

GCM

Gary - Chicago - Milwaukee ITS Priority Corridor

Corridor Transportation Information Center

*C-TIC Console Operator's
User Manual
Document # 9925.01*

PROPRIETARY AND CONFIDENTIAL

**GARY-CHICAGO-MILWAUKEE CORRIDOR
CORRIDOR TRANSPORTATION INFORMATION CENTER
CONSOLE OPERATOR'S USER MANUAL**

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1.0 INTRODUCTION

The C-TIC Console Operator's User Manual is designed to assist the operator at the Corridor Transportation Information Center with the navigation and use of the application programs in the C-TIC. This document will concentrate solely on the external appearance and behavior of the interface from the operator's point of view. However, this document does not assume the reader is familiar with standard windows terminology such as point, click, select, etc.

The Console Operator's User Manual is comprised of the following sections. Section 1 presents an introduction to the user manual. Section 2 provides an introduction to the X Window System interface and associated terminology. The procedure for logging in to the C-TIC interface and accessing the C-TIC main menu is outlined in Section 3. Section 4 presents the layout and functions of the Corridor Map Window and its menus. Section 5 describes C-TIC Internet functions. Operation of the C-TIC Account Editor is presented in Section 6. Section 7 outlines the functions contained in the C-TIC Subsystem Controller. Operation of C-TIC archive and backup utilities are discussed in Section 8. Section 9 summarizes the various reports produced by the C-TIC. Section 10 provides a description of the NWCD Incident Summary window.

Operators interested in a general description of the C-TIC system are referred to the C-TIC System Definition Document, #9931. Definitions, abbreviations and acronyms relative to the C-TIC system are presented in the System Glossary Document, #9936.

2.0 THE X WINDOW SYSTEM

The C-TIC applications use the OPEN LOOK Graphical User Interface (GUI) specification. This specification was developed as a standard for the X Window System (XWS) in order to provide users and developers with a simple and consistent environment across many different applications. In this section we will describe some characteristics which are shared by all the application programs in the C-TIC, as well as most GUI systems. This section will focus on the methods of navigating the system via the mouse, however, some actions may also be accessed via the keyboard and these will be discussed in the context of the specific program activities.

2.1 The Root Window

The C-TIC Root Window is shown in Figure 2-1. It provides the operator with a desktop on which a series of programs or windows can be opened. The initial root window may contain any of the items seen in the figure such as a clock, a console message window, a CPU monitor, or a minimized window icon. Each root window, or console, includes a pointer which is controlled by a mouse. The pointer is a key element to the XWS and is used to perform various important tasks such as clicking on an object.



Figure 2-1. C-TIC Root Window

2.2 The Mouse

The mouse is a device that is designed to easily navigate the XWS as it controls the actions of the on-screen pointer. The mouse for the C-TIC system, shown in Figure 2-2, is an optical device and requires a special mouse pad for operation. The movements of the mouse across the mouse pad are reflected by the on-screen pointer. If the operator moves the mouse to the left, for example, the on-screen pointer will move to the left. The mouse has three buttons that can be depressed. The three buttons are identified as left, center and right buttons given their location on the mouse.

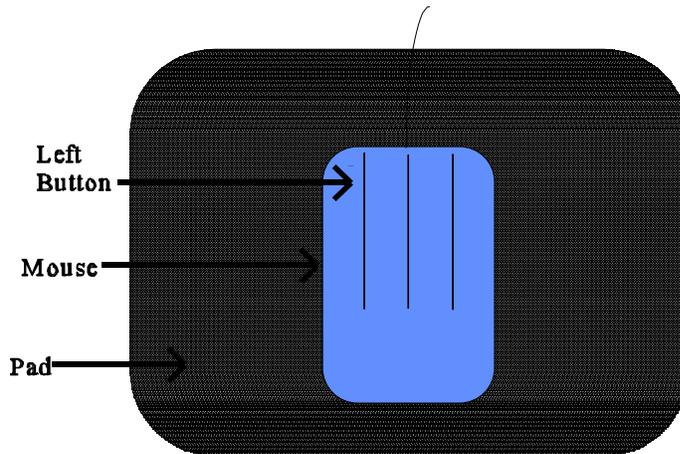


Figure 2-2. Mouse with Pad

Some commonly performed actions are listed below:

click - to depress and release a mouse button in one quick motion. Generally, clicking on an object will refer to depressing the left mouse button unless otherwise specified (*i.e., right clicking on the C-TIC Root Window*)

double click - depressing and releasing the mouse button twice in quick succession

drag - depress the mouse button over an object without releasing the button and move the pointer and object to a desired location

drop - to release the mouse button on an item that is being dragged

point - place the pointer (or cursor) over an object

select - to click on an object

2.3 Window Elements

The window is the basic object in which all program control resides. Some elements common to most windows include a minimize button, a title bar, a menu bar, scroll bars and resize corners. Figure 2-3 presents the typical window elements.

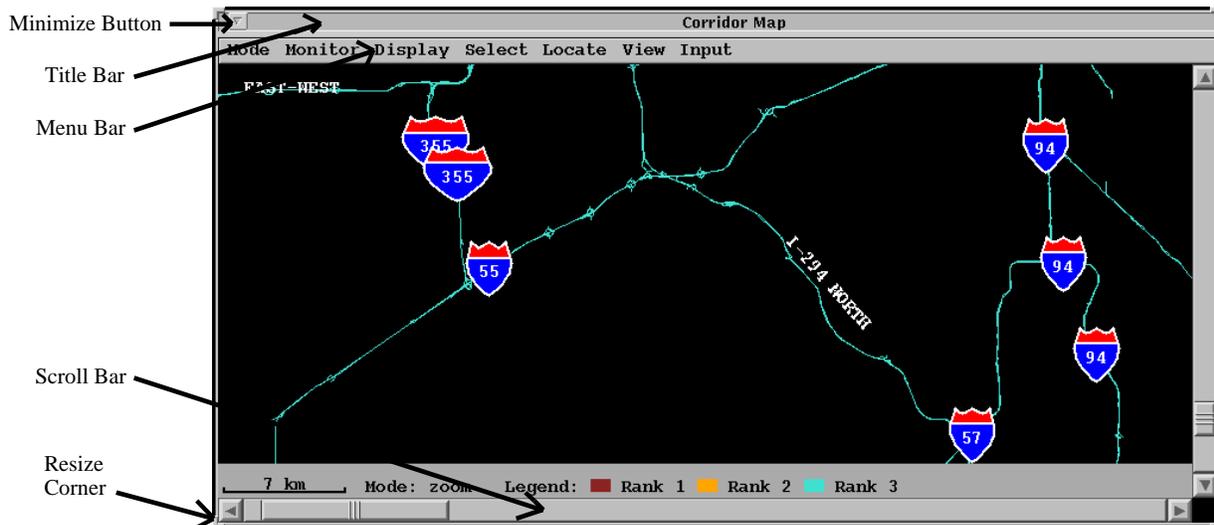


Figure 2-3. Typical Window Elements

The minimize button can perform multiple functions. Clicking on the minimize button will remove the window from the desktop and create an icon along the bottom of the root window. This action does not, however, stop the program in the window from executing. Right clicking on the minimize button or the newly created icon will display a pull-down menu with options such as refresh, resize, close or quit your window. The refresh menu item causes the window to be redrawn. The resize menu item is used to resize the window by clicking inside the window and dragging the mouse until the window has the desired size. The close menu item minimizes the window. The quit menu item terminates the program currently executing from the window.

Clicking on the title bar allows the user to move the window by dragging and dropping it at different location on the desktop. Executing a right click on the title bar will produce the same menu as a right click on the minimize button.

The resize corners of the window allow the user to manually resize the window. This is done by clicking and dragging any of one the 4 resize corners. These corners may not always be available and

some windows may have limitations on size placed on it by the underlying program.

Scroll bars, shown in Figure 2-4, allows the user to view all areas of a map or image that is too large to fit in a window. The viewing area can be moved by either clicking and dragging the slider or clicking on the arrow buttons.

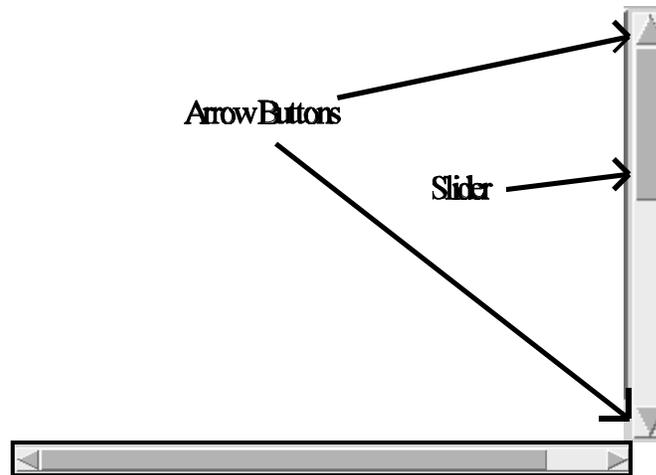


Figure 2-4. Scroll Bars and Their Components

The menu bar allows the operator execute a specific program function. This is accomplished by clicking on an item or word in a menu bar. The items in a menu bar normally contain features unique to the program in the window. Many of these features will be discussed in the following sections.

There are also special types of windows called pop-up windows. Pop-up windows may appear after selecting a menu item or as a result of some other system activity. These windows may provide information, recommend user actions, specify a warning, or ask for confirmation of certain conditions. Figure 2-5 presents a typical advisory pop-up window.

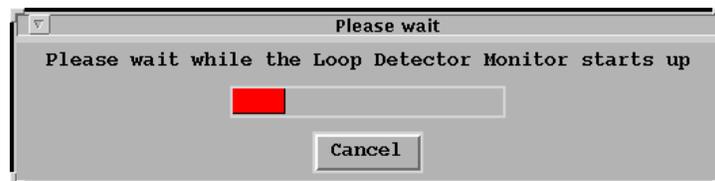


Figure 2-5. Advisory Pop-Up Window

Note that there will be a limit of at most twelve windows open on the screen at any time, regardless

of the window type. Any attempt to open more than twelve windows will trigger an audible alarm. To maintain an acceptable rate of access however, it is recommended no more than 8 windows be open simultaneously. Note that windows which display data in real time (i.e. loop detector occupancies, NWCD incidents, etc.) will be updated automatically with the exception of log file windows. This applies for both graphical and textual data.

2.4 Menu Items

Menu items are generally represented by a word in the menu bar. These items can execute new programs or change the characteristics of an existing program. Menus may also be of the pop-up type as is the case when you right click on the title bar. A menu item that activates a list of new actions to choose from is known as a pull down menu. A typical pull down menu is shown in Figure 2-6a. Some pull down menu items are activated by a right click like the one in Figure 2-6b.

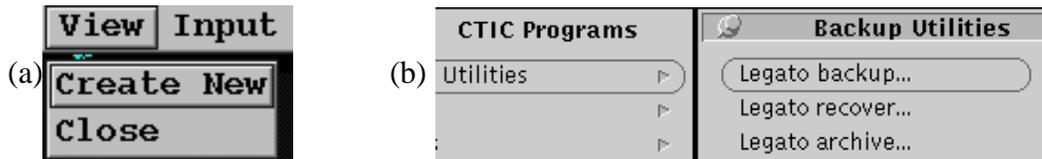


Figure 2-6. Pull Down Menus

2.5 Buttons and Other Objects

This section describes a variety of buttons and objects that are used throughout C-TIC applications to perform various tasks. The use of these may not be clear without the context of the application in which they appear. The intent of this section is to merely introduce the user to all the buttons and objects. Some buttons and objects are designed to simplify the use of the desktop, while others are designed to execute specific tasks.

Buttons appear in a variety of forms and can be used for different purposes. An action button, used to run a query or print selected output, is shown in Figure 2-7a. A button used to confirm an action is shown in Figure 2-7b.



Figure 2-7. Buttons

A special type of button is a radio button. The term "radio button" is derived from old car radios

which had buttons to select radio stations of which only one could be depressed at a time. Radio buttons in the XWS are used to select an item from a list which has choices that are mutually exclusive. For example, Figure 2-8 contains four radio buttons on the bottom of the menu list because each level selection is mutually exclusive of the other three levels and therefore only one can be chosen at a time. Figure 2-8 also shows a check list located at the top of the menu. A check list is a group of buttons or attributes that can be selected or deselected independently. All buttons are activated by clicking on them with the mouse or the user may simply press the return key if they are highlighted.

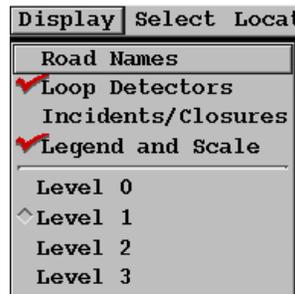


Figure 2-8. Menu with Checklist and Radio Buttons

A list box contains a list of items that can be selected. The list box shown in Figure 2-9 contains a list of C-TIC accounts. Here, a desired account can be selected by clicking on the line with the appropriate name. The account name is highlighted when the selection is made. The operator could then choose an appropriate action button following selection of a desired account.

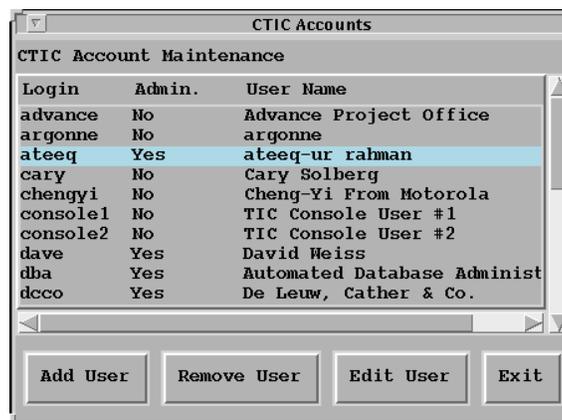


Figure 2-9. List Box

The entry box provides a means to enter user data in a window. Figure 2-10 contains an entry box used to locate a specific intersection. To enter data into the entry field simply click on the desired

entry box and enter in the appropriate information. Note that the mouse cursor must remain in the entry box while the information is being entered.



Figure 2-10. Entry Box

3.0 C-TIC BASICS

3.1 Logging on to the C-TIC

A valid login identification is required to access the C-TIC system. Login IDs can be obtained from the system administrator (see Section 6). The C-TIC log in screen is shown in Figure 3-1. To access the system, the operator should type their name in at the “Login:” prompt and hit the Return key. The cursor will then automatically move to the “Password:” prompt. The operator should then type in their password. Note that the password will not appear on the screen as security measure. There is no default password for a new user, so simply hitting the Return at the “Password;” prompt will suffice. New users must establish a password following the procedure outlined in Section 3.2.

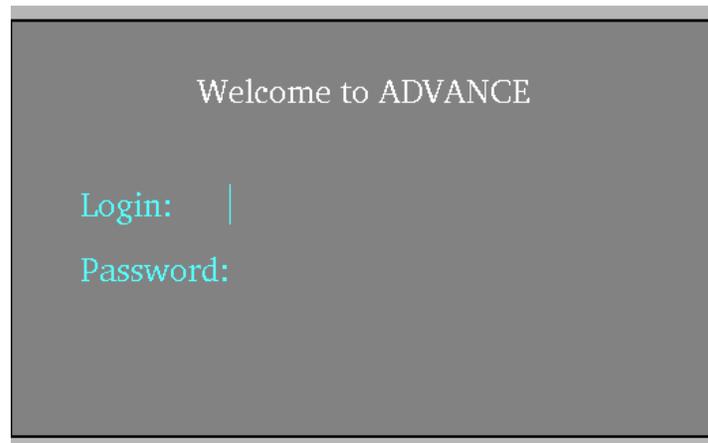


Figure 3-1. Login Screen

3.2 Passwords

Passwords are the single most important means of security available on the system. Therefore, all users should keep their the passwords a secret. New users are required to establish a password when logging in for the first time. The Password Verification Window will automatically appear when a new user logs on. The operator will need to type in the password twice to ensure that no typographical errors where made. Figure 3-2 shows the Password Verification Window.

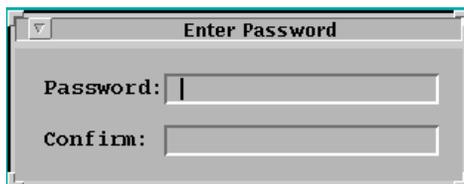


Figure 3-2. Password Verification Window

User passwords can be reset by the system administrator if an operator chooses to change his or her password.

3.3 Copyright Window

The Copyright Window, shown in Figure 3-3, is displayed after the user has performed a valid log in. The user must click on the "OK" button before the C-TIC Main Menu can be displayed.

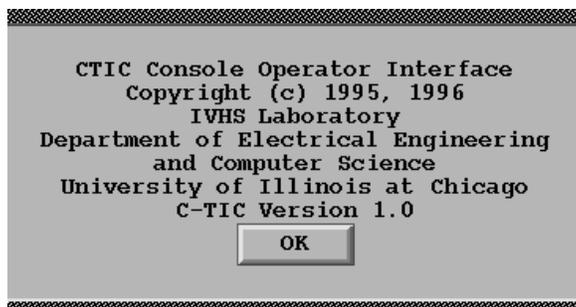


Figure 3-3. Copyright Window

3.4 C-TIC Main Menu

Once logged in, the Corridor Map Window, described in Section 4, and the C-TIC Subsystem Controller, described in Section 7 will be displayed. At this point, the user can access the C-TIC Main Menu. To obtain the main menu, the user should perform a right click on an open area of the desktop (see Figure 2-1, C-TIC Root Window). The pop-up window shown in Figure 3-4 will appear with a menu list inside. From here the user can select the appropriate program. To select a program to run, simply click on the text for the corresponding program.

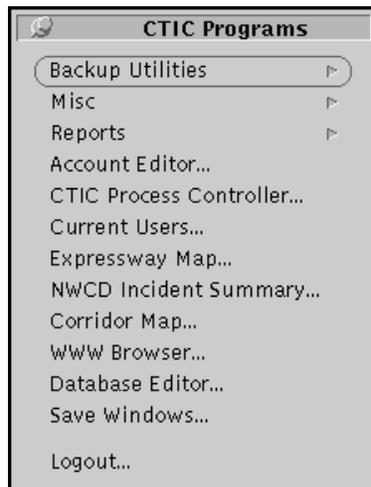


Figure 3-4. C-TIC Main Menu

Listed below is a synopsis for the items and programs on the C-TIC Main Menu:

The Backup Utilities option is a pull down menu with options for performing backups, archives, printing the contents of a tape, ejecting a tape and managing the C-TIC log files.

The Misc option is a pull down menu that contains the following standard workstation programs: Clock, Performance Meter, Print Tool, Text Editor and Snapshot.

The Reports option is a pull down menu with options for different reports. These reports are discussed in Section 9.

The Account Editor is an administrative tool to maintain user information. Access to this tool is restricted. Use of this tool is discussed in Section 6.

The C-TIC Process Controller is a graphical tool that allows the user to monitor, stop and start individual processes as well as view the log and status files for each individual process. Section 7 summarizes the functions of this tool.

The Current Users option displays a list of the users currently connected to the C-TIC.

The Expressway Map is a dynamic on-line reporting system that gives the user a graphical representation of current travel conditions within the corridor. Section 5 discusses Expressway Map functions.

The NWCD Incident Summary option displays a window with a list of any incidents received from Northwest Central Dispatch.

The Corridor Map option provides a graphical interface to the map of the GCM Corridor. The functions of this map are discussed in Section 4.

The WWW Browser function is used to access the Internet and World Wide Web through the Netscape browser. Details regarding the Netscape browser are not documented here.

The Database Editor is a development and debugging tool for viewing and editing information

stored in the C-TIC database.

The Save Windows option saves the current window positions and sizes and restores them after a log in for the next operator session.

The Logout option allows the user to log off the C-TIC.

3.5 Logging Out

Selection of the “Logout” option from the Main Menu allows the operator to log out of the C-TIC system. A confirmation window will appear, click on the OK button and the system will complete the sign off.

4.0 CORRIDOR MAP WINDOW

The Corridor Map Window provides a graphical display of the road network in the GCM Corridor. The main functionality of the C-TIC is accessed from this window since it is used to enter anecdotal information and to monitor information entering and exiting the C-TIC. The Corridor Map Window is accessed by selecting the “Corridor Map” item from the C-TIC main menu.

4.1 Menus

The Corridor Map Window is shown in Figure 4-1. The main components of the window are the menu, the map itself, the legend, the scale and the scroll bars. The menu is displayed along the top of the map and is used for selecting various commands which will be described in detail in the sections that follow. The map itself displays a portion of the map database. The portion displayed can be changed by zooming or using the scroll bars along the bottom and right edges of the window. The scale or zoom level can be displayed along the bottom of the map along with the legend which indicates which colors are used for each road rank.

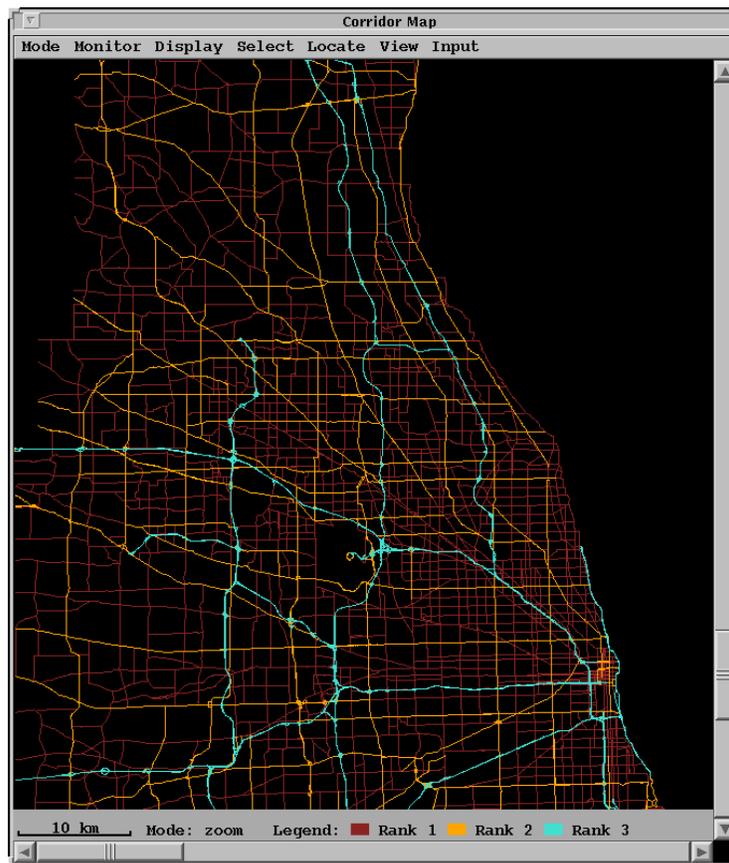


Figure 4-1. Corridor Map Window

Hot keys are also available to trigger the most commonly used functions on the corridor map. The various C-TIC hot keys are described when they apply and a summary of all hot keys is listed in Section 4.4.

4.1.1 Mode Menu

The Mode Menu is used to select between one of two modes of mouse operation. The operator may also use the hot keys “m” or “M” to toggle between the two modes. In *Zoom mode*, the mouse can be used zoom in to a selected point on the map. The left mouse button is used to zoom in and the right mouse button is used to zoom out. Similarly, the operator can use the hot keys “+” or “=” to zoom in or “-” or “_” to zoom out. These hot keys also function in *Select mode*.

In *Select mode*, the mouse is used to select segments on the map. Clicking the left mouse button near

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a segment selects that segment. Additional clicking of the left mouse button selects additional segments. The selected segment(s) will be highlighted on the map for easy identification. To cancel all selected segments, use the select menu and click on clear.

Nodes can also be selected while in Select mode. A node is the junction of two or more individual segments. A node is selected by clicking directly on it; this works best when zoomed in very close.

4.1.2 Monitor Menu

The Monitor Menu, shown in Figure 4-2, can be used by the operator to monitor incoming loop detector data. The operator should first select the segments of interest and then the event to monitor. Only the segments that were originally selected will be monitored and displayed in the resulting window. This makes it possible to have several windows each monitoring the same event in a different portion of the corridor. The operator can print the current contents of a monitor window to a file or to the printer at any time.



Figure 4-2. The Monitor Menu

4.1.3 Display Menu

The Display Menu, shown in Figure 4-3, controls which items are displayed on the map. By limiting the amount of information displayed, the speed of the corridor map interface can be improved. Check marks appear next to items that are currently displayed on the map. Selecting an item will either place or remove a check mark in the menu and cause that item to be displayed or removed from the map. Enabling the "Road Names" item will cause the expressways on the map to be labeled with their names. Enabling "Loop Detectors" will cause an icon to appear at the location of each loop detector. Enabling "Incidents/Closures" will cause active incidents and closures to be displayed on the map in the form of a special icon. Figure 4-4 shows the corridor map icons. Disabling the road names, loop detector or incident displays will remove all related icons from the map. Selecting "Legend and Scale" will enable or disable the display of the legend and scale at the bottom of the map window. The operator can also choose to display or remove the map legend with the hot keys "I" or "L".

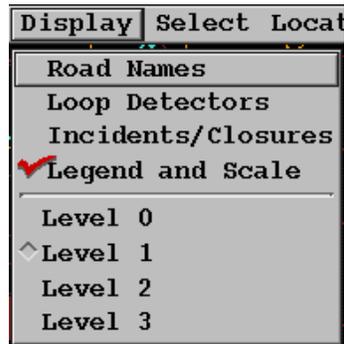


Figure 4-3. The Display Menu

The display menu is also used to control the ranks of the roads shown on the map. Ranks range from rank 3, typically expressways and tollways, to rank 0 roads which are typically residential streets limited to local access. Enabling level 0 causes all ranks of roads to be displayed. Note that rank 0 segments are only displayed if they intersect a rank 1 segment or higher. Enabling level 1 causes rank 1, 2 and 3 roads to be displayed. Enabling level 2 causes rank 2 and 3 roads to be displayed. Enabling level 3 causes roads of rank 3 to be displayed only. Only one of these three level options may be enabled at a time. The operator can also toggle between the various level displays with hot keys. The hot keys "0", "1", "2" and "3" display road levels 0, 1, 2 and 3 respectively.

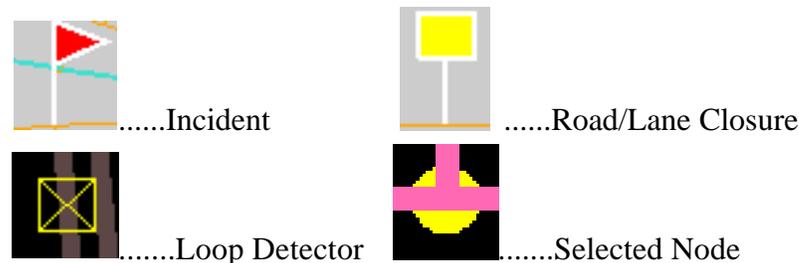


Figure 4-4. Corridor Map Icons

4.1.4 Select Menu

The Select Menu, shown in Figure 4-5, is used to directly select segments on the map without use of the mouse. Using the Select Menu, the operator can select all segments in the database, a specific segment, a set of segments on a specific road, or a specific intersection. Selections that are not displayed on a portion of the corridor map can be shown by using the locate function. The "Clear" menu item can be used to deselect all segments. The following sections provide more information about selecting segments, roads or intersections. Note that selections are not necessarily displayed

on the corridor map. The operator can use the Locate Menu, see Section 4.1.5, to display a selection that does not appear in the Corridor Map Window.



Figure 4-5. The Select Menu

4.1.4.1 Selecting Segments

Segments can be uniquely selected using a segment identifier. A segment identifier is at most 6 hexadecimal digits long. The input form used to select a segment is shown in Figure 4-6. The operator must enter the segment ID as a hexadecimal number (i.e., 3f4e2). The segment ID for a particular segment is displayed as part of the SIF contents for that segment. Segments are directional and there is a separate identifier for each direction of a two-way road.

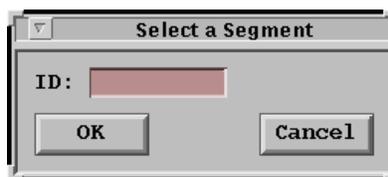


Figure 4-6. Selecting or Locating a Segment

4.1.4.2 Selecting Roads

The input form used to select a road or a portion of a road is shown in Figure 4-7. The operator can select a road by providing the name of a road that he or she intends to select. The name of the road can be entered in upper or lower case. Common prefixes and suffixes may also be used such as "St" or "Rd." The portion of a road between two intersecting roads can be selected using the "Name..." button. The "Name..." button will display a scrolling list, shown in Figure 4-8, of all cross roads on the given road and will allow the operator to select one or more cross roads from the list. To select the portion of a road between two streets (including the ending streets), select all crossroads between the streets in question. If the operator wants to select the portion of a road in a given city, then the

"City..." button should be used. The "All" button selects the entire road.



Figure 4-7. Selecting or Locating a Road

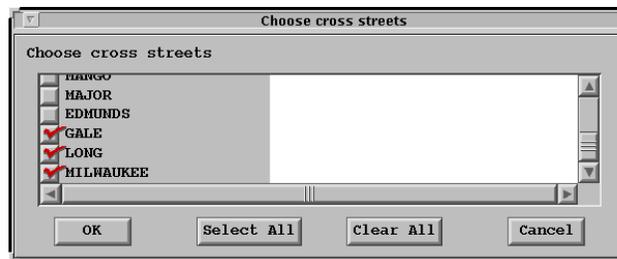


Figure 4-8. Choosing Cross Streets on a Road

4.1.4.3 Selecting an Intersection

The input form used to select an intersection is shown in Figure 4-9. The operator can select an intersection by providing the names of two roads which intersect one another. The two roads should be entered as "road1/road2" where *road1* and *road2* intersect one another and at least one of the roads is a rank 1 or greater street. Common prefixes and suffixes can be used in the road names (i.e. Rd, St, etc.). If more than one such intersection exists, a list will be displayed for each intersection after the operator presses the return key. This allows the operator to select the desired intersection from a list of intersections. The first intersection on the list is used if no intersection is selected from the list. If the intersection is not found, an error message is generated.

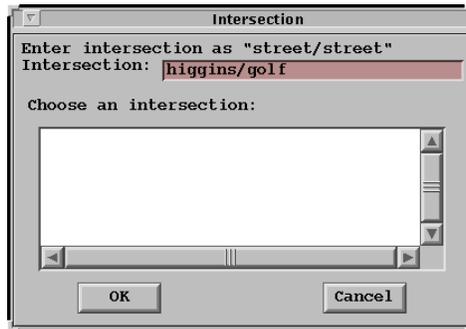


Figure 4-9. Selecting an Intersection

4.1.5 Locate Menu

The Locate Menu, shown in Figure 4-10, is used to quickly locate and display a portion of the road network. Selecting "Selection" will cause the map to be centered on the middle of the current selection. Selecting "Last Incident" will cause the map to be centered on the last active incident entered into the database. The remaining locate menu items require the user to enter a segment, link, intersection, road name, loop detector identifier, or latitude and longitude coordinates using similar windows. The entry will be placed in the center of the Corridor Map Window in each case.

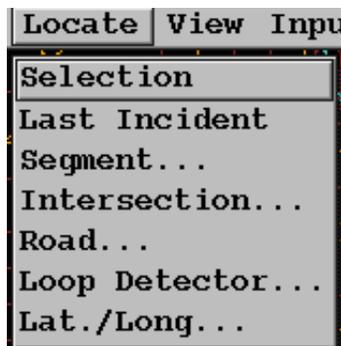


Figure 4-10. The Locate Menu

4.1.5.1 Locating Segments

Segments can be uniquely located using a segment identifier. A segment identifier is at most 6 hexadecimal digits long. The input form used to select a segment is shown in Figure 4-6. The operator must enter the segment ID as a hexadecimal number (i.e., 3f4e2). Segments are directional and there is a separate identifier for each direction of a two-way road.

4.1.5.2 Locating an Intersection

An intersection can be located by providing the names of two roads which intersect one another, see Figure 4-11. The two roads should be entered as "*road1/road2*" where *road1* and *road2* intersect one another and are rank 1 or greater streets. Common prefixes and suffixes can be used in the road names (i.e. Rd, St, etc.). If more than one such intersection exists, a list will be displayed for each intersection after the operator presses the return key. This allows the operator to select the desired intersection from a list of intersections. If no intersection is selected from the list, the first intersection is used. If the intersection is not found, an error message is generated.

4.1.5.3 Locating Roads

A road or a portion of a road can be located by providing the name of the road, see Figure 4-7. The name of the road can be entered in upper or lower case. Common prefixes and suffixes may also be used such as "St" or "Rd." The portion of a road between two intersecting roads can be located using the "Name..." button. The "Name..." button will display a scrolling list, shown in Figure 4-8, of all cross roads on the given road and will allow the operator to select one or more cross roads from the list, see Figure 4-10. To locate the portion of a road between two streets (including the starting and ending streets), select all crossroads between the streets in question. If the operator wants to locate the portion of a road in a given city, then the "City..." button should be used. The "All" button locates the entire road.

4.1.5.4 Locating a Loop Detector

Loop detectors can be located by clicking on the identifier for the loop detector from the list of valid identifiers shown in Figure 4-11. Only one detector can be selected from the list of radio buttons.



Figure 4-11. Locating a Loop Detector

4.1.5.5 Locating using Latitude and Longitude

Latitude and longitude coordinates can be used to identify a location on the map. Figure 4-12 shows the form used to enter latitude and longitude coordinates. Any coordinate entered outside the range of the map database will be moved to the closest boundary of the map. The latitude and longitude at the center of the map will be displayed in the window when the "Locate/Lat./Long." menu item is selected.

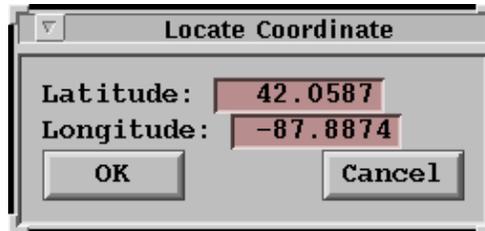


Figure 4-12. Locating Using Latitude and Longitude

4.1.6 View Menu

The View Menu, shown in Figure 4-13, is used to create and remove map displays. Selecting the "Create New" menu item will cause a new map window to be created which will operate independently of the current map window. Selecting the "Close" menu item will remove the current map window.



Figure 4-13. The View Menu

4.1.7 Input Menu

The Input Menu is shown in Figure 4-14. The test map window display can be configured through the "Map Properties" menu item. After selecting the "Map Properties" item from the input menu, a window will appear as shown in Figure 4-15. From this window, the operator can set the colors used to display the various road ranks, map background and boundaries.



Figure 4-14. The Input Menu

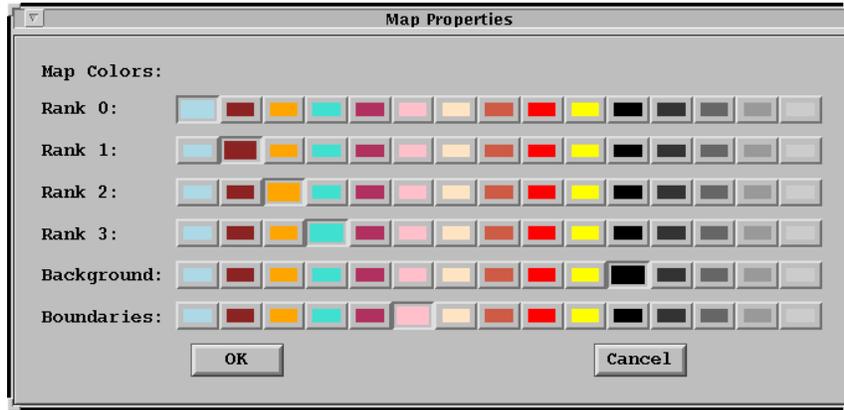


Figure 4-15. Map Properties Window

4.2 Data Windows

Various types of information can be queried from the database pertaining to a selected map object. This section describes in detail the form of the queries that are allowed and the resulting output. The right mouse button can be used in Select mode to bring up the data pop-up menu, see Figure 4-16. This menu will allow the operator to pick the type of data to display on the selected segments. This menu also allows the operator to write the data to a window or printer.

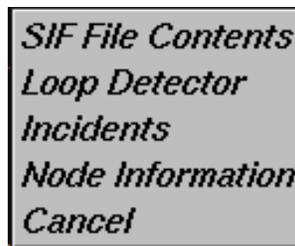


Figure 4-16. The Data Pop-Up Menu

4.2.1 SIF Contents

The Standard Interchange File (SIF) contains the road network structure, and various pieces of

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information about the roads in the network. SIF file data is organized on a segment basis. The data displayed for the SIF file is displayed on a per SIF segment basis as shown in Figure 4-17. Selecting OK from the SIF data window will dismiss the window. Selecting “Print” will print out the current window contents.

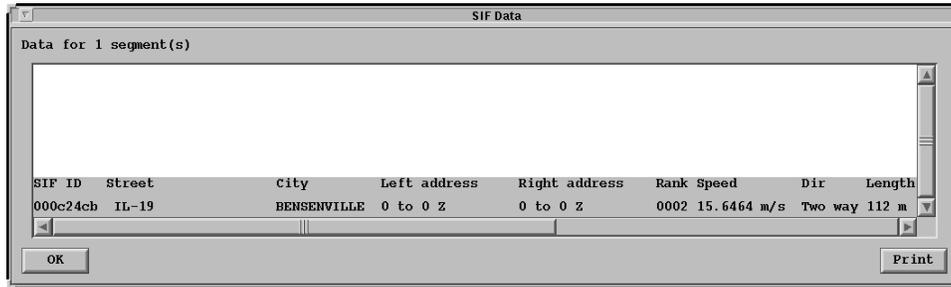


Figure 4-17. SIF File Contents

The following data is shown in the SIF data window:

SIF ID	Rank
Street name	Speed in meters/second
City name	Direction (one-way or two-way)
Left hand side address range	Starting node
Right hand side address range	Ending node

4.2.2 Loop Detector

Loop detector data is received by the C-TIC on a periodic basis. This data can be displayed in a window as shown in Figure 4-18. The data displayed in the loop detector window includes the detector ID, segment ID, street name, 5 minute occupancy, 5 minute volume, travel time and vehicle speed data.

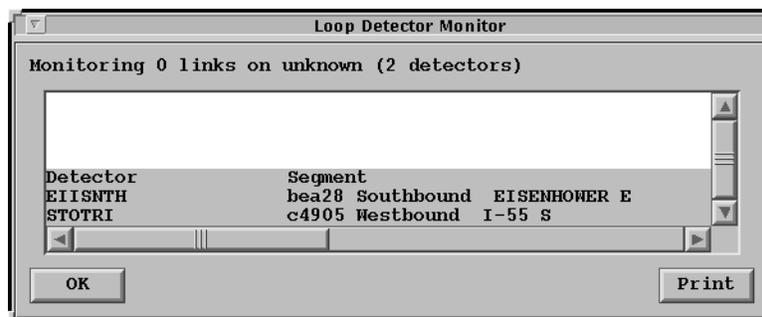


Figure 4-18. Loop Detector Data

4.2.3 Node Information

Information on a selected node can be obtained by selecting “Node Information” from the data pop-up menu. A node can be selected by clicking within 10 meters of an intersection (some zooming may be required), or by using the "Select/Intersection" menu item. There are three types of nodes: subnodes, shapenodes and nodes. Nodes occur where two non-rank 0 streets intersect one another. Subnodes occur where a rank 0 street intersects a higher ranked street. Shapenodes are used to define the shape of a long segment. The information displayed depends on the selected node. Figure 4-19 presents sample node information. The “Segments Starting Here...” button displays a list of segments that begin at the given node. The “Segments Ending Here...” button displays a list of segments that end at the given node. Figure 4-20 presents sample Subnode information. Figure 4-21 presents sample Shapenode information. The "Segment..." button displays segment information relative to the given subnode or shapenode. The Segment Information Window is discussed in the following section.

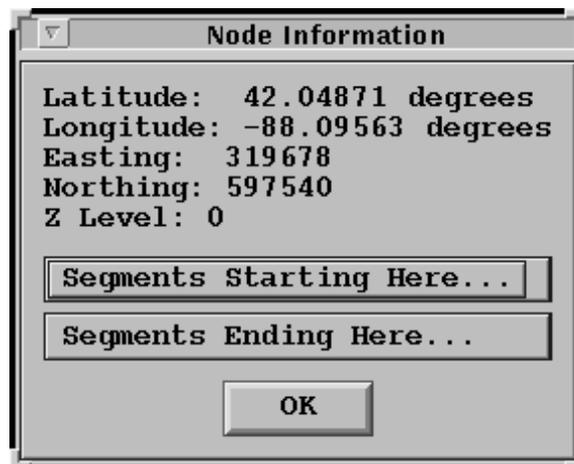


Figure 4-19. Node Information

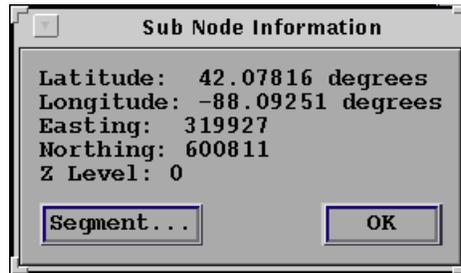


Figure 4-20. Subnode Information

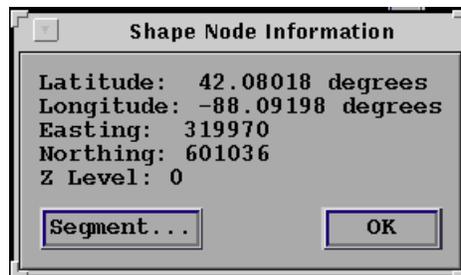


Figure 4-21. Shapenode Information

4.2.4 Segment Information

Segment information, shown in Figure 4-22, can be obtained by simultaneously pressing the "Control" key and left clicking on a segment. Segment information includes SIF ID, street name, rank, length, speed limit, headings, direction and geographical information. Address range information, shown in Figure 4-23, can then be obtained by selecting a road name from the "Addresses..." drop down menu.

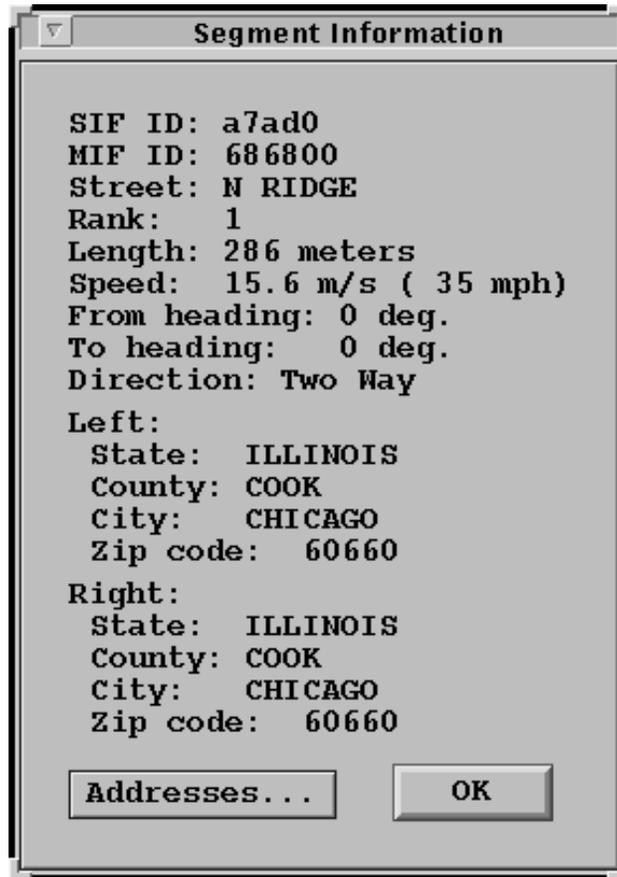


Figure 4-22. Segment Information

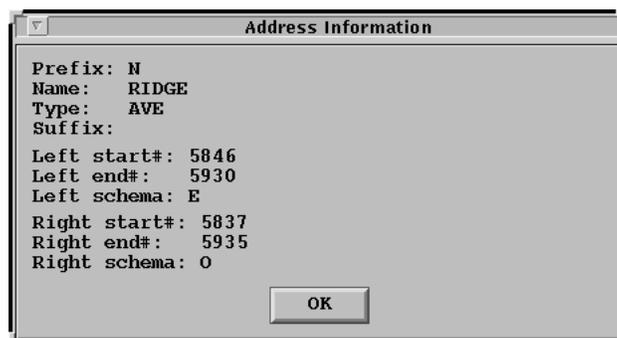


Figure 4-23. Address Information

4.3 Corridor Map Hot Keys

Table 4-1 summarizes the various hot keys which are available to trigger the most commonly used functions on the corridor map.

Hot key	Function
+ or =	Zoom in to current mouse location
- or _	Zoom out
m or M	Toggle between select/zoom modes
0	Display level 0 roadways and above
1	Display level 1 roadways and above
2	Display level 2 roadways and above
3	Display level 3 roadways only
l or L	Toggle legend display on/off
Ctrl + Left Click	Provides SIF info on selected segment

Table 4-1. Summary of Corridor Map Hot Keys

5.0 INTERNET FUNCTIONS

5.1 Expressway Map

The Illinois Department of Transportation (IDOT) Traffic Systems Center (TSC) collects data from the detectorized expressways in the Chicagoland area. This data, in the form of loop detector occupancies and volume counts, is transmitted to the C-TIC in one minute intervals. The C-TIC uses this data to provide an Internet page on behalf of the GCM Corridor containing a graphical view of congestion levels on each expressway and travel times to and from downtown Chicago. The expressway map program accesses this page using the Netscape World Wide Web browser.

To start the expressway map program, select "Expressway Map..." from the C-TIC main menu. After a short delay, the IDOT Detailed Expressway Congestion Map window will be displayed as shown in Figure 5-1.

The time-stamp near the bottom left corner of the window indicates the last time the displayed information was updated. The expressway map initially shows the traffic congestion levels based on the most current set of data. Selecting the "Reload" button located on the menu bar of the Netscape browser displays the latest set of TSC data received at the C-TIC.



Figure 5-1. Detailed Expressway Congestion Map

The colors displayed on the IDOT Detailed Expressway Congestion Map indicate the level of congestion along each segment of detectorized expressway. The congestion level is based on the occupancy level for each detector. Occupancy is the percentage of time a car is occupying a detector. A summary of the congestion levels, their related occupancy ranges and map colors are presented in Table 5-1.

Congestion Level	Occupancy	Segment Color
None	Less than 19%	green
Light	Greater than or equal to 19% but less than 29%	yellow
Heavy	Greater than or equal to 29% but less than 49%	brown
Extreme	Greater than or equal to 49%	red

Table 5-1. Congestion Level Summary

There are several locations on the expressway map where a left mouse click will bring up additional information. These locations are shown in Figure 5-1:

Clicking on the **GCM** logo displays the Gary-Chicago-Milwaukee Corridor Project home page. This page is described in Section 5.2.

Clicking on an expressway name or icon displays a detailed text list of the congestion levels at each detector and the calculated speed of vehicles at each detector - see Section 5.3.

Clicking on a travel time box displays a text list of travel times - see Section 5.4, and

Clicking anywhere else displays a help screen.

5.2 GCM Home Page

The GCM Homepage is displayed by clicking on the **GCM** logo on the expressway congestion map. The GCM Homepage is shown in Figure 5-2. From the GCM Homepage, the following categories of information are available by clicking on the underlined text:

- A description of the GCM project,
- IDOT Detailed Expressway Congestion Map - see Figure 5-1,
- Condensed Expressway Congestion Map,
- Expressway Data - Detailed information on individual expressways - see Section 5.3,
- Travel Times - Travel times to and from the downtown Chicago - see Section 5.4,
- Answers to the most frequently asked questions (FAQ) about the home page,
- New additions to the GCM Homepage, and
- Coming attractions to the GCM Homepage.

GCM Corridor Transportation Information Center

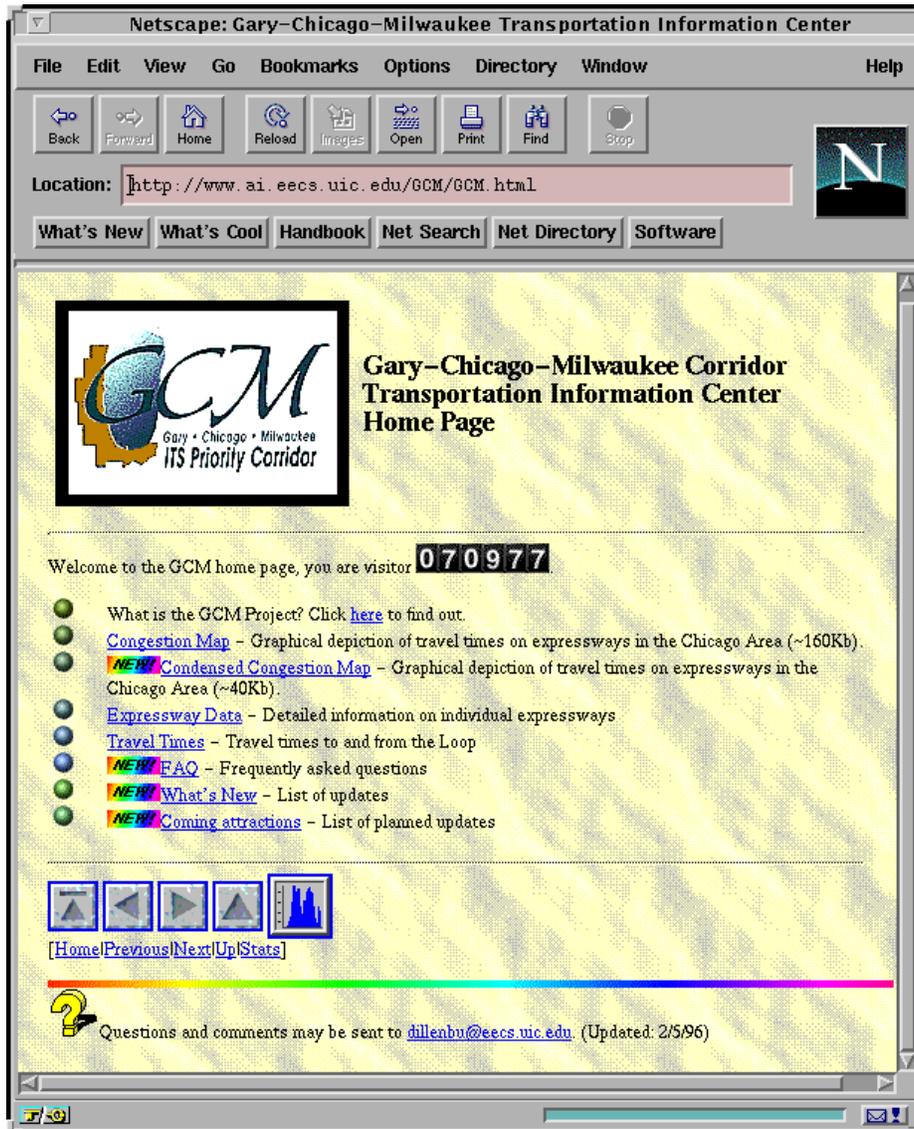


Figure 5-2. GCM Homepage

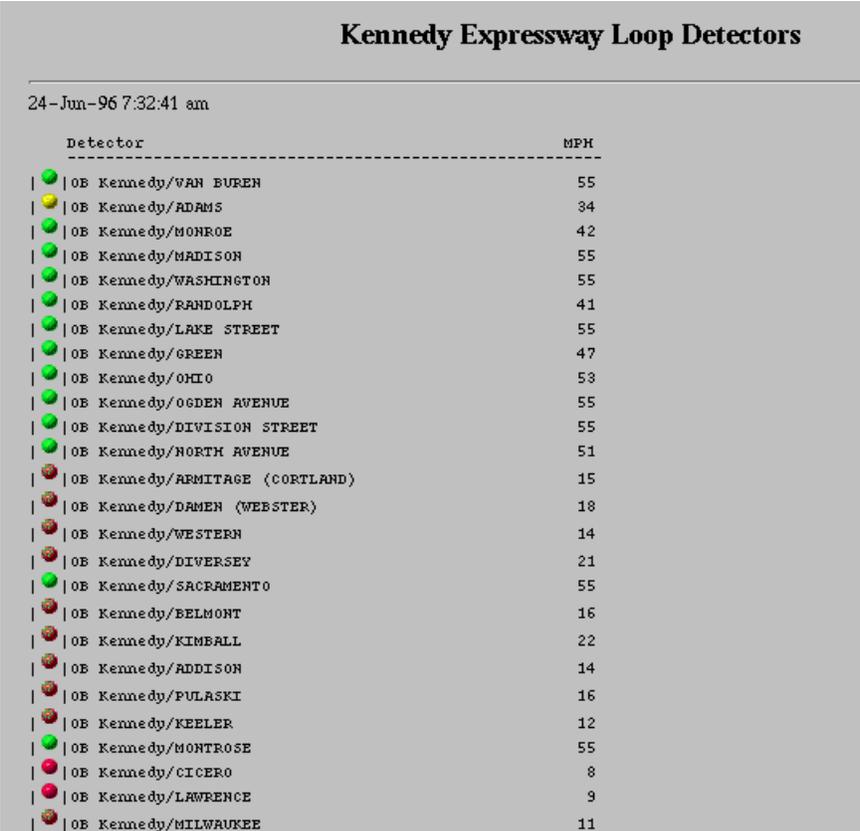
The Condensed Expressway Congestion Map allows lower speed connections to efficiently access the TSC data. The following sections describe the functions of the Expressway Data and Travel Times information categories.

5.3 Expressway Data

The expressway data page presents a listing of expressways for which detailed detector information is available. The following expressways are listed:

Edens	Kennedy	Interstate 57
Eisenhower	Elgin-O'hare	Kingery Highway
Dan Ryan	Stevenson	Eisenhower
Lake Shore Drive	Calumet	Extension

The detailed loop detector information for a particular expressway can be obtained by clicking on the appropriate expressway name or symbol on the Expressway Congestion Map shown in Figure 5-1. Figure 5-3 shows example data for the Kennedy Expressway.



Kennedy Expressway Loop Detectors

24-Jun-96 7:32:41 am

Detector	MPH
OB Kennedy/VAN BUREN	55
OB Kennedy/ADAMS	34
OB Kennedy/MONROE	42
OB Kennedy/MADISON	55
OB Kennedy/WASHINGTON	55
OB Kennedy/RANDOLPH	41
OB Kennedy/LAKE STREET	55
OB Kennedy/GREEN	47
OB Kennedy/OHIO	53
OB Kennedy/OGDEN AVENUE	55
OB Kennedy/DIVISION STREET	55
OB Kennedy/NORTH AVENUE	51
OB Kennedy/ARMITAGE (CORTLAND)	15
OB Kennedy/DAMEN (WEBSTER)	18
OB Kennedy/WESTERN	14
OB Kennedy/DIVERSEY	21
OB Kennedy/SACRAMENTO	55
OB Kennedy/BELMONT	16
OB Kennedy/KIMBALL	22
OB Kennedy/ADDISON	14
OB Kennedy/PULASKI	16
OB Kennedy/KEELER	12
OB Kennedy/MONTRORSE	55
OB Kennedy/CICERO	8
OB Kennedy/LAWRENCE	9
OB Kennedy/MILWAUKEE	11

Figure 5-3. Kennedy Expressway Data

5.4 Travel Times

The Travel Times Page, shown in Figure 5-4, presents travel time information to and from the loop along each of the major expressways. This page is identical to the page that results from clicking on a travel time box shown Figure 5-1.



The screenshot shows a web page titled "Travel Times" with a timestamp "24-Jun-96 7:28:55 am". Below the title is a table with two columns: "Destination" and "Travel Time (min)". The table lists various destinations and their corresponding travel times in minutes.

Destination	Travel Time (min)
Kennedy outbound from the Loop to Armitage	6
Kennedy outbound from the Loop to Montrose (Edens Merge)	23
Kennedy outbound from the Loop to O'hare Airport	54
Edens outbound from the Loop to Old Orchard	44
Edens outbound from the Loop to Deerfield Rd.	54
Dan Ryan outbound from the Loop to Calumet/I-57 merge (95th)	12
Stevenson outbound from the Loop to Harlem Ave.	13
Stevenson outbound from the Loop to the Tri-State Tollway	21
Eisenhower outbound from the Loop to Harlem Ave.	23
Eisenhower outbound from the Loop to the Tri-State Tollway	40
Eisenhower outbound from the Loop to Rt. 53	51
Lakeshore Drive N. outbound from the Loop to Bryn Mawr Avenue	11
Lakeshore Drive S. outbound from the Loop to Jeffery Blvd.	16
I-57 outbound from the Loop to Interstate-80	29
Calumet outbound from the Loop to Kingery	27
Kingery outbound from the Loop to the state line	34
Edens inbound from Deerfield Rd. to the Loop	47
Edens inbound from Old Orchard to the Loop	37
Kennedy inbound from O'hare Airport to the Loop	32
Kennedy inbound from Montrose (Edens) to the Loop	20
Kennedy inbound from Armitage to the Loop	6
Eisenhower inbound from Rt. 53 to the Loop	36
Eisenhower inbound from the Tri-State Tollway to the Loop	25
Eisenhower inbound from Harlem Ave. to the Loop	16
Stevenson inbound from the Tri-State Tollway to the Loop	29
Stevenson inbound from Harlem Ave. to the Loop	21
Dan Ryan inbound from Calumet/I-57 merge to the Loop	31
Lakeshore Drive N. inbound from Bryn Mawr Ave. to the Loop	11
Lakeshore Drive S. inbound from Jeffery Blvd. to the Loop	10
I-57 inbound from Interstate-80 to the Loop	49
Calumet inbound from Kingery to the Loop	50
Kingery inbound from the state line to the Loop	55

Figure 5-4. Travel Times Page

6.0 C-TIC ACCOUNT EDITOR

The C-TIC Account Editor provides a means for C-TIC accounts to be added, removed or edited. A C-TIC account is necessary in order for a user to access the functionality of the C-TIC. There are two levels of access, console operator and system administrator. Users with console privileges are not given access to any functionality which significantly effects the operation of the C-TIC. Users with administrator privileges have console access privileges and can additionally perform more significant operations such as shutting down individual C-TIC processes or deleting user accounts. Therefore, users limited to console access need not be familiar with the operations of the C-TIC Account Editor as its functions are available to users with administrator privileges only.

6.1 Main Menu

The main menu for the C-TIC Account Editor is shown in Figure 6-1. Above the main menu is an *account list* for users who currently have access to the C-TIC, each account is listed on a separate line. There are three columns in the account list, Login, Admin and User Name. The *Login* column gives the character string which is used to log in to the C-TIC. This string is limited to 8 lower case characters. The *Admin* column indicates whether or not a user has administrator access. A "Yes" indicates administrator access, a "No" indicates console user access. The *User Name* column displays the full name and/or a description of the account. User passwords are not displayed.

The *Remove User* and *Edit User* functions require that an account be selected before they will work. To select an account, position the mouse over a line and click the left mouse button. The scrollbars can be used to display additional accounts.

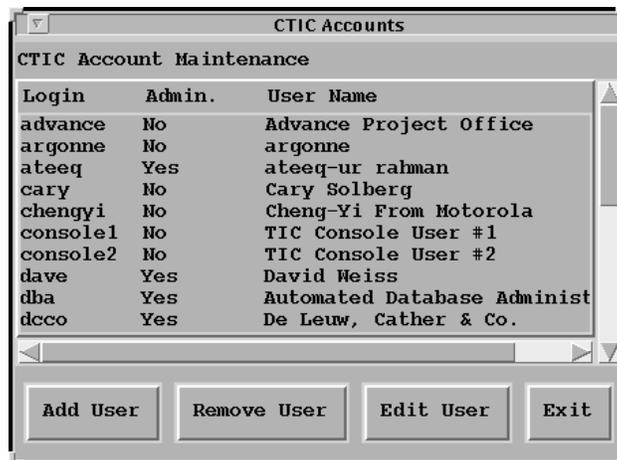


Figure 6-1. C-TIC Account Editor Main Menu

6.2 Adding a C-TIC Account

To add a C-TIC account, start by clicking on the “Add User” button in the main menu. This will bring up a window which prompts for the login identifier for the new account, see Figure 6-2. The login identifier must be from 1 to 8 characters long and all the characters must be lowercase. Any upper case characters will be converted to lower case. Hit the Return key or the “OK” button to continue entering the rest of the account information, or hit the ESC key or the “Cancel” button to stop the add user function.

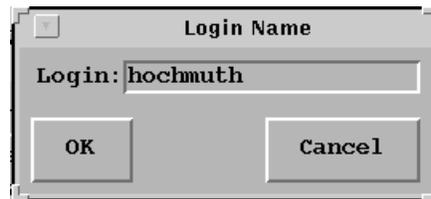


Figure 6-2. Adding an Account

After the login identifier has been entered, the Edit Account Window, shown in Figure 6-3, will be displayed. The user name and access privileges for the newly created account are entered using this window. The user name can contain both upper and lower case characters and any punctuation mark except for a colon (:). There is no limit on the length of the user name. Once the user name and access privileges have been entered, hit the Return key or the “OK” button to add the account, or hit the ESC key or the “Cancel” button to cancel the operation.



Figure 6-3. Editing a Newly Created Account

Once an account has been created, the user can log in by entering their log in identifier at the “Login:” prompt of the Login Window. Refer to Section 3 for a complete description of procedures for logging in to the C-TIC and establishing a password.

6.3 Removing a C-TIC Account

Removing an account will eliminate a user's access privileges and invalidate their login identifier. All files in the removed account will be deleted. To remove an account, select an account from the account list by clicking on it with the left mouse button and then click on the “Remove User” button in the Account Editor Main Menu. Click on the “Yes” button in the confirmation window to complete the removal or click on “No” to cancel the operation.

6.4 Editing a C-TIC Account

The user name, access privileges, and password can be changed for any C-TIC account. To edit an account, first select an account by clicking the left mouse button on it and then clicking on the “Edit User” button in the Account Editor Main Menu. The Edit Account Window for an existing user will appear as shown in Figure 6-4. Clicking on the “Reset Password” button will remove the password for an account so that the next time the user logs-in, they will be prompted to enter a new password. Note that any changes made to an account with the Edit Account Window will not take effect until the user logs-off and back on.

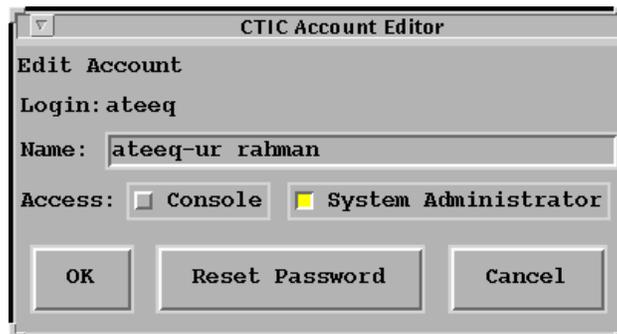


Figure 6-4. Editing an Existing Account

7.0 C-TIC SUBSYSTEM CONTROLLER

The C-TIC Subsystem Controller is primarily used to monitor the status of the individual C-TIC processes. The C-TIC process hierarchy is shown in Figure 7-1.

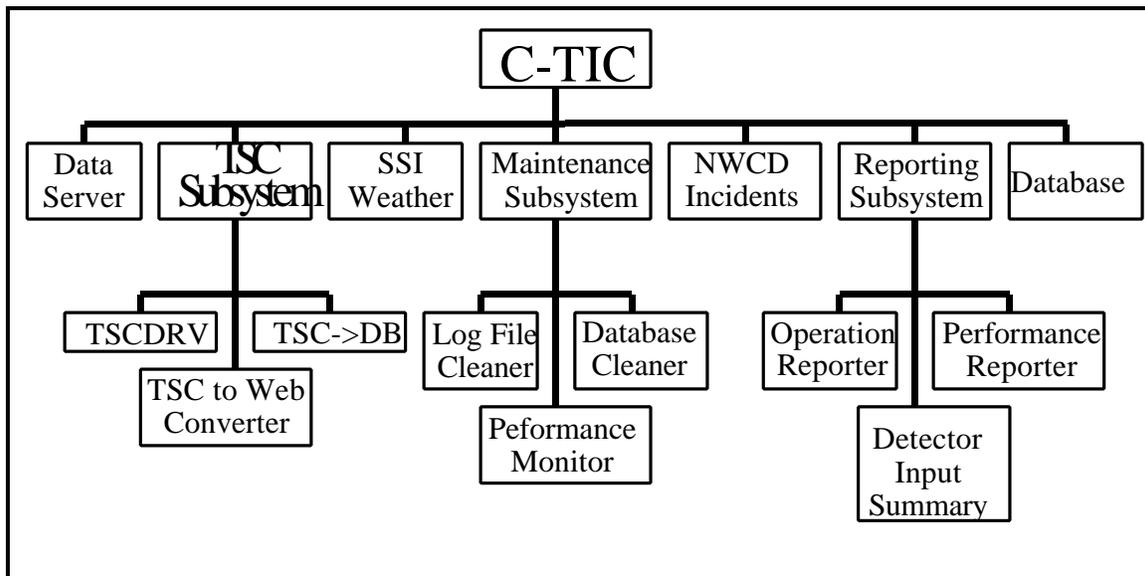


Figure 7-1. C-TIC Process Hierarchy

The structure of the C-TIC Subsystem Controller is based on the C-TIC process hierarchy. The C-TIC Subsystem Controller is started from the main C-TIC menu, see Section 3.4. The C-TIC Subsystem Controller Window is shown in Figure 7-2. The current time and date is displayed at the top of this window. The operator can click on the small caret () icons to reveal or hide the processes nested within the Subsystem Controller tree. Clicking on the carrot next to the “C-TIC” button will reveal the “Data Server”, “TSC Subsystem”, “SSI”, “NWCD Incidents”, “Database”, “Maintenance Subsystem” and “Reporting Subsystem” buttons. Clicking on the carrot next to the C-TIC button will hide all processes. Clicking on the carrots next to the “TSC Subsystem”, “Maintenance Subsystem” and “Reporting Subsystem” will reveal or hide the processes related to each subsystem.

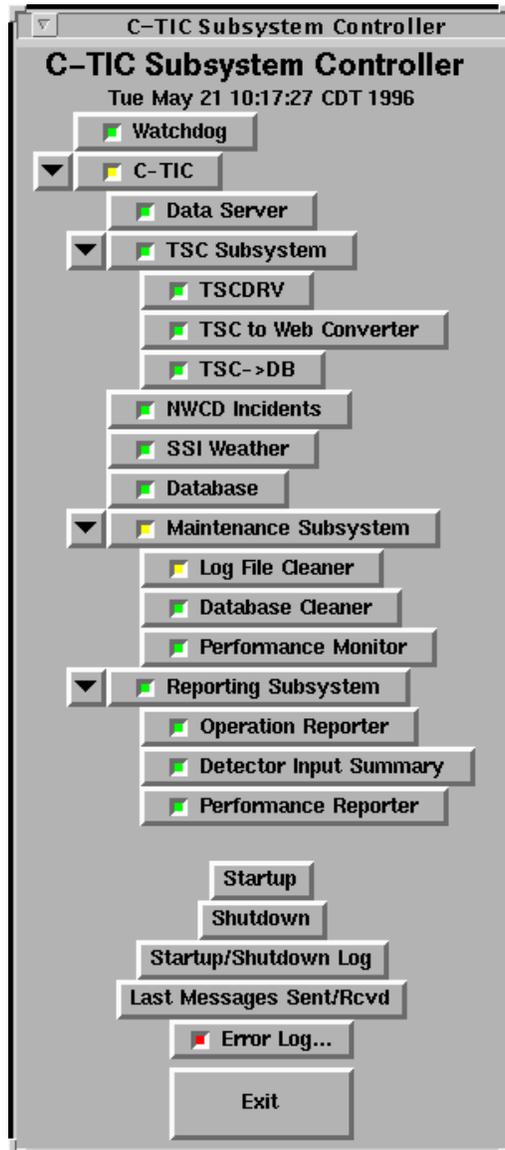


Figure 7-2. The C-TIC Subsystem Controller

The Subsystem Controller contains a single column of buttons. The colored square within each button indicates the operating status of each process. The status of each process is indicated, in descending order, as follows:

green - the process has not detected any error conditions

yellow - the process has detected an error but can continue to function properly

red - the process has detected an error and can no longer function properly

magenta (violet) - the process has detected a hardware malfunction and can no longer function properly

grey - the process has been turned off

The colored squares in the “C-TIC”, “TSC Subsystem”, “Maintenance Subsystem” and “Reporting Subsystem” buttons reflect the worst case status of the processes nested within each. If the colored indicator for the TSCDRV process was red, for example, the colored indicators in the “TSC Subsystem” and “C-TIC” buttons would also be red.

The process buttons are also used to view logfiles, view status windows, reset log files, clear errors, and startup or shutdown each individual process. The operator can right click on any process button to display the Process Control Pop-Up Menu shown in Figure 7-3. The contents of this pop-up menu are discussed in the following sections.



Figure 7-3. The Process Control Pop-Up Menu

7.1 Viewing Process Logfiles

The operator can view a logfile for a selected process by right clicking on its respective button and selecting the “Logfile...” menu item. The resulting logfile window contains any data and error messages associated with the program in question. The log file viewer has two modes of operation: auto-update and command mode. The auto-update mode displays new information as it is generated by the process, no commands can be entered while in auto-update mode. The command mode allows the operator to use Log File Viewer commands. Log File Viewer commands are presented in Table 7-1. To enter command mode from auto-update mode, press the “Control” and “C” keys

on its respective button and selecting the “Clear Errors” menu item. Note that clearing process errors returns the colored indicator to green.

7.3 Starting and Stopping Processes

If a process is not operating, then it can be started by right clicking on its respective button and selecting the “Startup” menu item. Operators with Administrator privileges can stop the operation of a selected software process by right clicking on its respective button and selecting the “shutdown” menu item. Prior to stopping a process, a confirmation window, will appear requiring the operator to acknowledge the shutdown. The Shutdown Confirmation Window is shown in Figure 7-5.



Figure 7-5. Shutdown Confirmation Window

7.4 Starting and Stopping the C-TIC

Operators with Administrator privileges can shutdown all C-TIC processes by using the "Shutdown" button at the bottom of the C-TIC process controller. Similarly, all process can be started using the “Startup” button. A C-TIC startup can be performed by users with operator privileges as well. When starting the C-TIC, all processes must be shutdown and all windows must be closed. The C-TIC startup will be delayed until these conditions have been met. The Startup/Shutdown Log, shown in Figure 7-6, will list messages related to starting and shutting down the C-TIC or individual processes. This list includes the name of the user initiating the startup or shutdown and when the processes where started or stopped. The Startup/Shutdown Log can be viewed by selecting the “Startup/Shutdown Log” button on the C-TIC Subsystem Controller.



```
Startup/Shutdown Log
Mon May 13 23:59:50 CDT 1996 lain starting rldr
Tue May 14 00:29:55 CDT 1996 lain starting ldis
Tue May 14 23:59:50 CDT 1996 lain starting rldr
Wed May 15 00:29:50 CDT 1996 lain starting ldis
Wed May 15 23:59:45 CDT 1996 lain starting rldr
Thu May 16 00:29:48 CDT 1996 lain starting ldis
Thu May 16 00:44:05 CDT 1996 lain starting tscToDB
Thu May 16 23:59:51 CDT 1996 lain starting rldr
Fri May 17 00:29:54 CDT 1996 lain starting ldis
Fri May 17 08:00:38 CDT 1996 lain stopping rldr
Fri May 17 08:37:39 CDT 1996 dillenbu stopping dbCleaner
Fri May 17 08:38:39 CDT 1996 dillenbu starting dbCleaner
Fri May 17 08:40:43 CDT 1996 dillenbu stopping dbCleaner
Fri May 17 08:41:05 CDT 1996 dillenbu starting dbCleaner
Fri May 17 23:59:59 CDT 1996 dillenbu starting rldr
Sat May 18 00:30:02 CDT 1996 lain starting ldis
Sat May 18 10:00:53 CDT 1996 dillenbu stopping rldr
Sat May 18 23:59:41 CDT 1996 dillenbu starting rldr
Sun May 19 00:29:44 CDT 1996 lain starting ldis
Sun May 19 23:59:50 CDT 1996 dillenbu starting rldr
Mon May 20 00:29:54 CDT 1996 lain starting ldis
Tue May 21 00:00:01 CDT 1996 dillenbu starting rldr
Tue May 21 00:29:34 CDT 1996 lain starting ldis
Waiting for data... (interrupt to abort)
```

Figure 7-6. Startup and Shutdown Logfile

7.5 Additional Buttons

The bottom portion of the C-TIC Subsystem Controller window contains three buttons labeled "Last messages sent/rcvd," "Error Log...," and "Exit." Clicking on the "Last messages sent/rcvd" button displays the window shown in Figure 7-7. This display shows the date and time the latest data was received from each input source connected to the C-TIC.

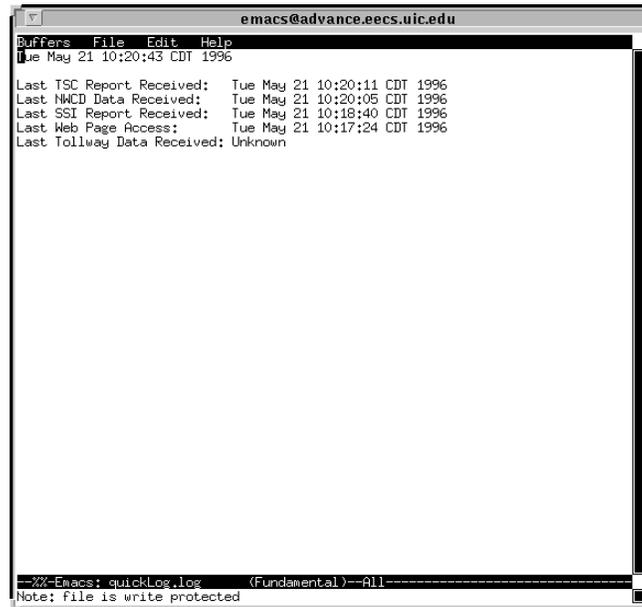


Figure 7-7. Last Messages Sent/Received Log

The "Error Log..." button has a indicator square in it that is colored red when an error has occurred. Clicking on the "Error Log..." button will display the C-TIC log file viewer. After viewing the log file, the light will be turned off until the next error is generated. The "Exit" button is used to exit out of the C-TIC Subsystem Controller program. Exiting the program does not affect the operation of the C-TIC.

7.6 C-TIC Processes

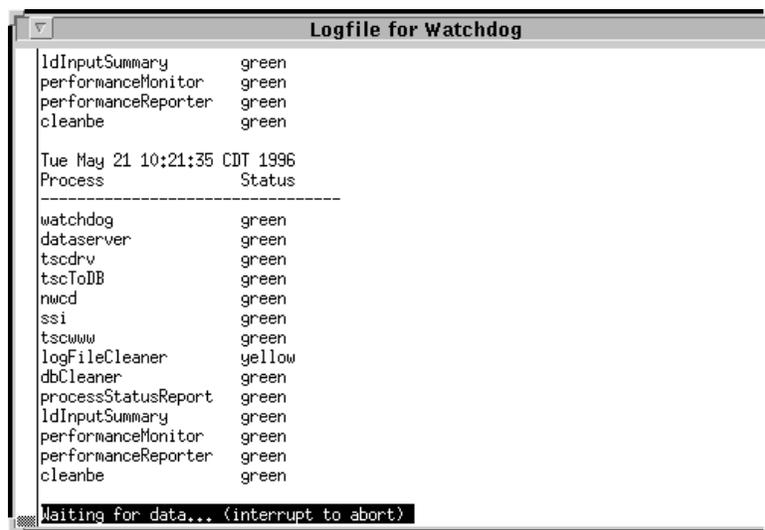
Each C-TIC process is responsible for maintaining a different subsystem of the C-TIC. The C-TIC processes are started when the C-TIC is powered up and remain running so long as the C-TIC is operational. The processes communicate with each other, the external world (via communication ports), and with the C-TIC database. Each process can be in one of two states as far as the C-TIC is concerned: running or not running. If a process is not running, then the associated C-TIC subsystem and any subsystems which depend on it will not be operational. The sections that follow provide a brief explanation of each C-TIC process, the processes it depends on and the processes that use it.

7.6.1 Watchdog

Depends on: none

Uses it: none

The Watchdog process is responsible for insuring that all other processes are running. If a process were to stop unexpectedly, then the Watchdog process would restart it. Note that the Watchdog process is not included in the process hierarchy shown in Figure 7-1 due to its peripheral monitoring function within the C-TIC. The Watchdog process will not generate any error messages and will not have a status window. The log file for the Watchdog process, shown in Figure 7-8, includes the status of each process updated once each minute.



```
Logfile for Watchdog
ldInputSummary      green
performanceMonitor  green
performanceReporter green
cleanbe             green

Tue May 21 10:21:35 CDT 1996
Process             Status
-----
watchdog            green
dataserver          green
tscdrv              green
tscToDB             green
nwcd                green
ssi                 green
tscwww              green
logFileCleaner     yellow
dbCleaner           green
processStatusReport green
ldInputSummary     green
performanceMonitor  green
performanceReporter green
cleanbe             green

Waiting for data... (interrupt to abort)
```

Figure 7-8. Watchdog Logfile

7.6.2 Data Server

Depends on: none

Uses it: TSC->DB

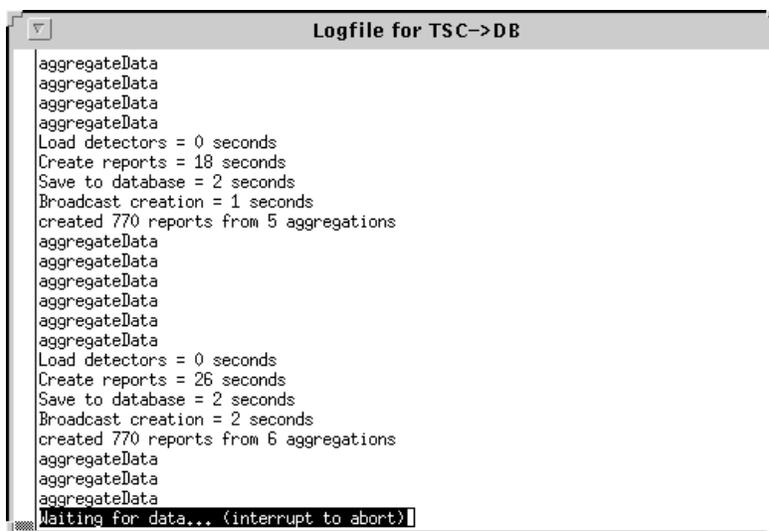
The Data Server process is responsible for transferring data between the other C-TIC processes and is therefore a critical part of the C-TIC. The logfile for the Data Server, shown in Figure 7-9, contains some startup information and an occasional error message.

7.6.4 TSC->DB

Depends on: Data Server, TSCDRV and Database

Uses it: none

The TSC->DB process takes formatted, one minute data from the TSCDRV process, aggregates it into 5 minute intervals and then stores the aggregated data into the C-TIC database. The TSC->DB logfile contains timing information which is useful in determining database performance, the number of aggregations done and the number of reports written to the C-TIC database. The timing information includes the amount of time required to load the loop detector data from the database, create new data reports, save the reports to the database, and to broadcast the data to the other C-TIC processes via the Data Server process. Figure 7-11 presents the TSC->DB Logfile.



```
Logfile for TSC->DB
aggregateData
aggregateData
aggregateData
aggregateData
Load detectors = 0 seconds
Create reports = 18 seconds
Save to database = 2 seconds
Broadcast creation = 1 seconds
created 770 reports from 5 aggregations
aggregateData
aggregateData
aggregateData
aggregateData
aggregateData
Load detectors = 0 seconds
Create reports = 26 seconds
Save to database = 2 seconds
Broadcast creation = 2 seconds
created 770 reports from 6 aggregations
aggregateData
aggregateData
aggregateData
Waiting for data... (interrupt to abort)
```

Figure 7-11. TSC->DB Logfile

7.6.5 TSC to Web Converter

Depends on: TSCDRV

Uses it: none

This process supports the Internet Web pages for the GCM project. These pages include the IDOT Expressway Congestion Map.

7.6.6 NWCD Incidents

Depends on: none

Uses it: none

The NWCD Incidents process receives data from the Northwest Central Dispatch center and displays this data in its logfile. Figure 7-12 presents the NWCD Incidents Logfile.

```
Logfile for NWCD Incidents
#TIC: New Incident Type CDTF
Incident History for: #EGP9631633

Entered      06/24/96  00:06:50  BY 2134A  20504
Dispatched   06/24/96  00:06:50  BY 2134A  20504
Enroute      06/24/96  00:06:50
Onscene      06/24/96  00:06:50

Initial Type: TS      Initial Alarm Level:   Final Alarm Level:
Final Type: TS      (TRAFFIC STOP) Pri: 3 Dispo:
Police BLK  Fire BLK
M Page:  Group: P02 Beat:  Src: R
Loc: UNKNOWN

Loc Info:
Name:                Addr:                Phone:

/0006 (20504 ) $OUTSRV      ,NO MORE INFORMATION
/0006                *DISPOS  2134A      #20504 HANSEN, EDWARD R
                        ,NO MORE INFORMATION

#PAP9603327: /0007 (GCC1 ,***** ) *ENHOSP A17  [HOSPITAL
]
#PAP9626862: /0008 (8344A ,8129 ) *CLEAR 8344A
#PAP9626862: /0009 (8142A ,8161 ) *MISC 8142A ,7113,411,9,290, TONY J PAROC
^advance!cticl,0/Logs/nwcd.out
```

Figure 7-12. NWCD Incidents Logfile

7.6.7 SSI Weather

Depends on: none

Uses it: none

This process receives weather related data from weather stations located in the corridor. Figure 7-13 presents the SSI Weather Logfile.

```
Logfile for SSI Weather

RPU 0 reports temp = 23.33 [deg C]
RPU 1 reports temp = 21.11 [deg C]
RPU 2 reports temp = 16.67 [deg C]
RPU 4 reports temp = 20.00 [deg C]
RPU 5 reports temp = 18.33 [deg C]
RPU 6 reports temp = 20.00 [deg C]
RPU 7 reports temp = 19.52 [deg C] [G], wet roads
RPU 8 reports temp = 20.00 [deg C]

Overall average temp 19.87 [deg C] 67.77 [deg F]

Weather Data Summary from ScanCPU 558 at Tue May 21 10:23:41 1996
-----
RPU 0 reports temp = 23.33 [deg C]
RPU 1 reports temp = 21.11 [deg C]
RPU 2 reports temp = 20.00 [deg C]
RPU 4 reports temp = 21.67 [deg C]
RPU 5 reports temp = 20.00 [deg C]
RPU 6 reports temp = 22.22 [deg C]
RPU 7 reports temp = 22.23 [deg C] [G], wet roads
RPU 8 reports temp = 21.67 [deg C]

Overall average temp 21.53 [deg C] 70.75 [deg F]
Waiting for data... (interrupt to abort)
```

Figure 7-13. SSI Weather Logfile

Weather data is collected from 9 stations. Table 7-2 presents the location of each SSI weather detector.

RPU #	Weather Detector Location
0	Dan Ryan Expressway
1	I-55 Kankakee River Bridge
2	IL-173 Piscasaw Creek Bridge
3	I-290 DesPlaines River
4	Elgin O'Hare Expressway
5	IL-64 Virgil Drainage Ditch
6	US-34 Fox River Bridge
7	I-80 Joliet
8	IL-53 Dundee Road

Table 7-2. SSI Weather Detector Locations

7.6.8 Operation Reporter

Depends on: All

Uses it: none

This process uses timestamps logged by the Watchdog and other related processes to track the status of each process. Process status is displayed as the amount of time each C-TIC process is green, yellow, red, magenta or gray (off). The output from this process is available as a standard report. See Section 9.3.2. Figure 7-14 presents the Operation Reporter Logfile.

GCM Corridor Transportation Information Center

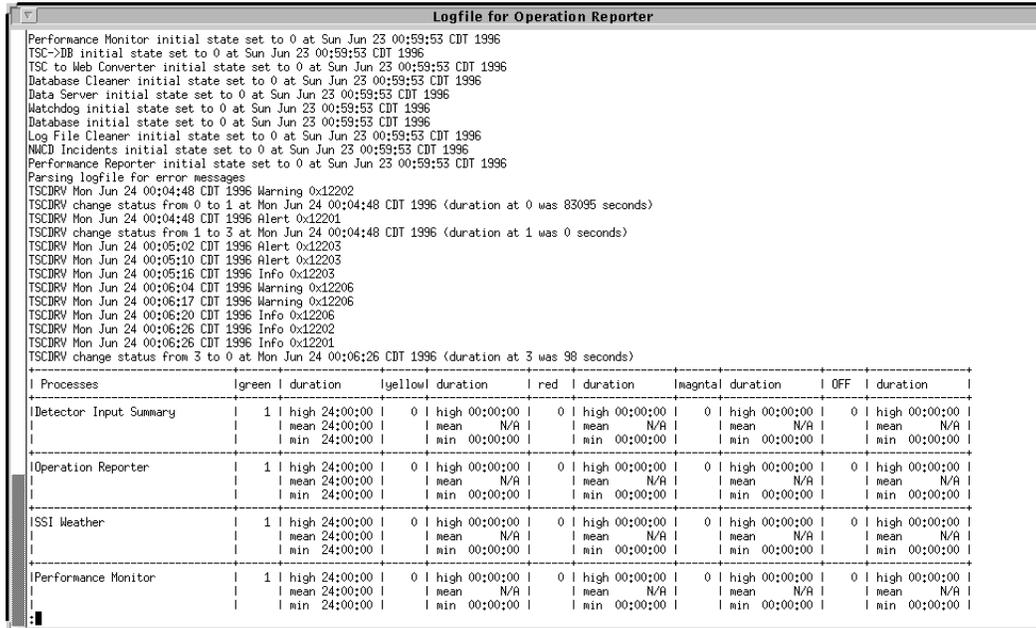


Figure 7-14. Operation Reporter Logfile

7.6.9 Performance Reporter

Depends on: Performance Monitor

Uses it: none

This process takes information from the Performance Monitor Logfile and graphically displays 24 hour summaries of eight performance measures. The output from this process is available as a standard report. See Section 9.3.3.

7.6.10 Detector Input Summary

Depends on: none

Uses it: none

This process summarizes the number of reports the C-TIC receives from each TSC loop detector. The output from this process is available as a standard report. See Section 9.3.1.

7.6.11 Database

Depends on: none

Uses it: TSC->DB

This is the Versant database process. It can be shutdown to speed up database backups.

7.6.12 Log File Cleaner

GCM Corridor Transportation Information Center

Depends on: none

Uses it: none

This process removes information contained in any process logfile that is more than 7 days old on a nightly basis.

7.6.13 Database Cleaner

Depends on: none

Uses it: none

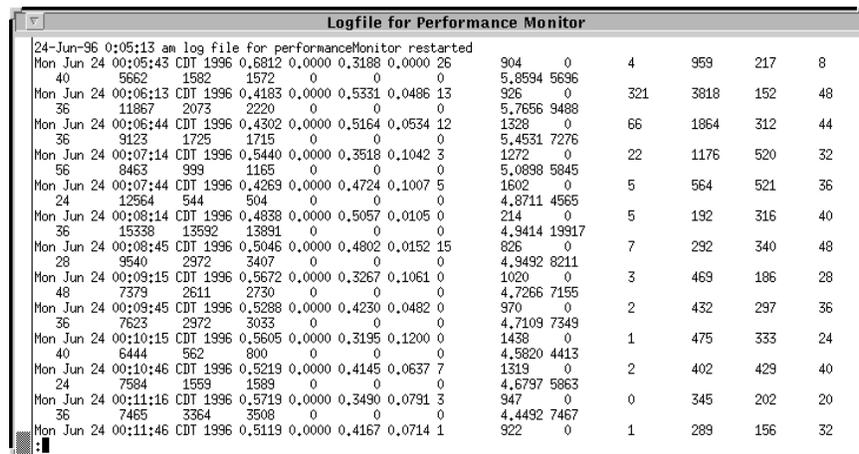
This process removes any information contained in the C-TIC database that more than 7 days old on a nightly basis.

7.6.14 Performance Monitor

Depends on: none

Uses it: *Performance Reporter*

This process collects various C-TIC performance measures and saves them to a log file. These measures include processor load, processor utilization and disk transactions per second.



The screenshot shows a window titled "Logfile for Performance Monitor" containing a table of performance data. The data is organized into rows, each representing a specific date and time. Each row contains multiple columns of numerical values, likely representing different performance metrics such as processor load, utilization, and disk transactions per second. The data points are recorded at regular intervals, such as every 15 seconds, as indicated by the timestamps (e.g., 00:05:43, 00:06:13, etc.).

Date/Time	CDT	1996	0,6812	0,0000	0,3188	0,0000	26	904	0	4	959	217	8
Mon Jun 24 00:05:43	CDT	1996	0,6812	0,0000	0,3188	0,0000	26	904	0	4	959	217	8
40	5662	1582	1572	0	0	0	5,8594	5696					
Mon Jun 24 00:06:13	CDT	1996	0,4183	0,0000	0,5331	0,0486	13	926	0	321	3818	152	48
36	11867	2073	2220	0	0	0	5,7656	9488					
Mon Jun 24 00:06:44	CDT	1996	0,4302	0,0000	0,5164	0,0534	12	1328	0	66	1864	312	44
36	9123	1725	1715	0	0	0	5,4531	7276					
Mon Jun 24 00:07:14	CDT	1996	0,5440	0,0000	0,3518	0,1042	3	1272	0	22	1176	520	32
56	8463	999	1165	0	0	0	5,0898	5845					
Mon Jun 24 00:07:44	CDT	1996	0,4269	0,0000	0,4724	0,1007	5	1602	0	5	564	521	36
24	12564	544	504	0	0	0	4,8711	4565					
Mon Jun 24 00:08:14	CDT	1996	0,4838	0,0000	0,5057	0,0105	0	214	0	5	192	316	40
36	15338	13592	13831	0	0	0	4,3414	19317					
Mon Jun 24 00:08:45	CDT	1996	0,5045	0,0000	0,4802	0,0152	15	626	0	7	292	340	48
28	9540	2972	3407	0	0	0	4,3492	8211					
Mon Jun 24 00:09:15	CDT	1996	0,5572	0,0000	0,3267	0,1061	0	1020	0	3	469	186	28
48	7379	2611	2730	0	0	0	4,7266	7155					
Mon Jun 24 00:09:45	CDT	1996	0,5288	0,0000	0,4230	0,0482	0	970	0	2	432	297	36
36	7623	2972	3033	0	0	0	4,7109	7349					
Mon Jun 24 00:10:15	CDT	1996	0,5605	0,0000	0,3195	0,1200	0	1438	0	1	475	333	24
40	6444	562	800	0	0	0	4,5820	4413					
Mon Jun 24 00:10:46	CDT	1996	0,5219	0,0000	0,4145	0,0637	7	1319	0	2	402	429	40
24	7584	1559	1589	0	0	0	4,6797	5863					
Mon Jun 24 00:11:16	CDT	1996	0,5719	0,0000	0,3490	0,0791	3	947	0	0	345	202	20
36	7465	3364	3508	0	0	0	4,4492	7467					
Mon Jun 24 00:11:46	CDT	1996	0,5119	0,0000	0,4167	0,0714	1	922	0	1	289	156	32

Figure 7-15. Performance Monitor Logfile

8.0 ARCHIVE & BACKUP UTILITIES

Archive and backup utilities are available by selecting the “Backup Utilities...” item from the C-TIC Main Menu (see Section 3.4). The Backup Utilities Menu, shown in Figure 8-1, allows the operator to backup C-TIC files, archive files, perform database backups, manage C-TIC files, and list files or database backups on a tape. The following sections provide a detailed description of these tasks. A tape must be loaded in the C-TIC tape drive prior to performing each of these tasks.

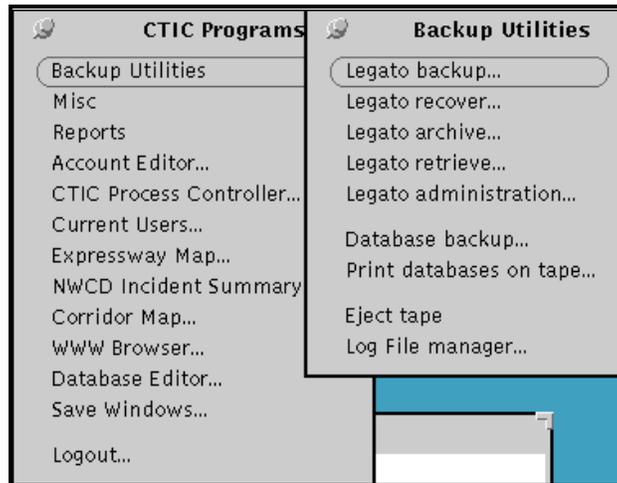


Figure 8-1. The Backup Utilities Menu

8.1 Legato Functions

8.1.1 Legato Administrator

The Legato NetWorker Administrator function is accessed by selecting the “Legato Administration...” item from the Backup Utilities Menu. The NetWorker Administration Window, shown in Figure 8-2, allows you to label and mount tapes in order to perform a backup or archive. Backup or archive volumes must be labeled before NetWorker can backup or archive files to them. NetWorker uses these labels to track and identify the contents of the backup or archive volumes. When you start a recover or retrieve, NetWorker automatically determines the necessary volume(s) and requests them by label name. This enables the operator to quickly locate backup or archive volumes required for recovering or retrieving a file.

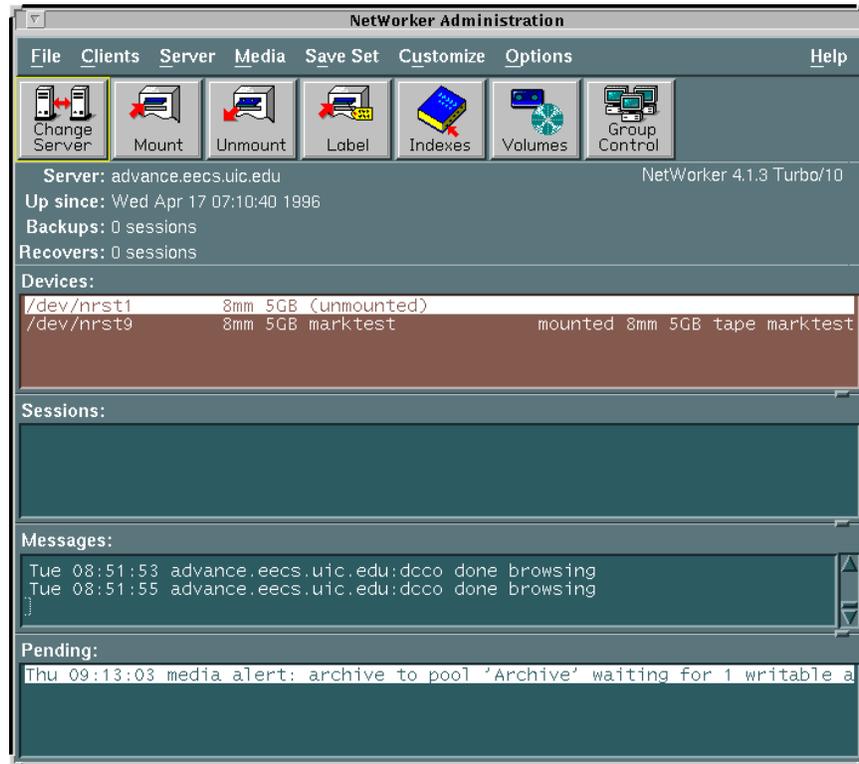


Figure 8-2. NetWorker Administration Window

The operator must also mount the backup or archive volumes after labeling them before proceeding with the backup or archive. To begin, load a blank media tape in the C-TIC main computer. Highlight the device in the “Devices” display in the NetWorker Administrator Window. Click the “Label” speedbar button. Enter a name into the “Volume name” field for the backup or archive (the operator does not need to select a pool because the default pool is already selected). Click the “Mount after labeling” box and then click the “OK” button to label and mount the backup or archive volume. A dialog box appears asking the operator to confirm your request (NetWorker asks for confirmation because existing data on a volume is lost when you relabel a volume). Click “OK” to confirm the labeling request or “Cancel” to quit the request. The name of the mounted volume appears next to the device name in the “Devices” display in the NetWorker Administrator Window. Once a tape is mounted and labeled by Leagto Administrator, the operator can proceed with backup and archive operations.

8.1.1 Legato Backup

This function is used to backup individual files or whole directories. The Legato Networker Backup function is accessed by selecting the “Legato Backup...” item from the Backup Utilities Menu. This function saves marked information on tape as a precaution in the case of a system failure. The Legato Networker Backup Window is shown in Figure 8-3.

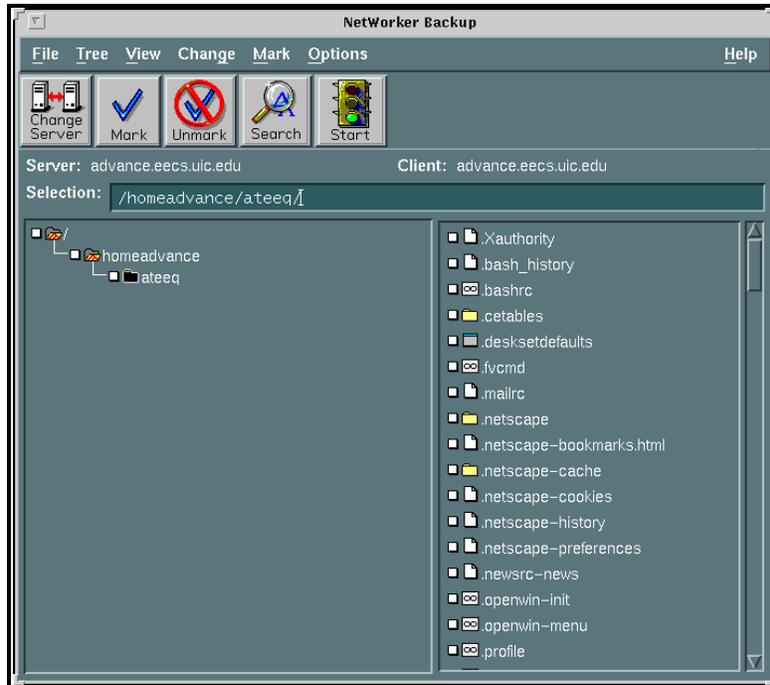


Figure 8-3. The Legato Networker Backup Window

While in the NetWorker Backup Window, the operator should click the check boxes or highlight the directories or files to backup and click the “Mark” speedbar button. Next, click the “Start” speedbar button and click the “OK” button in the Backup Options Dialog Box shown in Figure 8-4. The Backup Status Window will appear displaying the status of the backup. When the backup is completed, click the “Cancel” button in the Backup Options Dialog Box to close the window.

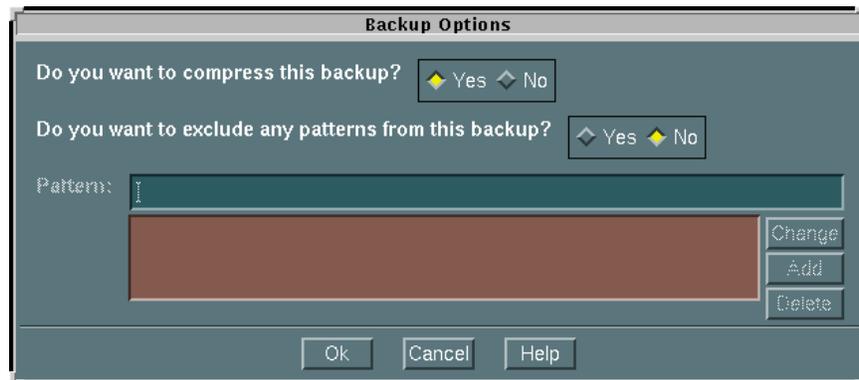


Figure 8-4. Backup Options Dialog Box

8.1.2 Legato Recover

The Legato Networker Recover function is accessed by selecting the “Legato Recover...” item from the Backup Utilities Menu. This function recovers data previously saved on tape and places it on the C-TIC system in the instance of a system failure where active data is lost. NetWorker displays entries in the NetWorker Recover Window for the files it saved during a backup. The operator should select the file or directory to recover from the list of entries. Click the “Start” speedbar button to begin the recover and click the “OK” button in the Conflict Resolution Dialog Box. Click the “Cancel” button to close the Recover Status Dialog Box after the recover completion time message appears.

8.1.3 Legato Archive

The Legato Networker Archive function is accessed by selecting the “Legato archive...” item from the Backup Utilities Menu. The layout of the Legato Networker Archive Window is identical to the Legato Networker Backup Window shown in Figure 8-2. While in the Legato Archive Window, mark the directory to archive. Click the “Start” speedbar button or choose “Start Archive” from the “File” pull down menu. The Archive Options Dialog Box, shown in Figure 8-5, appears. The “Archive Title” field shows the pathname of the currently selected directory or file. Type a comment in the “Annotation” field to reference the contents of the archive for future retrieval. Specify the “Volume Pool” as “Archive” from the arrow on the side of the “Archive Pool” field. Click the arrow again to close the list. In the “Operations” list, click “Verify” (this will verify that the data on archive media matches the data on local disk). Click “Groom” to remove files and directories from the C-TIC local disk after archiving is complete. Click the “Archive” button to continue. The Archive Status Dialog Box appears showing the archive process. Click “Cancel” to stop the archive process. A dialog box appears asking for confirmation. Click “OK” to stop the archive or “Cancel” to continue. The Archive Status Dialog Box provides the archive start time and the archive completion time. The

names of the archived files and directories scroll across the Archive Status Dialog Box as the archive proceeds. When the archive completes, the full pathname of the directory, the amount of data, the time elapsed and the number of the files archived are displayed.

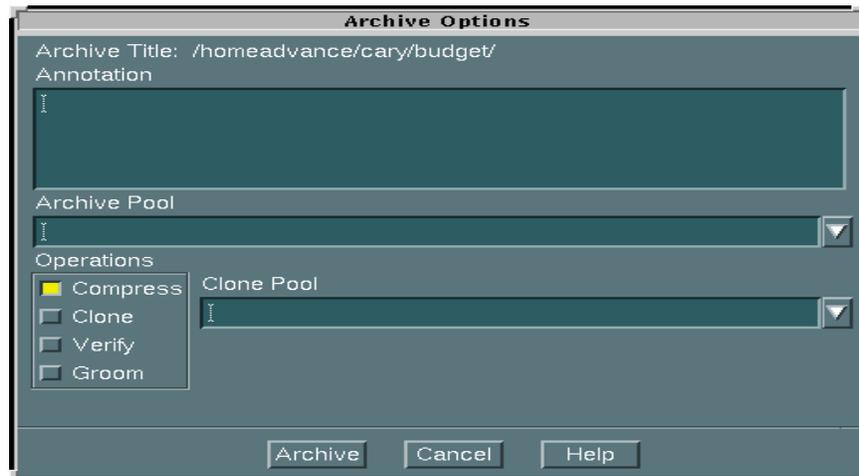


Figure 8-5. Archive Options Dialog Box

8.1.4 Legato Retrieve

The Legato NetWorker Retrieve function is accessed by selecting the “Legato Retrieve...” item from the Backup Utilities Menu. The Retrieve function copies files back to C-TIC local disk from archive volumes. The NetWorker Retrieve Window has fewer menus than the other NetWorker windows. Since archived save sets are not maintained in the online file index, the Tree, View, and Mark Menus are not present. The File, Change, Options and Help Menus are navigated in the same manner described for the NetWorker Backup, NetWorker Recover and NetWorker Archive Windows.

When you start the NetWorker Retrieve program, the “Archives” scrolling list is empty. The currently selected server is indicated directly beneath the speedbar. To display a list of archive save sets available on the currently selected server, click the “Query” button. The window displays a list of the archived save sets available for retrieval. Click the line containing the required save set in the “Archives” list in the NetWorker Retrieve Window. Select “Start Retrieve” from the “File” menu. Specify a new or existing directory in the “Relocate To” field if needed as retrieved files are copied to their original location by default. Click the “Overwrite Existing Files” box if you want NetWorker to replace existing files on the local disk with files retrieved from the archive volumes. If you do not select this option, NetWorker prompts you to resolve naming conflicts. Click the “OK” button to start the retrieval. The appropriate archive volume(s) must be mounted (See 8.1.1). During the retrieve operation, messages appear in the status field to inform the operator of the progress. To stop

the retrieve process, or to dismiss the Retrieve Status Dialog Box before retrieval has begun, click the "Cancel" button.

8.2 Database Backup

The Database Backup utility is used to save the data in the C-TIC database to tape or a file. The Database Backup utility does not require that the C-TIC be shutdown in order to obtain a consistent backup of the data in the C-TIC database. There are a number of options to select when performing a database backup:

Level - This indicates how much data will be saved. A level 0 backup saves all the data. A level 1 backup saves all the data which has been modified or created since the last level 0 backup (this is also known as an incremental backup). A level 2 backup saves all the data which has been modified or created since the last level 1 backup (another type of incremental backup).

Position - Selecting "Current" will overwrite the data on the tape, "Append" will append the backup to the end of the tape.

Device - This should be set to either "/dev/nrst9" for the tape drive, or to the name of a file to save the backup into (i.e., "/home/idot/db.dat").

Comment - This text is saved along with the backup and will be listed when a "Print databases on tape..." report is done.

8.3 Print Databases on Tape

This menu item generates a report of all the database backups which have been saved on the tape currently inserted in the tape drive. The report includes the date, time, database name, level and comment associated with each backup. The report is sent to the printer when it is completed.

8.4 Ejecting a Tape

Tapes can be ejected from the tape drive by selecting the "Eject tape" option from the Backup Utilities menu or by pressing the soft black button below the tape drive.

8.5 Log File Manager

The log file manager is a standard desktop application that is included with the C-TIC's operating system. Its operation is similar to that of standard file managers.

9.0 REPORTS

Report utilities are available by selecting the “Reports...” item from the C-TIC Main Menu (see Section 3.4). The Reports Menu, shown in Figure 9-1, allows an operator or administrator to generate reports summarizing current disk usage, files on tape, loop detector input, process operations and system performance.

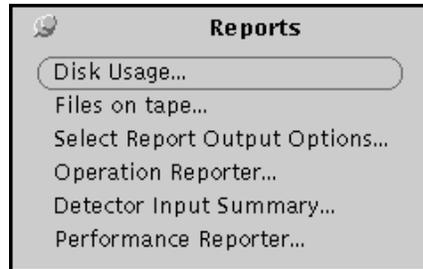


Figure 9-1. Reports Menu

There are three types of standard reports available from the C-TIC; Detector Input Summary, Operation Report and Performance Report. These standard reports are automatically generated each night by the C-TIC.

9.1 Disk Usage Report

The Disk Usage Report provides information on the amount of storage used on each of the hard drives attached to the C-TIC. The disk usage report is presented on the screen and can be saved to a file or sent to the printer after it has been completed. An example report is shown below:

Disk Usage Report generated on Tue Oct 03 11:18:47 CDT 1995

Filesystem	kbytes	used	avail	capacity	Mounted on
/dev/sd3a	19751	10320	7456	58%	/
/dev/sd3g	520047	420523	47520	90%	/usr
/dev/sd4c	1952573	1116364	640952	64%	/usr/local
/dev/sd3h	385095	164003	182583	47%	/homeadvance
/dev/sd0c	1255494	804091	325854	71%	/advance1
/dev/sd1c	1255494	1029197	100748	91%	/advance2
/dev/sd2c	1255494	787440	342505	70%	/advance3
/dev/sd7g	915334	325691	498110	40%	/tmp
/dev/sd5f	914542	257242	565846	31%	/advance4
/dev/sd6f	914542	344910	478178	42%	/advance5
/dev/sd7e	457263	61288	350249	15%	/advance6
/dev/sd5g	914542	407830	415258	50%	/advance7
/dev/sd6g	914542	322789	500299	39%	/advance8

The file systems listed in the first column of the report store the following data:

File system	Mounted On	Description
/dev/sd3a	/	System files
/dev/sd3g	/usr	System files
/dev/sd4c	/usr/local	System files
/dev/sd3h	/homeadvance	User files
/dev/sd0c	/advance1	Current log files
/dev/sd1c	/advance2	Archived data
/dev/sd2c	/advance3	NavTech data
/dev/sd7g	/tmp	Current log files
/dev/sd5f	/advance4	Database
/dev/sd6f	/advance5	Database
/dev/sd7e	/advance6	Database
/dev/sd5g	/advance7	Database
/dev/sd6g	/advance8	Archived log files

9.2 Files on Tape

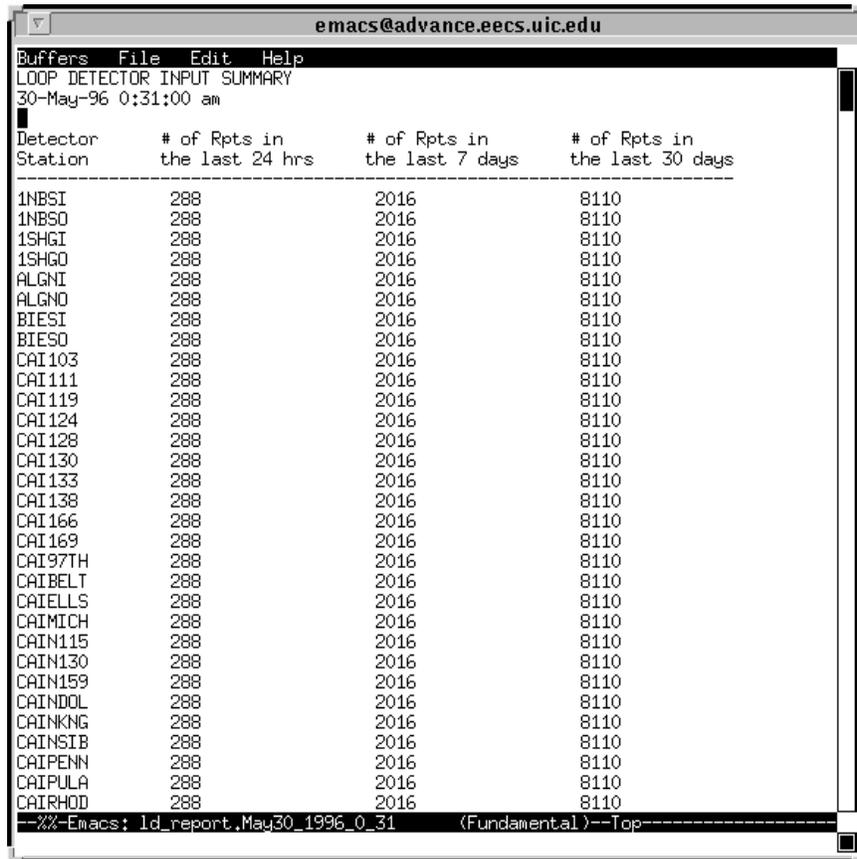
This report generates a list of all the files saved on all the backups on the tape currently inserted in the tape drive. Refer to Section 8 for more details.

9.3 Standard Reports

Three types of standard reports are produced by the C-TIC: Detector Input Summary, Operation Reporter and Performance Reporter.

9.3.1 Detector Input Summary

The Detector Input Summary presents the number of reports received at the C-TIC from each individual loop detector in the last 24 hours, 7 days and 30 days. This report is automatically generated by the system each night. The output from this report, shown in Figure 9-2, is written to a file by default. The operator can select the "Detector Input Summary..." menu item to generate this report at any time. The output from this report can be directed to a file or to the printer (See Section 9.3.4).



```
emacs@advance.eecs.uic.edu
Buffers File Edit Help
LOOP DETECTOR INPUT SUMMARY
30-May-96 0:31:00 am
Detector      # of Rpts in      # of Rpts in      # of Rpts in
Station       the last 24 hrs   the last 7 days   the last 30 days
-----
1NBSI         288                2016              8110
1NBSO         288                2016              8110
1SHGI         288                2016              8110
1SHGO         288                2016              8110
ALGNI         288                2016              8110
ALGNO         288                2016              8110
BIESI         288                2016              8110
BIESO         288                2016              8110
CAI103        288                2016              8110
CAI111        288                2016              8110
CAI119        288                2016              8110
CAI124        288                2016              8110
CAI128        288                2016              8110
CAI130        288                2016              8110
CAI133        288                2016              8110
CAI138        288                2016              8110
CAI166        288                2016              8110
CAI169        288                2016              8110
CAI97TH       288                2016              8110
CAIBELT       288                2016              8110
CAIELLS       288                2016              8110
CAIMICH       288                2016              8110
CAIN115       288                2016              8110
CAIN130       288                2016              8110
CAIN159       288                2016              8110
CAINDOL       288                2016              8110
CAINKNG       288                2016              8110
CAINSIB       288                2016              8110
CAIPENN       288                2016              8110
CAIPULA       288                2016              8110
CAIRHOD       288                2016              8110
--%%-Emacs: ld_report.May30_1996_0_31 (Fundamental)--Top-----
```

Figure 9-2. Detector Input Summary Output

9.3.2 Operation Report

The Operation Report summarizes the status of each process over the last 24 hour period. This report, shown in Figure 9-3, is automatically generated and printed by the system each night. The operator can select the “Operation Reporter...” menu item to generate this report at any time. The output from this report can be directed to a file or to the printer (See Section 9.3.4).

GCM Corridor Transportation Information Center

Processes	green	duration	yellow	duration	red	duration	magntal	duration	OFF	duration
Detector Input Summary	1	high 23:31:03 mean 23:31:03 min 23:31:03	1	high 00:28:57 mean 00:28:57 min 00:28:57	0	high 00:00:00 mean N/A min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00
Operation Reporter	1	high 24:00:00 mean 24:00:00 min 24:00:00	0	high 00:00:00 mean N/A min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00
SSI Heather	1	high 24:00:00 mean 24:00:00 min 24:00:00	0	high 00:00:00 mean N/A min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00
Performance Monitor	1	high 24:00:00 mean 24:00:00 min 24:00:00	0	high 00:00:00 mean N/A min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00
ITSC->DB	1	high 24:00:00 mean 24:00:00 min 24:00:00	0	high 00:00:00 mean N/A min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00
ITSCDRV	2	high 23:04:56 mean 11:59:08 min 00:53:21	1	high 00:00:00 mean 00:00:00 min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00	1	high 00:01:43 mean 00:01:43 min 00:01:43	0	high 00:00:00 mean N/A min 00:00:00
ITSC to Web Converter	1	high 24:00:00 mean 24:00:00 min 24:00:00	0	high 00:00:00 mean N/A min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00	0	high 00:00:00 mean N/A min 00:00:00

Figure 9-3. Operation Report Output

9.3.3 Performance Report

The Performance Report presents a 24 hour, graphical summary of eight C-TIC performance measures including processor load, processor utilization and disk transactions per second. This report is automatically generated and printed by the system each night. The operator can select the “Performance Reporter...” menu item to generate this report at any time. The output from this report can be directed to a file or to the printer (See Section 9.3.4). The performance report is saved as text when directed to a file. The text version of the Performance Report is shown in Figure 9-4.

hour	Load	Util (%)	Swapping	Paging
0	2.4826	0.4697	68	267
1	2.4382	0.4650	66	291
2	2.4642	0.4680	66	255
3	2.5152	0.4822	66	252
4	2.4578	0.4665	66	221
5	2.4313	0.4666	66	232
6	2.3985	0.4666	62	245
7	2.4316	0.4612	66	1676
8	1.6233	0.3576	69	952
9	1.3449	0.3323	72	3
10	1.4200	0.3419	80	59
11	1.3775	0.3319	74	40
12	1.4026	0.3332	74	17
13	1.3534	0.3305	74	6
14	1.4046	0.3396	80	6
15	1.3904	0.3403	82	13
16	1.3998	0.3452	81	10
17	1.5296	0.3562	71	5
18	1.3207	0.3233	72	0
19	1.3149	0.3207	72	0
20	1.3004	0.3220	72	0
21	1.3379	0.3229	72	0
22	1.2969	0.3207	72	0
23	1.3085	0.3226	68	0

Figure 9-4. Performance Monitor Text Output

9.3.4 Select Report Output Options

This menu item allows the operator to direct the output of any standard report to the printer, to a file, or to both. Figure 9-5 presents the Select Report Output Options Window.

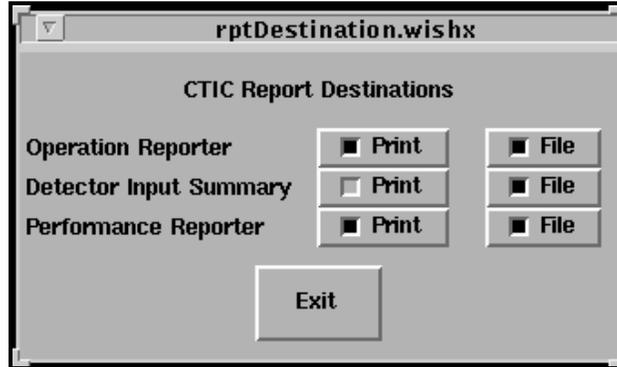
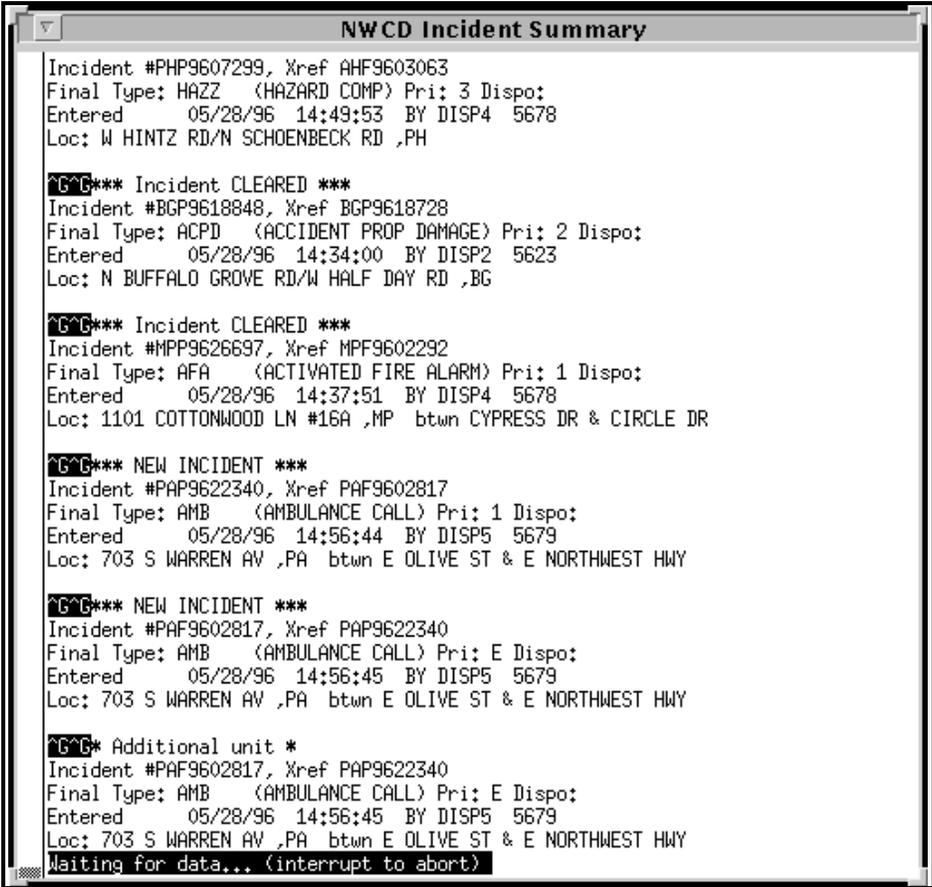


Figure 9-5. Select Report Output Options Window

Selecting a file button will direct the respective report to a file. Selecting the print button will direct the respective report to the printer.

10.0 NWCD INCIDENT SUMMARY

The NWCD Incident Summary Window, shown in Figure 10-1, is created by selecting "NWCD Incident Summary..." from the main C-TIC menu, see Section 3.4. The NWCD Incident Summary Window displays any incident reports received from Northwest Central Dispatch since the NWCD Incidents process was started. Past incidents can be displayed by using the scroll bar on the left hand side of the window. New incident reports will automatically be added to the window as they are received. Note that after resizing this window, the operator must type "F" while the mouse cursor is over the window to resume normal operation of the window.



```

NWCD Incident Summary
Incident #PHP9607299, Xref AHF9603063
Final Type: HAZZ (HAZARD COMP) Pri: 3 Dispo:
Entered 05/28/96 14:49:53 BY DISP4 5678
Loc: W HINTZ RD/N SCHOENBECK RD ,PH

^G^G*** Incident CLEARED ***
Incident #BGP9618848, Xref BGP9618728
Final Type: ACPD (ACCIDENT PROP DAMAGE) Pri: 2 Dispo:
Entered 05/28/96 14:34:00 BY DISP2 5623
Loc: N BUFFALO GROVE RD/W HALF DAY RD ,BG

^G^G*** Incident CLEARED ***
Incident #MPP9626697, Xref MPF9602292
Final Type: AFA (ACTIVATED FIRE ALARM) Pri: 1 Dispo:
Entered 05/28/96 14:37:51 BY DISP4 5678
Loc: 1101 COTTONWOOD LN #16A ,MP btwn CYPRESS DR & CIRCLE DR

^G^G*** NEW INCIDENT ***
Incident #PAP9622340, Xref PAF9602817
Final Type: AMB (AMBULANCE CALL) Pri: 1 Dispo:
Entered 05/28/96 14:56:44 BY DISP5 5679
Loc: 703 S WARREN AV ,PA btwn E OLIVE ST & E NORTHWEST HWY

^G^G*** NEW INCIDENT ***
Incident #PAF9602817, Xref PAF9622340
Final Type: AMB (AMBULANCE CALL) Pri: E Dispo:
Entered 05/28/96 14:56:45 BY DISP5 5679
Loc: 703 S WARREN AV ,PA btwn E OLIVE ST & E NORTHWEST HWY

^G^G* Additional unit *
Incident #PAF9602817, Xref PAF9622340
Final Type: AMB (AMBULANCE CALL) Pri: E Dispo:
Entered 05/28/96 14:56:45 BY DISP5 5679
Loc: 703 S WARREN AV ,PA btwn E OLIVE ST & E NORTHWEST HWY
Waiting for data... (interrupt to abort)

```

Figure 10-1. NWCD Incident Summary