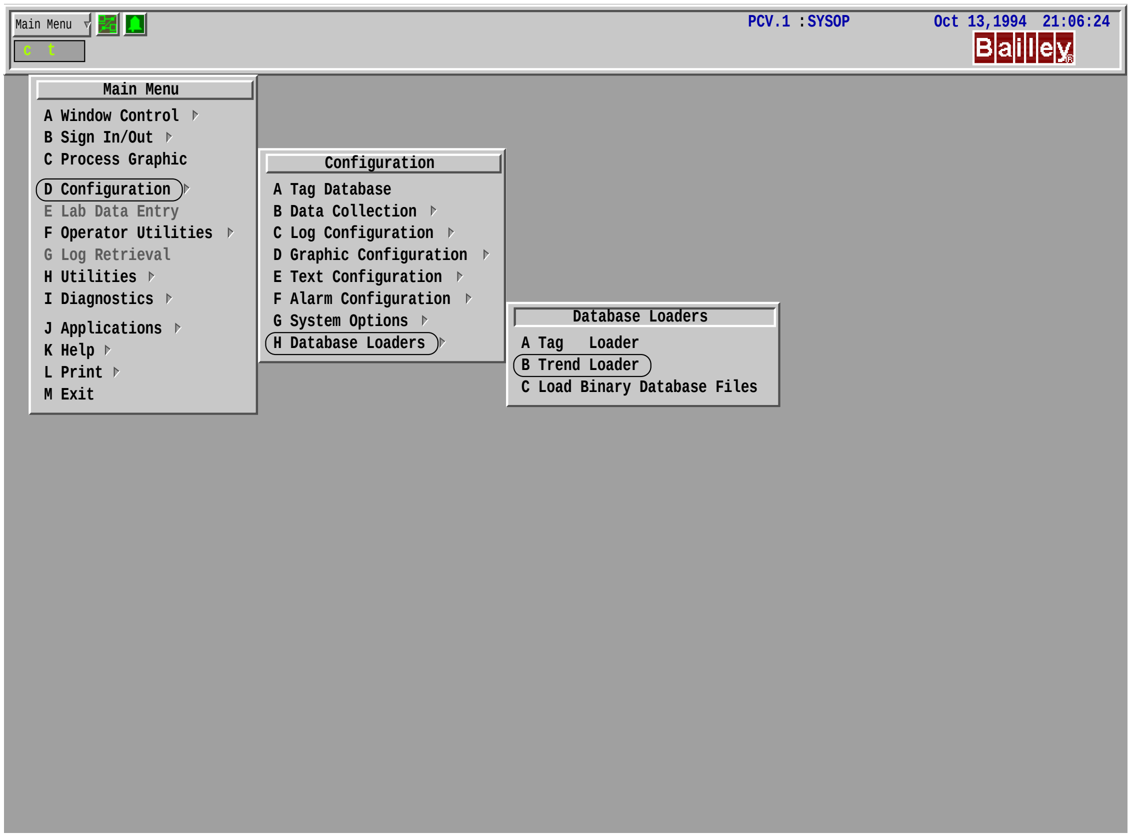

Figure 10-3. Selecting the Trend Loader Menu

```
                        < Trend Loader >

Format File Name                    trnd_dat.fmt

Format Description                  PCV <==> ASCII (MCS rev L)

First Index in Configuration          1

Last  Index in Configuration        500

Index Offset                          0

Trend Server                        PCV.1


F1  Select Offset                   F2  Select First Index
F3  Select Format                   F4  Select Last Index
F5  Select Server                   F6  Import Tags
F7  Export Tags                     F8  View   Tags
F9  Help                            F0  Exit to Previous Menu
```

Figure 10-4. Trend Loader Menu

Table 10-2 explains the operation of the function keys in the Trend Loader menu.

NOTE: An ASCII trend definition file must have a ".ttr" extension. It may be transferred to or from the DOS partition or a DOS-formatted floppy disk.

Table 10-2. Operation of Function Keys in Trend Loader

Function key	Operation
F1	Sets the offset that will be added to the index number when files are being read or written.
F2	Sets first index to include in generated configuration files.
F3	Selects a conversion format to be used. The “trnd_dat.fmt” file is the default file format. This format for trend list is produced using SLDG package. The “trnd_pcv.fmt” file can be used for a trend list prepared using the dBase structure in Table 10-3. Use edit checking to limit the entries as listed in Table 10-4. The “trnd_s1.fmt” format is used with MCS rev R or OIS-40 rev D or later.
F4	Sets last index to include in generated configuration files.
F5	Selects the server to load trends to.
F6	Initiates the updating of the trend configuration file using the currently selected format. Enter the file pathname of the ASCII text file to be converted. The trend configuration file “trenddef.cf” will be updated.
F7	Initiates the building of an ASCII text file using the currently selected format and the “trenddef.cf” file. Enter the file pathname of the text file to be generated.
F8	Lists trends defined in the ASCII file starting from the first trend index, the selected index of a selected tag name.
F9	Invokes the help screens.
F10	Exits to the previous menu.

To import trend configurations from SLDG, the OIS12 console creates the following Enhanced Data Collection classes:

- 2 second (data sampled every 2 seconds).
- 15 second (data sampled every 15 seconds).
- 1 minute (data sampled every 60 seconds).
- 10 minute (data sampled every 250 seconds).

The SLDG 5.6.1 trend configuration can be used to assign up to 2000 tags to the above four classes. The mandatory fields are the tag name, the resolution number and resolution units. The latter two fields are used to specify the historical class (e.g., 15S for 15seconds). Remember that Station tags need only be specified once for the OIS12 console, not as separate process value, set point, control output, and ratio trends. After importing a trend configuration from SLDG 5.6.1, the definitions of collection classes can be edited on-line to change any parameter (e.g., sampling rates and retention periods). If desired, new collection classes can be defined and tags can be reassigned on-line, to these new collection classes.

By default, the OIS12 console uses the “trnd_dat.fmt” trend format file for compatibility with SLDG 5.6.1. For compatibility with LAN-90 PCV Software Release 4.3A, 4.3B, and 5.0A, a native trend format file, “(trnd_pcv.fmt)” is also provided. This native trend format has additional information to more precisely define the OIS12 console trend configurations.

To accept trend configurations defined for the MCS rev S.1 and OIS40 series rev E.1 consoles, the OIS12 console has an additional trend format file, “trnd_s1.fmt”, which assigns:

- Tags for NORMAL trends to the “1 minute” collection class.
- Tags for FAST trends to the “15 second” class.
- Tags for ENHANCED trends to the “2 second” class.

SLDG 5.6.1 translates a trend configuration into an ASCII file with the file extension “.TTR” (e.g., “TRENDS.TTR”).

After importing a trend configuration created for another console type, the Enhanced Data Collection System may report fewer tags being collected than the number of trends in the configuration. This is not an error. The difference occurs when a trend configuration separately trends more than one of the process value, control output, set point, and ratio index for the same Station tags. The EDCS combines these into one collection, causing the apparent discrepancy.

When the OIS12 console exports trend configurations, the first and last indices are used to select the range of tags that will be processed and the tag index will be exported, with index offset added, for those tags assigned to Enhanced Data Collection System collection classes.

For example, if First Index = 1201, Last Index = 1600, and Offset = 2500, trend records for tags between 1201 and 1600 would be written with tag indices 2501 through 2900.

However, exporting trend configurations is usually less useful than importing trend configurations. The extended features of the OIS12's Enhanced Data Collection are not fully defined by a trend configuration. Exporting a data collection configuration as a trend configuration may include tags which cannot be trended on other consoles (i.e., Text String tags) and will not specify trending of a Station tags set point, control output, and ratio index.

SLDG 5.6.1 is a good tool for the initial configuration of trends on OIS12 consoles, especially if the trends are to be compatible with those on other Elsag Bailey consoles.

Table 10-3. OIS Trend Configuration

OIS Trend Configuration (dBASE Format)						Description
Field	Field Name	Type	Width	Dec	Col	
1	TRINDEX	Numeric	4	0	1	Trend index
2	TAGINDEX	Numeric	5	0	5	Trended tag index
3	TAGNAME	Character	14		10	Trended tag name
4	TRRESNUM	Numeric	2	0	24	Resolution number
5	TRSPNUNIT	Character	1		26	Resolution units

Table 10-3. OIS Trend Configuration (continued)

OIS Trend Configuration (dBASE Format)						Description
Field	Field Name	Type	Width	Dec	Col	
6	TRSPNUM	Numeric	2	0	27	Trend span number
7	TRRESUNIT	Character	1		29	Span units
8	TRMODE	Character	3		30	Collection mode
9	TRMETHOD	Character	4		33	Collection method
10	TRTYPE	Character	4		37	Trend type
11	TRSUBTYPE	Character	2		41	Trend subtype
12	TRRET	Numeric	2	0	43	Number of retentions
13	TRFILL	Character	1		45	Fill type (discrete only)

Table 10-4. Valid Entries for Trend Definition Fields

Field Name	Valid Entry
TRINDEX	1 - 500
TAGINDEX	1 - 5000
TAGNAME	14 characters (tag must be already configured)
TRRESNUM	2, 15 (secs), 1, 10 (min), 1 (hour), 0 (discrete)
TRRESUNIT	'S' - secs, 'M' - min, 'H' - hours, 'D' discrete
TRSPNUM	1 - 240
TRSPNUNIT	'H' - hours
TRMODE	'SMP' - sample
TRMETHOD	'EXCP' - exception
TRTYPE	'NORM' - normal
TRSUBTYPE	'CO' -control output, 'SP' -set point, 'CO' -control output, 'RA' -ratio index, 'PV' -all other
TRRET	1 - 64
TRFILL	'S' - step, 'L' - linear (valid for discrete trends)

ATTRIBUTES OF DATABASE TAG TYPES

SLDG 5.6.1 can be used to edit tags in an Enhanced Mode where the fields for each tag are specified, or in a Normal Mode (dBASE Browse) where the user must know which fields are to be defined for each tag type. Table 10-5 shows the database fields and indicates which tags use these fields.

NOTES:

1. Many of the tag fields which are imported will be overwritten by specifications when the tag is connected to the blockware by the interface to the INFI-NET. Examples are Engineering Unit Zero (VAL0), Engineering Unit Span (SPAN), and Engineering Unit Descriptor (EUDESC). For most purposes, these can be treated as being only descriptive information.

2. The SLDG 5.6.1 DANG, DADIGTL, DADIG, and DEVSTAT tag types are not supported by the OIS12 console. Use the DAANALG tag type in place of the DANG tag type.

The DEVSTAT tag types are used by MCS consoles to track internal conditions on the consoles. The OIS12 console runs with different hardware and thus does not support the DEVSTAT tag type.
The OIS12 console does not currently support the Data Acquisition Digital function block (Function Code 211) which is used by DADIGTL and DADIG tags in SLDG.

The DAANALG and DANG tag types are for the Data Acquisition Analog function block (Function Code 177). SLDG assigns extra fields to the DAANALG. The OIS12 console will import these extra fields (for example H2DELTA) but then replaces these with values from the blockware, thus treating a DAANALG tag as if it were a DANG tag. The OIS12 console DAANALG tag type is therefore the equivalent of both the SLDG DAANALG and DANG tag types.

When comparing S.1 tag format to L.3/M.1 tag format, the following differences are found:

- L.3/M.1 High Alarm Comment (64 characters) is replaced by S.1 Alarm Comment 2 (5 digits).

- L.3/M.1 Low Alarm Comment (64 characters) is replaced by S.1 Alarm Comment 3 (5 digits) or, if digital, Alarm Comment 1 (5 digits).

- L.3/M.1 Alarm Priority is replaced by S.1 Alarm Priority 1.

- Alarm Inhibit Tag has 14 characters in L.3/M.1 and 5 digits in S.1.

- High Variable Alarm Tag has 14 characters in L.3/M.1 and 5 digits in S.1.

- Low Variable Alarm Tag has 14 characters in L.3/M.1 and 5 digits in S.1.

- Device Number is labelled DEV_NUM in L.3/M.1 and is labelled DEV_NUMBER in S.1 (This applies to the DEVSTAT tag type which is not supported).

Table 10-5. Tag List Attributes

Tag List	Application[1]																	
Attribute	**ANALOG**	**DIGITAL**	**N90STA**	**RCM**	**RMSC**	**STATION**	**DD**	**MSDD**	**RMCB**	**INTANG**	**INTDIG**	**DAANALG**	**TEXT**	**TEXTSTR**	**FIELD/WITH[2]**	**OIS[3]/N90/INFO**	**INPUT BY[5]**	**Description**
TAGINDEX[4]	X	X	X	X	X	X	X	X	X	X	X	X	X	X	5N	M	B	Identifies the tag by number. Range: PCV 5.1 1-5000.
TAGNAME[4]	X	X	X	X	X	X	X	X	X	X	X	X	X	X	14C	M	C	Identifies the tag by name.
TAGDESC	X	X	X	X	X	X	X	X	X	X	X	X	X	X	32C	M	C	Describes the tag, its function, location, etc. (enter as two 16-character fields).
CUSTTAGID	X	X	X	X	X	X	X	X	X	X	X	X	X	X	32C	M	C	Additional description for the tag (optional).
TAGTYPE[4]	X	X	X	X	X	X	X	X	X	X	X	X	X	X	7C	M	C	Tag type name.
EUDESC															6C	M	C	Engineering units (EU) name.
EUINDEX	X				X	X				X		X			3N	N	B	Engineering units index number.
VAL0	X				X	X				X		X			11N	N	C	0% value (in EU).
SPAN	X				X	X				X		X			11N	N	C	Span (in EU).
SETPTVAL0						X									11N	N	C	0% value on the set point scale (in EU).
NUMDECPL	X				X	X				X		X			1N	M	C	Number of decimal places to use displaying the value; range: 0-6.
ZEROSTATE		X		X			X	X	X		X				6C	M	C	Zero state descriptor name.
ONESTATE		X		X			X	X	X		X				6C	M	C	One state descriptor name.
TWOSTATE								X							6C	M	C	Two state descriptor name.
THREESTATE								X							6C	M	C	Three state descriptor name.
FB1_0STATE							X	X							6C	M	C	Zero state descriptor name for feedback input 1.
FB1_1STATE							X	X							6C	M	C	One state descriptor name for feedback input 1.
FB2_0STATE							X	X							6C	M	C	Zero state descriptor name for feedback input 2.
FB2_1STATE							X	X							6C	M	C	One state descriptor name for feedback input 2.
FB3_0STATE								X							6C	M	C	Zero state descriptor name for feedback input 3.
FB3_1STATE								X							6C	M	C	One state descriptor name for feedback input 3.
FB4_0STATE								X							6C	M	C	Zero state descriptor name for feeedback input 4.
FB4_1STATE								X							6C	M	C	One state descriptor name for feedback input 4.
LOOP[4]	X	X	X	X	X	X	X	X	X			X	X	X	3N	M	B	INFI 90 OPEN loop address; range: 0-255.
PCU[4]	X	X	X	X	X	X	X	X	X			X	X	X	3N	M	B	INFI 90 OPEN PCU address; range: 0-255.
MODULE[4]	X	X	X	X	X	X	X	X	X			X	X	X	2N	M	B	INFI 90 OPEN module address; range: 0-31.
BLOCK[4]	X	X	X	X	X	X	X	X	X			X	X	X	4N	M	B	INFI 90 OPEN block address; range is module dependent.
ALMSTATE		X		X			X	X	X		X		X		6C	N	C	Logic state descriptor name for alarm state.
ALARMTYPE												X			3C	M	C	Type of alarming.
HALARM	X					X				X		X			11N	N	C	High alarm value (in EU).

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Table 10-5. Tag List Attributes (continued)

Tag List									Application[1]								
Attribute	**ANALOG**	**DIGITAL**	**N90STA**	**RCM**	**RMSC**	**STATION**	**DD**	**MSDD**	**RMCB**	**INTANG**	**INTDIG**	**DAANALG**	**TEXT**	**TEXTSTR**	**FIELD/WITH[2]**	**OIS[3]/N90/INFO**	**INPUT BY[5]**	**Description**
H2ALARM												X			11N	N	C	2-high alarm value (in EU).
H3ALARM												X			11N	N	C	3-high alarm value (in EU).
LALARM	X					X				X		X			11N	N	C	Low alarm value (in EU).
L2ALARM												X			11N	N	C	2-low alarm value (in EU).
L3ALARM												X			11N	N	C	3-low alarm value (in EU).
ALARMDB												X			11N	N	C	Deadband must be a positive number specified in EU.
HVARALMTAG												X			5N	N	C	High variable alarm tag index: the value of the tag determines the high variable alarm limit.
H2DELTA												X			11N	N	C	Delta value added to the high variable alarm value to give the 2-high variable alarm value; must be a positive number specified in EU.
H3DELTA												X			11N	N	C	Delta value added to the high variable alarm value to give the 3-high variable alarm value; must be a positive number specified in EU.
LVARALMTAG												X			5N	N	C	Low variable alarm tag index; the value of this tag determines the low variable alarm limit.
L2DELTA												X			11N	N	C	Delta value subtracted from the low variable alarm value to give the 2-low variable alarm value; must be a positive number specified in EU.
L3DELTA												X			11N	N	C	Delta value subtracted from the low variable alarm value to give the 3-low variable alarm value; must be a positive number specified in EU.
ALMINHTAG	X	X	X	X		X	X	X	X	X	X	X	X	X	5N	M	C	Index of tag which inhibits alarms.
ALMINHST	X	X	X	X		X	X	X	X	X	X	X	X	X	2C	M	C	Alarm inhibiting state (A, H, 2H, 3H, L, 2L, 3L, HD, LD).
PRIMDISP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	8C	M	C	Name of display called from an alarm summary, or from operating parameters for this tag.
ALMGROUP	X	X	X	X		X	X	X	X	X	X	X	X	X	2N	M	C	Alarm group number for this tag; range: 0-99 (0 is used for tags, not alarms).
ALMACKBC	X	X	X	X		X	X	X	X	X	X	X	X	X	1C	M	C	Broadcast alarm acknowledge messsages for this tag (Y/N).
ALMACKNL	X	X	X	X		X	X	X	X	X	X	X	X	X	2N	M	C	Node list number for broadcasting alarm acknowledge messages; 0-4 (0=broadcast to all nodes which have INFI 90 OPEN status (N90STA) tags configured in this OIS console).
ALMACKTR			X												1C	M	B	Transmit alarm acknowledge messages to this node (Y/N); valid only for OIS and computer INFI 90 OPEN status (N90STA) tags.
ALMSILTR			X												1C	M	B	Transit alarm silence messages to this node (Y/N); valid only for OIS and computer INFI 90 OPEN status (N90STA) tags.
ADSKEYBD	X	X	X	X		X	X	X	X	X	X	X	X	X	2N	M	C	ADP keyboard number; range: 0-4 (0 = all keyboards).

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Table 10-5. *Tag List Attributes (continued)*

Tag List									Application[1]								
Attribute	**ANALOG**	**DIGITAL**	**N90STA**	**RCM**	**RMSC**	**STATION**	**DD**	**MSDD**	**RMCB**	**INTANG**	**INTDIG**	**DAANALG**	**TEXT**	**TEXTSTR**	**FIELD/WITH[2]**	**OIS[3]/N90/INFO**	**INPUT BY[5]**	**Description**
ADSPANEL	X	X	X	X		X	X	X	X	X	X	X	X	X	2N	M	C	ADP number; range : 0-4 (0 = all panels, 1 = panel 1, 2 = panel 2, 3 = panel 3, 4 = panel 4).
ADSLAMP	X	X	X	X		X	X	X	X	X	X	X	X	X	2N	M	C	ADP number; range: 0-64 (0 indicates no ADP function) (the ADP keyboard, panel and lamp numbers define the full address of the lamp to light when this tag goes into alarm.
PR_ALARM	X	X	X	X		X	X	X	X	X	X	X	X	X	1C	M	C	Print alarms for this tag in the event log? (Y/N).
SV_ALARM	X	X	X	X		X	X	X	X	X	X	X	X	X	1C	M	C	Save alarms for this tag on disk? (Y/N).
PR_STCHNG		X		X			X	X	X		X				1C	M	C	Print state changes for this tag in the event log? (Y/N).
SV_STCHNG		X		X			X	X	X		X				1C	M	C	Save state changes for this tag on disk? (Y/N).
PR_OPACT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1C	M	C	Print operator actions for this tag in the event log? (Y/N).
SV_OPACT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1C	M	C	Save operator actions for this tag on disk? (Y/N).
MODTYPE			X												8C	M	B	Module type.
MODREV			X												2C	I	B	Revision level of modtype.
TP0TYPE															2N	M	B	Terminal type for terminal emulation mode, NIU port 0 (0 = terminal not configured, 1 = VT220 terminal, 2 = HP2392); valid only for NIU INFI 90 OPEN status (N90STA) tags.
TP1TYPE															2N	M	B	Terminal type for terminal emulation mode, NIU port 0 (0 = terminal not configured, 1 = VT220 terminal, 2 = HP2392); valid only for NIU INFI 90 OPEN status (N90STA) tags.
TP0LANG															1N	M	B	Language type for terminal emulation.
TP1LANG															1N	M	B	0 = USA, 1 = Norwegian.
PM1_0STATE									X						6C	M	C	Permissive state descriptors for RMCBs.
PM1_1STATE									X						6C	M	C	Permissive state descriptors for RMCBs.
PM2_0STATE									X						6C	M	C	Permissive state descriptors for RMCBs.
PM2_1STATE									X						6C	M	C	Permissive state descriptors for RMCBs.
TEXT_SET									X						3N	M	C	Number of text set to use for RMCB (0-100).
DEV_TYPE															16C	M	B	Device type.
DEV_NUMBER															1N	M	C	Device number (range 1-4).
DEVSUBTYPE															16C	M	B	Device subtype.
ALRM_PRTY1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1N	M	C	Alarm priority.
ALRM_PRTY2															1N	M	C	Bad quality priority.
ALRM_PRTY3															1N	M	C	High alarm for analog types; alarm for digital types.

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Table 10-5. Tag List Attributes (continued)

Tag List										Application[1]								
Attribute	ANALOG	DIGITAL	N90STA	RCM	RMSC	STATION	DD	MSDD	RMCB	INTANG	INTDIG	DAANALG	TEXT	TEXTSTR	FIELD/WITH[2]	OIS[3]/N90/INFO	INPUT BY[5]	Description
ALRM_PRTY4															1N	M	C	Low alarm priority.
ALRM_PRTY5															1N	M	C	2-high alarm or high deviation for stations.
ALRM_PRTY6															1N	M	C	2-low alarm or low deviation alarm for stations.
ALRM_PRTY7															1N	M	C	3-high alarm priority.
ALRM_PRTY8															1N	M	C	3-low alarm priority.
ALRM_PRTY9															1N	M	C	High deviation priority.
ALRM_PRTYA															1N	M	C	Low deviation priority.
ALRM_PRTYB															1N	M	C	High rate of change priority.
ALRM_PRTYC															1N	M	C	Low rate of change priority.
PID_BLOCK															4N	M	B	PID block (11-9998) address for tuning function.
SEC_LEVEL															2N	M	C	Security level (1-16).
SEC_GROUP															2N	M	C	Security group (1-16).
ALRMCMNT1		X	X	X			X	X	X		X		X	X	5N	M	C	Return to normal alarm comment.
ALRMCMNT2	X	X	X	X		X	X	X	X	X	X	X		X	5N	M	C	High alarm for analog types; alarm for digital types.
ALRMCMNT3	X					X				X		X			5N	M	C	Low alarm comment.
ALRMCMNT4															5N	M	C	2-high alarm comment.
ALRMCMNT5															5N	M	C	2-low alarm comment.
ALRMCMNT6															5N	M	C	3-high alarm comment.
ALRMCMNT7															5N	M	C	3-low alarm comment.
ALRMCMNT8															5N	M	C	High deviation alarm comment.
ALRMCMNT9															5N	M	C	Low deviation alarm comment.
ALRMCMNT10															5N	M	C	High rate of change alarm comment.
ALRMCMNT11															5N	M	C	Low rate of change of alarm comment.
CNTRLENABLE														X	C1	M	B	Control enable. Y = yes, N = no.
STR_LENGTH														X	2N	M	B	Console string lenght. Range: 0-80.
USER1															4C	I	C	Text field for user information.
USER2															4C	I	C	Text field for user information.
USER3															8C	I	C	Text field for user information.
USER4															8C	I	C	Text field for user information.
USER5															12C	I	C	Text field for user information.
USER6															12C	I	C	Text field for user information.
USER7															16C	I	C	Text field for user information.

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Table 10-5. Tag List Attributes (continued)

Tag List / Attribute	ANALOG	DIGITAL	N90STA	RCM	RMSC	STATION	DD	MSDD	RMCB	INTANG	INTDIG	DAANALG	TEXT	TEXTSTR	FIELD/WITH[2]	OIS[3]/N90/INFO	INPUT BY[5]	Description
	Application[1]																	
USER8															16C	I	C	Text field for user information.
USER9															20C	I	C	Text field for user information.
USER10															20C	I	C	Text field for user information.

NOTES:

1. The attributes noted as being applicable to a particular tag type are not necessarily required for every tag of that type; i.e., the alarm inhibit tag attribute need not be specified for every analog tag, only those which the alarm inhibit feature is desired.
2. N(umeric) = Numerals 0 to 9 only.
   C(haracter) = Alphabetic characters, special characters, and numerals (0-9) used as descriptors.
3. M = Needed by the operator console.
   N = Needed by INFI 90 OPEN modules (in tag list for reference only).
   I = For information only.
4. Must be supplied for the console to process tags correctly.
5. B = Input by ELSAG BAILEY.
   C = Input by CUSTOMER.

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LOAD BINARY DATABASE FILES

The Load Binary Database Files is a menu-driven utility to import Binary Tag Database file.

To access the Load Binary Database File:

From the Main menu (applies to Software Release 5.1 only), press/click **D - Configuration**, then press/click **H - Database Loader** to display the Database Loader menu, then press/click **C Load Binary Database Files** (Figure 10-5).

From the Main menu (applies to Software Release 5.2 only), press/click **D - Configuration**, then press/click **H - Database Loader** to display the Database Loader menu, then press/click **D - Load Binary Database Files** (Figure 10-1).

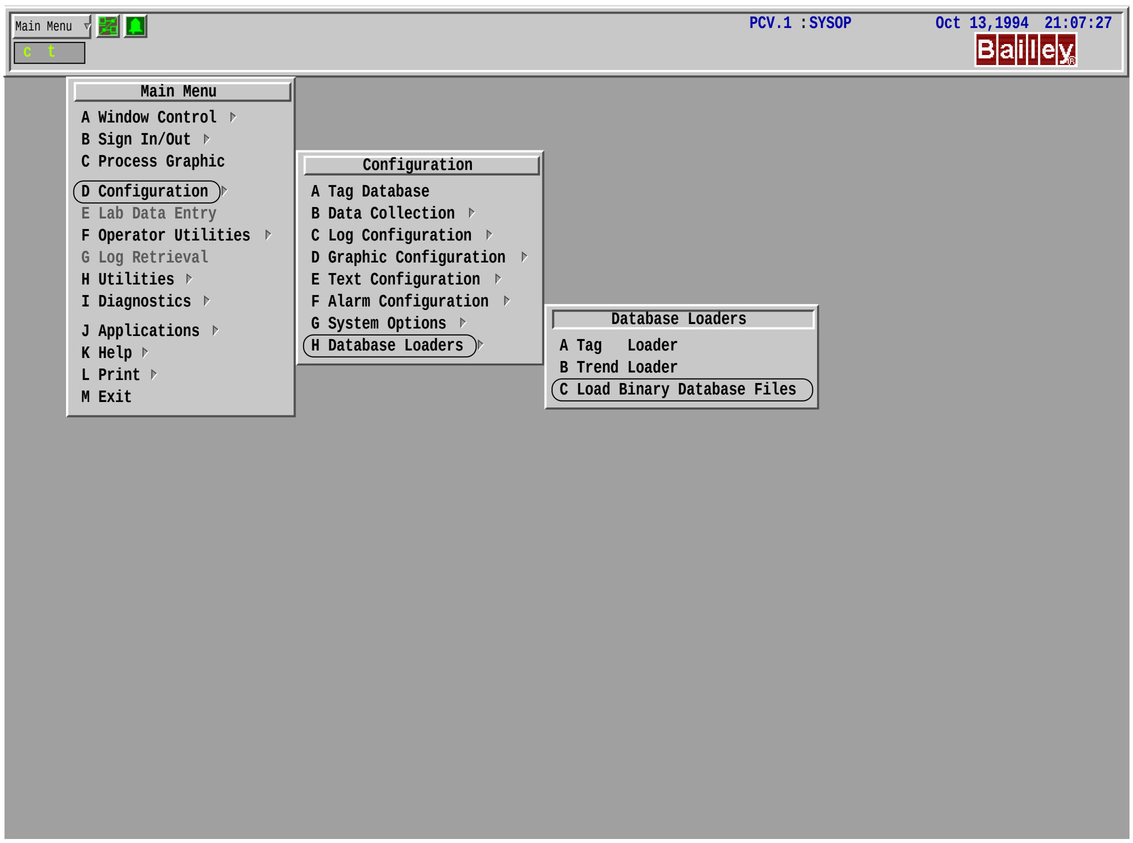

Figure 10-5. Load Binary Database Files

The Engineering Unit Descriptors, “eudscp.cf”, and Logic State Descriptors, “lsdscp.cf”, can be imported with this utility.

To load your Binary Database File, type in the full drive/directory where the database resides and press <F1>.

```
< Load Binary Tag Database Files>

Drive and Path of Binary Database Files
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

F1  Load

F9  Help                                F0 Exit
```

Figure 10-6. Load Binary Database Files Menu

Examples of file paths:

/dos/c	(DOS drive c: root directory).
/dos/c/mydir	(DOS drive c: in “mydir” subdirectory).
/dos/a/database	(Dos drive a: in “database” subdirectory).

SECTION 11 - USER/PERMIT CONFIGURATION

OVERVIEW

Press/click **D User/Group Configuration** from the System Options menu to display the User/Permit Configuration menu (Figure 11-1).

```
< User/Permit Configuration >

F1  Edit User Database                F2  Edit Permit Groups

F9  Help                              F0  Return to Previous Menu
```

Figure 11-1. User/Permit Configuration Menu

The system provides a flexible security system for gaining access to the various system services. The system consists of a list of users, a list of permit groups and a list of system permits. Users and permit groups are configured as part of the system configuration while system permits are provided as an integral part of the system.

The security system is configured by assigning users to permit groups and assigning system permits to permit groups. In doing this, users are given specific system privileges. The use of permit groups makes setting up and maintaining a user security system much easier than if permits were assigned directly to users.

In planning your security system configuration, the first step is to define the permit groups you will require. The groups typically correspond to job responsibilities in your plant. For example an operations group, a maintenance group and a supervisor group may be required. Each group is assigned the system permits that apply to their job function. Once the permit groups are defined the user list is created. Each user is identified and assigned to one or more permit groups depending on his or her job function.

In a multiple server network, each server may have a set of system permits for each permit group. This is very useful for restricting users to certain servers. For example, operations personnel may be assigned control privileges on a select server to limit their scope of control to a particular area of the plant.

AVAILABLE SYSTEM PERMITS

A default set of permits are provided by the system to allow access to various system services. Each permit group can have any number of these permits assigned to it. A user has the access privileges provided by all permits assigned to the group or groups that user belongs to.

Each System Permit provides a specific type of access to the system. Many of the system applications check an appropriate permit before giving a user the right to perform a certain operation.

Monitor Alarms

This permit provides the user with alarm management information. This includes alarm summary information and alarm group information. Without this permit, a user will not be notified of any alarm conditions. This permit should normally be provided except to individuals who are not responsible for the control of the process.

Control Process

This permit allows the user to take control action over the process. This includes set point changes, motor start/stops, and acknowledging alarms. Without this permit no control actions are allowed.

Exit System

This permit allows the user to exit from the OIS12 console software and optionally shut the system down. Without it, the user is forced to remain within the system and can not exit to the underlying operating system.

Configure Graphics

This permit allows the user to make changes to the graphics system. This includes the graphic designer, graphic file manager and graphic key assignments.

Configure Alarms

This permit allows the user to make changes to the alarm management system. This includes alarm inhibit states, and alarm printing options.

Configure Modules

This permit allows a user to make changes to the INFI 90 modules. This includes adding, removing and modifying blocks, changing module modes, and downloading module configurations.

Add/Remove Red Tags

This permit allows a user to add and remove red tag status to a system tag. Without this permit, a tag's Red Tag status can only be monitored, not changed.

Configure System

This permit allows a user to configure the system setup. This includes network setup, hardware options, user/permit setup, time and date changes.

Access System Utilities

This permit allows the user to access system utilities.

Access Workspace

This permit gives a user access to the QNX Windows work space menu. This allows the user to access and run applications outside the control of the system. Without this permit a user is restricted to the applications provided by the system and those configured into the Applications menu.

Configure Lab Data

This permit allows a user to configure the lab data entry system.

Configure Database

This permit allows a user to configure the system database. This includes tag definitions, engineering units, logic states, substituted text, etc.

Enter Lab Data

This permit allows a user to enter lab data into the lab data entry screens.

Change Archive Data

This permit allows a user to edit archived log data.

Configure Logs

This permit allows the user to configure all aspects of the logging system which includes log definitions, and log formats.

Change Operating Parameters

This permit allows the user to change the operating state of a tag. This includes taking a tag off scan, assigning a substituted value, and inhibiting a tag's alarms.

Control Red Tags

This permit allows a user to over-ride Red tag control lockouts. Without this permit control is blocked to all tags that are Red tagged.

Tune Modules

This permit gives the user the ability to tune the modules in the INFI 90 OPEN process control units.

View

This permit is used to gain access to the system and provides monitoring capability. Without this permit a user is not allowed to sign in to the system.

Override Keylocks

This permit bypasses the keyboard key locks. With this permit, a user does not need to activate the key locks to obtain access to keylocked operations, when using a mylar keyboard.

CONFIGURING PERMIT GROUPS

From the User/Permit Configuration menu press <F2> to display the Group List menu (Figure 11-2).

From the Systems Options menu press/select **C User/Group Configuration**.

```
                         < Group List >

 GROUP NAME   GID    GROUP NAME  GID     GROUP NAME  GID
 bailey       101    mail         40     pcvcfg      200
 pcvcntl      201    pcvmon      202     pcvtune     203
 root           0

 F1  Edit Group Permits                  F2  Add Group
                                         F4  Delete Group
                                         F6  Rename Group
 F9  Help                                F0 Return to Previous Menu
```

Figure 11-2. Configuring Permit Groups Menu

The menu is divided into two boxes; the top for selecting a Permit Group and the bottom for specifying the operation you wish to perform.

Some operations require you to select a specific Group from the list displayed in the top box. This is done by pressing <Left>, <Right>, <Up>, <Down>, <Home>, and <End>.

To add a new Permit Group press <F2>. This will open a prompt box where you will enter the new Group name.

To delete a Permit Group, first select the Group and then press <F4>. A prompt box will be displayed to allow you to verify your selection before the Group is deleted.

To change a Permit Group's name, first select the Group then press <F6>. A prompt box will be displayed where you will enter the Group's new name.

To edit the permits assigned to Permit Group, first select the group then press <F1> (Figure 11-3).

```
                    < Edit Group Permissions >

 Group:  pcvcnt1
 SERVER:    SYSTEM    NODE     [GLOBAL]

 KEY  DESCRIPTION                  KEY   DESCRIPTION
 a    Monitor Alarms               b     Configure Lab Data
 c    Control Process              d     Configure Database
 e    Exit System                  f     Enter Lab Data
 g    Configure Graphics           h     Change Archive Data
 i    Configure Alarms             l     Configure Logs
 m    Configure Modules            o     Change Operating Parameters
 q    Add/Remove Red Tags          r     Control Red Tags
 s    Configure System             t     Tune Modules
 u    Access System Utilities      v     View
 w    Access Workspace             z     Override Keylocks

 F1  Save Permits                        F2  Overview
 F3  Change Server                       F4  Change Node

 F9  Help                                F0  Return to Previous Menu
```

Figure 11-3. Editing Group Permissions Menu

EDITING GROUP PERMISSIONS

The Edit Group Permissions menu allows you to change the definition of a User Group. A list of the available system permits is displayed in the top box. Each permit that is currently assigned to the User Group is displayed in white. Move the highlight bar by pressing <Left>, <Right>, <Up>, <Down>, <Home>, <End>. The function highlighted can be added to or removed from the group by pressing <Space>.

To save your changes, press <F1>.

To select a server other than the default press <F3>. A server selection list will be displayed. Select a server from the list by pressing <Up>, and <Down>, and then pressing <Enter> to accept your selection. The current server is displayed in the top box. The server selection determines which set of permits are being modified. For basic operation, Never change the server from the default selection. The default, SYSTEM, provides for the setting of permits throughout the entire system rather than one particular server. If you are an advanced user and have more than one server this feature will allow you to maintain different permits on each of your servers. If you define a server to a specific Group it will over-ride any permits assigned to that Group at the SYSTEM level.

To select a node other than the default, SYSTEM, press <F4>. A list of the available nodes on your network will be displayed. Select a node from the list by pressing <Up>, and <Down> and then pressing <Enter> to accept your selection. The current node is displayed in the top box. The node selection determines which set of permits are being modified. For basic operation, never change the node from the default selection. By defining individual node permits a Group can have different privileges on each node. This may be desired, if for example you determine that control operations should only be allowed from the control room. By using this advanced feature you could restrict a users ability to control from non-control room locations. If you define a node to a specific group, it will over-ride any permits assigned to that Group at the SYSTEM level.

To display an overview of the Group's permits press <F2>. The overview is useful to advanced users who have taken advantage of the individual server and/or node group permits. The overview display presents the Group's permits in a two dimensional matrix. The matrix is required in order to illustrate the effective permits the Group has at any junction of node and server.

Press <F10> to return to the Permit Group Configuration menu.

PERMIT OVERVIEW

The permit system takes into account the user, the operator console being used and the server logged into. The Permit Overview screen provides the view you need when you configure permits that regard the user's console and server.

From the Edit Group Permissions screen shown below, press <F2> to get the overview screen.

```
                     < Edit Group Permissions >
Group:  chris_group
SERVER:    SYSTEM    NODE     [GLOBAL]

KEY DESCRIPTION               KEY   DESCRIPTION

a   Monitor Alarms            b     Configure Lab Data
c   Control Process           d     Configure Database
e   Exit System               f     Enter Lab Data
g   Configure Graphics        h     Change Archive Data
i   Configure Alarms          l     Configure Logs
m   Configure Modules         o     Change Operating Parameters
q   Add/Remove Red Tags       r     Control Red Tags
s   Configure System          t     Tune Modules
u   Access System Utilities   v     View
w   Access Workspace          z     Override Keylocks

F1  Save Permits                       F2  Overview
F3  Change Server                      F4  Change Node

F9  Help                               F0  Return to Previous Menu
> Press F2 to select the Overview screen.
```

Figure 11-4. Edit Group Permissions Menu

The Group Permits overview screen presents a cross table view showing the Console Node Name on the side and the Server Name on the top.

```
                      < Group Permits >
GROUP: chris_group

                                         SERVER NAME

                 SYSTEM                      node3and5

 NODE NAME
 GLOBAL         (abcdefghilmoqrstuvwz)       abcdefghilmoqrstuvwz
 BCI.1           abcdefghilmoqrstuvwz        abcdefghilmoqrstuvwz
 BCI.2           abcdefghilmoqrstuvwz        abcdefghilmoqrstuvwz
 BCI.3           abcdefghilmoqrstuvwz        abcdefghilmoqrstuvwz
 BCI.4           abcdefghilmoqrstuvwz        abcdefghilmoqrstuvwz
 BCI.5           abcdefghilmoqrstuvwz        abcdefghilmoqrstuvwz


 F9  Help                           F0  Return to Previous Menu
```

Figure 11-5. Group Permits Overview Screen

First set the Global/System permit, which is bracketed in Figure 11-6. The Global/System permit determines the permits generally applied throughout each group. Then change the Console/Server permits if necessary. Some configuration tasks that have system wide effects only check the Global/System permit level.

Setting only the Global/System permits allows all users in this group to have the same permits wherever they log in.

To specify greater detail in the permit structure you should first set the Global/System permits to the most appropriate permits for this group. Ensure the cursor is in the upper left over Global/System, press <Enter> and change the permits by pressing <Space> bar. Then press <F2> to return to the overview. You will see a display such as this:

```
< Group Permits >

GROUP: chris_group

                                           SERVER NAME

                  SYSTEM                     node3and5


 NODE NAME
 GLOBAL          (abcdefuvwz)                abcdefuvwz
 BCI.1            abcdefuvwz                 abcdefuvwz
 BCI.2            abcdefuvwz                 abcdefuvwz
 BCI.3            abcdefuvwz                 abcdefuvwz
 BCI.4            abcdefuvwz                 abcdefuvwz
 BCI.5            abcdefuvwz                 abcdefuvwz


 F9  Help                          F0  Return to Previous Menu
```

> After setting Global/System defaults

Figure 11-6. Global System Permit

Moving <Right> will show other defined Servers. Moving <Up>/<Down>/<Home>/<End> will show all other defined nodes.

```
< Group Permits >

GROUP: chris_group

                                          SERVER NAME

                   node3and5                 PCV.4

 NODE NAME
 GLOBAL           abcdefuvwz                (abcdefuvwz)
 BCI.1            abcdefuvwz                 abcdefuvwz
 BCI.2            abcdefuvwz                 abcdefuvwz
 BCI.3            abcdefuvwz                 abcdefuvwz
 BCI.4            abcdefuvwz                 abcdefuvwz
 BCI.5            abcdefuvwz                 abcdefuvwz


 F9  Help                          F0  Return to Previous Menu
```

> Panning the display to the right shows other servers.

Figure 11-7. Displaying Other Servers

To remove access to server PCV.4, move the cursor to Global/PCV.4, press <Enter> and remove all permits.

```
< Group Permits >

GROUP: chris_group

                                        SERVER NAME

                  node3and5                 PCV.4

NODE NAME
GLOBAL           abcdefuvwz               (           )
BCI.1            abcdefuvwz
BCI.2            abcdefuvwz
BCI.3            abcdefuvwz
BCI.4            abcdefuvwz
BCI.5            abcdefuvwz


F9  Help                          F0  Return to Previous Menu
```

> After removing access to PCV.4.

Figure 11-8. Removing Access

Now we will restrict this group, when seated at console BCI.4, so that members can control the process but not configure. Move the cursor to *BCI.4/System*. Press <Enter>, toggle off the configure options **C** and **D**. Then press <F2> to return to the overview.

```
< Group Permits >

GROUP: chris_group

                                         SERVER NAME

                 SYSTEM                    node3and5

NODE NAME
GLOBAL           abcdefuvwz                abcdefuvwz
BCI.1            abcdefuvwz                abcdefuvwz
BCI.2            abcdefuvwz                abcdefuvwz
BCI.3            abcdefuvwz                abcdefuvwz
BCI.4           (abefuvwz  )               abefuvwz
BCI.5            abcdefuvwz                abcdefuvwz


F9  Help                          F0  Return to Previous Menu
```

> After removing configuration permits when using console BCI.4.

Figure 11-9. Removing Configuration Permits

Follow the similar procedures to modify permits to suit your needs.

In Summary

Changes made in the System column will affect all default permits in the same row. Changes made in the Global row will affect all default permits in the same column. Changes made to a specific Console/Server will affect only that Console/Server combination. When reading the group permits ask yourself the following question:

"What permits does this group allow, when a member is seated at this console (BCI.4) and logged into this server (System)?"

CONFIGURING USERS

From the User/Permit Configuration menu press <F1> to display the User List menu (Figure 11-10).

```
                          < User List >

USER NAME          UID        DESCRIPTION

SYSOP              200        PCV System Operator/Administrator
root                 0
pcv                102        Default PCV Windows User
pcvtext            103        Default PCV Menu User



F1  Edit User Record                    F2  Add New User
F5  View Permits                        F4  Delete User
F9  Help                                F0  Return to Previous Menu
```

Figure 11-10. Configuration Menu

The menu is divided into two boxes; the top for selecting a current User and the bottom for specifying the operation you wish to perform.

Some operations require you to select a specific User from the list displayed in the top box. This is done by pressing <Left>, <Right>, <Up>, <Down>, <Home>, and <End>.

To add a new User press <F2>. This will open a prompt box where you will enter the new User's name. After you have entered a name the Edit User Record menu is automatically selected so that you can define the new user.

To delete a User, first select the User and then press <F4>. A prompt box will be displayed to allow you to verify your selection before the User is deleted.

To view the user's permits press <F5>.

Press <F10> to return to the User/Permit Configuration menu.

To edit a User's configuration, first select the User, then press <F1> (Figure 11-11).

```
--------------------------< User Configuration >--------------------------

USER NAME:          SYSOP

USER ID:            200

BASE GROUP:         bailey

DESCRIPTION:        PCV System Operator/Administrator

HOME DIRECTORY:     /home/SYSOP

SHELL PROGRAM:      /bin/sh

GROUPS:             bailey  mail  pcvcfg  pcvcntl  pcvmon  pcvtune
root

F1  Save Configuration                  F2  Set Defaults
F3  Change Group List                   F4  Change Password
F5  View Permits

F9  Help                                F0  Return to Previous Menu
```

Figure 11-11. User Configuration Menu

EDITING USER CONFIGURATION

The Edit User Configuration menu allows you to change the definition of a User. The user's configuration is displayed in the top box. The fields are selected by pressing <Up>, <Down>, <Home> and <End>.

To save your changes, press <F1>.

To force the configuration back to a default state press <F2>. This will change the contents of several fields in the configuration.

To display an overview of the User's permits press <F5>. The overview is useful to advanced users who have taken advantage of the individual server and/or node group permits. The overview display presents the User's permits in a two dimensional matrix. The matrix is required in order to illustrate the effective permits the User has at any junction of node and server.

Press <F10> to return to the User List menu.

Table 11-1. Permits Required

Activity	View Access Requires	Full Access Requires
Tag Database	View	Configure Database
Log Configuration	View	Configure Logs
Graphic Configuration	Configure Graphics	Configure Graphics
Text Configuration	View	Configure Database

Table 11-1. Permits Required (continued)

Activity	View Access Requires	Full Access Requires
Alarm Configuration Edit Alarm Groups Edit Priority Colors Edit Global Ack/Silence Edit ADS Displays	View	Configure Database
Alarm Configuration Edit Group Inhibits	View	Configure Alarms
System Options	Configure System	Configure System
Database Loaders	Configure Database and Access System Utilities	Configure Database and Access System Utilities
Configure Printer Spooler	Configure System	Configure System
Set Up	Configure System	Configure System
Lab Data Entry Configure Screens	View	Configure Lab Data
Lab Data Entry Enter Data	View	Enter Lab Data
Operator Utilities Operator Parameters Tag Summaries Block Details Tune	View	View
Operator Utilities Archive Monitor & Status	View	Configure Database
Log Retrieval	View	View
Utilities File Back Up Utilities File Restore Utilities Misc Disk Utilities Translation Utilities Log Utilities	Access System Utilities	Access System Utilities
Utilities Redundant Server Restore	Configure Database and Access System Utilities	Configure Database and Access System Utilities
Utilities Printer Utilities	Configure Alarms and Access System Utilities	Configure Alarms and Access System Utilities
Utilities Module Configuration (CLS)	Tune Modules	Configure Modules
Utilities Set Time and Date	Configure System and Access System Utilities	Configure System and Access System Utilities
Operator Actions Control Actions Alarm Acknowledge	View	Control Process
Block Details Tuning Displays	View	Tune Modules
Configure Application Menu	Configure System	Configure System

DEFAULT USER AND USER GROUPS

The default list of Permit Groups provided with the system are described in Table 11-2. The default list of Users provided with the system are described in Table 11-3.

Table 11-2. Permit Groups

Name	Included Permit
mail	None
bailey	None
pcvalarm	Monitor Alarm Groups - no system access
pcvmon	View, Monitor Alarms
pcvcntl	View, Monitor Alarms, Control Process, Enter Lab Data, Change Archive Data, Change Operating Parameters, Add/Remove Red Tags
pcvcfg	View, Monitor Alarms, Configure Database, Configure Graphics, Configure Lab Data, Configure Alarms, Configure Logs, Configure Modules, Tune Modules, Change Operating Parameters, Add/Remove Red Tags, Access System Utilities
root	All Permits

Table 11-3. Default Users

User Name	User Description	User's Ability	Permit Groups
pcv	The default User that is automatically signed in at start up	Monitors alarms can pass sign in request	pcvalarm bailey mail
SYSOP	System manager	Has full privileges in the system.	root
root	QNX super user Do not use to log in to pcv	Do not delete this user	

CAUTION **Never remove user *pcv* or *root* or you will not be able to log in.**

DEFAULT SYSTEM ACCESS

When the system is powered up it assumes the default system user. The default system user, *pcv*, like any other user of the system is assigned to Permit Groups. By default the default system user is assigned to the *pcvalarm* permit group. By default the *pcvalarm* permit group is given the *Monitor Alarms* permit. User access to the system is not allowed. The system opens the sign in dialog and waits for a user to sign in before allowing access to the system. Since the *Monitor Alarms* permit is present, alarm group information is displayed in the Executive Window. Thus a logged out console still allows you to see which process areas are alarming.

Changing the default system access involves assigning the *pcv* user to other user groups in order to provide additional privileges. By assigning the default system user to all user groups full access to the system would be provided. This is the suggested method of configuring the system for those sites where the security system is not required.

SECTION 12 - EDITING THE APPLICATION MENU

CONFIGURING THE APPLICATION MENU

The OIS120 console is shipped with only one user-application pre-configured as shown in Figure 12-1.

To modify any of the applications or to add to the user-applications, you will need to edit the Application menu.

From the Main menu click/press **D** to display the System Configuration menu. Then press **G** to display the System Options menu, and finally press **E** to display the User Application Configuration menu (Figure 12-1).

User applications can run on top of the OIS12 console window: you can return to the OIS12 console software without first leaving the application. Note that some knowledge of the QNX operating system is required to properly configure a menu item for the Application menu.

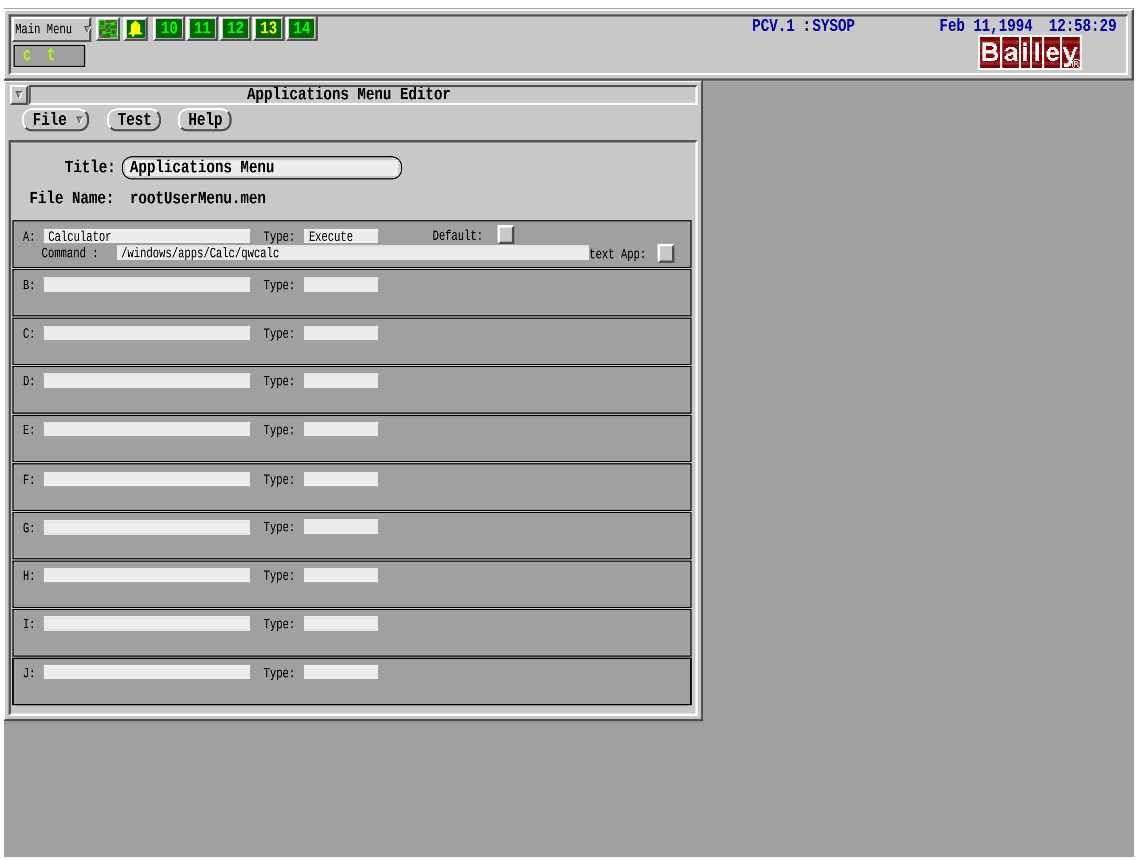

Figure 12-1. Application Configuration Screen

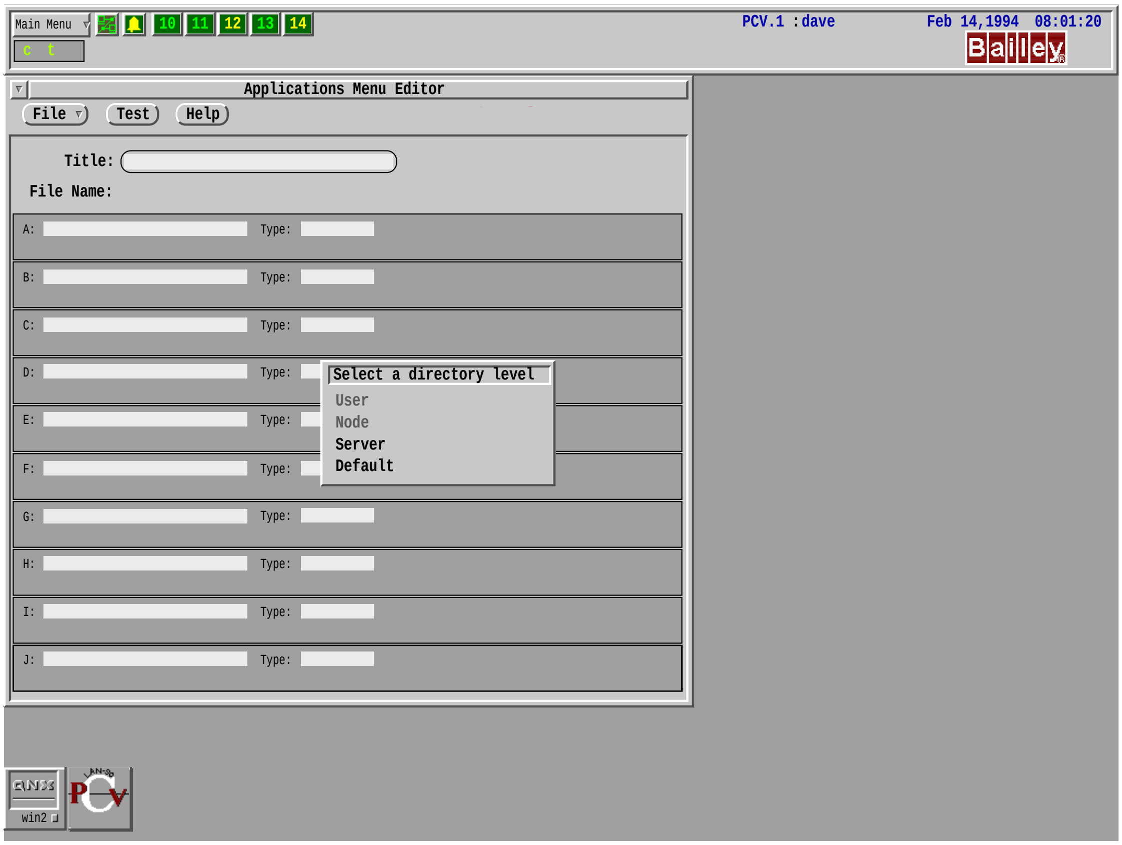

Figure 12-2. Application Record

Adding Applications

To add applications to the Application menu, select a directory level to bring up an application list (Figure 12-2).

Use <Tab> and <Shift Tab> to move between fields. Press <Esc> at any time to abandon any changes you have made. Table 12-1 describes the fields you must fill. Pressing <Enter> adds the application to the Application menu and selecting **File** and then selecting **Save** or **Save As** completes the entry process.

Table 12-1. Application Configuration Fields

FIelds	Description
Title	A unique title for the application menu.
File Name	Actual file name of menu (this field is not editable).
Program Name	Description of program.
Command	Command to run the application. Full path and program name is required.
Type	Defines program type (i.e., execute).
Text Application	Runs a shell for program.

Modifying an Existing Application

To modify an application on the Application menu, select the application to modify by moving the mouse to the type field, click the right mouse button. This brings up a Type *(X)* Window, where *(X)* is the number of the application in this screen. The Type of the application can be changed from this window to **Sub-Title, Execute**, **Sub-menu**, **Space** or **Line**.

Deleting an Application

To delete an application from the Application menu, select the application to delete by moving the mouse, then click/press on the **Program Name** and remove the name, next move to the command and delete it also.

SECTION 13 - CONFIGURATION LOADING SYSTEM (CLS)

OVERVIEW

The Configuration Loading System (CLS) program provides a direct interface to an INFI 90 OPEN or Network 90 system, from here on called an INFI 90 OPEN system.

CLS is used to create and edit the configuration of function blocks in the modules of a INFI 90 OPEN system. These configurations can be created in the modules and saved on disk. Configurations can also be created on the disk then loaded into the modules. CLS can also compare the configuration of a module to a configuration stored on disk and report any differences.

CLS can also be used to monitor a working system. Up to 24 block outputs can be monitored at once, and up to eight tunable block specifications can be modified at the same time.

The monitored data can be written to disk at a specified frequency, creating a log that can be reviewed later.

The setup of the monitor screen can be saved and reloaded later for reuse.

CLS can also calculate module utilization, module bus loading and BIM/SBM loading from the module configuration files and manually entered parameters.

No special hardware setup or connections are required to communicate with INFI 90 OPEN.

MODULE CONFIGURATION FILES

Module configurations you create can be saved in files on disk. Each module configuration will have a separate file name. The number of files that can be stored will depend on the size of the configuration and the storage capacity of the disk. A configuration typically requires between 2K and 80K of disk space.

The recommended method of naming files is:

10307.cfg

Module Address (07)

PCU node number (03)

Loop Number (1)

If you intend to use the configuration files with Elsag Bailey CADEWS Workstation programs, the extension ".cfg" must be used. Otherwise, you can use any file name that follows the DOS convention of eight characters plus a three-character extension.

NOTES:

1. With the introduction of INFI 90 OPEN and Superloop, configuration file naming conventions may be different from those used by CADEWS if a PCU or Loop address is greater than 99. For instance, if a module address was Loop 135, PCU 210, Module 03 then CLS will assign the cfg file a default name of "13521003.cfg" to maintain the naming convention. You can use a different file name if you wish.

2. If you are saving a configuration and there is already a file with the same name as the one you have chosen, CLS will prompt you with *Overwrite* or *Backup*. Press <Enter> or **B** to create a backup of the old file. It will be given the same name, but will have an extension of ".bak". If you wish to overwrite the existing file, press **O** and your save will replace the existing file.

Setting the Loop Number

If a CIU04 (INFI-NET CIU) is used as the INFI 90 OPEN interface device, you will have to specify the loop number to work with. The loop number is the loop number address set in all the LIS modules on the loop.

For a single loop system, the loop number is typically set to **1**.

If a multiple loop system is being used with INFI-NET to INFI-NET Bridges (SSB01), then the package can address any module, on any node on any loop, that is connected to the loop the CIU04 being used by CLS is on.

You can set the loop number from any menu where the prompt:

L - Loop Number

is displayed in the upper left corner of the menu. To set the loop number, press **L**, type the loop number, then press <Enter>. When you are using the monitor functions of CLS, you can tune and monitor inputs and outputs from multiple loops simultaneously if your INFI 90 OPEN system is configured with multiple loops.

On-Line Help

On-line Help is available wherever the prompt:

? HELP

is displayed in the lower right corner of the screen. Press **?** to display the help screens.

Module Problem Reports

Extensive Module problem reporting capability is part of CLS. Whenever a module reports a problem, the prompt:

Press <Space> for detailed module problem report

appears in the middle of the screen. Press <Space> to obtain the report. Depending on the number of problems, you may have to wait a few seconds for the report to display.

If there are many problems, they may not all fit into the computer's memory. If this occurs, a message is displayed and you must correct any existing problems before you can view the rest of the report.

Using CLS Off-Line

If CLS does not have a connection to a live CIU, you can still use it to create module configurations on disk.

However, when using CLS off-line, there is no check that the function codes you enter are allowed in the module type you are creating the configuration for. CLS will not prevent you from entering function codes for a COM04 into a configuration destined for a COM03 module. If you attempt to load a module with a configuration containing illegal function codes, the error message:

Undefined function code

will be displayed. Also, when using CLS off-line, there is no check that the configuration you create will fit the capacity of the module. It is possible for you to set up a configuration that will result in a module with more than 100% utilization. Be sure to check any configuration you have created off-line with the module utilization functions of CLS.

STARTING CLS (PASSWORD ENTRY)

To get to the CLS program from the General Functions menu, press/click **H - Utilities** to get to the Utility menu. From the Utility menu, press/click **Module Configuration (CLS)**. This calls up the CLS Password Entry screen (Figure 13-1).

There are three levels of access to CLS, and each level has its own password. The three levels are:

1. Master access level. This is the highest access level of CLS and permits full access to all CLS functions, including the ability to set the passwords for the three access levels, defining the Tuning Access List (the set of points that can be tuned by Tune level users), and enabling or disabling the Technician Action

```
CONFIGURATION LOADING SYSTEM
WITH PASSWORD ACCESS RESTRICTION

Enter Password:

F9 Exit CLS
```

Figure 13-1. CLS Password Entry Screen

Log (an automatic log of Tune level user actions). When first received from Elsag Bailey, CLS should have the Master access password **stmaster**.

2. Configure access level. This is the intermediate access level of CLS and permits full access to all CLS functions except setting passwords, editing the Tuning Access List, and setting the Technician Action Log.

When first received from Elsag Bailey, CLS should have no Configure access password; simply pressing <Enter> in the blank password entry field blank gives Configure level access.

3. Tune access level. This is the lowest level of CLS access privilege and denies the user access to any function that can make changes in the operation or configuration of a module or a configuration file. Tune access level users can tune blocks subject to the restrictions set by the Master level user in the Tuning Access List.

When first received from Elsag Bailey, CLS should have the Tune access password **sttune**. The passwords for your CLS program may have been changed from those described above by the Master user.

Enter your password at the *Password:* prompt (an asterisk will be displayed for each character in your password), then press <Enter>. If you want to exit CLS press <F9>.

If the password you enter does not match one of the three valid passwords, the password entry field will be cleared, and you can try entering a correct password. If you enter an incorrect password three times in a row, the CLS Application Window will be closed.

NOTE: The program distinguishes between uppercase and lower-case letters. The passwords **Operator** and **OPERATOR** are distinct. You must match your password exactly before the program will recognize it.

If you enter a valid password, you have access to CLS at the level defined by the password, and the CLS Main menu will be displayed (Figure 13-2).

NOTE: If you have Master level access to CLS, you will have some menu items on the CLS Main menu not shown in Figure 13-1; these additional functions are described in "Master Level Functions."

```
L  -  Loop Number
            CONFIGURATION LOADING SYSTEM
          WITH PASSWORD ACCESS RESTRICTION

                 F1 Module Operations
                 F3 PCU Operations
                 F5 Monitor Operations
                 F7 Bim Utilization
                 F8 Loop Operations
                 F9 Exit CLS
                                                ? HELP
```

Figure 13-2. CLS Main Menu

Tune Level Access Menu Restrictions

Tune level access users will not be able to use the following menu selections in CLS:

In the Module Operations menu:

- Change Module Mode.
- Edit Disk Configuration.
- Save Module on Disk.
- Restore Module From Disk.
- Set Default Module Types.
- Verify Module File.

In the Edit Module Configuration menu:

- Modify Block.
- Add Block.
- Delete Block.
- Set Module Mode.
- Copy Block.

- Move Block.

In the PCU Operations menu:

- Change Module Mode.
- Save PCU on Disk.
- Restore PCU from Disk.

In the Loop Operations menu:

- Save Loop on Disk.

MODULE OPERATIONS

Module operations allow you to perform operations on a single module configuration. Press <F1> from the CLS Main menu to call up the Module Operations menu (Figure 13-3).

```
L  -  Loop Number
                         Module Operations
                         *****************

F1 Set PCU Number        F2 Edit Module Configuration       ********
                                                        Loop Number:    0
F3 Set Module Address    F4 Edit Disk Configuration     PCU Number:     0
                                                        Module Address:0
F5 Change Module Mode    F6 Set Default Module Types    Type:
                                                        Rev:
F7 Save Module on Disk   F8 Restore Module from Disk    Mode:
                                                        Status: Off Line
F9 Verify Module & File  F10 Return To Main Menu
                                                              ? HELP
```

Figure 13-3. Module Operations Menu

Pressing <F10> returns you to the CLS Main menu, unless you are in the middle of an operation selected from the Module Operations menu (if you are in the middle of an operation, the menu item is highlighted in the menu box at the bottom of the screen). To cancel any operation in progress, press <Esc>. If the CIU is off-line, only the Edit Disk Configuration selection is available.

Setting Loop, PCU, Module, Mode, and Type

If you are using INFI-NET, set the loop number by pressing **L**.

Set the PCU number by pressing <F1>. The program will poll the requested PCU and display the status of any modules it finds. To interrupt this process, press any key.

Set the address of the module you want to work with by pressing <F3>.

To change the mode of the target module, press <F5>. The status of the selected module is displayed in the lower right corner of the screen.

If you are using the Elsag Bailey Engineering Work Station (EWS) software program, you must enter the module hardware type into a header file. Files produced by CLS are compatible with EWS. CLS does not need this information. The function <F6> - Set Default Module Types is a convenience for you. It allows you to enter the module hardware type into the file rather than asking you to remember each variation.

Editing Configurations (Module or Disk)

To edit a module configuration, press <F2>. To edit a configuration in a disk file, press <F4>. Both of these functions display the Configuration Editor menu (Figure 13-5).

NOTE: When working from the disk, the error messages that display with a module will NOT appear.

When you are editing a disk file rather than a module, you are asked to enter the module type. Pressing <Right> and <Left> will scroll through the available module types. When you are working with a module, you should use **<F6> - Set Default Module Types** to select the actual hardware type. This establishes which function codes are permitted in the configuration. When you edit a disk file configuration, you will also be prompted to enter a file name.

When you begin editing a file configuration, a file header appears (Figure 13-4). If you are working on a new configuration, the header will be blank. If you are editing an existing configuration, the configuration file head information you entered previously will be displayed. This provides you with a check that you are editing the module that you intended to edit. The header has room for the PCU number, the module address, customer name, date, and space for a description.

NOTE: Under *Module Type*, you must enter the module type. Pressing <Left> or <Right> allows you to scroll through the available modules.

Editing a configuration is explained in detail in ***EDITING A CONFIGURATION***.

```
┌ L  -  Loop Number─────────────────────────────────────────────────────┐
│ /home/SYSOP/10607.cfg                                                 │
│                                                                       │
│ User Name          : Qwerty Jones                                     │
│ Plant Site         : ACME Keyboard Co.                                │
│ Contract Number    : C200100                                          │
│ Description        : Plastic mould control for Legacy 101             │
│ PCU Number         :  6                                               │
│ Module Address     :  7                                               │
│ Module Type        : MFC03                                            │
│ Firmware Revision  :                                                  │
│ Date Module Saved  : 27-Feb-95  08:53                                 │
├───────────────────────────────────────────────┬───────────────────────┤
│ F1 Set PCU Number      F2 Edit Module Configuration│    ********      │
│                                                │                      │
│ F3 Set Module Address  F4 Edit Disk Configuration  │Loop Number:  250 │
│                                                │PCU Number:   250     │
│ F5 Change Module Mode  F6 Set Default Module Types │Module Address:7  │
│                                                │Type:   MFC04         │
│ F7 Save Module on Disk F8 Restore Module from Disk │Rev:    F_1       │
│                                                │Mode:   Execute       │
│ F9 Verify Module & FileF10 Return To Main Menu │Status:00 00 00 00    │
└────────────────────────────────────────────────┴─────────? HELP ──────┘
```

Figure 13-4. Sample Module File Header

Saving and Restoring Configurations

To save a module configuration to a disk file, press <F7>.

To load the selected disk file configuration into a module, press <F8>. A module can be loaded with a configuration that came from a module with a different address. When loading a module from disk, the module will be automatically initialized.

CAUTION	**Do not load a configuration unless you have saved the previous configuration. You may need to restore it if the new configuration does not control the process.** **Changing function code types or locations may invalidate tags based on the previous configuration.**

Verifying a Module Configuration

To compare the configuration in a module to the configuration stored in a disk file, press <F9>. Make sure that specified file path is correct, then type the file name. Press <Enter> and the header of the file will be displayed (Figure 13-4). If it is the correct file, press <Enter>. If any differences are found, messages showing the conflicts will be displayed. After the first conflict is found and noted, pressing any key will display the next fault.

Pressing <Esc> will cancel the verification.

EDITING A CONFIGURATION

From the Module Operations menu (Figure 13-3) press <F2> to display the Edit Configuration menu (Figure 13-5).

```
                         Configure Module
                       *******************

F1 Modify Block   F2 Add Block            PCU:   0 Module Address: 0
F3 Delete Block   F4 Tune Block           Type: COM04 Mode: Configure
F5 Set Module ModeF6 List Configuration   Rev:  N/A
F7 Copy Block     F8 Move Block           Summary: NVM Initialized State
F9 Utilization    F10 Return              Module Status: 02 00 00 00
                                                              ? HELP
```

Figure 13-5. Configuration Editor Menu

To move the cursor between fields, use the cursor keys. To move the cursor within a field, press <Ctrl Left> and <Ctrl Right>. When editing the specifications for a block, the <Home> or <End> keys will move the cursor to the top or end of the page. For fields requiring integer numbers, pressing <PgUp> will increment the number by one; pressing <PgDn> will decrement the number by one. For fields requiring text, pressing <Del> will erase the character above the cursor; pressing <Backspace> will erase one character to the left.

Modifying, Adding, and Deleting Blocks

Press <F1> (Modify Block) or <F2> (Add Block) and type in a block number. The function code number and specifications for that block will be displayed. To add to or modify the block, the module must be in configure mode or an error message will appear.

When entering a block number in Modify mode pressing <Ctrl PgUp> will find the next available block to be modified (note, however, that the <Ctrl PgDn> key does not find the next lowest block). To quickly move from one block to another press <Ctrl PgUp>. If the next block to appear is not the one you want, press <Esc> then <Ctrl PgUp> until the block you wish to modify appears.

In the Modify mode, pressing <Ctrl PgUp> may result in the message:

> *Module error : Undefined block*

If this occurs, enter an existing block number or set the block number to zero and then press <Ctrl PgUp>. To use this quick search feature, the block number shown in the inverse field must exist.

Press <F3> to delete a block.

NOTE: When deleting a block, the specification WILL NOT appear.

When you finish editing the module configuration, place the module in the execute mode by returning to the Module Operations menu and using the <F5> - Change Module Mode Selection. If there are any configuration errors the module will go into the error mode. Most of the common errors will be translated from hexadecimal numbers to a statement defining the problem and list the actual block numbers. Sometimes the error code will comprise more than one error, and because there is not enough room at the bottom of the screen, the errors will be displayed in hexadecimal format.

Tuning a Block

Press <F4> Tune Block and type in a block number. The function code number displayed will be the specifications for that block. If the Tune function <F4> is used, the cursor will be positioned at the first tunable parameter. If the block selected has no tunable parameters, the cursor will not appear on the screen and pressing any key will end that function.

When entering a block number, pressing <Ctrl PgUp> will find the next available block to be modified (note, however, that the <Ctrl PgDn> key does not find the next lowest block).

To quickly move from one block to another press <Ctrl PgUp>. If the next block to appear is not the one you want, press <Esc> and <Ctrl PgUp> until the block you wish to modify appears.

Pressing <Ctrl PgUp> may result in the message:

Module error : Undefined block

If this occurs, enter an existing block number or set the block number to zero and then press <Ctrl PgUp>. To use this quick search feature, the block number shown in the inverse field must exist.

Listing a Module Configuration

If a printer is connected to the computer <F6> will list the module configuration to the printer.

To stop a long listing, press <Esc>. The printer will stop when it finishes the block that it was printing.

Copying and Moving Blocks

<F7> allows you to copy a complete block's image and duplicate it to some other address. The main application for this function is to duplicate functions quickly.

<F8> will delete a specified block number and create a new block (also specified). Any other blocks that referred to the old block will have their references changed to reflect the new block number. You can take advantage of this feature to re-arrange some blocks after making changes to put block numbers in a sequential order for maximum system response.

After you press either <F7> or <F8>, you will be prompted for the source block number (the block you want to copy or move). Enter the source block number. You will then be prompted for a target block number. Enter the target block number. The target block will appear on the screen so you can edit it further if you wish. When you are sure that this is the block you want to copy, press <Enter>. A message will be displayed, asking you if you want to save it or not.

Locating Blocks or Function Codes

Pressing <Alt> will change the <F5> menu description to read *Display Blocks*, *<F6>* to read *Display Blocks = FC*, and <F9> to read *Display FC Desc.*

Pressing <Alt F5> allows you to browse through the configuration quickly. After pressing this key, you will be prompted to enter a starting block number. The configuration for this block will be displayed. Press <Enter> to display the next block.

<Alt F6> is similar to <Alt F5>, but as well as the starting block, you must enter a function code number. This feature allows you to scan a module for blocks with specific function codes. Press <Alt F9> for a list of all the available function code numbers and their names. Press any key to stop the scrolling, then press any key to continue.

Determining Module Utilization

Utilization allows you to examine module loading. Pressing <F9> displays the screen shown in Figure 13-6. This displays data about the loading of the module and its effect on the module bus. The values shown for bus loading are estimates, and real performance may vary.

For most intermodule communication on the module bus, the update rate used will be that specified in the Executive Block or Segment Control Block in the module.

```
                     Configure Module
                   ******************
                       Utilization Summary
Total of 844 blocks in 532 function codes
Total RAM utilization:  99566 bytes
Total NVM utilization:  16248 bytes
Total execution time:   107.74 milliseconds
Total Module Bus Usage: 8.3%

F1 Modify Block    F2 Add Block            PCU:   250 Module Address: 7
F3 Delete Block    F4 Tune Block           Type: MFC04 Mode: Execute
F5 Set Module ModeF6 List Configuration    Rev:   F_1
F7 Copy Block      F8 Move Block           Module Status: 00 00 00 00
F9 Utilization     F10 Return
                                                               ? HELP
```

Figure 13-6. Module Utilization Screen

For exception report type messages, the update rate used will be one message per five seconds for real-time points, or one message per ten seconds for Boolean type points. The sum of module bus loading figures for all the modules in a PCU should not exceed 75-80% because the results calculated are only estimates.

MONITOR BLOCK OUTPUTS

From the CLS Main menu, press <F5>, to display the Monitor screen (Figure 13-7).

```
 L  -  Loop Number
Loop PCU Mod Blk  Input Description       F.C.  Spec      Value
0-   0-  3-   100 - station PV Lo alarm -  80 - S 7 = 9.223e+018
 0-  0-  3-   100 - station PV Hi alarm -  80 - S 8 = -9.22e+018
 0-  0-  3-   100 - station PV-SP Dev   -  80 - S 9 = 9.223e+018
 0-  0-  3-   100 - station 2 PV Lo alarm -  80 - S 7 = 9.223e+018
 0-  0-  0-     0 -                     -   0 - S 0 =
Loop PCU Mod  Blk  Output Description        Value    Qlty   Alarms
 0-  0-  3-    42 - rcm                 =        0    Good
 0-  0-  3-    43 - set rcm             =        0    Good
 0-  0-  3-    44 - reset rcm           =        0    Good
 0-  0-  3-    45 - alarm rcm           =        0    Good
 0-  0-  3-  2R10 -                     =    0.000    Good
 0-  0-  3-     0 -                     =    0.000    Good
 0-  0-  3-    46 - override input      =    0.000    Good
 0-  0-  0-     0 -                     =        0    Good
 0-  0-  0-     0 -                     =
 0-  0-  0-     0 -                     =

F1 Setup Inputs        F2 Load Template      Display Mode: Active
F3 Setup Outputs       F4 Save Template      Scan period in seconds: 1
F5 Set Scan Period     F6 Enable Logging
F10 Exit Monitor
                                                                ? HELP
```

Figure 13-7. Monitor Screen

If the CIU is off-line, then only the Monitor mode templates can be edited and saved. The program will not scan the module. In older versions of CLS there were input and output parameters that could only be edited on-line; this version of CLS allows you to edit these parameters off-line.

Setting Up and Monitoring Inputs and Outputs

The top half of the screen allows you to make changes to blocks with tunable parameters. The tunable parameter and its value are displayed. When a block is called up, the program will display the first tunable parameter. Another tunable parameter could be displayed instead. Placing the cursor in the specification field will allow you to change the specification number for that block. If the block has more than one tunable parameter, both could be displayed on two lines. The most common use for the tunable parameters is to tune the S1 specification of a Manual Set Constant block (function code two) or Manual Set Switch block (function code 50). This block would change the control system and the effects could be seen in the outputs.

Enter the Loop, PCU, module address and block number. The right side will show the function code and the first tunable parameter for the entered block. To change the value, move the cursor to the Value field and enter the desired value. If desired, a brief description could be entered in the *Input Description* field. The bottom half of the screen allows you to monitor up to 24 block outputs. Press <Up> or <Down> to scroll through the 24 points. Press <Home> or <End> to go to the top or bottom of the list.

As well as displaying the output values, the alarm status, will be shown (e.g., high, low). If there are no alarms, the field will be blank. The point quality status is also shown. If for any reason, the block being monitored determines that its input data is bad, then the point quality flag will change from good to bad.

NOTE: Function codes 193 and 194 can be configured in the module and their specifications edited or tuned. However, CLS cannot monitor the outputs of these blocks.

Setting the Scan Period

Pressing <F5> will move the cursor to the scan period field, allowing you to change the scan rate of the outputs. The period is in seconds: one means scan every second, two means scan every two seconds. The maximum scan period is 999 seconds. Entering a value of 0 will force the scan rate to operate as fast as the module bus will allow. The more points being monitored, the slower the scan rate will be.

Saving and Loading Templates

After the inputs and outputs have been set up, pressing <F4> (Save Template) will save the screen as a template to a file. You will be prompted for a file name. This template can be recalled for reuse by pressing <F2> and entering the file name.

Logging

If desired, the 24 outputs can be saved to a file for later examination. The data is stored in ASCII and the format is the same as you would see on the screen. The file can be printed or viewed from the QNX command line using the "more" command (see your ***QNX Utilities Reference*** manual for details on using "more"). This data cannot be used by the CLS program.

PCU OPERATIONS

This menu provides the same basic operations as the Module Operations menu, except that the operations affect all the modules in a PCU.

> **NOTE:** These functions work with multiple modules or files, therefore some means of identifying the different modules or files is required. CLS uses the convention of ? and * for wildcard characters. When using a function that refers to a group of modules, the file name will be shown as *001??.cfg*. The two ? marks can refer to any file that starts with "001" and ends with ".cfg" and has two digits in between. In the above example, first 0 is the Loop number and 01 is the PCU number. If a Superloop system is being used, the Loop or PCU number can range anywhere from 1 to 250. The program will account for this. For example, if the PCU number is 135 on Loop 212, the file name would appear as **212135??.cfg**.

Pressing <F3> from the CLS Main menu, in any of the access levels, will display the PCU Operations menu (Figure 13-8).

```
L  -  Loop Number
                        PCU Operations
                       ****************




F1 Set PCU Number       F2 Set Default Module Types      ********
F3 Set Module Address   F4 List PCU Configuration     Loop Number:   0
                                                      PCU Number:    0
F5 Change Module Mode   F6 List PCU From Disk Files   Module Address:0
                                                      Type:
F7 Save PCU on Disk     F8 Restore PCU from Disk      Rev:
                                                      Mode:
F9 Verify PCU & Files   F10 Return To Main Menu       Status:  Off Line
                                                         ? HELP
```

Figure 13-8. PCU Operations Menu

Setting Loop, PCU, Module, and Mode

If you are using INFI-NET, set the loop number by pressing **L**. Set the PCU number by pressing <F1>. The program will poll the requested PCU and display the status of any modules it finds. To interrupt this process, press any key.

Set the address of the module to work with by pressing <F3>.

To change the mode of the target module, press <F5>. The status of the selected module is displayed in the lower right corner of the screen.

Listing Configurations (Module or Disk)

Pressing <F4> or <F6> will list all the modules in a given PCU to the “txt” print spooler.

Saving and Restoring Modules

<F7> will save all the modules to disk.

<F8> will restore all the modules in a particular PCU from disk. When restoring, the program will automatically put the module into the Configure mode. If a module that was saved on the disk is not in the PCU, an error message will appear. Pressing any key, except <Enter>, will allow the program to continue on to the next file or module. Pressing <Enter> will cause the program to retry the last operation.

CAUTION	**Do not load a configuration unless you have saved the previous configuration. You may need to restore it, if the new configuration does not control the process.** **Changing function code types or locations may invalidate tags based on the previous configuration.**

Verifying Modules

<F9> verifies all modules in a given PCU with the files on your disk. The program will stop at the first block that cannot be verified. Correct the error and try again to verify it. The error message will indicate if the file is not the same as the module.

If a file is listed for a module that is not in the PCU, the message:

Module error: Not Responding

appears at the bottom of the screen. Press <Esc> to continue to the next module.

BIM/SBM Utilization

The BIM (SBM for INFI-NET) has a fixed amount of memory. Each point that must communicate over the plant loop will use some of the memory. This function allows you to check if your system configuration will overload the BIM.

Press <F7> from the CLS Main menu to display the BIM/SBM Capacity Calculation screen (Figure 13-9).

```
┌──────────────────── BIM/SBM CAPACITY CALCULATION ──────────────────┐

  Total number of module addresses within this PCU (except CTM & SPM)   1
  Total number of nodes on this ring that talk to this PCU              0
  Total number of BCM's on this ring                                    0
  Total number of AOP's & RMSC's (F.C. 30, 70 & 68) in this PCU        48
  Total number of LMM auto exception reports in this PCU                0
  Total number of DOp's (F.C. 45) in this PCU                          36
  Total number of Analog Stations (F.C. 21, 22, 23 & 80) in this PCU   11
  Total number of RCM's, DDB00's, MSDD's or RMC's in this PCU            25
  Total number of blocks and tags in other nodes reading from this PCU; 0
      for plant loop, use nodes (including BCM) on this ring only;
      for superloop use nodes (excluding BCM) on all rings
  Total number of modules in other PCU's sending points to this PCU;    0
      for plant loop, use PCU's (including BCM) on this ring only;
  Total number of DI's (F.C 42&122) that reference different addresses 27
  Total number of AI's (F.C 26&121) that reference different addresses  2
  Total number of AI's and DI's (F.C. 26, 121, 42 & 122) in this PCU   29

                                       Total BIM usage (bytes)      1549
      (% of 9728 bytes on BIM01) / (% of 25088 bytes on BIM02)  15.9 /6.1

                                       Total SBM usage (bytes)      6460
                                        % of 192000 bytes on SBM01    3.3
└F1-Use Disk Files as Input; F2-Initialize Values to Zero────? HELP  ┘
```

Figure 13-9. BIM/SBM Capacity Calculation

To return to the CLS Main menu, press <F10>.

This function only works with configuration files, not modules, to calculate the BIM loading. Press <F1>, the program will then prompt you for the file you wish to check. The program will then read data from the file and display a screen (Figure 13-9). The highlighted items are the data from the file. The rest of the data must be entered manually. Calculate each module in the PCU and add the total. The total should not exceed 9.5K for the BIM01 or 24.5K for the BIM02.

Manually entered data will not change when a new configuration file is read. Before reading a new configuration file, press <F2> to reset all the fields to zero.

The calculations are an estimate and may not be accurate at high loadings. Other variables may need to be considered when loading gets too high. In designing a PCU configuration, the BIM/SBM utilization should be maintained below 80%.

NOTE: BIM/SBM utilization does not include the UDXR blocks (function codes 193 and 194).

LOOP OPERATIONS

Pressing <F8> from the CLS Main menu will display the Loop Operations menu (Figure 13-10). Loop operations are functions that are performed on all PCUs and modules on a loop.

```
 L  -  Loop Number
                      LOOP Operations
                      ****************

F1 Display LOOP Status                              ********
                                                Loop Number:   0
                                                PCU Number:    0
                                                Module Address:0
                                                Type:
                                                Rev:
F7 Save LOOP on Disk                            Mode:
                       F10 Return To Main Menu  Status:  Off Line
                                                        ? HELP
```

Figure 13-10. Loop Operations Menu

Display Status

Display Loop status (Figure 13-11) shows all nodes on the selected loop, their node type (e.g., MCS, CIU, PCU), and their status. Press <F1> to display the status of the selected Loop. This function only works with a CIU. The CIU04 must be used for a INFI-NET system. Either one (Plantloop) or four (INFI-NET) status pages will be displayed.

```
1.                       2.                        3.
4.                       5.   BCM   Error  M       6.   SBM   Error  M S
7.   CIU   Normal        8.   CIU   Error  M       9.
10.                      11.                       12.
13.                      14.                       15.
16.                      17.                       18.
19.                      20.                       21.
22.                      23.                       24.
25.                      26.                       27.
28.                      29.                       30.
31.                      32.                       33.
34.                      35.                       36.
37.                      38.                       39.
40.                      41.                       42.
43.                      44.                       45.
46.                      47.                       48.
49.                      50.                       51.
52.                      53.                       54.
55.                      56.                       57.
58.                      59.                       60.
61.                      62.                       63.
                                Esc - quit
                       Press any key for Next page...
 M = Module status problem   SYSTEM STATUS   S = Node status problem
```

Figure 13-11. Loop Status Screen

Saving Modules

Save Loop on Disk allows you to save a complete loop on disk. Press <F7> to call up the Save Loop display (see Figure 13-12). The program will then prompt you to specify the drive and directory to save the configuration files to. Once the drive and directory have been specified, press <Enter> to continue.

```
L  -  Loop Number
Select Directory for Save:
</>e
<..>

      NODE:    [1]

      PATH:   /home/SYSOP

      NAME:  [100??.cfg]
      FREE:  [17.89 MB ]

      Enter - Selects a file   Escape - Aborts file selection
F1 Display LOOP Status                               ********

                                                    Loop Number:   1
                                                    PCU Number:    0
                                                    Module Address:0
                                                    Type:
                                                    Rev:
F7 Save LOOP on Disk                                Mode:
                                                    Status:
                      F10 Return To Main Menu
                                                            ? HELP
```

Figure 13-12. Save Loop on Disk

The saved configuration files will automatically be given a name following the DOS conventions outlined earlier in ***MODULE CONFIGURATION FILES***. If a file with the same name already exists in the selected directory, the program will rename it with a ".bak" extension (e.g., "filename.cfg" will become "filename.bak"), and the newly saved file will be given a ".cfg" extension.

You need two megabytes to four megabytes (depending on your INFI 90 OPEN system size) of free disk space to save the module configurations for an entire loop.

If any errors occur that would normally require you to press a key, the program will retry the command for 60 seconds. If the error continues, the program will not save the module that caused the error and will continue with the next module. You need not press any key while this function is in effect. All errors encountered are written to an error log file called "cls.log" in the directory where the configuration files are stored.

The log file is an ASCII text file and will contain information about which PCUs were scanned to check that they were PCUs and were on-line, what modules were saved from the PCUs found, and what errors were encountered during the loop save process. If the log file already exists, the program will erase the existing file and create a new one. Note that this error log file could become very large if a lot of errors are encountered or if the system is a large system. This file can be printed or viewed from the QNX command line using the “more” command (see your QNX Utilities References manual for details on using “more”).

NOTE: Be sure to read the error log file when the save is completed, to check for any errors encountered during the save.

The function can be stopped at any time by pressing <Esc>.

MASTER USER FUNCTIONS

If you enter CLS with Master level access, you see the CLS Main menu shown in Figure 13-13. There are three menu selections that are not seen by Configure or Tune level users. The additional menu selections are:

- F2 Password Operations.
- F4 Tuning Access List.
- F6 Technician Action Logging.

```
L  -  Loop Number
                 CONFIGURATION LOADING SYSTEM
               WITH PASSWORD ACCESS RESTRICTION

                     F1 Module Operations
                     F2 Password Operations
                     F3 PCU Operations
                     F4 Tuning Access List
                     F5 Monitor Operations
                     F6 Technician Action Logging
                     F7 Bim Utilization

                     F8 Loop Operations

                     F9 Exit CLS

                                                  ? HELP
```

Figure 13-13. CLS Main Menu for Master Level Access

Password Operations

A user with Master level access to CLS can change the passwords that will be accepted for entry to the CLS program.

To change or view the passwords, press <F2> from the CLS Main menu. This will call up the Password Operations screen (Figure 13-14).

This display presents for editing four password fields of eight characters each. The first three of these fields define the password patterns that will be accepted for entry to the CLS package for each of the three access levels: Master, Configure and

```
L  -  Loop Number
          CONFIGURATION LOADING SYSTEM
        WITH PASSWORD ACCESS RESTRICTION

"Master" Access Level Password:              stmaster

"Configure" Access Level Password:

"Tune" Access Level Password:                sttune

CIU Password:

        Enter-Save & Quit; F10-Quit (No Save)
```

Figure 13-14. Password Operations Screen

Tune. Be careful in reassigning the master password: if you forget the new password, you will not be able to re-enter the CLS package with Master access privilege.

The fourth of these fields defines the password that will be sent to the CIU when the *Set PCU Number* function is performed from the Module Operations menu or the PCU Operations menu. The setting of this CIU password will make no difference unless the CIU itself has been set to enable CIU password protection. If this protection has been enabled, then the CIU password defined in the CLS package must match that defined in the CIU, otherwise the CLS package will be unable to communicate with the CIU, giving the error *Callup command required.*

Move the cursor between *Password* fields by pressing <Up> and <Down>.

Tuning Access List

Pressing <F4> from the CLS Main menu will bring up the Tuning Access display (Figure 13-15).

With this display, you can edit the list of block specifications that can be tuned by Tune access level users. The list consists of 256 possible rows of information: the first row (row number zero) is fixed and cannot be changed, but the last 255 rows can be edited. Each row defines a group of specifications in a particular group of function blocks or function codes as either being accessible for tuning or not.

Use the cursor keys to move between fields. To delete a row of information, move the cursor to that row, then press <F2>. To add a new row of information between existing rows, move the cursor to the second of the two existing rows (the higher index), and press <F1>. To print the contents of the list to the standard printer device, press <F3>.

```
                          Tuning Access List
 # ACCESS L P M B FC     SPECIFICATIONS

 0 DENY
 1 PERMIT   1   1
 2 PERMIT   1   3
 3 DENY     1   3    2
 4 DENY     1   3    4      12
 5 PERMIT                     15  4,5
 6
 7
 8
 9
10
11
12
13
14
15
16

F1 Insert Item              F2  Delete Item
F3 Print                    F9  Save               F10 Exit
```

Figure 13-15. Tuning Access List

Each row consists of fields in which you specify the following information:

ACCESS Enter either **Permit** or **Deny** (only the first letter needs to be entered), depending on whether you want to permit access to tuning of these specifications, or deny access. A blank field will cause that row to be deleted.

LOOP Enter the address of the Loop to which this permission or denial applies. Entering a blank in this field will cause this row to apply to all loops.

PCU Enter address of the PCU to which this permission or denial applies. Entering a blank in this field will cause this row to apply to all PCUs.

MODULE Enter address of the module to which this permission or denial applies. Entering a blank in this field will cause this row to apply to all modules.

BLOCK Enter address of the block to which this permission or denial applies. Entering a blank in this field will cause this row to apply to all blocks.

FUNCTION CODE Enter the function code number to which this permission or denial applies. Entering a blank in this field will cause this row to apply to all function codes.

SPECIFICATIONS Enter list of specification numbers to which this permission or denial applies. The list should be entered as specification numbers separated by commas. Entering a blank in this field will cause this row to apply to all specification numbers.

Whenever a user, operating CLS with Tune level access, selects the Tune Block function for a particular PCU/module/block address, the Tuning Access List will be checked in order to determine what specifications of this particular block will be tunable.

To show how CLS uses the Tuning Access List, an example is given. We have Tune level access and want to tune PCU three, Module four, Block 12, which happens to be function code 15. The sample list given in Figure 13-15 will be used for this example.

Each row of the Tuning Access List is consulted in turn, beginning with row number zero.

Row zero is constant, always consisting of DENY in the access field, with all other fields being blank. Thus row zero always directs that, at all INFI 90 OPEN addresses and for all function codes, access to tuning of all specifications should be denied. If no further rows had been defined with PERMIT access fields, the Tune level user would not be able to tune any blocks in the INFI 90 OPEN system. In our example, after looking at row zero, we are not allowed to tune any specifications in our target block.

Row one permits access to tuning of all specifications in all modules and blocks in PCU 1, regardless of function code. In our example, because we have selected to tune a block in PCU three, this row has no effect, and after row one, and we are still not allowed to tune any specification in our target block.

Row two permits access to tuning of all specifications in all modules and blocks in PCU three, regardless of function code. This matches our example case and after row two, we are allowed to tune all specifications in our target block; as long as they are defined as tunable in the module itself (i.e., the Tuning Access List cannot make tunable a specification that is by definition non-tunable at the module level).

Row three denies access to tuning of all specifications in all blocks in PCU three, module two, regardless of function code. This does not match our example case, so, after row three, we are not allowed to tune any tunable specifications in our target block.

Row four denies access to tuning of all specifications in PCU three, module four, block 12, regardless of function code. This matches our example case, so, after row four, we are not allowed to tune any specifications in our target block.

Row five permits access to tuning of specifications four and five in all PCUs, modules and blocks, so long as the block is function code 15. However, only specifications three and four are actually tunable for function code 15, so only specification four is allowed to be tuned. This matches our example case and because this is the last non-blank row of the Tuning

Access List, our final status is to be allowed to tune specification four in our target block.

Technician Action Logging

Pressing <F6> from the CLS Main menu will display the Technician Action Logging screen shown in Figure 13-16.

```
                    CONFIGURATION LOADING SYSTEM
                  WITH PASSWORD ACCESS RESTRICTION

                      TECHNICIAN ACTION LOGGING

 Enter drive, path, name and extension of file to hold encoded log info
        (specifying a blank file name will turn off logging)
  3:/pcw/cls/tal.log


  TAL file history:
  Found GOOD as of:      Found BAD as of:
                      1991/01/07  13:25  (invalid contents - truncated)
  1991/01/07  13:25
      Enter-Save; F1-Write log to ASCII file; F10-Quit (no save)
```

Figure 13-16. Technician Action Logging Parameters

At this display, you can select the name of a file (complete with drive and path name) to which tuning actions will be logged when the package has been entered by users with Tune level access. This logged information is stored in a file in an encoded form, which is not directly readable.

The lower portion of the screen displays information about any problems encountered while accessing the specified file, and the time and date when the problem was found (it is only while in Tune access level that the file is accessed). The types of problems that can be encountered are:

invalid contents - truncated indicates either that the file could not be found, or that the check patterns built into the existing file showed the contents of the file to have been changed from when the file was last saved by CLS. CLS responds to this error by either creating a new file of the appropriate name and adding the appropriate record, or truncating the existing file (throwing away the corrupted data) and adding the new record.

old version - appended indicates that the information contained within the existing file showed no signs of having been tampered with, but either this file was last updated by a copy of CLS other than this one, or this copy of CLS has been used to update another file since this one was last updated. CLS responds to this error by keeping the existing data in the file and appending the new information to the end of the file.

file error - not recorded indicates that for some reason CLS could not succeed in writing the information to the file and any new information was not logged.

View the logged information by pressing <F1>, then typing the drive, path, and file name of a file to write the log information to. This is an ASCII text file and can be viewed from the QNX command line using the "more" command (see your QNX Operating System manual for details on using "more"). The ASCII text form of a sample Technician Action Log is shown in Figure 13-17.

```
Date      Time      Action   PCU Mod Block  FC Spec Old_Value New_Value
91/01/07  12:30:57  ENTER
91/01/07  12:31:32  TUNE       0  24   240  53    9         11      12
                                                 11         12      11
91/01/07  12:31:54  TUNE       0  24   240  53    9         12      11
91/01/07  12:31:59  EXIT
91/01/07  12:32:52  ENTER
91/01/07  12:32:53  TIME STAMP
91/01/07  12:33:54  ENTER
91/01/07  12:34:06  EXIT
```

Figure 13-17. Sample Technician Action Log

Each action is recorded with the date and time when the event occurred. Four types of actions are recorded:

- ENTER.
- EXIT.
- TUNE.
- TIME STAMP.

ENTER records when CLS is entered by Tune access level users; EXIT records when CLS is exited. TUNE records when the Tune level user tunes blocks. TIME STAMP records when CLS is terminated by resetting or powering down the computer rather than being exited in the normal fashion. The time recorded for a TIME STAMP action will be within five minutes of when the actual reset or power down occurred.

For the ENTER, EXIT, and TIME STAMP actions, only the date, time and action descriptor are recorded. For TUNE actions, the following additional information is recorded: the PCU, module, block address and function code of the block being tuned; and the specification number, old value and new value of each specification whose value was changed.

SECTION 14 - CONFIGURING SEQUENCE-OF-EVENTS (SOE) LOGS

OVERVIEW

The SOE Logging package is intended for use by end-user job-site personnel to closely and rigorously monitor critical digital points where the given situation requires that the sequence of changes of state for these points or groups of points be known in the most exacting ways possible. SOE Logging meets this requirement by listing all digital state transitions in time order and in one-millisecond resolution.

The logs are produced in an Elsag Bailey Module. The SOE log system on the operator console retreives, stores and prints these logs for you.

The SOE logging package can interface to Rochester loggers or Elsag Bailey loggers. The external Rochester Instrument Systems (RIS) Sequential Events Recorder (SER) consists of one or more Event Capture Units (ECUs) connected to Rochester Communications Interface Unit through fibre optic communication links. Each ECU monitors hard-wired digital input points.

> **NOTE:** The Distributed SOE package is only available with Software Release 5.2 or later.

The SOE Logging manager will interface with an Elsag Bailey DCS Multi-Function Processor (MFP), containing Elsag Bailey Function Code 99 (Sequence of Events Log) and Function Code 210 (Sequence of Events Slave) blocks, or with an Elsag Bailey DCS Distributed SOE Sequence of Events Master (SEM) containing fixed SOE blocks 5000 and 5001, by using the ICI command for reading extended module problem reports, with a special flag set for receiving SOEs. Each FC99 block, in turn, communicates with one RIS SER Communication Interface Unit, requesting SOE data. Each FC210 block builds its own SOE data with its own timestamps with up to 32 digital inputs from up to two Digital Input Slave modules.

The SEM fixed block 5000 is a standard SOE trigger, which sends standard SOE data from a distributed SOE system to an OIS12 server. The SEM fixed block 5001 is summary SOE trigger, which sends summary SOE data from a distributed SOE system to an OIS12 Server. Hence the path taken by all SOE data is:

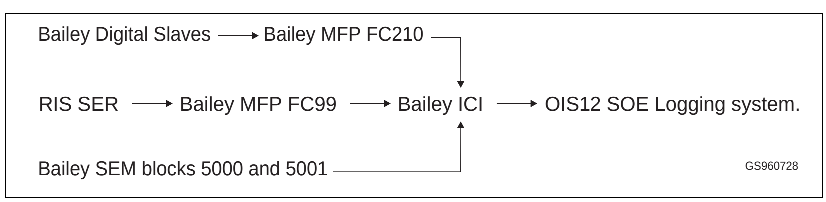

Figure 14-1. Path Taken by SOE Data

NOTE: The FC210 block can handle only two Digital Input Slaves, and therefore only 32 digital SOE points. Also, only one FC210 block can run in an MFP. Therefore, for SOE logging systems with more than 32 digital points but with only one MFP available, you must use FC99 and an RIS SER system to collect your SOE Logs.

The SOE Logging system allows the configuration and definition of the trigger tags, aging time, report types, report parameters, log definition, printer selection, and other information necessary for a complete implementation of features provided by Function Codes 99, 210 and 243. Also, each Server Node on the OIS12 Network can possess its own SOE Log database.

An overview of the SOE Logging system architecture for use with Function Code 99 appears in Figure 14-2.

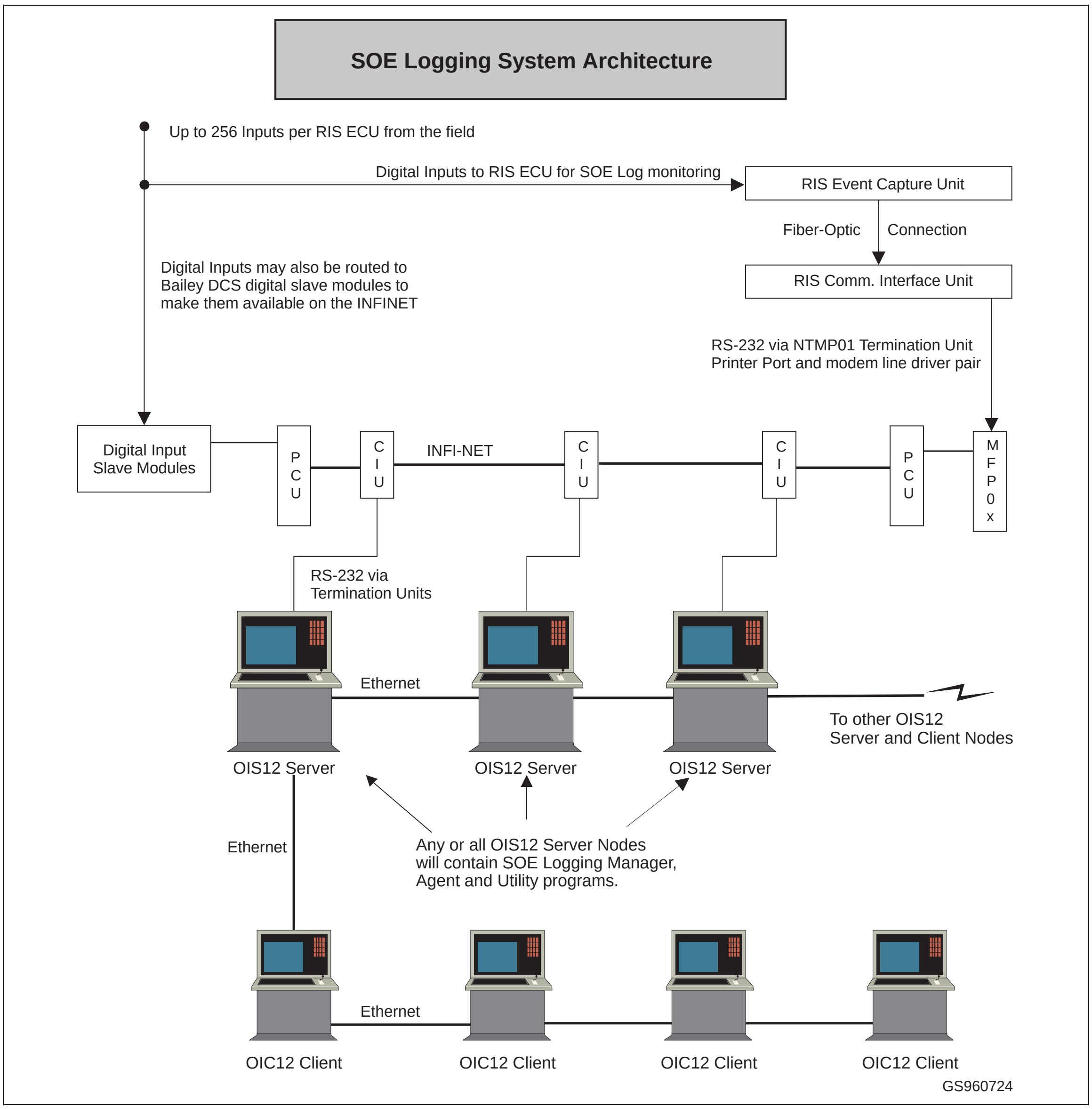

Figure 14-2. Typical SOE Logging Architecture

An overview of the Distributed SOE Logging system architecture appears in Figure 14-3.

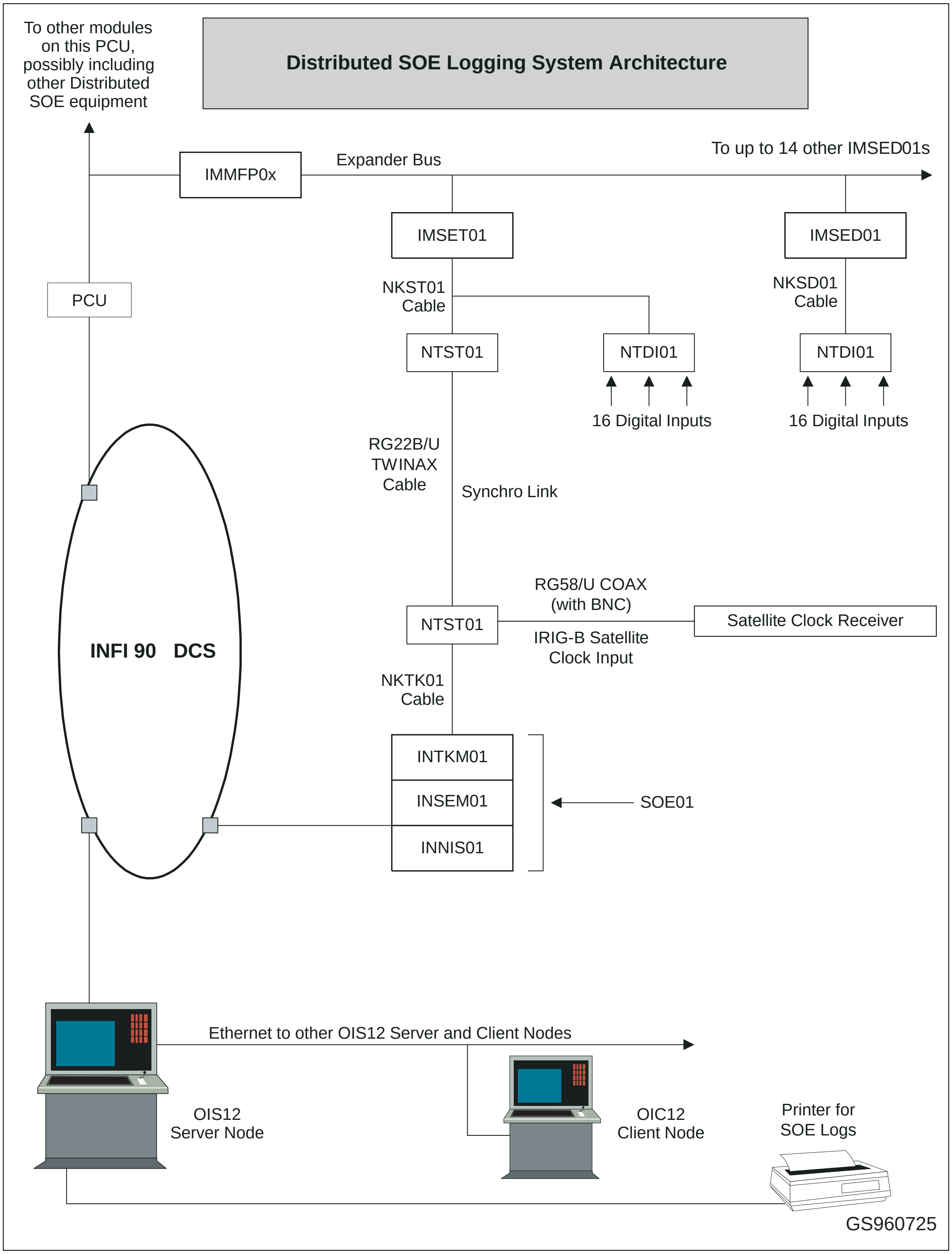

Figure 14-3. Distributed SOE Logging Architecture

SPECIFIC FEATURES OF THE SOE LOGGING SYSTEM

1. One millisecond resolution on change of state time stamps.

2. The following five types of SOE reports/triggering:

Standard Any SOE point change of state of Log Type Standard will result in a time-stamped SOE Report for this point. This SOE log will be stored in the MFP or SEM for the length of time specified within the corresponding Function Code 99/210 block or in the SEM Function Code 243 block (the aging time). This log must be read in by the SOE Logging System before this aging time expires.

Summary A Summary SOE Log is a report of all time-stamped SER points which are not normal (i.e., inactive, deleted from scan, or in alarm). This report can be demanded by the operator by changing the RCM block output of the corresponding SEM block 5001 or Function Code 99/210 block in the MFP (i.e., the Summary trigger) from State zero to State one through, for example, an RCM control pop-up.

Pre-Fault In a Pre-Fault Log, SER point changes of state will be stored per a designated quantity or time period (e.g., 50 events prior to trigger; ten minutes prior to trigger), then reported, in ascending order of time, when the Pre-Fault trigger is changed from State zero to State one.

Post-Fault In a Post-Fault Log, SER point changes of state will be reported only after the Post-Fault trigger is changed from State zero to State one. The points will continue to be reported until the Post-Fault trigger reverts back to State zero. The SOE Logging System must remove these logs from the MFP before the aging time expires.

Snapshot Snapshot Logs will have their points listed in ascending numerical order, but only after the Snapshot trigger is changed from State zero to State one. Snapshot points can be designated in groups such as those which are Normal, those which are Deleted from Scan, etc.

3. Snapshot logs are not available in all Rochester loggers. Elsag Bailey loggers via FC 210 only produce Summary and Snapshot reports. Elsag Bailey Distributed - SOE SEM modules possess only two SOE triggers, fixed-block 5000 for Standard reports, and fixed-block 5001 for Summary reports.

4. Each MFP-SER pair may have multiple FC 99 SOE report types. Each MFP may have only one FC 210 Elsag Bailey logger.

5. Support for up to 32 MFP-SER pairs.

6. Maximum 1536 points per MFP-SER pair.
   Maximum 32 points per MFP FC 210.
   Maximum 1500 points per SEM module.

7. 32 character descriptor for each SOE point.

8. Maximum 160 configured SOE reports.

9. SOE error reporting through the standard OIS12 console error handling system.

REQUIREMENTS

Hardware for Function-Code 99/210 SOE Logging

Make sure that the following hardware is included with the Server system as well as the INFI 90 OPEN DCS to which the server is connected via ICI.

- A Rochester logger consisting of one (or more) RIS ECUs and a RIS SOE Communications Interface Unit with one fibre-optic communications board per ECU.
  - or -
  An Elsag Bailey Digital Input Slave Module for 16 points and two modules for 32 points.

- At least one Elsag Bailey INFI 90 OPEN MFP is needed to contain the Elsag Bailey Function Code 99 for the Rochester logger or the Function code 210 for use with the Digital Slave.

- The LAN-90 PCV server must have at least one printer for SOE Logs to be sent to.

- A CRT terminal of some kind (e.g., VT100 or WYSE50 or Personal computer with a communications emulation program) is needed for issuing ISM-1 commands to the RIS CIU, if you wish to configure the RIS SER system.

- The proper RS-232-C cables are needed for the RIS-to-MFP hook-ups, and the RIS-to-CRT-terminal hook-up.

- Optionally, one Optical Disk System.

  NOTE: The points collected by the Rochester System are only available to the Elsag Bailey system in the form of SOE logs. If these points are needed in the process control system, as digital points, then these points must be physically wired into a Elsag Bailey input module, as well as the Rochester logger. Include these points in your calculations, when determining the number of slave modules required.

Hardware for Distributed SOE Logging

NOTE: The following hardware requirements pertain to the Distributed SOE architecture ONLY.

- One or more IMMFP0x Multi-Function Processor modules (rev F.0 or later) for use as Masters for the SET/SED pairs of modules.
- One or more IMSET01 Sequence of Events Timing modules.
- One or more IMSED01 Sequence of Events Digital input modules.
- One INTKM01 Time Keeper Master module. [1]
- One INSEM01 Sequence of Events Master module. [1]
- One INNIS01 Network Interface module. [1]
- The INTKM01 module, as well as all IMSET01 modules, each require one NTST01 time sync termination unit.
- The INNIS01 module requires one NTCL01 NIS termination unit.
- Each of the IMSET01 and IMSED01 modules require one NTDI01 digital I/O termination unit; 16 digital inputs each.
- The INTKM01 module requires one NKTK01 cable to connect it to its NTST01 termination unit.
- Each IMSET01 module requires one NKST01 cable to connect it to both its NTST01 termination unit and its NTDI01 termination unit.
- Each IMSED01 module requires one NKSD01 cable to connect it to its NTDI01 termination unit.
- The INNIS01 module requires one NKLS01 NIS-to-TCL cable to connect it to its NTCL01 NIS termination unit.
- All NTST01 termination units in the Distributed SOE architecture must be connected in series with RG22B/U TWINAX time-sync cables; impedance=95Ω, capacitance 52.5 pF.
- An optional IRIG-B Satellite Clock Receiver may be connected to the NTST01 termination unit of the INTKM01

1. The INTKM01, INSEM01 and INNIS01 trio of modules is collectively known as the SOE01.

Time Keeper Module, using an RG58/U COAX cable (with BNC).

- The LAN-90 PCV server must have at least one printer for SOE Logs to be sent to.
- Optionally, one Optical Disk System.

NOTES:

1. Unlike Non-Distributed SOE Logging blockware, the digital outputs of a Distributed SOE system are accessible both as SOE logs and as digital outputs to the loop through Function Code 242 (DSOE Digital Event Interface). Keep in mind, however, that the digital outputs provided by Function Code 242 must point to DO/Ls (Function Code 45) in order to be accessible to the rest of the DCS and to the OIS12 console.

2. For more information on how to wire up a Distributed SOE system on the Elsag Bailey DCS, please consult the **Elsag Bailey INFI 90 OPEN Distributed Sequence Of Events** instruction manual.

3. In order for the Distributed SOE system to function properly, the blockware in both the Sequence of Events Master (SEM) module, as well as the Multi-Function Processor (MFP) which serves as the SET/SED Master MUST be properly configured with 240-series Function Codes. For more information concerning these particular Function Codes, please consult the **Elsag Bailey INFI 90 OPEN Function Code Application Manual**, or the **Elsag Bailey INFI 90 OPEN Function Code Quick Reference Guide**. Also, see the Distributed SOE Blockware Example at the end of this section.

Software

In a Non-Distributed SOE system, each MFP must have at least one Function Code 99 or 210 trigger block configured within it to accept SOE Logs from the RIS equipment and/or digital input slave modules. In a Distributed SOE system, two trigger blocks, 5000 and 5001, already exist within each SEM.

Also, a Remote Control Memory (RCM) tag must be configured within the OIS12 console database to the hardware address of each Function Code 99/210 block within each MFP, as well as for blocks 5000 and 5001 within each SEM.

Digital tags must be configured in the database for all input field points used by the RIS equipment and/or digital input slave modules and/or Distributed SOE digital inputs modules. With the Elsag Bailey Function-Code 210 and Distributed SOE loggers, these would be real digital points. With the RIS logger, points that have been connected to a Elsag Bailey input module would also be real digital points. The points that are only used by the RIS logger should be set up as internal digitals. These points are used for configuration purposes and supply the description of the tag used in the log reports. The OIS12 console must have the SOE Logging option, as well as the Archive Manager loaded and enabled.

External Interfaces

The SOE Logging system requires the following interfaces:

- Each SOE Log Trigger Tag must be specified as an RCM tag within the OIS12 console tag database, with its ring, PCU, module and block being the same as that of the corresponding Function Code 99/210 block within the MFP, and/or the corresponding fixed-blocks 5000 and 5001 within the SEM.

- Elsag Bailey Function Code 99 uses communications protocol necessary to interface with a special Elsag Bailey communications board (manufactured by RIS) within the RIS Communications Interface Unit. This protocol is built into the firmware of the MFP itself and is beyond the scope of relevance to this document.

- Elsag Bailey Function Code 210 interfaces with one or two INFI 90 OPEN Digital Input Slave Modules to input and millisecond time-stamp up to 32 digital tags. The reports generated by this function code are equivalent in content to those generated by the RIS recorder through F.C. 99.

- SEM fixed output blocks 5000 and 5001 interface with the Distributed SOE system to input and millisecond time stamp Distributed-SOE events. Block 5000 is used for collecting Standard SOE events. Block 5001 is used for collecting Summary SOE events upon user demand by setting this RCM tag. These blocks are NOT configurable.

  NOTE: For more information on Elsag Bailey Function Codes 99 and 210, please consult the **Elsag Bailey INFI 90 OPEN Function Code Application Manual**, or the **Elsag Bailey INFI 90 OPEN Function Code Quick Reference Guide**.

CONFIGURATION OVERVIEW

SOE configuration for the OIS12 console involves the following:

1. OIS12 Database Configuration.

2. SOE General Parameters Configuration.

3. SER Configuration.

4. SOE Report Configuration.

Item one is achieved by entering database tags in the standard OIS12 manner.

Items two, three and four are achieved by way of three interactive utilities, which are invoked from the OIS12 Configuration menu hierarchy. Each of these programs use the same Server Node currently in use by the corresponding OIS12 Executive. These therefore include the ability to automatically switch to the SOE Logging system of a different Server Node should you switch the OIS12 Executive over to that particular node.

GENERAL KEYSTROKE RULES FOR SOE LOG CONFIGURATION UTILITIES

The general rules governing keystrokes for each of the three OIS12 SOE Log Configuration utilities, SOE General Parameters, SER Definition, and SOE Report Definition, are as follows:

<F1> Is used for saving an edited configuration.

<F9> Displays help information for the corresponding utility.

<F10> Is used for exiting a program, accompanied by a prompt whether or not to save the configuration changes made.

<PgUp> Causes the utility to go to the *previous page*. In the case of SOE General Parameters, this goes to the other half (the other 16) of 32 SERs, in the case of SOE Report Definition and SER Definition (if the cursor is over the SER number) this goes to the previous report or SER. In the case of SER Definition when the cursor is currently in the point definition area, this goes to the previous group of 64 digital input points. In all cases, <PgUp> wraps around from first to last.

<PgDn> Causes the utility to go to the *next page*. In the case of SOE General Parameters, this goes to the other half (the other 16) of 32 SERs, in the case of SOE Report Definition and SER Definition (if the cursor is over the SER number) this goes to the next report or SER. In the case of SER Definition when the cursor is currently in the point definition area, this goes to the next group of 64 digital input points. In all cases, <PgDn> wraps around from last to first.

<Left> Move to the previous field to the left in the current row. If there is only one field on the current row, this has no effect.

<Right> Move to the next field to the right in the current row. If there is only one field on the current row, this has no effect.

<Tab> Move to the next field to the right within current row, with wraparound to the left-most field of the next row.

<Shift Tab> Move to the previous field to the left, with wraparound to the right-most field of the previous row.

<Ctrl Left> Move to the left within a text field one character at a time; no wraparound.

<Ctrl Right> Move to the right within a text field one character at a time; no wraparound.

MAJOR STEPS IN CONFIGURING SOE LOGS

Database Configuration

Each field input to a Sequential Events Recorder or to a Digital Input Slave must have a corresponding digital tag defined in the OIS12 Database. In addition, each SOE report must have a Trigger Tag associated with it whose PCU, module, and block is SEM fixed block 5000, SEM fixed block 5001, or the address of the MFP Function Code 99 or 210 report block output. This must be an RCM type tag.

For a digital tag type, the following attributes must be defined for use by the OIS12 SOE software:

1. Tag Type (Digital - IntDig, RMCB, DD, Digital).
2. Tag Name.
3. Tag Description.
4. Logic State Descriptors.

For an SOE trigger tag, the following attributes must be defined:

1. Tag Type (RCM).
2. Tag Name.
3. PCU.
4. Module.
5. Block.

Both of these tag types are to be entered into the database in the same fashion as any other OIS12 tag.

For more information on tag database entry, please refer to Section 3.

SOE General Parameters Configuration

The SOE parameters configurable through SOE General Parameters are listed as follows:

1. Number of SERs (maximum of 32).

2. Number of SOE reports (maximum of 160).

3. Number of indices per recorder (i.e., field inputs; max.: 1536).

4. SER description.

Access SOE General Parameters by first selecting the **D Configuration** pull-down menu from the OIS12 Main menu, then by selecting **C Log Configuration** from the Configuration menu, then, from the Log Configuration menu, selecting **G SOE Logs**, then, from the SOE Logs menu, selecting **A SOE General Parameters**. This will bring up the SOE General Parameters display (Figure 14-4).

```
                    < SOE General Parameters >
 Number of Recorders      6
  Number of Reports      160

 Recorder Number      Recorder Description          Number of Inputs
        1            Event recorder number one               1536
        2            Event recorder number two                200
        3            Event recorder number three              400
        4            Event recorder number four               375
        5            Event recorder number five               150
        6            Event recorder number six                500
        7
        8
        9
       10
       11
       12
       13
       14
       15
       16
 Esc undo change Ins insert char Del delete char Ctrl <--> move within field
 F1 save  F9 Help  F10 exit  PgUp, PgDn other 16 SERs
```

Figure 14-4. SOE General Parameters Display

The input field is initially stationed on the field for the number of recorders. Use this field to define the number of Sequential Event Recorders that will be available for data collection. Use the field below it to define the number of SOE reports in the system. Use the keys as described in the General Keystroke Rules for SOE utilities above to move between and within fields. Use the <PgUp> and <PgDn> keys to toggle the displaying of the 1st to 16th SERs and the 17th to 32nd SERs.

Press the <F1> key to save the newly-edited SOE parameters configuration in the file “soeparam.cf”. If this file does not exist at this given time, it will be created. Otherwise, you will be asked whether or not the existing “soeparam.cf” is to be over-written. Press the <F9> key to display on-line help pertaining to SOE General Parameters.

Press the <F10> key to abort the editing of SOE General Parameters. You will be asked whether or not the current configuration is to be saved in the file “soeparam.cf”.

SER Configuration

The correspondence between recorder inputs and the OIS12 console database tags must be defined for each SER. This is accomplished by the SER Definition program.

Access SER Definition by first selecting **D Configuration** from the OIS12 Main menu, then, from the Configuration menu, selecting **C Log Configuration**, then, from the Log Configuration menu, selecting **G SOE Logs**, then, from the SOE Logs menu, selecting **B SER Definition**. This will bring up the SER Definition display (Figure 14-5).

```
                          < SER Definition >
 Recorder number     5     Number of inputs   1536
  Index  Tag Name    Index  Tag Name    Index  Tag Name    Index  Tag Name
   1 X-------  17 X-------  33 X-------  49  X-----
   2 X-------  18              34                50
   3 X-------  19              35                51
   4             20             36                52
   5             21             37                53
   6             22             38                54
   7             23             39                55
   8             24             40                56
   9             25             41                57
  10             26             42                58
  11             27             43                59
  12             28             44                60
  13             29             45                61
  14             30             46                62
  15             31             47                63
  16             32             48                64
 Esc undo change Ins insert char Del delete char Ctrl <--> move within field

 F1 save   F9 Help   F10 exit   PgUp prev page   PgDn next page
```

Figure 14-5. SER Definition Display

The input field will initially be on the recorder number field, and the display will initially show the first 64 SER indices for recorder number 1. The number of defined field inputs is displayed also. Use the <PgUp> and <PgDn> keys to display the previous 64 SER indices (with wrap-around to the last 64) and to display the next 64 (with wrap-around to the first 64) respectively.

You can enter the database tag names as well as move within the input field in the manner outlined in the General Keystroke Rules for SOE utilities above. Entry of database tags is restricted to the maximum number of inputs defined for this SER in the SOE General Parameters display. An error message is displayed if an attempt is made to enter a tag name for an index that exceeds the defined Database limit, if the tag is not of type Digital, if the tag name is invalid, or if the tag does not exist. Enter a different recorder number to bring up the SER definition display for that recorder.

Press the <F1> key to save the newly-edited SER definition parameters for SER Number *NN* to the file “serdefNN.cf”. If this file does not exist at this time, it will be created. Otherwise, you will be asked whether or not the existing “serdefNN.cf” is to be over-written. These files can number up to the designated maximum number of SERs, one for each defined SER.

Press <F9> to display on-line help pertaining to SER Definition.

Press <F10> to abort this SER Definition session and pass control back to the SOE Logs menu. You will be asked whether or not the current configuration for the current SER is to be saved.

SOE Report Configuration

SOE Reports can be defined, using the SOE Report Definition program. The following fields are involved in the definition of an SOE report:

1. **Report Status**: indicates whether the SOE Report is Active in monitoring and collecting SOE Logs, or if it is Inactive, or turned off (default: Inactive).

2. **Report Type**: one of five possible types outlined in the Overview, which determines the means and behavior of the SOE collection process (default: Standard).

3. **Report Title**: this title appears at the top of each page in each SOE Log (default: left blank).

4. **Trigger Tag**: the RCM Database Tag whose value is the digital output from the Function Code 99 or 210 block in the MFP or from fixed block 5000 or 5001 in the SEM (default: left blank; index = 0).

5. **SER Number**: the SOE recorder number. The SOE Report will input its SOE Logs from this SER (default: 1).

6. **Wait Time**: the time difference between when the state of the Trigger Tag changes from zero to one (i.e., when the SER begins filling its internal SOE buffer with new SOE Logs) and when the OIS12 Logging System begins collecting these Logs. The Wait Time applies only to SOE Reports of types Standard and Post-Fault (default: 30 seconds).

7. **Print Device**: the OIS12 print device to which spooled SOE Logs are to be printed. This device name will be an ASCII string (default: "/dev/spool/txt132").

8. **Number of Retentions**: the number of SOE Log Files to be kept (retained) by the OIS12 Logging System for subsequent printout/display-on-demand and/or archival (default: 0).

9. **Archive**: indicates whether (Yes) or not (No) retained SOE Log files are to be sent to the OIS12 Archive Manager for archival before being deleted from the hard disk (default: No).

NOTES:

1. The FC210 Standard trigger block as well as the FC99 Standard and Post-fault trigger blocks will change state from 0 to 1 immediately when a new SOE charge of state is detected. However SEM Standard trigger block 5000 will have a delay of 20 seconds or the time specified in Specification 55 of SEM Function code 243, whichever occurs last, before any SOE change-of-state triggers it.

2. The Wait Time in each SOE Report Definition must be less than the Aging Time of the corresponding Function Code 99/210/243 block. Otherwise, valuable SOE data would be lost.

Access SER Report Definition by first selecting **D Configuration** from the OIS12 Main menu, then, from the System Configuration menu, selecting **C Log Configuration**, then, from the Log Configuration menu, selecting **G SOE Logs**, then, from the SOE Logs menu, selecting **C SOE Report Definition**. This will bring up the SOE Report Definition display, shown in Figure 14-6.

```
                    < SOE Report  Definition >
 Report Number       55
 Report Status       Active     Inactive
 Report Type         Standard   Summary  Pre-Fault  Post-Fault Snapshot
 Report Title        TURBINE TRIP REPORT
 Trigger Tag         TAGNUMBER55
 SER Number          1
 Wait Time           00:02:00
 Print Device        /dev/spool/txt132
 No. of Retentions   14                Archive            No    Yes




Esc undo change Ins insert char Del delete char
 Ctrl ←→ move within field or change selection

F1 save  F9 Help F10 exit  PgUp prev SOE Report  PgDn next SOE Report
```

Figure 14-6. SOE Report Definition Display

The input field is initially be on the Report Status number field. Move between and within the fields as outlined in the General Keystroke Rules for SOE utilities above.

NOTE: If the current Report Status of a given SOE report is ACTIVE, then the Trigger Tag, Report Type and Wait Time fields are skipped.

Select the Report Status from one of the choices (Active, Inactive) by highlighting the choice, using the <Left> and <Right> cursor keys to move between choices. Similarly select the Report Type from the following five choices: (Standard, Summary, Pre-Fault, Post-Fault, Snapshot), as well as the Archive option from (No, Yes). Enter the Trigger Tag as a Tag Name. Enter the Wait Time either as a numeric value (in seconds) or in the format **hh:mm:ss**.

Enter a different report number to bring up the SOE Report definition display for that report.

Press <F1> to save the newly-edited SOE Report Definition parameters for Report Number *RRR* to the *RRRth* record of the data file “soereprt.cf”. If this file does not exist at this time, it will be created. Otherwise, you will be asked whether or not the existing “soereprt.cf” is to be overwritten.

Press <F9> to display on-line help pertaining to SOE Report Definition.

Press <F10> to abort SOE Report Definition, to be prompted whether or not the current configuration for the current report is to be saved, and to pass control back to the SOE Logs menu.

Error messages will be displayed, if:

- A numeric value entered is out of the range of allowable values.
- A non-valid Trigger Tag is entered.
- The value entered for the Wait Time exceeds the maximum allowable value (32767 seconds).

CONFIGURING THE RIS SER

Depending upon your SOE Log configuration, you may need to configure the RIS SER system, using RIS ISM-1 commands. These are outlined in the ***RIS Integrated System Monitor Instruction Manual***, Chapter 6 (ISM-1 Commands). To use ISM-1 commands, you need a CRT terminal (e.g., VT100 or WYSE50). Complete installation instructions of the ISM-1 system are provided in Chapter 2 (Installation) of the RIS manual.

In particular, SOEs of Report Types Pre-Fault and Post-Fault, which are available only with Elsag Bailey Function Code 99 (therefore requiring an RIS SER system), require that the RIS CIU be specially configured, by way of ISM-1 commands, to enable it to send Pre-Fault and Post-Fault SOE events to the OIS12 console. Each of these report types need a boolean trigger equation, whose purpose is to determine if and when Pre-Fault or Post-Fault trigger situations exist. Also, RIS SER digital points must be specifically designated as Pre-Fault points and Post-Fault points in order to show up in SOE Logs of these particular types.

Using RIS ISM-1 Commands to Configure Pre-Fault SOEs

For Pre-Fault SOEs, use the ISM-1 command pretrig to configure the pre-trigger equation. For example, you can have the pre-trigger tripped if RIS point five goes into alarm (by default, this is a zero to one logic-state transition simply by entering:

pretrig 5

Then, to designate RIS SER digital points to be Pre-Fault points, use the ISM-1 command:

prepoints s *pointnumbers*

For example, to Pre-Fault designate RIS SER digital points 21 to 30 inclusive, plus point 48, enter:

prepoints s 21-30 48

The RIS SER is now ready to report post-fault reports. In this example, points 21 through 30, plus point 48, are the only digital points that would show up in this SER's Pre-Fault SOE Logs. Also, if you wish to remove the Pre-Fault designation on, for example, points 16 through 20, enter:

prepoints r 16-20

Using RIS ISM-1 Commands to Configure Post-Fault SOEs

For Post-Fault SOEs, use the ISM-1 command posttrig to configure the post-trigger equation. For example, you can have the post-trigger tripped if RIS point three goes into alarm. By default, this is a zero-to-one logic-state transition simply by entering:

posttrig 3

Then, to designate RIS SER digital points to be Post-Fault points, use the ISM-1 command:

postpoints s *<pointnumbers>*

For example, to Post-Fault designate RIS SER digital points one to ten inclusive, plus point 16, enter:

postpoints s 1-10 16

The RIS SER is now ready to report post-fault reports. In this example, points one through ten , plus point 16, are the only digital points that would show up in this SER's Post-Fault SOE Logs.

Also, if you wish to remove the Post-Fault designation on points six through 10, enter:

postpoints r 6-10

Other Useful RIS ISM-1 Commands

Examples of other useful ISM-1 commands which would be helpful in monitoring and trouble-shooting your RIS SER are listed below. For a complete list of all ISM-1 commands, please see Pages 6-4 and 6-5 of the ***RIS Integrated System Monitor Instruction Manual*** mentioned above.

csum Contact summary report.

date Set RIS SER date and/or time.

dfs Delete RIS SER digital point from scan.

hist Display a history of all changes-of-state stored in RIS SER buffer.

port Set serial port communications protocol.

psum Point summary report.

rhist Display recent history of changes-of-state.

status Display diagnostic status of ISM-1 system.

DISTRIBUTED SOE BLOCKWARE EXAMPLE

The following module blockware example in Figure 14-7 outlines a Distributed SOE configuration with the following characteristics:

- The SEM is located at Loop one , PCU15, Module 12.

- The MFP Master is located at Loop one , PCU2, Module 15.
- The SET occupies expander bus address ten of the MFP Master.
- One SED occupies expander bus address 11 of the MFP Master.
- A total of 32 digital SOE inputs are illustrated here.

NOTES:
1. For more information and more details about Elsag Bailey Function Codes 241, 242, 243, 244 and 245, please consult the ***Elsag Bailey INFI 90 OPEN Function Code Application Manual***, or the ***Elsag Bailey INFI 90 OPEN Function Code Quick Reference Guide***.

2. SEM blocks 5000 and 5001 are fixed, and are not writable, nor are they visible through CLS. Simply configure RCM tags to point to these two blocks.

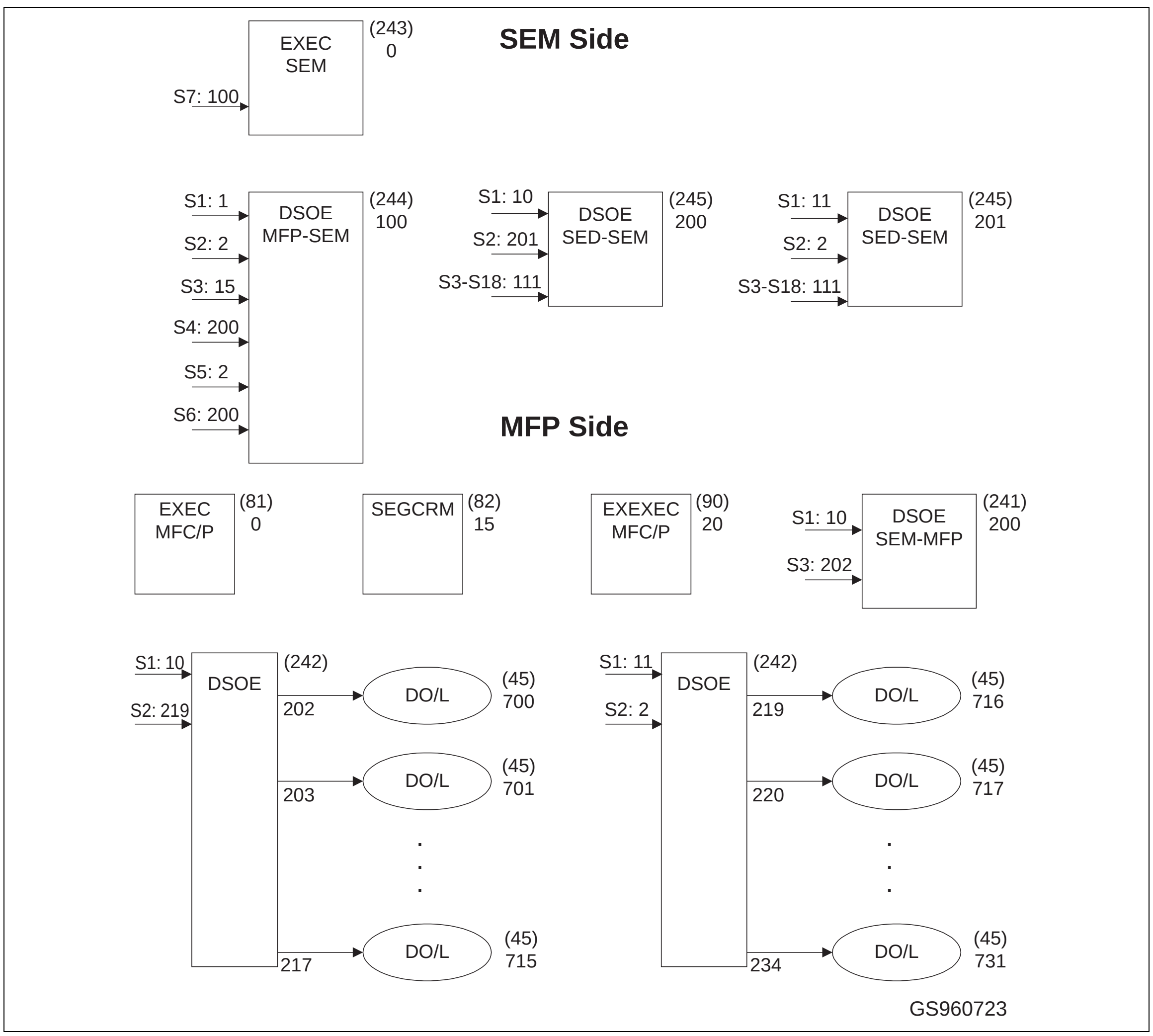

Figure 14-7. Distributed SOE Blockware Example

SECTION 15 - HARMONY 90 CONFIGURATION

OVERVIEW

Harmony 90 provides the external device interface for the OIS12 console. Basically, the OIS12 console communicates with a CIU (computer interface unit) to access the Elsag Bailey process control modules. With the Harmony 90 External Device Interface activated, the OIS12 console can also communicate with other process controllers not on the Elsag Bailey Net-90/INFI-NET system, such as the Bailey-Fischer & Porter MICRO-DCI and Modicon® Modbus PLCs.

The Harmony 90 External Device Interface emulates internal OIS12 to CIU interactions. Installable device drivers provide increased connectivity to process instrumentation and control devices. These drivers isolate the OIS12 console from the Protocol Specific requirements of such external devices. Additional, Harmony 90 configuration screens provide the user configuration facility for mapping the data from these devices into tag structures based on the CIU messages. The data received from the Protocol Specific Drivers (PSD) is placed in appropriate tag structures and is passed to the OIS12 console. Requests from the operator console are converted into device appropriate messages and are passed to the devices.

This transparent integration of external device data provides the same OIS12 look and feel for all data. The Harmony 90 External Device Interface gives the OIS12 console the capability to act as a console to multiple system environments for process monitoring and control while maintaining the OIS12 console operator environment.

The interface between the Harmony 90 executive and the Protocol Specific Driver is an open published specification which allows third party or in-house developers to create PSDs for new or specialized equipment.

Limited, customer specific, solutions have been engineered by Elsag Bailey for interfacing to Modular RTUs, GE Fanuc Series 5, Series 6 and 9070 PLCs and Allen-Bradley PLC5s. PSDs can be prepared for other PLC, SCADA and RTU systems.

Internally, the OIS12 console stores its tag configuration data in a large tag database. With the Harmony 90 External Device Interface, a portion, at the upper end of this database is reserved for external device Harmony 90 tags while the remainder still serves the standard tags associated with data from the Elsag Bailey modules.

To utilize the external device interface requires installation of drivers for the communications protocols. Each driver has a start-up file which contains necessary parameters. This file must be edited to reflect the installation requirements. Configuration screens are provided for setting up the driver.

Additional configuration screens are provided to select the devices to be addressed and the data groups or areas that are to be accessed within each device. The standard tag configuration facility has been extended to provide extra fields whereby the external points can be addressed as required by the device protocol. Once configured, these tags can be utilized in much the same way as internal tags.

HARMONY 90 SETUP

Installation

Harmony 90 is a component of the OIS12 console and therefore requires no separate installation. However, you will need to install a Protocol Specific Driver before you activate Harmony 90.

Installation of a PSD (Protocol Specific Driver) is covered in the related driver manual.

Menu Operations

The OIS12 console menu operations use the open look user interface standard, whereby a menu is initiated with the right button on the mouse, and an action is initiated with the left button.

When data is entered on a screen, it is not saved until the user selects UPDATE.

Activating Harmony 90

When Harmony is enabled, it must be assigned a portion of the tag database. The assignment splits the database into two regions. This split is created by setting the starting Harmony tag index number in the system options. The lower region, with tag numbers less than the specified starting tag index, is managed by the CIU support and the upper region is managed by the Harmony 90 external device interface.

The Console Configuration screen should be accessed via the menus shown in Figures 15-1 and Figures 15-2.

Press <F2> - Edit Console Options.

Page down to the second screen as shown in Figure 15-2.

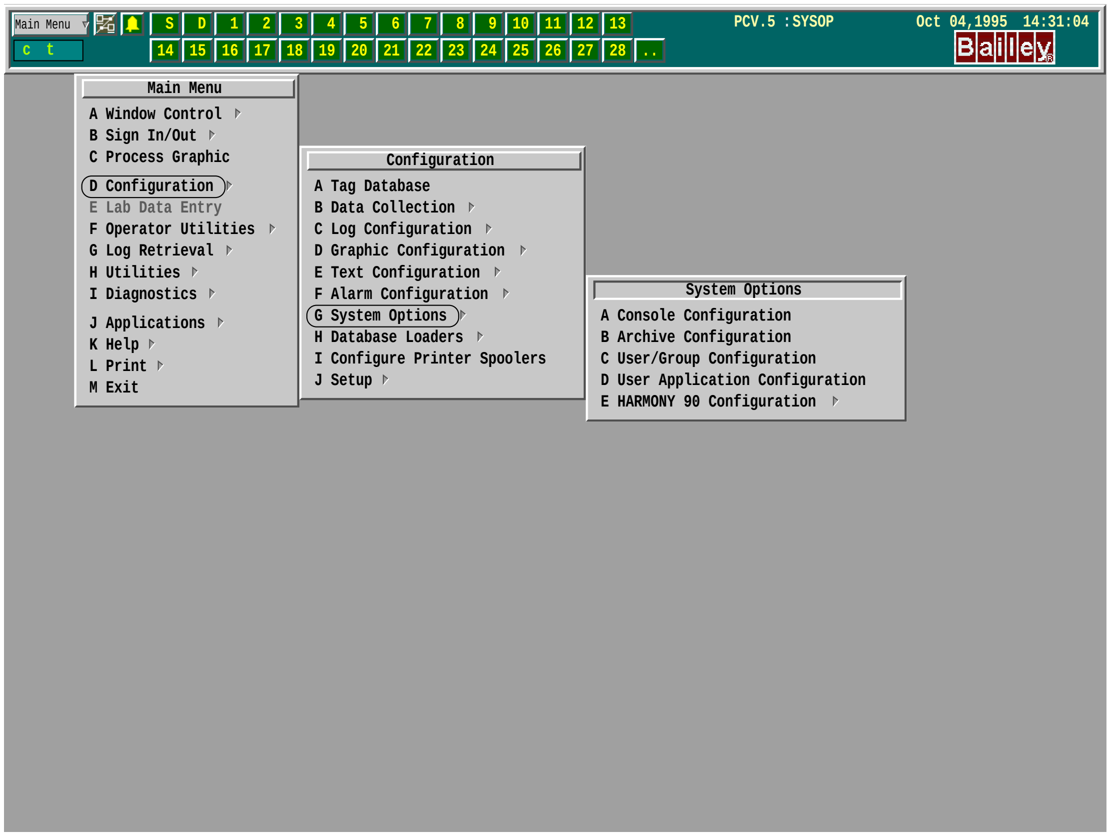

Figure 15-1. Console Configuration Screen

```
<Server Client Options (PCV.5) >

HARDWARE OPTIONS 1                                   Page 2 of 3

MKM/EMKI Keyboard              Not Installed   N90   INFI 90   OIS
    Keyboard Port               /dev/ser2
 Auxiliary Keyboard Node          0

 Alarm Terminal                 Disabled     Enabled
    Alarm Port                  /dev/ser2
    Baud Rate                   9600
    Terminal Type               vt100

 CIU Scanner                    Disabled     Enabled
    Net Type                    Plant loop   Infi net
    Driver                      Serial       Simulator
    Module Time Stamp           Disabled     Enabled
    Baud Rate                   19200
    Parity                      NONE
    Device                      /dev/cti2

 Harmony Executive              Disabled     Enabled
    First Index                  3000

 F1 Save  F9 Help  F10 Exit  PgDn Hardware Page PgUp Software Page
```

Figure 15-2. Server Client Options

The area of the screen being referenced is in **bold** type.

By default, Harmony 90 is disabled. Select "Enabled", then set the Harmony 90 starting tag number. Any tags before this index are standard OIS12/CIU/Net-90 tags. Tags including, and after, the starting index are Harmony 90 tags. In the example, tag 3000 is a Harmony 90 tag.

Press <F1> - Save Settings.

Press <F10> - Exit.

On-Line Help

The window-oriented configuration facility can provide on-line help in two ways. Generalized topic help may be selected via the Help button at the top of a screen (window). Context sensitive (i.e., help specific to one entry field) can be requested by placing the mouse pointer on the field of interest (no need to click on the field) and keying <Alt> **H**.

Configuration Overview

The Harmony 90 External Device Interface requires configuration of device addressing details in order to locate data items in the external device. The following hierarchy of device addressing parameters is used in the configuration:

DRIVER Installs protocol drivers for use by the OIS12 console.

DEVICE Specifies a device by its address, if an address is needed Selects the driver/protocol and any protocol variation provided by that driver. Presents the user with a list of PLC Models to simplify selection of Protocols.

GROUP Specifies the starting location and size of a block of data within the Device, the data type and the rate at which this group is to be read.

TAG In a Elsag Bailey environment, data is stored and transmitted not as discrete data items but rather as structures, or groups, of data elements. The individual data points in the external devices must be mapped onto these structure attributes through the use of tags.

TAG ELEMENT Refers to a structure attribute which addresses a specific singular data point in the external device.

The Harmony 90 edit screens provide a means of configuring tag data structures in order to permit the association of structure attributes with data points in the external devices.

Configuring Drivers

The driver configuration procedure serves to enter the information needed by the Harmony 90 External Device Interface to start and use the driver. That is, the name of the driver and the name of the start-up file used to configure the driver. Any driver configured will be started automatically.

The instructions for editing the start-up file are contained in the PSD's manual.

Access the driver configuration entry screen (Figure 15-1) via:

Main Menu->Configuration->System Options->Harmony 90 Configuration->Driver Configuration

In the configuration entry screen, select a blank record and fill in the two required fields. The first field is the driver name, and the second is the argument string that will be passed to the driver on start-up.

Driver Name: specifies the driver executable file name.

Arguments: generally, only the name of the start-up file is passed as a start-up parameter; for example, “mb_start”.

In most cases, additional parameters will be passed to the driver through the start-up file. Any parameters expected by the driver, from the argument string, will be specified in the driver manual.

A typical example of arguments required by a driver is a QNX RS-232-C port name and its communication parameters; baud rate, number of data bits, number of stop bits and parity.

Select Update at the top left of the window after defining each instance of a driver.

Defining a Device

Each device that is to be addressed by the Harmony 90 interface requires a device definition. This definition includes the port via which the communication link must be established and the protocol specific address by which the driver must reference the device. The driver must be installed, configured and started before you can define devices. This definition is driver and protocol specific and as such is validated by the driver. Each device definition consists of the six fields, described in Table 15-1.

The device name is used later when configuring groups. It can be any name you choose such as *Pumphouse*, *Crusher*, *Device1*, *PLC3* etc.

Since in general a driver may utilize multiple ports, the device definition must specify the port via which a device must be addressed (even if only one port is used by a driver).

Table 15-1. Device Definition Information Summary

Field	Description
Device Name	A user defined name for this device. It may be any unique string e.g., Pumphouse, *Crusher*, *DeviceC1*, *PLC3*.
Port Name	A QNX port name or blank if the driver does not use QNX ports. The contents of this field should be described by the driver reference literature. If this driver does communicate over QNX ports, then this field is required since a single driver can service more than one port and the driver needs to know to which port this device is attached. Valid ports can be confirmed from QNX by the command “ls /dev”.
Device Type	Selects the type of device. Press the menu button (right button) on the mouse. Select from the list of device types supported by all configured drivers.
Device Address	Device address in string format. The details of the contents of this field are described in the driver reference literature. The default address format will be indicated above this field once a device type is selected.
Status Tag	OIS12 tag name of a digital report tag used for device status. This tag will be set to one when this device's status is bad and zero when the device's status is good.
Time Sync Flag	Flag to enable time sync for this device.

In instances where a special interface card is used and not a QNX port, and the card is controlled directly by the driver, no port address is required and the port field should be left blank. Valid devices can be confirmed from a QNX prompt with the command “**ls /dev**”. This will list all valid devices.

Selecting the PLC Model in the device type field, selects the driver and the protocol used for communication. **Menu** clicking the mouse (right button) on this field presents a pick list of all available device types from all running drivers.

Where a device is not provided for in the device type list, selecting a similar device type is not supported. Such a selection could result in no communication, perfect communication or faulty communication. Standards are only a guideline and are often implemented as best fit the device. Consider the following:

A driver may support several device types with a single protocol, such as pure modbus. Drivers may also support several device types but with variations of the protocol for each device, such as the GE Fanuc implementation of modbus, where model specific addressing variations and channel configuration must be supported. When a network supports multiple protocols, the driver may also support entirely different protocols for different devices, such as Ethernet™ or Allen-Bradley.

Addresses are required where devices share a communication channel or are networked. Each device address must be specified. Some devices have no address and each must then be on a separate port. The address field should be blank for devices with no address. Even where a device is on its own port, it may still require an address to be defined.

The address field allows up to 80 characters. This provides for drivers that need long addresses such as 12-digit Ethernet addresses or the inclusion of phone numbers for dial-up access of remote terminal units (RTUs).

A status tag can be configured for each device. This tag will be set whenever the device communication fails. The tag must be a Digital Report or Internal Digital tag. We recommend that you configure this tag for the 'D' (devices) alarm group. When the device fails, this tag goes into alarm and all the tags using this device will be set to bad quality.

The time sync flag serves to enable or disable time syncing. Enabling time syncing will request the Harmony 90 external device interface to send the current OIS12 console time to the external device so that the devices can be synchronized to the OIS12 console time. Some PSDs or devices do not support time syncing. The time sync will be sent once every 10 minutes to each device for which the time sync flag is enabled. The format of the time sync is driver specific, so check the driver manual. PLCs and other devices have their own logic and control cycles. In general, the time sync will not directly be used to update the clock of the device so changes in time will not upset control strategies. Instead the time will be written to a data area in the PLC. The PLC will use this data to update its clock or be used otherwise as necessary. The accuracy of the time depends on the transmission delay and the PLC cycle time before reading the data. The accuracy of the 10 minute interval depends on the accuracy of the real time clock in the OIS12 server.

To define a Harmony 90 device, select the following path:

Main->Configuration->System Options->Harmony 90 Configuration->Device Configuration

This will bring up an edit Window session allowing up to 100 device definitions.

DEFINING A GROUP

After a device has been defined, its related data groups may be defined. Each group is a defined range of data that is to be accessed within a device. It is assumed that the data ranges have either Read/Write access or just Read access. Part of the group definition is to define the address of the first data element in this range of data. The format of this address should be presented above the address field, and this is dependent on the PLC Model selected in the device type field in the device definition.

Groups will be scheduled and issued for reading as soon as the group is defined. Tag data will be updated as tags are defined.

Table 15-2. Group Definition Data Summary

Field	Description
Group Name	The name used to reference the group when configuring tags. e.g., Group1, PLC2Analogs.
Device Name	The name of the device associated with this group. Menu click on this field and select.
Address	The address of the first data element of the range of data. This includes all of the information required to access this data range. The contents of this field are described in the driver manual. String of up to 80 characters.
Range	The number of data items in this group. The interface size limitation is 512 for digital, and 512 data bytes for all other types. This maximum may be reduced (and enforced) by the driver. Consult the driver manual.
Data Type	The data type for all data items in this group. See Table 15-3 for group data types (Press <Alt> **H** for help on this field).
Scan Rate	The rate at which Harmony 90 will poll the driver with update (read) requests for the group. The scan rate range is 0.5 seconds to 9999 seconds in 0.5 second increments.
Status Tag Name	The name of a digital report or internal digital tag used to reflect the status of this group.

Group Data Types Transferred To and From Driver

Table 15-3 shows the Harmony 90 to PSD API standard data types. These data types must be assigned to data groups to pass data between the Harmony 90 interface executive and drivers.

Table 15-3. Group Data Types

Type	Size in Bytes	Data Type Descriptor
0	2	Unsigned short integer (Intel® format - low byte first).
1	2	Signed short Integer (Intel format - low byte first).
2	4	Unsigned long integer (Intel format).
3	4	Signed long integer (Intel format).
4	4	IEEE float (real 4 - Intel format).
5	8	IEEE double (real 8 - Intel format).
6	<=17	ASCII numeric, float assumed. Valid characters include “0123456789” and “+-.,Ee”. Field separator is assumed to be a space.
7	<=17	ASCII HEX - integer fields separated by a space.
8	1=8	Byte oriented digital data - first addressed data element is the least significant bit of the first byte, 8th address in MSBit, 9th address is LSBit of next byte, etc.
9	2=16	Packed digital (register oriented digital data) - first addressed element is LSBit of the first 16 bit word (Intel format), 16th addressed element is in MSBit of the word, 17th is LSBit of next word, etc.
10	2	BCD (binary coded decimal) in unsigned short integer (hi byte 1st), 16 bits to 4 digits.
11	2	12 bits to 3 digits. The top 4 bits in every word are ignored.
12	<=80	ASCII text.

All data types are converted to float for use within the OIS12 console, except the boolean types eight and nine and the text types six, seven and 12). These data types are provided to minimize the requirement for translating within the drivers. For some devices a driver may still be required to convert data to one of the standard data types.

To define a group, select the following path:

Main->Configuration->System Options->Harmony 90 Configuration->Group Configuration

This will bring up an edit Window session allowing up to 100 group definitions.

As the groups are being established, the error log should be displayed on the screen. Messages from the driver are written to the error log as they occur. If the group definitions which are being entered are too burdensome for the communications rate of the associated port, the following message will appear in the log.

Unable to scan groups as configured

The preceding message indicates that Harmony 90 has been unable to read one or more groups from the PLC at the specified scan rate. This message is generated by the driver, at most, every 30 seconds to reduce the number of error messages in the error log.

The message is not specific to one group because one group itself is not the problem. The pattern of group scan rates exceeds the communication capacity of the specified baud rate for the associated port. The time delay between these messages will indicate when the problem is occurring and may be used to guide alterations to the groups configured.

The actions available to you to correct this problem are:

1. Increase and/or stagger the time between reads for groups until there are no longer too many reads to be processed within a second issued at any given time.

2. Increase the communications rate on the port used.

3. Remove unnecessary groups or consolidate data within the device so that fewer groups are required. For example:

> For a selected baud rate of 9600, approximately five read commands should be processed per second. The calculated time required to process a message includes generating and issuing the read command, receiving the data back from the controller, plus the device turnaround time.

If five groups are set to a one second scan rate, then these are the only groups of data which can be handled at this baud rate.

HARMONY 90 TAG CONFIGURATION

Overview

Once the required Harmony 90 drivers have been installed, the Devices have been defined, and the groups have been configured, the tags can be defined.

There are 13 different tag types supported by the OIS12 console. This section describes how tags are used in the OIS12 console and describes the common tag elements. It will then describe each individual tag type and its use.

Tags

The OIS12 console is a supervisory console interface for control logic that resides in Elsag Bailey controller modules. As a supervisory console, the OIS12 console provides access to process/sensor data and facilitates operator adjustment of set points that reside in the Elsag Bailey controller modules. The OIS12 console does not itself provide control logic processing. This is provided in function blocks programming in the controller modules. Generally, the OIS12 console provides no processing of data within or for tag data except for limiting some data ranges based on settings uploaded from controller modules. When Harmony tags are set up for external device control logic, the tag elements must be associated (connected) with external device data variables that can appropriately represent the tag's intended functionality. For this purpose, the external device logic may need to be altered or enhanced to mimic Elsag Bailey function block behavior.

Elsag Bailey recommends that the user implement tags for external devices in the simplest way possible as described in this manual. However, the Harmony 90 interface does not limit the user in this respect. It is essential that the user understands the purpose of and the built-in OIS12 console response for each tag element in order to select or create external device data variables. For example, the tag quality element is of a higher priority than its alarm elements in a tag's display template alarm field.

Tag Types

Table 15-4 lists the 13 tag types. The first five types are described in detail with typical applications. The remaining eight types have their component elements listed but with no typical application. For these the implementation is left to the user.

Table 15-4. Tag Types

Type	Function	Description
Digital	Monitor	Used to monitor a digital point or coil.
Analog	Monitor	Used to monitor an analog point.
RCM	Control	Remote control memory used to control a single coil.
RMSC	Control	Remote manual set constant used to control a single analog point.
Station	Control	Used to control and monitor a single control loop.
DD	Control	Device driver. This tag monitors a value and two feedbacks, has auto/manual modes and has two boolean outputs.
MSDD	Control	Multistate device driver. This tag monitors a value and four feedbacks, has auto/manual modes and has a three or four state output.
RMCB	Control	Remote motor control block.value, two feedbacks, two permissives, two state outputs.
TextSel	Control	Text selector. Reads an analog value that is used to select a message from a message list.
DigRpt		Digital report. Writes a digital output. The value written is not read back from the device.
AngRpt		Analog report. Writes an analog output. The value written is not read back from the device.
DAANG		Data analog. 27 elements.
ASCII		ASCII string. Reads and writes a string of up to 80 characters.

Tag Definition Fields

The first screen presented during tag definition looks almost the same for Elsag Bailey CIU tags and Harmony 90 tags. The first obvious difference is the edit Harmony 90 button. This button is only visible for Harmony 90 tags. On the Harmony 90 tags the button is inactive and grayed when the tag name is missing or the tag type cannot be used for Harmony 90.

A less obvious difference between CIU and Harmony tags is that the fields below the horizontal dividing bar are editable for Harmony 90 tags. For CIU tags these fields contain values uploaded from the Elsag Bailey modules. These values cannot be obtained from external devices and so must be entered manually. These fields set display limits and indicator styles. These fields are tag type specific and will be described with the description of each tag type.

The figure below shows a station tag. The portion of the screen below the horizontal bar varies with the tag type. This figure also shows the help for the station type. Press <Alt> **H** with the mouse cursor on the type field. Note that zero is not a valid entry. These fields must be edited as described for the specific tag type.

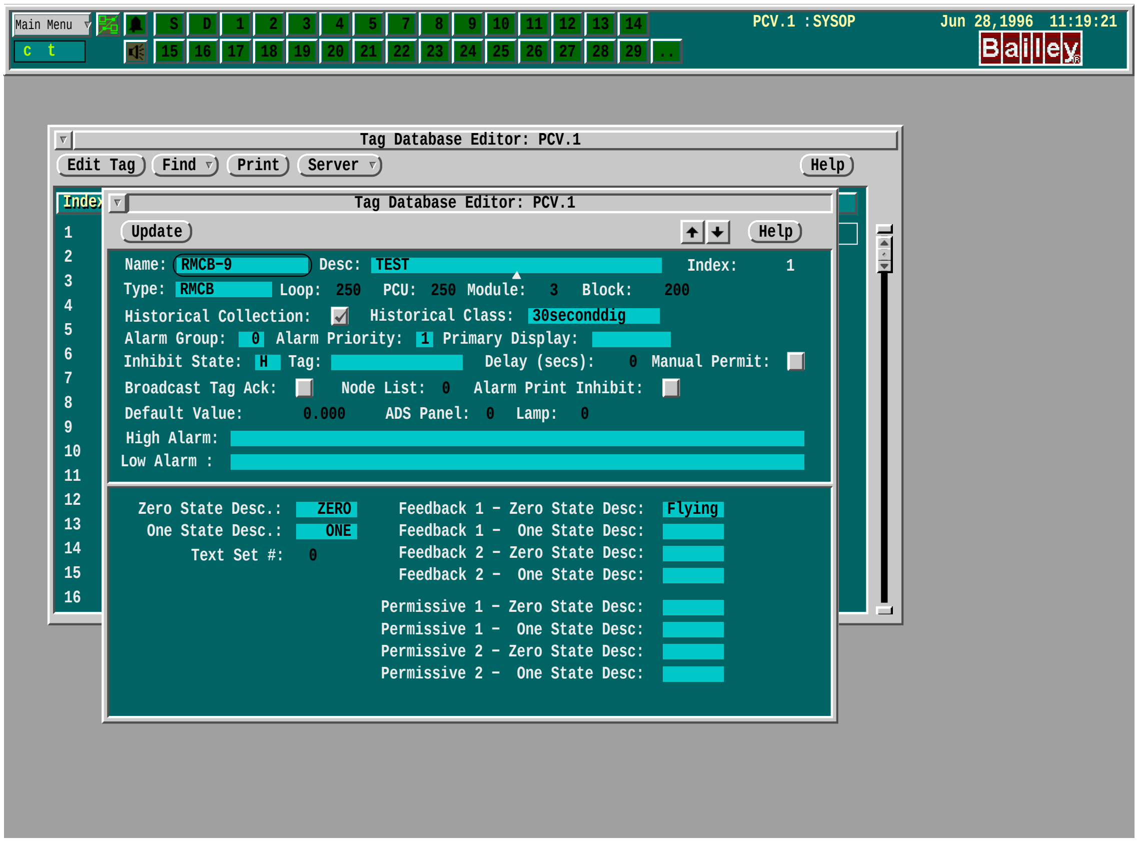

Figure 15-3. Standard Tag Definition Menu

Mapping Individual Tag Elements

Each OIS12 tag is a complex data object that contain as many elements as required to represent the related function blocks found in Elsag Bailey modules. Some elements are of interest to operators and other elements may only be utilized within the modules.

In order to install a Harmony tag, each element of the tag that the user wants to associate with external device data must be mapped to an external device data point. A tag element is mapped by filling in its group and point address fields which identify the point location in the external device. It must be remembered that by selecting a group, the user also selects a device and protocol and limits the point address selection to the address range of the group. There are four other fields that must be filled in to define translation of the device value into a display value.

The fields used to map a single tag data element are defined in Table 15-5, Tag Element Mapping Information.

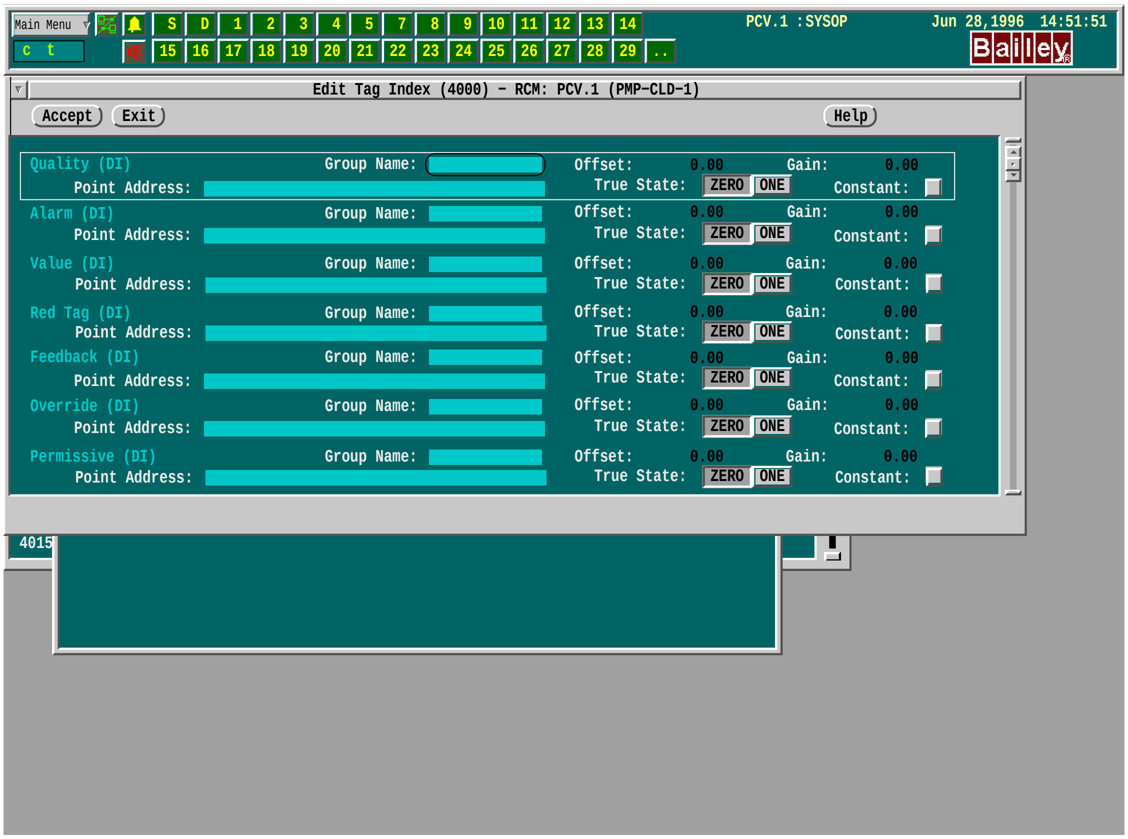

Figure 15-4. Harmony 90 Point Definition Menu

It is important to note that the user does not have to use every possible tag element, but should set unused elements to a constant value.

Table 15-5. Tag Element Mapping Information

Field	Description
Group Name	The name of the group holding this piece of data. Menu click, then select the group to use.
Point Address	The specific address of this piece of data in the external device. Note that this refers to the address of the point value and not the offset to the value into the selected group.
True State (Digital)	This only applies to digital values. The TRUE state is normally ONE. Thus a ONE in the device is a ONE on the display. This holds for read and writes. Inverted logic would be used: 1. Where a tag set and reset write to the same point. The reset TRUE state should be ZERO so that pressing reset writes a ZERO and reverses the action of the set. 2. Logical TRUE is usually associated with the boolean 1 state. If a sensor provides a contact open state for sensor called DOOR OPEN, and the external device sends a 0 state for DOOR OPEN, then the associated TRUE state should be set to ZERO. See Zero/One State Descriptors - Tag Definitions.

Table 15-5. Tag Element Mapping Information (continued)

Field	Description
Offset (Analog)	The analog offset can be used for translating incoming raw values to engineering unit (EU) values, and for translating outgoing EU values to raw values. The default value is 0.0. When no conversion is required, offset should be set to 0.0. (see also Gain) The applied formulas are: EU = (Raw * Gain) + Offset Raw = (EU - Offset) / Gain.
Gain (Analog)	The analog gain can be used for translating incoming raw values to engineering unit (EU) values, and for translating outgoing EU values to raw values. The default value is 1.0. When no conversion is required, gain should be set to 1.0. (see also Offset) The applied formulas are: EU = (Raw * Gain) + Offset Raw = (EU - Offset) / Gain.
Constant Select	This check box is used to select a constant value for this element. the constant value field will be displayed when this box is enabled. Constant select cannot be enabled for outbound tag elements such as set points, set/resets etc. cannot be constants.
Constant Value (Overlays Offset field)	The constant value is the EU value supplied to the tag data element in place of an incoming value. No external device data is mapped to this element when constant is selected. For digital elements, any non-zero value represents a TRUE. Constant Value cannot be assigned to outbound tag elements such as set points, set/resets etc. cannot be constants.

Tag Quality

If the external device has logic to determine quality, then the quality element may be configured, otherwise it should be set to a constant zero.

The quality for a Harmony 90 tag becomes bad when the tag's quality element or one or more of its tag element-associated groups is assigned bad quality. A group's quality is set bad when the driver cannot read or write its data.

WARNING	**If you are not using the Quality element then set it to a constant zero value. Also set the Alarm element to zero if it is not used.**

Red Tag

When a process or piece of equipment is under service and operating the equipment might result in a hazard, the switches that operate the equipment are locked out from use by a red tag. This is a physical tag signed by the operator who installs the tag. The tag may also be a clamp and numbered lock.

Because the operator at an OIS12 console can also control equipment, an electronic red tag is provided. The logic for the red tag resides in the external device which actually controls the process. Logic in the device must not allow operator requests to cause operation of the equipment. The OIS12 console will still issue operator actions to the device. The red tag element is a read only element. Setting this point in the external device will place a red *RT* on a standard tag faceplate to indicate that the operator action will be ignored. The operator can still output settings to place the equipment in a proper start-up mode when the lock out is removed.

WARNING	**Lock out of a point that is RED TAGGED must occur in the external device.**

Engineering Units

Engineering units are the units of measure used to display tag variables. e.g., volts, feet, boxes, kiloPascals. Should the external device provide litres/minute and you wish to display gallons/hour then you will need to translate the values. The Gain and Offset are used for this purpose applying the formula:

EU = (RAW * GAIN) + OFFSET

With the default value of 1.0 for Gain and 0.0 for Offset, the Raw value is equal to the EU Value.

Element Type

Beside each element name you will notice a bracketed indicator that specifies the general OIS12 console data value type for the element according to the following:

(DI) Digital Input.
(AI) Analog Input.
(SI) String Input.
(DO) Digital Output.
(AO) Analog Output.
(SO) String Output.

Digital tag elements must be associated with a digital (boolean) data group and analog tag elements must be associated with an analog (integer, real, BCD, float, etc.,) data group. Inputs are read from external devices and outputs are written to external devices.

Digital Tag Type

Digital tags are typically assigned to monitor single digital values along with associated alarm and quality indicators. In order to monitor the value of a point, only the value element needs to be configured.

Table 15-6. Digital Tag Elements

Element	Type	Description
Value	DI	Digital value.
Alarm	DI	Alarm state forced from the external device.
Quality	DI	Quality indicator forced from the external device.
Red Tag	DI	Red tag is unused on standard digital tag faceplates as no operator actions exist.

Tag Definition Fields

Zero/One State Descriptors: **Menu** click on the field and select the description to use.

Alarm Definition: Select zero for alarm on Zero state. Select one for alarm on One state. Select two for None (no alarming). Press <Alt> **H** with the cursor on this field for help info.

Print State Changes/Save State Changes: Toggles for system event logs.

Analog Tag Type

Analog tags are typically assigned to monitor single analog values along with associated alarm and quality indicators.

In order to monitor the value of a sensor, only the value element needs to be configured.

Table 15-7. Analog Tag Elements

Element	Type	Description
Value	AI	Analog value.
Hi Alarm	DI	High alarm state forced from the external device.
Lo Alarm	DI	Low alarm state forced from the external device.
Quality	DI	Quality indicator forced from the external device.
Red Tag	DI	Red tag is unused on standard analog tag faceplates as no operator actions exist.

Tag Definition Fields

Number of Decimals: Specify the number of digits displayed to the right of the decimal point.

Eng. Units: Engineering Units, menu click and select.

High/Low Limit: Used to set alarm trip points.

EU Zero/Span: Used to control the max/min display values.

NOTE: If the EU Zero and SPAN are left at zero, then an analog tag will display and capture all values. This is the only tag type which will ignore the span. This is useful for capturing large (out of normal range) values to logs.

RCM (Remote Control Memory)

The RCM tag and its standard display template were designed to interface to a single digital control variable with related digital monitor/feedback signals. It can be applied as a simple interface to set/reset/monitor a single digital data point or as a motor control interface with permissive enabled start/stop, feedback, plus override.

Table 15-8. RCM Tag Elements

Element	Type	Description
Value	DI	RCM value read from the external device. This element value drives the square box on the OIS12 tag display. It typically represents the external device logical acceptance of the set/reset command outputs.
Alarm	DI	RCM alarm forced from the external device. This element drives the RCM tag template alarm indicator as long as quality is good.
Quality	DI	RCM quality forced from the external device. This element overrides the RCM tag template alarm when quality is bad.
Red Tag	DI	RCM read tag forced from the external device. This element drives the red tag indicator on the RCM template but does NOT Lock out the user at the console. The safety logic must reside in the device.
Feedback	DI	RCM feedback obtained from the external device. This element drives the feedback display on the RCM tag template, which is displayed as a chevron pointer.The feedback element should be mapped to a feedback signal if a suitable signal can be obtained. The RCM feedback confirms set/reset action. The tag switch type in the tag definition, should be set to two to show the feedback indicator.
Override	DI	RCM override obtained from the external device. This element drives the tag override indicator on the RCM template.
Permissive	DI	RCM permissive obtained from the external device. This element drives the tag permissive indicator, “NP”, which shows if the permissive is zero and the value is zero. The logic to enable/disable the tags set/reset commands when permissive is set must be placed in the external device.
Reset Cmd	DO	RCM reset command output - outputs the selected TRUE state value.
Set Cmd	DO	RCM set command output - outputs the selected TRUE state value.

Tag Definition Fields

Switch Type: Selects the Value and Feedback display template indicators. The value indicator is a square box that moves between zero (up) and one (down) to show the state of the value field. The feedback indicator is a triangle (or chevron) that shows the feedback state.

0 = Shows the Value indicator only.
1 = Shows neither of the indicators.
2 = Shows both indicators.
3 = Shows the Feedback indicator only.

Alarm Definition: Can be set to alarm when the value is zero or one, or can be set to two to never alarm. The OIS12 console will cause an alarm when the value element for this tag is the same as the alarm value configured.

Zero/One State Desc: **Menu** click on the field and select.

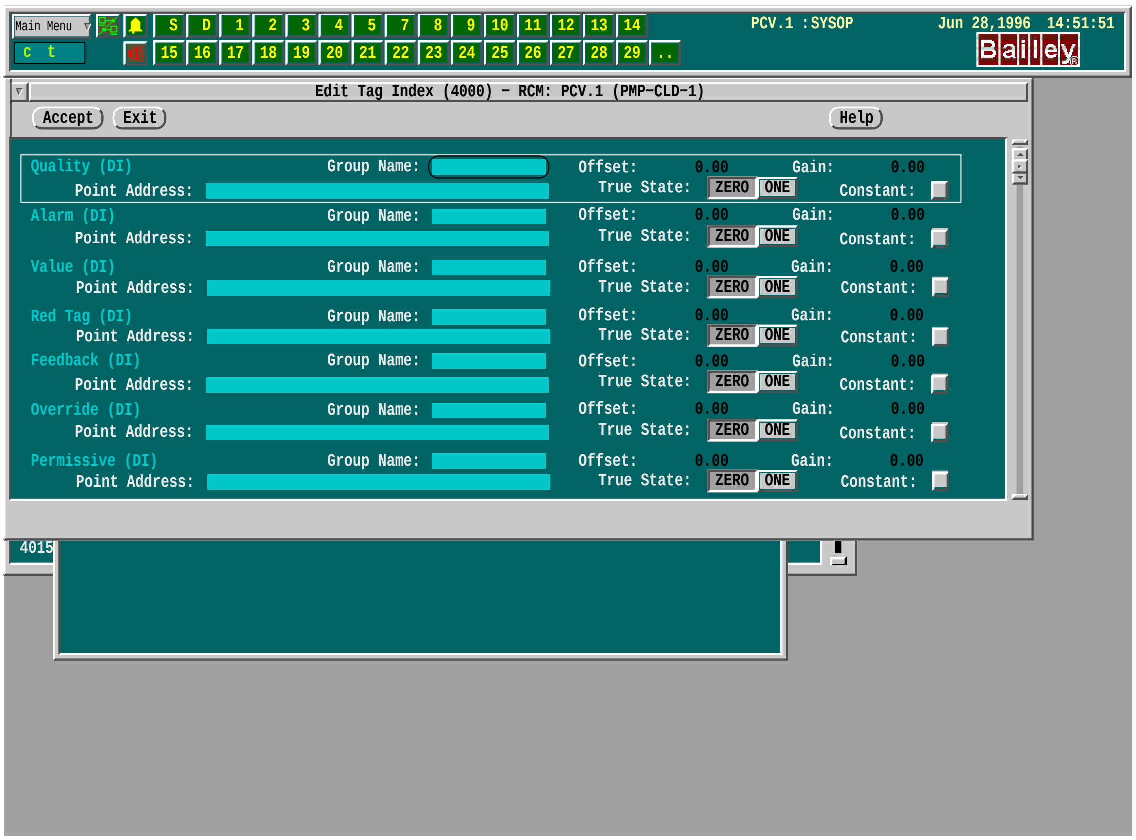

Figure 15-5. Typical RCM Element Mapping

RMSC (Remote Manual Set Constant)

The RMSC tag and associated standard display faceplate serve to set/monitor a single analog (real) variable. The variable may typically be a set point or limit to some control algorithm. Additional tag attributes (elements) provide for monitoring high/low alarm level violation and other digital feedback signals that can be related to the analog variable's associated control algorithm logic circuitry.

In the simplest form the RMSC tag and standard faceplate can serve to set/ramp/monitor a single analog data point. For this the user would map the Value and Set Output to the same address and set the remaining elements to constant values or blanks. On the tag definition screen the user would set the fields as follows:

- Set the *Low Limit* and *EU Zero* fields to the same value (typically 0.0).
- Set the *High Limit* and *EU Span* to the same value (often 100.0).

Table 15-9. RMSC Tag Elements

Element	Type	Description
Value	AI	RMSC value from the external device.
Quality	DI	RMSC tag quality forced from the external device.
Red Tag	DI	RMSC red tag forced from the external device.
Tracking	DI	RMSC tracking indicator from the external device. 1 = Tracking other source. 0 = Value from set output.
Lo Alarm	DI	RMSC low alarm forced from the external device.
Hi Alarm	DI	RMSC high alarm forced from the external device.
Set Output	AO	RMSC output value to external device.

Tag Definition Fields

Number of Decimals: Set to the number of digits to be displayed to the right of the decimal point.

Eng. Units: **Menu** click and select.

High/Low limits: Define the trip points for alarms.

EU Zero/Span: These limit the max/min values displayed.

The maximum value stored in the tag database is limited to the EU span. If you need to collect values larger than 999,999 then you will need to set the span appropriately and ignore the ****** indicating an overflow on the faceplate displays. You could instead use the analog tag to capture the values.

These steps are important, as the OIS12 console will not allow values outside of the EU range to be entered or displayed. The maximum value displayed by this tag is 999999.

NOTE: If left at 0.0 the RMSC tag will ONLY display ZERO.

This screen shows the recommended configuration of the RMSC elements. Only the Value and Output elements are configured.

STATION (Digital Control Station)

The Station tag serves as an interface for single loop control. For Elsag Bailey N90/INFI 90 OPEN applications, it functions as the interface to STATION function blocks allowing an operator to select the operating mode, change set points, and generally monitor the control loop.

Figure 15-6. Typical RMSC Point Menu

Table 15-10. Station Tag Type Elements

Element	Type	Description
PV value	AI	Process value from external device.
Quality	DI	Tag quality forced from external device.
Red Tag	DI	Red tag indicator from external device.
Auto / Manual	DI	Mode indicator from external device. 1=Auto, 0=Manual.
Cas / Ratio	DI	Cascade/ratio indicator from external device. 1=Cascade, 0=Ratio.
Stn Level	DI	Station level from external device. 0=Local, 1=Computer (com). In com mode one cannot ramp output values, but the exact value can be set via the keypad.
Cmpt Stat	DI	Computer ok status indicator; 1=ok.
Out Stat	DI	Output status indicator; not used

Table 15-10. Station Tag Type Elements (continued)

Element	Type	Description
Out Track	DI	Output tracking flag; 1=tracking.
Man Lock	DI	Manual lock indicator; 1=locked.
Bypass	DI	Bypass flag; not used.
PV Qual	DI	PV quality indicator from external device. Drives pv quality indicator next to the regular quality indicator only when tag quality = good.
SP Track	DI	SP tracking indicator; No display on faceplate.
SP Value	AI	Set point value from external device.
CO Value	AI	Control output value from external device.
RI Value	AI	Ratio index value from external device.
Set Mode	AO	Set mode output to external device. See Table 15-11 for detail.
Set SP	AO	Set point value to external device.
Set CO	AO	Control output value to external device.
Set RI	AO	Ratio index value to external device. Maximum = 10.

Tag Definition Fields

Number of Decimals: Set to the number of digits to be displayed to the right of the decimal point.

Eng. Units: **Menu** click and select.

High/Low Limits: Set the alarm trip point levels for the Process Variable.

PV/SP Zero: Set to the Minimum value to be displayed for the Process Variable (PV) and the Set Point (SP) value.

PV/SP Span: Sets the maximum value that will be displayed for the Process Variable (PV) and the Set Point (SP).
Maximum = PV/SP Zero plus + PV/SP Span.

Deviation Limit: Sets the alarm level for deviation of the Process Variable (PV) from the Set Point (SP). Causes a low deviation or high deviation alarm when the deviation limit is exceeded.

Application Notes For the Station

The high/low limit values defined in the OIS12 console tag definition cause will cause the OIS12 console to generate alarms based on the PV input value not on the station control output.

The high/low limit values and the EU zero and span are all shown on the faceplate.

See the function code manual for a fuller description of the expected action of a station tag under the Elsag Bailey system.

The computer ok status input causes the **CMPTR** button to appear when its value=1 and the faceplate is in focus and accessed.

Pressing the **CMPTR** button has the effect shown in the Table 15-11.

The **CMPTR** button can only be pressed if the computer ok status is one.

The station type in the tag definition determines whether the **cascade** or **ratio** button is shown.

The station output is the same when either the cascade or the ratio button is pressed.

The Value written to the external device for the Set Mode output is determined by which button on the faceplate is pressed and the states of the inputs listed in Table 15-11.

The Set Mode output element writes a value to the external device when one of the following buttons is pressed:

- Computer.
- Auto/Manual.
- Ratio (or Cascade).

The value written is determined by the states of the three inputs:

- Station Level.
- Auto/Manual.
- Ratio/Cascade.

Table 15-11 lists all possible combinations. The description of each state is followed by its numeric value in brackets.

Table 15-11. Station Mode Output Value Chart

Input Element			Cmptr Button[1]	Auto/Man Button[1]	Ratio (or Casc) Button[1]
Station Level	Auto/Manual	Cascade/Ratio			
Local (0)	Manual(0)	Off(0)	7	Auto(1)	Ratio(2)
0	0	On(1)	7	1	Auto(1)
0	Auto(1)	Off(0)	7	Manual(0)	Ratio(2)
0	1	On(1)	7	0	Auto(1)
Com(1)	Manual(0)	Off(0)	6	No Output(x)	Ratio(2)
1	0	On(1)	6	x	Auto(1)
1	Auto(1)	Off(0)	6	x	Ratio(2)
1	1	On(1)	6	x	Auto(1)

NOTE:
1. Pressing this button will result in this output being written to the device

DD (Device Driver)

NOTE: Mode is an analog value from the external device. Set Auto and Set Manual are digital values written to the external device. For the Auto/Manual state from the external device to be represented in the Mode value, the external device logic must set the mode value based on the locally derived Auto/Manual status.

Table 15-12. DD Tag Elements

Element	Type	Description
Value	DI	Value read from the external device drives the square box on the tag display.
Alarm	DI	Input drives the tag alarm.
Quality	DI	Drives the tag quality.
Red Tag	DI	Drives the red tag.
Mode	AI	Drives the mode status of this tag. Manual=0, Automatic=1, Remote=2.
Feedbk Sts	DI	Currently unused.
Feedbk #1	DI	Feedback input #1.
Feedbk #2	DI	Feedback input #2.
Override	DI	Override indicator.
Set Auto	DO	Set automatic mode - Always sends a TRUE state.
Set Manual	DO	Set to manual mode output - Always sends a TRUE state. Configure the true state to zero if you are addressing this element to the same point as the set auto element.
Set Cmd	DO	Set command output - always sends a TRUE state.
Reset Cmd	DO	Reset command output - always sends a TRUE state.

MSDD (Multistate Device Driver)

Table 15-13. MSDD Tag Elements

Element	Type	Description
Value	DI	The value input.
Alarm	DI	Drives the tag alarm.
Quality	DI	Drives the tag quality.
Red Tag	DI	Drives the red tag.
Last State	AI	Last state indicator value (0,1,2, or 3).
Req State	AI	Requested state indicator (0,1,2, or 3).
Mode	DI	Mode indicator; 1=Manual, 0=Automatic.
Feedbk #1	DI	Feedback #1 input.
Feedbk #2	DI	Feedback #2 Input.
Feedbk #3	DI	Feedback #3 Input.
Feedbk #4	DI	Feedback #4 Input.
Override	DI	Override indicator.
Ctrl Overr	DI	Control override indicator.
Set Auto	DO	Set to auto mode output - always sends TRUE state.
Set Manual	DO	Set to manual mode output - always sends TRUE state.
Set Output	AO	Set output (0,1,2,or 3).

RMCB (Remote Motor Control Block)

Table 15-14. RMCB Tag Elements

Element	Type	Description
Value	DI	This value input.
Alarm	DI	The alarm input.
Quality	DI	Drives the tag quality.
Red Tag	DI	Red tag input.
Feedbk #1	DI	Feedback #1 input.
Feedbk #2	DI	Feedback #2 input.
Bad Start	DI	Bad start indicator input.
Fault	DI	Fault indicator input.
Perm #1	DI	Start permissive #1 input.
Perm #2	DI	Start permissive #2 input.
Error Code	AI	Error code value.
Acknldge	DO	Acknowledged output.
Set Cmd	DO	Set command - always sends a TRUE.
Reset Cmd	DO	Reset command - always sends a TRUE.

Text Selector

Table 15-15. Text Selector Elements

Element	Type	Description
Record	AI	Analog input to indicate text record # to select
Quality	DI	This DI drives the tag quality.
Red Tag	DI	Red tag indicator (unused).
Color	AI	Color selector value input.
Blink	DI	Blink indicator.

Digital Report

This is the type used for Device and Group statuses. In status applications all fields can be blank, as no points are read from the PLC. Harmony 90 sets the value for the LAN-90 PCV display.

Table 15-16. DO Tag Elements

Element	Type	Description
Value	DO	This is the digital value to be written.
Alarm	DO	This is the alarm value.
Quality	DO	This drives the quality indicator.
Red Tag	DO	This tag element is unused.

Analog Report.

Table 15-17. AO Tag Elements

Element	Type	Description
Value	AO	This is the Analog Value to be written.
Hi Alarm	DO	High Alarm indicator sent to the external device.
Lo Alarm	DO	Low Alarm value sent to the external device.
Quality	DO	Quality indicator sent to the external device.
Red Tag	DO	This tag element is unused.

DAANG (Data Analog Report)

Table 15-18. DAANG Tag Elements

Element	Type	Description
Value	AI	The primary value input.
Quality	DI	This DI drives the tag quality.
Low Alarm	AI	Low alarm; 0,1,2, or 3.
Hi Alarm	AI	High alarm; 0,1,2, or 3.
Auto / Manual	DI	Auto / manual indicator; 0=Auto.
Tracking	DI	Tracking indicator.
Multilevel	DI	Multilevel alarms enabled flag.
Comm Q	DI	Communications quality.
Calculation	DI	Calculation flag; not used.
Constraint Enable	DI	Constraint enabled; not used.
Permit Input Select	DI	Permit Input select indicator; not used.
Next Hi Limit	AI	Next high alarm level value.
Next Lo Limit	AI	Next low alarm level value.
Red Tagged	DI	Red tag indication.
Hard Fail	DI	Hardware failure indication.
Out of Range	DI	Out of range indication.
Limited	DI	Limited flag; not used.
Calculated	DI	Calculated value indicator.
Qual Override	DI	Quality override indicator.
Scan Status	DI	Scan Status indicator; 0=OK, 1=Error.
Dev Alarm	DI	Device Alarm indicator.
Rate Alarm	DI	Rate of Change Alarm.
Var Alarm	DI	Variation Alarm.
Suppress Alarm	DI	Suppress Alarms flag.
Re Alarm	DI	Realarm Indicator.
Set Manual	AO	Set Manual value output (when in Auto mode).
Set Value	AO	Set Value output.

ASCII String

Table 15-19. ASCII Tag Elements

Element	Type	Description
Quality	DI	This drives the tag quality.
Red Tag	DI	Red tag indicator; not used.
Status	DI	Status indicator; not used.
Qual Overr	DI	Quality override indicator.
Blk Inhibit	DI	Block Inhibit indicator; not used.
Auto Manual	DI	Mode indicator; 1=Manual, 0=Auto.
Pdt Echo	DI	Not used.
Pkt Updt	DI	Data Updated flag.
Data Lock	DI	Data Lock indicator.
Mode Lock	DI	Mode Lock indicator.
Seq Number	AI	Sequence Number of this text string.
Orig Len	AI	Original Text string Length (not used).
Rec Len	AI	Recorded Length of the text string (not used).
ASCII String	String In	ASCII text string input.
ASCII String	String Out	ASCII text string output.
Set Auto	AO	Set Mode.
Set Status	DO	Set Status; 0=OK, 1=Error.
Set Seq Number	AO	Set Sequence Number.
Set Rec Len	AO	Set Recorded Length.

HARMONY 90 EXPORTING AND IMPORTING CONFIGURATION DATA

The Harmony 90 external device configuration can be exported to a text oriented file for documentation or modification purposes. The Harmony 90 external device configuration can be imported from a text file. The imported file could have been exported, exported and modified or generated by another software package. The file format, described below, has a fixed columnar location for each field that is compatible with database packages.

> **NOTE:** Harmony 90 exported device configurations do not include the standard tag data nor the driver start-up file. Standard tag data is exported via the Tag Export routines. You should also save Standard Tag data as Harmony 90 configuration data is keyed to tag names.

Export and Import operations are located on the following menu path:

Main->Configuration->Database Loaders->Harmony Loader

When Exporting (F3) a configuration file the default directory is "/bci/pcv/data/temparea". Only use this temparea when exporting in order to print or copy.

WARNING	**Files in this temporary area can be deleted without warning. Always specify a directory.**

The export process is a low priority function in the console environment and a complete export operation will be noticeably effected by system loading. Only those device, group, and tag definitions that have been defined are exported but every database record will be interrogated.

When Importing (F1) is selected, a Pop-Up will ask you :

"Do you want to Erase the Entire Configuration?"

Answering Yes (the default) will discard your entire Harmony 90 mapping data, including Device and Group definitions, but will not affect any of the OIS12/CIU tag definitions nor the driver definitions. If you chose No then the new configuration information will be merged with the current one. In the event that a new definition is read in with the same name as an existing one, then the new one will replace the old one.

NOTE: Harmony 90 tags will all go into bad quality during the import process but alarms will be cleared as the tag is imported as long as it is error free.

Import errors will occur and items will fail to import if associated prior items failed to import. Imported devices must use configured drivers and the drivers must be running. Imported groups must use configured devices. Imported external tag mappings must use configured groups and the OIS12/CIU tag definition must also exist. Necessary items are configured if imported in the current session. Tag definitions are saved and imported via:

Main->Configuration->Database Loaders->Tag Loader

Harmony 90 Export and Import Tag Format Rules

1. Data Structures are described in DESCENDING Order of DEVICES, GROUPS, TAGS in the text file.

2. Each Data Structure Definition is identified by a Keyword. All Keywords are in the first 12 character positions of a line. The Keywords are case sensitive.
The KEYWORDS are shown below followed by the explanation:

DEVICE	Identifies a Device Definition.
GROUP	Group Definition.

TAG	Starts every line that defines a tag element.
“	Comment Lines begin with double quote.

3. Device and Group Definitions are on a single line. Tag definitions are multiple lines. One line per Tag Element.

4. Only configured Tag definitions are exported.

5. If a tag exists in a file then every Tag Element whether used or not must be in the file. Elements are specified by their position only. That is, an analog input must have five tag elements and a digital input must have four tag elements. The tag elements must be in the order of the elements as listed for each tag type.

6. The following keywords are used for the tag types:

DIGITAL	Digital Input Tag Definition.
ANALOG	Analog Input Tag Definition.
RCM	Remote Control Memory Tag Definition.
RMSC	Remote Manual Set Constant Tag Definition.
STATION	Station Tag Definition.
DD	Device Driver Tag Definition.
MSDD	Multistate Device Driver Tag Definition.
RMCB	Remote Motor Control Block Tag Definition.
DAANG	Data Analog Report Tag Definition.
TEXTSELECT	Text Selector Tag Definition.
ASCII	ASCII String Tag Definition.
ANGRPT	Analog Output Tag Definition.
DIGRPT	Digital Output Tag Definition.
UNDEF	Undefined Tag Type.

Table 15-20. Group Definition Format

#	Width	Description
1	12	Keyword **GROUP**.
2	12	Group name.
3	12	Device name that holds this data.
4	12	Data type (0 to 12; see group data types).
5	12	Scan rate in seconds (0.5 sec increments).
6	12	Range; consecutive addresses to access.
7	79	Group address.
8	14	Status tag name.
9	4	Access; “RO”= Read Only, “RW”=Read+Write.

Table 15-21. Tag Element Definition Format

#	Width	Description
1	12	Keyword **TAG**.
2	14	Tag name.
3	12	Tag TYPE KEYWORD; See Above.
4	12	Group name.
5	38	Point address.
6	12	True state for boolean (TRUE/FALSE).
7	12	Zero value for analog, or constant value.
8	12	Gain value for analog.
9	12	Constant Indicator; “YES” or “NO”.

Order of the Elements for Importing Each Tag Type

Table 15-22. Digital Input Tag

Order	Element Type	Description
1	DI	Quality
2	DI	Alarm
3	DI	Value
4	DI	Red Tag

Table 15-23. Analog Input Tag

Order	Element Type	Description
1	DI	Quality
2	DI	Low Alarm
3	DI	High
4	DI	Red Tag
5	DI	Value

Table 15-24. RCM Tag

Order	Element Type	Description
1	DI	Quality
2	DI	Alarm
3	DI	Value
4	DI	Red Tag
5	DI	Feedback
6	DI	Override
7	DI	Permissive
8	DO	Sustain Reset
9	DO	Sustain Set

Table 15-25. RMSC Tag Type

Order	Element Type	Description
1	DI	Quality
2	DI	Low Alarm
3	DI	High Alarm
4	DI	Red Tag
5	AI	Value
6	DI	Tracking
7	AO	Set Output

Table 15-26. Station Tag

Order	Element Type	Description
1	DI	Quality
2	AI	PV Value
3	DI	Auto/Manual
4	DI	Red Tag
5	DI	Cascade/Ratio
6	DI	Station Level
7	DI	Computer OK status
8	DI	Station Output status
9	DI	Output tracking
10	DI	Manual interlock
11	DI	Station is in bypass mode
12	DI	PV quality
13	DI	Tracking
14	AI	SP value
15	AI	CO value
16	AI	RI value
17	AO	Set mode
18	AO	Set SP value
19	AO	Set CO value
20	AO	Set RI value

Table 15-27. Device Driver Tag

Order	Element Type	Description
1	DI	Quality
2	DI	Alarm
3	DI	Value
4	DI	Red tag
5	DI	Mode
6	DI	Feedback status
7	DI	Feedback #1
8	DI	Feedback #2
9	DI	Override
10	DO	Set auto
11	DO	Set manual
12	DO	Sustain set
13	DO	Sustain reset

Table 15-28. Multistate Device Driver Tag

Order	Element Type	Description
1	DI	Quality
2	DI	Alarm
3	DI	Value
4	DI	Red tag
5	AI	Last state
6	AI	Request state
7	DI	Mode
8	DI	Feedback #1
9	DI	Feedback #2
10	DI	Feedback #3
11	DI	Feedback #4
12	DI	Override
13	DI	Control override
14	DO	Set auto
15	DO	Set manual
16	AO	Set output

Table 15-29. Remote Motor Control Block Tag

Order	Element Type	Description
1	DI	Quality
2	DI	Alarm
3	DI	Value
4	DI	Red tag
5	DI	Feedback #1
6	DI	Feedback #2
7	DI	Bad start
8	DI	Fault
9	DI	Start permissive #1
10	DI	Start permissive #2
11	AI	Error code
12	DO	Acknowledge
13	DO	Sustain set
14	DO	Sustain reset

Table 15-30. Text Selector Tag

Order	Element Type	Description
1	DI	Quality
2	AI	Color
3	AI	Text selection
4	DI	Red tag
5	DI	Blink

Table 15-31. DAANG Block Tag

Order	Element Type	Description
1	DI	Quality
2	AI	Low Alarm
3	AI	High Alarm
4	AI	Value
5	DI	Auto/Tracking
6	DI	Tracking
7	DI	Multilevel
8	DI	Communication Quality
9	DI	Calculate
10	DI	Constraints Enabled
11	DI	Permit Input Selected
12	AI	Next High Limit
13	AI	Next Low Limit
14	DI	Red Tag
15	DI	Hardware Failure
16	DI	Out Of Range
17	DI	Limited
18	DI	DI Calculated
19	DI	Quality Override
20	DI	Scan status
21	DI	Deviation Alarm
22	DI	Rate Alarm
23	DI	Variable Alarm
24	DI	Suppressed Alarm
25	DI	Toggled to Re-Alarm
26	AO	Set Status
27	AO	Set Value

Table 15-32. Digital Report Tag

Order	Element Type	Description
1	DO	Quality
2	DO	Alarm
3	DO	Value
4	DO	Red Tag

Table 15-33. Analog Report Tag

Order	Element Type	Description
1	DO	Quality
2	DO	Red Tag
3	AO	Value
4	DO	Low Alarm
5	DO	High Alarm

Table 15-34. ASCII String Tag

Order	Element Type	Description
1	DI	Quality
2	DI	Alarm status
3	DI	Red tag
4	DI	Quality override
5	DI	Alarm inhibit in blockware
6	DI	Auto/manual
7	DI	Normal echoed PDT
8	DI	Packet updated
9	DI	Data interlock
10	DI	Mode interlock
11	AI	Sequence number
12	AI	Original byte count
13	AI	Received byte count
14	SI	Sting in
15	SO	String out
16	AO	Set auto
17	DO	Set status
18	AO	Set sequence number
19	AO	Set received length

APPENDIX A - GRAPHIC ELEMENTS SUPPORTED

SODG GRAPHIC ELEMENTS SUPPORTED

Tables A-1 through A-7 list the supported graphic elements. Some graphic elements used by other Elsag Bailey operator consoles are NOT supported by the OIS12 console. If unsupported graphic elements are in the graphic source file, they are ignored.

NOTE: ".dt" file format is not used. All graphics are converted from .dr type graphic files and .dy type symbol files.

Table A-1. General Graphic Elements Supported

Graphic Element Line
Circle
Polygon
Arc
Text
Static Symbol

Table A-2. Configuration Display Elements Supported

Graphic Element Tag Name
Tag Descriptor
Engineering Units
Logic State Descriptor
MSDD Logic State Descriptor
Alarm Comment
Alarm Limit
Alarm Limits (High and Low)
Alarm Ticks (High and Low)
Scale Limit
Scale Limits (High and Low)
Node Address
Module Address
Node Error Configuration Text - Node Off-Line
Node Error Configuration Text - Module
Node Error Configuration Text - Communication System
Node Error Configuration Text - Node Status
Alarm Group
Data Acquisition Analog Reference Value
Data Acquisition Analog Bar Pivot Tick

Table A-3. Interactive Elements Supported

Graphic Element
Control Select Keystrokes[1] Trend Select Keystrokes Alarm Summary Select Keystrokes
Display Select Keystrokes Primary Display Keystrokes Soft Key[2]
Pop-up Window Select Keystrokes Pop-up Window Select Keystrokes with Tag Index

NOTES:
1. The prompt option for disjoint prompt with tag name and highlight box (control option 35) is NOT supported.
2. Only module problem reports (function 4) are supported.

Table A-4. Alarm Indicators Supported

Graphic Element
Alarm Indicator
Node type/configuration error[1] Node error[1] Module type and configuration error[1] Module mode[1] Module error[1] Alarm state indicator

NOTE:
1. Not fully supported. Works as corresponding “ed”.

Table A-5. Dynamic Indicators Supported

Graphic Element
Value Moving Value Dynamic Bar Dynamic Pointer Deviation Bar - (Type 1) Logic State Descriptor Alarm Comment
Station Mode (type 1) Station Status (type 1) Station Mode (type 2) Station Status (type 2) Station Tracking (type 2)
RCM Override Indicator RCM Set Permissive Indicator RCM Output Indicator RCM Feedback Indicator
RMCB Bad Start Text RMCB Fault Indicator Text RMCB Permissive LSD RMCB Error Code Text RMCB Feedback LSD RMCB Feedback Indicators

Table A-5. Dynamic Indicators Supported (continued)

Graphic Element
DD Override DD Mode DD Output Indicator DD Feedback Indicator
MSDD Override MSDD Mode MSDD Output Indicator MSDD Feedback Indicator MSDD Control Override
RMSC Tracking Indicator
Text
Node Type and Configuration Error Node Error, Short Form Node Error, Long Form - Off-Line Node Error, Long Form - Module Node Error, Long Form - Communications Node Error, Long Form - Node Status Module Type and Configuration Error Module Mode Module Error Indicator Module Status Bytes
Data Acquisition Analog No Report Indicator Data Acquisition Analog Constrained Value Indicator Data Acquisition Analog Bi-Directional Bar Data Acquisition Analog Mode (value source) Lock Data Acquisition Analog Variable Alarm Indicator Data Acquisition Analog Quality Override (driven) Indicator Data Acquisition Analog Moving Next Alarm Limit Data Acquisition Analog Next Highest/Lowest Alarm Limit Data Acquisition Analog Moving Next Alarm Limit Ticks Alarm Priority Alarm State Alarm State Quality Red Tag Status Red Tag Outline Exception Report Text

Table A-6. Dynamic Symbol Elements Supported

Graphic Element
Digital Dynamic Symbol
Analog Dynamic Symbol Advanced Analog Dynamic Symbol (33 ranges)
RMCB Dynamic Symbol MSDD Dynamic Symbol - Current State MSDD Dynamic Symbol - Requested State
Exception Report Discrete Dynamic Symbol (XRDDS)

Table A-7. Dynamic Chart Supported

Graphic Element
Alarm Summary
Block Details Chart
Trend Chart
Shewhart Mean (XBar) Chart Shewhart Range (R) Chart Shewhart Standard Deviation (S) Chart Shewhart Individual X (X) Chart Shewhart Moving Range (mR) Chart Shewhart Median (M) Chart Shewhart Midrange (Mr) Chart Shewhart Range for Median (R(M)) Chart CUSUM Chart EWMA Chart TSA Chart

Table A-8. Dynamic Chart Not Supported

Graphic Element
XY Plot

APPENDIX B - ENHANCED DATA COLLECTION SYSTEM (EDCS) OVERVIEW

INTRODUCTION

The Enhanced Data Collection System (EDCS) is the component of the OIS12 console responsible for collecting, filtering and storing historical data. The following section describes the rationale and objectives of the EDCS, as well as briefly outlining its operation.

EVENT DATA VS. SAMPLED DATA

In the original trending system (i.e., LAN-90 PCV 5.0 and earlier), trends were based on live values of a trended tag sampled at periodic intervals. Between samples, however, the tag values could change several times. This could sometimes lead to an aliasing effect, introduced into the sampled data by missing these intermediate changes.

The EDCS was created to record all changes to each tag's live value, not just sample a tag's value at fixed intervals. Since changes occur at random times, a time-stamp is recorded along with each change to a tag's live value. The combination of time-stamp and recorded value is referred to as an event.

FILTERING AND STATISTICS

The live collection component of the EDCS is capable of recording and storing a continuous stream of event data from the OIS12 Real-Time Database. Event data for each tag must be streamed in ascending time-stamp order. Another component of the EDCS handles any non-sequential time-stamped event data.

The EDCS introduces the concept of historical collection classes to the OIS12 console. Each class defines the method of collecting, filtering, aging, storing and archiving event data for one or more tags. As shown below, the Historical Class Configuration Screen (Figure B-1) provides fields for each method.

A class can be defined for a group of tags with common collection needs. Each tag in the group acquires the collection scheme when they are assigned to the class. Any change to the collection scheme is automatically inherited by the tags belonging to the class.

The EDCS defines three types of data collection: *analog, digital* and *manual/import.* Only certain historical class configuration fields are available with each collection type. Unavailable fields are dimmed on the Historical Class Configuration screen.

```
< Edit Historical Class Definition 001 >

Class Name :    1secondana
Collection Type Analog Digital
Trigger Tag                         Trigger State   Zero One
Event Filter :  % Change of Span         1
                Minimum Report Time      1 seconds

Aging Period              Retention Period            Archive
Raw Events                    2   hours               No Yes
Hourly Statistics             0   days                No Yes
Shift Statistics              0   days                No Yes
Daily Statistics              0   days                No Yes
Weekly Statistics             0   weeks               No Yes
Monthly Statistics            0   months              No Yes

F1  Save Class Definition
F5  View Tags In Class
F9  Help                          F0  Return to Previous Menu
```

Figure B-1. Historical Class Configuration Screen

With *analog* collection, all fields are enabled to allow full collection capabilities. With *digital* collection, only the *Trigger Tag*, *Trigger State*, *Minimum Report Time* and *Raw Events* fields are enabled. The *% Change of Span* field is dimmed since a digital value has no span, only states. Statistics are not actively calculated for a digital. Only one *manual/import* collection class can be defined. As the name suggests, this collection type is meant for storing manually entered or imported event data which may not be in time-stamp order. Only the *Raw Events* field is un-dimmed since no additional processing is done with the incoming event data other than storing and archiving.

Collection of event data can be continuous or triggered by the state of a digital tag. Specifying the Trigger Tag and the Trigger State, lets you define which tag and which state that tag must be in to trigger data collection. When the Trigger Tag goes into its Trigger State, the current state of the Triggered tag is recorded. All events for the Triggered tag are then recorded until the Trigger Tag leaves its Trigger State, at which point a **No Data** event is recorded for the Triggered Tag, and event recording is stopped. When collecting, tags assigned to the analog and digital historical collection classes can also be filtered. A filtered event is generated only if the current event value compared with the last value (when or after the minimum report time has expired), has exceeded a percentage of the tags span. For a station-type tag, separate filters are maintained for the process variable, set point, control output and ratio index. The % Change of Span and the Minimum Report Time fields allow you to define the filtering characteristics.

Only analog value and digital change-of-state events are filtered; all other events (alarm, status, etc.) bypass the filter and are always recorded.

The minimum report time filter holds events until the difference between the last recorded event and the current time equals or exceeds the filter time. Any events received while a filter is active overwrites the currently held event. Once the filter has expired, the held event is released with its original time stamp. This event is then recorded and treated as the last recorded event.

Statistics can be calculated for tags assigned to an analog-type collection class. If no filtering is defined, incoming raw events are used, otherwise, internal filtered events are used.

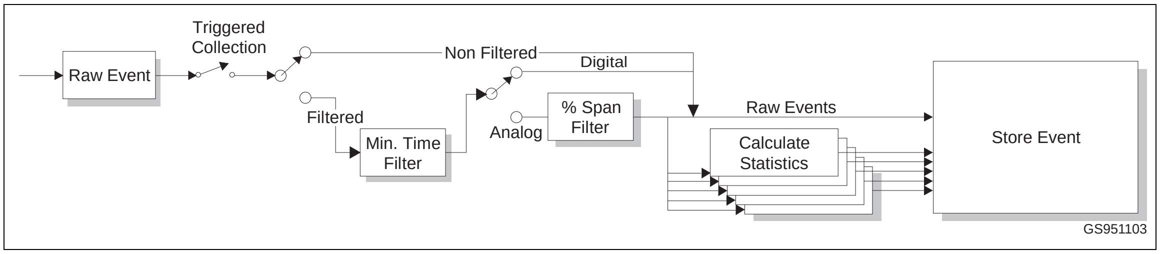

Figure B-2. EDCS Data Flow

STORAGE

If the retention period for the Historical Class is non-zero, events for each tag are cached in RAM until either the RAM buffer is filled or a maximum time has passed. Events are cached for quick look-ups by other components of the OIS12 console system. When flushed, the events are stored by the Historical Storage Server to a file on the hard disk.

The storage server maintains hourly event files, for example, 10:00 to 11:00. Events are stored in ".ef" (event file) files until they are aged. An event file is aged half an hour after it is completed, so, for example the 10:00 - 11:00 file is aged at 11:30. Part of the aging cycle converts and shrinks the event file into a ".cef" (compressed event file) file. The next part of the aging cycle copies the events for tags which must be archived into another compressed event file. This archive event file is submitted to the archive management system. The final part of the aging cycle removes events from the compressed event files which exceed the retention period.

DATA RETRIEVAL

The EDCS provides many facilities for retrieving event data. Raw event data, periodic data and statistical data between a given start and end time can be retrieved. Periodic data is event data sampled over a given time. Statistics including percentage bad, number of events, sum, sum squared, minimum value and time and maximum value and time are calculated over a given time interval. A retrieval request can also be completed by retrieving event data from archives.

Event data exists in several places within the OIS12 console system. The time period of the retrieval request determines which places are searched in order to complete the request.

Searches may be done on:

1. The memory cache within the live collection server. This area is searched only when the start time of the request is close to the current time.

2. On-line event files and compressed event files managed by the storage server. This area is examined when the search period is within the retention period.

3. Files being delivered to the archiver are placed into a temporary area until the archiver gets around to storing it. This temporary area is checked next, just in case the archiver is busy or off-line.

4. Archived event and imported trend files managed by the archive management system. This area is examined when the search period is beyond the current retention period. If the disk on which the needed archive files are found is mounted, the archived files are accessed directly in order to retrieve the events to complete the request. If the request indicates that off-line archived files should be searched, the retrieval system queries the archive catalog for a list of archived files and volumes on which the files are stored. If desired, the retrieval system then asks for the archive system to mount each volume one at a time. As each volume is mounted, the retrieval request is gradually completed.

When raw event data is requested, it is always requested over a certain period. The first event returned will always have a timestamp that is less than or equal to the requested start time. This is done so that the state of the tag <u>at</u> the requested start time can be determined. Events are then returned until either 1) the requested number of events have been returned; 2) the requested end time has been reached; or 3) there are no more recorded events to return. If, for some reason, data is not available for a particular period of time, then a Bad Value event is returned indicating the start of the bad period.

When periodic event data is requested, the retrieval system samples the raw events. The first periodic event is the last event stored before the starting search time. The sample period is added to the start time to give a current search time. The next sample is the last event stored before the current search time. The period is successively added until the query completes.

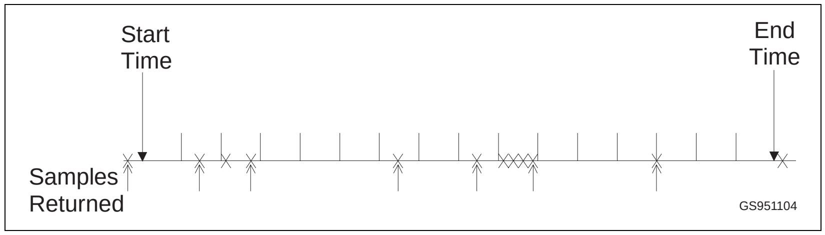

Figure B-3. Converting Events to Periodic Samples

The purposes of statistical calculations are to allow the user to query the EDCS for values useful in further calculations, as well as to permit the collection of values over a long period of time and reduce storage requirements. Even after raw events have been discarded by the EDCS, the Calculated values may be maintained. There are five time periods over which statistics are calculated: hour, shift, day, week and month. Shorter periods may be requested, but these are derived from raw events at the time of the request. Longer periods are derived from the shorter ones. All times within the EDCS are recorded in milliseconds. Several statistical values are maintained for each period including:

- ***Total number of events over the period*** - This value is incremented each time a new event (good or bad) occurs.
- ***Minimum good value over the period*** - During the period, the minimum and maximum values are recorded, as well as the times at which they occurred.
- ***Time of minimum good value.***
- ***Maximum good value over the period.***
- ***Time of maximum good value.***
- ***Amount of time the values were bad over the period*** - The amount of time that the tag was bad is recorded.
- ***Weighted summation of the good values over the period*** - This is calculated by the equation:

  $$\sum_{k=1}^{n} V_k t_k$$

  Where

n	Total number of samples.
k	Sample number.
V_k	Value of the kth sample.
t_k	Duration over which the value stayed at V_k , in seconds.

The equation is the summation of each event's value multiplied by the length of time the event existed. The length of time the event existed is either the time since the last event or the beginning of the period.

- ***Weighted summation of the good values squared over the period*** - This is calculated by the equation:

$$\sum_{k=1}^{n} V_k^2 t_k$$

The equation is the summation of each event's value squared multiplied by the length of time the event existed.

To picture how weighting a value by time makes a difference to more complex calculations, the illustration below shows a hypothetical series of events. In this illustration, four events occur within a 60-second period.

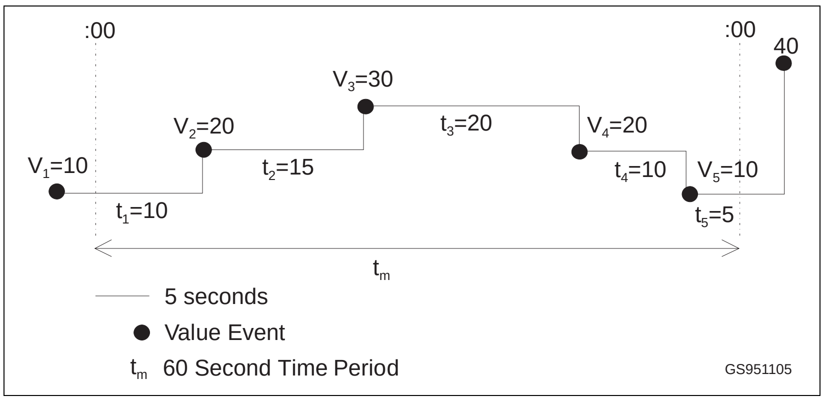

Figure B-4. Gather Calculations for a Hypothetical Series of Events

Without taking time into consideration, the average for the events is:

$$\frac{20 + 30 + 20 + 10}{4} = 20$$

Taking time into consideration, the average is given by the equation:

$$\frac{\sum_{k=1}^{n} V_k t_k}{t_m - t_b}$$

Where

t_m	Total amount of time in the period, in seconds.
t_b	Total amount of time that the tag was bad during the period t_m, in seconds.

The numerator of the equation is the weighted sum of the values. The denominator is the amount of time the events were good over the period. All time durations are specified in seconds.

From this equation, the average for the event is:

$$\frac{10 \times 10 + 20 \times 15 + 30 \times 20 + 20 \times 10 + 10 \times 5}{60 - 0} = 20.83$$

From this example, it is clear that calculations weighted by time must be performed to provide accurate results for more complex calculations.

APPENDIX C - TIME ZONE RULES

TIME ZONE RULES AVAILABLE IN QNX/PCV 5.2

Table C-1. Time Zone Rules

Name of Time Zone	Rule
Greenwich Mean Time	utc00
New Zealand	nzst-12
Eastern Australia	east-10
Central Australia	cast-09:30
Japan	jst-09
Western Australia	wast-08
China	cst-08
Hong Kong	hkt-08
Korea	kst-09
India	ist-05:30
Moscow	mst-02mdt-03,M3.5.0/2,M9.5.0/2
Eastern Europe	eet-02eest-03,M3.5.0/2,M9.5.0/2
Central Europe	cet-01cest-02,M3.5.0/2,M9.5.0/2
Middle Europe	met-01mest-02,M3.5.0/2,M9.5.0/2
Western Europe	wet00west-01,M3.5.0/2,M10.5.0/2
United Kingdom	wet00west-01,M3.5.0/2,M10.5.0/2
Eastern Brazil	bst03
Newfoundland	nst03:30ndt02:30,M4.1.0/2,M10.5.0/2
Western Brazil	bwst04
Atlantic	ast04adt03,M4.1.0/2,M10.5.0/2
Eastern	est05edt04,M4.1.0/2,M10.5.0/2
Central	cst06cdt05,M4.1.0/2,M10.5.0/2
Mountain	mst07mdt06,M4.1.0/2,M10.5.0/2
Pacific	pst08pdt07,M4.1.0/2,M10.5.0/2
Alaska	akst09akdt08,M4.1.0/2,M10.5.0/2
Hawaii	hast10
Samoa	sst11

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Form I-E96-102-6.1E Printed in Canada 10/97

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